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# THE UNIVERSITY *of* EDINBURGH

College of Arts, Humanities and Social Sciences  
School of Health in Social Science  
Nursing Studies

Declaration for Doctor of Philosophy submission

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- (c) that the work has not been submitted for any other degree or professional qualification except as specified, and
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Signed:

Adam Lloyd



# THE UNIVERSITY *of* EDINBURGH

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School of Health in Social Science

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Presented for Doctor of Philosophy submission

Title of thesis:

A video ethnography of leadership during emergency department resuscitation.

Author's name:

Adam Lloyd

Doctor of Philosophy

The University of Edinburgh

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## Abstract

Background: Leadership during emergency department (ED) resuscitation has traditionally been conceptualised as a singular and hierarchical phenomenon, often with one doctor being designated as the leader of all aspects of the resuscitation episode. This is set against a positivist backdrop which seeks to quantify a leader's behaviours or traits.

Emerging research, however, suggests that leadership can be dynamically shared amongst team members who each contribute to leadership depending on the needs of the group. This research study positions leadership as a team-level concept.

Introduction: The thesis will observe how leadership is expressed in ED resuscitation teams – who initiates leadership, how it is enacted, how it evolves over time – through the lens of shared leadership theory.

### Aim(s)

To study leadership during emergency department resuscitation using a team-level approach.

### Objective(s)

- (1) To develop a team leadership behavioural marker tool that can be used as a framework to identify who displays leadership and how they do this.
- (2) Using a team behavioural marker tool as a framework, conduct a video-based ethnography of leadership based on observations of real patient care episodes.

Methods: This study is a mixed-method ethnography located at a large ED in Scotland, triangulating data from (1) questionnaires, (2) interviews and (3) video recordings of ED resuscitation. Using these methods, a team leadership taxonomy was developed to provide a framework for conducting ethnographic

observations of leadership during resuscitation. Data collection was from July 2015 to July 2018.

Specifically, the methods included:

- (1) one hundred questionnaires were distributed to ED resuscitation staff.
- (2) twenty interviews were conducted with Consultants (n=5), Charge Nurses (n=5), Registrars (n=3), Staff Nurses (n=4) and Foundation Year Doctors (n=3).
- (3) twenty resuscitation episodes were reviewed using video with full ethnographic field notes. Over 300 resuscitation cases were observed in total to immerse the researcher in the resuscitation environment.

Analysis: Based on critical realism, an interpretive analytic framework was used in keeping with ethnography. Thematic analysis was used to develop themes from interviews and observations. Where relevant, descriptive statistics were used when providing quantitative data.

Findings: A team leadership taxonomy was developed using the three discrete data sets with substantial inter-rater reliability ( $\kappa = 0.72$ , 95% CI: 0.62–0.82) (Objective 1). Building on this behavioural taxonomy, four main themes emerged in the ethnography (Objective 2):

- (1) Leadership is conceived and practiced as a plural concept – during twenty resuscitation episodes a total of 323 leadership behaviours were observed (avg=16 per case). In 75% of cases, leadership was shared between 3 or more team members; this finding was corroborated by interview statements, such as *“everyone in that room can have a leadership role”*.
- (2) Leadership is contingent and adaptive – leadership was observed to evolve in response to situational factors, such as patient acuity, the experience of the team and who was present in the room.
- (3) The meaning of leadership is heterogeneous – staff conceptualised leadership differently, with ambiguous semantic boundaries and the identity of the ‘leader’ having multiple meanings.

(4) There is a distinction between nursing and physician leadership – nurses and doctors exhibited leadership differently. Whilst Doctors overtly display leadership, transcripts from interviews and observations highlighted that Nurses' leadership is often 'silent', 'subtle' and 'in the background'.

Conclusion: To view leadership of complex resuscitations as the product one of individual leader risks negating the subtleties of adaptive team performance. Leadership, as reported by clinicians and observed on video during this mixed-method ethnography, is best conceived as a collective group process where individuals dynamically contribute leadership actions depending on situational factors. This conclusion shifts the focus of leadership and its theory away from the individual leader and towards leadership as a shared team construct.

## Lay abstract

**Background:** Leadership of emergency medical situations is often thought to be the role of a senior doctor. Research that seeks to understand leadership, therefore, primarily focusses on the actions of these doctors, despite there being evidence that leadership can be shared between different team members who are providing care.

**Introduction:** This research study will investigate how leadership is enacted by different team members during emergency medical situations in an emergency department (ED).

**Aim and objectives:** The study aims to better understand leadership in ED resuscitation situations. Objective 1 is to design a tool that can be used to measure who displays leadership and how they do this. Objective 2, supported by the first, is to observe resuscitation in detail in a technique known as ethnography.

**Methods:** Data is collected using (1) questionnaires (2) interviews (3) video recordings of patient care episodes in the ED. One hundred questionnaires were distributed to ED resuscitation staff. Twenty Doctors and Nurses (11 Doctors and 9 Nurses) were interviewed. Twenty videos were reviewed using the team rating tool, whilst approximately 300 videos were viewed in total to immerse the researcher in the study environment.

**Findings:** A team rating tool was developed which, when used by a second independent video reviewer, produced consistent results. Four main themes were found when analysing the three sets of data:

(1) Rather than leadership being displayed by a one individual, leadership is almost always distributed between different staff who collectively share the leadership role.

(2) Leadership is affected by different factors, such as the severity of the patient's illness, the resources available, and the personalities of the staff delivering care.

(3) Nurses and doctors describe and enact leadership in different ways. Whilst doctors often clearly demonstrate leadership through their actions or directions, nurses achieve leadership in informal and less obvious ways.

(4) There is no consistent definition of leadership; staff reported a variety of interpretations of which suggests that multiple meanings of leadership exist.

Conclusion: Leadership is practiced as a plural and dynamic team behaviour which involves multiple team members contributing their leadership skills. This conclusion suggests that the study of leadership should focus on team leadership processes rather than on individuals occupying the hierarchical leader role.

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## Research outputs

The work undertaken in this doctoral thesis submission has resulted in several research outputs. A summary of these outputs is provided below:

### **Peer-reviewed journal publications**

**Lloyd A**, Clegg G (2017) Leaders, leading or leadership?: A taxonomic need for emergency care. *International Emergency Nursing*. **33**; 59-60

**Lloyd A**, Dewar A, Edgar S, et al (2017) How to implement live recording in the clinical environment: A practical guide for clinical services. *International Journal of Clinical Practice*. **71**(6); e12951

**Lloyd A**, Lowe D.J, Edgar S, et al (2017) Video recording in the emergency department: a pathway to success. *Emergency Medicine Journal*. **34**:628-630

**Lloyd A**, Clegg G (2017) Resuscitating leadership research. *Resuscitation*. **110**; e1

Lowe D.J, Dewar A, **Lloyd A**, et al (2017) Optimising clinical performance during resuscitation using video evaluation. *Postgraduate Medical Journal*. **93**:449-453

**Lloyd A**, Clegg G (2016) From leaders to leadership in emergency care. *Nursing Times*. **112**; 41/42, 10-12

Lowe D.J, James S.A, **Lloyd A**, Clegg G (2016) Feasibility of EEG to monitor cognitive performance during venous cannulation: EEG Distracted Intravenous Access (E-DIVA) *BMJ Simulation and Technology*. **2**; 68-72

**Lloyd A**, Clegg G, Crouch R (2015) Dynamic nurse leadership in high-pressure situations. *Emergency Nurse*. **23**; 24-5

### **Conference Presentations**

**Lloyd A** (2017) From the sim world to the real world: video recording emergency department trauma. *18th International Trauma Care Conference*, England 2016 (oral)

**Lloyd A**, Connolly C, Middlemiss R, Morris J, Crouch R, Clegg G (2016) 24 hours in A&E: A video analysis of nurses' clinical and non-clinical task performance during live clinical resuscitation episodes. *2nd Global Conference on Emergency Nursing & Trauma Care*, Sitges 2016 (oral)

**Lloyd A**, Clegg G (2016) 'It's a silent leadership': An interview and questionnaire study investigating staff conceptualisations of leadership during emergency department resuscitation. *2nd Global Conference on Emergency Nursing & Trauma Care*, Sitges 2016 (oral)

**Lloyd A**, Clegg G (2016) Leadership during cardiopulmonary resuscitation: a video-analysis of clinical patient episodes. *Scottish Cardiac Arrest Symposium*, Edinburgh 2016 (poster)

Edgar S, Clegg G, Dewar A, Letham K, Lowe D, **Lloyd A** (2016) Video in the healthcare workplace – opportunities to educate and enhance practice. *6<sup>th</sup> National Scottish Medical Education Conference*. Edinburgh 2016

(Accepted)

**Lloyd A**, Black P, Clegg G (2018) 1000 Hours of Observing Nurses: Towards a Theory of Nursing Leadership During Emergency Department Resuscitation. *3rd Global Conference on Emergency Nursing & Trauma Care*, Noordwijkerhout, The Netherlands (oral)

**Lloyd A** (2018) Video lessons from the resus room. Emergency Medicine Research Group Edinburgh 10th Anniversary Conference, Edinburgh (oral)

### **Achievements**

Scottish Nursing, Midwifery and Allied Health Professions Research Awards Finalist 2017 – Early Career Researcher of the Year nominee

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## 1.0 Introduction

Leadership has been extensively researched in a range of resuscitation situations (Hunziker et al 2013). The majority of research has focused on emergency resuscitation teams (ERTs). ERTs, also known as Medical Emergency Teams or Rapid Response Teams, are typically composed of multi-professional, multi-speciality staff that operate as a mobile resuscitation team within a hospital. They are activated when a patient within a ward is deemed critically unwell. This team of doctors, nurses, resuscitation officers and other ancillary staff gather from different services and specialities to provide urgent care to the patient.

Another area of leadership research has focused on emergency department (ED) resuscitation teams. ED-based resuscitation teams are solely composed of ED staff, unless speciality staff input is specifically requested. For example, if a patient has suffered a major trauma event then a surgeon or orthopaedic doctor may be requested to attend the ED. These teams do not provide care to patients out with their service and, when required, gather in designated resuscitation 'rooms' or 'bays' to provide care. Patients admitted here are normally conveyed to accident and emergency departments by ambulance services. The setting of ED resuscitation, as opposed to ERTs, provides the context for this thesis.

### 1.1 The importance of leadership in resuscitation

The need to understand how leadership and other interpersonal skills affect patient care largely came about after a series of landmark reports highlighted that patient care could be improved by focussing on the non-technical skills that complement clinical performance (Institute of Medicine 2000). Since these reports, leadership has predominantly been cast as a non-technical skill that can influence clinical processes and outcomes. An

aggregate look at the literature reveals a consistent and broad consensus that compared with poor leadership, optimum leadership during resuscitation produces better outcomes (Capella et al 2010, Künzle et al 2010).

One example of how this effect is often researched comes from a randomised controlled trial that measured the effect of leadership instructions on simulated resuscitation outcomes (Hunziker et al 2010). The study included 237 medical students in 79 teams of 3. All participants were video-taped during a baseline visit where they took part in a witnessed cardiac arrest scenario. At a follow up visit four months later, the teams were then randomised to receive either technical instruction – arm and body position of the cardiopulmonary pulmonary resuscitation (CPR) provider – or brief leadership instructions.

The leadership instructions included four items: (1) decide what to do; (2) tell your colleagues what they should do; (3) make short and clear statements; (4) ensure adherence to the cardiac arrest algorithm. The primary outcome was length of time that CPR was delivered which is known to be one of the strongest predictors of survival after cardiac arrest (Idris et al 2012, Rea et al 2014). Secondary outcomes included time to start chest compressions, time to defibrillation and time to ventilation.

This study found that those groups who had brief leadership instructions had a median CPR time of 120 seconds, whilst the technical instruction groups delivered CPR for a median of 87 seconds ( $P < 0.001$ ). The time to first measure of any act of CPR – defined as compressions, defibrillation or ventilation – was 44 seconds in the leadership groups and 67 seconds in the technical instruction groups ( $P < 0.18$ ).

Findings such as these have been replicated and extended in other types of resuscitation studies, such as qualitative research, which has pointed towards leadership being the ‘key non-technical skill’ (Hjortdahl et al 2009). Integrative reviews as well as systematic reviews have concluded that optimal leadership, regardless of how this is defined, produces better outcomes; these

outcomes can range from clinical outcomes or team-reported measures (Fernandez-Castelao et al 2013, Ford et al 2016).

## 1.2 Different approaches to leadership

ED resuscitation or 'resus' teams usually follow a rough blueprint that guides how the team should perform. A review by Mellick and Adams (2009) provides a visual representation of this team structure in Figure 1.1.

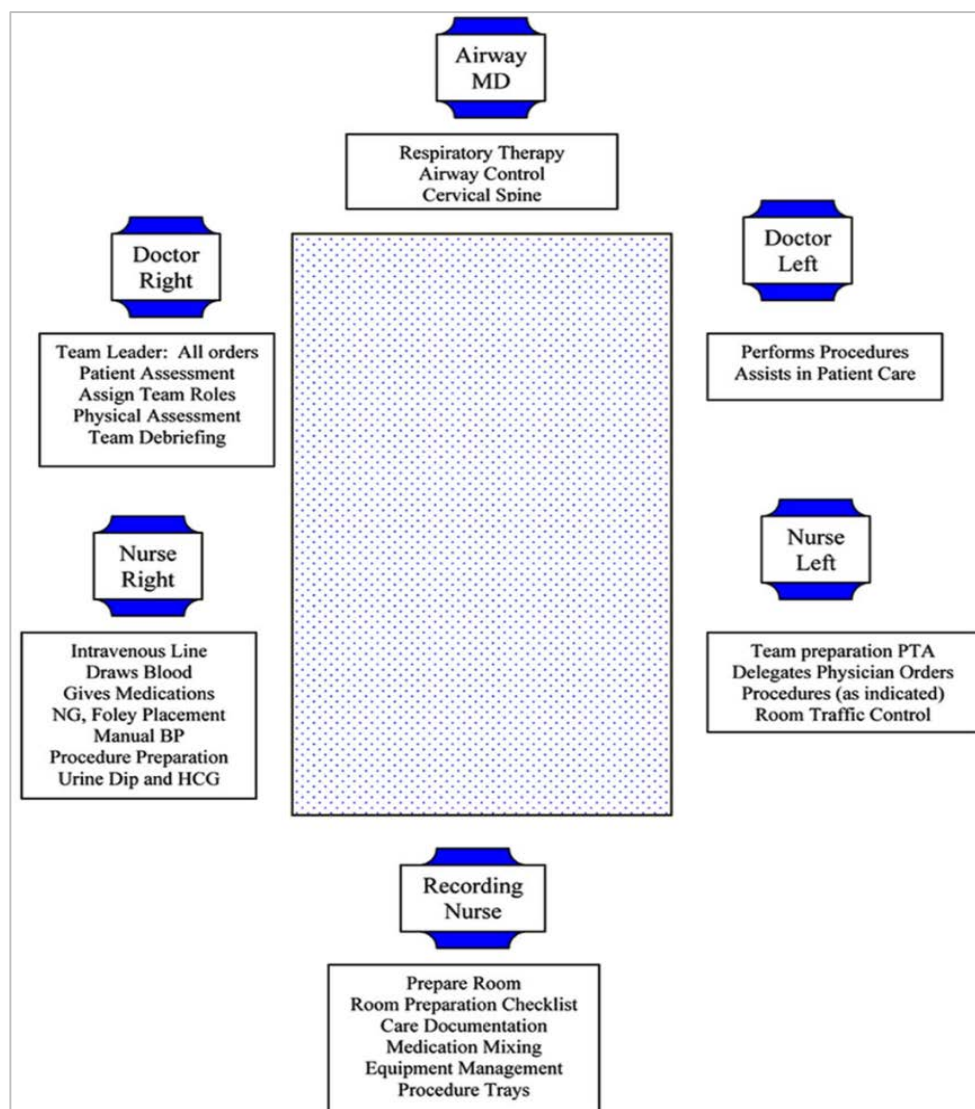


Figure 1.1. Example of a team structure during resuscitation (Mellick and Adams 2009)

The number and variety of staff that normally gather in the resus room, when coupled with the complex processes of delivering resuscitative care, means that studying and theorising leadership can be approached in a number of ways.

By far the most common approach is to report the actions of the lead doctor in the room. This doctor can be formally appointed as the team leader and, in some EDs, is required to wear a tabard that has 'TEAM LEADER' writing on the front and back. The outcome of having this lead doctor in the room is that leadership has become synonymous with their position. Studies by Cummings and Mayes (2007), Briggs et al (2015) and Hoff et al (1997) – all of which describe the optimum type of leadership that this lead doctor should display – are exemplary of normative resuscitation studies.

This thesis departs from this individualistic and positional approach. Instead, a team-level view of leadership is adopted, primarily through a qualitative lens of inquiry. This approach recognises the leadership contributions of all resus team members and seeks to describe some of the more nuanced and dynamic aspects of leadership that is enacted during challenging resuscitation situations.

The decision to conceptualise leadership as a plural phenomenon rather than at the individual level is, in part, based on what the sociologist Herbert Blumer referred to as a 'sensitising concept'. A sensitising concept is an experience or situation that gives researchers, particularly those observing defined environments, a rough direction or guide. Using the researcher's voice, the sensitising concept that informs this thesis is provided in Figure 1.2 below.

One Tuesday I was working clinically in the emergency department, based in the resuscitation rooms. This Tuesday began normally with routine presentations. Around mid-morning an alert was received over the departmental tannoy from the ambulance service about a young male who had been found unconscious. *“Crash call. Patient going into resus in 12 minutes”*. He was not responding to verbal or pain stimuli, but he was still breathing. Cases like this, as opposed to the cases where immediate life is not at risk, appear to heighten the energy amongst staff in the room. They understand that it is a ‘proper’ resus case.

Despite the severity of the patient’s illness, the standard team that had assembled were jovial and pockets of informal chat ensued. In these brief pauses before the patient arrives it is not uncommon for staff to casually chat – even joke – with one another. The patient arrived and the team started going through the motions, all the while with the consultant stood at the foot of the bed. This can be considered traditional team functioning, with the formal leader at the foot of the bed, organising care whilst other staff are hands-on.

Soon after arrival, the patient began having difficulty breathing. The deterioration in physiology was marked by an increase in the number of sounds and lights being produced by the vital signs monitoring equipment. Set against this backdrop, along with the need for more drugs and equipment, the team performance was being stretched. Recognising this, the consultant leader orchestrated people and tasks with more urgency. Their overt direction was complemented by implicit co-ordination within the team; we knew what each were doing and our familiarity allowed us to move forward, often nudging each other in the right direction.

Several hours later another tannoy announcement was made. *“Crash call. Resus. 4 minutes”*. A relatively young female was in cardiac arrest. Whilst the consultant was treating a different patient, a team consisting of a senior

registrar, a charge nurse, a junior doctor, 2 medical students, one nursing student and myself gathered in the resus bay.

The patient arrived on a mechanical CPR device and the team looked to the senior registrar. Rather than going through the motions, the registrar appeared static. As a result, the team became static and teamwork became disjointed.

It should be made clear that this is not an observation of competence or ability. It was simply a difficult case with lots of moving people and parts involved. A clinical colleague of mine calls this a 'lumpy' case. About 5 minutes in, we were not moving forward and we were not performing optimally.

At this point another senior nurse walked past who was familiar with the mechanical CPR device. He came to the threshold of the room and nodded to the registrar, as if asking permission to enter the active clinical area. He gave the charge nurse a warm "hello" as they knew each other well. This senior nurse noticed that the patient's body position was relatively low down in the machine. He put on a pair of gloves and ushered the junior doctor and I to give him a hand in repositioning the patient, appearing to sense everyone's unease. During this time, it was only this nurse's voice that could be heard. He was asking about the patient and asking what we had done so far.

During the next 5 to 10 minutes the registrar became less active. The nurse started to direct the team, providing suggestions about the next steps. His actions appeared to help the charge nurse become more vocal. A series of co-ordinated actions were overseen by the nurse and the charge nurse.

This appeared to occur with implicit agreement from the registrar, who would still be classed as the team leader. The nurse and charge nurse did not ask whether they were allowed to direct the team. Nor did they designate themselves as formal team leaders. They simply acted and the team

followed. When decisions had to be made, the registrar organically looked to the senior nurse for their input.

Sadly, despite the care she received, this lady died. As if continuing their displays of leadership, these nurses took the time to debrief with the staff in the room.

Figure 1.2 The sensitising concept guiding the approach of this study

This sensitising concept illustrates how the different approaches to studying leadership can result in different conclusions. If the traditional individualistic approach is used, then only the actions of the lead doctor would be observed as they occupy the positional leader role. If a team-level approach is used, then the actions and contributions of all team members are recognised.

This latter approach will be applied in this research study. Based on ethnographic methodology, three research methods – video observations, interviews and questionnaires – will be used to observe and describe how leadership is enacted at the level of the team during ED resuscitation.

In addition to setting this conceptual boundary, the experience outlined in Figure 1.2 provides the general methodological direction. This research sets out with a team-level construct in mind, rather than with theory-generating research such as in grounded theory. This steers the study towards purposeful observational research of leadership as it is enacted in a team setting.

The use of a sensitising concept also highlights a central issue that falls within the norms of ethnographic research. The issue is concerned with the researcher's voice: when should it be used; how should it be used; what should be communicated.

Although the features of ethnography will be outlined in full in Chapter 5 (Philosophy, Theory and Methodology), a central tenet of ethnography that is useful to clarify at this early stage is the necessary use of the 'first person' to understand the biography of the researcher using them self as the

'instrument' of research, potential biases, and the multiple researcher-to-environment interaction points throughout the research process (Dieckman 1993). As LeCompte (1982) argues,

*“Since the research in ethnography cannot eliminate biographical determinants, the makeup of the researcher is critical to the quality of the work done...these issues are perhaps most critical to us as scholars and to the credibility of the work we do, since we have no allegedly dispassionate mediator or ‘instrument’ between us and the phenomena we observe”* (p 43).

Therefore, the use of the “I” voice will be a necessary feature of this ethnography going forward. This will be purposefully used, for example in specific reflexive points. However, it will also feature in explaining how the research ‘field’ was managed, how staff were engaged with, and other issues where appropriate. This voice is a requisite for ethnographic research (Venkatesh 2012) and should be viewed as supportive of the primary analytical and objective writing.

### 1.3 Defining leadership

It has been reported that there are over 1400 definitions of leadership (Volckmann 2012). The normative definitions of leadership adhere to the traditional concept of leadership which focus on an individual. An illustrative example is the definition offered by Hemphill and Coons (1957) who state that *“Leadership is the behavior of an individual when he is directing the activities of a group toward a shared goal”* (p 7).

The approach taken by this thesis moves towards definitions that are more pluralistic and dynamic. The definition offered by D’Innocenzo et al (2016) is used to guide this research is that leadership is:

*“an emergent and dynamic team phenomenon whereby leadership roles and influence are distributed among team members” (p 1968).*

It is also useful to recognise at this introductory stage that whilst terms such as power and responsibility overlap with the concept of leadership to some degree (Graen and Uhl-Bien 1995), this research will solely be focussing on clinically orientated leadership. Broadening the discussion to include terms such as power and responsibility necessarily brings a separate literature base that would dilute the focus of functional leadership as it is expressed during resuscitation.

#### 1.4 Outline of thesis

The following chapter, chapter 2, will provide a background to leadership. This will include a history of leadership and early studies, as well as an overview of current leadership discourse. The chapter will then move on to introducing leadership in healthcare, narrowing down to the specific context of the resuscitation room environment.

Chapter 3 outlines the team leadership literature that provides a rationale for conceptualising leadership at a team level, rather than the traditional individual forms of leadership. The challenges of applying individual and hierarchical models of leadership follow, providing further support for the approach taken in this study.

To inform this research study, chapter 4 presents a literature review of studies that have measured or described leadership during resuscitation episodes. The implications of the literature review findings are then discussed.

Chapter 5 describes the philosophical, theoretical and methodological issues associated with a video ethnography of leadership. This chapter outlines the 5 discrete phases of this study, providing a rationale for the choice of methods used.

As this research is utilising video data, chapter 6 presents the ethical and legal approvals that were required. As this is a non-routine data collection technique in emergency care settings, this is discussed narratively to inform the reader of how these important issues were addressed.

Chapter 7 is Part 1 of the findings, reporting the results of developing a team leadership rating tool that aided ethnographic observations.

Chapter 8 is Part 2 of the findings, reporting the results of the questionnaires, interviews and observations that formed the ethnography.

A discussion of these findings is then provided in chapter 9, including the theoretical and clinical applications of the results. The strengths and limitations of the study are also provided in this chapter.

Last, chapter 10 is the conclusion, drawing together the salient points of the research study and summarising the work that has been undertaken.

## 2.0 Background

There are several contexts framing this research study on leadership during ED resuscitation which will be outlined in this background. First, the history of the phenomenon of leadership is important as the origins of the term and its meanings set the scene for how it is conceptualised today. Second, an up-to-date overview of current leadership discourse naturally follows this history. Third, there is a context of leadership in general healthcare that informs this study which is conducted within the norms and language of the National Health Service. Fourth and final, the most specific context is the background to leadership in emergency resuscitation scenarios.

The argument made in this background is that these contexts naturally converge to position leadership as a phenomenon that is generally considered unidirectional, hierarchical and focussed on one individual leader (Grint 2011) (Figure 2.1). However, the viewpoint adopted in this thesis – constructing leadership at the level of the team – goes against the tide of normative discourse, thus there is a need to appraise the norms and practices of leadership to provide a rationale for the decisions made in this study.

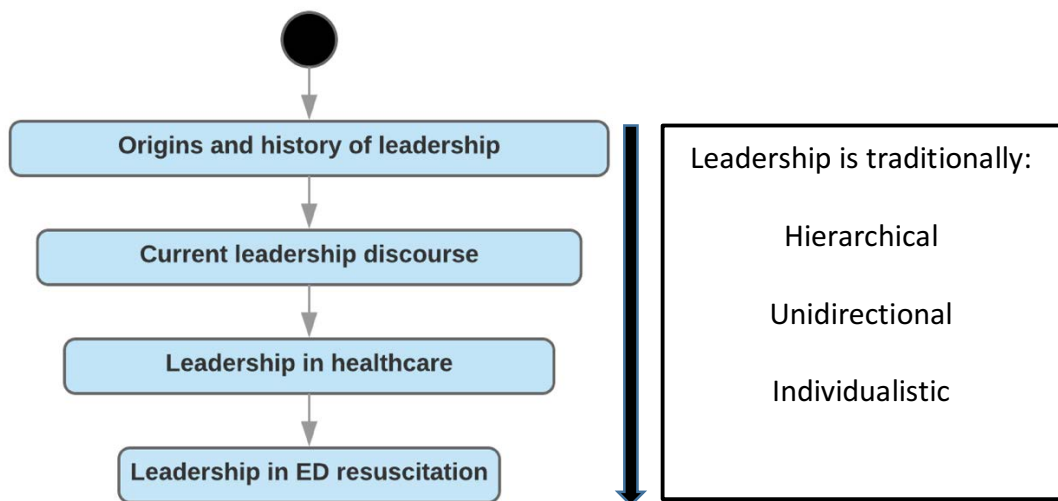


Figure 2.1. Overview of background chapter

## 2.1 Background to leadership

This first section offers an historical overview of leadership. This overview is informed by questions asked in Grint's (2010) leadership text, such as 'What isn't leadership', 'What was leadership' and 'Can we do without leaders'. This is unusual for a leadership text as these traditionally offer the reader a definition of leadership on page 1, and continue with explanations about how people can develop the traits or behaviours to satisfy the definition.

Grint's questions, however, allude to the fact that although leadership can appear rather innate and effortless to conceive, the idea of leadership comes from somewhere. It has changed and evolved over time. Leadership in early civilisations is different from leadership in the 21<sup>st</sup> century developed world. It is influenced by the historical and ideological context in which it is situated. Authors like Grint, as well as Day and Antonakis (2012), provide useful guidance as they acknowledge the inflection between past and present leadership.

## 2.2 Origins of leadership

Leadership comes from somewhere. It is unlikely that this was a specific day or event. But the contemporary phenomenon of leadership as it is understood in society, in healthcare and in resuscitation teams, stems from some antecedent processes.

In an interesting series of experiments, Dyer et al (2009) explored how leadership is expressed in different group sizes (8 people, 10 people, 100 people and 200 people). The crowd of 200 people were asked to walk around a large non-descript room. Their only rule was to stay within an arm's length of one another. When the experiment started the group formed a mass of people, perpetually swirling around an imaginary centre point, creating a human wheel. The experiment was then re-run with a handful of confederates who had to move to a specific target without communicating, either verbally or

non-verbally, their intentions. The result this time was that all participants converged around the unknown target within 75 seconds (Figure 2.2). The significance here is that this behaviour is almost exactly replicated in simulated models of animal behaviour (Couzin et al 2005).



Figure 2.2. Image of study participants replicating animal models of leadership (Dyer et al 2009, supplementary material)

Leadership, it appears, has evolved as a universal process. It is not a unique human trait, but a feature of mammalian life. Explicit leadership behaviours comparable to those of humans have been observed in pigeons, gorillas, chimpanzees, wolves, zebras, fish, dolphins and ants, amongst others (Conradt et al 2009, King et al 2009, Smith et al 2016). A recent review concluded that *“Despite common assumptions often made around the notion of human uniqueness, interestingly, we found no clear divide between human and non-human social mammals with respect to the emergence of leadership...”* (Smith et al 2016, p 62).

When framed within this *hominid* context, leadership is something that has been a necessary part of evolution (King et al 2009). Judge et al (2009)

argued that *“It is fair to surmise that whenever there is social activity, a social structure develops, and one (perhaps the) defining characteristic of that structure is the emergence of a leader or leaders”* (p 855). There is good evidence that human hunter-gatherer ancestors gained an evolutionary advantage from following the leaders who were often morphologically or anthropometrically superior (Smith et al 2015).

Although early hominid groups function differently from modern societies, there is some evidence that this innate interpretation of leadership still runs beneath human conscious. Experimental studies have shown, for example, that the look of someone’s face can determine whether they are perceived as a leader through instinctive judgements of facial cues (Van Gucht and Grabo 2015). People know when they see a face they can trust, or a face that portrays competence. Olivola et al (2014) found that this extends to specific professions, where individuals correctly guessed business, sports and military leaders with an above-chance accuracy, simply by being shown pictures of their faces. Similarly, an individual’s physical appearance and prestige are strong predictors of their likelihood of leadership (von Reuden et al 2014). People prefer physically formidable leaders in times of war and conflict, and nonthreatening features during peace (Murray 2014). Even physical attractiveness has been experimentally shown to influence whether people are viewed as leaders (Praino et al 2014).

Taken together, it is necessary to acknowledge that these archaic heuristics, to some degree, may contribute to contemporary leadership conceptualisations (Lord and Emrich 2000). In other words, the history and biology of leadership that is seen and felt cannot be separated from how it features in modern society.

### 2.2.1 Early leadership in text

Although it is known how *hominidae* and their immediate ancestral lineage organised their social groups (Harari 2014), leadership first features in text far later. Grint (2011) offers a timeline of what is known about the earliest writings on leadership. Several thousand years before Christ, military-style leadership featured prominently in the era of Ramesses of Egypt and early Cretan civilisations. This idealised a leader's role as the conqueror and authoritarian. The earliest classical leadership texts followed suit. Sun Tzu's *The Art of War* and Kautilya's *The Arthashastra* (around 320 BC) place strength and dominance as the cornerstone of leadership. Grint (2011) observed that "To a very large extent our knowledge of leadership in ancient times is crucially dependent upon the existence of written texts, and here lies the first lesson of leadership: history is written, generally speaking, by the winners" (p 3). This was carried forward by Aristotle, then Plato, through to Machiavelli's *The Prince* in the 16<sup>th</sup> century, which is considered an early prescriptive writing on leadership.

When reflecting on leadership during these time epochs, it is natural that the term developed these connotations. The leaders of cities and societies were those who had power and wealth. Often, these were acquired through warfare or military based action.

### 2.2.2 Early leadership studies

The earliest leadership studies mirrored the tone of these texts with a strong emphasis on command and control. The French economist Jean Baptiste Say published a treatise on political economy in 1803 which, for the first time, acknowledged the importance of formal oversight in the production industries that were emerging as the cornerstone of western societies at the time. It was not until 1840 when James Montgomery published his book *Cotton Manufacture* that leadership was formally identified as a key part of managing day-to-day activities. Up until this point it was mainly land ownership and the provision of labor that were considered the determinants of social progress.

Thomas Carlyle (1795-1881), a notable leadership scholar and philosopher of his time, considered command and control normative leadership. Scholars like Carlyle signal an important point in the history of leadership. Developed societies were passing through the industrial revolution, demarcating those with social power and those who worked for people with power. Leaders, at this time, were on the influential side of this demarcation which brought with it a degree of authoritarian behaviour. Consider how day-to-day society was governed during the mid-to-late 19<sup>th</sup> century: societies were less liberal; protests were generally quashed; workers' rights were not commonplace; transparent and accountable democracies were not fully formed. Leadership, then, was still embodied with control.

Society, Carlyle argued, needed this type of leadership to bring order. Interestingly, this was most clearly voiced at his inaugural address as Rector of the University of Edinburgh in 1866. He praised Machiavelli for his convictions that:

*“it was solemnly necessary, at times, to appoint a Dictator; a man who had the power of life and death over everything, who degraded men out of their places, ordered them to execution, and did whatever seemed to him good in the name of God above him”* (p 178).

He spoke of Oliver Cromwell's necessary autocracy during the English Civil War and his tone suggested that he wanted this type of leadership to continue:

*“And I give you this as an instance that Oliver did faithfully set to doing a Dictator's function, and of his prudence in it as well...It had become a nuisance, and could not have continued much longer. That is an instance of the manner of things that were done when a Dictatorship prevailed in the country, and that was how the Dictator did them. I reckon, all England,*

*Parliamentary England, got a new lease of life from that Dictatorships of Oliver's; and, on the whole, that the good fruits of it will never die while England exists as a nation" (p 180)*

Moving closer to modern times, this language and ideology became suffused with the 'Great Men' of the 20<sup>th</sup> century. Economic turbulence and World Wars were followed by industrialised western societies. Here, men like Henry Ford and F.W Taylor shaped leadership discourse as it became associated with modern management and productivity. The production industries such as car manufacturing, steel works and labouring dominated modern economies.

Thus, there was a shift during the 19<sup>th</sup> and 20<sup>th</sup> century where leadership became less militarised and more synonymous with scientific management. Good leaders got things done, were more efficient and produced better results (Ford 2010, Mann 2009).

Summarising the above, this early work appears to be distant from contemporary notions of leadership. Society does not tend to associate leadership in the 21<sup>st</sup> century with dictators or crusaders, nor judge a leader by their ability to oppress.

Although true, the suggestion here is that a soft conceptual link between historic and modern ideas of leadership still exists, which has important implications for setting the scene for how leadership is understood during resuscitation.

Consider the role of leaders in today's society. These are people who lead teams, organisations or complex social machineries. Leaders and their corresponding acts of leadership are visible in politics, in healthcare and in business. How do they orchestrate change and leverage the efforts of their followers? How do they make change happen? In the context of resuscitation, how do they get the team to perform at their best?

Often, this mechanism is leadership. And with this mechanism comes an inherent degree of control and authority. Whilst this is not enforced in the

same manner as archaic leadership, modern leadership still flickers with the embers of control, often with one leader at the centre. The perceived remit of the leader – to mobilise the collective group in a certain direction – has not changed for centuries.

Leadership in ED resuscitation, therefore, cannot be unwoven from the origins of leadership. Nor can contemporary healthcare leadership be viewed in a vacuum, separated from the contexts that have shaped it. The history of leadership is acknowledged here as the backdrop to current ideas of leadership.

### 2.3 Current leadership discourse

Moving away from historic notions of leadership, Day and Antonakis (2012) suggest that leadership, as it is understood today, can be divided into nine major schools of thought (Figure 2.3). The trait school holds that certain characteristics differentiate leaders from non-leaders, whereas the behavioural school claim that behavioural styles are key (e.g democratic versus autocratic). Contingency theory focusses on situational elements that moderate the effectiveness of the leader, whilst contextual suggests that contextual factors support or suppress certain leadership behaviours. The sceptics of leadership school challenge these positions, arguing that reported outcomes may be due to biased implicit leadership theories rather than good leaders. Relational school is based on the leader-member exchange theory (LMX) which posits that the relationship between the leader and follower determines leadership, rather than the leader them self. The New leadership era is characterised by transformational rather than transactional leaders, who are inspirational and induce a following for the greater good. How and why leaders become leaders is the drive of information-processing leadership whilst biological/evolutionary, as highlighted above, focusses on the socio-biology of leadership.

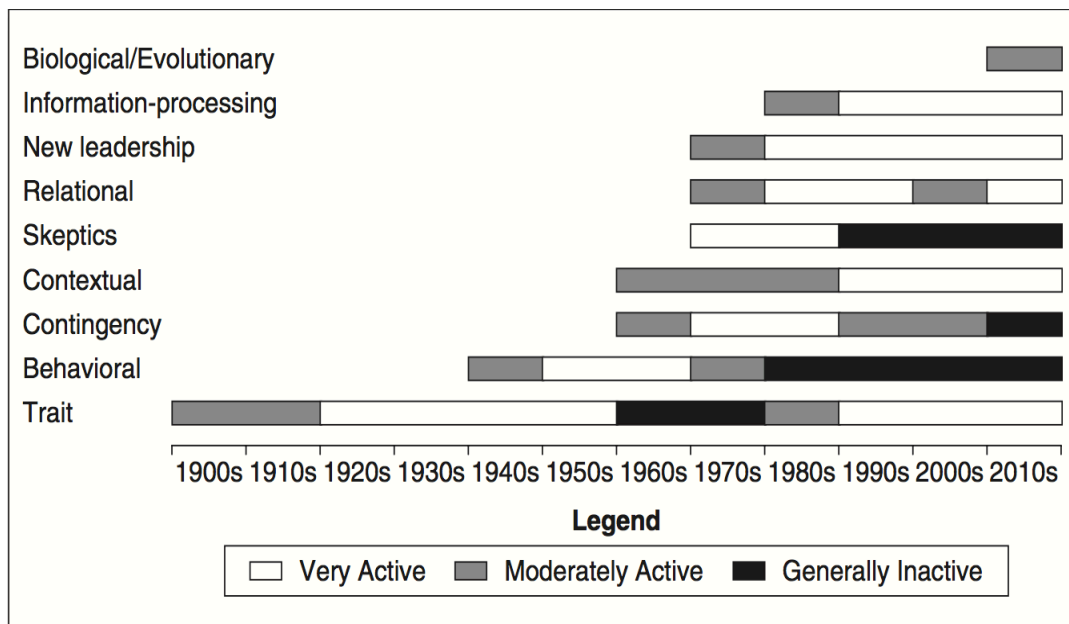


Figure 2.3. The nine major schools of leadership (Day and Antonakis 2012)

As noted by Day and Antonakis (2012), their timeline and the list of schools within their timeline is by no means exhaustive. Yet even within this single text, leadership research is a patchwork of paradigms, ideas and theories. Therefore, it is important to assess the breadth and depth of these paradigms and theories as they provide the platform for a team-level approach to leadership in this thesis.

### 2.3.1 Overview of current leadership literature

Thousands of empirical and theoretical leadership studies have been produced since the early work of Say and Montgomery. The most useful overview that can be offered stems from a series of large reviews of current leadership literature. Meuser and colleagues (2016) reviewed 14 years of research that was published in the top 10 leadership journals up to 2014. In total they included 864 articles and conducted a network analysis, allowing them to visualise the degree of theoretical integration within the studies. They identified the focal leadership theory that formed the basis of the article and

mapped this against any supporting leadership theories. This was insightful research as it highlighted which theories are prominent, and which ones receive relative inattention.

The review found that, overwhelmingly, extant literature is still based on what could be considered the historical leadership ideologies. These form the theories that are orientated to focus on one individual and how they utilise their leadership. For example, consider the network maps of transformational and trait leadership (Figure 2.4 and 2.5). These networks are dense with studies and have strong connections with other leaders-centric theories. This evidences that a considerable amount of research is orientated towards an individual-centric approach.

Contrast this with what is known about more distributed forms of leadership such as participative/shared leadership and, specific to this thesis, leadership in teams (Figure 2.6). This network is far less dense and the connections within are weaker.

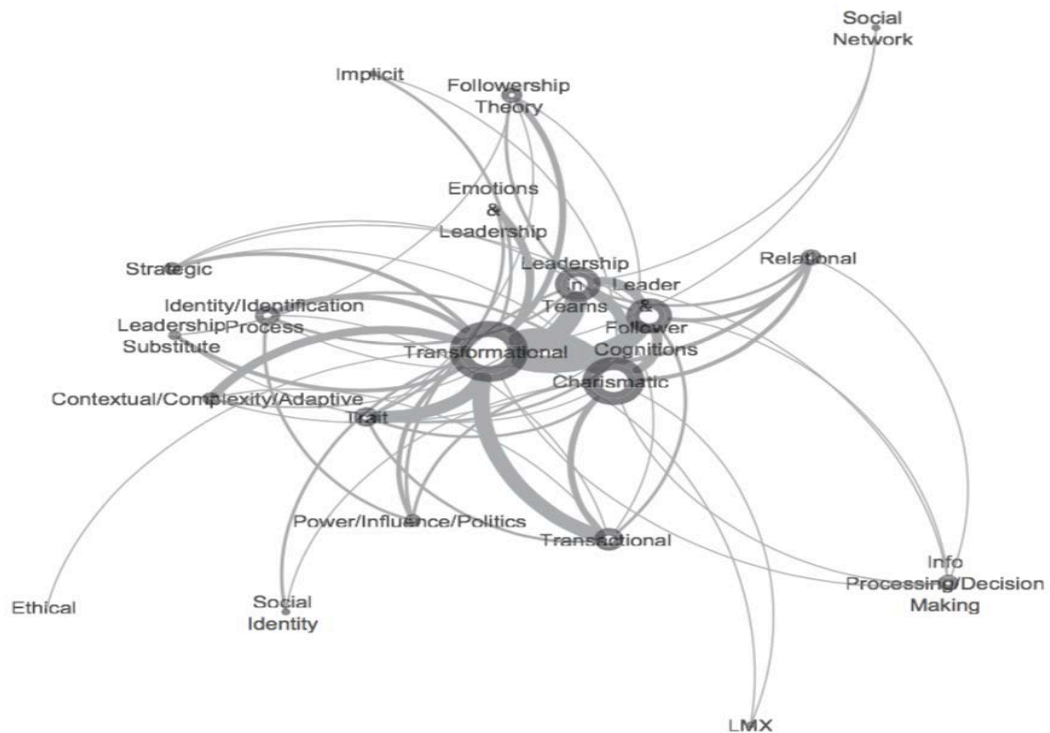


Figure 2.4. Network map of transformational leadership theory (Meuser et al 2016)

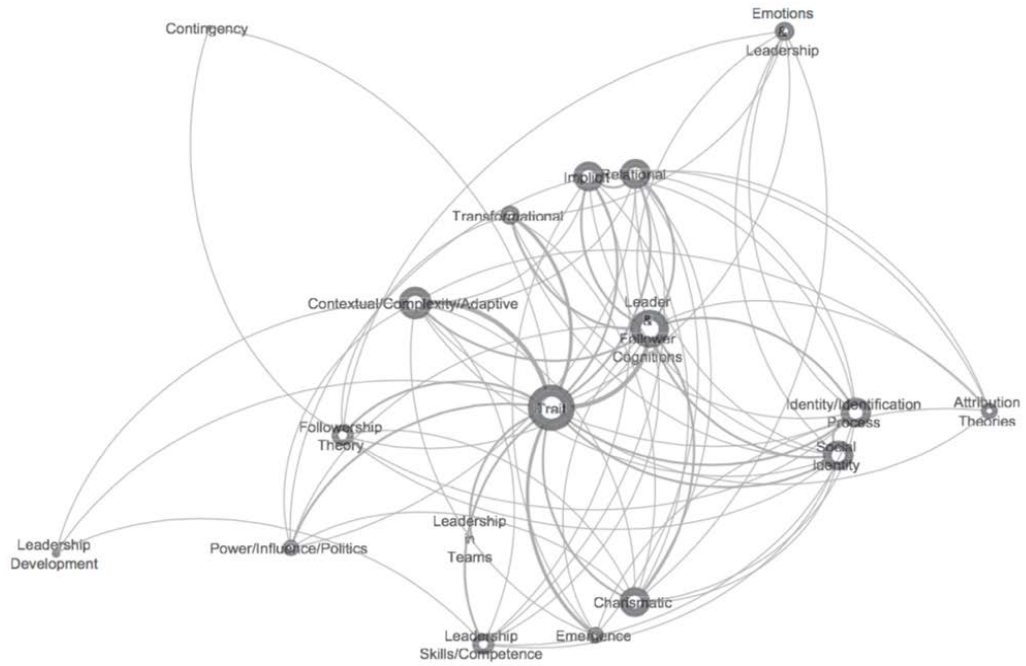


Figure 2.5. Network map of trait leadership theory (Meuser et al 2016)

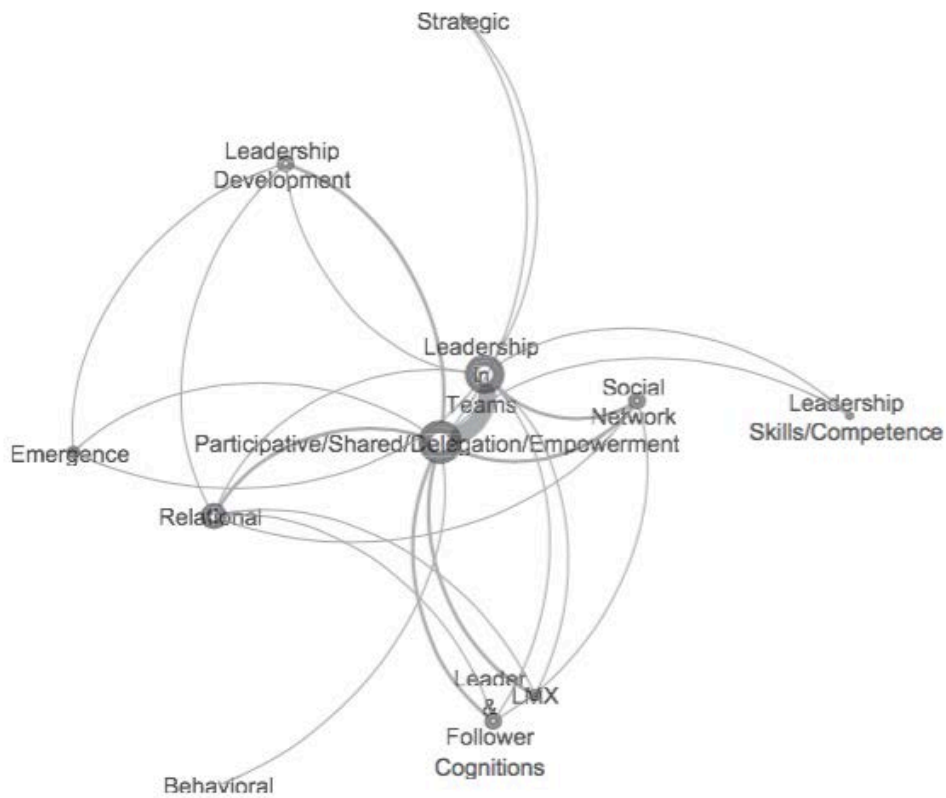


Figure 2.6. Network map of leadership in teams theory (Meuser et al 2016)

This signals two things. First, that current leadership discourse is heavily leader-centric. Second, that the approach taken in this thesis – to construct leadership as a plural team phenomenon – can address an identified gap in the literature.

In support of the review by Meuser et al., another relevant overview of the leadership literature comes from a special series in *The Leadership Quarterly* (LQ). This, along with *Leadership*, are the principal leadership journals. In 2014, the LQ published a special series of articles which reported on the previous 25 years of leadership research.

Dionne et al (2014) reviewed 790 articles and reported on the degree of analytical coherence within the papers. For example, in conceptual articles, did the authors relate to an explicit theory? In empirical articles, did the authors state how their study related to theory and did this theory align with measurement and analysis? The authors found that appropriate measurement and alignment with theory occurred in the majority of studies, with an upward trend developing over time. This is something to be celebrated; it points to a literature base that is, in the main, methodologically robust. Articles generally have a strong link between theory and outcome.

Importantly, however, a necessary point to consider in light of the findings from the review by Meuser and colleagues' (2016) is the typologies of leadership that were being analysed; it may serve no use to have strong alignment between theory and outcome if some forms of leadership are excluded.

In their 25-year review, Dionne and colleagues (2014) used 29 distinct leadership categories when reporting on levels of analysis within the included papers. This was based on a previous taxonomy developed by Yammarino et al in 2005, yet the authors recognised that the literature had grown significantly during the preceding 9 years, so they had to expand their categories. At first glance this may appear an extensive list – 29 leadership categories represent

a diverse literature base. However, the most complete list in published literature is provided by Dinh et al (2014). These authors identify a total of 66 discrete leadership theory categories.

It is useful to briefly pause and acknowledge the broadness of the leadership literature. Most disciplines may have a handful of theories that underpin their work. Whereas leadership, with its long history and versatility, has 66. This also serves to highlight why providing a thorough overview of leadership at this early stage is essential before converging to the narrower context of ED resuscitation.

Dinh et al. provided some aggregate data relating to the unit of analysis within these 66 theories. This gives insight in to the types of leadership that are being studied and the types that are not. Although they could not provide this for all theories, they identified whether leadership was a function of variables such as the event, individual or organisation. If it was the event, the theory would focus on the immediate situation. If it was the individual, the theory focussed on the person who was the identified leader. Last, if it was the organisation, the theory looked at the context of the work environment.

Extrapolating from the 66 theories provided, a reasonable estimate is that at least 75% of all leadership theories use an individual as their unit of analysis. This means that when leadership is being studied, 75% of the time the actions of functions of one person is being reported.

There is an important conclusion to take away from this overview that, as suggested here, represents the first major contribution of this thesis to the study of leadership. The findings from Dinh et al. corroborate the findings of the review by Meuser et al (2016) who provided the network maps above. It is evident that the networks of individual-centric theories are more dense and well-connected because leadership theory and its resulting research has disproportionately used the individual as the unit of analysis. Despite there

being approximately 66 distinct leadership theories, at least 75% of these use one individual as the primary variable.

During the earlier years of behavioural and trait theory research this was entirely appropriate. These were concerned with the qualities and attributes of one person in a business/managerial capacity. But as theories have been developed and more diverse understandings have grown, leadership research has generally not kept pace. By and large the individual remains the focus of study, negating important issues such as context, environment and surrounding organisational structures.

Reflecting on the 'sensitising concept' in the introduction, how is it possible to capture a team's actions through the lens of one individual? How could one explain the expression of leadership from different team members if the nominal team leader was the only person observed?

Owing to the challenges of applying individual and hierarchical leadership theories to complex resuscitation teams, a team-level approach can be argued for when studying leadership in ED resuscitation teams.

## 2.4 Background to leadership in healthcare

The above sections have given a general background to leadership, both its history and its current trends. This section narrows down to the third context which is the form of leadership in healthcare. At this level, healthcare informs this thesis by providing the immediate backdrop for the language and practices that are common amongst clinicians who work in emergency care and deliver resuscitative care.

Akin to the concept of general leadership, leadership in healthcare was not formed from a single event. One doctor or nurse did not start leadership; it has always resided in healthcare in some form, from the earliest medical pioneers who were considered leaders, to the people who ran establishments caring for the infirm. Similar to general discourse, opinions and perceptions of

leadership in healthcare – what it is, what makes it good and bad, how it can be developed – have been shaped by history and context.

Early writings on leadership in healthcare spoke of the ideals of a leader. Nurse Mary Pickering wrote in the *American Journal of Nursing* in 1921 that:

*“In order to be a constructive leader the individual must be technically expert in her field, broadly and liberally educated; she should possess a personality that will win people; she must have a religion or philosophy of life; above all she must be of steadfast character, unselfishly devoted to high ideals of world service”* (p 601).

Sternagel (1948), writing in the *Journal of the American Medical Association*, voiced the qualities of medical leadership:

*“Knowledge and ability and experience are required, knowledge and ability to judge wisely in all issues, experience of long practical dealing with difficult problems, with a record of using those experiences for self education and self training. Sincerity, pure devotion to straightforward principles...Not common honesty alone but intellectual honesty...Enthusiasm is needed, earnest controlled enthusiasm...A leader must possess a certain restraint”* (p 945)

These types of writings, in many ways, mirror the early work on leadership in other industries described above. It is evident how the mention of leadership naturally induces people to describe the ‘great’ leader. Sections of healthcare have continued this to some extent, with articles idealising the traits and characteristics of iconic leaders, such as Florence Nightingale and other pioneers (Stanley 2007).

Healthcare has clearly evolved in a number of ways since these early publications. Care systems are more complex, treatments have advanced and intricate technologies are used by clinicians daily.

The most comprehensive review of leadership in the modern era of healthcare was published in 2008 after the National Institute for Health Research (NIHR) commissioned a review of the literature (Hartley et al 2008). Later turned into a book (Hartley and Benington 2010), the authors reviewed how theory has intersected with healthcare, how policies have used leadership models and what types of leadership health researchers routinely study.

Overwhelmingly the authors found that leadership in healthcare has adopted the ideologies and language of traditional leadership, with a focus on specific leader-individuals. In their summary, they note how *“leadership manuals and books often begin with a set of prescriptive behaviours, competencies or qualities required in leaders, and some assertions about the impact that leadership has on team or organizational performance. A large number of books and articles on leadership consist either of a list of ideal traits or behaviours, without any theory or context”* (p 6).

Hartley’s work serves as a useful reflection point in this chapter. It alludes to the idea that the very fabric of leadership in healthcare is based on – or at least closely linked to – historical leadership ideas coupled with the norms from the scientific management paradigm. This is, perhaps, a natural consequence of healthcare systems becoming more complex. Core features of care organisations now include budgets, targets, efficiency, processes and innovation. These are quasi-organisational issues and some have come to view healthcare as simply another business (Jones 2000).

Other indicators for the adoption of traditional leadership comes from institutions such as the NHS Leadership Academy. Their Healthcare Leadership Model serves as a national template and is based on items such as Influencing for results, Connecting our service, Developing capability and

Holding to account. Again, the language used is imbued with quasi organisational-management notions.

In support of this theme the UK's principal health think tank, The King's Fund, recently published an evidence synthesis on leadership (West et al 2015). This was an important piece of work that included contemporary research that had been carried out after Hartley and Bennington's major review in 2008. The King's Fund reviewed 80 years worth of research and noted how the dominance of trait and behavioural theories – mainly transactional leadership – had created a narrative in keeping with the historical leader-as-hero ideology. They observe the number of requirements that, according to research, leaders in healthcare should have: high energy levels; stress tolerance; an internal locus of control; emotional maturity; personal integrity; socialised power motivation; achievement orientation; low needs for affiliation; technical competence; conceptual skills and interpersonal skills. They should help interpret the meaning of events, create direction and alignment around strategies and objectives, nurture commitment and optimism, encourage trust and cooperation, create a sense of collective identity, organise and coordinate work efforts, enable collective learning, ensure necessary resources are available, develop and empower people, and promote social justice and morality.

This lengthy list, in many ways, symbolises the challenges of studying leadership when it is comprised of such diverse principles and focusses on one positional leader. It is also necessary to recognise that two discrete contexts can be discussed when referring to leadership in healthcare. The first is health services at a managerial level which naturally connotes the quasi-management language. The second, however, is the idea of leadership as it is enacted informally, within teams or at the patient's bedside. As evidenced by the work undertaken by the NIHR and The King's Fund, no meaningful distinction is routinely drawn – as can be reasonably assessed in published

literature – between the language and meanings of leadership in its diverse healthcare locales.

## 2.5 Background to leadership in resuscitation

The introductory chapter set out a broad overview of leadership in ED resuscitation. Extending the narrative above, this background section highlights the continuation of leadership being positioned as a leader-centric idea rather than leadership as processes or actions (Thomas et al 2013).

Towards the start of this research study a systematic review was published, titled ‘A Systematic Review of Tools Used to Assess Team Leadership in Health Care Action Teams’ (Rosenman et al 2015). This review is a comprehensive piece of work that best describes the current landscape of team leadership research.

The authors found 61 published tools that assess team leadership, which initially suggests a wealth of overlapping research. Yet the design of the review reported ‘team’ leadership with a different meaning to this thesis. Team leadership, as described by Rosenman and colleagues, referred to whether leadership was applied as part of a global team assessment, or whether this was applied as the sole component of the study. In both circumstances, leadership was still measured by the actions of the nominal leader.

This research study, in reference to the supporting definition above, posits that leadership roles and influence can be distributed amongst team members. Thus, in their discussion, the authors describe a common inconsistency in studies that currently measure team leadership; the authors

*“could not ascertain how leadership was conceptualized during measure development. As a result, it was often unclear whether the assessment tools were being used as they were intended. For example, Gaba and colleagues [reference] designed a tool to assess leadership at the team level, yet*

*adaptations of this tool [references] focused on assessing the performance of an individual leader” (p 1413)*

Furthermore, when the behavioural components of published tools are noted, they further highlight the tendency to identify the display of leadership from one individual. In the studies where leadership was the primary focus of the assessment, 62% of studies used the Leadership Behaviour Description Questionnaire which asks resuscitation team members to rate the nominal team lead on up to 100 items. One conclusion that can be drawn is that the momentum of individualistic leadership research that is evident in the above background sections is inherently carried forward within the resuscitation literature.

## 2.6 Summary

The contexts outlined in this chapter argue that leadership – from its history, its modern meaning, to its form in healthcare and in resuscitation – has had a fairly stable leaning towards individual leaders and the traits that they should have. Despite the notion that the requirements of leadership in emergency resuscitation situations are markedly different from other general forms of leadership, the ideologies, theories and language in these contexts are often similar.

In contrast to these norms, this research acknowledges a more diverse and plural form of leadership, one that is focussed on the processes of leadership and the contributions of multiple individuals to the team-activity of resuscitation. This conceptualisation stems, in part, from the sensitising concept. But also from research that is calling for more eclectic approaches to leadership. Hernandez et al (2011) have produced one such model, where they argue for a two-dimensional framework for describing the loci and mechanisms of leadership (Figure 2.7). The locus refers to the source of leadership, and the mechanism is the means by which it is enacted.

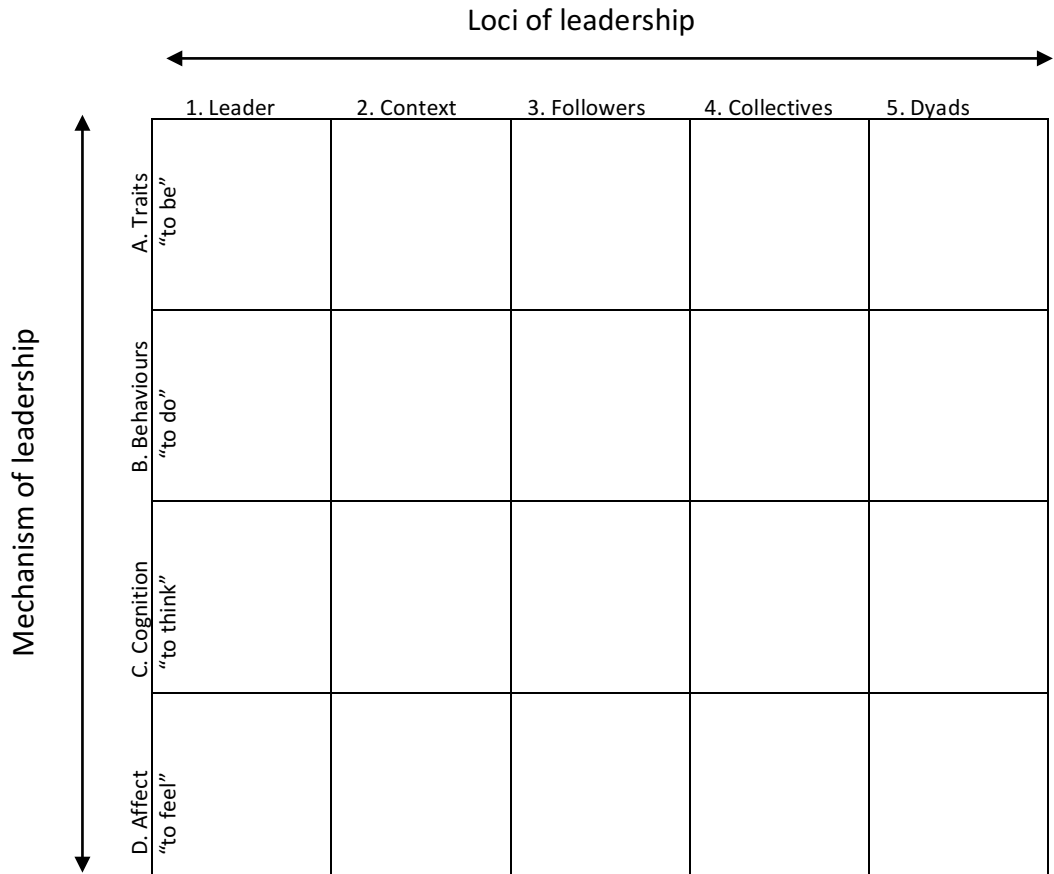


Figure 2.7. A two-dimensional framework of leadership models (adapted from Hernandez et al 2011, p 1166)

As can be seen from this model there are up to twenty plausible forms of leadership, yet the literature discussed in these background sections converge to a narrow interpretation of leadership. With this eclectic approach in mind, the following chapter will set out a clear rationale for applying a team-level construct of leadership in this research study.

## 3.0 Team leadership

The rationale for studying leadership at the level of the team is based on three complimentary arguments: (1) there is a relevant history of team-based research; (2) current approaches to leadership are insufficient; (3) there is evidence that shared forms of leadership is beneficial.

### 3.1 Team-based research

The sensitising concept highlighted that some of the processes that shape and influence leadership can extend beyond one person acting in a leadership vacuum. This thesis moves away from theories that describe leadership as vertical, unidirectional and concerned with individual attributes (e.g trait theory, charismatic theory), as well the theories that measure how one individual expresses leadership (e.g transactional or transformational).

Instead, this study is informed by groups of scholars who started to move away from leaders-centric models towards the end of the 20<sup>th</sup> century (Avolio *et al* 1996). Their alternative ideology placed greater emphasis on groups of individuals working towards common-goal leadership values (Yammarino *et al* 2012, Zaccaro *et al* 2001).

The literature for team-level leadership has a diverse background. Unlike the medical or biological sciences where literature predominantly resides in one locale, leadership spans diverse professions and disciplines. Studies measuring leadership during resuscitation can be situated in the medical, nursing, psychology and mainstream leadership literature.

Some of the earliest team-level work is associated with Follett (1924), Benne and Sheats (1948) and Gibb (1954). In her work *Creative Experience*, Mary Parker Follett first introduced the *law of the situation*. Here, she argued

that rather than people following a designated leader in all situations, people should follow the person who can most appropriately lead based on their knowledge of the situation. This has been popularised in various theories, namely the situational leadership theory (Hersey and Blanchard 1972). However, Follett made a key distinction. Contingency theories still use an individual as the unit of analysis. They assert that a leader should adapt their leadership to situational needs, represented by Hersey and Blanchard's landmark model (Figure 3.1). Hersey and Blanchard would argue, for example, that if a leader believes the team is highly competent they can simply delegate tasks to the members. If the leader thinks the team has low competence, they will need to be far more directive; the rationale for this model is entirely logical.

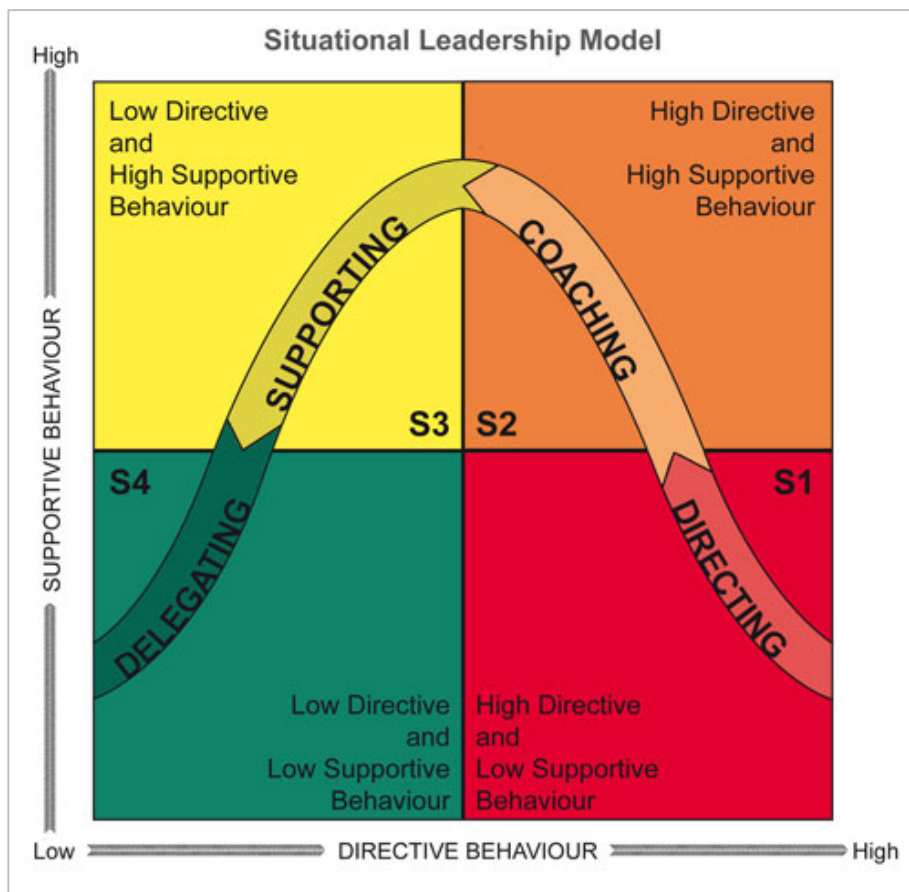


Figure 3.1. Hersey and Blanchard's Situational Leadership Model

Follett, however, argued that different people should assume the leadership role depending on the situation, not that a single leader should alter

their leadership style depending on the situation. This is an important difference, where the unit of analysis for leadership changes from an individual to a team.

In another move away from the leader-centric ideology, Kenneth Benne and Paul Sheats published an article in 1948 titled "*Functional Roles of Group Members – The Relative Neglect of Member Roles in Group Training*". They were the first to articulate 19 different roles that members of a group could occupy, and that some of these roles overlap or could be considered leadership roles. They argued that:

*"No sharp distinction can be made between leadership and membership functions, between leader and member roles. Groups may operate with various degrees of diffusion of 'leadership' functions among group members or of concentration of such functions in one member or a few members. Ideally, of course, the concept of leadership emphasized here is that of a multilaterally shared responsibility"* (p 41).

Gibb (1954) furthered this narrative and first mentioned the term 'distributed leadership' when writing a chapter in the *Handbook of Social Psychology*. He suggested that rather than conceive leadership as dualisms, leadership can be distributed or focused. Here, leadership is a duality or a continuum. He suggested that group members can autonomously engage in leadership functions and, as such, there may be plurality to the phenomenon.

The above literature highlights a broad change in tone that occurred at the turn of the 20<sup>th</sup> century. Despite more empirical evidence gathered for the presence of more plural forms of leadership, texts still promoted the conventional viewpoint. Rost (1993), for example, extensively reviewed literature set against this changing backdrop and found that over 130 books published from the 1980s onwards still advocated for the normative

hierarchical 'top down' leadership. Nevertheless, this early team-based literature provides the backdrop for team level leadership.

### 3.2 Challenges of current leader-centric approaches

The second argument that forms a rationale for team leadership is that current leader-centric models are insufficient. Whilst the number of leadership studies that have been conducted should be lauded, there have been some unintended consequences of a literature base that is both narrow in terms of scope and varied in terms of application. Dansereau et al (2013) voice this idea as: *"If each of these diverse traditional theories alone captures the meaning of leadership, then how can there be so many views? How can they all share the name of leadership?"* (p 798). In other words, how can 66 diverse theories of leadership all claim to 'be' leadership?

There is strong support that the traditional approach of leader-centric research is limited and, as such, the leadership literature is filled with discontent (Crevani 2015, Alvesson and Spicer 2012). Despite a large body of leadership research, a disproportionately small amount of actionable findings have been produced (Collinson 2014).

As evidence of this support and to illustrate the long-held viewpoint that traditional research approaches to leadership are insufficient, a series of quotes are provided. Bennis first voiced deficits in leadership research nearly six decades ago, stating:

*"Of all the hazy and confounding areas in social psychology, leadership theory undoubtedly contends for top nomination...Probably more has been written and less is known about leadership than about any other topic in the behavioral sciences"* (1959, p 259).

The organisational psychologist Fred Fiedler observed its continuation, arguing that *“There are almost as many definitions of leadership as there are leadership theories—and there are almost as many theories of leadership as there are psychologists working in the field”* (1971, p1).

Modern scholars have also echoed this sentiment. Hackman and Wageman (2007) noted how *“there are no generally accepted definitions of what leadership is, no dominant paradigms for studying it, and little agreement about the best strategies for developing and exercising it”* (p 43). Most recently, Day and Antonakis wrote in their influential text *The Nature of Leadership* (2012) that *“...leadership researchers have struggled for most of the last century to put together an integrated, theoretically cohesive view of the nature of leadership, invariably leading to disappointment in those who attempted it”* (p 4).

This was most clearly evidenced when a group of leadership scholars pursued a general theory of leadership. Over 10 years of work was undertaken by multiple individuals, faculties and institutions, yet the authors described their efforts as an *“enduring and elusive quest”* (Sorenson et al 2011, p 29). They concluded that the meanings and values of leadership were simply too disparate to produce a unified theory.

These quotes illustrate a longevity of consensus that there is a mismatch between the type of research or literature being produced and tangible leadership outcomes. When considering these arguments, coupled with the realities of dynamic and complex resuscitative care, a plural team-based approach to leadership represents an appropriate approach.

### 3.3 Benefits of team leadership

The final argument that supports a shared form of leadership stems from a growing body of literature that suggests there are benefits of distributing leadership. Three meta-analyses have been recently published that, when

comparing outcomes with groups receiving vertical leadership from one individual, find a positive relationship between shared leadership and team performance (Nicolaidis et al 2014, Wang et al 2014, D’Innocenzo et al 2016).

A study specific to emergency medical scenarios was conducted by Künzle et al (2010) who measured leadership behaviours in 12 anaesthetic teams consisting of one physician and one nurse during a video-taped simulated non-routine event (asystole). The authors found that high performing teams shared their leadership between the doctor and nurse, whereas low performing teams had unequal leadership distribution weighted towards the physician.

Benefits have also been reported in other safety-critical industries which operate in similar time-pressured and dynamic environments. Research from the aviation (Bienefeld and Grote 2014a), military (Ramthun and Matkin 2014) and police industries (Jones and Hinds 2002) all advocate the distributing of leadership in appropriate situations.

### 3.4 Summary

Although there are several approaches that can be taken when studying leadership in ED resuscitation, the rationale outlined here argues that a clinically useful and theoretically coherent way forward is to apply a shared team leadership model.

## 4.0 Literature review

The literature review is the first point at which the theoretical and methodological decisions made up to this point influence the output of this thesis. From the outset this study is concerned with leadership – not specific nominal leaders – in the resuscitation room. To design a literature review that includes studies that measure leadership as an individual phenomenon may not reflect the reality of resuscitation room care which involves groups of highly-trained individuals performing complex, simultaneous tasks. In addition, this would negate the contributions of those staff who are not in the designated leader position.

As such, this literature review will evaluate studies that have used observational methods to describe leadership during resuscitation. These studies have the advantage of observing leadership as it happens, rather than presupposing that all leadership actions will stem from one individual. In support of these decisions, the extensive NIHR review of leadership in healthcare cited in Section 2.4 stated:

*“How leadership is understood will have an impact on how and where we recognise (and accept leadership). If leadership is seen as primarily about particular individuals with special accomplishments (heroic individuals even), then there may be under-recognition or acceptance of the contributions which others in the team or unit can make” (Hartley et al 2008, p 9).*

Therefore, the thread running throughout the previous chapters take effect in this literature review by evaluating studies that measure leadership from any and all resus team members.

## 4.1 Methods

### Search strategy

The Medline, Embase, PsycINFO, Cinahl and Cochrane Library databases were searched for peer-reviewed articles published in English. The rationale for choosing these databases was that they cover the majority – if not all – of the potential journals where resuscitation leadership studies would be published. Medline and Embase are the primary medical databases, Cinahl is the primary nursing database, PsycINFO covers the psychology literature and the Cochrane library represents a collection of databases.

A combination of medical subject headings (MeSH) and keyword search terms were used. This approach has the advantage of including papers that are not categorised as MeSH terms within the host's database, but are still relevant to the subject area. For example, whilst 'Resuscitation' is a MeSH term in all medical databases, 'Resuscitation Room' is not. Furthermore, studies based in the resuscitation room may not be captured by the generic term of 'Resuscitation' which may colloquially refer to cardiopulmonary resuscitation. Therefore, the search strategy outlined here is comprehensive enough to cover the variants of resuscitation. The search was conducted in Week 4 November 2015 and no date restrictions were applied. The following search terms were used:

Theme 1:

Leader\* (including variants Leaders AND Leadership)

AND

Theme 2:

Resuscitation OR Resuscitation Room OR Medical emergenc\* OR Emergency patients OR Trauma

Whilst Theme 1 was straightforward to construct, Theme 2 had a range of variants that were linked to resuscitation. For example, studies could code their keywords depending on location (e.g resuscitation room) or on the type of patient requiring resuscitation (e.g trauma or emergency patient). As such, a range of MeSH and keyword search terms were used to retrieve all resuscitation studies.

### Screening of results

The initial search yielded 2565 results (Figure 4.1). After duplicates had been removed, there were 1844 unique results. A filter was set to only include peer-reviewed journal articles, leaving a total of 799 papers. The titles of all results were read to assess whether the article was relevant to leadership in ED-based resuscitation. The abstract of articles with relevant titles were then read to determine whether they were suitable for a full text review. At this stage, the reference lists of included articles were also hand searched. Of the 799 results, 17 articles were deemed relevant and these were read in full. Two members of the Ph.D team (AL and GC) reviewed these articles and applied the inclusion and exclusion criteria by consensus.

### *Inclusion and exclusion criteria*

This review used several inclusion criteria:

- 1) Studies were based on ED resuscitation
- 2) Studies used any form of observation method (e.g participant observation, video)
- 3) Data were based on real patient episodes

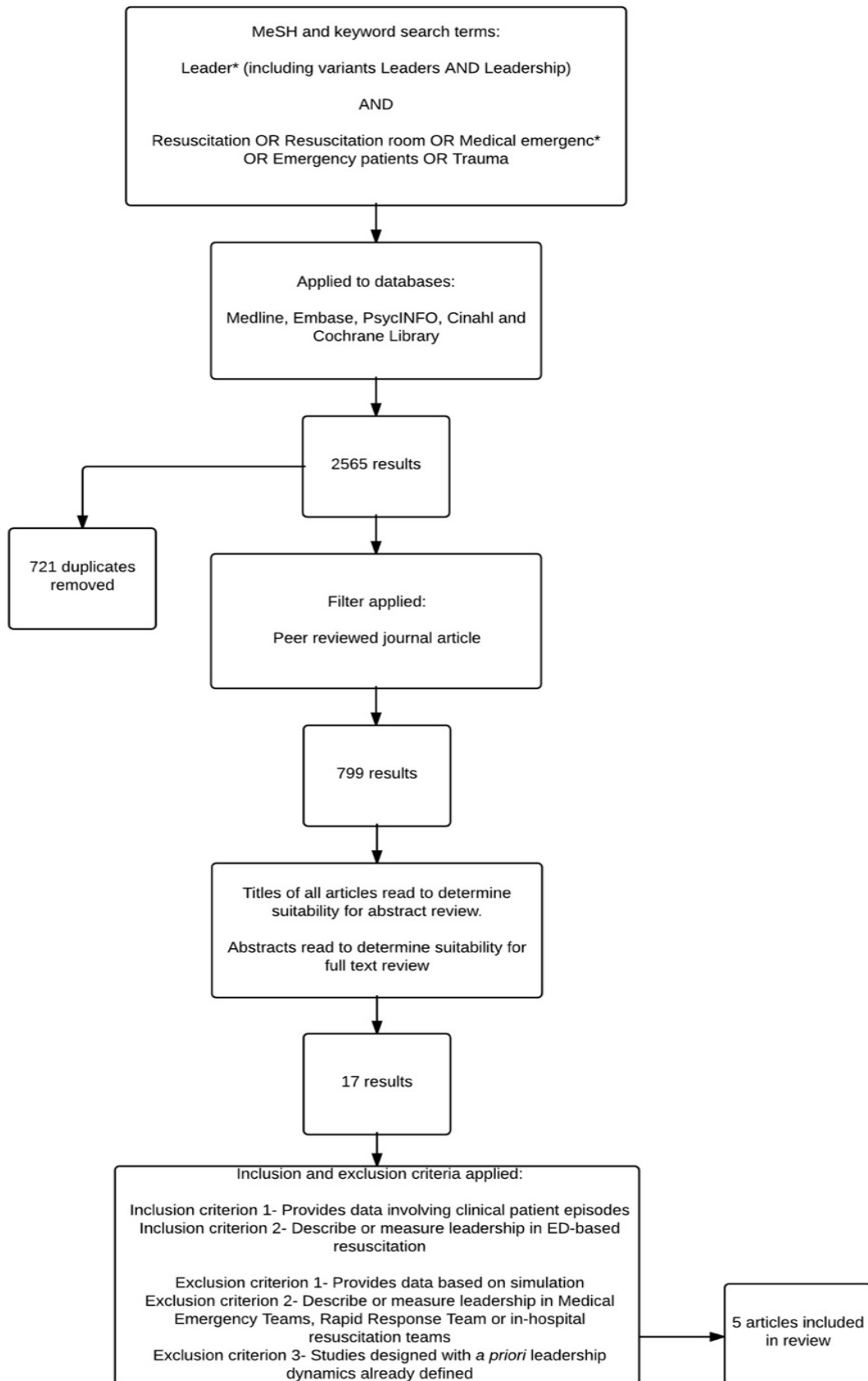


Figure 4.1. Flow chart of literature review search strategy

This review used several exclusion criteria:

- 1) Studies were based on simulated resuscitation
- 2) Studies focused on ERTs (e.g in-hospital resuscitation teams such as Medical Emergency Teams or Rapid Response Teams)
- 3) Studies used *a priori* leadership models (i.e they designed their study based on predetermined leadership models)

#### 4.1.1 Rationale for criteria

Resuscitation functions differently in different settings. The intention was to only include studies that were based in the ED as ERTs have different team composition and team dynamics. Studies were also included that were based on observation of actual patient resuscitation episodes as opposed to simulated scenarios. Previous research using video debrief of real resuscitation cases highlights how a team's perception of their performance may differ from how actually they performed when using objective feedback (Xiao et al 2002). Therefore, studies were included that observed resuscitation as it happened, rather than how staff reported it happened. This meant that simulation studies were excluded which, although recreate the patterns of resuscitative care, cannot reproduce the real events and stimuli of true patient care (Issenberg et al 2005).

The criterion that excluded the majority of the articles was criterion 3. As outlined above, the intention here is to not focus on research which simply measured compliance with a predefined leadership pattern as this approach negates any leadership activity out with the observer's presupposed model. For example, if a doctor, surgeon or nurse was displaying leadership in a resuscitation situation and the observer had chosen to focus on one individual who ought to be the team leader, then this leadership expression would be missed. This decision is in keeping with previous observational studies that have measured the processes of leadership rather than one formally appointed

leader (Rydenfelt et al 2015, Sadideen et al 2016). This is also in keeping with the broad theoretical and methodological approach of this thesis.

## 4.2 Analysis

Leadership within teams has been studied across a range of different sectors and professions, and there is no universally accepted approach of measurement and description. A large meta-analysis extensively reviewed different forms of team leadership in over 3000 teams across various industries, including safety-critical fields such as medicine and aviation (D’Innocenzo et al 2016). This identified the salient elements that are relevant to measuring and describing leadership in teams. These are formality, distribution and temporality. Formality refers to whether leadership is always thought to reside with a formal leader position authorised by the organisation, or whether others can informally emerge as leaders. Distribution describes the extent to which the wider team participates in leadership, and temporality describes leadership as either a static feature or one which adapts with time. These dimensions were used to analyse the results of the literature review and provide measurable components of leadership within teams. This helps to understand *how* leadership functions in the resuscitation room, rather than *what* leaders do.

## 4.3 Results

Of the 17 articles that were read in full, 5 met the inclusion and exclusion criteria. A profile of the included articles is provided in Table 4.1 along with a review of the leadership observations.

Profile of studies						Analysis of leadership			
Study	Country	No. of sites	Method	No. of patients	Formality	Distribution	Temporality		
Xiao et al 2004	USA	1	Video observation	18	Can be formal and informal	Shared	Dynamic		
Cole & Crichton 2006	England	1	Direct observation and interviews	6	Formal	Fixed	Static		
Klein et al 2006	USA	1	Direct observation and interviews	175	Can be formal and informal	Shared	Dynamic		
Berlin & Carlström 2008	Sweden	1	Direct observation and interviews	6	Can be formal and informal	Shared	Dynamic		
Sarcevic et al 2011	USA	2	Video observation, direct observation and interviews	181	Formal	Shared	Dynamic		

Table 4.1. Profile of studies included in the literature review

### 4.3.1 Study designs

All-but-one of the included studies were based on observations of resuscitation teams at a single hospital site; Sarcevic et al (2011) conducted their observations across two hospital sites. All studies focussed on trauma resuscitation

teams which means that ED, surgical and anaesthetic staff would likely be present during resuscitative care. As trauma resuscitation teams are typically co-led by surgical doctors in the U.S.A, three of the five studies would have had a surgeon identified as one of the senior doctors in the room than an ED doctor.

One study used video recordings of resuscitation events as their sole source of data, whilst the remaining four studies used a mix of direct observation, video observation and interviews. The sample size for observations ranged from 6 patient episodes to 181 patient episodes.

### 4.3.2 Theme 1 – Formality of leadership

Three of the five studies described leadership as having the potential to be informally expressed, as well as being formalised if the situation required. Xiao et al (2004) observed team leadership functions in trauma resuscitation teams at a major regional trauma centre in the U.S.A, stating that they *“did not assume leadership was provided by only the most senior team leader... We analysed the behaviour of all the team members to identify leadership behaviours performed by any and all members of the team”* (p 160).

Klein and colleagues (2006) conducted a large ethnographic study of a Level 1 emergency trauma centre in the U.S.A. Based on their observations, they proposed that leadership could be organically expressed from three positions – the senior, middle grade and junior doctor – but this still remains within a hierarchy.

Last, Berlin & Carlström (2008) undertook a case study of emergency trauma teams based in a university hospital in Sweden. The authors describe how leadership can reside within the hands of the formalised team leader, however it can also take an 'emergent' form. Here, leadership can be displayed by someone out with the formal leader role. They described this as: *"If the new leader was distinct and took initial initiatives, certain members of the team could shift leadership focus and begin to act according to the new leader's orders"* (p 572). This is illustrated in their description of an episode when an anaesthetist began to exhibit leadership attributes without being the formal team lead: *"When the team leader gives the team orders, the team glances quickly at the anaesthetist, who from now on has implicit 'superordinate veto' and endorses the words of the team leader with a glance"* (p 572). Emergent leadership was observed throughout team development and maturation, although it is not made clear whether the number and professional grade of team members involved was variable over time.

The remaining two studies described leadership as formalised. In their mixed-method ethnographic study, Cole and Crichton (2006) observed 6 trauma activations at a teaching hospital in England with the aim of describing trauma team dynamics in relation to human factors science. Their observations described leadership remaining with one designated leader throughout the resuscitation which is suggested to be the most senior doctor in the room. The final study is the largest to investigate leadership during ED-based resuscitation. Sarcevic and colleagues (2011) measured leadership dynamics at two Level 1 trauma centres in the U.S.A using a combination of video recordings and direct observations. The study used a grounded theory methodology to categorise leadership as 'intra-disciplinary' (between trauma surgical staff) and 'cross-disciplinary' (between trauma surgical staff and emergency department doctors). Within these broad headings the authors described 'solo', 'intervening', 'parallel' and 'collaborative' forms of leadership. Solo leadership reflects the leadership residing with one person, whereas intervening describes an element of shared leadership overseen by a formal

team leader. Parallel describes two independent leaders who simultaneously enact leadership – a dynamic which was reported as being the most detrimental to care as it splits the direction and coordination of the team. The authors observed formal leadership in that leaders do not emerge throughout the resuscitation; rather, less experienced staff are granted some autonomy at the discretion of the formally designated leader.

#### 4.3.3 Theme 2 – Distribution of leadership

Closely linked with formality is distribution, which reflects whether team members can contribute leadership behaviours. Four of the five studies observed the sharing of leadership to some extent, whilst one study – Cole and Crichton (2006) – reported leadership as fixed to one individual. These authors described team performance as a function of one individual: *“The leader is responsible for team preparation prior to the patient’s arrival, analysis of findings, development of a management plan and coordination of patient referral to other specialists. The team leader also has a responsibility for the team members”* (p 1260).

The studies which report leadership being shared amongst team members describe this plurality in similar ways. Xiao et al (2004) argued for an adaptive model of leadership, one which casts leadership as a fluid process which is dependent on situational conditions such as team composition, resource availability and patient status.

Klein et al (2006), using grounded theory principles, inductively developed a model that they called ‘dynamic delegation’. This sharing of leadership occurs between three medical team members who seamlessly share leadership, however the senior doctor in the room is able to veto other staff member’s leadership.

Berlin and Carlström (2008) described a similar form of shared leadership in their recollection of a resuscitation event. As teams evolved

together a *“pattern of action emerged with some of the team spontaneously and without directions from the team leader ‘holding back’ while other ‘acted’. In addition, others could recognize requirements and either assisted or allowed themselves to be assisted across professional boundary lines”* (p 573).

Last, although Sarcevic et al (2011) report a formalised form of leadership, it is still shared in the parallel and collaborative forms that were observed during trauma resuscitations.

#### 4.3.4 Theme 3 – Temporality of leadership

The final element of temporality mirrors the results of distribution in that those studies which reported shared also reported that leadership is dynamic over time. The study by Cole and Crichton (2006) is the only one to depict leadership as static during the course of a resuscitation event. When considered with the previous theme, leadership was observed to evolve during different phases of resuscitation events, being expressed by different people in different ways depending on the immediate need of the group.

#### 4.4 Discussion

The studies included in this review raise several salient points that must be considered when looking forward to the methodology of this thesis. As noted in Section 3.2 above, the leadership field is filled with discontent due to inconsistencies and contradictions and, in many ways, the findings here are representative of these challenges. As there is no standardised approach for measuring and reporting leadership in resuscitation, the reviewed articles have observed and described leadership in a variety of ways.

This idea has been systematically reviewed by Rosenman and colleagues (2015) who reviewed tools that assessed leadership in health care action teams. The scope of their review was to include research focussing on *“interdisciplinary teams performing complex, critical tasks under high-*

*pressure conditions*” (p. 1408) – a broad term which includes resuscitation teams. The authors found that leadership has been assessed using 61 different tools in health care action teams. In other words, there are 61 different plausible ways of measuring leadership in resuscitation teams. The authors identified 37 discrete functions that could signal leadership. More recently, a mixed methods study by Leenstra et al (2016) developed a leadership taxonomy for trauma which produced 67 different behavioural markers. This is an important discussion point for this thesis; it has become the norm to identify a leader and then list the number of attributes or skills that they should possess to satisfy the idea of ‘good’ leadership. However, the variation in leadership, from its theory to its practical application, is clearly present in resuscitation research.

The second salient point is that the traditional leader-centric conceptualisation of leadership, which is predominantly downward and residing with the most senior doctor in the room, does not appear to reflect the reality of how leadership and team processes interact. Whilst consultant led care has been shown to improve outcomes across patient and service performance metrics (Academy of Medical Royal Colleges 2012), the nature and contribution of leadership appears more nuanced. Variables such as clinical situation, team composition, patient-task urgency and individual skill set all combine to create unique resuscitation events that require different individuals present to display leadership attributes at different times.

Early in this thesis process a manuscript arguing this point was submitted for publication by the Ph.D candidate, co-authored by supervisor Dr Gareth Clegg and Professor Robert Crouch at the University of Southampton. The manuscript, titled ‘*Dynamic nurse leadership in high-pressure situations*’, was published in *Emergency Nurse* in June 2015 (Lloyd et al 2015). A cautious conclusion is that this appears to be a signal that a dynamic team-level construct of leadership is welcomed in the literature.

The third and final salient point is that the literature reviewed here suggests that the current understanding of how leadership is formed, initiated and maintained during resuscitation is incomplete. For example, Klein *et al* (2006) argue that leadership is de-individualised in that it is vested in three professional positions rather than in the individuals occupying those positions. In practical terms, this means that leadership will reside with the person in 'position A', irrespective of who that person is. Cole and Crichton (2006), however, suggest that it is the team's ability to recognise the strengths and weaknesses of individuals, as well as how familiar team members are with one another which influences resuscitation performance. This assertion asks fundamental questions of the historical 'positional' view of leadership, one where the senior doctor is always considered the leader regardless of who they are or their relationship with the team.

#### 4.5 Limitations

The literature review, whilst positively offering a team-level perspective of leadership, does have some limitations. First, there are a small number of studies, all of which have focused on trauma. The availability of similar work across the full spectrum of medical emergencies would better capture the challenges of leadership in resuscitative care. Second, there is a lack of a standardised approach to the measurement and description of leadership dynamics. This presents a fundamental problem for leadership research as *"...the way in which researchers define the phenomenon may in fact influence the nature of its observed relationship with team performance"* (D'Innocenzo *et al* 2016, p 1965). Similarly, there is a lack of external validation of the leadership models used with little emphasis on correlation with clinical patient outcomes or team performance metrics. Last, this review excluded simulation data. It was decided that whilst the simulated environment is useful for training, it is always an abstraction of actual resuscitation practice (Issenberg *et al*

2005). Therefore, only studies involving actual patient resuscitation events which reflect the nuances of 'real' leadership were selected.

#### 4.6 Conclusion

By opting to frame leadership at the team level rather than at the level of the individual, this review has found that there are a small number of studies that use naturalistic observational methods to measure the processes of leadership. Those studies that have observed leadership processes rather than leaders point to several important themes: that it can be shared amongst team members, either formally or informally, and it can evolve dynamically over the duration of a resuscitation event rather than being fixed with one person.

#### 4.7 Chapter summary

This chapter concludes with two key points that will inform the next chapter on philosophy, theory and methodology. First, observing formally designated leaders in the resuscitation room will offer nothing new to an already extensive body of literature. This thesis will re-focus the lens of inquiry onto *leadership* – who displays leadership and when, how they do this, and whether leadership is best conceived as a team phenomenon. A second manuscript was submitted for publication by the Ph.D candidate arguing for research to take this direction, co-authored by supervisor Dr Gareth Clegg. The manuscript, titled '*From leader to leadership in emergency care*' was published in the *Nursing Times* (Lloyd and Clegg 2016). Again, a cautious conclusion is that this appears to be a small signal that the approach to be taken in this thesis is welcomed by the academic community.

Second, the inclusion of studies that have used naturalistic observational techniques has highlighted that it is possible to understand some of the finer grain elements of leadership. Therefore, pursuing ethnography as

the methodology for this thesis offers the chance to observe the richness of leadership in the resuscitation room.

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## 5.0 Philosophy, theory and methodology

### 5.1 Overview of chapter

Chapter 5 is one of the largest in this study and covers different ideas, ranging from philosophical viewpoints to the specific methods used. Accordingly, the following summary provides an overview of the core points that will be discussed in the chapter.

Philosophical viewpoint – what is the ontological and epistemological position?

Critical realism (Maxwell 2012)

Theory – which theory informs the methodology?

Shared team leadership (Pearce and Sims 2000)

Methodology – what approach will be taken to study leadership?

Ethnography

Aim(s)

To study leadership during emergency department resuscitation using a team-level approach

Objective(s)

- (1) To develop a team leadership behavioural marker tool that can be used as a framework to identify who displays leadership and how they do this
- (2) Using a team behavioural marker tool as a framework, conduct a video-based ethnography of leadership based on observations of real patient care episodes

### *Research Question(s)*

Several research questions will be explored during this ethnography:

- How is leadership empirically enacted during emergency department resuscitation?
- Are there differences between Nursing and Medical leadership as it is experienced in the resuscitation room?
- How appropriate is the application of shared leadership theory to emergency department resuscitation scenarios?

Methods – what techniques will be used?

- 1) Video observation (20 patient care episodes – supported by observations of 300 patient care episodes to immerse the researcher in the environment)
- 2) Interviews (20 interviews)
- 3) Questionnaires (100 questionnaires will be distributed)

It is also worthwhile highlighting in this summary that whilst ethical considerations are often placed within the 'methods' section of theses, this research went through extensive ethical, legal and data protection approvals, particularly for using video to record patient care. As such, these issues will be discussed in a separate chapter which will outline the approval processes in full (Chapter 6).

## 5.2 Aim of chapter

The aim of this chapter is to provide the reader with an understanding of how philosophy and theory informed the methods used, with implications for analysis and interpretation. The chapter starts by giving an overview of why philosophical considerations are important, and introduces ontological and

epistemological arguments. From here, the onto-epistemic position for this thesis is outlined as well as discussing its strengths and limitations.

A description of how theory has informed the choice of methodology and the methods used is then given.

### 5.3 The importance of research philosophies

To introduce the broad approach to research philosophies for this research, the researcher's voice is used in Figure 5.1a.

At the start of this study I had the opportunity to meet with a group of post-doctoral researchers, most of whom were fresh from their viva panel discussion. This was a diverse group of individuals who had studied across a range of disciplines, located in over a dozen countries. One female researcher travelled to a small area of Lebanon, observing the influence of religion on family structure. A second male had studied contract law in America with a focus on informal contracts, such as those created amongst friends and family. As one of the novice researchers in the room I listened intently to their discussions and jotted down nearly everything I heard. Many of the discussions were, at the time, rather arcane. They ranged from the macro idea of philosophical assumptions to the micro idea of field note pro forma choice. They all, however, related to the broad idea of 'research methods'.

Since that day I have continued taking these jottings, amassing nearly 100 research-related which are provided in a word cloud below (Figure 5.1b). I have chosen this format because it serves to highlight the breadth of terminology in the literature which relates to the broad idea of 'research methods'.



Figure 5.1b. Wordcloud of research terms

The most useful insight that day came from one researcher who placed primacy on the philosophical underpinnings of their doctoral work. The researcher explained the core philosophical considerations of ontology and epistemology issues in terms of a large, complex maze. Individuals can start at different ontological openings to the maze – at realism or idealism – but they all work their way towards the common centre. They can wander through different epistemological paths – say positivism or constructivism – yet they all attempt to arrive at the same valid end-point. Philosophy, then, determines the nature of knowledge that is produced during doctoral work.

Figure 5.1a. A reflection on research philosophies

The scale of the researchers ‘maze’ is vast. Globally, healthcare research expenditures are in excess of \$265 billion annually (Moses *et al* 2015), with over 25,000,000 articles published by 15,000,000 academics in the last 15 years (Boyack *et al* 2013). These researchers, their colleagues, their studies and the resulting outputs will likely have overt and subtle philosophical variants. The challenge here is that *“philosophical ideas often remain hidden”* (Wilson and Stutchbury 2009, p 57). Yet, as Pring (2000) suggests, *“without the explicit formulation of the philosophical background – with implications for verification, explanation, knowledge of reality – researchers may remain*

*innocently unaware of the deeper meaning and commitments of what they say or how they conduct their research”* (p 89).

The purpose of this section is to describe how this study navigated the maze, which paths were taken and why, and what it means when placed in the context of the larger research landscape.

## 5.4 Existing frameworks for research

Before outlining the choices made here, it is worthwhile to briefly consider the diversity of existing research frameworks, as well as the challenges that stem from this diversity. Crotty’s landmark text, *The Foundations of Sociological Research* (1998), provides a useful insight when considering ontological and epistemological issues. Crotty recognises that a common initial problem that researchers need to contend with when beginning a study is that research terms are often *“thrown together in grab-bag style as if they were all comparable terms”* (p 3).

For example, consider what is meant by the term ‘epistemology’. According to Crotty there are three epistemological positions: constructivism, objectivism and subjectivism. However, Higgs (2001) and Guba and Lincoln (2005) refer to Crotty’s epistemologies as ‘paradigms’ which are sets of beliefs, assumptions and conventions that shape how questions can be asked, how these can be answered and what constitutes an appropriate answer. Higgs describes the three core paradigms as empirico-analytical, interpretive and critical, whereas Guba and Lincoln describe positivism, post-positivism, critical theories, constructivism and participatory/cooperative.

A third and final take on research epistemologies comes from Creswell (2013) who promotes the idea of philosophical worldviews which he describes as *“a general orientation about the world and the nature of research that a researcher holds”* (p 6). Creswell argues that the four worldviews are postpositivism, constructivism, advocacy/participatory and pragmatism.

What is clear, even from reflecting on just one research term, is that philosophical ideas can be articulated in a variety of ways. It would be naïve to suggest that this variation simply reflects a confusion of research terminology; rather, researchers will conceptualise the same research issue differently which has important semantic value. It would be easy for the novice researcher to approach onto-epistemological considerations in a ‘grab-bag’ style without giving the necessary critical thought to these issues. The challenge for this section, then, is to address some of these challenges whilst providing a clear philosophical and methodological structure for the project.

The first step, therefore, is to outline what is meant by ontology and epistemology. Clarification about research methodology terminology will then be given to provide a clear direction for this thesis. Following this, an overview of the main epistemologies – positivism, post-positivism, post-modernism and constructivism – will be offered. The section will conclude with the ontology and epistemology that underpin this work, along with its strengths and weaknesses.

## 5.5 Ontology and epistemology

### 5.5.1 Ontology

Ontology is the study of ‘being’ and the nature of existence. It is concerned with the structure of reality and what it means when something is said to exist (Ormston *et al* 2014). A thorough definition from the SAGE Dictionary of Social Research Methods defines ontology as “*A concept concerned with the existence of, and relationship between, different aspects of society such as social actors, cultural norms and social structures...Ontological issues are concerned with questions pertaining to the kinds of things that exist with society*” (p 202). Bryman (2008) builds on this by noting a form of social ontology, one which is concerned not only with the

physical elements that exist within society, but also whether social entities exist independently of people or whether these themselves are constructed by the perceptions and interpretations of individuals within society.

There are two overarching ontological positions that have dominated research discourse. These are realism and idealism (referred to as nominalism by Burrell and Morgan 1979). *“The realist position”*, according to Cohen *et al* (2011), *“contends that objects have an independent existence and are not dependant for it on the knower”* (p 6). In other words, there is an external reality which exists out with people’s perceptions, interpretations or beliefs about it.

Ormston *et al* (2014) point out that *“Idealism, on the other hand, asserts that reality is fundamentally mind-dependent: it is only knowable through the human mind and through socially constructed meanings, and no reality exists independently of these”* (pg 5). Over the past several decades more nuanced positions have been put forward. These include naïve realism, critical realism, historical realism, participative reality, collective idealism, contextual idealism, radical idealism and relativism (Heron and Reason 1997, Blaikie 2007, Ormston *et al* 2014). However, for clarity, the two main ontologies remain realism and idealism.

### 5.5.2 Epistemology

Whilst the ontologist studies something when it is said to exist, the epistemologist studies something when it is said to be known. An epistemology *“is a theory of knowledge – what can be known, and what criteria such knowledge must satisfy in order to be called knowledge rather than beliefs”* (Blaikie 1993, p 7). It is at this epistemological level where divergence in the literature becomes apparent. Ormston *et al* (2014) frame their epistemological discussion in terms of knowledge acquisition, leaning towards the debate of Aristotelian deductive reasoning versus Baconian inductive reasoning.

Extending their earlier work, Blaikie (2007) introduces two other forms of reasoning to acquire knowledge, called retroductive and abductive. Retroductive logic seeks to marry patterns in data with the structures or mechanisms that produce them by ‘fitting’ models to the situation. Abductive logic appears to have hermeneutic phenomenology roots through abducting an account of the social world using participants’ accounts of everyday actions or beliefs.

This reasoning approach contrasts with Denzin and Lincoln’s landmark work (1994), who label epistemological ideas in terms of objectivist, modified dualist and subjectivist approaches. Blaikie (1993) discusses epistemology in pragmatic terms by acknowledging that there is “*a fundamental choice to be made by the social researcher*” (p 203) – those ‘insiders’ who immerse themselves in the environment under study and those ‘outsiders’ who simply observe, measure and report the elements within the environment. Here, Blaikie’s view neatly aligns with the outsiders-as-realists and insiders-as-idealists (or nominalists) approach.

The final and most prominent approach to epistemology is concerned with the ‘isms’: positivism, constructivism and their variants (Burrell and Morgan 1979). These ‘isms’ are most commonly understood with positivism being associated with realism, and constructivism being associated with idealism.

### 5.5.3 Clarifying ontological and epistemological terminology

It is easy to surmise from these discussions that, even at this early philosophical stage, ideas and terminology appear to diverge, and even contradict in some circumstances. The novice researcher needs to contend with this palette of definitions. For example, how should one proceed with ‘paradigms’, ‘schools’, ‘interpretive frameworks’, ‘traditions’ and ‘theoretical frameworks’?

For some, paradigms represent “*basic belief systems based on ontological, epistemological and methodological assumptions*” (Guba and Lincoln, p 107). This view fits with Rossman and Wilson’s (1985) purist stance which advocates that all aspects of research ought to be conducted within the prescribed guidelines of one’s paradigm.

Others have rejected this, arguing that “*conceptual and methodological issues are separable on several dimensions*” (Tashakkori and Teddlie 2010, p 6), to the extent that when they are combined together under one label it results in the incompatibility thesis – i.e. there is no way of satisfying the purist stances of some epistemologies.

Another form, termed paradigm pluralism (Tashakkori and Teddlie 2010), asserts that multiple paradigms may serve as the underlying philosophy to satisfy the needs of the methodology. Creswell *et al* (2003) provide an example of this. They presented six mixed-method research designs, arguing that no individual paradigm would provide an appropriate philosophical basis for the study; each design would be open to critique.

The most extreme extension of this is an a-paradigmatic stance. Patton (2002) describes this in practice, claiming that “*in real-world practice, methods can be separated from the epistemology out of which they emerged*” (p 136). Providing a useful summary of this work, Morgan (2007) suggests there are four common interpretations: paradigms as overarching worldviews, as epistemological stances, as model examples and as shared beliefs amongst a research community.

Clearly there exists a chasm between the a-paradigmatic and purist stances, filled by all the various interpretations of paradigms and epistemologies. The purists would argue that a paradigm is the highest order idea, whilst the a-paradigmatics would suggest a dissolution between higher and lower order ideas.

After consideration of these various arguments, epistemological ideas are discussed here in the traditional sense of positivism, post-positivism,

constructivism and so on. These are the higher order conceptualisations under which paradigms can sit (Figure 5.2).

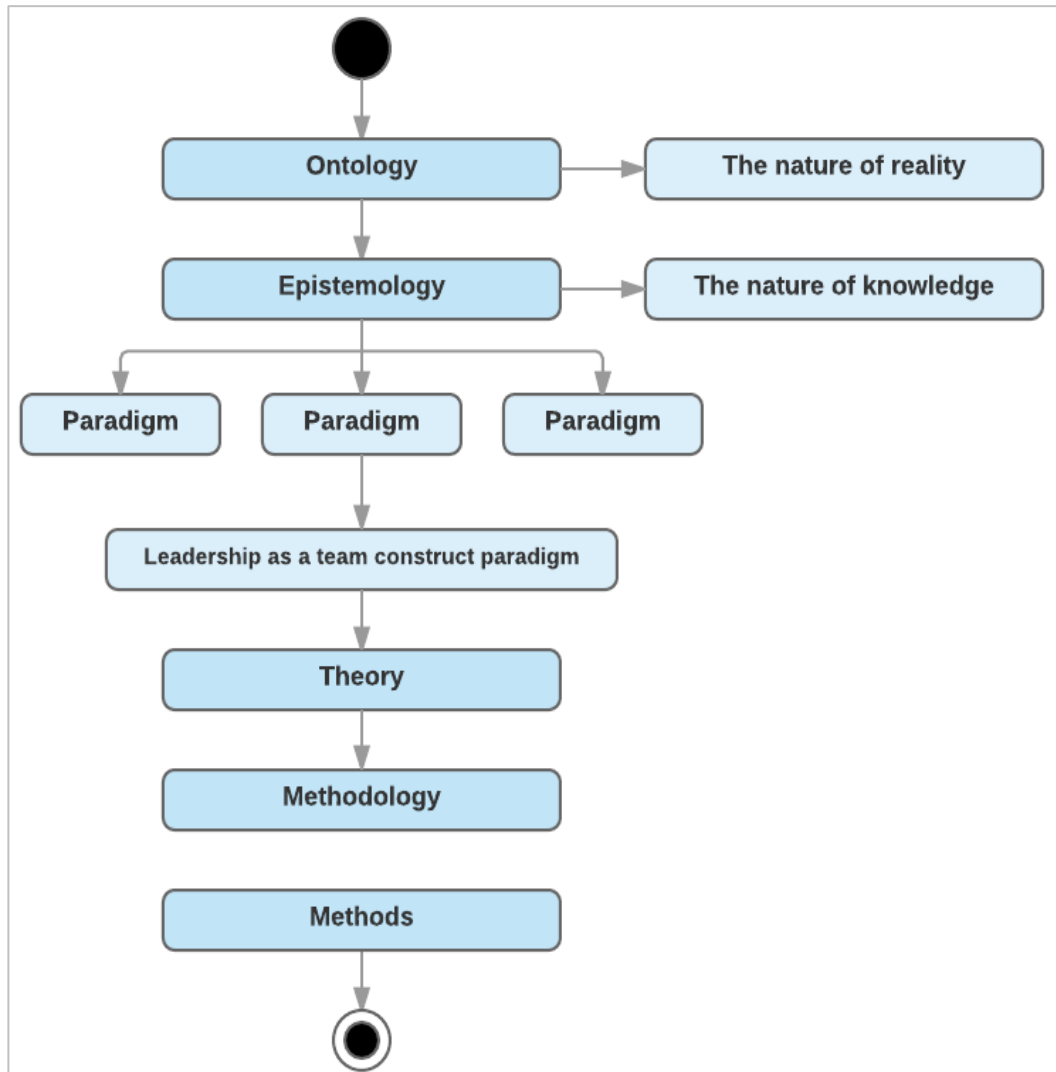


Figure 5.2. Overview research terminology

Furthermore, paradigms are referred to in the same sense as Morgan (2007), who conceptualises paradigms as “*shared beliefs among a community of researchers*” (p 53). Not only does this pay homage to Thomas Kuhn’s (1962) original interpretation of the word, but it also resonates with contemporary scholars by acknowledging that different paradigms exist within and between disciplines. For example, grounded theorists all adhere to the same underlying principles of grounded theory. Yet different practices have

emerged within grounded theory – paradigms set by groups of researchers – that are slight variants from one another.

With this clarification in mind, the epistemologies available to this thesis will be outlined, concluding with the chosen onto-epistemology.

## 5.6 Available epistemologies

### Positivism

The birth of positivism arguably dates back to ancient times with Plato's and Socrates' beliefs of knowledge (Johnson and Gray 2010). Plato and Socrates believed in unchanging absolute truths, gained through *a priori* deductive logic. Positivism has firm roots in naturalism – the belief that “*there can be a natural scientific study of people and society...in spite of the differences in subject matter of the various scientific disciplines, both natural and social, the same method or logic of explanation can be used*” (Blaikie 1993, p 13).

Positivism took hold during the Renaissance and advanced by Francis Bacon who published *The New Organon* (1620) in response to Aristotle's original publication of *The Organon*. Both advocated empirical scientific logic, as opposed to pure rationalism put forward by Plato, favouring to pursue knowledge that can be verified by the experience of man.

Rene Descartes' *Discourse on Methodology* (1637) leaned towards Plato's rationalistic logic in that “*researchers should attempt to distance themselves from any influences that might corrupt their analytical capacity*” (Ormston *et al* 2014, p 9). Moving into the Enlightenment, modern empiricism is associated with John Locke, David Hume and John Stuart Mill.

All of these scholars have contributed to positivism as we understand it today, however it was the French philosopher Auguste Comte who is attributed with coining the term in the 19<sup>th</sup> century (Beck 1979). In his view, the study of social phenomena could and should be studied according to the laws of natural

phenomena, through unbiased and rigorous observation; science is the only way to achieve true knowledge.

A second branch of positivism was born in Vienna during the 1920s known as logical positivism (Blaikie 1993). Hacking (1983) has noted its central pillars of being anti-theoretical, anti-causation, concerned with observation and, crucially, concerned with empirical verification.

An interesting point in the 19<sup>th</sup> century was the publication of Darwin's *On the Origin of Species* in 1859. Whilst the theory of evolution was quantitative in terms of how it had been conceived, designed and reported, its publication saw a mellowing of foundational beliefs. Those positivists-as-realists saw that the theory represented dynamic, changing truths which challenged core Platonic principles. Albert Einstein's challenge to Isaac Newton followed, with the positivist landscape now taking on a more nuanced, moderate tone. This was arguably the start of the contemporary post-positivist movement.

### Post-positivism

Halfpenny (1982) suggests that it is possible to identify 12 different versions of positivism, highlighting how this once common epistemology separated into discrete paradigms. The most prominent of these is the area of post-positivism. According to O'Leary (2004), this is an umbrella term used to describe all approaches that still obey positivistic philosophy following the rejection of mainstream positivism. Thomas Kuhn's work, formalised in *The Structure of Scientific Revolutions* (1962), arguably epitomises the shift from positivism to post-positivism. Hammersley and Atkinson (2007) claim that:

*"He, and others, showed that the work of those involved in the major developments of scientific knowledge in the past was shaped by theoretical presuppositions about the world that were not themselves based on empirical research, and many of which are judged by scientists today as false"* (p 11).

Furthermore, science itself, *“rather than displaying the gradual build-up of knowledge, is punctuated by periods of revolution when the theoretical presuppositions forming the ‘paradigm’ in terms of which scientists in a particular field have previously operated are challenged and replaced”* (p 11).

A further softening of the strict adherence to the rationalism and empiricism that underpinned positivism was voiced by the 20<sup>th</sup> century philosopher Karl Popper. Whilst referring to the physical and social sciences, Popper argued that although he agreed *“with Comte and Mill – and many others... – that the methods in the two fields are fundamentally the same”*, he did not *“intend to assert that there are no differences whatever between the methods of the theoretical sciences of nature and society; such differences clearly exist, even between the various natural sciences themselves, as well as between the various social sciences”* (Popper 1957, p 130).

What Popper alludes to in his writings is that knowledge is not perfect nor infallible; rather, through falsification, those ideas that are temporally considered ‘truths’ can be disproven. This forms the basic tenets of post-positivist views.

Scientists of the physical and social phenomena alike do not conform to naïve realism. Although they pursue knowledge by limiting bias and practising rigorous ‘scientific’ methods, there is an appreciation of the value-laden nature of facts and truth (Robson 2011). A final tenet noted by Philips and Burbules (2000) relates to considering the socio-political landscape of knowledge. This brings in ideas of post structuralism and post modernism which will be briefly discussed below.

### Post modernism

Post modernism, in many ways a broader extrapolation to post positivism, is seen as a challenge to the dogma of the Renaissance and the

Enlightenment, spreading into the arts and literature as well as the natural and social sciences (Alvesson 2002). Robson (2011) claims that *“Essentially, whatever modernism advocated is opposed by postmodernists”* (p 16). The promulgation of rationalism and universal truths characteristic of the modern positivists was rejected by postmodernism. Blaikie (2007) cogently described this as: *“Objective criteria that are presented as a basis for distinguishing truth from falsity are seen to be nothing more than forms of persuasion that are designed to show that what is claimed is true”* (50).

The postmodernist era saw socio-political epistemologies emerge, such as Marxism, feminism and queer theory, which were all concerned with the influence of power structures on bodies of knowledge. Broadly these are conceived as critical theories (Denzin and Lincoln 2011) as they are based on a transactional, historical realism that places the social, political and cultural norms of the time at the heart of knowledge and truth debates.

The postmodernist, then, did not subscribe to mainstream positivist-as-realist ideas that were commonplace throughout the Renaissance and the Enlightenment. As Ezzy (2002) discusses, there are a spectrum of postmodernists, from those who are moderates calling for a refinement of traditional modernist ideas, to those who are staunch opponents of all modernist beliefs. Consequently, this led to widespread criticism of postmodernism. As Wilson (1998) wrote:

*“The philosophical postmodernists, a rebel crew milling beneath the black flag of anarchy, challenge the very foundations of science and traditional philosophy. Reality, they propose, is a state constructed by the mind, not perceived by it. In the most extravagant version of this constructivism, there is no ‘real’ reality, no objective truths external to mental activity, only prevailing visions disseminating by ruling social groups”* (p 44).

Here, Wilson groups together postmodernists and constructivists under the same ‘black flag’. Whilst they share ontological similarities, the viewpoint of

Wilson is not shared here as constructivism is considered a discrete epistemology (Johnson and Gray 2010). Indeed, to group together all non-positivist research under the same flag is creating a black flag of positivist research that includes all non-constructivist research.

### Constructivism

Similar to the birth of positivism, the origins of constructivism (or relativism as it is also known) dates back to ancient Greece. Opponents of the teachings of Plato and Socrates were known as the Sophists. These philosophers believed in a fluid reality, one in which knowledge is perceived, created and acted upon by man. As the Greek philosopher Protagoras once said: *“Man is the measure of all things”*.

Moving through medieval times, the beginnings of qualitative thinking can be seen through Johann Dannhauser’s examinations of biblical texts, introducing hermeneutics. The Enlightenment in Germany – the *Aufklärung* – saw Immanuel Kant publish his *Critique of Pure Reason* (1781). He attempted what he called a Copernican revolution of philosophy, arguing that:

*“perception relates not only to the senses but to human interpretations of what the senses tell us. As such, knowledge of the world is based on ‘understanding’, which arises from reflecting on what happens, not just from having had particular experiences. Knowing and knowledge therefore transcend basic empirical enquiry”* (Ormston et al 2014, p 11).

Wilhelm Dilthey and Max Weber followed on from the *Aufklärung*, as well as the hermeneutic origins of Dannhauser, by emphasising that knowledge should pursue the lived experiences of individuals and interpretations of these experiences.

In contemporary research the manifestations of constructivism are visible through the proliferation of methodologies that largely do not conform

to the pro-positivist epistemology, broadly falling under the banner of qualitative research. Johnson and Gray (2010) have outlined the key developments. There was a growth in the 1920s and 1930s of phenomenology associated with Husserl, Heidegger and Gadamer as well as cultural relativism associated with Boas. Symbolic interactionism was popularised by Mead and Blumer, whilst the critical postmodernists theories were formalised by authors such as Marx. Last, Foucault and Derrida were best known for their work on post structuralism. Taken together, this range of constructivist methodologies are anti-foundational (Lincoln 1995). That is, they refuse to *“adopt any permanent, unvarying (or “foundational”) standards by which truth can be universally known”* (Lincoln *et al* 2011, p 119).

### 5.7 Onto-epistemological conclusions

It appears that debates about what constitutes reality and knowledge have lasted millennia, from the Plato and Sophist factions of Greek antiquity up to the current groups of quantitative and qualitative researchers. Indeed, Teddie and Tashakkori (2011) call these the contemporary ‘paradigm wars’ – although this thesis would refer to these as the epistemological wars as the higher order idea explained above – starting in the 1970s with the rise of post-positivism and constructivism as a refutation of positivism. The 1990s saw conflict between the post-positivists, constructivists and critical theorists whilst current debates continue between purist methodologists and mixed-methods scholars.

Denzin and Lincoln (2011) place these wars in seven historical moments in the qualitative camp: the traditional (1900-1950), modernist (1950-1970), blurred genre (1970-1986), crisis of representation (1986-1990), post-modern (1990-1995), post-experimental (1995-2000) and the methodologically contested (2000-2010).

Unsurprisingly this history tends to produce epistemologies and researchers that are dichotomous. This is significant for this thesis because it induces the novice researcher, like myself, to subscribe to one absolute or the other: to physicalism or materialism, empiricism or rationalism, absolutism or relativism, deduction or induction, scientism or humanism, nomothetic understanding or ideographic understanding and, perhaps most fundamental, scientific explanation or human understanding (Tashakkori and Teddie 2010).

This message was at the heart of Charles Percy Snow's famous Rede Lecture in 1959, titled *The Two Cultures*. Snow lamented to a University of Cambridge audience:

*"A good many times I have been present at gatherings of people who, by the standards of the traditional culture, are thought highly educated and who have with considerable gusto been expressing their incredulity at the illiteracy of scientists. Once or twice I have been provoked and have asked the company how many of them could describe the Second Law of Thermodynamics. The response was cold: it was also negative. Yet I was asking something which is about the scientific equivalent of: Have you read a work of Shakespeare's? I now believe that if I had asked an even simpler question—such as, What do you mean by mass, or acceleration, which is the scientific equivalent of saying, Can you read?—not more than one in ten of the highly educated would have felt that I was speaking the same language. So the great edifice of modern physics goes up, and the majority of the cleverest people in the western world have about as much insight into it as their neolithic ancestors would have had"* (1959, p 15-16)

Attempts have been made to avoid scholars becoming a silo in the Shakespearean or Thermodynamic camp. The philosopher and logician Charles Sanders Peirce (1839-1914) is believed to have coined the term *synechism* which avoids the tendencies that are dichotomous. To think *synechistically*, writes Tashakorri and Teddie (2010), "*helps one avoid the*

*error of “false choice”, which is too commonly used in our journals and books as a way of describing the world as argument form” (p 70). It “involves attempting to reconcile opposing principles and viewpoints” and “acknowledges weak, moderate, and strong forms of concepts, and avoids the category of necessity” (p 70).*

The ontological and epistemological disposition of this research has evolved in the spirit of synecism. Having reflected on the long history of onto-epistemic arguments, a broad range of classic and contemporary literature, and the necessary personal disposition of the researcher – my background, motives and beliefs – the view of critical realism is adopted as the onto-epistemological position of this study (Maxwell 2012). This will be outlined below, along with its merits and weaknesses, after which the resulting theory, methodology and choice of methods will be discussed.

## 5.8 Critical realism

The opening sub-sections of this chapter have illustrated how historical and contemporary debates about knowledge and reality have often been polarised. Whilst there are different paradigms within different ontologies and epistemologies, broadly speaking there are the positivists (the objectivists) on one side and there are the constructivists (the relativists) on the other. Critical realism, as suggested here, is a stance that avoids the polarity which characterises the epistemology-paradigm wars that has evidently troubled researchers for centuries.

Critical realism is traditionally associated with the work of Roy Bhaskar, however it was first used in the context discussed here by the social scientist Donald Campbell in 1974. The main proponent of critical realism today is Joseph Maxwell. He describes the core principles of critical realism which *“combines a realist ontology (the belief that there is a real world that exists*

*independently of our beliefs and constructions) with a constructivist epistemology (the belief that our knowledge of this world is inevitably our own construction, created from a specific vantage point, and that there is no possibility of our achieving a purely “objective” account that is independent of all particular perspectives” (2012, p vii).*

At first glance this appears to be a “*philosophical oxymoron*” (Maxwell and Mittapalli 2010, pg 146). It has been customary for the objectivists and relativists to be separated, and never the twain shall meet. Here, critical realism utilises an ontology that traditionally falls within the objectivist realm whilst employing an epistemology that falls within the interpretive realm.

### 5.8.1 Strengths of critical realism

Despite these criticisms, this form of realism is becoming more accepted amongst researchers for several reasons (Gorski 2013). Gorski correctly acknowledges that “*The shortcomings of positivism and empiricism are old news by now. Strong forms of interpretivism and constructivism seem equally problematic*” (p 659). Critical realism offers a way to acknowledge the differences between the methods and evidence-gathering processes that separate the social and physical sciences, whilst also avoiding the “*extreme skepticism about the possibility of authoritative discourse in social inquiry that characterizes the ‘postmoderns’*” (Erickson 2017, p 58).

Within the qualitative community itself there has been recognition that the dubiety about what constitutes a form of generalisable knowledge is hindering the study of social phenomena. A leading qualitative researcher, Martin Hammersley, described how:

*“[the] postmodernist image of qualitative inquiry is not only ill-conceived but...The postmodern approach is founded on some false assumptions that undermine the distinctive nature of social research...one consequence of this has been a legitimization of speculative theorizing; another has been a*

*celebration of obscurity, and associated denunciations of clarity...[this] leads toward an abdication of the responsibility for clear and careful argument aimed at discovering what truths qualitative inquiry is capable of providing” (2008, p 11).*

This thesis addresses the obscurity directly and proposes a realist ontology – that there are “*real objects that exist independently of our knowledge of their existence*” (Schwandt 2007, p 256) – with a constructivist epistemology – that “*our knowledge of those real objects is never direct but mediated by mediated by our concepts and language*” (Erickson 2017, 58).

In keeping with constructivism it is at this stage that the researcher’s disposition has to be voiced (LeCompte 1982): I believe that the reality that surrounds the work in this thesis is independent of my thinking. I also recognise that the knowledge put forward through this work is not universal, nor is it infallible. I do not claim that there are social laws that determine X causing Y; rather, the purpose of this research is to understand why X causes Y in some circumstances, and to understand causes as processes that are contextually embedded.

Critical realism sets the boundaries of knowledge for this research by attempting to validly explain how leadership operates during resuscitation, particularly leadership at a team level, whilst acknowledging that the findings of this thesis will not represent a universal truth.

### 5.8.2 Criticisms of critical realism

All research positions have areas that can be critiqued and academics on both sides of the realist versus idealist debate have been able to cast doubt on critical realism, exactly because it seeks a middle ground between the classic quantitative-qualitative divide.

It is viewed as a quasi-foundationalist approach due to its ontological roots, particularly by the qualitative camp whose constructivist epistemology

usually clashes with realism. The fundamental criticism was formed by Smith and Deemer (2000). They claimed that a realist ontology, whilst holding a constructivist epistemology, can serve no useful purpose as the real world cannot be accessed for as long as one is constrained through relativism. They argue that *“Maxwell is unable to show us how to get reality to do some serious work”* (p 883).

## 5.9 Theory

Thus far the onto-epistemic position that sets the parameters for this thesis has been outlined. The next step is to identify the theory that underpins the methodology and choice of methods.

*“Theories...”, according to Reeves et al (2008), “...give researchers different ‘lenses’ through which to look at complicated problems and social issues, focussing their attention on different aspects of the data and providing a framework within which to conduct their analysis”* (p 631).

As highlighted above, there are approximately 66 different theoretical leadership ‘lenses’ in published literature (Dinh et al 2014), which suggests there are many plausible ways to approach the measurement of leadership. Articulating which leadership theory supports this work essentially describes *how* this will be done, with direct implications for study design, analysis and interpretation.

Dinh and colleagues (2014) provide useful thematic category titles whilst describing the 66 extant leadership theories. For example, inspirational leadership theory and transformational leadership theory fall under the category title of ‘neo-charismatic theories’, whilst followership theory and romance of leadership come under ‘follower-centric theories’.

Interestingly, the broad idea of team-based leadership can be positioned under a number of different category titles. The first and most obvious group are the team leadership theories. These include the *“nature of*

*leadership in different types of teams, determinants of team performance, procedures for facilitating team learning, guidelines for team building, and leadership function in decision making in groups*" (Dinh et al 2014, p 57). The second are the contingency theories, such as situational leadership theory and contingency theory itself. These describe leaders adjusting to different situations or altering the situation to fit him or herself. Last, and perhaps the most contentious, are the behavioural theories. Up to this point behavioural theories have used an individual as the unit of analysis, thus these may not be suitable to apply to complex teams. However, team leadership is characterised as a participative and shared behavioural theory by Dinh et al. as the way in which leadership is distributed in teams can be conceptualised in different ways. Burke et al (2011) provide a succinct explanation of this:

*"What seems to differ among the various conceptualizations is the manner in which the responsibilities are shared and the exact nature of what constitutes 'leadership'. For example, some researchers explicitly view shared leadership as an emergent phenomenon that occurs within the team... whereas others do not disallow that shared leadership can be formally prescribed"* (p 342).

In practical terms, this corroborates the findings of the literature review in chapter 4. Published observational studies disagree with how leadership is enacted within teams; does one leader formally allow other team members to lead, or do other team members organically emerge as leaders through their actions and behaviours? This question suggests there is potential for leadership to be shared as a behavioural feature of one individual, or distributed amongst team members depending on the situational needs of the group.

Reflecting on this, as well the identified ontology and epistemology, Pearce and Sims' (2000) shared leadership theory is adopted as the theory informing this study. This theory states that *"leadership can exist as a shared*

*group level phenomenon...Whereas vertical leadership entails the process of one individual projecting downward influence on individuals, shared leadership entails the process of shared influence between and among individuals”* (p 116). Opting to apply shared leadership theory allows this research to achieve its aim of understanding leadership at the team-level.

### 5.9.1 Shared leadership theory

Shared leadership theory has evolved in light of several other strands of leadership research. Table 5.1 provides an extensive overview of the history of shared leadership theory. The term is often used interchangeably with similar forms of leadership such as ‘collective’ or ‘distributed’. As such, Pearce and Sims’ shared leadership theory can be – and has been – interpreted in several ways. This is most apparent when reading shared leadership studies that have used different measurement strategies to investigate the same global idea.

D’Innocenzo et al (2016) summarise these differences as strategies of aggregation, density (or dyads) and centralisation. Aggregation strategies use an undifferentiated whole of team members, making no distinction between which members of the team display leadership. Someone viewing two individuals exhibiting leadership may describe strong shared leadership, whilst one individual in a controlling position may lead to the perception of poor shared leadership.

Density or dyadic exchange strategies examine the networks within team and the extent to which the dyads within the network are ‘filled’ with leadership. If all the links within the network are present – i.e. the team members perceive leadership from all other team members – then the leadership network is said to be complete. Carson and colleagues (2007) used this measurement strategy and asked group members the extent to which they

<b>Theory/research</b>	<b>Key issues</b>	<b>Representative authors</b>
Law of the situation	Let the situation, not the individual, determine the 'orders'	Follet (1924)
Human relations and social systems perspective	One should pay attention to the social and psychological needs of employees	Turner (1933), Mayo (1933), Barnard (1938)
Role differentiation in groups	Members of groups typically assume different types of roles	Benne and Sheats (1948)
Co-leadership	Concerns the division of the leadership role between two people – primarily research examines mentor and protégé relationships	Solomon et al (1953), Hennis and Bennis (1998)
Social exchange theory	People exchange punishments and social rewards in their social interactions	Festinger (1954), Homans (1958)
Distributed leadership	Leadership is a group function	Gibb (1954)
Management by objectives and participative goal setting	Subordinates and superiors jointly set performance expectations	Drucker (1954), Erez and Arad (1986), Locke and Latham (1990)
Emergent leadership	Leaders can 'emerge' from a leaderless group	Hollander (1961)
Collective leadership	Leadership is a 'constellation' of roles from group members	Hodgson et al (1965)
Mutual leadership	Leadership can come from peers	Bowers and Seashore (1966)
Expectation states theory and team member exchange	Team members develop models of status differential between various team members	Berger et al (1972), Seers (1989)
Participative decision making	Under certain circumstances it is advisable to elicit more involvement by subordinates in the decision-making process	Vroom and Yetton (1973)
Vertical dyad linkage/leader member exchange	Examines the process between leaders and followers and the creation of in-groups and out-groups	Graen (1976)

Substitutes for leadership	Situation characteristics diminish the need for leadership	Kerr and Jermier (1978)
Self-leadership	Employees, given certain conditions, are capable of leading themselves	Manz and Sims (1980)
Self-managing work teams	Team members can take on roles that were formally reserved for managers	Manz and Sims (1987, 1993)
Followership	Examines the characteristics of good followers	Kelly (1988)
Empowerment	Examines power sharing with subordinates	Conger and Kanungo (1988)
Shared cognition	Examines the extent to which team members hold similar mental models about key internal and external environmental issues	Klimsoki and Mohammed (1994), Cannon-Bowers and Salas (1993), Ensley and Pearce (2001)
Connective leadership	Examines how well leaders are able to make connections to other both inside and outside the team	Lipman-Blumen (1996)

Table 5.1. Historical basis of shared leadership, in chronological order. Adapted from Pearce and Conger (2003)

relied on other individuals for leadership. The found that the density of shared leadership increases as more team members exhibit leadership (Figures 5.3a, 5.3b, 5.3c).

Centralisation strategies refers to the extent of an individual's leadership reach within a group. A team member who exhibits the majority of leadership would be considered the central node of the group, thus if a team's leadership is highly centralised then this would suggest one or two people are serving as leaders.

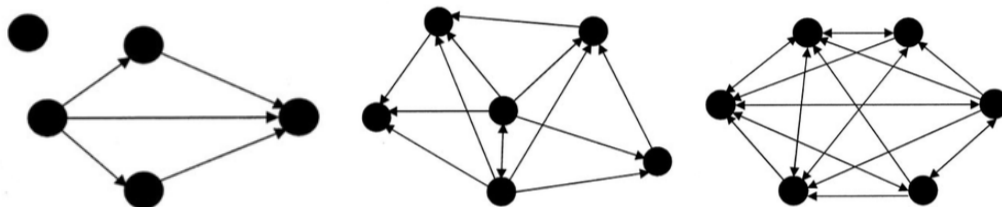


Fig 5.3a. Low density      Fig 5.3b. Medium density      Fig 5.3c. High density  
 Figures from Carson et al (2007, p 1226)

Conversely, groups with low centralisation would have high degrees of shared leadership.

The most useful and clinically relevant measurement strategy for this study will be to use centralisation as the overarching conceptualisation of shared leadership. As D’innocenzo et al (2016) highlight about centralisation, *“Members with higher individual node centralities occupy more powerful roles within the team and would likely be recognized as leaders”* (p 1973).

Although the thread running throughout this research study is a focus on teams and not individual leaders, it is important to acknowledge that senior doctors and senior nurses have more influence in the resuscitation room due to their experience and clinical acumen. Resuscitation teams do not represent leaderless groups; rather, centralisation measurement strategies offer the ability to measure leadership set against anticipated professional norms and practices where teams will receive the majority of their leadership from senior clinicians, whilst not excluding those that aren’t in these senior roles.

## 5.10 Methodology

The philosophical and theoretical arguments made up to this point are extended in the methodology here. It is at the methodological level where theory informs the research methods used. As a point of clarification, the term methodology is referred to as *“a way to systematically solve the research*

*problem*” – a way to understand “*the various steps that are generally adopted by a researcher in studying his research problem along with the logic behind them*” (Kothari 2004, pg 8). This contrasts with research methods which are the actual techniques used to collect and/or analyse data.

#### 5.10.1 Considering alternate methodologies

At the macro level, there are several approaches that can be taken to study leadership in ED resuscitation. One of the most common is to use a questionnaire to survey how a team believes a leader is performing (Robinson et al 2016, Sakran et al 2012). Another, which is often used alongside a questionnaire, is to use performance level metrics to measure whether a ‘good’ leader produces ‘good’ outcomes, such as reduced time to computed tomography scanner, time to intubation, time to operating room, time in emergency department, length of stay, number of complications and mortality rate (Capella et al 2010). Whilst these quantitative-orientated methodologies can provide a useful insight into how teams perceive leadership, and whether their perception corresponds with clinical outcomes, this positivist approach has one fundamental challenge. As Cohen et al (2011) articulate:

*“Where positivism is less successful...is in its application to the study of human behaviour where the immense complexity of human nature and the elusive and intangible quality of social phenomena contract strikingly with the order and regularity of the natural world”* (p 7).

At this level the effect of opting for either positivism or constructivism is felt. With this in mind, a reasonable conclusion is that a positivist methodology is not optimum for measuring leadership in the socially dynamic environment of the resuscitation room. It is worthwhile to note that this conclusion neatly aligns with the philosophical and theoretical ideas discussed above, creating a strong link between theory and methods in this thesis.

Furthermore, this is supported by the findings of the literature review (Chapter 4) which purposefully excluded studies using *a priori* leadership models. These studies use, either explicitly or implicitly, individualistic leadership theories which, in turn, results in studies measuring how good or bad one individual team leader performs. As discussed, to explain complex-adaptive teams as the product of one team member precludes observing any other leadership behaviours during dynamic resuscitation events and does not align with critical realism or shared team leadership theory (Pearce and Sims 2000). Set against this backdrop, the methodology used for this research is ethnography.

### 5.11 Ethnography

A useful way of framing ethnography comes from the opening volume of the journal *Ethnography*. The editors Willis and Trondman (2000) wrote the usual invitation to writers, readers and researchers, welcoming everyone to the journal. They opened by highlighting that central to ethnography is the uncovering of the 'this-ness' and the 'lived-out-ness' of people's lives (p 6). The simplicity with which they describe the aims of ethnography is a purposeful understatement; ethnography is methodology that allows researchers to observe how people live their lives, what processes mediate their taken-for-granted social interactions, and the subtle cultural elements that influence their lived experiences.

In the context of this thesis, ethnography is chosen as the methodology exactly because it offers the chance to understand the 'nitty gritty' of leadership in ED resuscitation – to understand the dynamism of leadership during the 'sensitising concept' – as opposed to describing how one nominal leader is effective. In doing so it is possible to shine a light on some of the taken-for-granted aspects of leadership, and unpack some commonly held leadership assumptions.

### 5.11.1 Background of ethnography

The predecessor to ethnography was known as ethnology (Hammersley and Atkinson 2007). Ethnology took the form of accounts written by travellers or missionaries, sometimes in the form of personal jottings or sometimes as in-depth accounts as travellers passed through different villages. It was not until the 18<sup>th</sup> century when sociologists and anthropologists started conducting their own observations of villages and communities that ethnography took prominence, and it became associated with western anthropology.

Ethnography developed in the context discussed above – the context of evolving ontologies and epistemologies – specifically how positivism, post-positivism, post-modernism and constructivism advanced over centuries. For simplicity, the viewpoints of positivism and constructivism can be separated to show how ethnography was affected by these ideologies.

Writings on social practices grew throughout the Renaissance and Enlightenment and were characterised by their adoption of positivist ontology. This is entirely understandable as many of the world's leading scholars at this time were conducting work that remains foundational for modern science. The physics of Galileo and Isaac Newton were influencing a realist worldview which suggested that general laws could be universally applied throughout the physical world. Causations, it would have been argued during this time, can be found between two variables as long as some of the elements were consistent and stable. The job of the 'scientist' during these centuries was to observe, tabulate and objectively report the laws and practices that governed the phenomenon of concern.

An important question that was raised during the Renaissance and Enlightenment was whether these physical rules could be applied to the social world. The English economist and philosopher William Petty believed it was possible and, in 1690, published his book *Political Arithmetic*. Some of the

European philosophers “saw the possibility that social processes could be mathematically modelled and that theories of the state and of political economy could be formulated and empirically verified in ways that would parallel physics, chemistry, and astronomy” (Erickson 2017, p 38). The French philosopher Comte, mentioned earlier when discussing positivism, described this as the worldview of sociology – the adoption of physical principles in social sciences. His contemporary Adolphe Quetelet even put forward the term ‘social physics’, highlighting the prominence of positivism.

The majority of ethnographies during the 17<sup>th</sup>-19<sup>th</sup> century were conducted with this ontology and epistemology in mind. The first manual to aid anthropologists and scholars, published in 1874 by the British Society for the Advancement of Science (Figure 5.4a), prescriptively described what measurements – physical and social – should be taken when observing people, as well as how this should be done. As can be seen from the pages of this manual (Figure 5.4b, 5.4c), there was a strong onus on precision and replicability.

Running somewhat parallel to this worldview was the other ‘pole’ – the constructivists. The German philosopher Wilhelm Dilthey referenced above advocated for a move away from what he called *Naturwissenschaften* – the framing of the natural sciences – towards a far more social and relativist form of inquiry – *Geisteswissenschaften*. His approach was most vividly evident when two anthropologists conducted the same ethnography and came to two markedly different conclusions.

The first scholar, Robert Redfield, travelled from the University of Chicago to a village near Mexico City called Tepoztlán. Here, Redfield published an ethnography in 1930 explaining the life and cultures within this village as fairly normal and stable. Two decades later Oscar Lewis from the University of Illinois travelled to same village having formed a career observing

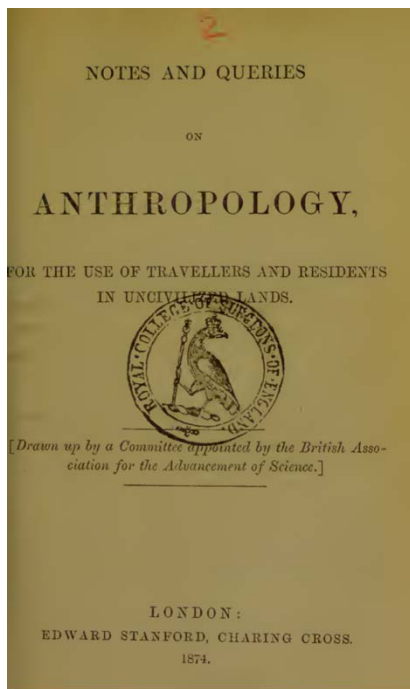


Figure 5.4a. Front cover of manual measurement

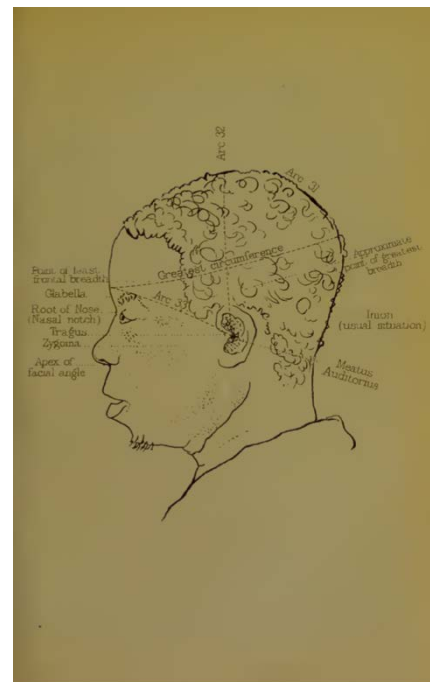


Figure 5.4b. Anatomy

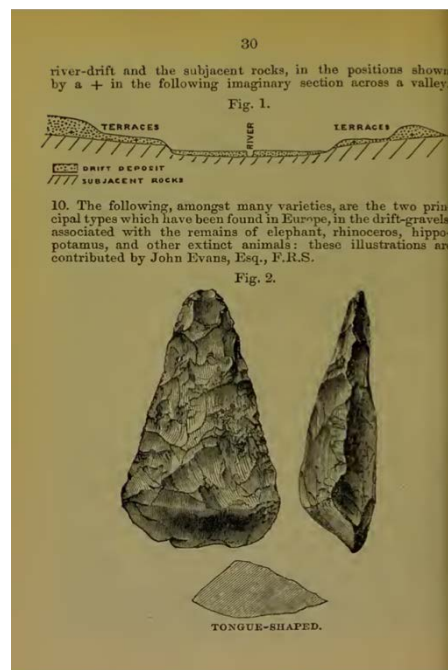


Figure 5.4c. Terrain measurement

socio-economically deprived Latin American families. Lewis studied the people of Tepoztlán through a Marxist lens, suggesting that differences in power and class influenced villagers' sense of frustration.

The chasm that existed between these two ethnographies sparked fierce debate amongst anthropologists and sociologists. The realist ethnography was challenged by the idealists who pointed out that different perspectives could be taken to study the same group of people. As more critical ethnographies were being published, it was argued that a variety of ideologies could influence how the researcher conducted their work: economic powers related to different social classes; gender studies were often framed within a male dominated discipline; homosexuals were studied from a heterosexual viewpoint; race and religion influenced how white and African-American communities were described.

This relativist and constructivist viewpoint sharply contrasts with realist ethnography and is still an important consideration for a modern ethnography. This is now referred to as the 'crisis of representation' in ethnography that *"refers specifically to the uncertainty within the human sciences about adequate means of describing social reality. This crisis arises from the (noncontroversial) claim that no interpretative account can ever directly nor completely capture lived experience"* (Schwandt 2015, p 45).

Again, it is evident how the disharmony in academia manifested as disagreements about what constitutes valid knowledge. These differing worldviews have evolved in parallel and set the scene for any researcher interested in doing an ethnography.

The landmark ethnographers of the 20<sup>th</sup> century are Bronislaw Malinowski and Alfred Radcliffe-Brown, and their work is the most useful for instructing how to proceed. Malinowski travelled to a small group of islands

known as the Trobriand Islands in Melanesia, off the coast of north-west Australia. Here, Malinowski lived amongst the local indigenous people to document systems of exchange amongst the population. Radcliffe-Brown primarily conducted his ethnographic work in an archipelago of islands known as the Andaman Islands, south-west of India.

The main difference between Brown and Malinowski's work is the way in which they explained how the social processes they observed connected with the environment. Malinowski reported that social patterns or behaviours occurred to satisfy basic functional needs (survival), whilst Radcliffe-Brown believed that these occurred for broader, social interactional purposes (meaning). Irrespective of these differences, this signals the eclecticism of ethnography. If 100 researchers conducted an ethnography of these archipelagos now, it is likely that there would be variation in where the researchers settled, what and who they observed, how they situated themselves within the field, what data they collected, what field note instruments were used and how they reported their findings.

#### 5.11.2 The features of ethnographic research

The eclecticism of ethnography, whilst positive, has meant that the methodology has received criticism as there are still no universal practices or standards (LeCompte and Goetz 1982). Of all the publications that list what ethnography is, and its purpose, the textbook from Martyn Hammersley and Paul Atkinson (2007) detail the core features that can be carried forward from the Malinowski era into contemporary research:

- 1) People are observed in their routine environments, rather than in conditions abstracted by the researcher.
- 2) Participant observation is the main source of data, however data can be gathered from a range of sources including interviews and documents.

3) Data collection is generally unstructured in two senses. First, data are not gathered through a fixed data collection system that is specified at the start of the project. Second, interpreting the data is driven by the analysis process and not a predefined system.

4) People are typically observed in a small group or setting to allow for in-depth study.

5) Data analysis focusses on the interpretations of meanings, experiences and interactions and the relation to local and wider contexts. Quantitative or statistical outcomes are secondary to the descriptions, explanations and theories that are discussed in light of the ethnographic data.

The sixth and last important feature, although not mentioned by Hammersley and Atkinson (2007), is the notion of reflexivity. The term reflexivity, according to the Oxford English Dictionary, has its roots in the meaning of 'capable of bending back'. Strauss (1956), writing about Mead's initial work on anthropological reflexivity, suggests that it is through reflexiveness "*the turning-back of the experience of the individual upon himself – that the whole social process is thus brought into the experiences of the individuals involved in it*" (p 211).

Reflexivity is a process where the researcher acknowledges their positionality within the research with the aim of understanding how they and the world being studied interact with one another (Erickson 2017). This process "*communicates to readers our recognition that knowledge claims are conditioned and partial, a notion that has been uncontroversial in ethnography circles for some time*" (Lichterman 2017, p 36).

Babcock (1980) describes a number of different forms of reflexivity, from private to public, individual to collective, implicit to explicit and partial to total. A useful description of reflexivity relevant to healthcare professionals comes from Finlay and Gough (2003) who identify that reflexivity can be about oneself, about inter-subjective relationships, about positional order and can be done as a team process. The most useful ongoing reflexivity will be for me to consider this as a process of introspection about myself and inter-subjective

relationships. This due to my position as an 'insider researcher' (Greene 2014), having formed professional relationships with the 'participants' prior to this doctoral work and being familiar with the processes of practices of the environment being studied.

Taken together, the five features described by Hammersley and Atkinson (2007) and the sixth feature of reflexivity – a form of using the researcher's voice – will be the guiding principles for this ethnography and provide some structure for what types of data will be gathered, how it will be handled and how findings will be interpreted.

### 5.11.3 Tensions in ethnography

Having discussed how ethnography has developed at moderate length, there are some fairly practical tensions that all researchers pursuing ethnography will need to address. This is, usefully, a working example of the researcher's voice in action. Hammersley (2006) identified four perennial tensions that are outlined and then responded to:

#### (1) Participant or analytic perspective?

There is a fundamental need to understand the views of the people being observed. It would be naïve to assume that an in-depth account can be offered without hearing and incorporating the opinions of the participants. To understand a particular setting or process necessitates that the people involved explain why they happen and their meanings. However, there is also a requirement to develop an analytic perspective. The researcher may draw conclusions that are different – or even contradict – some of the individual participant's perspectives based on their observations. Should the participant or analytic 'voice' be dominant?

#### (1) Response

I want to avoid what may be a false dichotomy where the participants' perspective is said to oppose an analytic perspective. The participant's voice is given primacy when discussing how they view leadership, but the analytic voice is favoured when pulling together a collection of voices and drawing a conclusion from them. I do not view these different voices as competing; rather, each will be more or less appropriate depending on the issues being discussed and the phase of research.

#### (2) Historical or ahistorical?

Traditionally ethnographers would spend long periods of time in the field. They would spend at least a year, if not several years, living in the communities and locales that they were observing. Often this would include eating, sleeping and socialising alongside the people in the community. They could live within, and be a part of, the history of their surroundings. Contrast this with more modern ethnographies where researchers typically focus on what is happening in a defined period of time or a defined place. This has nurtured an ahistorical perspective where there is an assumption that processes that are observed during that moment are representative of what happens normally. Is an ahistorical perspective satisfactory, or does the researcher need to spend extended periods of time in the field?

#### (2) Response

I do not follow an ahistorical perspective for the purposes of this Ph.D. Resuscitative care is challenging and emotive and leadership cannot be viewed in a vacuum. This would ignore professional relationships and norms, often based on years of working together. I believe this is also an appropriate approach given the team-based nature of healthcare. Clinicians develop trust, teamwork and patterns of working with colleagues they are familiar with. This is relevant when observing how teams interact, thus reflecting on these histories is a necessary part of this research study.

### (3) Local or wider context?

Observing people within a specific setting or timeframe means that the researcher has easily identifiable parameters for their context. But to what extent should the ethnographer try to understand the wider context? If a local perspective is advocated, then one could argue that this does not take into account wider societal influence which may affect the local setting in a number of hidden ways. Yet, if the researcher does pursue a wider context then where should these boundaries be set? In other words, where are the limits of observation?

### (3) Response

I promote a wider context viewpoint which acknowledges that leadership can be affected by people's experiences outside of the resuscitation room. For example, a bad leadership experience may influence whether a Nurse or Doctor decides to speak up. Or a professional disagreement may alter how responsive a team is in delivering resuscitative care. Equally, the organisational context of the hospital and the wider cultural issues of the NHS cannot be ignored. Nurses and Doctors are socialised in different ways (Willis 2012) and the effect of inter and intra-professional norms are also relevant. This holistic view, I believe, better reflects care delivery in a busy emergency department.

### (4) Discovered or constructed?

When outlining the context, is this discovered as the Ph.D journey progresses, or is this purposefully constructed? If it is constructed, then is this done by the researcher or by the participant? (I.e. do the people being observed tell the researcher how far they should extend their observations).

### (4) Response

Given my background as a Nurse and my familiarity with the setting and staff, it is natural that the context is constructed. This has been done both formally

and informally, through choice with my supervisors and through sensitising conversations with clinical colleagues. To suggest that the context of this study is discovered would imply no prior knowledge of the conceptual boundaries for the work produced here.

#### 5.11.4 Locating the field: a focussed, mixed-method ethnography

The final issue to consider in this section on ethnography is a typological one. Traditional ethnographies are deemed realist and cultural, particularly through an anthropological lens, in that they observed a population of people in their native culture as well as being strict in their adherence to methods. Here, this research necessarily takes a modern tone and can be classified as a 'focussed' ethnography as well as being mixed-methods research.

With regards to the former, the field for this ethnography – whilst being a complex resuscitation environment – is located in a limited space. Figure 5.5a represents the 'field' for this video ethnography and is the interface through which ED resuscitation is recorded using the smots™ video installation which was chosen for the service. As can be seen from this image, there are a number of separate resuscitation bays with the ED. There are 4 resuscitation rooms or bays in total. The first 3 are designated A, B and C. These are generally used for day-to-day resuscitation cases. A 4<sup>th</sup> bay is called the 'trauma' room. This bay is generally used for patients who are severely unwell, such as patients presenting with major trauma or cardiac arrest. A further schematic is presented in Figure 5.5b (page 117) which shows the location of the video cameras.

Similarly, the attention of observation is limited to leadership, rather than all non-technical skills or inter-personal behaviours. Because of this physical and conceptual boundary, the contemporary label of a 'focussed' ethnography can be applied here (Cruz and Higginbottom 2013). A focussed ethnography is in keeping with the adaptations of historical ethnographies which would typically observe an entire village or population in their



Figure 5.5a. View of the resuscitation rooms from the viewing terminal

surrounding environment. Applying the same ethnographic principles in a focussed ethnography allows for detailed observation in a defined area of healthcare (Salzmann-Erickson 2018, Wall 2015).

With regards to the latter, the use of different methods – video observation, interviews and questionnaires – mean that this research is framed as a mixed method ethnography. This, for some, may be a taken-for-granted assumption (Creswell 2010). Following on from their first mixed methods textbook in 1998, Tashakkori and Teddlie described mixed methods as “a *distinct third methodological movement*” in their 2003 Handbook (p 24), largely distinguishing it from the quantitative and qualitative movement. This text set

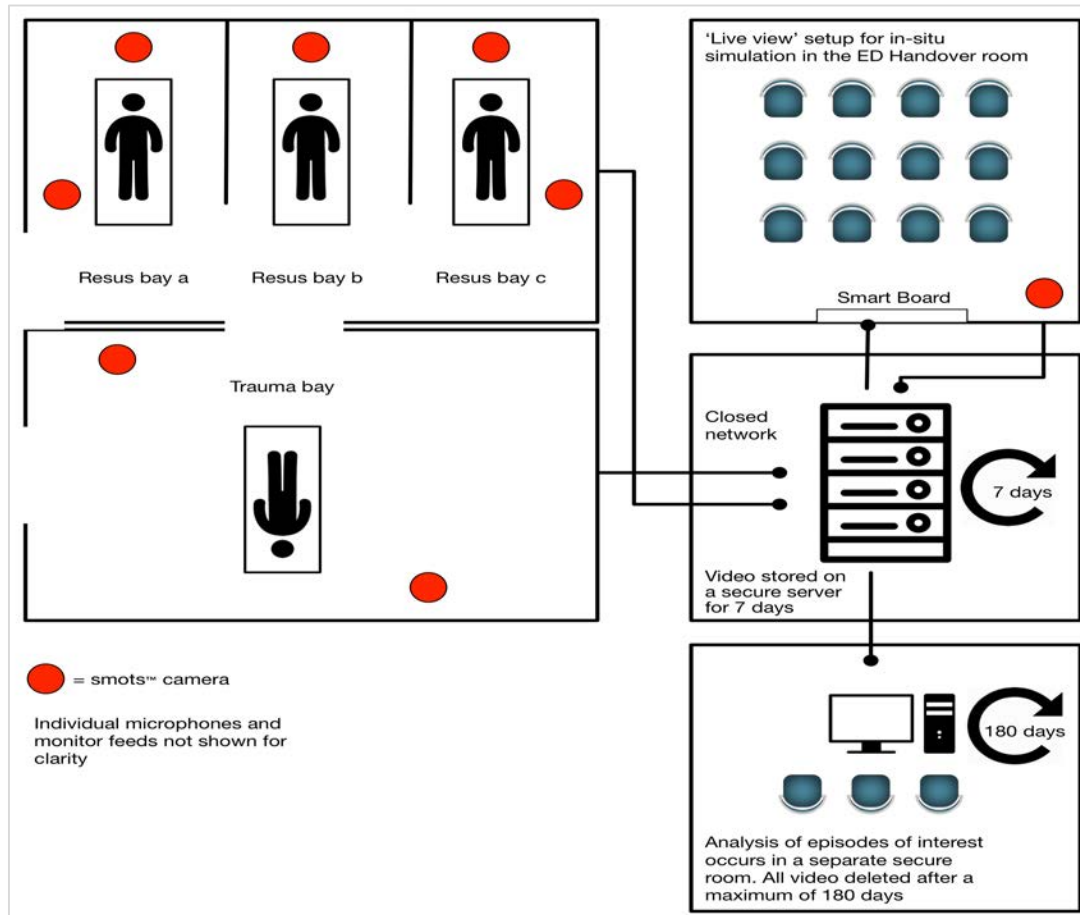


Figure 5.5b. Schematic of resuscitation room video camera placements and video viewing room

the tone for much of the mixed method discussion throughout the previous 15 years and their viewpoint is accepted amongst mixed method purists (Morse and Niehaus 2009).

However, there have been some unintended consequences of positing mixed methods as a distinct approach. The exponential growth of mixed methods research has led to a confusion in terminology. In a 2007 study, Johnson et al. surveyed 21 researchers about their definition of mixed methods research. Obtaining 19 definitions, there was variability in what was being mixed, when the mixing occurred, the breadth of mixing, the reason for mixing and initial drive for the research. In a 2011 article titled *The Good, the Bad, and the Ugly in Mixed Methods Research*, Bergman observed that whilst *"Disputes about an appropriate terminology are part of any discipline. ...*

*Diverging from an established terminology also leads to confusion, rather than clarification, even though the initial aim may have been clarification” (p. 272).*

Here, the intention is to avoid becoming embroiled in the micro and macro issues of mixed method classification by drawing on the texts by Creswell and Plano-Clark (2007), as well as the more refined text by Tashakkori and Teddlie (2010), which call for a degree of pragmatism. The “*central premise*”, argue Creswell and Plano Clark (2007), “*is that the use of quantitative and qualitative approaches, in combination, provides a better understanding of research problems than either approach alone*” (p 5).

By positioning a mixed method approach within the practices and norms of a methodology (ethnography), the mixing of metaphysical arguments is avoided. Mixing methods within the methodology of ethnography is beneficial as it offers the chance to combine “*elements of qualitative and quantitative research approaches (e.g., use of qualitative and quantitative viewpoints, data collection, analysis, inference techniques) for the purposes of breadth and depth of understanding and corroboration*” (Johnson et al 2007, p 123).

Mixing methods, as opposed to the historical approach of singular participant observation, is chosen because it is acknowledged that the standards of research, particularly in healthcare, are continually increasing. Simply documenting leadership practices by way of description would satisfy traditional ethnography, but it would be open to questions of rigour and clinical relevance. As such, the mixing of methods within this ethnography is designed to give a richer understanding of leadership during resuscitation whilst also aligning with the demands of modern health research.

#### *5.11.4.1 Validity*

The final issue to be outlined that dovetails from the discussions above is that of validity. Validity is concerned with the rigour and credibility of research

findings, which descends from the appropriateness and application of research methods (Dixon-Woods et al 2004).

Despite validity being a perennial issue for qualitative research, there is still no commonly agreed framework for how to address criteria for validity akin to quantitative research (Rolfe 2006). There are, however, several criteria that are commonly advocated in research literature. The ideas of triangulation, respondent validation and reflexivity are used here (Mays and Pope 2000).

Triangulation will be used whilst combining the three data sets of questionnaires, interviews and observations. Respondent validation is present through questionnaires and interviews where the researcher's account is compared with those of the research subjects. Reflexivity, as described above, is a key feature of this ethnography. Together, these criteria form a cohesive strategy to ensure validity throughout the research process (Noble and Smith 2015).

## 5.12 Methods

Methods are the techniques or instruments used to conduct research. Here, they are informed by the research methodology of ethnography. In this sense, the methods chosen are the mechanisms through which the research begins the "*study of real-life situations...*", with Burgess (1982) going on to say that "*...The methods that can be used in these studies are unstructured, flexible and open-ended*" (p 15). This attests to the flexibility of ethnography, insofar as different sites and contexts will require different types of ethnographic techniques. The methods chosen here are:

1. Video observations of actual resuscitation events (n=20 – supported by observations of a further ~300 patient care episodes)
2. Interviews with resuscitation team members (n=20)(Consultant=5, Charge Nurse=5, Registrar=3, Staff Nurse=4, Foundation Year Doctor=3)
3. Questionnaires distributed to resuscitation team members (n=100)

These methods are chosen to meet the aim and objectives of this research study. As a brief reminder these are:

### Aim

To understand leadership during emergency department resuscitation using a team-level approach

### Objective(s)

- (1) To develop a team leadership behavioural marker tool that can be used as a framework to identify who displays leadership and how they do this
- (2) Using a team behavioural marker tool as a framework, conduct a video-based ethnography of leadership based on observations of real patient care episodes

During the planning of methods in the first year, contact was made with Emeritus Professor Rhona Flin at the University of Aberdeen. Professor Flin is an industrial psychologist who has contributed to work on behavioural marker tools for surgeons, anaesthetists, scrub practitioners and paramedics, as well as a Ph.D on surgeon's leadership. A meeting was hosted with Professor Flin and the Resuscitation Research Group in the spring of 2015 prior to any data collection. This was used as a forum to hear from resuscitation and psychology experts about how to optimise research methods and inform the issues of methodological rigour as well as clinical relevance. In light of this discussion, the methods were designed in five phases, with each phase informing the next one; this is in keeping with iterative ethnographic methodology. These 5 phases were set against Objective 1 and Objective 2 so that data collection serves two complementary and parallel purposes which is to provide data for the taxonomy as well as the ethnography that it will inform respectively (Table 5.2). Setting out data collection to address both objectives also highlights at this stage how the findings will be presented as two separate chapters.

### 5.12.1 Rationale for developing a taxonomy

In recognising the standards of health research, simply collating a series of descriptions from observations would not be satisfactory for doctoral work. Observations need to be set within some type of framework or categorisation system to give order and consistency. This is important for the issue of reliability as other researchers who want to observe leadership through the same lens of inquiry should be able to use this framework in comparable research.

By far the most common approach to studying socio-behavioural phenomena in healthcare has been to use some form of behavioural taxonomy or marker tool. These have become a feature of almost all professional groups and are mandatory in some training programmes (Table 5.3). A necessary objective, therefore, that will allow this study to meet its aim is to develop a team leadership taxonomy that can measure who exhibits leadership and how they do this. The systematic review of leadership tools by Rosenman and colleagues in 2015 revealed that a team-level construct has not yet been established.

The need to base leadership observations in a form of taxonomic system was argued in a manuscript submitted by the Ph.D candidate and co-authored by supervisor Dr Gareth Clegg. Titled 'Leaders, leading or leadership?: A taxonomic need for emergency care', this manuscript was published in *International Emergency Nursing* (Lloyd and Clegg 2017a). A cautious conclusion that can be drawn is that this suggests that developing a tool in support of ethnographic observations is welcomed.

<u>Phases</u> <u>Methods included</u>	<u>Objective 1</u> <u>Purpose</u>	<u>Objective 2</u> <u>Purpose</u>
<b>Phase 1</b> - Initial canvas of extant behavioural tools - distribute leadership questionnaires - observe first 5 resuscitation videos	Data developing the first iteration of leadership taxonomy	Data collection for ethnography
<b>Phase 2</b> - conduct first 10 interviews - observe a further 5 resuscitation videos	Data developing the second iteration of leadership taxonomy	Data collection for ethnography
<b>Phase 3</b> - conduct a further 10 interviews - observe a further 5 resuscitation videos	Data developing the third iteration of leadership taxonomy	Data collection for ethnography
<b>Phase 4</b> - expert discussion group	Taxonomy review	Taxonomy review
<b>Phase 5</b> - validate the leadership taxonomy for inter-rater reliability using 5 resuscitation videos	Taxonomy validation	Data collection for ethnography
↓	↓	↓
- observation of 20 resuscitation videos - 20 interviews with resuscitation team members - 100 questionnaires distributed to resuscitation staff	A team leadership behavioural taxonomy	A video ethnography of leadership

Table 5.2. Research methods collecting data to meet the objectives

<b>Professional groups</b>	<b>Categories of skills</b>
Anaesthetists (Fletcher <i>et al</i> 2003)	Task management, team working, situation awareness, decision making
Surgeons (Yule <i>et al</i> 2006)	Situation awareness, decision making, task management, leadership, communication and teamwork
Scrub practitioners (Mitchell <i>et al</i> 2013)	Situation awareness, communication and teamwork, task management
Paramedics (Sheilds and Flin 2012)	Situation awareness, decision making, communication, teamwork, leadership
Delivery suite (Jackson <i>et al</i> 2014)	Situation awareness, decision making, communication and teamwork, leadership
Intensive care unit (Reader <i>et al</i> 2006)	Teamwork, situation awareness, task management, decision making
Anaesthetic practitioners (Rutherford <i>et al</i> 2015)	Situation awareness, teamwork and communication, task management
Junior doctors (Dearden <i>et al</i> 2015)	Situation awareness, decision making, communication and team working, task management
Emergency physicians (Flowerdew <i>et al</i> 2012)	Management and supervision, teamwork and cooperation, decision making
Neurosurgery (Michinov <i>et al</i> 2014)	Cooperation and teamwork, situation awareness, explicit coordination, decision making, leadership, other
Nurse anaesthetists (Lyk-Jensen <i>et al</i> 2014)	Situation awareness, decision making, task management, team working
Pharmacists (Irwin <i>et al</i> 2015)	Situation awareness, decision making, leadership, teamwork, task management

Table 5.3. Behavioural taxonomies used in different professional groups

## 5.13 The 5 phases of the research study

This section will describe the methods and how these methods were used to collect data. The rationale for – and analysis of – these methods will feature when writing the discrete phases, rather than as separate sections. For example, Phase 1 included distributing leadership questionnaires and observing video recordings. Therefore, these will be discussed within that subsection. Phase 2, however, included interviews. Thus the design and interpretation of interviews will be discussed in this subsection.

### 5.13.1 Phase 1

Phase 1 involved three elements of data collection. First, a range of literature was reviewed to identify existing published markers of leadership. Second, a leadership questionnaire designed for this study was distributed to ED resuscitation staff. Third, the first five resuscitation videos were observed.

The first step towards developing a leadership tool and undertaking this ethnography involved canvassing the literature to identify salient markers of leadership during resuscitation. This was to address a fundamental question: what should be looked at when observing leadership during resuscitation?

Whilst this appears obvious, it is often understated. As previously highlighted it has become routine for studies to describe the traits or attributes of the nominated leader. However, as highlighted by Bryman (2011), this creates a problem: *“If the view is taken that everything a leader does is suffused with symbolism, it could be argued that every act is a potential act of leadership, but that too causes possible difficulties for the researcher because it is then difficult to know what not to observe”* (p 20).

Accordingly, literature from several strands of health research were examined: (1) existing emergency team tools (2) team simulation tools (3) extant leadership taxonomies (4) observational research (5) experimental

studies (6) training programmes and (7) team organisation research. The elements extracted from these sources identified what the markers of leadership are, thus contributed to the first iteration the leadership taxonomy.

#### (1) Existing team rating tools

Cooper et al (2010) – They let the team know what is expected of them through direction and command. They maintained a global perspective: prompts – monitoring clinical procedures and the environment. Remaining hands off where possible. Appropriate delegation.

Andersen et al (2010) – Monitors the team so that tasks are performed in the correct prioritised order. Can be hands off, but knows when to be hands on. Prioritises communication. Provides a plan, speaks out when in doubt.

Walker et al (2011) (for doctors) Takes a lead and clearly instructs assistants with requirements for arrest and/or defers leadership. Support and supervises staff lacking experience/familiarity with tasks or equipment. Instructs Nursing group. (for anaesthetists) Advises team on best management and contingency plans, takes lead if required. Takes lead of airway control and ventilation. Supervises and supports staff lacking familiarity with tasks or equipment. (for nurses) Supervises and supports junior team/inexperienced (nursing) members. Leads if no medical staff have arrived yet.

#### (2) Existing team simulation tools

Reid et al (2012) – Clearly identified team leader. Assigns roles to team members and maximises their skill set. Directs/redirects team members effectively. Monitors actions of team members. Addressing specific persons when requesting information/assigning tasks. Uses closed loop communication (orders directed & confirmed). Resolves conflict. Engages team members in decision making. Recruits additional personnel when appropriate. Maintains global view. Performs tasks in appropriate sequence/prioritises. Reprioritises when necessary. Avoid fixation errors.

Provides interim summary/assessment for team coordination. Summarises case for transfer of care. Work-load balancing.

Grant et al (2012) – Clearly identifies he/she will lead the resuscitation. Delegates roles and responsibilities appropriately. Uses effective closed loop communication. Manages team resources effectively. Verbalises thoughts and summarises periodically for benefit of the team. Asks for and acknowledges input from team. Reassesses and re-evaluates situation frequently. Avoids fixation errors. Refrains from active participation where possible. Shows anticipation of future events by asking for preparation of equipment or medication not yet needed. Asks for appropriate help early and shows awareness of own limitations.

### (3) Leadership taxonomies

Henrickson-Parker et al (2013) – Maintaining standards. Training. Making decisions. Supporting others. Manage resources. Communicating. Directing. Coping with pressure.

Steinemann et al (2012) – Team leader is clearly recognisable at all times. Any transitions between leaders is clear. Briefs the team prior to patient arrival. Debriefs the team (provides feedback) after resuscitation is time permits. Accepts input from all team members and facilitates team problem solving. Keeps a 'birds-eye' view and delegates tasks. Clarifies team member roles. Calls for additional team or dismisses team as necessary. Time management.

### (4) Observational research

Xiao et al (2004) – Strategic planning. Reporting plans. Critiquing plans. Coaching. Maintaining awareness. Information requests.

### (5) Experimental studies

Hunziker et al (2011) – Instructing colleagues what they do. Assign and distribute tasks. Make short and clear statements – decide what to do. Ensure algorithms of care are adhered to and monitor team to confirm adherence.

#### (6) Training programmes

Norris and Lockey (2012) – Knows the team's name and capability. Be knowledgeable and credible to influence the team. Stay calm and control distractions. Keep everyone focused. Be a good communicator. Be decisive in action but listen. Manage conflict. Delegate tasks appropriately. Watch out for stress, fatigue and distress within the team. Be assertive and authoritative when the situation requires. Have situational awareness. Monitor the situation, give an overview. Listen and decide on course of action. Involve the team in decision making, encourage shared responsibility and use people's knowledge and experience.

Cooper (2001) – Let the team know expectations (through direction and command). Demonstrated the use of uniform guidelines. Displayed a positive attitude throughout the resuscitation event. Decided what should be done. Decided how things should be done. Allocate tasks to specific people. Make sure his/her role within the team is clear to the other team members. Planned work to be done. Maintain definite standards of performance. Remains 'hands-off' where possible, however knows when to provide hands-on care.

#### (7) Team organisation research

Mellick and Adams (2009) – (for doctors) Assigns team roles. Team debriefing. (for nurses) Team preparation prior to arrival. Delegates physician orders. Room traffic control. Assists less experienced nursing colleagues. Work collaboratively with the medical leader. Prioritise nursing interventions. Facilitate effective team communication. Allocating nursing roles. Directing the nursing team. Assembling the team.

Having read this broad literature, a point of saturation was reached where further studies did not reveal any new actions of leadership. These initial behaviours provided the foundation – a baseline of leadership that informed

the first iteration of the taxonomy as well as the type of questions that populated the questionnaire.

### 5.13.2 Questionnaires

The second element of Phase 1 was distributing a leadership questionnaire. The questionnaire was the first set of empirical data gathered for the study. This was chosen for two reasons. First, the questionnaire is a fairly efficient way of gathering quick, aggregate level data about the idea being researched (Thom 2007). This meant that the data collected during this process could help refine the interview questions and the process of observation. Second, it offered an indication about whether the choices made up to this point about philosophy, theory and methodology were coherent. The anthropologist Malinowski noted that ethnographies start out with something that he called ‘foreshadowed problems’; that is, research of this type is, in part, guided by the initial inclinations of the researcher. The research has to start somewhere and proceed in a direction that is largely bound by the researcher’s disposition. For this research, the sensitising concept in the introduction gave this sense of direction – the questionnaire was the first mechanism through which the appropriateness of this direction could be explored.

#### 5.13.2.1 Questionnaire design

Several factors were considered when developing the questionnaire to distribute to staff. Issues such as what the questionnaire will measure, types of scales used (e.g frequency, thurstone, rasch, guttman, mokken, likert or multiple choice) (Rattray and Jones 2007), question wording (Murray 1999), length of questions (Lietz 2010) and potential bias (Sedgwick 2013) were all important points to address. In keeping with the chosen theory and methodology, it was decided that this questionnaire would be distributed to all members of the resuscitation team, regardless of profession or grade; to

understand team leadership, the entire team's opinion has to be heard. This would also avoid common sources of bias, such as selection and volunteer bias (Sedgwick 2013).

A 9-item questionnaire was designed, 6 to collect baseline demographics and 3 multi-part questions focussing on leadership (Figure 5.6a, 5.6b). Importantly, the questions allowed both objectives to be achieved. Objective 1 – developing a leadership taxonomy – was aided by Question 8 which required staff to identify leadership behaviours. Objective 2 – producing an ethnography – was aided by Questions 7 and 9.

Another relevant consideration was the phraseology of questions. According to questionnaire literature (Lietz 2010), an often overlooked part of questionnaire design is the switching between negative and positive propositions. This can occur when researchers use a likert scale to assess whether respondents disagree or agree with a statement. An example of this would be:

*On a scale from 1 to 5, with 1 being strongly agree and 5 being strongly disagree, to what extent do you agree or disagree with the following statements:*

- *Climate change is scientific fact (positive)*
- *Humans do not contribute to carbon dioxide emissions (negative)*
- *Sea levels are rising (positive)*
- *Fossil fuels do not cause environmental problems (negative)*

Here, the wording of the question requires the respondent to change between positive and negatives ideas. This is not considered best practice in questionnaire design (Rattray and Jones 2007). As such, a likert scale was used for the first leadership question (Question 7) which assessed the extent to which ED staff agreed or disagreed with positive statements based on

## Staff Questionnaire



### Clinical leadership in the resuscitation room

As part of a research project we invite you to fill in the following questionnaire on clinical leadership in the resuscitation room. Please read carefully and answer the following questions:

<p><b>1. What is your role within the Emergency Department? Please tick one of the following:</b></p> <p>Consultant <input type="checkbox"/></p> <p>Registrar <input type="checkbox"/></p> <p>Junior Doctor <input type="checkbox"/></p> <p>Other Doctor Please specify _____ <input type="checkbox"/></p> <p>Deputy/Charge Nurse <input type="checkbox"/></p> <p>Staff Nurse <input type="checkbox"/></p> <p>Nurse Practitioner <input type="checkbox"/></p> <p>Nurse Specialist <input type="checkbox"/></p> <p>Other Nurse Please specify _____ <input type="checkbox"/></p> <p>Clinical Support Worker <input type="checkbox"/></p> <p>Other Please specify _____ <input type="checkbox"/></p>	<p><b>2. What is your gender? Please circle one:</b></p> <p>Male    Female    Prefer not to answer</p> <hr/> <p><b>3. What age are you? Please circle one:</b></p> <p>&lt;21      21-25      26-30      31-35</p> <p>36-40    41-45      46-50      51-55</p> <p>55+</p> <p style="text-align: center;">Prefer not to answer</p> <hr/> <p><b>4. How many years have you been qualified?</b></p> <p style="text-align: center;">_____ years</p> <p style="text-align: center;">(if less than one year put 1)</p> <hr/> <p><b>5. How many years have you worked in A&amp;E?</b></p> <p style="text-align: center;">_____ years</p> <p style="text-align: center;">(if less than one year put 1)</p> <hr/> <p><b>6. How many years have you worked in the resuscitation room?</b></p> <p style="text-align: center;">_____ years</p> <p style="text-align: center;">(if less than one year put 1)</p>
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Version 1.0 Date 01/07/15

Figure 5.6a. Front side of leadership questionnaire used in this study

<b>7. Please tick one of the following for each statement:</b>	Strongly agree	Agree	Don't know	Disagree	Strongly disagree
At any one time there can be more than one person displaying leadership in the resuscitation room	[ ]	[ ]	[ ]	[ ]	[ ]
The active leadership role can be shared amongst individuals during treatment in the resuscitation room	[ ]	[ ]	[ ]	[ ]	[ ]
The type of leadership required is dependent on situational factors (e.g severity of patient illness, experience of the team)	[ ]	[ ]	[ ]	[ ]	[ ]
Leadership is determined more by who the individual is/their personality rather than by their professional grade	[ ]	[ ]	[ ]	[ ]	[ ]
When working in the resuscitation room I display leadership	[ ]	[ ]	[ ]	[ ]	[ ]

<b>8. Name up to 5 behaviours, tasks or actions that NURSES do when they display leadership in the resuscitation room:</b>
1) _____
2) _____
3) _____
4) _____
5) _____

<b>8a. Name up to 5 behaviours, tasks or actions that DOCTORS do when they display leadership in the resuscitation room:</b>
1) _____
2) _____
3) _____
4) _____
5) _____

<b>9. Who, in order from most likely to least likely, displays leadership in the resuscitation room out of the following professionals:</b>	
Professional	Likelihood of displaying leadership
Junior Doctor	Most likely 1) _____
Staff Nurse	2) _____
Registrar	3) _____
Deputy/Charge Nurse	4) _____
Consultant	Least likely 5) _____

**END OF QUESTIONNAIRE**

Version 1.0 Date 01/07/15

Figure 5.6b. Reverse side of leadership questionnaire used in this study

shared team leadership theory. This was to maintain a strong link between theory and methods, and to ensure consistency of asking positive propositions.

Question 8 was included to identify the leadership behaviours that staff felt were relevant in the resuscitation room. This was probably the most useful question in inputting empirical data into the team leadership tool. Question 8 gave the respondent's enough space to identify up to 5 leadership behaviours, actions or tasks for both doctors and nurses. Asking about nursing leadership advances

existing literature as previous questionnaire-based research routinely surveys staff about the lead doctor in the room and does not recognise the contribution of nurses (Sugrue et al 1995).

Question 9 was included to explore the relationship between medical and nursing leadership. Previous observational studies have shown that nurses may informally lead without necessarily being in the formal leadership position (Klein et al 2006). Thus, asking staff which profession and grade is most likely to display leadership is useful as it gives respondents the opportunity to construct their answer without adhering to an *a priori* leadership hierarchy.

To ensure an even distribution, every medical and nursing handover was attended to explain why the questionnaire was being handed out, as well as the rationale for the choice of questions. This gave an opportunity to answer any questions that the staff had.

Once these data were gathered they were processed using the 'cutting and sorting' technique (Ryan and Bernard 2003) which is explained in full in Section 5.13.5.1 below. Broadly, this involved identifying similar responses and grouping them together in behavioural categories. In total, the questionnaire was distributed to 100 ED resuscitation team members.

### 5.13.2.2 Reflexive point

The first-person voice here is to offer insight into the environment in which the questionnaire was distributed, and how I engaged with the staff. I attended the clinical handovers of nursing and medical staff which are done separately in the host service. Here, I explained the purpose of the research study, limiting the discussion to simply state this was a 'clinical leadership' questionnaire as reflected by the title of the questionnaire itself.

Medical handovers were different to the nursing handovers. The former involved doctors of all grades reporting on their patients, often with time for something called a '1-minute wonder' which is an educational opportunity for someone to share an interesting case. Nursing handovers were Charge Nurse led, with little-to-no time for educational opportunities as they were required to release the nursing staff from the previous shift.

The different format meant that the handovers were very different. During the medical handovers, staff were happy to take the time to complete the questionnaire after I had given an overview of the Ph.D research. The Consultant staff were engaging and encouraged the doctors to contribute to this research. The nursing handovers were somewhat rushed, as if completing the questionnaire was preventing the nurses from being where they were supposed to be. Owing to this I took a more passive approach at these handovers, stating that I was happy to liaise with the nurses during the course of their shifts to have an informal chat about the purpose of the questionnaire. Chatting one-on-one with these staff appeared to ease anxieties about filling in the questionnaire and was a necessary part of negotiating access to the field.

### 5.13.3 Video ethnography

The final element of Phase 1 was ethnographic observation of actual resuscitation episodes using video recordings. As explained in the summary of this chapter, the ethical and clinical approvals required for the study were extensive. Therefore, these issues will be discussed in a separate chapter which will outline the approval processes in full (Chapter 6).

Five resuscitation videos were identified using the smots™ video system which was installed in the host service. Using the first iteration of the taxonomy which had been formed from the previous two elements of Phase 1, leadership behaviours were tagged in the smots™ interface to identify who displayed leadership and how they did this, as well as a time stamp to categorise behaviours in real-time.

#### *5.13.3.1 Rationale for video observation versus participant observation*

It has been established that the ethnographer has traditionally spent extended periods of time 'in the field'. This will have often been periods of years, most of the time using pen and paper to document everything they see. As previously mentioned, the discipline has evolved since the anthropological beginnings of Malinowski and Radcliffe-Brown, and there is now recognition that strict adherence to the orthodoxy of ethnography is no longer necessary (Brewer 2000). Indeed, it may be entirely inappropriate to spend years in the field for the sake of tradition.

This sentiment is carried forward when considering the resuscitation room environment. Here, there are several features of (1) the phenomenon of leadership itself, as well as (2) the environment of the resuscitation room, that mean traditional participant observation may not be optimum.

(1) First, the phenomenon of leadership as processes of cognition, behaviours, traits or affect are not immediately obvious to observers. It is not one predetermined datum point that can be easily documented by someone viewing resuscitative care. This is evidenced by the reviews of Rosenman et

al (2015) and Leenstra et al (2016) that documented over 100 markers of leadership.

A study that supports this idea was conducted by Härgestam and colleagues (2016) who have done some informative work on leadership. The authors audio and video recorded 18 simulated trauma resuscitations, focusing on how the designated team leader exhibited their leadership. A series of images from this publication illustrates the subtlety of some leadership processes (Figure 5.7a, 5.7b, 5.7c). For example, in figure 5.7a, the leader takes a 'hands-off' approach and oversees all the team's activity. Contrast this with Figure 5.7b and 5.7c where the leaders position themselves within the team to have an immediate effect on care. Similarly, it can be seen from Figure 5.7d and 5.7e that some leadership processes can occur non-verbally, such as a directive hand gesture or an authoritative facial expression.

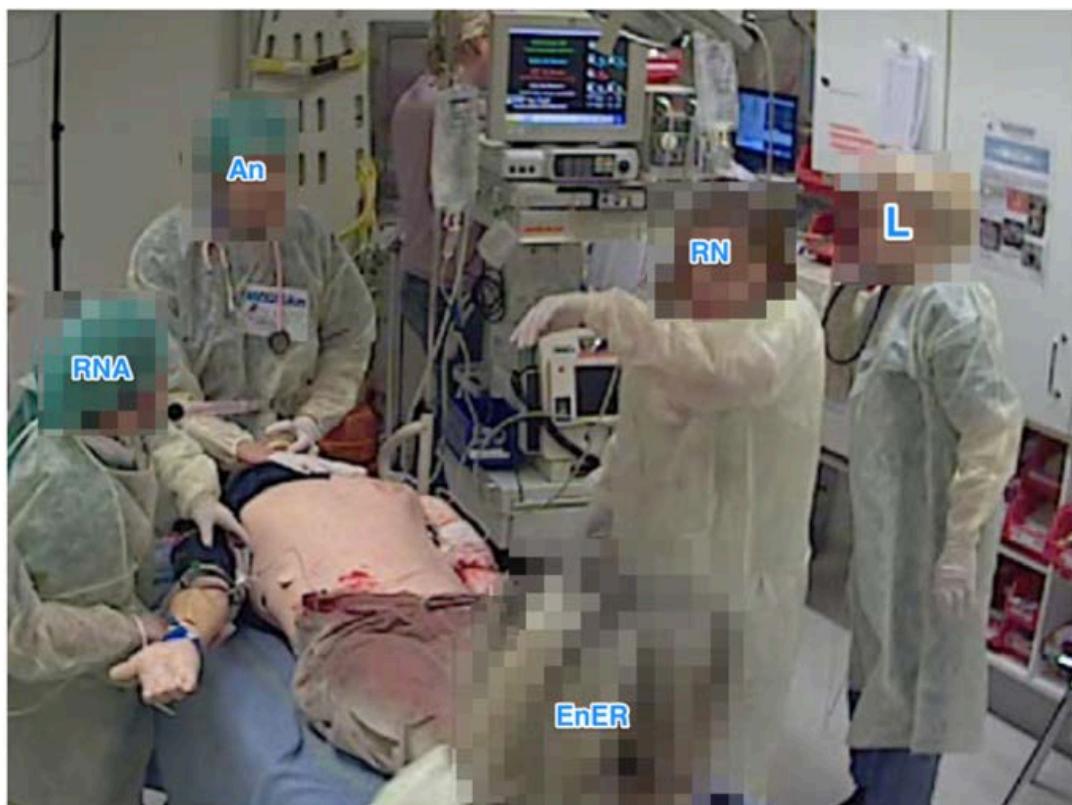


Figure 5.7a. The leader takes a 'hands-off' approach (Härgestam et al 2016)

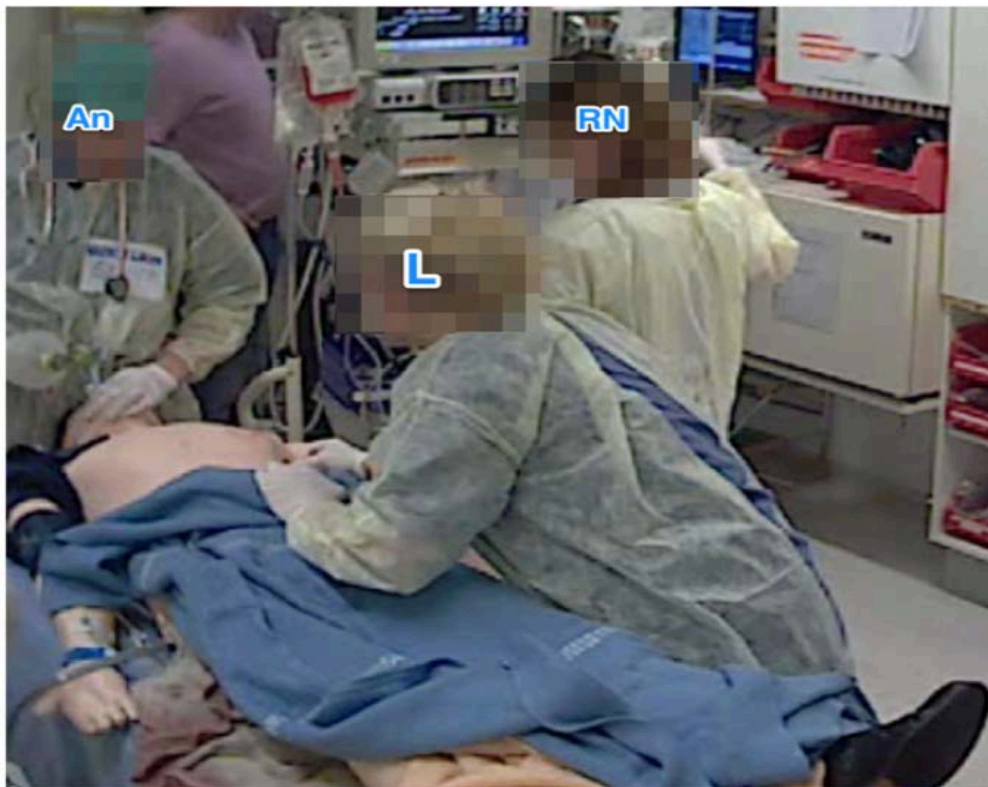


Figure 5.7b. The leader delivers 'hands-on' care (Härgestam et al 2016)

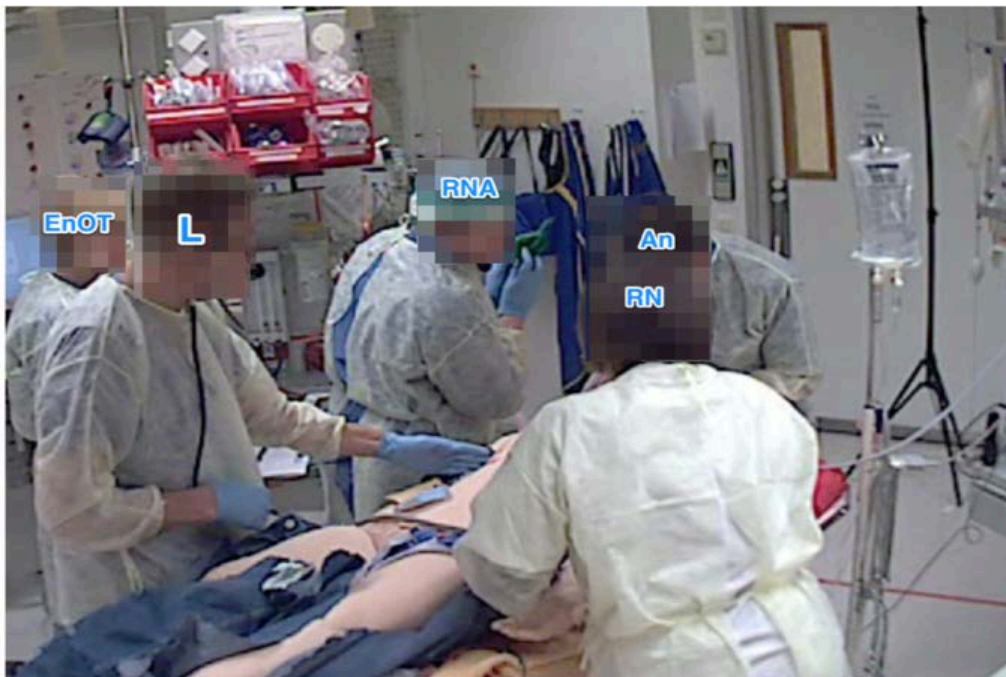


Figure 5.7c. The leader directs care at the bedside (Härgestam et al 2016)



Figure 5.7d. Non-verbal leadership instructions (Härgestam et al 2016)



Figure 5.7e. Further non-verbal leadership instructions (Härgestam et al 2016)

When considering the transient and subtle nature of leadership, a reasonable conclusion is that capturing this level of detail using traditional first-person participant observation would be challenging. Video offers a way to consistently identify leadership processes, as well as an opportunity to replay footage and document findings without having to write down 'live' hand-written notes. The latter may be susceptible to miss key leadership expressions.

(2) The second factor that makes participant observation challenging is the environment of the resuscitation room itself. The challenge stems from the complexity of people, patients, disease, equipment, drugs and interventions all connecting together in short periods of time. This is commonplace in the resus room where teams typically gather on short notice. Documenting meaningful details about how leadership intersects with these variables presents a problem.

An illustrative working example that serves to communicate this complexity comes from a small project delivered as departmental audit. One 24-hour period was identified and, using the video system, the type and frequency of nursing tasks completed within the 24-hours was analysed.

During this period, 24 patients presented with 20 different initial diagnostic impressions. The average duration of resuscitation episode (hh:mm) was 01:19. Nurses completed a total of 269 tasks, of which 226 (84%) were clinical and 43 (16%) were non-clinical (Table 5.4). There were 63 different tasks completed with an average of 11 per resuscitation episode. Twenty-one different medications were prepared and/or administered on 45 separate occasions, as well as nurses utilising a range of core and advanced clinical skills, such as airway management and use of a mechanical CPR device. Although this small departmental audit only focused on one team member – the staff nurse – a large number and range of tasks were completed. If this was to be extrapolated to a team typically composed of 5-6 individuals – potentially more during larger cases – and then include the processual

<b>Total no.of tasks: 269</b>		
<b>Technical: 226 (84%)</b>	<b>Non-technical: 43 (16%)</b>	<b>Average: 11 per pt episode</b>
<b>Technical tasks - 226</b>		
<b>Medication preparation and/or administration</b>	<b>Interventional/diagnostic</b>	<b>Preparation and/or use of equipment</b>
<b>45 (20%)</b>	<b>165 (73%)</b>	<b>16 (7%)</b>
<b>Naloxone(1)</b>	Electrocardiogram(13)	Use of auto CPR device(1)
<b>Oxygen(9)</b>	Log roll(1)	Use of suction equipment(1)
<b>Clopidogrel(1)</b>	Neurological observations(1)	Preparation of intraosseous device(1)
<b>Vitamin K(1)</b>	Airway management(1)	Preparation of defibrillator(1)
<b>Salbutamol(4)</b>	Manual blood pressure(2)	Use of 1 <sup>st</sup> infusion device (4)
<b>Ipratropium(4)</b>	Rectal thermometer(1)	Use of 2 <sup>nd</sup> infusion device (2)
<b>Prednisolone(1)</b>	Catheterization(2)	Use of BAIR hugger(1)
<b>Clarithromycin(3)</b>	Bladder washout(1)	Preparation of arterial line equipment(2)
<b>Co-amoxiclav(2)</b>	Administer blood(1)	Preparation of ventilation equipment(1)
<b>Amoxicillin(2)</b>	Administer fluids(14)	
<b>Pabrinex(2)</b>	Assistance with RSI(1)	
<b>Propofol(2)</b>	Cricothyroid manipulation(2)	
<b>Morphine(3)</b>	Cannulation(2)	
<b>Nitrous Oxide(1)</b>	Apply cast(1)	
<b>Ceftriaxone(1)</b>	Urinalysis(1)	
<b>Midazolam(1)</b>	Chest auscultation(1)	
<b>Paracetamol(3)</b>	Skin assessment(1)	
<b>Diazepam(1)</b>	Cardiac monitoring(23)	
<b>Rocuronium(1)</b>	Oxygen saturation(24)	
<b>Ondansetron(1)</b>	Blood pressure(24)	
<b>Hyoscine(1)</b>	Blood capillary glucose(24)	
	Temperature(24)	
<b>Non-technical tasks - 43</b>		
<b>Patient related</b>	<b>Non-patient related</b>	
<b>36 (84%)</b>	<b>7 (16%)</b>	<b>Total: 43</b>
<b>Providing comfort/reassurance(21)</b>	Providing support to family(4)	
<b>Acts of holistic care(6)</b>	Teaching student nurse(2)	
<b>Personal care(4)</b>	Providing support to care worker(1)	
<b>Last offices(1)</b>		
<b>Supporting patient with dementia(1)</b>		
<b>Supporting patient with learning disability(1)</b>		
<b>Supporting confused patient(1)</b>		
<b>Social inquiry about patient's wellbeing(1)</b>		

Table 5.4. Summary of clinical and non-clinical tasks. () = count of task

elements of leadership, the data needed to be measured would quickly exceed 1000 datum points. Attempting this without video would likely miss some of the detail.

Other published studies provide further justification for the use of video compared with the usual paper and pen technique. Two studies have compared the level of detail that is captured by video and routine documentation. Oakley et al (2006) measured the standard of paediatric trauma resuscitation set against national Advanced Trauma Life Support guidelines, comparing video with what was documented in the medical notes. Ninety resuscitations were analysed, with the authors finding that medical documentation only detected 20% (10) of performance deficiencies that were identified using video. A study with a similar design was carried out by Mackenzie et al (1996), focussing on airway management in 48 patients. In addition to routine documentation, the authors asked the clinicians to fill out an anaesthesia quality assurance form after each patient for the purposes of the study. Even after including this extra paper report, only 2 performance deficiencies were identified, compared with 28 identified by video footage.

Based on the literature and the arguments above it is suggested here that using video as the method of observation is optimal. Attempting to identify salient leadership expressions from different team members during complex care delivery would be hindered if first-person observation was used with live hand-written notes during real-time resuscitation.

#### *5.13.3.2 Writing field notes during observations*

Following the decision to use video observation, another consideration related to the choice of appropriate field note documentation. Although using video may represent a technological advancement for ethnography (Shrum and Scott 2017), a key feature of ethnographic writing is the quality of the field

notes (Hammersley and Atkinson 2007). Without adequate description of the field, the benefits of using video may be mitigated if the salient elements of the observation remain hidden. Put simply, video observation does not necessarily equate with better observation.

The recommendations for what constitutes adequate field notes, in many ways, reflects the 'old' versus 'new' ethnography debate. Authors with more of a classical leaning suggest items such as:

Spradley (1980) – Space, the physical place or places. Actor, the people involved. Activity, a set of related acts of people. Object, the physical things that are present. Act, single actions that people do. Event, a set of related activities that people carry out. Time, the sequencing that takes place over time. Goal, the things people are trying to accomplish. Feeling, the emotions felt and expressed.

Emerson et al (1995) – Who is he? What does he do? What do you think she meant by that? What are they supposed to do? What did she do that? Why is that done? What happens after...? What would happen if...? What do you think about...? Who is responsible if...?

Chiseri-Strater and Sunstein (1997) – Date, time and place of observation. Specific facts, numbers, details of what happens at the site. Sensory impressions, sights, sounds, textures, smells and taste. Personal responses to the fact of recording field notes. Specific words, phrases, summaries of conversations and insider language. Questions about people or behaviours at the site for future investigation. Page numbers to help keep observations in order.

Newer texts, perhaps reflecting the changing tide of ethnography, suggest items such as:

Brewer (2000) – Time, date and location. Identities of the people involved. Exigencies and circumstances involved in any instance that is recorded.

Mulhall (2002) – Structural and organisational features. People. The daily process of activities. Special events. Dialogue.

Cloke et al (2004) – Locating an ethnographic setting. Describing the physical space of that setting. Describing others' interactions within that setting. Describing your participation in interactions in that setting. Reflecting on the research process. Self-reflections.

Murchison (2010) – Narrative story telling, placing the reader in the position of researcher. Sensory experience, retelling the story of what you are witnessing, hearing or experiencing.

After considering this literature, a decision was made to use the broader suggestions of the contemporary authors for two reasons. First, many of the elements identified in the older literature are not relevant for a video ethnography in a modern resuscitation setting. Features of this environment are stable and predictable. Therefore, documenting these every time a new patient enters the environment would not benefit the reader. The video technology can communicate some of these features to the reader, such as space, actors, events and objects.

The second reason why using broader field notes is that this ethnography has a clearly defined focus. Classic field note guidance was born from the need to document expansive social structures or interactions within populations. Often the anthropologists or sociologists who were conducting ethnographies were researchers from westernised universities. Trying to situate the reader 'in the field' of an archipelago several thousand miles away

required many pages of notes to adequately describe even minor details. This thesis, whilst acknowledging the requirement for detailed descriptions, has different challenges to those of 18<sup>th</sup> and 19<sup>th</sup> century researchers.

Therefore, field notes taken here will be set out with three main components. The first will be to support Objective 1 of developing the team leadership taxonomy. These notes are what Burgess (1982) termed methodological field notes. This is very much a literal interpretation of Burgess, as these will identify areas of strength and weakness in the different iterations of the tool.

The second and third components will support Objective 2 in that these will be substantive and analytic notes (Brewer 2000). These will be descriptions of events and interpretations of these events respectively which will form a key data set in the ethnography. As Murchison (2010) highlights, setting out notes in this way allows the researcher some flexibility in terms of the length and format of writings. For example, some may be 'jottings' using words or phrases, whilst others may be prose.

In summary, this first phase involved canvassing the literature to document identifiable leadership behaviours, distributing questionnaires to ask staff what leadership means to them, and observing 5 resuscitations to tentatively use the first iteration of a leadership taxonomy.

#### 5.13.4 Phase 2

Attesting to the iterative nature of ethnography, this phase began with the findings of the previous phase in mind. The first method in Phase 2 involved designing an interview schedule with 2 parts (Figure 5.8a and 5.8b). Part 1 (Figure 5.8a) captured the background information of the interviewees and Part 2 (Figure 5.8b) listed the questions that had been informed by the research process up to this point. Whilst the first phase was largely focussed





## Part 2 - Semi-structured interview questions

Prior to commencing the interview, the participant will be given a brief overview of the project as well as having time to ask informal questions.

1. Who is the leader in the resuscitation room?
  - 1.1. Is there more than one leader?
  - 1.2. Does the active leader role change during the course of resuscitation room treatment?
2. What factors influence the type of leadership that is required?  
For example, the experience of the team, the severity of the patient
3. In the resuscitation room is the role of the leader determined by their profession or by the individual/their personality?
4. What are the behaviours, actions or tasks in the resuscitation room that mark out leaders from non-leaders?
  - 4.1. Are there leadership behaviours, actions or tasks that are specific to nurses?
  - 4.2. Are there leadership behaviours, actions or tasks that are specific to doctors?
5. Have you experienced leadership conflict in the resuscitation room?
  - 5.1. If so, how did this conflict effect team performance?
6. What makes a 'good' and 'bad' leader in the resuscitation room?
7. Do you take a leadership role in the resuscitation room?
  - 7.1. If so, what is it you do?

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Version 1.0 Date 01/07/15

Figure 5.8b. Semi-structured interview questions

on producing a first-use leadership taxonomy, this second phase introduced interviews and a further 5 observations to test a more refined second iteration.

A decision was made to interview 5 Consultants and 5 Charge Nurses first as these represent the most senior staff in the resuscitation room. Although the overall focus here is concerned with the team's opinions and expressions of leadership, these staff have the most clinical experience and therefore are more familiar with either delivering or acting on leadership. Their input during the early stages of interviewing could help refine the interview questions in anticipation of interviewing more junior medical and nursing staff.

#### *3.13.4.1 Designing the interview schedule*

From the outset it was recognised that the 'golden thread' – from philosophy, theory, methodology to methods – had to be continued when designing the interview. The ontology and epistemology of critical realism is that reality exists independently of people's perceptions and thoughts, but the understanding of this reality retains a constructivist or relativist epistemology; that is, this research approach to understanding leadership in ED resuscitation does not form a universal truth – it is imbued with an inherent worldview and is relevant to the context in which it is being studied.

As highlighted by Seale (1998), one way this influences interviewers is whether they frame interview data as a resource or as a topic. The former suggests that the words and views expressed by the interviewee reflects the reality of phenomenon as it is outside of the interview. Interview data as a topic, however, views the interview as a process of social interaction and, as such, data generated is locally and jointly produced.

In keeping with the identified philosophical framework, a logical conclusion here is to view interview data as a topic. The researcher cannot erase him or herself from the interview, nor can they meaningfully account for the intricacies of the social interaction that occurs between them and the interviewee. Because of this, it is acknowledged that the data produced by the

interview process will have been shaped by the researcher's background and professional relationship with the interviewees, as well as general disposition during the interview and a range of other subtle factors. This viewpoint aligns with critical realism and its sensitivity to local and contextualised knowledge.

One conclusion that could be drawn from this, if a strict positivist stance was taken, is that interviews are simply collections of opinions with little validity or generalisability. It should be stressed that whilst local and contextualised knowledge is being advocated, using an analytical framework (described in the section below on interview analysis) can bring the appropriate level of rigour.

Another factor that was considered when designing the interview was the type and structure of the questions. As Rapley (2007) has observed, there are many typologies of interview, such as *“active, biographical, collaborative, conversational, depth, dialogical, focused, guided, informal, life-history, non-directed, open-ended, oral history, reflexive, semi-structured”* (p 15). The chosen format here is the semi-structured interview. This method allows the researcher to set the general direction of the interview whilst still giving the freedom for *“other questions emerging from the dialogue between interviewer and interviewees”* (DiCicco-Bloom and Crabtree 2006, p 315). For this thesis, this meant questions could be asked about the nuances of team leadership whilst also allowing the interviewees to bring in the ideas that were important to them.

The third and final issue that was important when thinking about the interview process was that of 'neutrality'. The term *“implies that an inquiry is free of bias or is separated from the researcher's perspectives, background, position, or conditioning circumstances”* (Given 2008, p 5). Broadly, there are those who argue that neutrality is the cornerstone of interviewing to avoid bringing bias into the process. There are, however, also arguments for

avoiding neutrality as this creates a hierarchical, imbalanced dialogue where the interviewee is treated as an 'object' (Rapley 2007).

A third viewpoint is that remaining neutral is methodologically unachievable as the interviewer is an active part of the social interaction and is responsible for guiding at least part of the process.

Again, as the philosophical disposition here is critical realism, accounting for – and excluding – all potential biases is difficult and fits with a positivist view of knowledge. As a Nurse interviewing clinical colleagues about challenging and emotive resuscitation, it is necessary to acknowledge that the content of the interviews will undoubtedly require some input. A practical question that should be asked is whether interviewees would respond in the same way if the questions were being asked by someone who is unknown to them and unfamiliar with ED care. A reasonable middle-ground position to take is that the researcher cannot exclude all known and unknown sources of bias, but that it is necessary to account for them where possible.

#### 5.13.5 Analysis of interviews

Similar to the numerous typologies of interviews that exist, there are also different ways of analysing data once they have been collected. Different analytic approaches have varying levels of theoretical tradition, such as in conversation analysis, interpretive phenomenological analysis, discourse analysis, critical discourse analysis, grounded theory, narrative analysis and historical/Foucauldian discourse analysis (Perakyla and Ruusuvuori 2011). If content analysis is chosen, this could be conventionally, directionally or summatively (Hsieh and Shannon 2005).

The choice of how to analyse the interviews was guided by the underlying constructivist epistemology; this is to say that the data do not represent a global truth about leadership, but that the findings are one attempt to explain the phenomenon supported by methods that have been applied rigorously. It is worth being clear about this point as positivists would argue

that the researcher's role within interview analysis is to find the 'truth' within the text; the claim would be that valid results are only possible through a positivist and objective approach.

As constructivism has evolved there has been a growing recognition that different perspectives of the same truth can be identified within interview transcripts. Ely *et al* (1997) voiced that claims of themes passively emerging *"can be misinterpreted to mean that themes 'reside' in the data, and if we just look hard enough they will 'emerge' like Venus on the half shell. If themes 'reside' anywhere, they reside in our heads from our thinking about our data and creating links as we understand them"* (p 205). Similarly, Braun and Clarke (2006) argue that *"An account of themes 'emerging' or being 'discovered' is a passive account of the process of analysis, and it denies the active role the researcher always plays in identifying patterns/themes, selecting which are of interest, and reporting them to the readers"* (p 80).

To summarise, the realist part of critical realism means that certain realities and truths to leadership are recognised. Crucially, the constructivist approach here is one path to measuring and describing this; no single approach is infallible. With these arguments in mind this thesis uses thematic analysis for interview data.

#### *5.13.5.1 Thematic analysis*

Thematic analysis has been chosen because it offers a versatile framework for analysing interview transcripts. For some, thematic analysis is viewed as a tool that can be used within different methods (Boyatzis 1998). For others, thematic analysis falls within established analytic approaches, such as grounded theory or interpretive phenomenological analysis (Ryan and Bernard 2000).

The specific method chosen here is described by Braun and Clarke (2006) who argue for thematic analysis to be considered a distinct method in its own right. This means that it can be used within different research methodologies. This research will use a six-step process identified by Braun and Clarke (2006) (Table 5.5).

The findings of these interviews will be presented in Chapter 8, however it is important to demonstrate how the thematic analysis framework was practically used to produce the results. This is, surprisingly, an often overlooked part of the thematic process where reports simply state that thematic analysis was used without actually detailing how this was employed (Guest et al 2012). Being explicit about this is beneficial for several reasons. As questioned by Ryan and Bernard (2000, p 86), *“If researchers fail to identify important categories during the exploratory phase of their research, what is to be said of later descriptive and confirmatory phases?”*. In addition, *“being explicit about how we establish themes allows consumers of qualitative research...to assess our methodological choices”*. Last, it gives research users *“a jargon-free vocabulary to communicate with each other across disciplines and across epistemological positions”* (p 86).

The first step having completed the first 10 interviews involved becoming ‘familiar’ with the data. This was primarily achieved through audio recording interviews and transcribing the audio files verbatim. The next two steps were arguably the essence of thematic analysis – generating initial codes and searching for themes. At this stage literature highlights how this can be done in two ways. Deductive approaches *“involve using a structure or predetermined framework to analyse data”*, whilst inductive *“involves analysing data with little or no predetermined theory, structure or framework and uses the actual data itself to derive the structure of analysis”* (Burnard et al 2008, p 429).

Phase	Description of the process
1. Familiarising yourself with your data:	Transcribing data (if necessary), reading and re-reading the data, noting down initial ideas.
2. Generating initial codes:	Coding interesting features of the data in a systematic fashion across the entire data set, collating data relevant to each code.
3. Searching for themes:	Collating codes into potential themes, gathering all data relevant to each potential theme.
4. Reviewing themes:	Checking if the themes work in relation to the coded extracts (Level 1) and the entire data set (Level 2), generating a thematic 'map' of the analysis.
5. Defining and naming themes:	Ongoing analysis to refine the specifics of each theme, and the overall story the analysis tells, generating clear definitions and names for each theme.
6. Producing the report:	The final opportunity for analysis. Selection of vivid, compelling extract examples, final analysis of selected extracts, relating back of the analysis to the research question and literature, producing a scholarly report of the analysis.

Table 5.5. Six-step process of thematic analysis (Braun and Clarke 2006)

Intuitively neither of these broad approaches, if applied rigidly, were suitable. Deduction would align with the type of studies that this thesis is trying to avoid – those studies that use predetermined leader-centric models to measure whether one person complies with their metrics of good leadership. Yet pure induction was also not suitable as some observational and questionnaire data had been collected by this point, meaning interview analysis was not started with a blank slate. These data represented the

beginning of the core codes and themes relevant to leadership in ED resuscitation starting to form. Thus, whilst the purpose of interviews was to give voice to the interviewees as well as develop an analytic perspective, the empirical data gathered by this point meant that interview analysis began with broad themes and categories in mind.

Fereday and Muir-Cochrane (2006) proposed a hybrid approach of deductive and inductive coding and theme development in their study of performance feedback in nursing practice which was most applicable for this project.

As a working example of how this was applied in practice, analysis began using Saldana’s landmark text *The Coding Manual for Qualitative Researchers* (2015). Saldana highlights how initial codes and sub-themes can “range in magnitude from a single word to a full sentence to an entire page from a text to a stream of moving images” (p 3). Traditionally the inductive approach would use first cycle coding as ‘first impression’ notes; codes would be one or two words (Figure 5.9). But as outlined, this process began with a corpus of data from questionnaires and observations already gathered from Phase 1. This meant that rather than identify one or two words as codes, it was more appropriate to code sentences and passages.

Text	Codes/subthemes
(1) He cares about me. He has never told me but he does. (2) He’s always been there for me, even when my parents were not. He’s one of the few things that I hold as a constant in my life. So it’s nice. (3) I really feel comfortable around him.	(1) Sense of self-worth (2) Stability  (3) “Comfortable”

Figure 5.9. Example of first impression single-word codes (Saldana 2009)

The processing technique used to analyse the text follows the ‘cutting and sorting’ method outlined by Ryan and Bernard (2003), which “*involves identifying quotes or expressions that seem somehow important and then arranging the quotes/expressions into piles of things that go together*” (p 94). Although this sounds rather simplistic, this is the easiest method for allowing constant comparison and visualisation of adaptable themes (Lincoln and Guba 1985). Microsoft Excel 2015 was used to process the data which involved using colour coding within passages to signal initial themes.

Although the findings will be discussed in full in Chapter 8, a brief colour-coded segment of passage from an interview with a Charge Nurse (Participant 0010) is provided below as a working example:

*Interviewee: The co-ordinator, or the leader of resus if you like, has to have an idea of what’s going on in every single bay of the resus room. So if we’ve got 4 in resus that person should know about every single one of them, not in depth, but they should be able to say ‘A is a really sick patient. B isn’t. B will be coming out shortly’ so they should understand the flow of resus and should know about anybody that is coming in and I think that’s more of a nurses role than maybe the – potentially a doctors role (**Subtheme 1**). Ehm, its about knowing what staff you’ve got on in resus. So knowing who will need a bit more support. So if you’re in with – on the day shift for example we are supposed to have 3 nurses in resus, often you have one very very senior nurse who leads it (phone interrupts). So you would have one very senior nurse who leads resus then you may have, kind of, a middle of the road person – somebody who is not quite up and leading but is very experienced nonetheless and then you often have a junior one. So again, if you’re the leader its about knowing who needs the extra assistance, knowing what Docs you’ve got on, you do need to know your doctors quite well in resus because we have a lot of different medical staff coming through the department all the time so you’ve got to make*

*sure the right person is seeing the right patient (Subtheme 2). Ehm, being able to have – I think its about being able to have an overview as well. Sometimes its not necessarily about being directly involved. So I will often go in to – go in with, I don't know, say we've got a trauma coming in and not necessarily involve myself in it, because sometimes I think you can see a bit more of the bigger picture when you're not directly involved in care (Subtheme 3).*

Interviewer: And when you see, say if your medical colleagues would be the doctor lead – the registrar, the consultant – when you see them getting more hands on, perhaps doing a task instead of taking that overview, do you feel as though you then...

*Interviewee: (interrupts) Yeah it really depends on the situation. If the – let's just call it a consultant for the sake of argument – if they're doing something because there is nobody else in the room who can do it, then I think that's probably acceptable. If they're doing it and there's registrars and things in the room that A. can do it and B. actually could do with that experience, then yeah I would probably rather see them step back (Subtheme 4).*

As can be seen, single words or phrases are purposefully not being isolated as this may miss the wider context and tone of the interviewee's responses. Asking participants about leadership as a socio-behavioural phenomenon is better communicated through conveying the fuller concepts discussed. The multiple subthemes identified during this passage were therefore:

- (1). *What the leader does/what leaders do*
- (2). *Sensing from team/known individuals/relationships*
- (3). *What the leader does/what leaders do*
- (4). *Person/situation dependant*

This process was used for all 10 interviews, tentatively folding in steps 4 and 5 – reviewing themes, and defining and naming themes. In keeping with ethnographic methodology this process occurred iteratively. As the authors of this thematic analysis approach said in a later article, *“These stages...should not be viewed as a linear model, where one cannot proceed to the next phase without completing the prior phase...rather analysis is a recursive process”* (Clarke and Braun 2013, p 121).

With these interview data in hand the second iteration of the leadership taxonomy was developed, incorporating in the responses from interviewees during the first 10 interviews. Again, this is illustrative of how each phase achieved both complementary objectives – interview responses yielding data that helped develop a leadership tool (Objective 1) as well the mixed-method ethnography (Objective 2). Using this second iteration taxonomy, another 5 ED resuscitation episodes were observed using the video recording system. Again, methodological field notes were taken during periods of observation (Objective 1) whilst also taking substantive and analytic field notes to support the ethnography (Objective 2).

#### 5.13.6 Phase 3

This phase began with a taxonomy that had been informed by literature, questionnaires and interviews with senior nurses and doctors. Phase 3 continued by interviewing a further 10 resuscitation team members. This time the full resuscitation team were invited to interview: Registrars, Junior Doctors and Staff Nurses. In total 5 Consultants, 5 Charge Nurses, 4 Staff Nurses, 3 Registrars and 3 Junior Doctors were interviewed. As far as can be determined this is one of a few studies to purposefully survey and interview the complete resuscitation team when exploring team leadership.

The analysis of these interviews followed the processes discussed in Phase 2, however this time step 4 and 5 (reviewing themes, and defining and

naming themes) were more pertinent. By this stage initial themes were being developed from interview transcripts with Consultants and Charge Nurses. This meant that analysing the interviews of other staff members involved comparing and contrasting themes, refining existing categories and adding in other themes if appropriate.

Using the third and final iteration of the leadership taxonomy, the tool was applied to a further five resuscitation episodes to measure who exhibited leadership, how they did this and the other salient aspects of leadership that helped meet the objectives and answer the research questions.

At the end of Phase 3 a large corpus of questionnaire, interview and observational data had been collected that informed the design of the leadership taxonomy (Objective 1) and produced data for the ethnography (Objective 2).

#### 5.13.7 Phase 4

This phase occurred towards the end of data collection and involved inviting experts to a discussion group about the leadership taxonomy and the findings up to this point. In many ways this was a sense-check of the thesis and its content by staff who have done similar work, or those clinicians who could be using the taxonomy.

The formalised approach for gathering consensus is through a Delphi study (Keeney et al 2006). The Delphi technique *“is a group facilitation technique, which is an iterative multistage process, designed to transform opinion into group consensus”* (Hasson et al 2000, p 1008). Often there are at least 3 ‘rounds’ or ‘cycles’ of iteration until consensus is achieved (Hsu and Sandford 2007).

It has been recognised, however, that there are more informal approaches to gathering consensus than a discrete Delphi study (De Villiers et al 2005, Powell 2003). At one end of this informal spectrum there is a

process known historically as GOBSAT, or Good Old Boys Sat Around a Table (Greenhalgh 2014); as Greenhalgh voices, this used to be *“the fruits of a weekend’s hard work by a dozen or so eminent experts who had been shut in luxury hotel, usually at the expense of a drug company”* (p 7). These groups often produced clinical guidelines or treatment protocols which have now fallen down the evidence-based medicine hierarchy.

Moving towards the more formalised end of the spectrum, it was decided that whilst a discrete Delphi study was not possible within the research study timescale, it would still be useful and clinically important to invite subject matter experts to provide their thoughts on the project. The aim was to cover three different areas of expertise: (1) research methods (2) emergency medicine resuscitation (3) behavioural marker tools – psychology.

The group consisted of:

(1) Dr Colin Chandler (Ph.D Supervisor) – Lecturer

(1) Dr Alistair Dewar – Senior Registrar and Ph.D Student

(2) Dr Gareth Clegg (Ph.D Clinical Supervisor) – Honorary Consultant in Emergency Medicine

(2) Dr Randal McRoberts – Consultant in Emergency Medicine. Pre-hospital and Retrieval Medicine Consultant

(3) Emeritus Professor Rhona Flin – Industrial Psychologist

(3) Dr Shelly Jeffcott – Human Factors Lead, Psychologist

The aim was to be fairly practical with this group discussion and viewed it as a forum for critique; to understand the strengths and weaknesses of the tool and the research methods used up until this point, as well as how to optimise the remaining data collection time.

The themes discussed at this session will be outlined in the findings chapter (Chapter 8), however the key action point from this forum was that it was advisable for a second independent video reviewer to use the leadership tool to mark leadership behaviours – and who was enacting them – on another set of resuscitation videos.

#### 5.13.8 Phase 5

Following on from the expert discussion session it was recognised that although the tool had been developed from a range of data sources – literature, questionnaires, interviews and observations – the final step was to ensure reliability. This was to address a fundamental question: if another person used the tool and applied it to the same video cases to observe leadership from resuscitation team members, would they produce the same results? In other words, would different observers agree with one another about the same episode of care?

This was the same ethnographic issue that Robert Redfield and Oscar Lewis encountered when they both studied the lives of the Tepoztlán people in the early 20<sup>th</sup> century, coming to two markedly different conclusions.

Measuring this idea brings together several terms that are used in the literature, such as agreement, reliability, concordance and consistency (Yi et al 2008). A number of different statistical terms are also introduced when describing agreement, such as percentage agreement, kappa, cronbach's alpha, product-moment correlation and intra-class correlation coefficient (Lange 2010). Furthermore, different types of tests can be used, such as inter-rater, intra-rater and test-retest (Rousson et al 2002).

For the purposes of this study the most appropriate measure of reliability was inter-rater reliability (IRR), described as the *“measurement of the extent to which data collectors (raters) assign the same score to the same variable”* (McHugh 2012, p 276). This, temporally, differs from inter-rater

agreement which does not measure the extent of agreement consistently over time (Gisev et al 2013). Furthermore, Hellgren (2012) highlights that inter-rater agreement as it is commonly expressed as percentages of agreement does not account for chance. As such, it has historically been rejected as an adequate measure of IRR (Cohen 1960, Krippendorff 1980).

After consultation with an Epidemiologist working with the supervisory team (Resuscitation Research Group) and a fellow Ph.D student developing a similar rating tool, the most appropriate statistical analysis to measure IRR is Cohen's kappa (Cohen 1960). Importantly, kappa statistics "*measure the observed level of agreement between coders for a set of nominal ratings and corrects for agreement that would be expected by chance*" (Hallgren 2012, 26). In simple terms, Cohen's kappa accounts for the likelihood that two coders will score the same behavioural marker by chance. The following formula is used when calculating IRR:

$$\kappa = \frac{p_{(a)} - p_{(e)}}{1 - p_{(e)}}$$

*Cohen's kappa: where  $p_{(a)}$  denotes observed percentage of agreement and  $p_{(e)}$  denotes the expected probability of agreement by chance. Formula written using equation writer in Microsoft Office Word 2017*

To compute a confidence interval (CI), an appropriate threshold of potential error had to be chosen. The typical CI in healthcare is calculated to 95%, translating to a significance level of  $p=0.05$ . According to the standard area under a normal distribution curve, 95% area under the curve lies within 1.96 standard deviations of the mean. Thus, the formula to calculate the lower and upper thresholds for a 95% CI uses 1.96 as the multiplier:

$$\kappa - 1.96 \times SE_{(\kappa)} \text{ to } \kappa + 1.96 \times SE_{(\kappa)}$$

*95% confidence intervals: where  $SE_{(\kappa)}$  denotes the standard error rate for kappa. Formula written using equation writer in Microsoft Office Word 2017*

The following formula was used to calculate the standard error rate:

$$SE_{(\kappa)} = \sqrt{\frac{p_{(a)}(1 - p_{(a)})}{n_{(t)}(1 - p_{(e)})^2}}$$

*Standard error rate: where  $SE_{(\kappa)}$  denotes the standard error rate for kappa,  $p_{(a)}$  denotes observed percentage of agreement,  $p_{(e)}$  denotes the expected probability of agreement by chance and  $n_{(t)}$  denotes the total number of behaviours observed. Formula written using equation writer in Microsoft Office Word 2017*

Having observed 15 resuscitation episodes, a further 5 care episodes were downloaded into the video review system and a second independent video reviewer was identified. A Registrar with previous experience of coding clinical care videos was chosen as a suitable second coder. Before starting, the the two coders jointly reviewed a separate corpus of 5 videos as training scenarios where the rationale for the taxonomy and the methods used up to this point were explained. This was a session to converge ideas so that there was a common understanding of how behaviours were being interpreted.

The observational data scored with the taxonomy were treated as nominal values (also referred to as categorical) meaning that the coders either agreed or disagreed with the expression of a leadership marker, and either agreed or disagreed with the absence of leadership behaviours. The decision was taken to set time parameters on scoring behaviours:

- A time window of 15 seconds was set for coders to agree on scoring the presence of the same leadership behaviour. This scale was used to allow clinicians to start and finish their action. For example, a Consultant explaining the next steps of a patient's care plan may be coded at the start of their sentence or at the end, thus 15 seconds was chosen as a reasonable cut-off.
- A time window of 30 seconds was set for coders to agree on scoring the absence of leadership behaviours. This scale was used to ensure

that both coders agreed on clear epochs of time where neither interpreted actions as leadership. For example, if this scale was set to 5 or 10 seconds, one reviewer could code nearly every sentence or act from an individual as leadership and still generate a strong IRR score without the appropriate agreement from the second reviewer. Setting a 30 second scale meant that both reviewers would review the same cluster of behaviours and actions in an episode of care delivery and agree that none represented leadership.

In practical terms, the smots™ video system was used by the Registrar to upload the identification of leadership behaviours into the database and generated a Microsoft Excel workbook complete with the time stamp and marker identifier. The database for the 5 separate videos was then saved on a separate computer and the smots™ system was deleted of their input. This meant that the second reviewer scored the videos blinded, without being able to view what scores had been assigned and what time stamp had been used. After the second reviewer had completed the scoring of videos, the 10 excel workbooks were then paired and analysed for IRR. Calculating the IRR score marked the end of data collection.

## 5.14 Summary

This chapter has set out the research methods used during the study and why these were chosen, encompassing the issues of reality (ontology), knowledge (epistemology), theory and methodology. As outlined section 5.13.3 above, due to the extensive approval processes to gain permission for this ethnography, these have purposefully not been explained these in this chapter. Before the findings are presented, the ethical, legal and data protection issues will be addressed.

## 6.0 Ethics and approvals

Ethical discussions are often placed within the 'methods' section of publications and theses, however this is provided in a separate chapter for several reasons. First, the role of the researcher as a Nurse within the NHS and as a student within a higher education institution means that this work was subject to two different approval systems. Second, the different research methods used – video recording, interviews and questionnaires – required different levels of approval within the systems. Third, because the department's video system is one of the first of its kind in the UK – if not the first – the video working group has been part of a broader national conversation about using video to record resuscitation. Whilst not the central purpose of the study, the contribution to national dialogue supports the decision for a separate chapter.

Owing to these issues, it is prudent to separate these discussions into a discrete chapter so that the complex approval processes are clear to the reader.

### 6.1 Ethics in emergency care

Historically, emergency medicine is a speciality that has had to deal with complex ethical issues (Nee and Griffiths 2002), particularly around consent (Coats et al 2006). The speciality has to contend with abiding by the same ethical principles of autonomy, nonmaleficence, beneficence and justice as all other domains of healthcare (Beauchamp and Childress 2001), whilst at the same time attempting to advance knowledge and care delivery in patients who may be severely unwell. The basic premise is that studying emergency care is challenging when patients may not be in a position to consent. Specifically, patients presenting with a medical emergency may not be able to satisfy the broad requirements of informed consent (Coats and Goodacre

2009). Beauchamp and Childress (2001) allude to these in their landmark *Principles of Biomedical Ethics* text: a person must have freedom of choice, must be provided with sufficient information and they must have appropriate mental capacity.

At the start of this research process the video working group acknowledged that attempting to embed video recording would touch on a number of these core ethical principles, as well as the corresponding legal and data protection principles. The steps taken to ensure the ethical, legal and data protection issues were appropriately addressed will now be presented.

## 6.2 University of Edinburgh and NHS Lothian approval procedures

The Nursing Studies Ph.D programme falls within the School of Health in Social Science at the UoE. This department operates an ethics review system that is designed to work in partnership with the NHS ethics review service.

There are 2 levels to the UoE ethics system. Level 1 is a self audit form and is completed for all studies that are not subject to review by an external NHS ethical committee. The second level, known as level 2-3, is the UoE ethical review committee for those studies which have not been submitted through the NHS ethics service. In short, if a study has been approved by NHS Lothian's ethics service it does not need ethical approval from the UoE.

The video system that was proposed, as described in the following paragraphs, did not require review by an ethical committee as advised by the Scientific Officer of the South East Scotland Research Ethics Service. Therefore, documentation was submitted to the Nursing Studies Ethics Review Panel, receiving subsequent approval (REF NURS010 29.05.2015).

Section 6.3 below will outline how approval decisions were made, such as why NHS ethics review was not required. Using the researcher's voice in parts to illustrate the experience of implementing video 'in the field', the following section describes how video transitioned from an idea into a functioning system.

### 6.3 The approval processes – Kotter's model for change

Using video in medicine is not particularly new; the first documented case of video in healthcare can be traced back to 1947 when it was used at a medical association meeting at Johns Hopkins hospital (Trimble and Reese 1947). It was not until 20 years later when Peltier et al (1969) described the use of video as an adjunct in clinical education that video was known to emergency medicine. Since then video has been used in diverse clinical specialities, such as psychiatry (Zarate et al 1997), general family practice (Ram et al 1999) and surgery (Larsen et al 2008). Similarly, it has been used across the spectrum of emergency care, including different types of resuscitation situations (Jiang et al 2010, Chen et al 2015) and in minor injury consultations (Sandhu et al 2009).

Despite video being available for 70 years, a number of surveys have highlighted how sporadic video use is. Ellis et al (1999) surveyed 221 trauma centres in the USA and, whilst 95% of centres who used video found it be an effective learning tool, 80% were not videotaping. Taylor et al (2011) surveyed 70 hospitals across the USA, Canada and the UK, totalling 307 clinical areas including EDs. Whilst the majority of operating rooms, intensive care units and neurology units reported using video, only 12 of 65 (19%) of EDs reported video recording. A third study by Rogers and colleagues (2010) surveyed 108 adult and paediatric trauma centres in the USA. Of the 107 sites that responded, only 20% were capturing video data. A final study by Campbell et

al (2006) surveyed 167 trauma centres in the USA, with 125 respondents. Of these, 18% reported using video.

The reoccurring theme found in these studies is that EDs do not pursue video systems because of the ethical, legal and data protection barriers. Staff do not know how to navigate these hurdles, nor address the change management issues such as gaining departmental and executive support. There is little-to-no guidance on how clinicians can practically go about implementing video (Blank-Reid and Kaplan 2009, Ryan and Gaudry 1996).

Even as far back as 1969 when Peltier et al. first used video in emergency medicine teaching, the authors were questioned: *“What is the legal status of the videotapes?... do they become part of the patient record? Can they be used in the courtroom...Can such television videotapes be used legitimately to evaluate the performance of emergency room personnel for the purposes of promotion or dismissal?”* (p 823). We anticipated that we would be tasked with answering the same type of questions, perhaps with a greater degree of importance given current data protection and privacy laws.

Recognising these barriers, we knew that if we sought approvals without the necessary preparatory work, the intention to use video would likely fail. Staff and approval groups are aware that video is a sensitive source of data, thus a thorough approach was required.

We opted to draw on Kotter’s 8-step template for leading change (Kotter 1996). Kotter proposes that implementing change – in this case a bespoke video system – is about getting people on board with your vision. These sections will outline the change management and procedural issues we encountered and how we engaged with the NHS’ and University’s approval processes along the way. Kotter’s template gave us a framework which allowed us to go from idea generation to video installation.

### 6.3.1 Step 1 – Create a sense of urgency

Before we set out to embed video within our department, it was necessary to consider how video would fit into the broader healthcare landscape. Video recording live episodes of patient care is viewed as fairly novel, but departments already measure their performance through a range of metrics and indices. One study by an Australian group measured the number of standard assessment and risk forms used for older patients across 11 hospital sites (Redley and Raggatt 2017). They found that 152 forms were used, comprising 3700 elements. Of these, 17% were duplications.

This is symbolic of the general sense of over measurement in health care, where *“Checklists, pathways, algorithms are a tempting way for organisations and healthcare professionals to signal to the outside world that they are making a good faith effort to ensure service quality”* (Allen 2017, p 1). Video has to be viewed as adding meaningful value to an industry already full of data.

In keeping with high-reliability organisations, we viewed video as a tool that would allow us to better understand the complexity of the resus room (Plsek and Greenhalgh 2001). National reports had signalled that resuscitative care was inconsistent across Scotland. For example, only 43% of patients with a stroke are thrombolysed within the recommended time window (NHS Scotland 2015a), and less than 40% of major trauma patients with a severe head injury receive a computed tomography scan within the one-hour national target (NHS Scotland 2015b). Furthermore, 38% of major trauma patients do not receive the recommended Consultant-led care on initial assessment, whilst patients with severe sepsis and septic shock receive inconsistent care (College of Emergency Medicine 2014).

We had initial discussions with clinical staff members to share our idea and hear their thoughts and concerns. This gave us a sense of how supportive

staff were and whether they believed video could benefit our department. Kotter suggests that for change to be successful, 75% of an organisation needs to buy into the proposition. In other words, it was really important for us to explain why video can *“help drive quality improvement to the next level”* (Makary 2013, p 29).

### 6.3.2 Step 2 – Build a guiding coalition

Creating a sense of urgency allowed supporters and early adopters from within the department and organisation who were receptive to the ‘big opportunity’ to come forward. As more discussions were had, more people engaged with the conversation around video-audit. This took several months, however at the end of this process we were in a position to build what Kotter describes as a ‘Guiding Coalition’. A guiding coalition including a range of expertise, status and organisational influence is essential to institute the attitudes and practices necessary to launch and, most importantly, to sustain change.

Our initial Coalition included individuals from within the ED – the Clinical Director, Clinical Nurse Manager and senior clinical staff. Of equal importance was the need to reach out to other divisions and levels of the organisation. During this process, we found that multi-level engagement with the hospital’s clinical management team as well as the Medical Director allowed us to canvas the views of staff from the bedside to executive level.

The ED resus room is not only the domain of ED staff, but is also visited by a range of clinicians from acute specialties. These non-ED clinicians would also be a part of our continuous video audit. Expanding our guiding coalition to include personnel from out with the immediacy of ED allowed the message of change to diffuse throughout the organisation as a whole

### 6.3.3 Step 3 – Form a strategic vision

Before outlining what this step involves, it is important to recognise that the previous steps required continual attention and re-evaluation. No matter how powerfully the strategic vision is set out, should the message behind the big opportunity be lost, the project will inevitably lose traction.

A strategic vision goes beyond simply installing a video audit system. The work that goes into – and results from – video implementation is achieved through a series of interconnected value adding frontline clinical processes; the vision is to make those processes visible to all staff and then empower them to contribute to change.

There were several pillars that were important to the strategic vision of our video-audit system. These centre around practical questions such as: what is the purpose of the video-audit system; how will the video be used; who will have access to the footage; what governance measures are in place; what data management system is in place; how will patient privacy and confidentiality be maintained; will individual performance be assessed.

These questions should be answerable in a clear and consistent manner and determined how we approached the approval groups of NHS Lothian and the UoE. There is an imperative to be honest about the challenges that exist, but also to create a sense of trust that the system is intended to improve patient outcomes and benefit staff.

At this stage it was necessary to formalise the strategic vision, including addressing the questions above. Our approach involved production of several key documents which are provided in the Appendix:

#### (1) Video Audit Framework

This is considered the master document which detailed our approach to many of the key issues associated with video audit (Appendix A). Our document had

several distinct sections. The main section describes the allowed uses of the video. Our system is designed solely for audit and service evaluation purposes and, as such, patient and staff consent would not be sought. It does not form part of the patient record and it is never used for individual assessment or feedback; this is a strictly non-punitive system. Similarly, it is never used for departmental teaching purposes or Morbidity and Mortality meetings.

Furthermore, the video footage can only be viewed by a member of the department's Video Audit Team (VAT) who are a small group of ED staff (4-6 people). It is allowable for an individual member of staff to request to review video of an episode they were directly involved in. In this case, a member of the VAT who has training in video debrief facilitates the viewing. Video review is used for auditing technical and non-technical aspects of care as well as ergonomic evaluations of the room and equipment. Output from video-audit is fed back at a service level.

The second section of the Framework documents the chain of accountability and what to do should there be a cause for concern while reviewing a section of video footage. The VAT report to a Departmental Oversight Team which includes senior clinical and managerial staff as well as the Medical Director of the hospital. From here, regular reports of activity are provided to the hospital's Clinical Management Group. This group contains the heads of nursing and medical directorates as well as the clinical leads from all hospital divisions. Furthermore, within this section of the *Video Audit Framework* we have an explicit escalation policy. Should any member of the VAT witness behaviour on the video that is a cause for concern, for example professional misconduct or criminal activity, then they report this through an escalation policy (Appendix B). This is reviewed by the Departmental Oversight Team in the first instance and the Clinical Management Group should the situation require.

## (2) Data Management Framework

This document outlines how the video will be collected, stored and accessed. We used a fixed camera installation from Scotia UK PLC called smots™ (Figure 5.5a – page 108). This combination of cameras and microphones allows continuous 24-hour audio-visual recording of the 4 resuscitation bays, as well as the screen display from the vital signs monitors. Video data is sent to a secure server behind 2 card-entry door systems within the ED. An automatic 7-day deletion loop is set on this server, meaning that the vast majority of footage is never viewed. Members of the VAT consult a prospectively maintained log of patients treated in the resus room, identifying cases fulfilling audit criteria. These files are transferred through a secure, offline network connection to a video viewing room which is locked at all times – key access is controlled using a delegation log.

We created a separate local area network (LAN) within our hospital building between the ED and viewing room to ensure data security. Once within the video viewing room, footage is subject to an automatic deletion policy of 180 days to allow time for video analysis within smots™. This allows footage to be studied and tagged with metadata. Standard Operating Procedures govern the workflow for the collection and analysis of video and create an audit trail of what resuscitation episodes are being viewed and for what purposes. Summary information is reported back to the Departmental Oversight Team.

### (3) Audit programme

Decisions about what to audit and who should be involved in video review are taken by the Departmental Oversight Team. We wished to ensure that the process of selection of audit projects is transparent and reflects the needs and concerns of all of the groups working in the resus room. The Departmental Oversight Team are also apprised of audit findings and provide a conduit for positive feedback to staff, and ensuring that training needs and process refinements are fed into the educational and operational activity planning of the ED.

#### 6.3.4 Step 4 – Enlist a volunteer army

The ability to enlist a volunteer army will be dependent on how successful a sense of urgency has been created, how well constructed the guiding coalition is and how clearly the strategic vision has been communicated. The volunteer army needs to come from within the clinical department's own ranks, including doctors, nurses, clinical support workers, porters, radiographers and visiting specialities; the staff must feel this initiative is happening 'with them' rather than 'to them'. The concerns of staff were verbalised by this point and addressed in the strategic vision. Failure to acknowledge the broad range of people's apprehensions will lead to pockets of negativity which can permeate throughout the department and the hospital more widely.

Our approach was to engage with staff in a variety of locations and formats. We presented the initiative to all medical and nursing staff at clinical handovers. This took approximately one month to ensure we covered the full staffing rota. Other groups of ED staff including Radiographers and Porters were visited opportunistically by the project team or by requesting an audience at their team meetings. Following this, a series of open 'drop-in' sessions were advertised throughout the hospital, where staff could come to the ED and ask about the proposed system in more detail. Providing this opportunity was a vital part of wider hospital staff engagement. We recognised that staff may feel hesitant about voicing their anxieties in the open forum of clinical handovers. Offering this type of session gave the opportunity for individuals to address their specific concerns in a one-to-one capacity.

The final strand of staff engagement involved speaking with groups who are not permanently based in the ED, but who will be observed on the video-audit system nevertheless. These include visiting specialities, such as Anaesthetics, Critical Care, Surgery, Cardiology. Importantly, staff partnership

representatives were included in these conversations from the outset. Transparency in these interactions was important in building safety into dialogue with staff. Enlisting this volunteer army took a considerable amount of time. However, ensuring that this group was large and diverse helped the initiative progress.

### 6.3.5 Step 5 – Enable action by removing barriers

According to Kotter (1996), leading change is *“less about finding or generating brand-new good ideas than about knocking down the barriers to making those ideas a reality”* (p 97). Embedding video cameras in the resus room has, broadly, two categories of obstacles. Thus far we discussed the first category – the change management hurdles – in detail. The second category are procedural hurdles, such as the ethical, legal and data protection approvals that are needed to implement video-audit. By thoroughly addressing steps 1, 2, 3 and 4, these procedural challenges were far easier to overcome.

At this stage we had the support and backing of the guiding coalition and a growing acceptance from our volunteer army. A sense of urgency and a powerful strategic vision were beginning to transform people’s general concerns into enthusiasm about the potential clinical impact of video data. This created a sense of readiness within the organisation.

The momentum gathered up to this point was harnessed when seeking ethical, legal and data protection approvals. We had preliminary discussions with these departments to share our vision and explain the process that we had been through up until this point.

(1) The Scientific Officer of the South East Scotland Research Ethics Service was consulted about our intended use of video, and whether this would require review by an ethical committee. We highlighted several key points associated with the video system. First, the parameters of video use were limited to either

evaluating what level of care the service provided, or auditing care set against a recognised standard. This was informed by the NHS Health Research Authority (HRA) who are a non-departmental public body that oversee the regulation of research in the UK. This body offers guidance in terms of what constitutes research, and what does not. The intended use and of this video system aligned with the HRA's guidance on Service Evaluation or Clinical Audit, designed to answer the questions: "*What standard does this service achieve?*" or "*Does this service reach a predetermined standard?*" (HRA 2016).

The Scientific Officer reviewed our documentation and determined that our video system would not require review by an ethics committee. This advice can be viewed in Appendix C. Other centres that have embedded video recording equipment have received similar opinions (Gelbert et al 2009). In the USA and Australia for example, departments who have video recorded resuscitations have been advised by their ethics service that quality assurance work does not fall within an ethical committee's remit (Ritchie and Cameron 1999, Carbine et al 2000).

(2) Contact was made with the Central Legal Office (CLO) who are the in-house solicitor to NHS Scotland. Again, we submitted our documentation for their consideration. Our system would not be seeking consent from patients or staff which is an ethical issue as well as a legal one. The debate around consent in emergency medicine, particularly audit and improvement work in the speciality, has lasted decades (Smith 1992, Caserat et al 2000, Wade 2005). One argument that lends support for not prospectively seeking consent from patients and staff is that doing so may hinder attempts to improve care. O'Donnell et al (2008) point out that "*if previous consent is mandatory, many important and potentially life-saving measures cannot be studied*" (p f83). This idea has been found in cardiac arrest research, where mandatory consent has lead to a decrease in the number of trials being conducted (Nichol et al 2004).

The CLO were satisfied with the legality of video recording and further pointed out that the unlikely event of resus room video footage being requisitioned by a legal body, it would be likely to aid timely settlement or, in fact, admonition where appropriate. This advice can be viewed in Appendix D.

(3) The final approval required related to the handling of video data. At the time these discussions the video system and the data it collected were subject to the same comprehensive provisions of the Data Protection Act as other non-video sources, broadly set out in Schedule 1 of the Act (UK Parliament 1998). Under this act, data should be processed for specific lawful purposes, it should not be kept for longer than necessary and appropriate technical and organisational measures should be taken to ensure it is secure.

Our *Data Management Framework* was designed to address these provisions, with particular emphasis being placed on the fact that video was stored on a secure server, and data was transmitted to a locked viewing room on an 'offline' LAN. Practically, this meant that no NHS or University employee – including those with administrator rights or access – could access the video footage, either purposefully or accidentally. The Caldicott Guardian was satisfied with the provisions put in place. As a side note, this office is now being consulted with since the new General Data Protection Regulation came into force on 25<sup>th</sup> May 2018.

These 3 approvals meant that video recording could begin in the ED. However, as highlighted at the start of this chapter, the ethical requirements at the UoE had to be considered in addition to the NHS. As a brief reminder, if a project receives review by an ethical committee within the NHS, then this does not routinely require review by a UoE ethics committee.

As we were advised by the NHS ethics service that review by a committee was not required, this served as a trigger for my documentation to be reviewed by the UoE ethics committee.

Accordingly, I submitted my application to the School of Health in Social Science ethics committee. Within this submission, I detailed the NHS approvals that were now in place and that my role would fall under the Video Audit Team governance documents that had been established. On July 29<sup>th</sup> 2015 I received approval from the committee to proceed with my doctoral work (REF NURS010). This is also provided in Appendix E.

The 3 remaining steps – generating short term wins, sustaining acceleration and instituting change – were addressed by the ED's video group after the audit system was implemented.

### 6.3.6 Conclusion

Embedding this video system was a challenge in terms of ethical, legal and data protection approvals, as well as change management issues. The full process – from idea generation to video installation – took approximately 18 months and involved many discussions with various staff groups.

About 12 months after installation the service started receiving requests for guidance and information from across the UK and abroad. Other sites were attempting to embed video recording systems and it appeared that the issues discussed above were hindering attempts to implement video. A manuscript was submitted as a 'how to' guide to the *International Journal of Clinical Practice*. The paper, titled '*How to implement live video recording in the clinical environment: A practical guide for clinical services*' was published (Lloyd et al 2017a). Similarly, a manuscript was submitted to the *Emergency Medicine*

*Journal* offering advice specifically for emergency departments which has also been published (Lloyd et al 2017b). Second major contribution

## 6.4 Summary

The approval processes required for implementing a video recording system presented this study with additional challenges. However, by thoroughly addressing the concerns of approval groups, staff and patients we were able to embed a video system that offered a platform for an ethnography. The findings from the ethnography will now be presented in the following chapter.

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## 7.0 Findings Part 1: Development of a team leadership taxonomy (Objective 1)

The methodology section in Chapter 3 set out this research with two complementary objectives that would allow the study to achieve its aim. In keeping with this methodology, the findings will be presented in two chapters. This first chapter presents the development of a team leadership taxonomy which achieves Objective 1. Part 2 of the findings will follow (Chapter 8), and present the ethnography in keeping with Objective 2.

As Table 5.2 illustrates on page 122, both chapters will cover all 5 phases of the research process as the data collected during these phases were input into the leadership taxonomy as well as the ethnography.

### 7.1 Developing the team leadership taxonomy

In the methodological chapter it was discussed at length how historical ethnographies have shaped the requirements for modern ethnographies. Although the scope and focus of ethnographies have evolved, there is still a need to structure observations within a system of classification so that researchers who want to observe similar phenomena can use the classification system to inform their study. This moves researchers away from the challenges encountered by Redfield and Lewis when they came to different conclusions when observing the same population in Tepoztlán.

For team leadership the most important consideration for this research study was to develop a tool that was based on existing resuscitation data and couple that with leadership markers as identified by staff.

Having gathered data in Phase 1 from (1) existing team rating tools (2) team simulation tools (3) extant leadership taxonomies (4) observational research (5) experimental studies (6) training programmes and (7) team

organisation research, the elements of these tools were distilled into Version 1 of the leadership taxonomy (Table 7.1).

<b>Leadership through an action, behaviour or task that achieves or leads to the achievement of mutual team goals</b>	
<b>Leadership marker</b>	<b>Example</b>
<b>(L1)</b> They prepare/brief the team (before patient arrival where possible)	1) They assign/allocate team roles to members of the team 2) They let the team know what is expected of them
<b>(L2)</b> They identify themselves as a leader	1) This can be done explicitly through verbalisation of their leadership role 2) This can be done implicitly through providing direction, command, guidance or instruction to the team
<b>(L3)</b> Maintains situation awareness, prompts clinical procedures	1) They display signs of situation awareness 2) Projects plan through information gathering and sharing
<b>(L4)</b> Manages resources. Orders medications, equipment, procedure	1) Organises/orders medications or equipment 2) Prioritises tasks depending on patient or team needs
<b>(L5)</b> Management of the room	1) They display room traffic control 2) They call for extra staff or dismiss staff depending on clinical necessity
<b>(L6)</b> Manages communication/listens to others and shares in decisions	1) They manage team communication
<b>(L7)</b> They support and/or teach other team members	1) They support/supervise other less experienced or unfamiliar team members 2) They display educational/teaching abilities with any task, equipment or procedures to other team members

Table 7.1. Version 1 of the team leadership taxonomy. Leadership behaviours are numbered between 1-7 to aid shorthand writing (e.g. L5 = management of the room). SA = situation awareness

Several things can be noticed about Version 1. First, the scope of this iteration is broad. The wording of leadership as an ‘action, behaviour or task’ allowed diverse examples to be included in the tool. Second, the remit of the tool is to itemise leadership that ‘achieves or leads to the achievement of mutual team goals’. This was included to align with the applied theory (Pearce and Sims 2000). There is purposefully no mention of what constitutes good or bad leaders; the tool is to be used to measure leadership that comes from any team member and benefits communal team goals.

In anticipation of finding the strengths and weaknesses of the tool during periods of observation, the questionnaire was distributed to 100 ED resuscitation staff asking them what constitutes leadership in the resuscitation room. Importantly, the same language of ‘behaviour, task or action’ was used in the questionnaire as it was used in the leadership taxonomy. This was because it was recognised during the review of relevant literature that leadership could mean different things to different people. Indeed, the systematic review by Rosenman et al (2015) found 61 different tools in circulation underpinned by 66 different leadership theories.

The wording of the leadership question, therefore, made leadership something tangible and clinically relevant. Staff were asked to name the behaviours, tasks or actions that doctors and nurses do when they display leadership in the resuscitation room. This anchored the question in real-life resuscitation scenarios rather than in the ideals of healthcare leadership.

### 7.1.1 Overview of questionnaire respondents

Of the 100 ED resuscitation staff that were surveyed, 72 responded. A summary of the responses to gender, age range, years qualified, years working in A&E and years working in the resuscitation rooms is provided in Table 7.2. A total of 40 Doctors, 26 Nurses and 6 non-medically trained staff (i.e. Clinical Support Workers) responded to the survey (Figure 7.1).

<b>Gender</b>	Male	43 (60%)
	Female	27 (37.5%)
	Prefer not to say	2 (2.5%)
<b>Age range</b>	21-25	6 (8.3%)
	26-30	23 (31.9%)
	31-35	17 (23.6%)
	36-40	12 (16.7%)
	41-45	6 (8.3%)
	46-50	4 (5.6%)
	51-55	3 (4.2%)
	Prefer not to say	1 (1.4%)
<b>Years qualified</b>	Mean = 9.0 years	(Std Dev = 7.0) (Range 1 – 32)
<b>Years working in A&amp;E</b>	Mean = 6.6 years	(Std Dev = 5.9) (Range 1 – 25)
<b>Years working in the resuscitation room</b>	Mean = 5.7 years	(Std Dev = 5.3) (Range 1 – 24)

Table 7.2. Demographic and clinical profile of the 72 questionnaire respondents

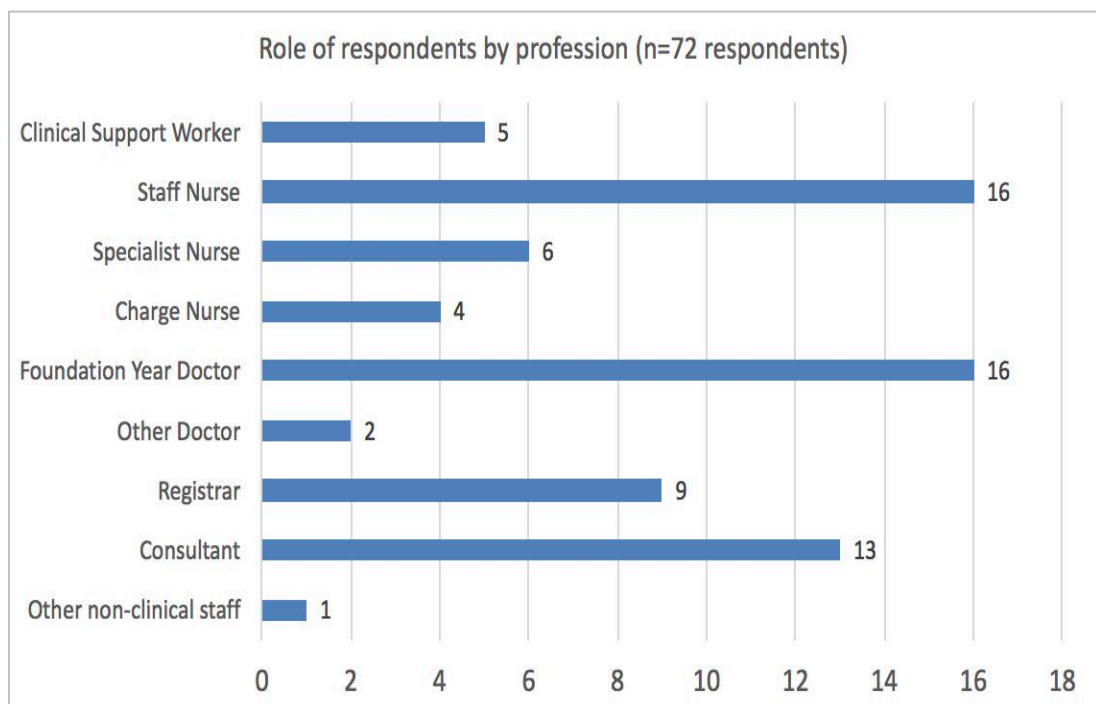


Figure 7.1. Professional role of questionnaire respondents

### 7.1.2 Staff identifying leadership

The questionnaire that was distributed gave staff enough space to identify up to 5 leadership behaviours for both doctors and nurses. With 72 responses, this yielded 510 leadership behaviours, tasks or actions – 254 for nurses and 256 for doctors. Having reviewed existing tools and survey studies in the previous chapters, this represents a comprehensive data set in initial stage of taxonomy development. It should be noted that an additional 12 comments were provided but these were ineligible on the questionnaire forms.

Once these data were collected, they were processed into behavioural categories using the cutting and sorting technique (Ryan and Bernard 2003). Knowing that these would be fed into the second version of the leadership tool, a balance had to be found between having a broad enough scope at this early stage, whilst also being judicious with the number of categories used.

A useful guide to help with this decision came from a behaviour rating tool developed by Sarah Henrickson-Parker whose Ph.D was supervised by Emeritus Professor Rhona Flin, mentioned earlier as advising this research work. Henrickson-Parker and colleagues (2012, 2013) designed a leadership inventory for surgeons in the operating room made up of 8 behavioural elements. This acted as a rough guide; a slightly higher number of categories was aimed for which could then be refined into Version 2. Attempting to use a tool with too many categories, however, would mean that the observer could, in theory, score nearly every behaviour as an act of leadership.

Beginning with nurses' leadership, the 254 responses were input into Microsoft Excel 2013 and each line was reviewed for initial categories. As a working example here, the first respondent noted 5 behaviours, tasks or actions that signalled nursing leadership. The text in brackets represents the tentative categories which were colour coded to aid with analysis:

- 1) Save lives (unspecified/generic)
- 2) Guides doctors to do the right thing (nurses supporting doctors)
- 3) Patients' advocate/patients' interest (holistic/patient-family care)
- 4) Calm, professional (professionalism/manage stress)
- 5) Compassion towards patient (holistic/patient-family care)

Another participant identified a different set of behaviours:

- 1) Delegating roles (allocation or delegation)
- 2) Requesting kit/drugs to be set up/drawn up in advance of pt [patient] arriving (setting up/preparing/situation judgement)
- 3) Good communication (communication)
- 4) Skilled at setting up kit quickly and efficiently (clinical/tasks performance)
- 5) Not frightened to question patient management (suggesting/questioning team)

Again, this clinician's responses were placed in initial categories of behaviour. At the end of this process the 254 responses were organised in 11 categories that would contribute to Version 2. A table depicting these categories was produced so that a comparison could be drawn between the tables of categories for nurses and doctors (Table 7.3a).

The same cutting and sort technique was applied to the 256 responses for doctors' leadership, resulting in 12 categories (Table 7.3b).

As can be seen there is considerable overlap between how staff think nurses and doctors display leadership, with 9 of the 11 nursing elements repeated in the doctors table. However, there are some important differences. Two elements – nurses supporting doctors and suggesting/questioning the team – were not identified as part of doctors' leadership. Instead, the

categories of remaining hands off/standing back, making decisions and sharing their mental model were reported to be part of doctors' leadership.

	Allocation or delegation	
	Supporting/directing/coaching team	
	Communication	
	Professionalism/manage stress	
	Setting up/preparing/situation judgement	
	Clinical/tasks	
	Patient-team organisation	
	Holistic/patient-family care	
	Nurses supporting Doctors	Potentially specific to Nurses
	Suggesting/questioning team	
None	Unspecified/generic	

Table 7.3a. Categories of nurses' leadership behaviours

	Allocation or delegation	
	Supporting/directing/coaching team	
	Communication	
	Professionalism/manage stress	
	Setting up/preparing/situation judgement	
	Clinical/tasks	
	Patient-team organisation	
	Holistic/patient-family care	
	Remains hands-off/stands back	Potentially specific to Doctors
	Makes decisions	
	Shares mental model	
None	Unspecified/generic	

Table 7.3b. Categories of doctors' leadership behaviours

These results appear to reflect how resuscitation teams generally perform. Resuscitation events will have a senior doctor in the room who will make decisions about patient care. If they are comfortable with how care is being delivered they may indeed stand back from the patient's bed and allow the team to continue without delivering 'hands-on' care. Similarly, nurses can reasonably support doctors or make suggestions to aid the team as they see fit. Therefore, the results of the responses appear to reflect the clinical environment which is important for its relevance to real-life resuscitative care.

With these results in hand the first version of the tool was used during observations of 5 resuscitation episodes. Although the behaviours identified would undoubtedly help refine the second iteration of the taxonomy, using the first version during actual observations was necessary to understand the practicalities of coding leadership in real-time.

### 7.1.3 Using Version 1 to observe resuscitation episodes

Before discussing the use of Version 1 during the first five resuscitation cases, it is useful to clarify the type of cases that were observed. In line with the aim and objectives of the study, the intention was to capture resuscitation events where leadership would be prominent.

The host service is considered a regional referral site. This is equivalent to a Level 1 or 'major' ED centre, meaning that the department receives critically ill patients as well as patients who need routine A&E care. On average, about 600 patients per month are treated in the resuscitation rooms having been pre-alerted by the Scottish Ambulance Service. One month's worth of audit data has been provided to illustrate the frequency and variety of patients cared for in the resus bays (Figure 7.2).

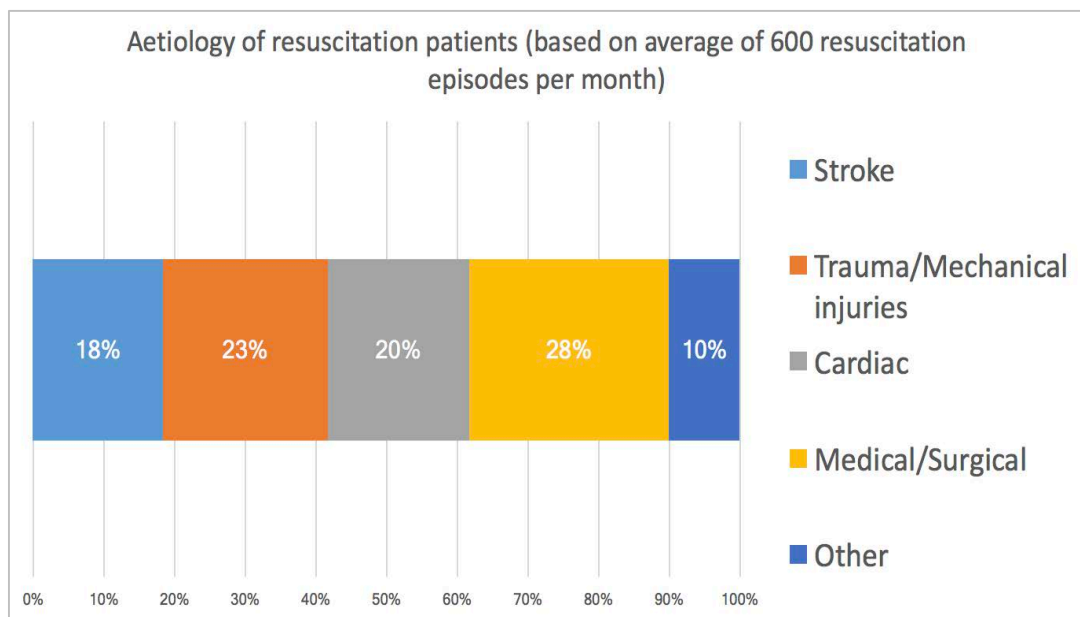


Figure 7.2. Aetiologies of patients presenting to the resuscitation room (based on average of 600 resuscitation episodes per month – data from July 2015)

Resuscitation cases were chosen that would challenge team performance, thus the requirement for leadership would be greater. For example, consider the resource and interpersonal skills required for a patient who presents in the resus room following a fall (Patient 1). Then consider a patient who presents having had an out-of-hospital cardiac arrest (OHCA) (Patient 2). Patient 1 will need to be assessed by the resus team and will likely require an x-ray or computed tomography scan. Notwithstanding any atypical features, the patient will be conscious and no life-saving interventions will be needed.

Patient 2, however, will challenge the team in a number of complex and inter-connecting ways. Every aspect of care is delivered under the pressure of time. Advanced life support guidelines (Resuscitation Council UK 2015) necessitate that the patient receives a range of interventions simultaneously, such as chest compressions, oxygen and defibrillation if indicated. Medications such as adrenaline and amiodarone are to be delivered at specific time points and the lead doctor in the room will often also be responsible for treating the underlying cause of the cardiac arrest. In the case of cardiac

arrests that are not amenable to defibrillation, the lead doctor has to consider at least eight aetiologies (commonly known as the 4 Hs and 4 Ts – hypoxia, hypovolaemia, hypo/hyperkalaemia, hypothermia, tension pneumothorax, thrombosis, tamponade, and toxins). Furthermore, the application of these tasks has to occur in the right order at the right time, requiring careful co-ordination of different team members during a stressful situation. This latter patient better reflects the type of situation where leadership would be prominent.

As a relevant side note, a study was undertaken by the Resuscitation Research Group to measure whether challenging scenarios like the presentation of Patient 2 has a recognisable cognitive effect, led by a researcher from Glasgow University. The study used an electroencephalography (EEG) machine which, put simply, can measure cognitive load through sensors placed on the scalp (Figure 7.3a). Cognitive load theory proposes that there are 3 elements that contributes to whether someone's cognitive capacity is exceeded and therefore thinking impaired: intrinsic – the demand of executing the current task; extraneous – the demands of processing information not directly related to the current task; germane – the demand to translate the task into learning (Haji et al 2015).

An EEG machine was attached to 10 final year medical students and 10 emergency medicine consultants and they were asked them to perform 3 tasks. The first was intravenous cannulation on a simulation arm. The second was a paced serial addition test (PASAT) where they added a sequence of numbers. The third was a combination of the two tasks. This final task is known as the distracted intravenous access (DIVA) test which was developed by Smith et al (2012).

Using the EEG software it was found that medical students had significantly higher cognitive workloads during the DIVA test than emergency medicine consultants (Figure 7.3b). In other words, their cognitive 'bandwidth' or ability to think was more impaired than the consultants. Whilst this result is



Figure 7.3a. Participant completing intravenous cannulation on simulation arm whilst wearing the EEG monitor (Lowe et al 2016, p 69).

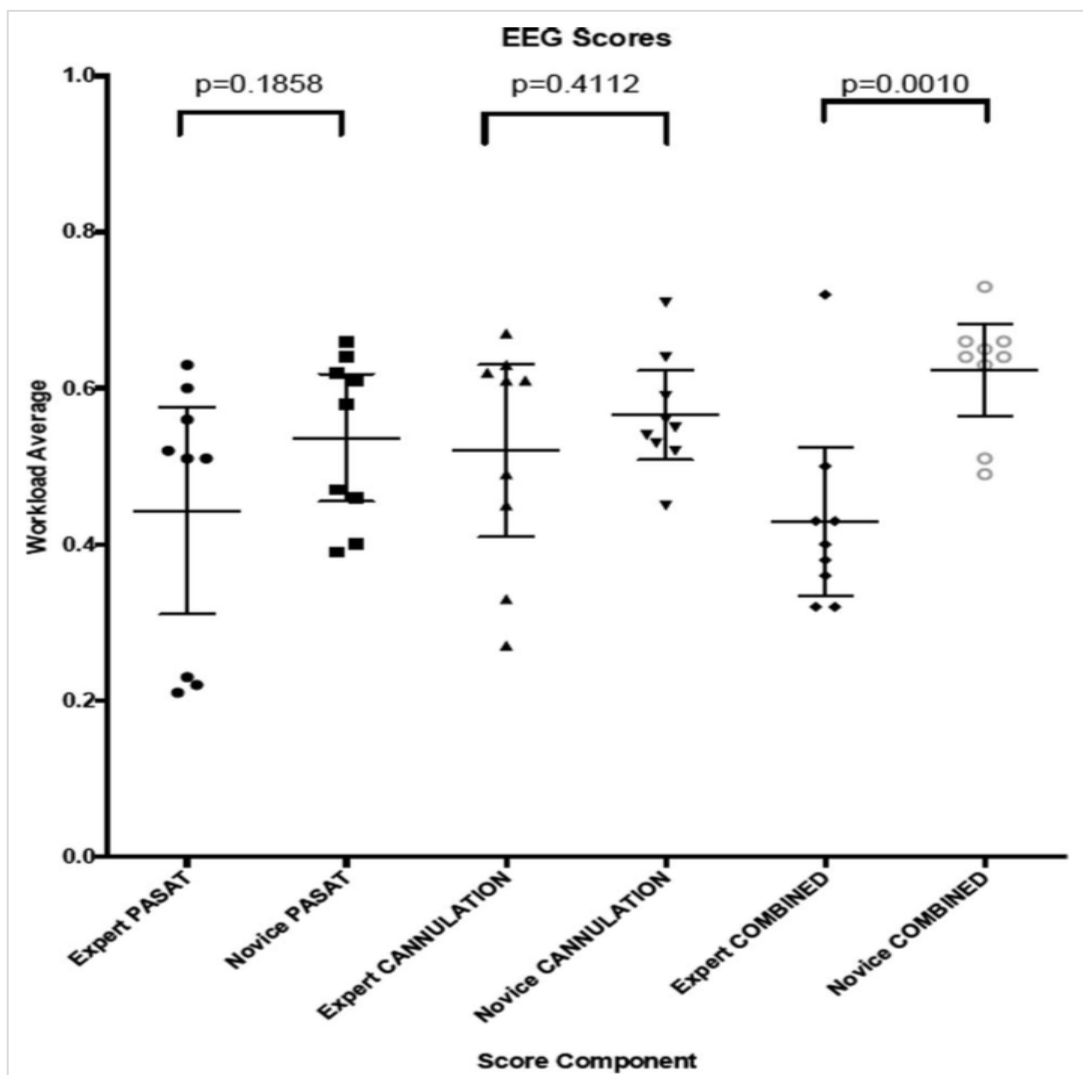


Figure 7.3b. Means and 95% CIs for the EEG scores of novices (final year medical students) and experts (emergency medicine consultants). PASAT= paced auditory serial addition test (Lowe et al 2016, p 70)

expected, it highlights that even consultants can feel cognitively stretched when having to complete intricate tasks simultaneously.

When considering this in the context of choosing useful resuscitation cases to observe, it further highlights why opting for more challenging cases will yield more challenging and dynamic team processes, thus the demand for leadership will be higher. Put simply, there was a focus on critically-ill patients because leadership is considered one of the biggest predictors – if not the biggest predictor – of outcome (Hunziker et al 2010, Hunziker et al 2011).

### 7.1.3.1 Methodological field notes of using version 1

Set against the backdrop above, 5 resuscitation cases were identified as suitable. The first 5 patients had suffered an OHCA and were transported to the resuscitation rooms by the Scottish Ambulance Service. A profile of these patients and their presenting circumstances is provided in Table 7.4.

<b>Patient episode</b>	<b>Patient presentation</b>
Case 1 File name: Cardiac arrest 1	Patient arrives at 15:01 66 y/o. Unknown patient with unknown downtime. Received bystander CPR. PEA arrest with 20 minutes of ALS. Now producing complexes on the defib machine.
Case 2 File name: Cardiac arrest 2	Patient arrives at 13:06 88 y/o. Unwitnessed asystolic cardiac arrest. Has received 50 minutes of ALS by the ambulance crew. Now in PEA. PMH includes arthritis.
Case 3 File name: Cardiac arrest 3	Patient arrives at 05:44 48 y/o. Been having chest pain since 10pm the night before. Previous MI approximately 10 years ago with one stent in situ. On arrival had a witnessed VF cardiac arrest, receiving one shock. Back to sinus rhythm.
Case 4 File name: Cardiac arrest 4	Patient arrives at 21:03 35 y/o. Has had chest pain since 7pm this evening. Patient is obese with severe asthma. Patient suffered cardiac arrest in the ambulance whilst to travelling to the ED. Still in cardiac arrest on arrival. Has refractory VF and already received 6 shocks.
Case 5 File name: Cardiac arrest 5	Patient arrives at 11:25 77 y/o. Seen by GP 3 days prior with right sided flank pain. Last night was breathless. Known COPD patient. PMH of PE the previous year. Known has acute abdominal and flank pain. Patient has cardiac arrest in the department and dies.

Table 7.4. Profile of the first 5 resuscitation patients observed

In keeping with Burgess' (1982) description of methodological field notes – as opposed to substantive and analytic notes which will contribute to the ethnography in Part 2 (Brewer 2000) – this section provides the development of the tool and discusses some of the weaknesses identified in Version 1. The salient points identified in the field notes during the first 5 resuscitation cases were:

*“The leadership behaviours displayed before the patient arrives can be assigned in two categories (L1 and L2). For example, many of the markers are ‘providing direction, issuing commands’ in L2 could also be labelled as ‘preparing/briefing the team’ in L1”*

*“L2 ‘providing direction, issuing commands’ appears to underpin almost all leadership markers. For example, displaying L4 would require issuing an instruction”*

*“L3 and L4 are too similar with regards to displaying SA and ‘prioritising tasks’ as prioritising tasks requires elements of SA”*

*“Again, L2 ‘giving instruction’, and L4 ‘projecting plans through information gathering and sharing’ have too much overlap”*

*“Decision making is a notable omission from this list (for example deciding to PLE)”*

*“Can we code two behaviours at once? Or would that mean our inventory is not sensitive to distinct behaviours, actions or tasks?”*

*“Even within ‘preparing/briefing the team’ this can involve different elements, such as projecting plans – this is perhaps where shared mental model enters. How does this relate to SA?”*

A specific note taken from patient case Cardiac Arrest 2 highlighted how patterns of overlap were being noticed between the different markers in L1-L7:

*“Similar to what I observed in cardiac arrest 1, the nurse prepares the room without any guidance (looking for CO2 monitoring), yet this influences the rest of the resus event – this is a key nursing action. Is the gathering of adrenaline an example of SA (anticipation of future states) or is this an example of managing resources?”*

*“Consider role allocation both at the start and within a resuscitation event – does role allocation equal management of the room but just at an earlier stage?”*

*“A frequent expression is something along the lines of ‘Can someone get some adrenaline out’. Is this giving direction/giving a command or is this an example of SA – or should we be coding as both?”*

At the end of observing these 5 resuscitation cases, markers of leadership from team members were scored, including how and when they did this. Methodologically, this marked the end of Phase 1. The field notes above were then coupled with the responses from the questionnaires to refine and improve a second iteration of the leadership tool.

#### 7.1.4 Version 2 of the leadership taxonomy

Pulling together the results from the questionnaires and the methodological field notes suggested that there were several areas where Version 2 could improve on Version 1. First, the questionnaires had highlighted differences in staff perceptions between doctors’ and nurses’ leadership. As a result, 2 categories were added to reflect the specific behaviours identified for doctors and nurses (Table 7.5). For the nursing category this was ‘supporting medical staff’ and for the physician category this was ‘remaining hands-off’. In addition, staff reported that a clinician’s ability to remain calm and professional, as well as providing a holistic approach to patient care, were important leadership functions during resuscitation.

Second, the methodological field notes highlighted the overlap that existed between categories L2, L3, L4 and L5. Decision making was also a key leadership function that was not included in the first iteration. The following categories of Version 1 were transposed into a refined Version 2:

Version 1

- (L2) Identify themselves as a leader
- (L3) Maintains situation awareness
- (L4) Manages resources
- (L5) Management of the room

Version 2

- (L2) Decision making/providing plan
- (L3) Managing and directing resources
- (L4) Professionalism and holism

<b>Leadership which achieves or leads to the achievement of mutual team goals, such as:</b>	
<b>Leadership marker</b>	<b>Example</b>
<b>(L1)</b> They prepare/brief the team (before patient arrival where possible)	1) They assign/allocate team roles to members of the team 2) They let the team know what is expected of them
<b>(L2)</b> Decision making/providing plan	1) Projects plan through information gathering and sharing 2) Makes a judgement and provides direction accordingly
<b>(L3)</b> Managing and directing resources	1) Organises or assigns resources, including equipment and personnel 2) Prioritises tasks depending on patient or team needs
<b>(L4)</b> Professionalism and holism	1) They remain calm during stressful/pressured situations, instilling this within the team 2) Act holistically through maintaining a safe, compassionate environment – acting as the patient’s advocate

<b>(L5)</b> Manages communication	1) They manage team communication 2) Listens to others and shares in decisions
<b>(L6)</b> They support and/or teach other team members	1) They support/supervise other less experienced or unfamiliar team members 2) They educate/teach less experienced or unfamiliar team members
<b>Profession specific</b>	
<b>(L7)</b> Nurses: Supporting medical staff	1) Contribute to or challenge decisions made by medical staff 2) Providing suggestions/guidance about medications or treatments
<b>(L8)</b> Doctors: Remaining hands-off	1) Standing back and assessing the overall situation

Table 7.5. Version 2 of the leadership taxonomy complete with questionnaire and observational data.

Another minor change that was made related to the guidance or remit of the tool explained in the heading. This was changed as, by this point, many informal conversations had been had with staff ‘in the field’ whilst on clinical duties. Removing the phraseology of ‘behaviour, action or task’ in these conversations helped clinicians digest the concept of the work. Therefore, I amended the phrasing of the tool to simply state ‘leadership which achieves or leads to the achievement of mutual team goals’.

The data collection of Phase 2 consisted of using this new iteration during observations of a further 5 resuscitations as well as interviewing 10 resuscitation team members. In keeping with the analytic framework of leadership centralisation (D’Innocenzo et al 2016), 5 Consultants and 5 Charge Nurses were interviewed first as they can reasonably be expected to exhibit the majority of leadership, thus their opinions were sought first.

Whilst the results of these interviews will be presented in Part 2 of the findings, the interviews gave an opportunity to sense-check version 2 whilst asking the questions in the semi-structured schedule. The summary from these interviews was that the second iteration had no salient omissions.

This version was then used whilst observing a further 5 resuscitation cases. In keeping with the approach of choosing episodes of care where leadership would plausibly be prominent, 2 OHCA cases, 2 major traumas and 1 major haemorrhage were identified as suitable for review. The important methodological field notes written during this set of resuscitation cases were:

*“Something that is being mentioned in interviews, as well as being evident on camera, is that experienced nurses do a lot of preparatory work prior to patient arrival. According to our definition, does this equate to some form of leadership? In this resus, the nurse anticipates the need for adrenaline, which is confirmed by the Consultant as ‘a good idea’. This anticipation often saves time if the patient needs adrenaline (or any other drugs) in a time-critical resus”*

*“There may be some overlap between L2 and L3. Does ‘prioritises tasks’ overlap with ‘making a judgement and providing direction’?”*

*“Think about the doctor specific ‘hands off’ item. Consider what has been said during the interviews in terms of consultants who hand the leadership role to the registrar or trainee. When they do this, do they believe they have done this 100% - they fully expect them to lead. Do they registrars fully believe this? Do they view the consultant as a safety net, and therefore do not fully feel in the leadership position?”*

*“After the consultant has spoken about his role, he stands back, not intervening whilst the trainee directs resources and equipment. However, in him standing back, he has complete oversight of the room. Is he the leader? Is the trainee leading? Is the Reg allowing the trainee to actively lead, overseen by two levels of Reg leader and consultant leader?”*

Similar to process to refine Version 1 into Version 2, these field notes and insights from the interviews were used to produce the third and final major iteration. This marked the end of Phase 2.

### 7.1.5 Version 3 of the leadership taxonomy

Phase 3 began in the same manner as Phase 2. The findings from the first 10 interviews were coupled with the methodological field notes to produce a third and final major iteration change (Table 7.6). The main changes involved removing the nursing specific 'supporting medical staff' element as well as the doctor specific 'remaining hands-off' element. This was done as there was limited scoring for these elements. In addition, they could reasonably be expressed in the other categories of the tool. For example, a nurse suggesting a course of action could come under 'managing and directing resources' or 'support and/or teach other team members'.

Similarly, if a physician was to stand back and not actively contribute to the team's performance then this may not be viewed as leadership *per se*; rather, when they become active in the resuscitation then this would be expressed as one of the other 6 categories.

Another minor change included amending the title/remit of the tool, similar to the minor change made to Version 2. This time, however, interviews with Consultants and Charge Nurses revealed how their language often focussed on leadership being a means to achieve effective patient care. Their input was less about 'mutual team goals' which was the terminology in Version 2, and more about safe outcomes for the patient. Therefore, the final alteration was to change the title to something simpler and based on clinical language.

Phase 3 continued with a further 10 interviews and observing a further 5 resuscitation episodes. By this stage the data collection was less about discovering new categories and more about refining the elements already in the tool. The tool, at this point, had been developed from a broad range of studies, 510 datum points from questionnaires, 10 interviews with senior resuscitation team members and observations from 10 real patient resus cases – totalling approximately 30 hours of video observation and analysis.

<b>Leadership which leads to the achievement of safe and efficient patient care, such as:</b>	
<b>Leadership category</b>	<b>Example</b>
<b>(L1)</b> Prepares or briefs the team  (may occur before patient arrival)	1) Allocates team roles to members of the team  2) Lets the team know what is expected of them
<b>(L2)</b> Makes decisions and provides plan	1) Projects plan through information gathering and sharing  2) Makes decisions and enacts accordingly
<b>(L3)</b> Manages and directs resources	1) Organises resources, including equipment and personnel  2) Manages people and the environment – room control
<b>(L4)</b> Maintains a professional and holistic resus room	1) Remains calm during stressful/pressured situations, instilling this within the team  2) Holistic care through acting as the patient's advocate and patient comfort/reassurance
<b>(L5)</b> Manages communication	1) Manages team communication with the room  2) Facilitates optimum dialogue between team members
<b>(L6)</b> Supports or teaches other team members	1) Provides support to other team members  2) Teaches less experienced or unfamiliar team members

Table 7.6. Version 3 of leadership taxonomy

As such, this phase was broadened to now include the full resuscitation team. This was an important decision for the study as it signalled a strong team-based approach to ethnographic inquiry as well as a team-level construct of leadership. Four interviews were conducted with Staff Nurses, three with emergency medicine Registrars and three with Foundation Year Doctors (also known as trainees). This gave us a variety of opinions, including senior grade, middle grade and junior doctors, as well as senior, middle and junior grade nurses. A point to clarify here is that whilst other speciality doctors were observed and their leadership contributions marked during video review, these staff groups were not interviewed. This decision was made as these groups are not routinely part of the resuscitation team. Furthermore, opting to include one speciality – for example surgeons – would have meant that other specialities would then reasonably need to be included. This would have started a chain of including intensivists, anaesthetists, orthopaedic doctors and stroke physicians, which would have ultimately diluted the input from the core ED resuscitation team.

The interviews with Staff Nurses, Registrars and Junior Doctors highlighted that no salient markers of leadership were being overlooked. All core leadership behaviours voiced during the interviews were already in the leadership tool.

As the final corpus of videos for the taxonomy, a further 5 resuscitation cases were identified that broadened the exposure of the tool; 2 were OHCA's, 1 was septic shock, 1 was a case of critical desaturation after laryngospasm and 1 was a severe overdose. The important methodological field notes this time, however, were far less numerous as the majority of shortcomings had already been addressed through the previous iterations. These were:

*“Cases like this suggest that different types of leadership will be needed in different types of cases. The difficulty with this patient is not their acuity, but their aggression and their volume. This would suggest that leadership in this*

*case would be managing people and communication, whereas other cases may be more of a 'teaching' case or a 'do this now' case"*

*"L4 is difficult to code. How can we know when someone is remaining calm – instilling this within the room etc – is this too subjective?"*

*"Interestingly, the consultant is doing what the nurses usually do: they are suggesting something to the active leader, which is then the catalyst for something to happen, without necessarily formally saying the thing that they are suggesting"*

Completing the interviews and completing the 15<sup>th</sup> video observation marked the end of Phase 3.

#### 7.1.6 Validating the leadership taxonomy: expert discussion group and inter-rater reliability

Phases 4 and 5 were the final stages of producing a tool. Phase 4 involved inviting subject matter experts in research methods, emergency medicine resuscitation and behavioural marker tools to a discussion group about the leadership taxonomy. Here, critique was offered about the theoretical and practical design of the tool.

This session lasted approximately 2 hours and resulted in several outcomes. First, the intended use of the tool has to be clear; would this be a tool used for formalised assessments of practice or for giving insights into care delivery. A decision was made to opt for the latter. Previous taxonomies, such as Flowerdew's tool for measuring emergency physician's non-technical skills (Flowerdew et al 2012, 2013) had 4 categories, 12 elements, 71 examples of good and poor behaviour, and a rating section for unacceptable, acceptable and exemplary standards. Given the detail of that taxonomy it is clear that Flowerdew's taxonomy is to be used for assessment of performance. The tool developed here, however, is designed to give an insight into leadership during resuscitation: how centralised leadership is; how many staff contribute leadership behaviours; what type of leadership is most common. This tool

should be viewed as an adjunct to more detailed observations of leadership rather than *the* tool to understand all of the complexities of leadership.

The second outcome related to minor changes to the elements and wording. The group confirmed that profession-specific leadership would not be optimum as this would start a trajectory of profession-specific leadership tools to be used in the same patient care episode. Minor wording changes included removing 'they' and simply describing the actions themselves.

The third and final outcome was to advise that a second independent video reviewer should code a sub-set of resuscitation videos to generate an IRR score. This was Phase 5 of the study. The second coder was an Emergency Medicine Registrar with previous experience of scoring video footage with a behavioural marker tool. In addition, having a Doctor and a Nurse score the videos further reduces the chance of viewing clinical care through the lens of one single profession which may potentially introduce unintended biases. The second coder and the author used the 3<sup>rd</sup> iteration of the taxonomy on a separate set of 5 videos which had been downloaded into the smots™ system.

Using Cohen's kappa as a measure of IRR can range from -1 to 1, where -1 indicates perfect disagreement, 0 indicates completely random agreement and 1 indicates perfect agreement. The value of -1 is rarely used in observational research of this kind as users of Cohen's kappa are interested in the extent to which two observers agree.

The commonly agreed thresholds for interpreting kappa values are cited to Landis and Koch (1977) who stated:

0.0 – 0.20 indicates slight agreement

0.21 – 0.40 indicates fair agreement

0.41 – 0.60 indicates moderate agreement

0.61 – 0.80 indicates substantial agreement

0.81 – 1.0 indicates perfect or almost perfect agreement

More conservative estimates have been promoted (Krippendorff 1980), however the medical and humanities disciplines have largely adopted the values above. With this in mind, coder 1 (Registrar) and coder 2 (the author) independently scored the 5 resuscitation videos. Table 7.7 presents the summary data whilst Table 7.8 presents the raw data.

		Coder 1	
		Present	Absent
Coder 2	Present	81	9
	Absent	14	64
		Unadjusted agreement	0.863 (86.3%)
		Unadjusted disagreement	0.137 (13.7%)

Table 7.7. Unadjusted levels of agreement and disagreement

	C1 (P) C2 (P)	C1 (P) C2 (A)	C1 (A) C2 (P)	C1 (A) C2 (A)	
Resus video 1	6	3	2	27	L1
	10	1	1		L2
	12	1	1		L3
	0	0	0		L4
	9	0	1		L5
	1	0	0		L6
Resus video 2	2	0	0	7	L1
	0	1	0		L2
	6	0	0		L3
	0	0	0		L4
	3	0	0		L5
	0	0	1		L6
Resus video 3	0	0	0	5	L1
	2	0	0		L2
	4	1	0		L3
	0	0	0		L4
	0	0	1		L5
	0	0	0		L6
Resus video 4	1	0	1	12	L1
	2	2	0		L2
	4	0	0		L3
	1	0	0		L4
	5	2	0		L5
	1	0	1		L6
Resus video 5	0	1	0	13	L1
	4	0	0		L2
	2	2	0		L3
	1	0	0		L4
	4	0	0		L5
	1	0	0		L6
<b>Total</b>	9	4	3	64	L1
	18	4	1		L2
	28	4	1		L3
	2	0	0		L4
	21	2	2		L5
	3	0	2		L6

Table 7.8. Raw data from the 2 video coders. C1 (P) = coder 1 scoring present. C2 (P) = coder 2 scoring present. C1 (A) = coder 1 scoring absent. C2 (A) = coder 2 scoring absent

Using the formula below, the raw data were input into the equation as follows:

$$\kappa = \frac{p_{(a)} - p_{(e)}}{1 - p_{(e)}}$$

where

$$p_{(a)} = \frac{n_{(p)} + n_{(np)}}{n_{(t)}}$$

$$p_{(e)} = (p_{(1)} \times p_{(2)}) + (p_{(3)} \times p_{(4)})$$

The table below identifies the individual variables (Table 7.9):

		Coder 1		
		Present	Absent	
Coder 2	Present	81 ( <b>n<sub>p</sub></b> )	9	0.535 ( <b>p<sub>2</sub></b> )
	Absent	14	64 ( <b>n<sub>np</sub></b> )	0.464 ( <b>p<sub>4</sub></b> )
		0.565 ( <b>p<sub>1</sub></b> )	0.434 ( <b>p<sub>3</sub></b> )	168 ( <b>n<sub>t</sub></b> )

Table 7.9. Specific equation values from the raw data

Inputting these values into the formula produces:

$$\kappa = 0.723$$

Using the equation for standard error rate and 95% CIs, the following figures were input in the Cohen's function in Microsoft Excel 2017:

$$SE_{(\kappa)} = \sqrt{\frac{p_{(a)}(1 - p_{(a)})}{n_{(t)}(1 - p_{(e)})^2}}$$

$$SE_{(\kappa)} = 0.05$$

$$\kappa - 1.96 \times SE_{(\kappa)} \text{ to } \kappa + 1.96 \times SE_{(\kappa)}$$

Hence, the 95% CIs are:

$$0.62 \text{ to } 0.82$$

It can be concluded, therefore, that there was substantial inter-rater reliability when using the leadership taxonomy ( $\kappa = 0.72$ , 95% CI: 0.62–0.82).

### 7.1.7 Analysis

The development of the leadership taxonomy is the most quantitatively orientated aspect of this research study. As such, it is necessary to consider these findings in the context of other published behavioural marker systems. Useful comparators have also calculated IRR using values similar to kappa. The most common is known as within-group agreement ( $r_{wg}$ ) which also *“lies between 0 = no agreement and 1 = complete agreement and represents the degree to which a number of raters agree on the absolute ratings they*

*provided*” (Mitchell et al 2012, p 204). Importantly, this is equivalent to kappa for calculating IRR in that it allows more than 2 observers to rate more than 2 elements, often involving scales that grade behaviours.

Three published taxonomies – anaesthetists’ non-technical skills (Fletcher et al 2003), surgeons’ non-technical skills (Yule et al 2008) and scrub practitioners non-technical skills (Mitchell et al 2012) – have used  $r_{wg}$  for calculating IRR. Mitchell and colleagues reported an IRR across their 3 categories between 0.72 and 0.75. Yule and colleagues (2008) reported an IRR across their 5 categories between 0.51 and 0.72. And Fletcher et al 2003 reported an IRR across their 4 categories between 0.56 and 0.65.

Two other studies have used kappa in their evaluations of taxonomies. Rutherford et al (2015) used a weighted kappa in their study of anaesthetic practitioners’ non-technical skills, producing a value of  $\kappa=0.39$  across 3 categories. The second study was the report by Henrickson-Parker et al (2013) about the development of the surgeons’ leadership inventory and is the most similar study to this research study. These authors used Cohen’s kappa to determine IRR, finding a value of  $\kappa=0.70$  when reviewing 4 videos of surgical operations.

As further evidence of the contribution of this thesis a Letter to the Editor was submitted by the Ph.D candidate, subsequently published in *Resuscitation*, commenting on a publication where leadership scores were consistently variable (Lloyd and Clegg 2017b). The publication noted how *“This fits an emerging pattern in the resuscitation literature where there is considerable variation in how leadership is conceptualised, measured and rated”* (p e1).

Taken together, the results described here suggest that the team leadership taxonomy developed as part of this study has substantial reliability and, based on initial questionnaire, interview and ethnographic data, is clinically relevant to ED resuscitation.

## 8.0 Findings Part 2 – an ethnography of leadership (Objective 2)

With the leadership tool providing a framework for observation (Objective 1), part 2 of the findings presents the ethnography (Objective 2). The three data sets are the questionnaires, interviews and observations of actual resuscitation episodes.

The structure of this chapter aims to build layers of converging data. The chapter will start with the responses to the questionnaire, moving on to the interview findings, then finishing with the ethnographic observations. Presenting the findings in this way starts with summary quantitative findings of the questionnaire and builds towards the ‘thick’ descriptions of observations to enrich the ethnography of leadership (Geertz 1973).

It is also useful to clarify that the results and analysis of discrete sections will be presented side-by-side rather than as separate results and analysis chapters. This will be done for two reasons. First, given the volume of data collected it is reasonable that the interpretation needs to be aided by analysis when the results are available to the reader; writing several thousand words of results separated from any analytical commentary would not be optimum.

The second reason relates to the traditions of interpretive ethnographic work. Atkinson (2015) observes how ethnographic data collection and analysis occurs *parri passu* – from the Latin *pari* meaning equal and *passu* meaning step (translating to ‘with an equal step’ or ‘on equal footing’). “*In other words*”, writes Atkinson, “*the collection of data is informed by the emergence of potentially rewarding analytic concepts, and in turn fieldwork helps us to extend, develop and refine those concepts*” (p 9). The methods used in this study have iteratively informed the next stages, thus presenting results and analysis *parri passu* best reflects the way conclusions were drawn and decisions were made.

## 8.1 Summary findings

This ethnography of leadership during ED resuscitation has yielded 4 main themes:

- 1) Leadership is plural
- 2) Leadership is contingent
- 3) Distinction between nursing and doctor leadership
- 4) The meaning of leadership is heterogeneous

These four themes will be woven throughout the three sections presenting the questionnaire, interview and ethnographic findings.

## 8.2 Questionnaire results

The questionnaire was designed to capture baseline demographic data as well as responses to leadership-specific questions. Of the 9 questions, 3 multi-part questions asked about specific leadership opinions. One of these questions (Question 8) has been discussed at length in Part 1 of the findings as these data were used to develop the leadership taxonomy. Therefore, the responses to Question 7 (5 parts) and Question 9 are relevant to the ethnography and will be provided here.

Question 7 consisted of 5 parts and asked the respondents the extent to which they agreed or disagreed with statements based on the theory informing the thesis – shared team leadership theory (Pearce and Sims 2000). As this was handed out during the first phase of the project, this was the first time the concept of shared team leadership could be tested against the norms

of individual-doctor leadership. As the title of the questionnaire simply stated this was a questionnaire focusing on ‘clinical leadership in the resuscitation room’, an important to note is that the concept of shared team leadership was not voiced to staff in recognition that this could bias the responses. The theoretical and clinical disposition was not shared to allow respondents to organically form their own views about the nature of leadership during resuscitation.

Question 7.1 asked clinicians the extent to which they agreed with the statement: *At any one time there can be more than one person displaying leadership in the resuscitation room*. The results indicate that ED clinicians overwhelmingly believe that leadership is a plural phenomenon (Figure 8.1). Out of 72 responses, 90% (65) agreed or strongly agreed that more than one person can display leadership at any one time. Only 8% (6) of respondents disagreed with the idea of plural leadership.

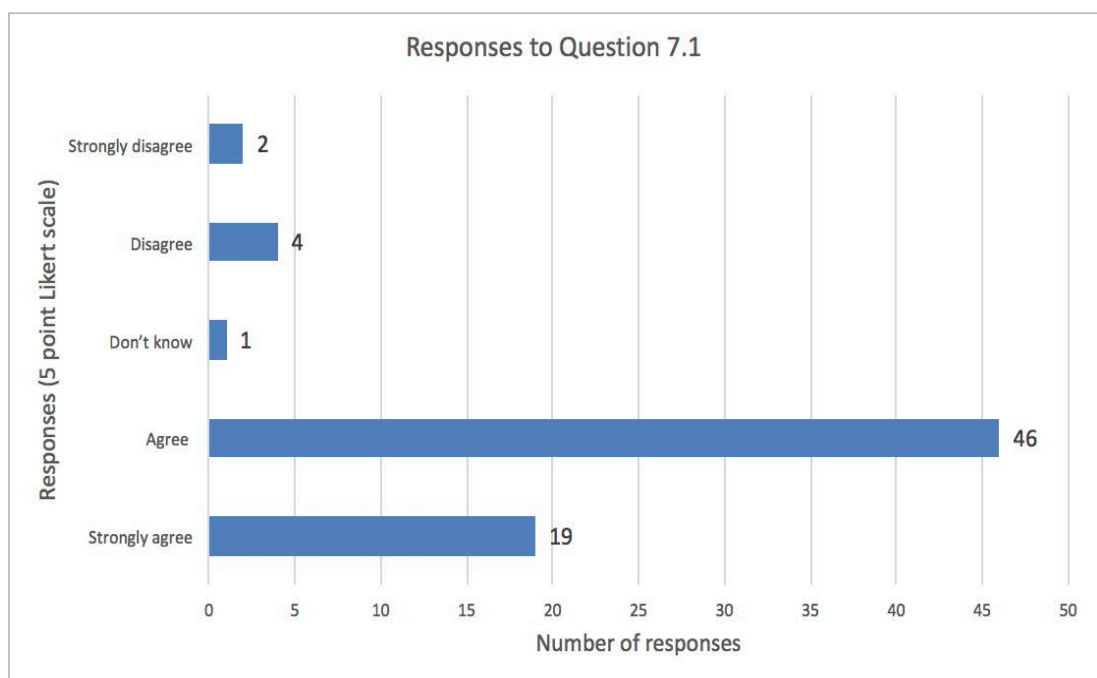


Figure 8.1. Responses to Question 7.1 (72 responses) – ‘*At any one time there can be more than one person displaying leadership in the resuscitation room*’

Question 7.2 asked clinicians the extent to which they agreed with the statement: *The active leadership role can be shared amongst individuals during treatment in the resuscitation room.* The results indicate that the majority of clinicians believe the active leadership role can be shared (Figure 8.2). Out of 70 responses, 69% (48) agreed or strongly agreed that leadership can be shared, whilst 27% (19) of respondents disagreed with this idea.

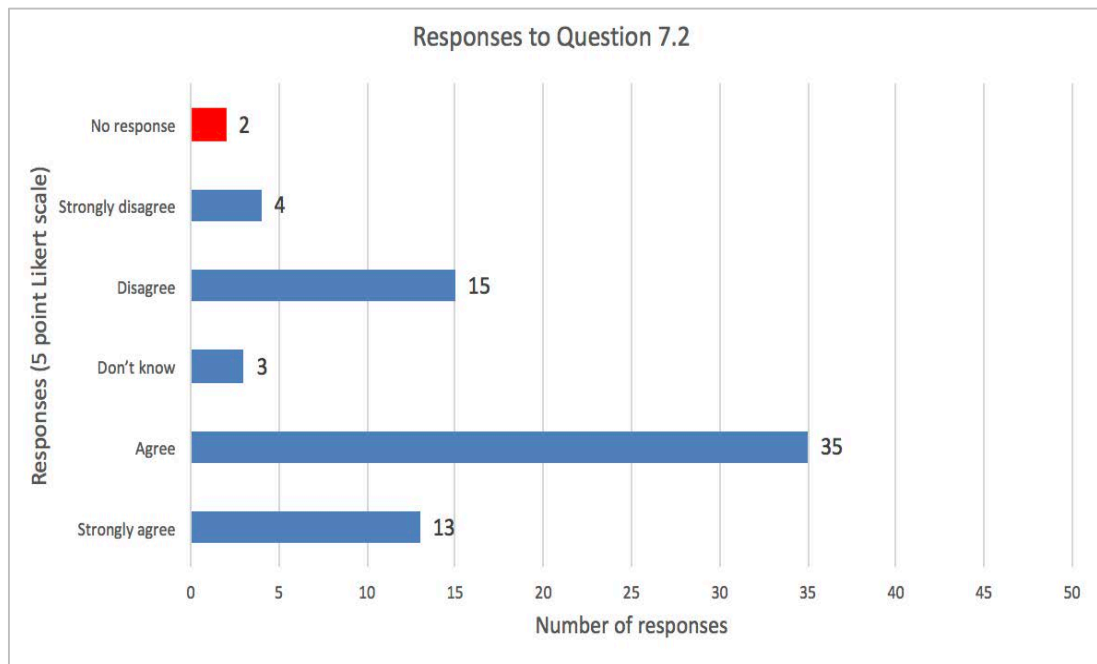


Figure 8.2. Response to Question 7.2 (70 responses) – ‘*The active leadership role can be shared amongst individuals during treatment in the resuscitation room*’

Question 7.3 asked individuals the extent to which they agreed with the statement: *The type of leadership required is dependent on situational factors (e.g severity of patient illness, experience of the team).* As can be seen from Figure 8.3, all-but-three of the respondents (96%) agreed or strongly agreed that leadership is dependent on situational factors in the resuscitation room. Of the 71 responses, only 2 (3%) disagreed with the statement.

Question 7.4 asked clinicians the extent to which they agreed with the statement: *Leadership is determined more by who the individual is/their personality rather than by their professional grade.* As Figure 8.4 illustrates, 80% (56/70) of staff believe leadership is less about staff grade and more

about people's personalities. Of the 70 responses, an important minority of 17% (12/70) believed professional grade determined leadership.

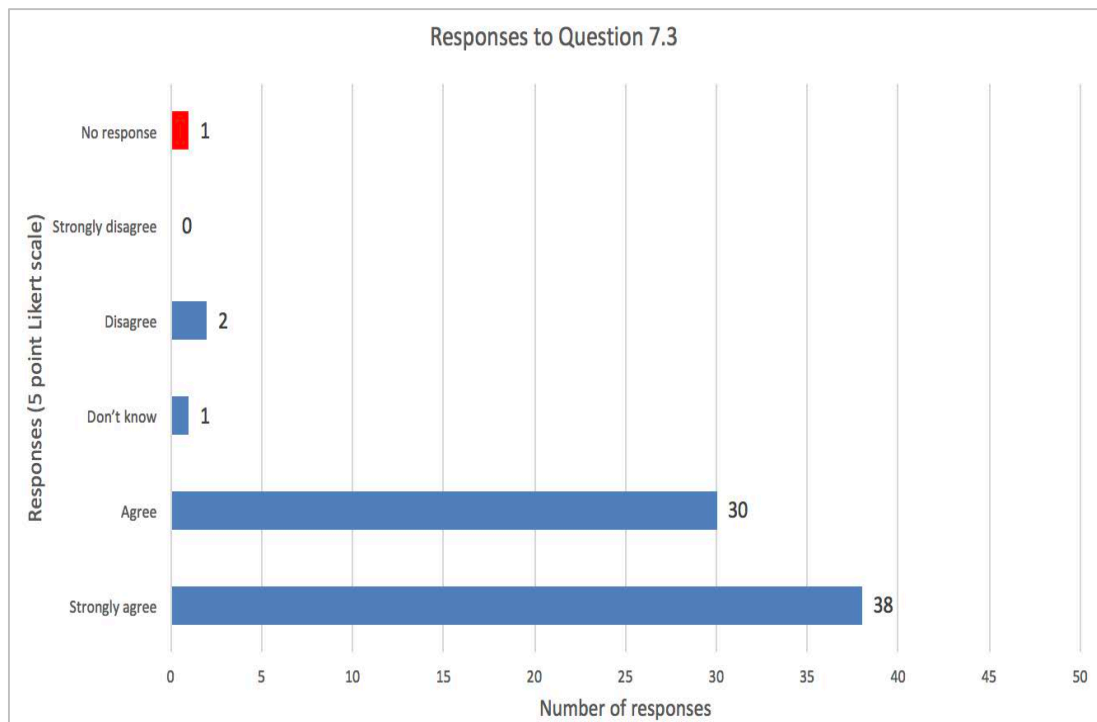


Figure 8.3. Response to Question 7.3 (71 responses) – ‘The type of leadership required is dependent on situational factors (e.g severity of patient illness, experience of the team)’

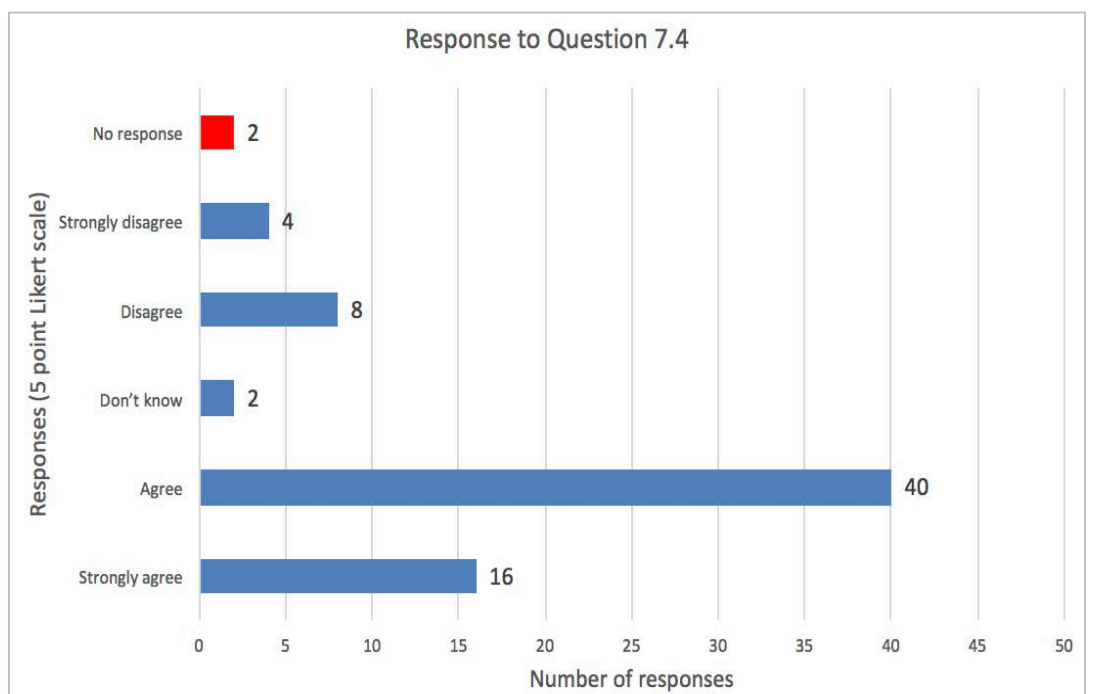


Figure 8.4. Response to Question 7.4 (70 responses) – ‘Leadership is determined more by who the individual is/their personality rather than by their professional grade’

The final question in this section, Question 7.5, asked clinicians the extent to which they agreed with the statement: *When working in the resuscitation room I display leadership*. The majority of clinicians (68%) reported exhibiting leadership (Figure 8.5). However, when this was matched against profession, it was found that nurses are less likely to report leadership behaviours (65%) than ED doctors (100%).

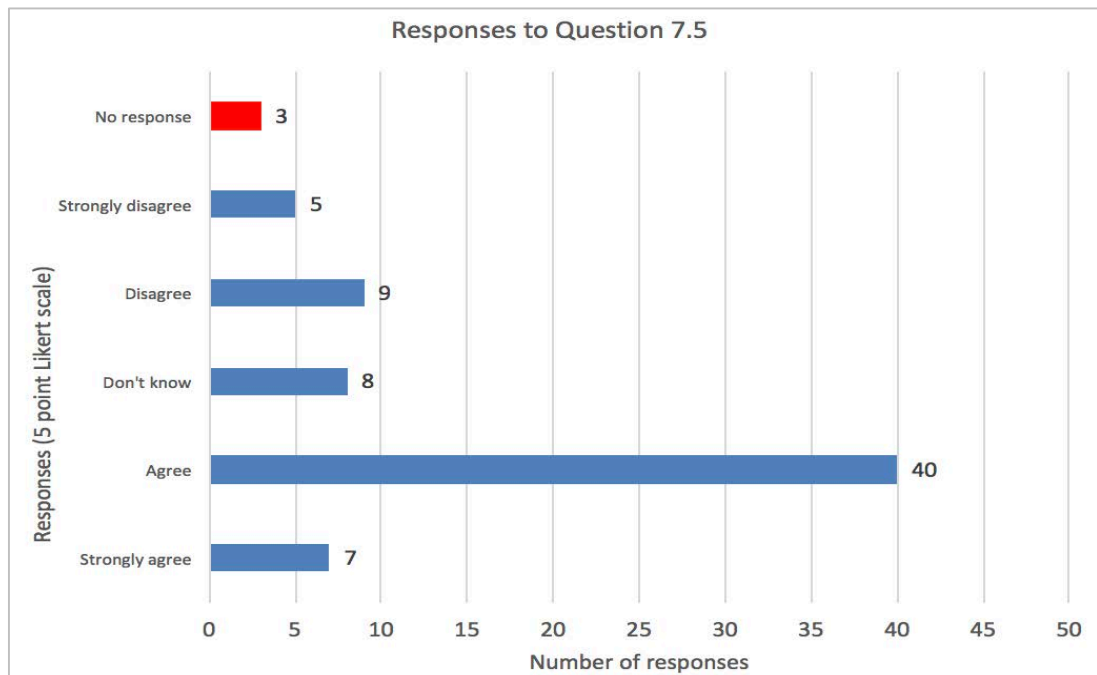


Figure 8.5. Response to Question 7.5 (69 responses) – ‘When working in the resuscitation room I display leadership’ (all professions)

Question 9 asked clinicians to rank the likelihood of professional groups exhibiting leadership, including consultants, staff nurses, deputy/charge nurses, registrars and junior doctors. We asked staff to rank likelihood on a 5-point scale, starting with most likely and ending with least likely. As can be seen from Figure 8.6, there was a strong sense that consultants are the most likely to lead (75% of votes). An interesting finding is that staff reported an equal likelihood of leadership from registrars and charge nurses, gaining 42%

of votes and 41% of votes respectively. A second finding of interest is that the majority of respondents reported junior doctors as least likely to display leadership (59% of votes), whilst the most junior member of the nursing team – the staff nurse – received 35% of votes.

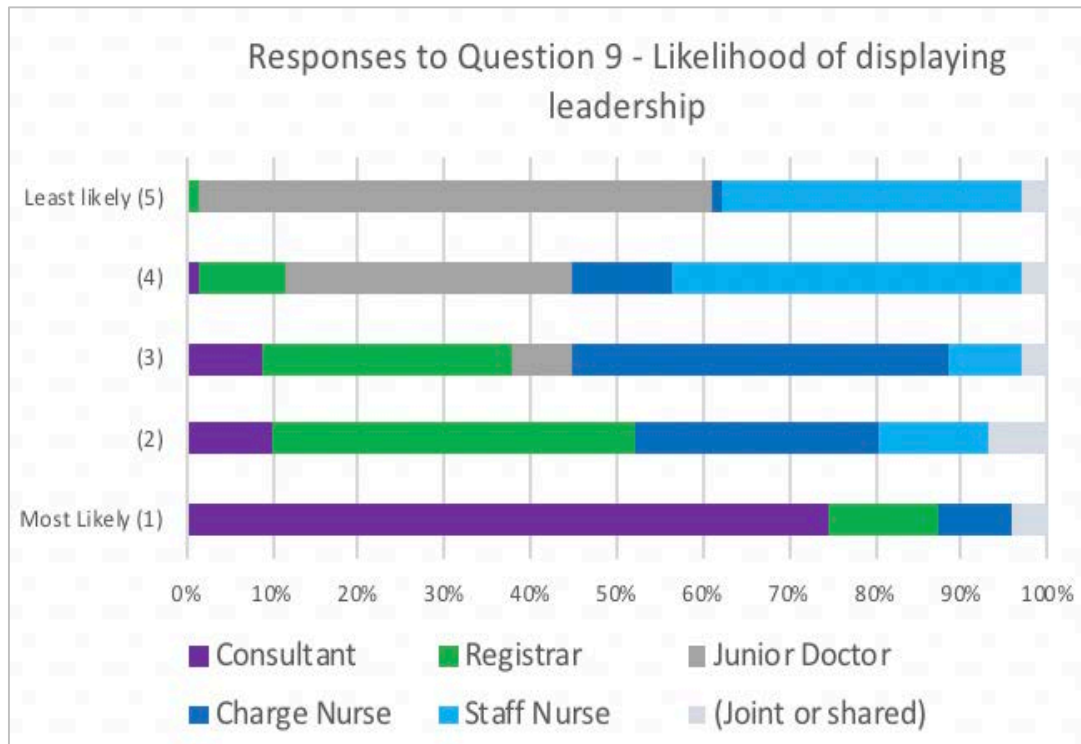


Figure 8.6. Responses to Question 9 (69 responses)– ‘Who, in order from most likely to least likely, displays leadership in the resuscitation room out of the following professionals’

### 8.2.1 Analysis of questionnaire results

The results of the questionnaire provide quantitative evidence that supports the major findings for this thesis, particularly the first three themes. Question 7.1 and 7.2 measure the potential singularity or plurality of leadership (Theme 1). With 90% of respondents agreeing or strongly agreeing that more than one person can display leadership at any one time (Question 7.1), and 69% of respondents agreeing or strongly disagreeing that the active leadership can be shared (Question 7.2), this suggests that leadership is plural. This finding neatly aligns with the underlying shared leadership theory (Pearce and Sims 2000).

Question 7.1 and 7.2 also overlap with the analytic ideas of formality and distribution that were used in the literature review in Chapter 4. If leadership was formalised then this would imply that the organisation (in this case the emergency department) prescribes who the leader of the resuscitation will be. If leadership was not distributed then this would imply the absence of leadership contributions from other staff members. Both results support the notion that the distribution of leadership can be done informally, and that all leadership does not stem from the identified senior doctor in the room.

Question 7.3 and 7.4 provide data that support Theme 2 – that leadership is contingent. All-but-three (96%) of respondents believe leadership is dependent on situational factors and 80% believe that leadership is more determined by who the person is/their personality rather than their professional grade. From this it can be inferred that there is no single typology of leadership; rather, leadership is enacted differently by different individuals and is dependent on resuscitation events as well the people in the room.

These questions overlap with the final analytic element used in the literature review chapter of temporality. Temporality proposes that leadership is either static or dynamic. The results here suggest that leadership is dynamic, contingent on situational factors.

Theme 3 – a distinction between nurses' and doctors' leadership – is supported by Question 7.5. Although 68% of respondents reported that they display leadership during resuscitation, this was disproportionately weighted towards ED doctors (100%) with only 65% of nurses agreeing in kind.

A necessary step in this analysis process is to situate these results in the wider landscape of comparable resuscitation leadership surveys and observational studies. In one study, Sakran and colleagues (2012) asked trauma resuscitation teams to rate the leadership behaviours of trauma leaders. The scoring system allowed for a possible maximum score of 80, and

scores were classified as low (18-45), medium (46-67) and high (68-72). They included 7 Consultants (known as Attendings) and found an inverse relationship between experience and leadership scores (Figure 8.7); the two consultants with the most experience had two of the three lowest scores.

Attending Surgeon	Sex	Age (years)	Postfellowship Experience (years)	Leadership Score (Average)	Performance Improvement (Occurrences over 5 years)
1	M	36	1	70	0
2	M	38	3	68	15
3	M	38	4	68	16
4	M	39	1	69	0
5	M	40	5	53	2
6	M	46	11	66	11
7	M	49	1	54	2

Figure 8.7. Profile of consultants with accompanying leadership scores (Sakran et al 2012, p 238)

In a similar vein, Robinson et al (2016) surveyed 102 medical and nursing staff who were part of cardiac arrest teams. The authors found that whilst 90% (9/10) of Registrars (team leaders) agreed or strongly agreed that there was clear leadership at all cardiac arrests, only 24% (5/21) of Nurses, 33% (12/36) of 2<sup>nd</sup> year junior Doctors and 49% (17/35) of 1<sup>st</sup> year junior Doctors responded in kind.

The largest and most thorough study was conducted by Henkel et al (2016). They video recorded 30 paediatric resuscitations and asked 3 staff members to score performance against the trauma non-technical skills tool, of which leadership is the first category. This is a validated tool for scoring team performance during traumas (Steinemann et al 2012). The authors asked a Consultant, a Surgeon and a Nurse or advanced practice provider to score the videos. With 28 videos suitable for analysis, the Doctors rated the non-technical scores higher than the Nurses/advanced practice providers in 23 (82%) of cases. When they performed an inter-rater reliability analysis for each category, they found poor agreement across all elements ( $\kappa = 0.03 - 0.25$ ). Specific to leadership, agreement about the leader's performance only occurred 25% of the time.

These studies largely corroborate the initial questionnaire findings in a number of ways. Research that sets out to measure how effective one leader is does so on the assumption that team members view one person as the leader. An assumption that runs even deeper is that someone with positional authority – most likely the senior doctor – exhibits some behaviours that readily fall under the banner of leadership. But as research suggests, a leader may report themselves as displaying leadership without this being felt by the very people who they claim to lead.

The summary from this first tranche of data, as well as comparable research, is that leadership and the perception of who the leader is may not conform to the traditional individual doctor-leader narrative.

### 8.2.2 Reflexive point

As explained during the section on ethnography, one of the tenets of pursuing a fair and unbiased ethnography involves there being a degree of reflexivity. Reflexivity means that conclusions drawn from this thesis are “*more transparent and disputable by readers*” (Lichterman 2017, p 38), which is good conduct for the research process.

My reflexivity here takes the form of introspection, about myself and about my inter-subjective relationships. Jean Briggs’ ethnography of living amongst the Utku eskimos was rich with reflexivity (1970), yet the positivist-minded researchers could easily point to this as a mere collection of subjective experiences; Salzman (2002), for example, noted how her manuscript “*could have been subtitled ‘All about Jean’ for it is very much the author’s own story as a researcher*” (p 806).

Here, my reflexivity is challenged by the norms of academic healthcare research. How can I write about statistics using inter-rater reliability in one breath, and then unearth opinions in interviews in another? How can I satisfy

the requirements of doctoral work that straddles the precision of positivism in medical studies as well the nuance of constructivism in the humanities and social sciences?

My primary reflexive thought is that whilst I was initially feeling positive about the questionnaire results, this was more of an anxiety. This was because I had found a fairly strong signal of plural leadership so early into the study. But I had been hardwired to think that doctoral candidates had to work for years to find any interesting data. And here I was with a corpus of data giving some useful, but still far from conclusive, insights into leadership already.

I started to look for alternative explanations: could I have cajoled staff too eagerly to fill in my questionnaire; could I have projected my own dispositions and theoretical viewpoint on the staff? Even further afield, as the first Nurse to study for a Ph.D in the department, is it possible that the respondents wanted me to succeed and so provided answers they thought I wanted to hear? Similarly, as a Nurse asking about leadership, did the Nurses want me to 'find' their leadership?

I discussed these thoughts with my supervisory team and reflected on the manner in which I was interacting with the research environment. The presentations at clinical handovers and the questionnaire made no mention of my internal thoughts about leadership, nor did they mention that the study was informed by shared leadership theory. I was reassured, in part by team discussion and in part by working clinically in the resuscitation room, that the signal to come from the questionnaires was a fair reflection of how leadership unfolds during resuscitations and not due to skewing data collection.

### 8.3 Interview findings

As highlighted above, the initial results from the questionnaires served to 'set the scene' for the richer and more nuanced qualitative data captured

through interviews. The interviews largely mark the transition between the quantitative and qualitative arms of this mixed-method ethnography.

Building on the four main themes of this thesis – (1) leadership is plural (2) leadership is contingent (3) distinction between nursing and medical leadership (4) the meaning of leadership is heterogeneous – the interviews will be presented in line with Attride-Stirling’s (2001) approach of providing thematic network maps (see Figure 8.8 for an example). These network maps position the 4 main themes as global themes, filtering down to organising and basic themes. Figure 8.9 depicts the complete network for the 4 global themes.

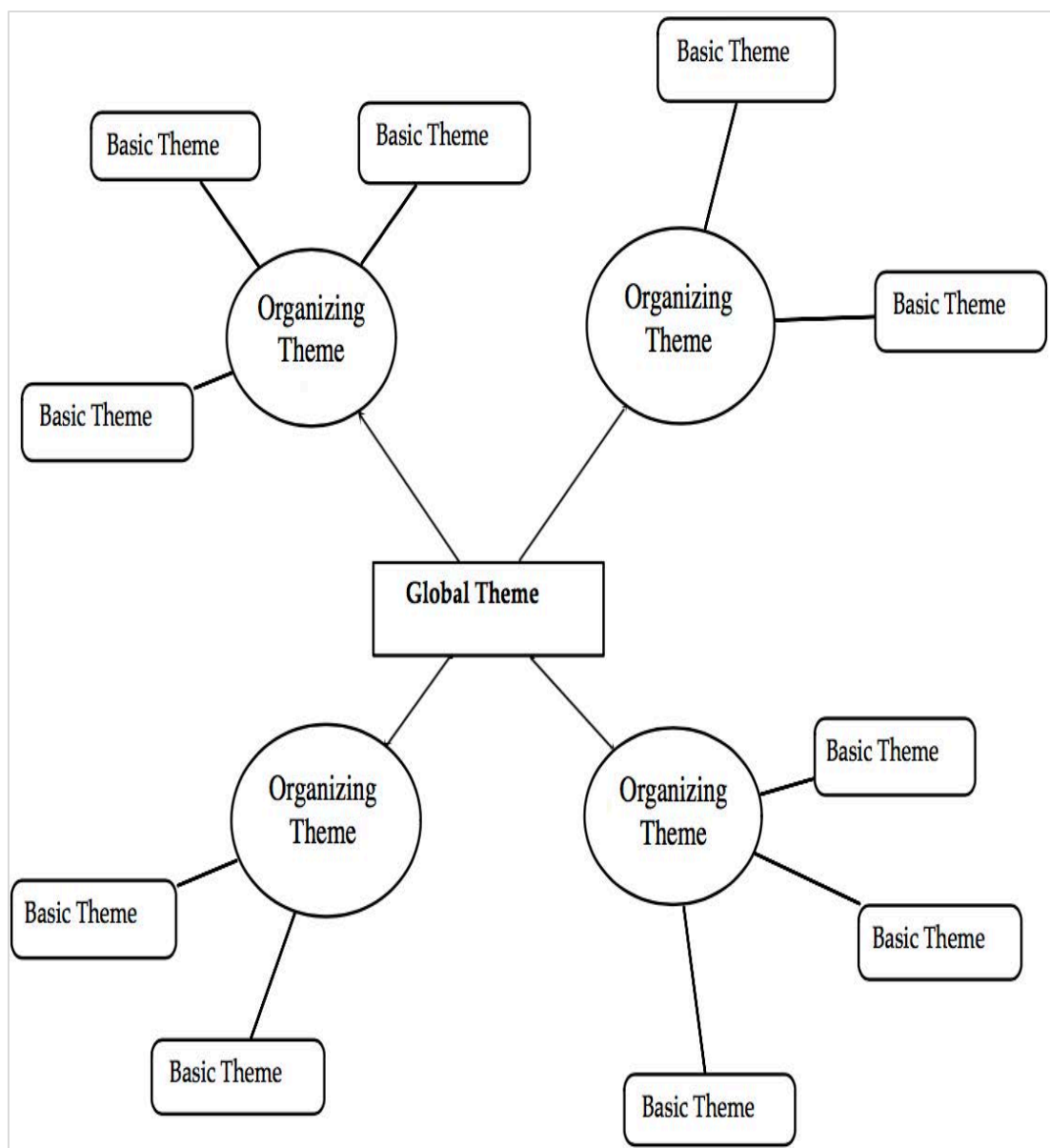


Figure 8.8. Use of thematic network map (Attride-Stirling 2001, p 388)

### 8.3.1 Global theme 1: Leadership is plural

The opening questions of the interview schedule aimed to understand interviewees' general conceptualisations of leadership. The first 10 or so minutes of the interviews were a chance to gauge the broad tone and direction of leadership opinions, further highlighting the benefits of the semi-structured technique.

As interviewees described what leadership meant to them, how they understood it and how it was practiced, it became apparent that a major theme is the plurality of leadership. As one Consultant put it:

CONS 0003

*"So eh, I think there are in every resus, there are instances where all of – pretty much all, almost all of the team members can show leadership qualities and have leadership roles"*

This global theme can be divided into more organising themes and basic themes in line with Attride-Stirling (2001) (Figure 8.10).

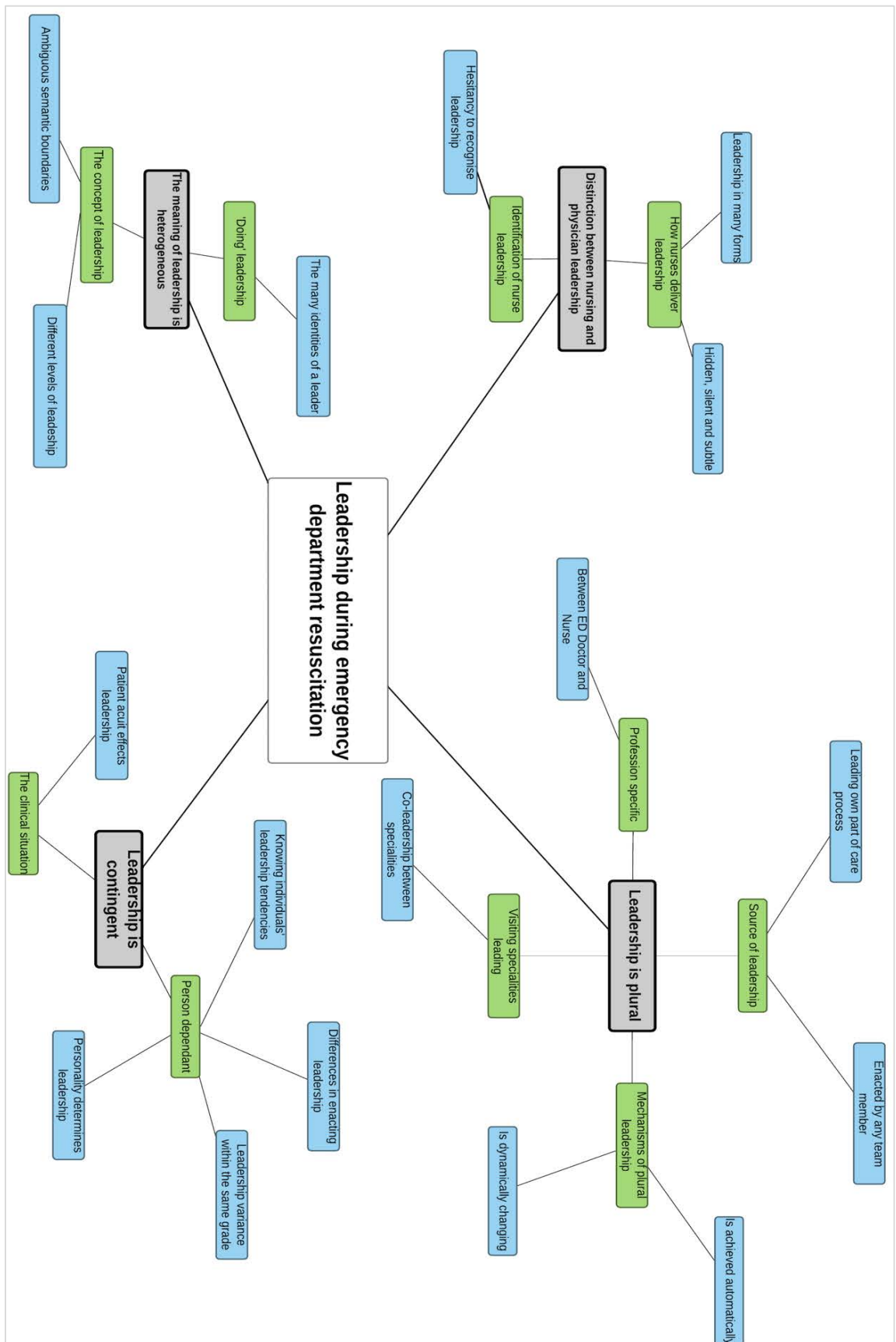


Figure 8.9. Thematic network map of the 4 global themes

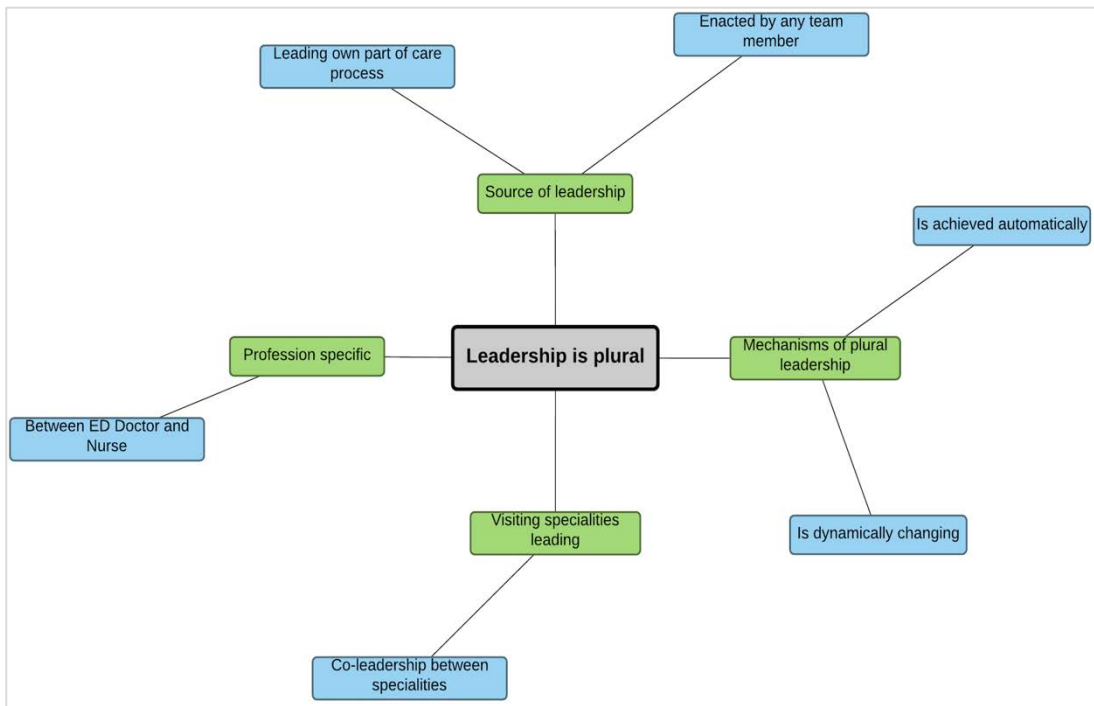


Figure 8.10. Thematic network map of global theme 1 (leadership is plural) and the relating organising and basic themes

Organising theme: Source of leadership

Basic theme: leadership can be enacted by any team member

When describing the properties of leadership as a plural concept, staff reported that leadership can stem from any member of the resuscitation team. One Consultant articulated that leadership extends from the most senior medically trained staff to the CSWs:

CONS 0009

*“I think each member of the resus has a different skill set and different roles that they are comfortable doing, and I think within that mind-set, they are their own leaders to an extent. I guess we’re all our own leaders and, so yeah, there is a role for leadership with the staff nurses and such like, and CSWs, but they’ve got to be part of the bigger picture”*

This sentiment was shared by two Charge Nurses, one of whom suggested that students can also fulfil the leadership role:

CN 0010

*“But in terms of the clinical picture, and a patient being in resus and the leading of that resuscitation, no I think it can be interchangeable. And actually, sometimes it is the person doing the least, and that doesn’t necessarily have to be the consultant or the most in charge nurse. It could be the student in the room, do you know, so they – if they’ve stepped back and they’re seeing what’s going on and actually they are the one that is saying that person’s blood pressure has dropped, ‘do you know you’ve attached that bag of fluids through the wrong drip’ or, do you know...”*

CN 0007

*“I’m saying team lead, I’m using that loosely because it could be me, it could be the consultant, it could be the reg, it could be an ODP. You know, the roles are interchangeable”*

A Registrar and Staff Nurse reported a similar viewpoint, stating:

REG 0017

*“I think leadership, ehm, can stem right the down to the CSW or – across the team really. You could have, for instance, a good CSW who can see the dynamic of the team not working or just sort of point out that, you know, ‘this is what’s going on’. So I think its responsibility, yeah, whoever has got that badge at the top. But leadership I think extends throughout the team”*

SN 0014

*“So it’s not always to say that the purple (the consultant) is leading, because we could – (laughs) ‘the purple’ – it could be the junior that’s very good or the reg that’s very good and leads it”*

### Basic theme: staff leading their own part of the care process

Interviewees described a distinct type of plural leadership, where clinicians lead their own part of the overall care process:

CONS 0008

*“I think they all have – everybody in that team has a different role, but there will be times when everyone in that team will have a leadership role and for that I was thinking, you know, if you’re a CSW and you – there’s a resus that you’ve brought the family into, and they’re looking after the family, you know, they’ve got a leadership role in that respect. So I mean your roles do vary a lot, so I think at certain times almost everyone in that room can have a leadership role”*

CN 0010

“Ehm, the anaesthetist is the lead for airway and anaesthetic drugs and my senior doctor is the lead for everything else”

#### *8.3.1.1 Analysis*

In keeping with the process of triangulation, these findings are considered alongside the responses to the questionnaire. Question 7.1 of the questionnaire - *At any one time there can be more than one person displaying leadership in the resuscitation room* – measures the equivalent idea. With 90% of respondents agreeing or strongly agreeing, the interview data corroborates the earlier findings.

### Organising theme: The mechanisms of plural leadership

Basic theme: is achieved automatically

Another important idea that clinicians raised was not just that different clinicians can occupy the leadership role, but that they do this with a degree of automaticity. Several senior resuscitation staff described this as:

CN 0007

*“yeah yeah, they just do it automatically. Nobody is offended or – communication doesn’t break down it’s just like an automatic...you have to take it over”*

CN 0007

*“yeah we just do it, we just do it. It’s just a natural – like being a senior nurse...sometimes its automatic. You just take it over”*

CONS 0001

*“I think that that happens, people do assume the leadership position without asking any permission or maybe even without realising that they are doing it, but often with the actual leader not realising”*

Three staff members described how this can occur at a non-verbal level where clinicians implicitly understand the leadership roles in the resuscitation room:

CONS 0002

*“I think the interesting thing is whether that’s done sort of cognitively or not cognitively. I think that a lot of resuscitation is done without ever formally designating a leader, sometimes without anyone actually being in a formal leadership role”*

REG 0015

*“I’ve been in scenarios that we’ve had 3 reg resuses because we’re actually a bit bored and there’s not that much going and its quite nice doing a resus with*

*3 of us. That's – we can just task share or leadership share quite easily. And we don't need to vocalise it, we just know it happens"*

CONS 0001

*"I think that in some resus situations the leader is just kind of implied rather than actually like explicitly stated"*

Basic theme: Is dynamically changing

A separate but related theme emphasises how this does not occur through anticipated phases of the resuscitation episode; rather, staff appear to report a fluidity and spontaneity to leadership being distributed which was expressed by clinicians of every grade:

CN 0010

*"Yeah I think its totally fluid, I don't think you can have one person all the time"*

SN 0011

*"So yeah, to begin with, you see your consultant as the leader for that scenario, but when stuff happens I think there will be people that will take over that role discretely"*

CONS 0002

*"So almost by definition the leadership is being sort of shared out and might be sort of equally spread over a whole load of people and that actually there is no one person leading the whole thing and it's just a bit of a free-flowing soup of leadership"*

REG 0015

*"you can pull people in to do a bit more leading temporarily or to do a step back overall leadership view when it's all going wrong. And I think you're in that"*

*continuum of it is leadership and a lot of it is based on resources...And it's quite nice to actually, if somebody else is free, to take a step back and do less management and more leadership. And I think that's – I do view it as a continuum and it's very hard describe and you're always in flux"*

JDS 0018

*"Yeah I think its plural. I think there's a hierarchy. There's always an understanding – you could step forward and lead for this bit...So yeah, there's definitely times where you can all together do different things that could be viewed as leader things"*

One Registrar described a lived example of the 'flux' of sharing leadership as:

REG 0015

*"So like, I did a resus with (name of consultant) a few months ago where, you know, it was quite nice. I think it was a weekend I don't know when it was. And I sat there, kind of, at the top, doing the airway and I thought 'shit, I'm kind of stuck doing the airway and it would be nice if I could free myself up'. But I can still command. So I looked at (name of consultant) and (name of consultant) kind of knew, and was like 'ok you've done this bit and I'll do this bit' and we kind of shared that leadership role for maybe 5 minutes till I freed myself up. And then I could be the leader again and just like, (they're) like 'great, yep, great, keep on going' and he just went back to the department. So it's difficult. It's like leadership is – sometimes you have to share leadership, you know"*

### **8.3.1.2 Analysis**

Reflecting on this organising theme, the opinions provided by interviewees align with the earlier questionnaire findings. Question 7.2 - *The active leadership role can be shared amongst individuals during treatment in the resuscitation room* – was carefully worded to be distinct from the previous

question about aggregately sharing leadership. With nearly 70% of respondents agreeing or strongly agreeing with this statement, a reasonable conclusion is that clinicians may not necessarily have to verbalise that they are handing-off or assuming the leadership role. The leadership position, either residing with one person or multiple people, appears to be implicitly understood by the team in the room.

Organising theme: Profession-specific

Basic theme: shared between ED Doctor and Nurse

One form of plurality that was identified by resuscitation staff, mainly by Charge Nurses, was that leadership is primarily a role for the senior nursing and medical team. One Charge Nurse voiced:

CN 0007

*“usually the doctor leads the doctors and the nurse will sort of lead the nurses”*

Other nursing colleagues and one medical colleague voiced a similar idea, stating:

CN 0010

*“I feel like, so, I feel like overall, the flow of resus, because I feel like it does need to be split, you need to have a leader from the nursing staff and a leader from the doctors. So, normally that will be the most experienced person who is on for the resus that day and the most experienced doctor. So lets say nurse and consultant...so I think that really should be a dual role. I feel like the coordination of resus falls back on the nurses a lot more than it should. However, so I think you need to have the 2 names, because otherwise it muddies the water”*

CN 0006

*“I think that the medical and nursing staff – there’s a leader of the nursing staff as well, ehm, you know the more senior members of staff who make sure that everybody else is doing what they’re meant to do as well. Ehm, so I think there’s places for 2 leaders, but one to overlook everything that the nursing staff are doing and the consultant to look over everything”*

CN 0010

*“I think that’s good from a nursing and a doctor perspective. You should have one nurse that speaks up and one doctor that speaks up and it makes it so much easier to know who is following what directions”*

CONS 0009

*“Ehm, I think the ED consultant primarily and the ED charge nurse I would have thought. These are the two main, out of the traditional team, they are the only 2 who should do that role”*

Organising theme: Visiting specialities leading

Basic theme: co-leadership between specialities

Although still falling within the major theme of plural leadership, another discrete form that was described was that of co-leadership between speciality doctors and the ED team. Interviewees of all grades identified co-leadership between different specialities as a feature of sharing leadership:

SN 0014

*“Yeah, I think when other specialities come in they have, you know, they have all the rights. They’ve been asked to come and see this patient. If they’re going to accept them then yeah, why shouldn’t they take over the situation and become the new leader”*

CONS 0009

*“Yeah if it’s just ED there then its fine, ehm, everyone still looks to me as the leader. But when there is critical care down, the anaesthetics registrar or the ICU registrar will often, by default, assume they’re the leader when they come in to resus. So if I’m trying to tube then they’ll quite easily stand at the foot of the bed and start barking out orders”*

JDS 0016

*“I’m trying to think, say, if a surgeon came down to give an opinion and while they were doing their assessment, maybe they would be the leader. But then you’d know. But as long as you were in the department, ultimately it’s the A&E team that are in charge of that patient. You know, and I suppose you say, well with anaesthetics the anaesthetist is often the leader, but that’s because their supporting airway and ventilating the patient... The tube is supervised and then you feel very much at that point that it is the anaesthetics that are leading but that’s because they are about to whisk a patient off”*

### *8.3.1.3 Summary of first global theme*

Evident from these interviews is that leadership is conceived and practiced as a plural idea. Furthermore, the process of sharing leadership occurs non-linearly, where staff organically and transiently assume the function of the leader. At a methodological level, this finding is the end product of a theoretical decision to apply a team-level theory which gave the opportunity to ask all resuscitation staff about intricate team processes. This diverges away from what could be considered the typical choice of leadership methodologies which often asks staff, primarily medical staff, about the traits of good physician leadership (Sakran et al 2012).

Another relevant summary point to highlight is that in addition to a strong momentum towards a concept of distributed leadership, the majority of opinions expressed by interviewees align with the centralisation measurement strategy as discussed in Chapter 3. This strategy refers to ‘nodes’ of leadership

that are likely to be more prominent. Centralisation is reflected by statements which still hold that the senior medical and nursing staff are more likely to be considered leaders, whilst not excluding Registrars, Staff Nurses and Junior Doctors from assuming that role.

### 8.3.2 Global theme 2: Leadership is contingent

The second global theme to emerge from this study relates to the idea that the expression of leadership has many dependencies. Interviewees reflected on the range of resuscitation scenarios they have been involved in. This variation was mirrored by a variety of leadership practices that were contingent on several factors, such as the people in the room and the patient's clinical situation. These form the basis for the network map for this global theme (Figure 8.11).

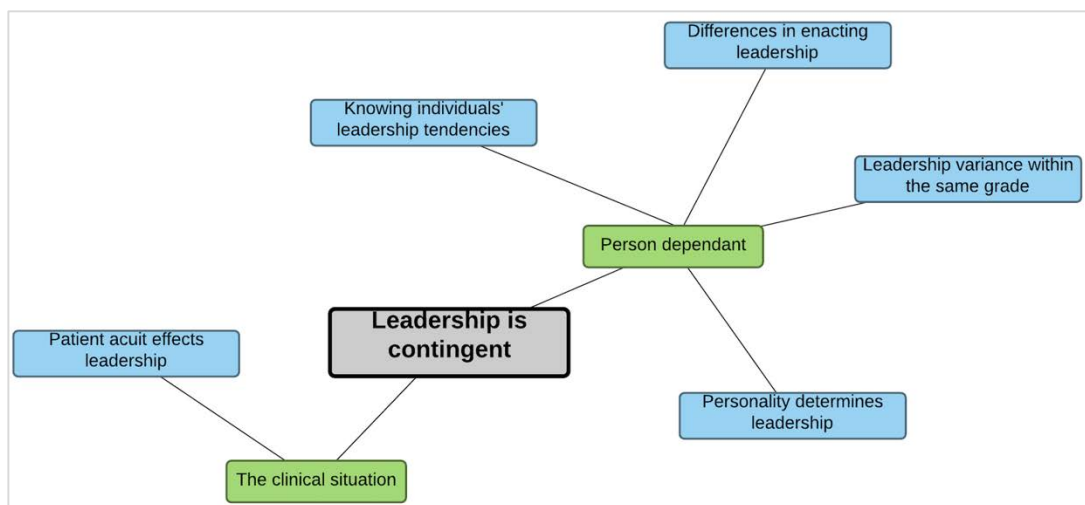


Figure 8.11. Thematic network map of global theme 2 (leadership is contingent) and the relating organising and basic themes

Organising theme: Person dependant

Basic theme: personality determines leadership

The first important finding within this theme is that staff believe that an individual's personality is the primary determinant of leadership. Several

nurses repeatedly identified this, with one Charge Nurse focussing on issues of personality on four separate occasions:

CN 0010

*"I think there should be a crossover, and again I think its personality – totally personality dependent"*

*"so, ehm, yeah personality dependent. But with the right personalities it works really really well"*

*"Definitely. It is personality dependent"*

*"From a doctor's perspective, again, personality dependant"*

SN 0014

Interviewer: *"what do you think influences..."*

Interviewee: (interrupts) *"...I suppose personalities"*

CN 0006

*"yeah I think that, ehm, its very personality dependent"*

Medical colleagues appeared to verbalise an equivalent idea, stating:

CONS 0001

*"And I think if you ran the same resus with 5 different consultants you would find that the leadership styles are very different and probably that if you asked everyone, the nurses, the junior doctors in the room did you really feel like you knew who was leading or that they had an oversight, they would give you different answers depending on the personality of the person"*

JDS 0016

*“And so you can imagine then, would a junior reg be more sort of frittery than maybe a senior very assertive reg. And just also kind of characters. I think you could probably have even FY2 doctors who just really rated themselves and would just really take on a real leadership role. I’m not saying that’s wrong, it’s just different”*

One Registrar outlined how the difference in personalities between them and their peers could influence the team’s delivery of care:

REG 0017

*“I think – there are different personalities so...name names. But (name of registrar), (they) would be quite comfortable saying ‘hold on a sec, this isn’t right’ you know. And just challenge the consultant to make the, kind of – have a discussion and make the better decision. Whereas I think at my stage I would be – I would find that tough. I would find that a challenge to do it without trying to upset the consultant. But I think that’s a personality thing”*

Interestingly, when asked whether personality is more influential than grade, nursing staff identified the former:

SN 0012

Interviewee: *“Yeah, oh yeah. I think personality based, definitely”*

Interviewer: *“Ok, do you think personality more than grade?”*

Interviewee: *“Yeah, I would say so”* (door interrupts)

SN 0011

Interviewer: *“So do you think its arbitrarily with the position of consultant or more to do with who they are?”*

Interviewee: *“That’s a really good point actually, I think there’s a huge element of you are wearing the purple therefore you are the consultant therefore you*

*are the leader. But many consultants have different personalities, ehm, so I think it's both"*

SN 0011

Interviewer: *"Do you think that some band 5s are, perhaps, more leaders than other band 5s, even though they are the same grade?"*

Interviewee: *"I don't know. Yes and no. Yes and no. It really depends on the person's personality and their experience"*

Basic theme: leadership variance within the same grade

A related theme that offers insight into why staff place such importance on personality is concerned with the idea that clinicians within the same grade or level of training are perceived to be different in their leadership role. Several medical colleagues discussed this:

CONS 0003

*"I think grade and experience comes as a factor but far more than that I wouldn't be comfortable handing that off to say just 'the registrar' or – its very much a function of the individuals involved which is why it matters so much to try and know the personalities and experience of your team that's with you. Ehm, we've spoken a lot about leadership in the nominal 'I am the lead role' but I think there's so many other aspects of that"*

CONS 0009

*"Yeah, it is very registrar dependent. Some of them will look at you constantly as they're running it. Some of them will ask you questions every couple of minutes about what they should be doing and then some just ignore you and get on with it"*

CONS 0001

*"I think it's very individually specific, you know some people are better at that than others and indeed that even may change during the same case"*

REG 0015

*"...because you're in that mixed mode that's dependent on who they are – there are some that I would give total autonomy to, you know, 'crack on, do what you want, I'm here technically as a name', that I can say that I am here because you have to have a registrar or a consultant nominally supervising you"*

REG 0015

*"And actually, it depends which consultant is on. There is sometimes when I'll go in, there will be certain consultants that I'll be like 'ok we're going to have to do everything by the book', like properly by the book. Sometimes there are certain consultants that actually, I can lead this person, I trust them enough to, you know, just do it"*

One Consultant and one Registrar described how this variation manifests when they are in the resuscitation room:

CONS 0002

*"My predefined safety net was struck and that's a personal thing about where you set that safety net, you know, it's going to vary from individual to individual. In this case the safety net was triggered and I then intervened"*

REG 0015

*"So in leadership, I tend to become more strict. And not strict as in harsh, but strict as in I'll start to quieten. You know, you can see me – if I'm quiet then I'm really thinking and I want everybody else to be quiet...I just tend to vocalise what I think more or if I'm treating I vocalise all my thoughts so that everybody knows where in my mental journey I am and what I want to have done"*

### Basic theme: differences in enacting leadership

Another distinct but similar finding was that people in the leadership position often have different 'styles', suggesting that there is no single leadership typology for resuscitation scenarios. Both medical and nursing team members of all grades described this:

CN 0007

*"...and that's my big thing with resus, being in the resuscitation room, is being a leader, everybody does it different. It doesn't matter what the patient comes in with, it should be the same systematic approach but every consultant and reg has got a different way of doing it"*

CN 0006

*"Sometimes you've got consultants that are, you know, you just know that if they are on they are leader and there is not any question about that. And there are other ones that are a little bit more laid back and you know, not slower, just a little bit needing – you need to sort of back them that little bit more. So you can kind of gauge that situation by who you're on with yeah"*

CN 0010

*"There are certain people that I would say like to be more hands on, and certain people that don't like to touch a patient at all"*

SN 0014

*"So it's kind of – depends who you're working with and what grade and what confidence they have"*

CONS 0001

*“But I think that within a group of consultants you will find that there are some that are more naturally leaders than others. And there are some, probably like me, that don’t necessarily enjoy doing it but will do it when they have to. And I think if you ran the same resus with 5 different consultants you would find that the leadership styles are very different”*

JDS 0016

*“I think there’s a vast range of styles of how consultants approach the resus...so you get – you’ll get someone who is super excited about having a plan, allocating roles before people come in and all this kind of thing. You know, they like to have a system. And then you’ll get a more, kind of, fluid type, right...you get people who are going to lead by the book and this is the kind of – and then you’ll get someone who is a bit more, ehm, what would you say, kind of, less structured approach to leadership”*

One Consultant voiced how they thought they enacted leadership compared to colleagues with the same positional role:

CONS 0001

*“so my own way – because I was never really that comfortable leading. I was always a bit of a ‘stand in the corner let it all happen’ kind of person, and as I’ve kind of become more senior my way of dealing with it is obviously leading actively when I have to and when I don’t have to retreating back into my own style of ‘ill stand over here and make sure that everything is ok...”*

Basic theme: knowing individuals’ leadership tendencies

Marking the transition into the final linked theme, one Registrar highlighted how this organising theme of ‘person dependant’ is so prominent in the minds of the team that individuals’ specific leadership tendencies can be explained:

REG 0015

*“So I think some consultants – there are very differing styles. You could take extremes, so for instance (name of consultant). I think in my experience (they) is very, kind of, structured, regardless of what is coming in. Ehm, compared to someone like (name of consultant) for instance, who might be seemingly less structured. Maybe a bit more banter. Also a lot of teaching as well but certainly not the same structured approach that someone like (name of consultant) might take”*

This is understood amongst the resuscitation team as evidenced by the range of senior and junior staff expressing the same statements:

CN 0010

*“And I also think that there’s a bit of that, that (name of consultant) is a very clinical person, you know, and I think (they) probably just – wasn’t even – god I’ve focused on (name of consultant) when actually (name of consultant) was just as involved. Ehm, I think maybe there’s a bit of them that just gets quite excited, you know, they’re passionate about their jobs”*

SN 0012

*“Ehm, (name of consultant) would be, kind of, battling with her for it – the leadership. But if it was say (name of consultant), you know, (they) would maybe step back a bit, ehm, because (they’re) a bit more chilled out and, you know”*

CONS 0001

*“And I just know that there are some – don’t quote the (named consultant)s...but, who when they stand in the resus they are obviously the leader and everyone knows it and if they have a question they’ll go to (them) and then there’ll be other people, probably a bit like me, and a few other maybe*

*more junior consultants, or maybe just people who personality's like that, who will assume the leadership role when they have to do it"*

REG 0015

*"And I think a lot of it is personality types. If you see, for example, (name of consultant) (they'll) just wander in, wander back out you know, there's no – I know I'm still overall leading, you know, because if that happened at every resus the nurses would be like 'what the hell is going on?'"*

RGE 0015

*"It all comes down to relationships and how people act. So if you put in a room, like, (name of consultant) who's great, but (they) just talks. People will just look to (them) as the leader because (they) just talks, within a minute just by chatting and (their) – it's kind of relationships, its trust, (their) confidence, (their) build, the way (they) comes across. You'd go 'actually let's follow this (person)'. I think probably, whereas, I go if you (name of consultant) (they'd) just wander off. You'd be like – which is a bad thing because sometimes if you don't have enough people that are senior enough you're then left leaderless"*

JDS 0018

*"Ehm, if I walk in and I see (name of consultant) I'm like right 'we are going to have a good resus' and I'm probably going to get the chance to step up a bit. But not to the point where I feel uncomfortable because (they) will ask me throughout, many times, how I am getting on. If I walk into a resus and its (name of consultant) I'm like 'oh fuck what am I going to get wrong this time'"*

### [8.3.2.1 Analysis](#)

In support of the statements outlined here, and linking this corpus of data to the previously collected questionnaires, the results to Question 7.4 – *Leadership is determined more by who the individual is/their personality rather*

*than by their professional grade* – are a useful indicator of the consistency of findings. Eighty per cent of respondents (56/70) believed that personality rather than professional grade determines leadership, thus there is strong alignment between the two data sets.

Organising theme: The clinical situation

Basic theme: patient acuity effects leadership

The second organising theme is that leadership is contingent on the clinical situation, specifically the patient's disposition. Clinicians suggested that there are two scenarios at either end of the patient acuity spectrum that determine the type of leadership required. First, that a patient is severely unwell and requires time-dependant interventions which is mirrored by the need for immediate leadership. Or second, that a patient is physiological stable which means that the need for someone to occupy the leadership role is not urgent. This was expressed in the following ways:

SN 0014

*"I think there's two kind of situations that come in to my head and one is that you've got a very sick, unstable patient and I think there's almost a different leadership and I think most of the nurses would then agree that they look to the doctors, the medics, because they're thinking what do we need to do to make this patient better, make the patient safe. And I think there's probably your other type of patients who come into resus who aren't as sick, a bit more stable, who you've seen the situation, it's almost a protocol. You know you need to do this this this and this and everything will be ok"*

CONS 0003

*"So the time pressure from the resuscitation for one, so how critically ill – the impression you have of how critically ill the patient is, so the time frame that you have to do say all the interventions in. If you've got a major trauma patient*

*who you really want to get intubated, lines, drains in and transferred to scan within half an hour then you've got to go some. Ehm, and you may – it may be if you don't have enough staff or enough appropriately trained staff in order to do them then the team lead might have to, although should try and resist pitching in, so time is one. How severely the patient is unwell is another. Ehm, the, the exact staff that you have in resus, and I think that's what makes it so dynamic...Ehm, so I think that the specifics of the staff involved, the team composition matters. Ehm the exact – what the intervention is required will matter as well, so if you have to intubate somebody, then for the – yeah there's all the prep which you can continue to show leadership, have an overall awareness of, and when you're doing the checklist, but when you're actually intubating and staring down the airway I've got no idea what the patients rhythm is doing at that point, ehm, where they're bleeding from if suddenly a venflon falls out, so, ehm , intubation I would be more explicit about it. It depends on the nature of the task you need to accomplish”*

CONS 0002

*“So broadly I think it should be a designated leader. So I think it's very very case dependant. So when you say who actually leads, you know there are plenty of resuses that are done without a consultant, you know, so at night for example when the registrars are leading them. And I think it's very case dependant in terms of the acuity of the patient. So when we think about resuscitation that can range from actually relatively straight forward things that go into the resuscitation room, more from a flow/time management thing like stroke for example, that has very little in the way of leadership requirement, to very complex multi trauma patients. Ehm, so that leadership really is extremely variable”*

CONS 0002

*“I think the other thing is there's acuity, but the big one is time. Time is what determines the sort of level of leadership that you need. If you have a*

*completely non time pressured patient, it doesn't really matter if you don't have a leadership and things just sort of flow along..."*

JDS 0016

*"So say if it's a trauma call or a red code or whatever they call it. You know there's a team waiting. There's either a consultant or a senior registrar and it's kind of, maybe they take on a big leadership role. But then you get other resuses where perhaps the department is quite busy. Perhaps it's sort of medical-ish non-arrested patient, so you with a couple of the nurses and maybe one doctor. And then I think in that situation its far more dynamic than perhaps a big trauma type situation. Because then there's the initial tasks that need to be done and then when you're actually thinking of a plan or whatever what's going on, I think people tend to all make, kind of, suggestions about the way things are going and sometimes maybe it'll be the doctor that has something to offer but maybe actually, one of the nurses will say 'I think this this this and this' and 'shall I do this'. And so I've often been in situations where I think it's been extremely dynamic whereas there's been other situations where, you know, maybe the reg or consultant is just saying 'this is what's happening. Can you do this? Can you do that?'"*

A useful summary, also highlighting the challenges of studying leadership, came from the following interaction:

JDS 0016

Interviewee: *"So it's the mix of people – it's the case, it's the mix of people that are there and then the personalities of those individual people"*

Interviewer: *"And all those seem to swell together?"*

Interviewee: *"Uh huh, I think so. That doesn't help with your quest to work exactly what's going on with these, kind of, leadership team work dynamics but I think in my opinion that's the reality of the situation"*

### 8.3.2.2 Summary of second global theme

The final insight from the Junior Doctor above depicts the reality of leadership as entirely the product of a cluster of situational factors, all of which combine to create, in theory, unique resuscitation events. A resuscitation episode with four staff members has six working relationships, eight staff has twenty-eight, and a larger resuscitation episode with twelve staff has sixty-six potentially unique relationships. This equates to sixty-six subtle variations of leadership personalities, tendencies, perceptions and responses all enmeshing in short epochs of time (Figure 8.12).

As outlined in the discussion section of the literature review (Chapter 4), whilst research has tried to articulate a coherent picture of leadership during resuscitation it has done so set against this backdrop of complex people and environments. Published research has, therefore, encircled as many leadership behaviours as is possible to account for the reality of adaptive resuscitation episodes. Rosenman and colleagues' (2015) systematic review of interdisciplinary acute care teams noted 37 discrete functions of a leader, whilst Leenstra et al (2016) developed their trauma leadership taxonomy with 67 different leadership behaviours. This symbolises the spectrum of leadership as has been expressed by the interviewees in this thesis.

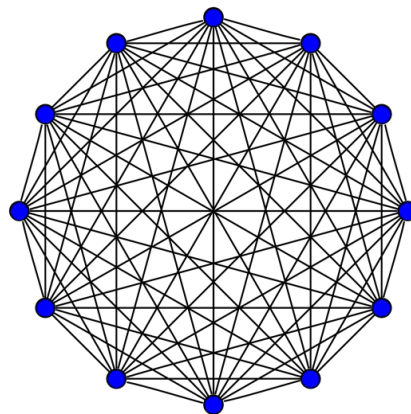


Figure 8.12. A visualisation depicting the sixty-six inter-personal connections between twelve different resuscitation staff

As was noted in the questionnaire findings section, it is necessary to situate the results produced here within the context of extant research. Few comparable studies have investigated contingent leadership, however two articles published by Yun (et al 2003, et al 2005) are important. Yun's first study was a 6-month ethnography of leadership in a trauma resuscitation setting in the USA. They observed over 100 hours of resuscitation and concluded that the effectiveness of leadership, delivered by one leader, is dependent on the severity of patient illness and the experience of the team.

The second study was experimental to test the results of their original ethnography, using a 2x2x2 design (2 – severely injured vs. not severely injured X 2 – experienced vs. inexperienced team X 2 – directive vs. empowering leadership). Ninety-one trauma staff participated in simulated scenarios, including nurses, doctors and trauma surgeons. The authors found that a directive leader was more effective when injury severity was high, and an empowering leader was more effective when injury severity was low (Figure 8.13a). Similarly, a directive leader was more effective when the team was inexperienced, whilst an empowering leader was optimum for an experienced team (Figure 8.13b).

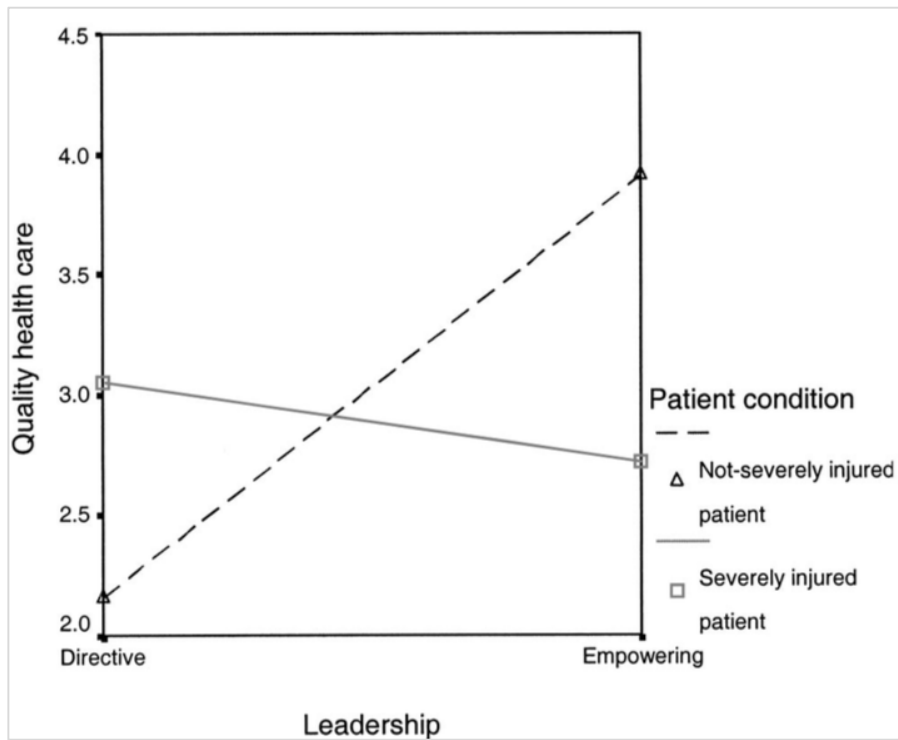


Figure 8.13a. Effect of leadership and patient condition and quality of care (Yun et al 2005, p 1292)

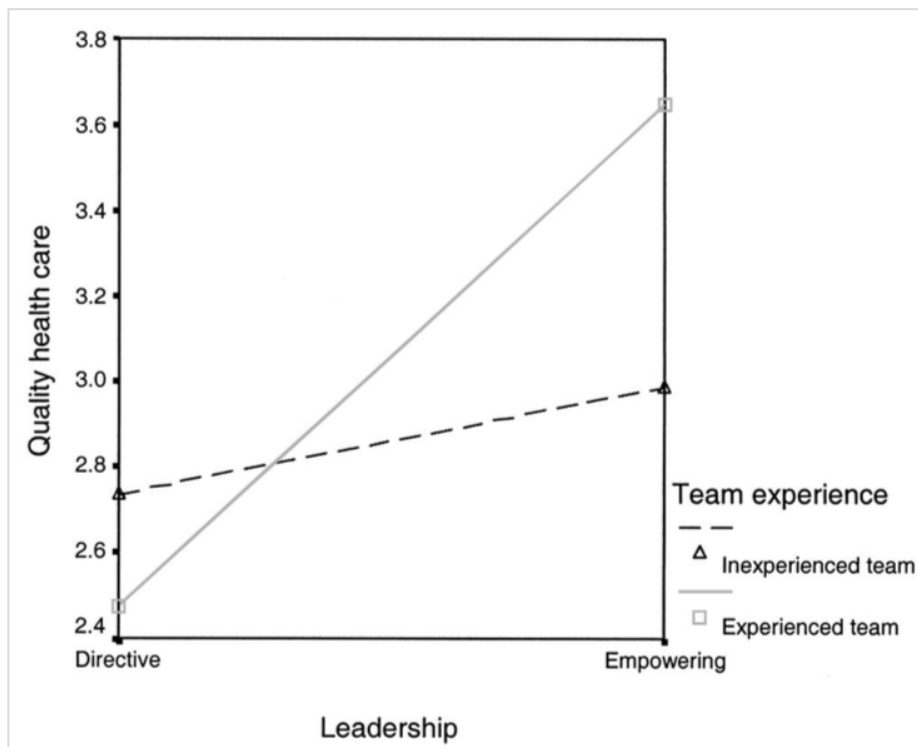


Figure 8.13b. Effect of leadership and team experience on quality of care (Yun et al 2005, p 1293)

These findings are consistent with Hersey and Blanchard's situational leadership theory (1972), however this thesis extends the contingencies not just to one single leader, but that the dependencies of leadership are experienced and acted upon by all team members. In addition to the nominal leader adapting their leadership skills, it is evident that the other team members also adapt their leadership contributions where necessary, stepping in and out of the leader role depending on group need. This further cements the justification of applying Pearce and Sims' shared leadership theory (2000) as the theory underpinning this thesis.

### 8.3.3 Global theme 3: Distinction between nursing and physician leadership

As evidenced throughout this research, a decision was made to take a holistic approach and apply team-level leadership theory to encompass the perspectives of all resuscitation staff. However, in addition to viewing leadership through a team lens, an equally important consideration is for the author – a Nurse – to contribute to the science of nursing practice as well as clinical emergency nursing care. With this in mind, the third global theme is about the distinction between leadership as experienced by nurses and doctors.

An interesting relationship exists between the basic themes of this global idea which suggest that nurses, whilst displaying leadership behaviours that help achieve the common goal for the resuscitation team, do so within a boundary of role expectation and professional norms (Figure 8.14).

#### Organising theme: How nurses deliver leadership

##### Basic theme: leadership in many forms

Physicians routinely expressed archetypal leadership traits and behaviours as being the cornerstone of medical leadership. These are behaviours such as speaking up, providing direction and commanding the room. Nurses, whilst

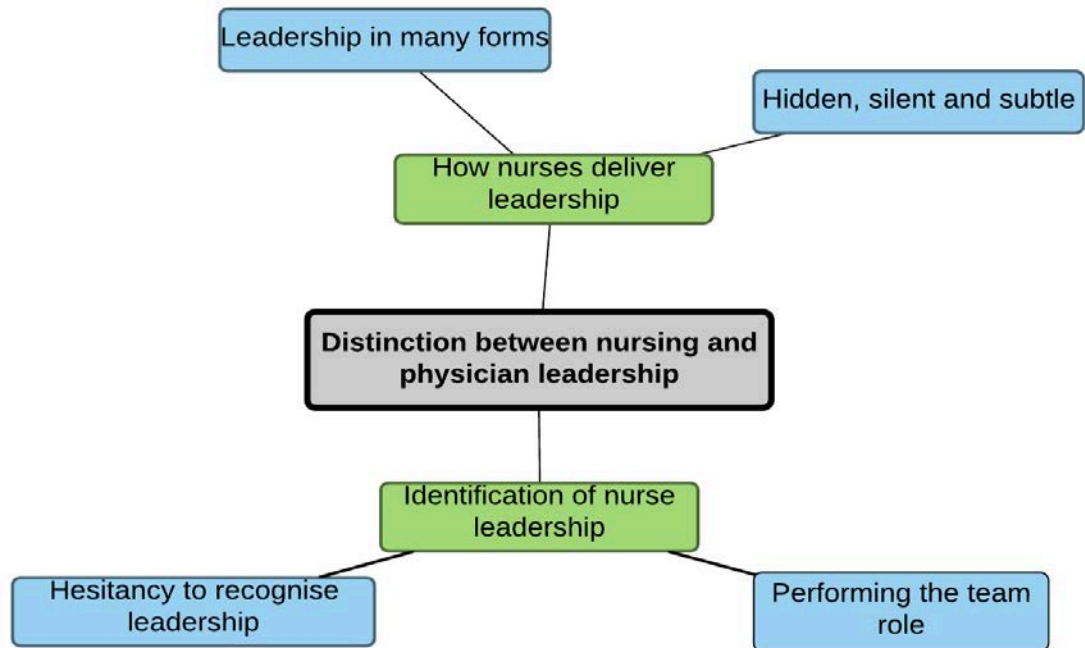


Figure 8.14. Thematic network map of global theme 3 (distinction between nursing and physician leadership) and the relating organising and basic themes

mentioning similar core themes, articulated a more diverse understanding of leadership. Two senior nurses explained leadership in reference to providing dignity in death:

CN 0004

*“that other one that I was telling you about, that example, I was being – I kind of flipped in and out of a couple of leadership type roles in that. Because I saw that the patient was really sick and I wasn’t happy with the care they’ve received so made sure that they got the right care (phone interrupts). So I recognised that she was sick... But then I flipped into something entirely different, which is really kind of – and a few doctors get uneasy about it, I told the patient that she was dying. So I knew, and I just told her. I said ‘actually you’re really not very well’ and she knew, she knew herself. And she said ‘I’m really, amn’t I not’, I said ‘no you’re not, I think you’re dying’”*

CN 0007

*“so there was a patient came into resus and was going to die, lost his output. (name of consultant) was there and one of the doctors. And the doctors went to start CPR and I just went like that (holding their arms in the air signalling to stop). I held the man in my arms and he died. And that is leadership because I’ve been there, I’ve been an advocate for that patient as well...I’ve worked here for years, let the patient die, so leadership was just like the head saying no”*

Other nurses depicted their leadership as thinking ahead of the lead doctor and having oversight of the resuscitation:

CN 0005

*“I think in resus it is that we are so familiar with resus that before the doctor has even had the thought in their head we’ve already thought it and we’ve already opened up what they are going to ask for next. So it’s about forward thinking and in terms of moving to scan, I’m already thinking in my head how many staff I’ll need to pull from areas to do that so it’s like forward thinking. So the doctors are making all the decisions and we are so aware of what’s about to happen next, so it’s like preplanning”*

SN 0011

*“There’s a huge influence from the charge nurses and they are very experienced in these, kind of, resus, ehm, scenarios...the charge nurses sometimes, they have a certain kind of commanding – yeah, it’s like they almost know, they almost have the initiative to think first what the leader, you know, what the consultant would decide. So it’s almost like they are a step ahead”*

SN 0013

*"I mean I think the nurses definitely have a role of – especially senior nurses who are more familiar with the resus room...they're much more aware of the ebb and flow and what happens and what needs to happen next and predicting what's going to be happening. And I think that's probably got a lot to do with leadership, is understanding the bigger picture and being able to use your team to benefit the, kind of, clinical care and the journey"*

CN 0004

*"For example, if you look at the trauma we had on, ehm, on Saturday night. Ehm, (name of consultant) was in charge but so was I because I was keeping tabs on everything that was going on and making sure people reported back and keeping control. I think that's quite important, because if you don't have – because when you're team leader and thinking of the clinical lists to go through and recapping you can very quickly lose control of what's going on in the environment. And that's where working, kind of, in partnership with your senior doctor – it's important to keep the handle on what's actually happening with the patient, what's going on, their external bits and pieces and steering that towards 'actually have you spoken to – you need to report that back', you know. And it's just constantly going through that in your head. And it's quite funny, because there were a few times during that resus there would be a lull in whatever was going on and I would say like 'so', and then (name of consultant) would then go 'so let's recap', so we take cues off each other a lot of the time"*

SN 0013

*"Whereas if you do watch someone deteriorating and you can see it happening and you're always having to be a few steps ahead in these, anticipating what people are wanting and what they're going to need, be that from another nurse or doctor or patient, and you can see that something is going to happen then you kind of have to stop, ask questions – 'what's going on here, where are we going' – and I guess in some ways that's leadership"*

Basic theme: hidden, silent and subtle

Despite the richness of leadership described here by nurses, their opinions were tempered by their belief that they have to enact leadership differently to medical colleagues. Nurses report not being able to display leadership as overtly as doctors:

CN 0005

*“So, although the consultant is the medical lead, the nurse, the senior nurse, is kind of doing leadership in the background as well if you know what I mean”*

CN 0004

*“well officially it’s the doctor that’s the team leader of the actual resuscitation. But I think a lot of the time it’s a, ehm, it’s actually subtly a joint role between the senior nurse and the senior doctor in the room”*

CN 0007

*“...if you’ve got a Reg who’s new to the department, sometimes you’ve got to discretely say ‘would you like me to do this would you like me to do that’, without actually saying ‘you should be doing this and you should be doing that’”*

CN 0005

*“yeah I think we do take a leadership role or whoever is in there – the senior nurse...It’s a silent leadership, it’s like a – the resus wouldn’t function without it. It’s a silent leadership, sometimes not always silent (laughs)”*

One reason that could explain this finding, as evidenced by the statements below, is that nurses do not want to undermine the medical role or challenge the expected leadership patterns of resuscitation:

CN 0007

*“Because I’ve got quite a strong personality and I can sometimes be, probably be a bit overbearing. It might look to be intimidating to people so I’ve got to be aware of my style of leadership, and say ‘would you like me to do this’”*

This Charge Nurse began by acknowledging that they often have considerably more ED and resuscitation experience than some of the medical staff:

CN 0007

*“yeah they might feel undermined but I wouldn’t – I’d hate for them to feel undermined because I see my role as to support them in the department. Like we’ve spoke before, I’ve been here 10 years, got a lot of experience. People are here for 6 months to a year, I’m a point of contact and knowledge for these guys as well. But I wouldn’t want to go and say ‘you should do this you should do that’...”*

Even though the nurse knows what is required for patient care, they have to reframe their assertion into question and say:

*“...would you like me to do this blood gas for you, would you like me to run a bag of fluids through’...but I’ve seen it so many times, you get stuff ready and say ‘I’ve done that for you’, and to support them”*

When asked directly – *“do you think that when the senior nurses do that, that is them taking the leadership role without necessarily...”* – the Charge Nurse interrupted with *“yeah, undermining the registrar, yeah”*.

Another Staff Nurse suggested that overt leadership by nursing staff may be perceived negatively by the resuscitation team:

SN 0011

*“You don’t want to be perceived as someone who’s over confident...because, you know, because there is always that fear that ‘aw she’s so over confident or he’s so over confident, how dare he speaks up like that’ or ‘how dare he acts like a leader’. So you have to kind of get a certain balance sometimes to not be perceived as someone who is trying so hard or someone who’s actually, you know, taking a step forward, you know, actually doing the right thing”*

Organising theme: Identification of nurse leadership

Basic theme: hesitancy to recognise leadership

The effect that this has on nurses is that there appears to be a reluctance to self-identify their acts of leadership. A revealing interaction with a Charge Nurse embodied this idea when asked whether nurses recognise their leadership contributions:

CN 0010

Interviewee: *“(interrupts) No probably not. I think some of us probably do, ehm, but no I don’t think everybody does”*

Interviewer: *“And why do you think that is?”*

Interviewee: *“I don’t know (laughs). I think we’re not – well it’s a ranking thing probably. We’re not comfortable – well some of us are not comfortable challenging people that are – have historically been seen as more senior and actually it shouldn’t be a seniority thing. It should be a ‘you have a different role and a different job to me’. Ehm, but I think that’s what probably stops a lot of people from seeing themselves as a leader as well”*

Other nurses were equally as hesitant to describe their actions as leadership, even when they rated the same actions by other colleagues as leadership:

SN 0012

Interviewer: “And when you’re doing that, would you consider that that’s you then having a leadership role?”

Interviewee: “Mm, I don’t see myself as a leader, you see, at any time. So, maybe a manager than a leader (laughs). Manage the situation rather than lead it”

Interviewer: “Let’s say a registrar or a consultant does that thing that you do, you know, they’re making sure everybody’s ok and they’re making sure everything is ok, would you think that they are doing leadership there?”

Interviewee: “Mm...mm...”

Interviewer: “Because my question would be, do you think that the leadership role is a function of what it is that somebody is doing, or who it is that’s doing it?”

Interviewee: “...yeah. I suppose then if they’re managing it then they are leading it, aren’t they? So in a sense when I am kind of managing it, I am kind of leading it. So I’m a leader without knowing it”

SN 0011

Interviewee: “if I know that certain things are not being done, I would just say ‘this needs to be done’ but I don’t perceive that as leadership, like I don’t perceive that as being a leader”

Interviewer: “That’s interesting. Let’s say the charge nurse did and said the very same thing – they gave the same instruction at the same time in the same way – do you think you would then class as what they did as leadership?”

Interviewee: “Yeah”

Interviewer: “Why would it be, that you wouldn’t say that that’s you being a leader?”

Interviewee: “Why would I – ok, why do I say that? Ehm...Yeah that’s interesting. That’s an interesting point. I guess it’s because I don’t see myself as a senior role, like I don’t hold a senior role. Ehm, I am the advocate of the patient so therefore I would speak out if I know that, you know, something is like going on that, ehm, for the patient’s safety, so I would, I would say

*something. However, I wouldn't – I would not take that as being a leader, maybe because of my personality or maybe because I feel like I'm not senior enough to be classified as a leader in this situation"*

In a similar vein, nurses acknowledged that their senior colleagues would not view themselves in a leadership capacity despite their peers viewing them as such:

SN 0013

Interviewer: *"It's interesting, because I'm speaking to the charge nurses as well, do you think that they view themselves as a leader in the room?"*

Interviewee: *"Not at all"*

Interviewer: *"That's interesting"*

Interviewee: *"And they certainly are. And they all do it in their different ways. Some of them maybe a bit more subtly"*

#### [8.3.3.1 Analysis](#)

Referencing these themes back to the questionnaire results, again there is strong corroboration between the two sets of data. When all staff were asked whether they displayed leadership in the resuscitation room, a look at the aggregate responses shows a fairly expected outcome. However, when the responses are displayed by profession it highlights that all ED doctors other than those who are newly qualified believe they display leadership, whilst only two-thirds of nurses report the same.

There is extensive literature discussing how nurses and doctors feel about their roles, the boundaries of the professions and where responsibilities overlap as well as differ (McKay and Narasimhan 2012). The issues that are often cited are summed up by Braithwaite et al (2016) as clinical tribalism, hierarchy and professional stereotyping. A reoccurring theme in published research is that, when surveyed, nurses report feeling on the lower side of this

professional hierarchy (Rafferty et al 2001, Schmalenberg and Kramer 2009, Tang et al 2013) which then influences the manner in which they interact with physicians. Nursing practice, considering the historical difference in working labour and gender, has organically grown as subservient to medicine (Vazirani et al 2005) and was described as the 'doctor-nurse game' in a prominent *New England Journal of Medicine* article in 1990 (Stein et al 1990).

The essence of this 'game' is that nurses use strategies, either consciously or subconsciously, to manage their working relationship with medical staff. Nurses assimilate to this hierarchical culture (Kim and Oh 2016), learning about the hidden rules that exist between the two professions.

Braithwaite et al (2016) conducted an interesting laboratory-controlled experiment with 35 groups of doctors, nurses and allied health professionals to test the extent to which these inter-professional behaviours were exhibited out with the hospital setting. Even when these groups were doing healthcare related tasks, the groups showed no sign of the type of professional stereotyping that has been so routinely documented. The authors concluded that:

*"...if you invite clinical professionals to do teamwork under laboratory conditions, in situ workplace tribal and hierarchical behaviours are not readily replicated. Personal, rather than professional behaviour, dominates in the laboratory. There are grounds for believing, therefore, that stereotyping is an artefact of healthcare workplaces and history to a considerable degree. Put another way, in the workplace there are perceptions of marked behavioural patterns distinguishing doctors, nurses and allied health professionals. Our study suggests that these are not necessarily grounded in external reality, nor are they formed on the basis of demographic differences or personality; they simply do not manifest to any extent in controlled settings"* (Braithwaite et al 2016, p 8).

Although Braithwaite's conclusion is intriguing, the nurses that were surveyed and interviewed as part of this study describe their lived reality of leadership as imbued with these professional expectations, almost mitigating the use of their leadership skills by doing these 'silently', 'subtly' and 'in the background'.

#### Basic theme: performing the team role

The alternative narrative that nurses offered when explaining their actions as non-leadership behaviours was that they simply view what they do as their team role. When asked whether nurses are likely to believe they show leadership skills, this Staff Nurse replied:

SN 0013

*"I'm sure they won't look at it like that, they'll just think that they are doing their job. I mean I wouldn't have ever thought about it in that way, like, never have considered myself walking into the resus team as the leader. However, I know that probably there's quite a lot of times where it has happened, on reflection. I wouldn't have thought it at the time though"*

When asked about their belief, they stated:

SN 0013

*"I don't know if it would be a leadership role, it would be more just like performing my team role"*

As the interviews progressed, some of the interviewees started to question their own default narrative that nurses do not participate in leadership. There was a tone of self-reflection which appeared to stem from discussing issues that would usually remain dormant:

SN 0014

Interviewer: *“do you feel as though you put yourself in a leadership role?”*

Interviewee: *“I think to a certain extent maybe – like part of it yes. Obviously I’m not as medically as them so it depends what the patient needs and what – and how sick they are. But yeah I will step in and say ‘yeah right we’re going to do XYZ, we’re still to do this, we need to do that’. And sometimes you do feel as though you’re giving them the tasks instead of vice versa. But we’re doing it however many times in a week, like, when they’re not”*

SN 0012

*“I suppose I would now, actually, thinking about it. And also if I’m looking after student nurses in resus then obviously I’ll be leading them. And the CSWs as well”*

### *8.3.3.2 Summary of third global theme*

Studies that have investigated leadership using similar methods as this research study, namely observations and interviews, have highlighted a degree of commonality amongst opinions of nurses and their leadership contributions. One of the studies included in the literature review chapter was Kleine and colleagues’ (2006) ethnography of trauma resuscitation teams. They observed approximately 250 hours of resuscitation – 175 patients – and interviewed 33 staff members.

The medical interviewees voiced sentiments such as:

*“From the bottom to the top, the nurses really keep things organized. They make sure everything is done. In an appropriate way and in an appropriate amount of time, make sure everything is done in a pattern”* (p 609)

*“The nurses here protect the patients. They know more than most of the residents they’re working with. They will come and get the attending if the*

*residents are screwing up, or they'll tell the residents [equivalent to Junior Doctors] to stop screwing up directly" (p 611)*

One Doctor at Consultant level described how:

*"There's sort of like a blank check order form that, as the attending physician, I'll sign and assume the responsibility for their actions, saying that this would have been an order of mine. It is unique. In our TRU [trauma resuscitation unit], the nurses act almost independently under our orders" (p 611)*

Despite a consensus that nurses, to some degree, contribute to leadership, there were similar undertones of professional stereotyping and clinical hierarchy as found in this thesis. The authors noted how *"Nurses are lower in the formal hierarchy than are residents, but nurses exert considerable informal influence over trauma care... TRU nurses' power in the TRU rankles some residents"* (p 611). This was acknowledged by a Consultant-level Doctor who stated that *"Every single month, the residents complain that the nurses in the TRU have too much freedom and too much power"* (p 611). The effect that this has is similar to the voices of nurses interviewed as part of this study, with one Nurse explaining: *"We can gently tell the docs what we think... The nurses are very experienced here, and there's usually so much going on that you're left to handle things by yourself"* (p 609).

Most interesting is the analysis presented by the authors. As they explain their findings they largely disregard the input of nurses and state that there are only *"three potential active leaders of the trauma team – the attending surgeon, the surgical fellow and the admitting resident"* and that this leadership is *"ranked in a clear and rigid hierarchy"* (p 602). This, despite presenting a corpus of evidence that leadership does not operate as prescriptively as they then suggest.

More broadly, this again serves to highlight the potential thorny issue of applying a particular theory or methodology which is at odds with analysis. Nurses in Klein's study, akin to Nurses interviewed here, explain their leadership with deference. This thesis, however, by linking a compatible theory with methodology and analysis, recognises the lived reality of nurses as important sources of leadership.

#### 8.3.4 Global theme 4: The meaning of leadership is heterogeneous

An undertone that runs throughout some of the ideas expressed during the interviews is the inherent variation in the meaning of leadership. The heterogeneity of leadership crosses a number of different themes (Figure 8.15)

Organising theme: The concept of leadership

Basic theme: ambiguous semantic boundaries

Despite the consensus that leadership is important, both for the patient and for the clinical team, there is no hegemonic viewpoint on what leadership actually is. One Charge Nurse described this as:

CN 0010

*"it's a loose term and it's – I suppose it's difficult because I think there is 2 – as I said – there is leadership in a clinical scenario. And there's the co-ordination side of things. And actually, you could argue that this is not necessarily anything to do with leadership, and it's about flow. But I do think that the 2 kind of merge. And yeah, the boundaries are a bit blurry"*

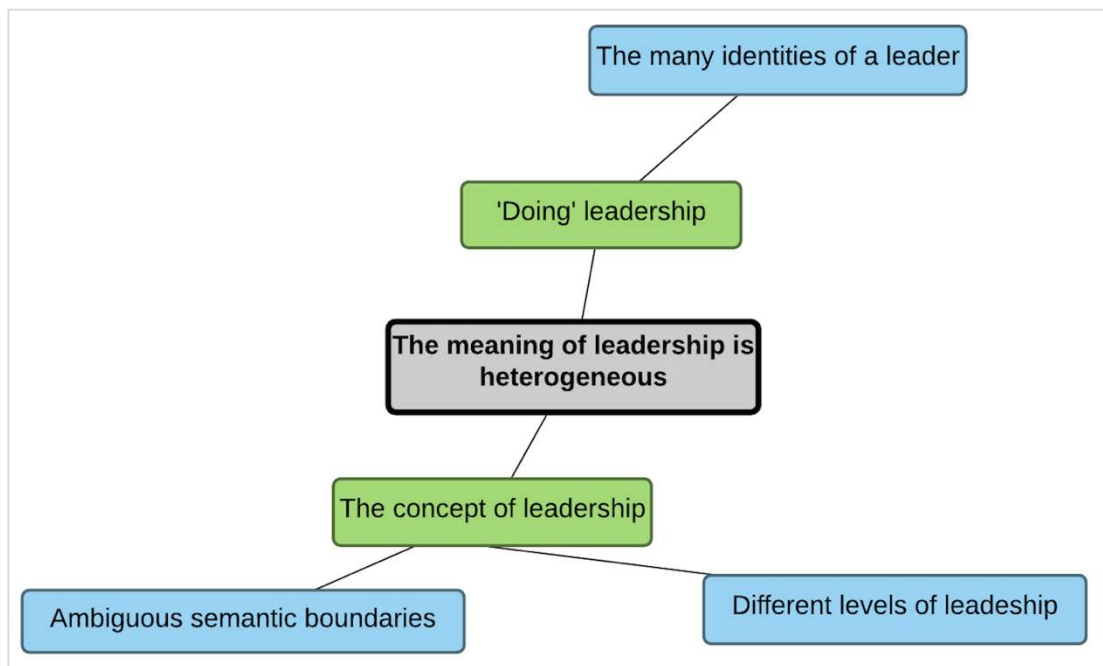


Figure 8.15. Thematic network map of global theme 4 (the meaning of leadership is heterogeneous) and the relating organising and basic themes

Other staff also mentioned similar types of 'blurriness':

SN 0011

Interviewee: "So with leadership, someone who's confident and I guess with leadership experience comes to my mind as well, some with experience. Ehm, also I'm thinking of, kind of, organisational skills"

Interviewer: "Ok, so..."

Interviewee: (interrupts) "...in a context of like, ehm - I don't know if organisational skills are appropriate but more, kind of, taking the leadership role so that everyone knows exactly what they are allocated to do"

CONS 0003

"there's so many other aspects of leadership and followership going on that it's implicit within the team. And it doesn't have to be – the vast majority of times it isn't an explicit 'I am the lead you will do what I say and I will tell you if you are the team lead' – it's not quite as – it's far more dynamic in every case"

REG 0015

*“Do you know I was going to say it’s presence. But what do I mean by that? You know, there’s – it’s part presence, part charisma. Sometimes it’s – most of the time it’s easy to pick out who the leader is and it is someone who is – it’ll be the person who is laying down clear instructions. Maybe that’ll be it”*

The ambiguity of leadership was most evident when staff questioned their own disposition. The responses of a Registrar (0015) highlighted this:

*“Because I’ve, like, there are times when there’s a lot of people – there’s a lot of resuses coming in at the same time. Some of these people don’t have this much experience and they are technically leading their own resus but I’m – am I supervising them or leading them? I have to think about that actually”*

Interviewer: *“I guess it would be interesting to hear, do you think – do you draw a distinction between leading in that sense of you are the leader of the resuses, and active leadership as it is being felt and perceived by a working team?”*

Interviewee: *“It’s a bit of both. If you ask me the same question 2 minutes later I’d probably give you a slightly different answer”*

In a similar vein, some staff indirectly voiced a contradiction in their understanding of leadership. One Consultant stated:

CONS 0001

*“So I think the thing that leaders have to do is be aware of everything going on in the room, be aware of all the information coming in, process it and use it to make decisions...”*

However, they later argued that:

*"...but that it's not solely the leader's responsibility. So the leader, I think, should use the expertise of their team to assist with decision making. And I often will, kind of, think I know what to do or what might be the best thing to do next...but I'll ask the team as well 'was there anything else you think I've missed anything. Have you thought of anything else?'...input from the rest of the team. Especially if you have a skilled team, you know, senior ED people – senior Reg, senior Nurse – then they are pretty helpful with decision making"*

#### Basic theme: different levels of leadership

Another conceptual idea that became apparent was that leadership is thought of as having different 'levels'. Positioned as a continuum, staff moved between bedside clinical leadership and leadership of a specific intervention, the case, the resuscitation environment and the department as a whole. Staff of all grades expressed this:

CONS 0002

*"Ehm, and that again is very interesting because even though you have leadership of the patient, then there's specific other procedures. For example, like anaesthesia going to happen and actually does the anaesthetist have leadership of that procedure? So, there's kind of overarching leadership but then there's task specific leadership. And there's different ways of handling that. Do you delegate – do you say 'right for this procedure you are going to lead, you're in charge, do what you like'. Or do you maintain overall leadership and actually still control every element of the resuscitation?"*

REG 0015

*"So its – actually its an interesting concept because then I become supervising but I'm actually still leading because I still am in charge of 3 – I'm leading on a different level because although they're leading for that individual patient, I have the kind of lead for the whole 3 patients"*

CN 0010

*“the leader of resus if you like, has to have an idea of what’s going on in every single bay of the resus room. So if we’ve got 4 in resus that person should know about every single one of them, not in depth, but they should be able to say ‘A is a really sick patient. B isn’t. B will be coming out shortly’. So they should understand the flow of resus and should know about anybody that is coming in”*

SN 0011

*“sometimes the consultant will be holding the airway, ehm, and even that as a role, you can get distracted so easily. Someone has to stand far back and just observe what everyone else is doing and a lot of the time, sometimes that doesn’t happen, in my experience. But in my experience, if someone is standing back and taking that role of what are you doing, you know, someone should be doing this, and just observing and assessing what’s going on, step by step, that for me is the ultimate leadership role”*

One Registrar (0017) delineated between leadership and responsibility, positioning leadership as something distinct from a Consultant’s formal oversight as the highest graded team member:

*“Often I’ll work with consultants. And the dynamic there is quite tricky because they might ask you to lead. But actually as the most senior person they are essentially the responsible clinician or most responsible – the person who has ultimate responsibility. Ehm, that’s not to say they are the leader. But there is, sort of, an unusual dynamic there if you’ve got someone who has got more responsibility but is not leading the team per se”*

Organising theme: ‘Doing’ leadership

Basic theme: the many identities of a leader

One theme that emerged as staff described how leaders actually 'do' leadership was a heterogeneous understanding of leaders themselves. For some, the leader's remit was overseeing a broad direction for the team:

CONS 0002

*"And, you know, my definition of the leader is that he is trying to get a group of people to achieve a course of action in the most efficient, effective, safe manner possible. So the – if you can – even though you may internally be feeling a whole variety of emotions, your external portrayal of those is absolutely vital because that is going to have direct influence on how the team performs"*

REG 0017

*"So, as leader, I kind of see that I'm trying to create that environment so that everyone can feel open enough to be able to contribute as best as possible, to make sure the patient gets the best care. So I think as the leader, I guess there's 2 components for me. It's about setting the standards and leading by example. But also making sure as best as possible that I facilitate the best environment"*

For others, the identity of the leader was quite defined:

CN 0004

*"clear instructions, clear – a clear plan of attack. That sounds awful but a clear plan of attack. Ehm, structure to their instructions, not just, you know not just 'I want this this this and this'. That's just hopeless, you need to be precise with your instructions. Ehm, constantly going over what's happened because I think sometimes if you don't do that that's how things get missed. Ehm, and respecting your colleagues, fellow colleagues"*

JDS 0018

*"[leadership] isn't just about what happens there and then in the resus room. Its about what happens after it. And, ehm, its all about – I think a debrief whenever its done which is rarely. You'll never hear anyone say 'oh yeah I think that was a bad idea that we did a debrief'. You'll never hear that. But yet in the 6 months I think I've only had 2 debriefs here...Ehm, so I think a good leader then realises – because it's an accumulative effect"*

For one Consultant (0009), part of exercising leadership was even attributed to physical stature:

*"I think it's the ones who remain calm, the ones at the bottom of the bed with the space around them observing everything, rather than getting stuck in. Even stuff like physical stature and embodiment of pose. I mean (name of consultant) is the prime example. He's like 6'4 so he doesn't have much bother making himself known as the leader. Ehm, and, those things. And authority of voice I guess, volume of voice, even pitch"*

A good summary of the diversity of the leader was voiced by REG 0017:

*"Ehm, I suppose from my point of view or from my perspective, ehm, essentially I see it as a responsibility. I see it as my responsibility. Ehm, ultimately – to the best possible care for the patient. Ehm, I guess it starts from me leading by example. So everything that I do in there really is, kind of, a demonstration of – I think – leadership. So, the standards that I have. From washing hands to, you know, the intricacies of treatment decisions. Ehm, all of the things I think are demonstrations of leadership. And I guess what I'm aiming for is to learn as well through leadership. So not to assume anything going in there. Not to assume that any of the people in the resuscitation room are going to be lesser or less contributing to the team"*

#### 8.3.4.1 Summary of fourth global theme

Apparent from the interviews is that there is no single shared meaning of leadership as reported by ED resuscitation staff. Instead, there are multiple meanings of leadership that are heterogeneous, crossing conceptual and behavioural levels.

It is suggested here that this can be viewed as a symptom of the problems with current leadership discourse which was outlined in the literature review chapter. A popular narrative has emerged in which more leadership is *de facto* synonymous with better leadership. Indeed, published research in healthcare has argued that there are over 9000 theories of leadership and management (Barie 2005). This has led to what Giovanni Sartori called conceptual stretching (1970).

Sartori observed the expanding influence of a separate field – political science – during the 1950s, 60s and 70s, recognising that more and more social practices could fall under the remit of political science. He coined the term ‘conceptual stretching’ to describe how distinct theories or ideas could be grouped together to expand their reach and applicability.

In terms of leadership, a quote from his landmark publication in 1970 is fitting for the vagueness of leadership:

*“By and large, so far we have followed (more or less unwittingly) the line of least resistance: broaden the meaning – and thereby the range of the application – of the conceptualizations at hand. That is to say, the larger the world, the more we have resorted to conceptual stretching, or conceptual straining, i.e., to vague, amorphous conceptualizations”* p (1034).

Evident in the interviews is the conceptual stretching of leadership. The ambiguity of the concept and of the practicalities of exercising leadership mean that *“almost everything can be squeezed in and benefit from the aura of leadership”* (Blom and Alvesson 2015). The heterogeneity of leadership, then, is an important theme to emerge from this thesis.

### 8.3.5 Reflexive point

My reflexivity during and after the interviews was mainly focussed on the dialogue that I shared with Charge Nurses. Specifically, I struggled with trying to find a balance between the analytic and participant perspective. Using the participant perspective means that I would listen to the interviewee and relay their statements here. For example, when I asked my first interview question about who leads resuscitations, Charge Nurse 0005 simply replied *“ehm, the consultant”*. The analytic perspective which I was becoming more accustomed to felt compelled to dig a little deeper. Having asked only one question in response – *“is that something that is static across all resuscitations?”* – Charge Nurse 0005 then offered a fuller description of her opinion:

*“And I mean like, we’ll facilitate resource. So if we need extra nurses or extra doctors, we’re the ones that generally sort that out. If we need equipment, if we need packs opening up, if we need equipment brought down from theatre or you know, the major haemorrhage protocol put out or anything like that. So, although the consultant is the medical lead, the nurse, the senior nurse is kind of doing leadership in the background as well if you know what I mean”*

This example epitomises the challenge I faced when trying to give primacy to the participant’s voice whilst also pushing for a deeper, analytic perspective. Similar to the power imbalance described by nurses in the resuscitation room, I felt I was probing my senior nursing colleagues who would otherwise be my managers in most other situations. I believed I had to push beyond the one or two-word answers and access the opinions such as the one provided above – the ‘thick’ descriptions (Geertz 1973) – yet as a comparatively junior nurse I questioned the extent to which I could do this.

I also reckoned with my development as a researcher and the effect that this had on my interview technique (Rowley 2012). I had read a usefully candid article by a fellow Ph.D student about their novice interviewer mistakes (Gesch-Karamanlidis 2015), and I too confronted my role in the interview process. I started out by asking 'who is the leader', thus framing my interview individualistically which I did not intend to do. By the end of the interviews, I was far more open, asking 'When you think about leadership in the resus room, how is it you think about that?'

After discussion with my supervisory team and further introspection I concluded that my thoughts were similar to other researchers and ethnographers, albeit their reflexivity would be contextualised to them. As I have previously mentioned, an interviewer cannot remove him or herself from the interview process. They will have *some* effect on the collection and analysis process. But the steps that I took to account for these factors means that striving for an analytic perspective whilst hearing the participant's voice is achievable.

## 8.4 Ethnographic findings

This final section will present the ethnographic findings in two stages. The first stage will describe the results of using the validated leadership taxonomy to quantitatively measure the extent to which leadership is shared. The second stage presents the substantive and analytic field notes in line with traditional ethnographic inquiry (Burgess 1982). This last section is the final layer of data, building on the questionnaire and interview findings above.

### 8.4.1 Stage 1 – Observing resuscitation using the leadership taxonomy

Twenty resuscitation episodes were observed using the leadership matrix. Each case was observed once to become familiar with the scenario. Using the leadership taxonomy during a second viewing, video segments were tagged with the type of leadership being displayed, when this occurred and who initiated the leadership behaviour. One hour of video footage was equivalent to approximately 2.5 – 3 hours of analysis.

An overview of these medical emergencies is provided in Table 8.1. As can be seen, a diverse range of resuscitation episodes were chosen. These patients attended at different times of the day, had different aetiologies and required specific interventions and team actions. This serves to highlight the variety of scenarios in which leadership is required.

With the centralisation analytic framework in mind (D’Innocenzo et al 2016), the first important result is the proportion of leadership behaviours that different team members exhibited. A total of 323 leadership behaviours were observed during the 20 resuscitation cases, averaging 16 leadership expressions per case (range 7 – 43). As can be expected, Consultants displayed the majority of leadership (58%). However, an interesting finding is that Nurses were the second most likely profession group to exhibit leadership (18%), followed closely by Registrars (15%) (Figure 8.16 – page 255).

Figure 8.16 communicates the aggregate proportion of leadership behaviours that were enacted by different team members whilst reviewing the 20 resuscitation episodes. However, this does not illustrate the extent to which leadership was centralised. For example, the non-Consultant staff could have expressed their leadership in only a handful of cases, meaning that leadership was solely provided by the Consultant in the majority of cases. Alternatively, resus staff could have evenly distributed their leadership across all the patient episodes.

<b>Patient episode</b>	<b>Patient presentation</b>
Case 1 File name: Cardiac arrest 1	Patient arrives at 15:01 66 y/o. Unknown patient with unknown downtime. Received bystander CPR. PEA arrest with 20 minutes of ALS. Now producing complexes on the defib machine.
Case 2 File name: Cardiac arrest 2	Patient arrives at 13:06 88 y/o. Unwitnessed asystolic cardiac arrest. Has received 50 minutes of ALS by the ambulance crew. Now in PEA. PMH nil.
Case 3 File name: Cardiac arrest 3	Patient arrives at 05:44 48 y/o. Chest pain since 10pm the night before. Previous MI ~10 years ago with one stent in situ. On arrival had a witnessed VF cardiac arrest, receiving one shock. Now has sinus rhythm.
Case 4 File name: Cardiac arrest 4	Patient arrives at 21:03 35 y/o. Has had chest pain since 7pm this evening. Patient is obese with severe asthma. Patient suffered cardiac arrest in the ambulance whilst travelling to the ED. Still in cardiac arrest on arrival. Has refractory VF and already received 6 shocks.
Case 5 File name: Cardiac arrest 5	Patient arrives at 11:25 77 y/o. Seen by GP 3 days prior with right sided flank pain. Last night was breathless. Known COPD patient. PMH of PE the previous year. Known has acute abdominal and flank pain. Patient has cardiac arrest in the department and dies.
Case 6 File name: Cardiac arrest 6	Patient arrives 12:30 35 y/o. Collapsed at veterinary surgery with cardiac arrest. Received bystander CPR. Coarse VF was initial rhythm and received 4 shocks. Now in sinus tachycardia.
Case 7 File name: Major Trauma 2	Patient arrives at 06:51 52 y/o. Patient was run over by a bin lorry and dragged under the axel of the vehicle. Has extensive traumatic injuries to lower extremities. The patient arrives hypotensive (BP 88/64) and tachycardic (HR 105).
Case 8 File name: Cardiac arrest 10	Patient arrives at 16:02 55 y/o. Witnessed cardiac in own home. Son gave bystander CPR until ambulance crew arrived. Patient has been in refractory VF and received 6 shocks. No known PMH and arrives on mechanical CPR device, still in cardiac arrest
Case 9 File name: Major Trauma 1	Patient arrives 23:33 40 y/o. The specialist pre-hospital Medic One team deliver this patient. Patient fell 3 floors out of a window, leading to hypovolaemic cardiac arrest. Has bilateral thoracostomies in situ. Regained cardiac output after 20 minutes of no cardiac output.
Case 10 File name: Major Haemorrhage 1	Patient arrives at 05:12 85 y/o. Had a large haematemesis at 03:30. Wife found patient covered in blood in their bedroom. Patient continued vomiting blood with paramedics and now lost about 1.5-2 litres of blood. Blood pressure is 91/42 and oxygen saturations are 81% on air. Patient has had previous pR bleeds.
Case 11 File name:	Patient arrives 01:05

Overdose 1	28 y/o. The patient was home this evening and reportedly took an illicit substance. Since then his girlfriend has observed unusual behaviour and the patient is making distressed noises.
Case 12 File name: Cardiac arrest 126	Patient arrives 12:23 62 y/o. Patient went for a run this morning and was found by their partner at 11:40 unconscious in their home. Patient had a VF cardiac arrest and partner gave bystander CPR. They received 6 shocks from the ambulance crew. PMH includes an MI ~4 years ago.
Case 13 File name: Cardiac arrest 131	Patient arrives at 12:03 50 y/o. The patient was being transferred between the Western General Hospital and the Royal Infirmary of Edinburgh when they had a cardiac arrest. Has been in PEA since their arrest in the back of the ambulance. Likely aspirated on arrival into the resus rooms.
Case 14 File name: Septic shock 1	Patient arrives at 14:00 91 y/o. Patient was out for lunch with son. Son found patient in toilet slumped over with laceration to left eye. Initially GCS 3, making respiratory effort. PMH includes recurrent chest infections.
Case 15 File name: Critical desaturation 1	Patient arrives at 22:17 45 y/o. The patient was at her dad's funeral when she fell over a step and broke her ankle. Compromised skin on the medial malleolus. Pedal pulses present. During procedural sedation goes into laryngospasm and requires urgent RSI.
Case 16 File name: Major Trauma	Patient arrives at 20:05 40 y/o. The specialist pre-hospital Medic One team deliver this patient. They jumped ~30 feet off a motorway bridge in a suicide attempt. Had a tension pneumothorax and now has bilateral thoracostomies. Received pre-hospital blood. Hypotensive at 70 systolic and tachycardic at 120. Patient was intubated on scene.
Case 17 File name: Major Trauma 47	Patient arrives at 12:40 63 y/o. Patient was riding a motorbike at 30-40mph when he swerved to avoid a car and hit a fence. Patient was able to remove his own helmet. Apparent injuries to the left sternum and left arm, with possible gross thoracic injury. Unknown cervical spine status.
Case 18 File name: Major Trauma 48	Patient arrives at 18:10 28 y/o. Earlier this afternoon the patient was running in open gorse and fell. Immediate open tibia and fibula fracture with large laceration to the thigh. The patient has a precautionary neck collar in situ. Vital signs have been stable throughout ambulance transfer.
Case 19 File name: Cardiac arrest streaming 1	Patient arrives at 14:24 55 y/o. Witnessed PEA arrest and received bystander CPR. No shocks were administered. Adrenaline was used and managed to return circulation. The patient is now making respiratory effort.
Case 20 File name: Rapid sequence intubation 26x	Patient arrives at 04:56 42 y/o. Pressed their personal emergency alarm button at 03:30 and was found by the 'falls team' at ~04:30. Found GCS 3 with blood coming from their nose. Paramedics querying alcohol excess. Complex PMH including pre-cordial catch syndrome and Asperger's

Table 8.1. Overview of the 20 medical emergencies observed whilst using the leadership taxonomy

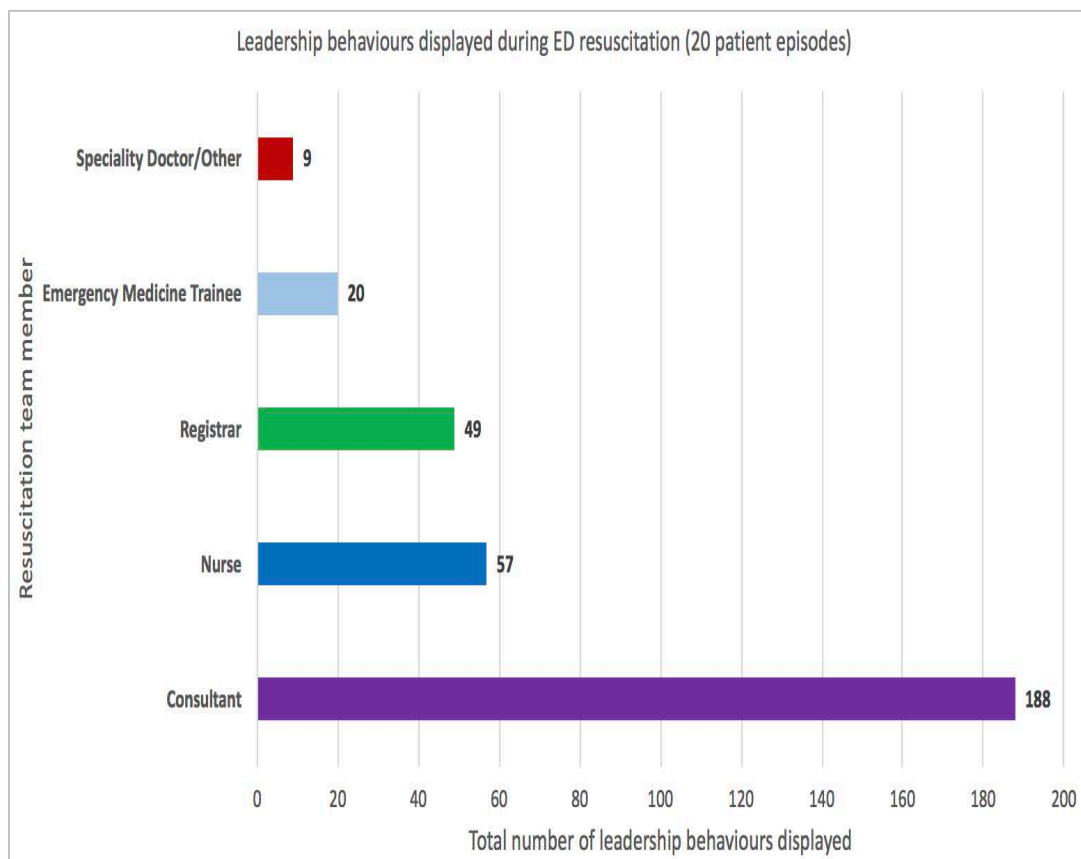


Figure 8.16. Total number of leadership behaviours displayed by different resuscitation team members (N=20 cases)

As Figure 8.17 shows over the page, the latter form of distribution was observed, where leadership was expressed by at least two team members in 19 of 20 resuscitations episodes. In 75% of resus cases (n=15), at least three different team members exhibited an identifiable leadership action. Five cases showed the most dilute centralisation with four separate team members contributing leadership. Only one resuscitation episode – Case 6 – was led by a single team member. This finding supports the first major theme of this research study that, in this context, leadership is plural (Theme 1).

Another idea that can be developed from the aggregate graph of Figure 8.16 above is the number of times in each case that team members provided leadership. For example, did the Consultants average out their 188 leadership behaviours over the course of the 20 resus episodes, or where they clustered in a limited number of cases that required more leadership?

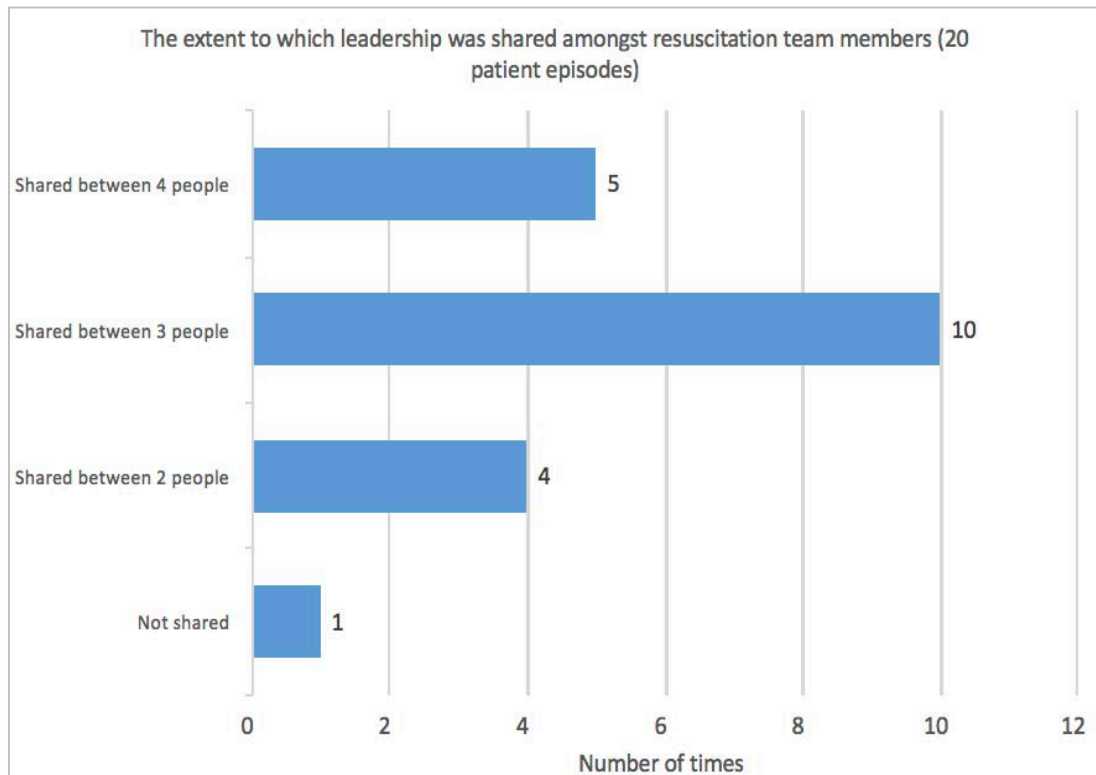


Figure 8.17. The number of times leadership was shared or not shared during resuscitation episodes (N = 20 cases)

Figure 8.18a displays this distribution, showing the number of times that Consultants were observed to initiate leadership in each case. As can be seen, two cases prompted over 25 discrete expressions of leadership from the Consultant, whilst cases 3, 11 and 18 did not involve any identifiable leadership from this profession group. Directly below this, Figure 8.18b shows the equivalent distribution for Nurses, followed by Registrars, Foundation Year Doctors and Speciality Doctors/Other (Figures 8.18c, 8.18d, 8.18e respectively).

To aid interpretation, it is possible to place these figures side-by-side as a summary graphic which allows for easier comparison of leadership behaviours for all team members in each case (Figure 8.18f – page 260). What can be gleaned from this snapshot is the inherent variation of who displays leadership and how many times they are required to enact this, thus supporting the second major theme of this study that leadership is contingent (Theme 2).

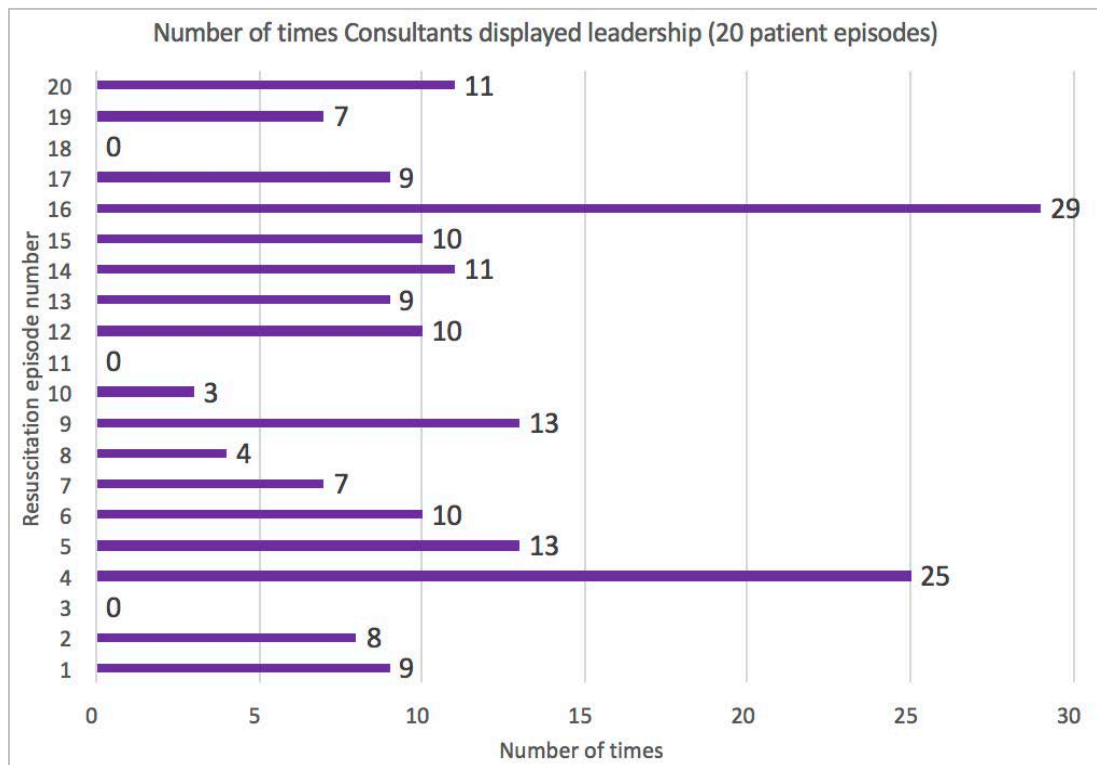


Figure 8.18a. Number of times per resuscitation episode Consultants expressed leadership behaviours (n = 20 patient episodes)

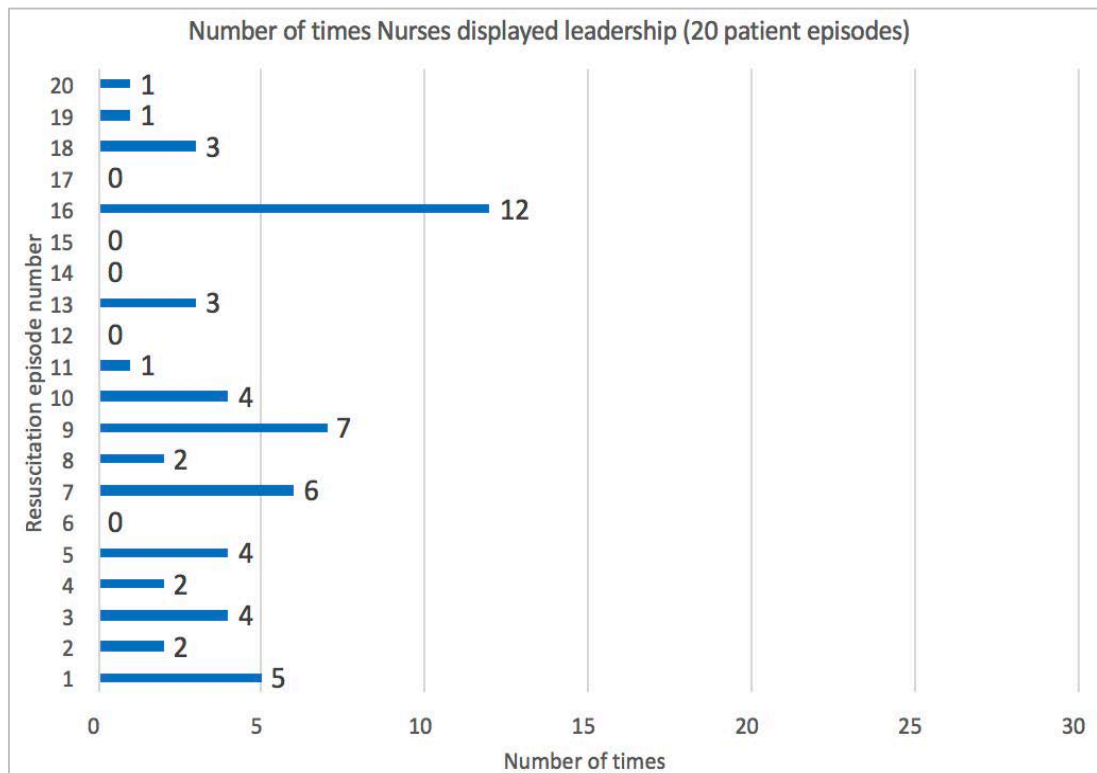


Figure 8.18b. Number of times per resuscitation episode Nurses expressed leadership behaviours (n = 20 patient episodes)

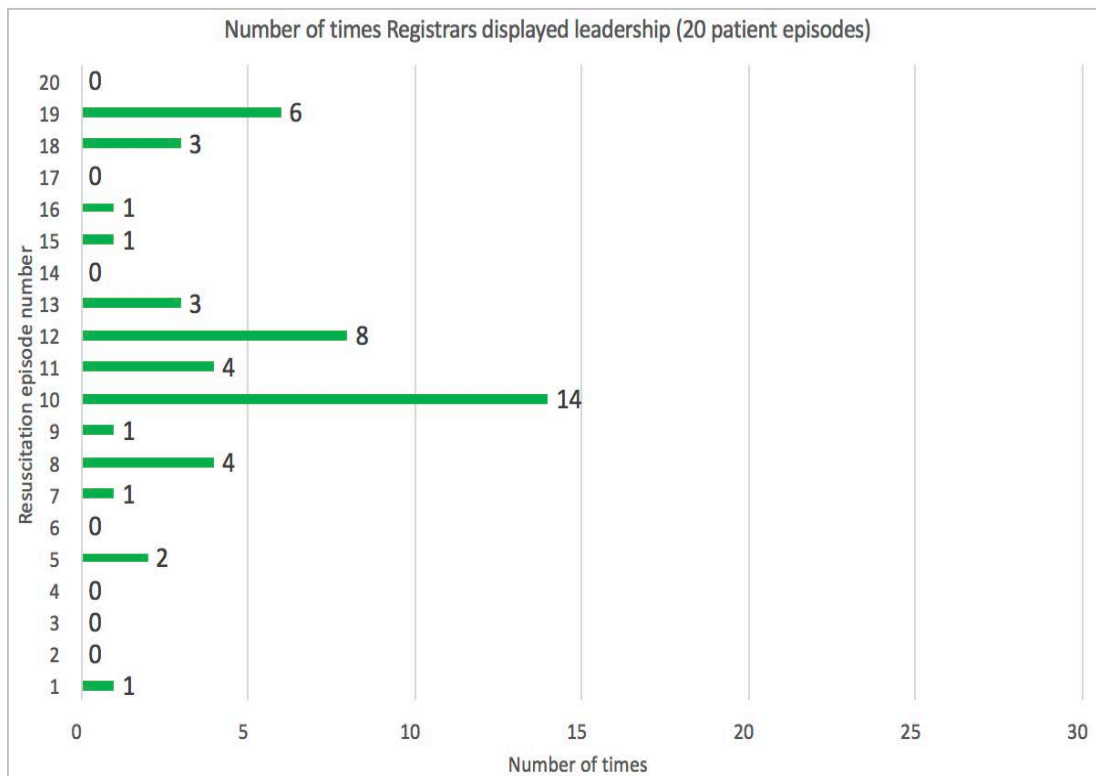


Figure 8.18c. Number of times per resuscitation episode Registrars expressed leadership behaviours (n = 20 patient episodes)

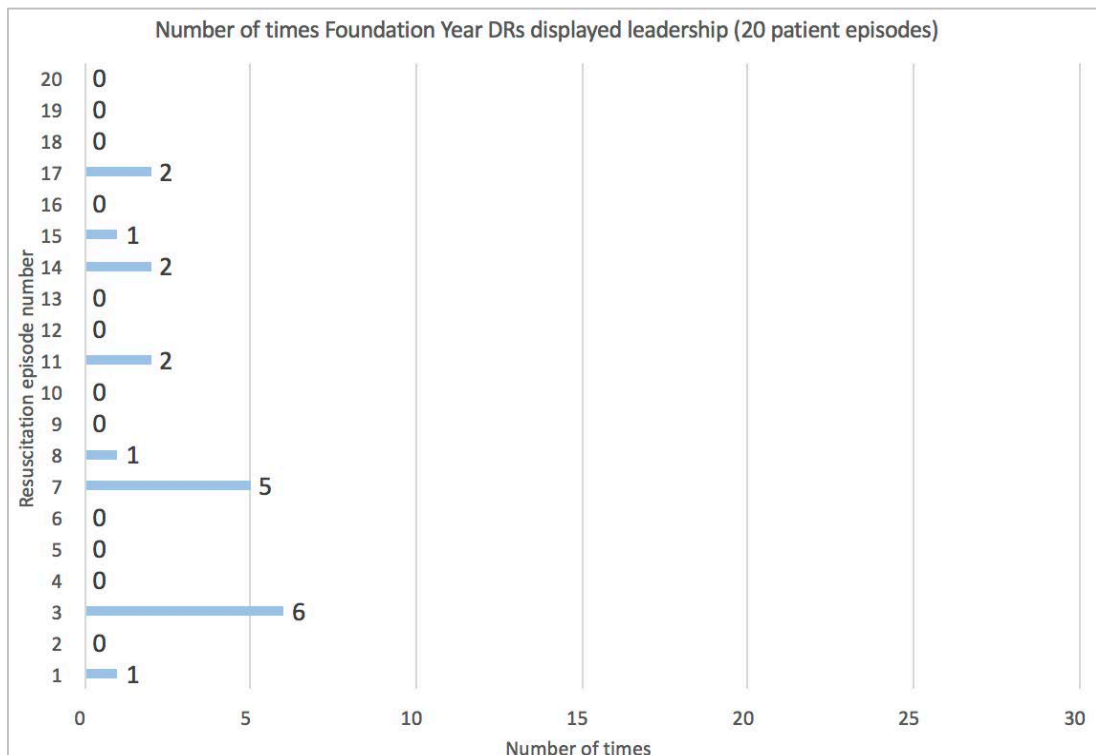


Figure 8.18d. Number of times per resuscitation episode Foundation Year Doctors expressed leadership behaviours (n = 20 patient episodes)

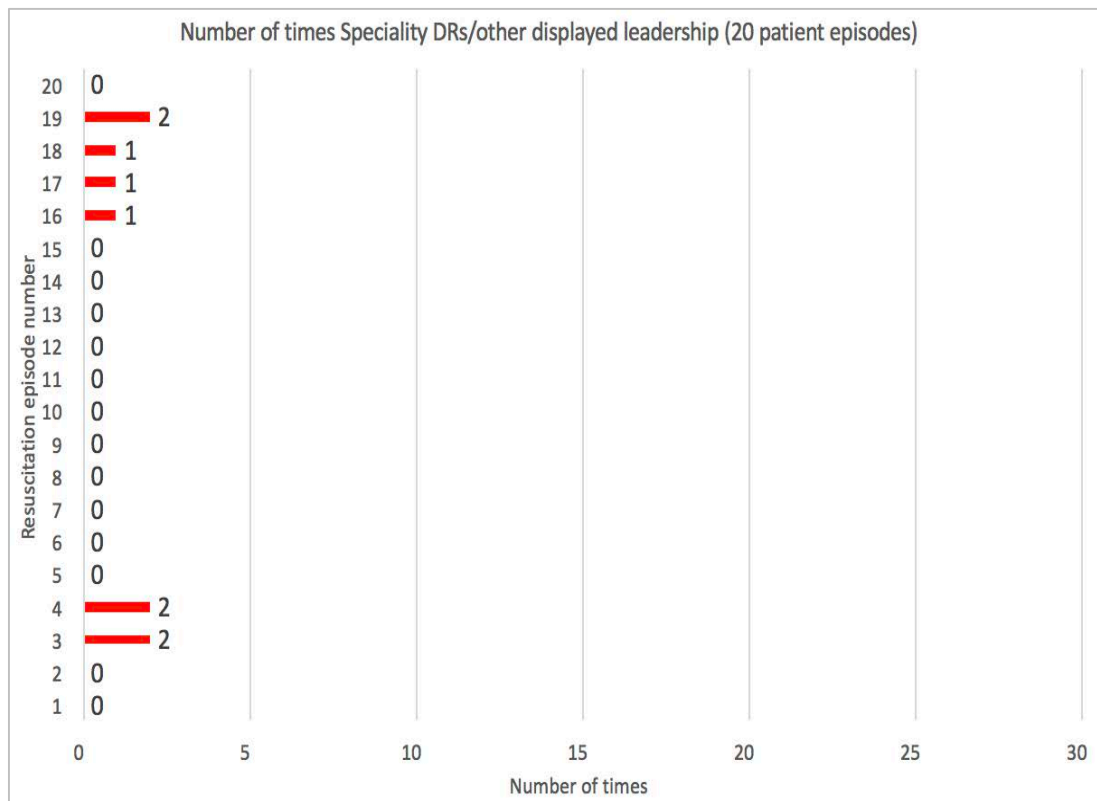


Figure 8.18e. Number of times per resuscitation episode Speciality Doctors/Other expressed leadership behaviours (n = 20 patient episodes)

In addition to reporting these data mapped against the team members who displayed the behaviours, these data have been mapped against the 6 categories of behaviour that formed the leadership taxonomy which was presented in Part 1 of the findings chapters above. By mapping the 323 observed actions by team member and category, it is possible to understand who initiates leadership as well as the patterns of behaviours that are actually being utilised.

Similar to the aggregate graph of behaviours mapped against team member, Figure 8.19 illustrates the summative graph of the number of times each behavioural category of the leadership taxonomy was observed. The directive categories – (L2) makes decisions/provides plan and (L3) manages/directs resources – were the most common actions, accounting for 58% of all observed behaviours. The least common observed category was L4 – ‘maintains professional and calm resus room’ (3%).

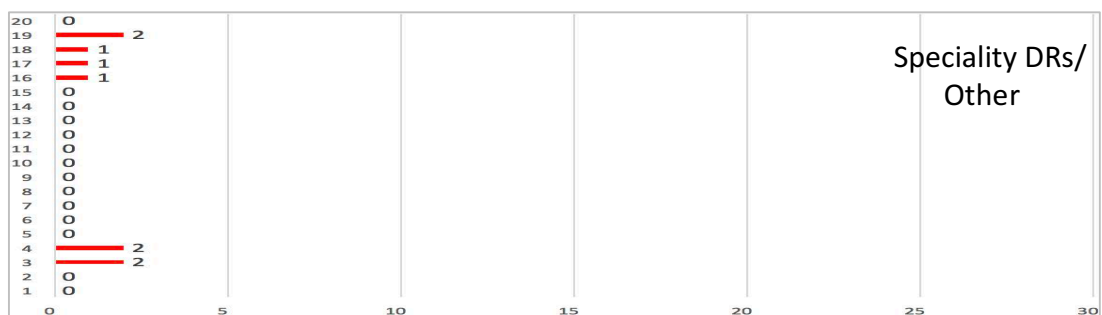
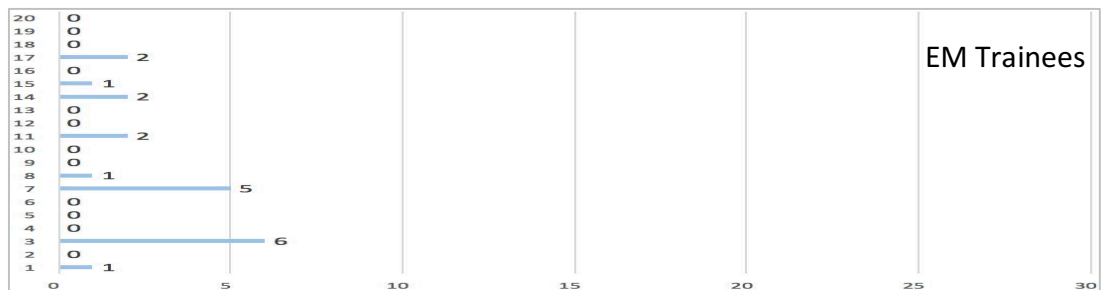
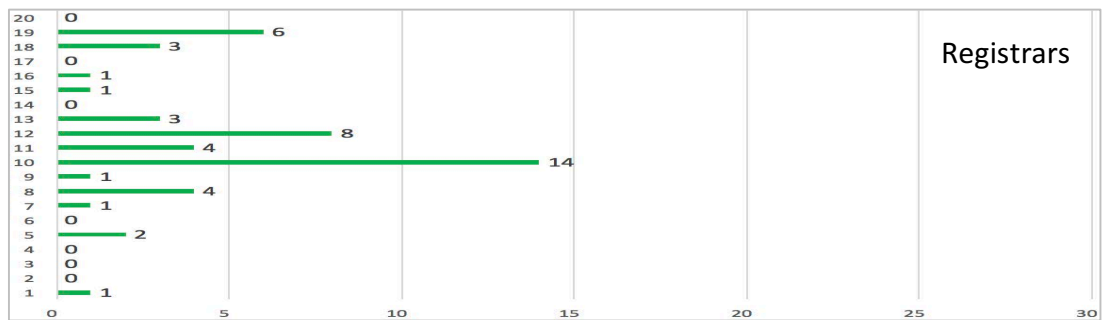
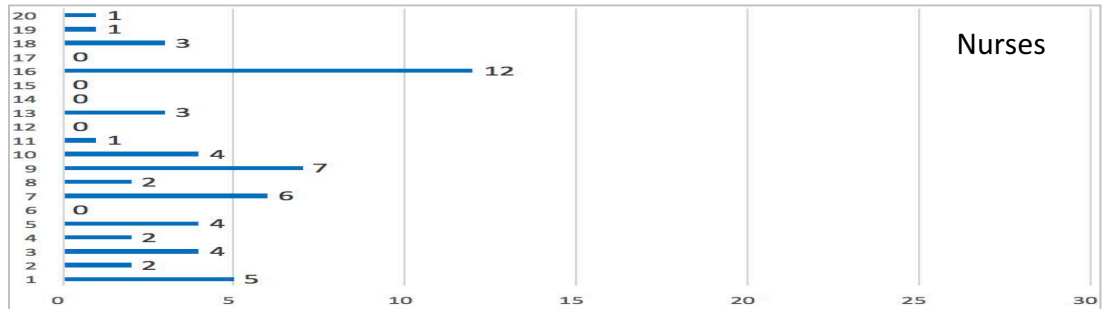
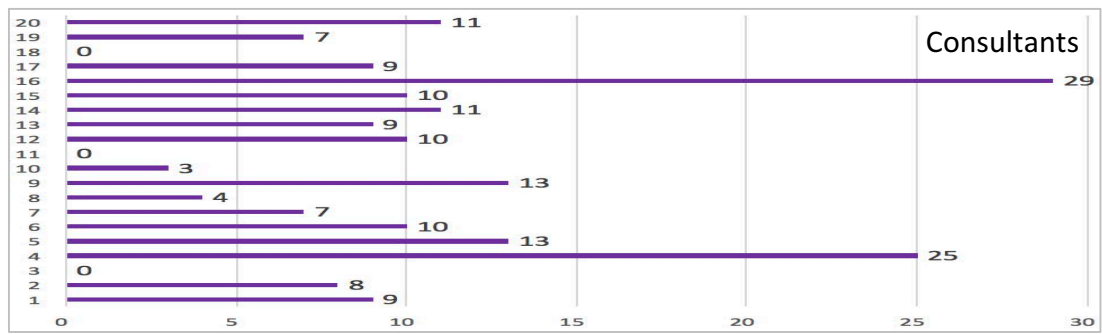


Figure 8.18f. Summary graph of team members' leadership behaviours in each case

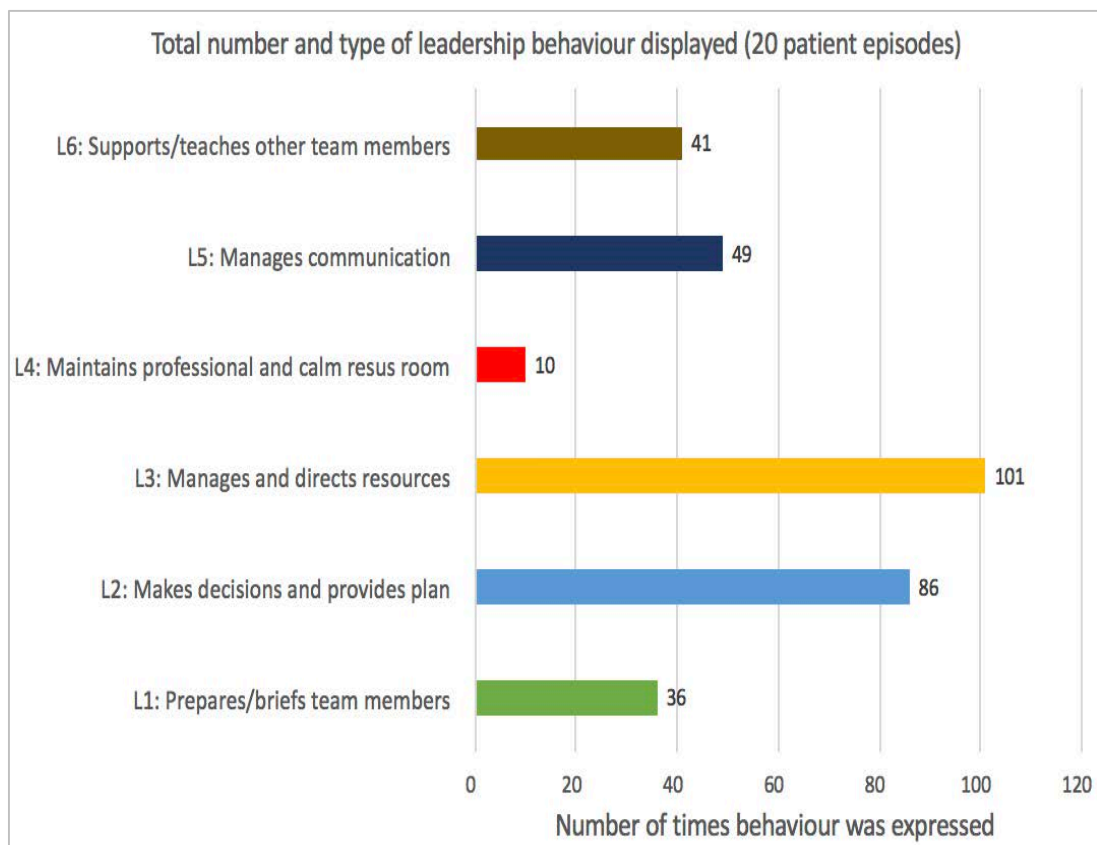


Figure 8.19. Total number of times each leadership category was displayed (N=20 cases)

This aggregate graph can again be divided into the individual categories to show how many times each category of behaviour was observed on a case-by-case basis. Figure 8.20a depicts the first category L1 (prepares/briefs team members), Figure 8.20b depicts the second category L2 (makes decisions and provides plan), whilst Figures 8.20c, 8.20d, 8.20e and 8.20f depict the remaining behavioural categories respectively. It can be seen, for example, in the first figure that preparatory behaviours (L1) were absent in cases 5, 8, 10, 14, 18 and 20. However, they accounted for nearly 50% of all leadership in case 1.

To optimise interpretation, a summary graphic that allows for easier comparison is provided in Figure 8.20g – page 265. It is clear that there is considerable variation in the number of times that each type of leadership is required, thus lending further weight to the theme emerging from this research study that leadership is a contingent phenomenon (Theme 2).

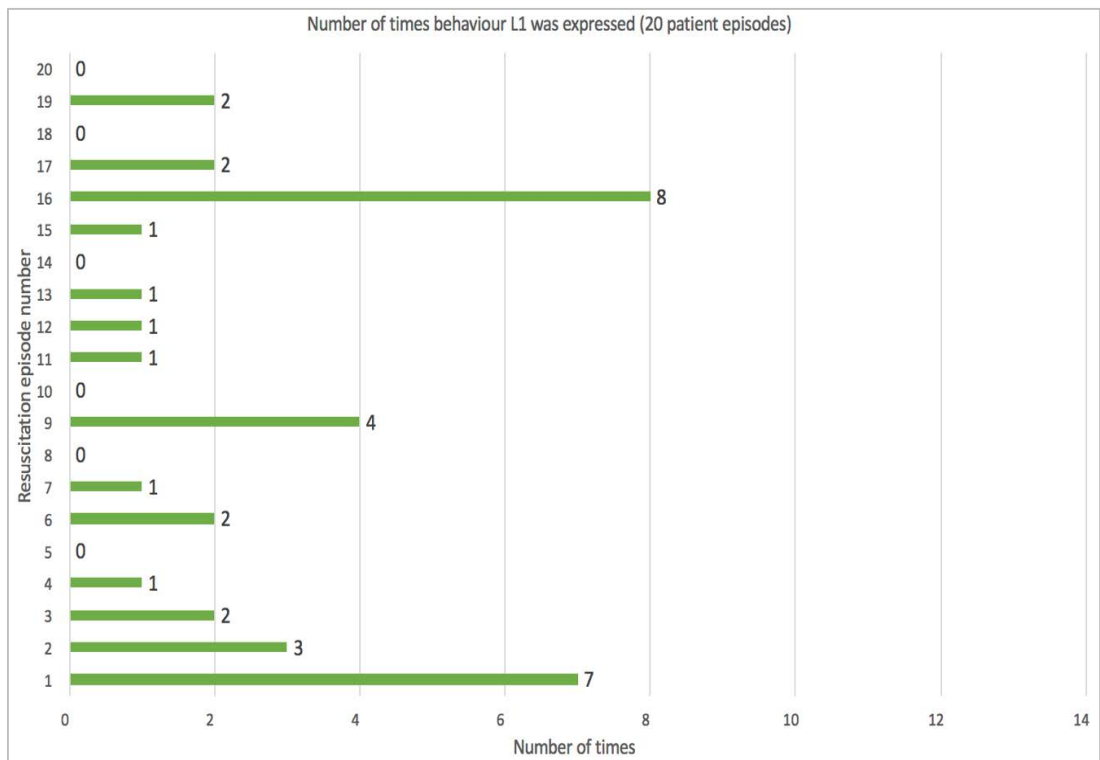


Figure 8.20a. Number of times per resuscitation episode that behaviour L1 'Prepares/briefs team members' was expressed (n = 20 patient episodes)

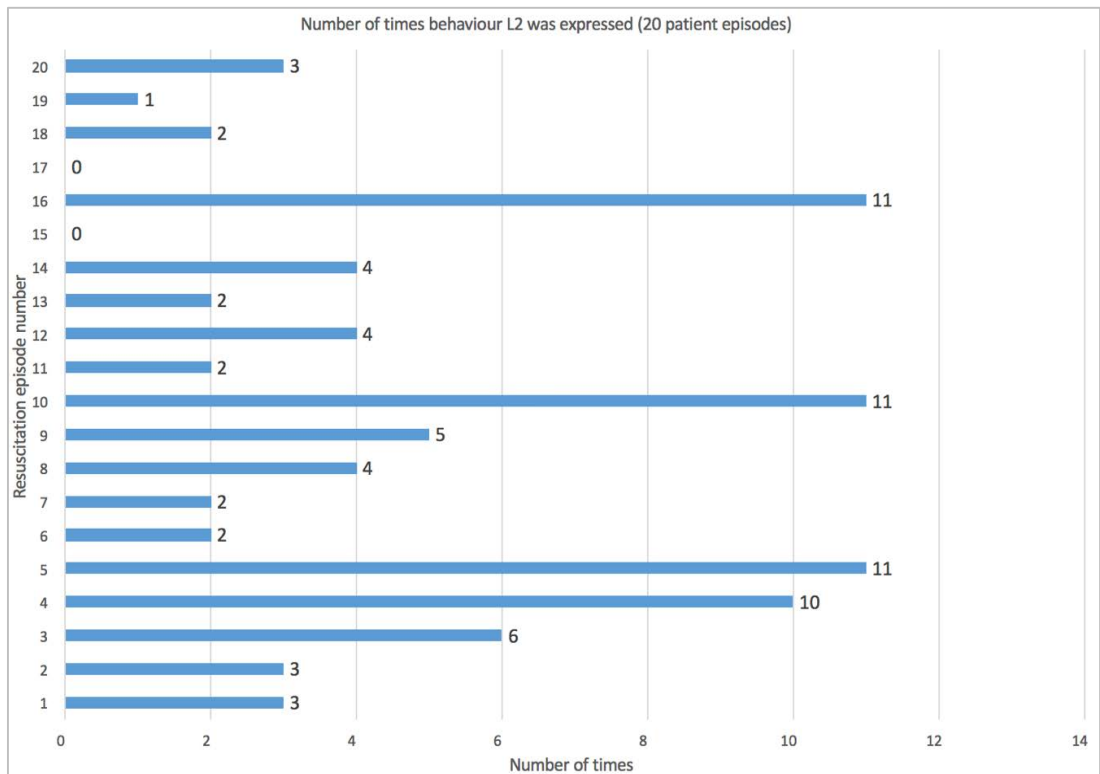


Figure 8.20b. Number of times per resuscitation episode that behaviour L2 'Makes decision and provides plan' was expressed (n = 20 patient episodes)

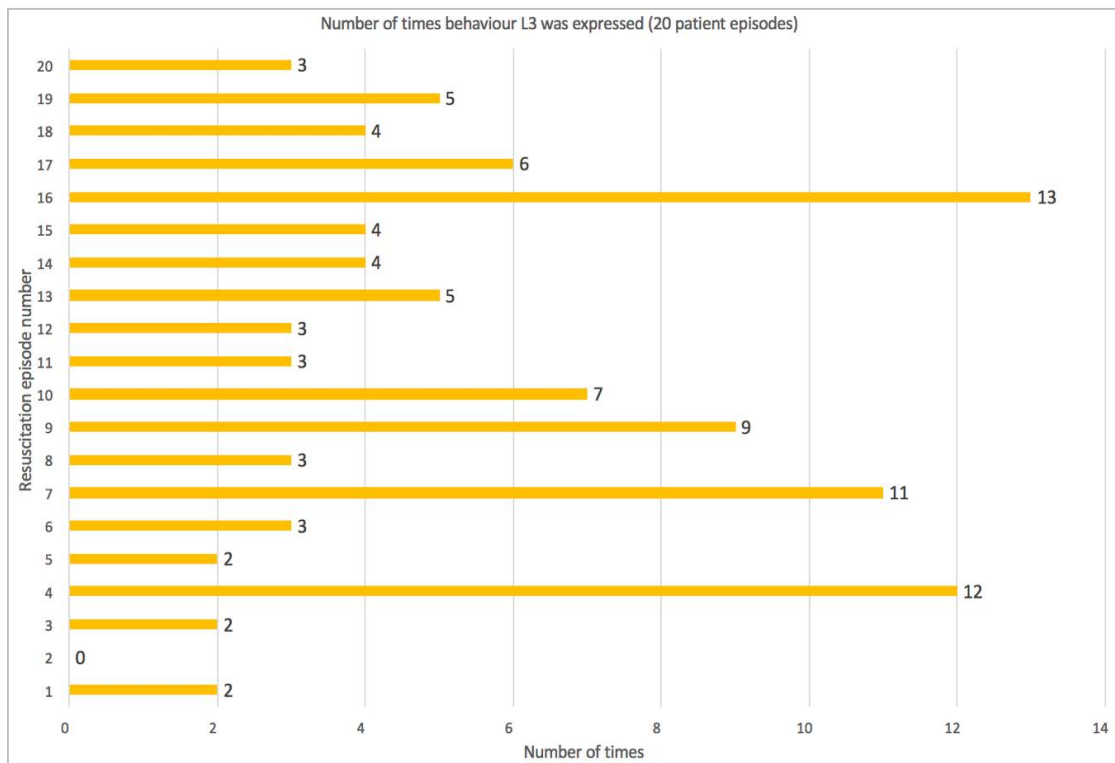


Figure 8.20c. Number of times per resuscitation episode that behaviour L3 ‘Manages and directs resources’ was expressed (n = 20 patient episodes)

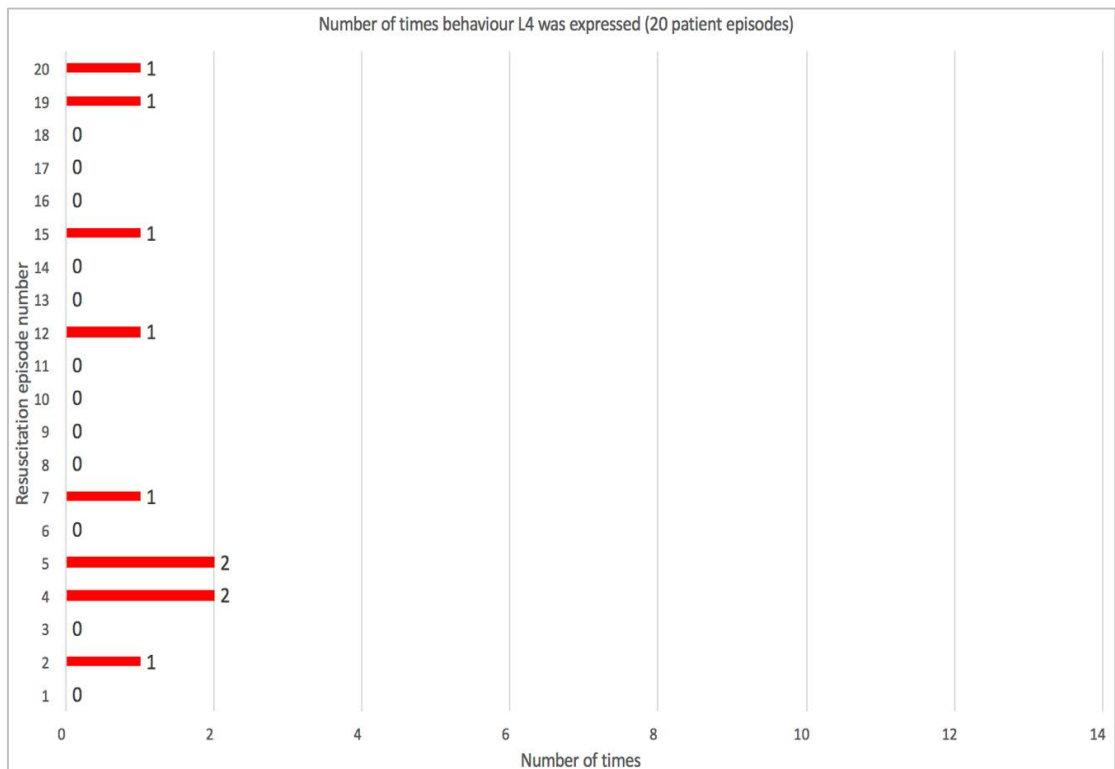


Figure 8.20d. Number of times per episode that behaviour L4 ‘Maintains professional and calm resus room’ was expressed (n = 20 patient episodes)

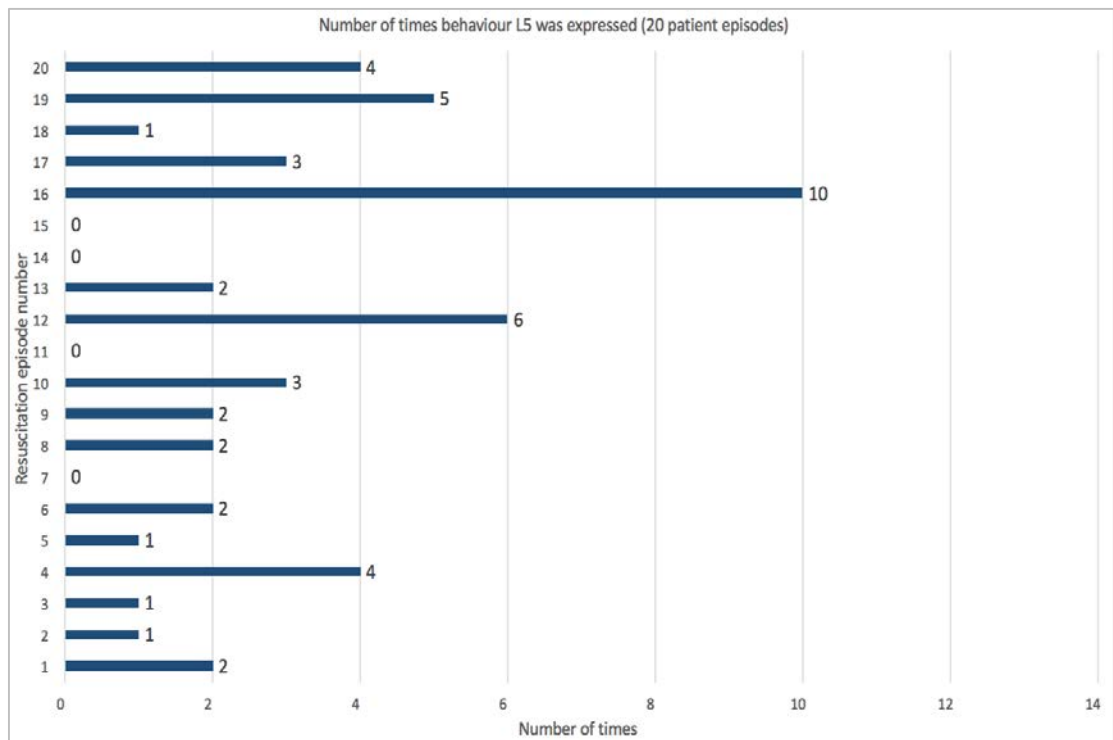


Figure 8.20e. Number of times per resuscitation episode that behaviour L5 'Manages communication' was expressed (n = 20 patient episodes)

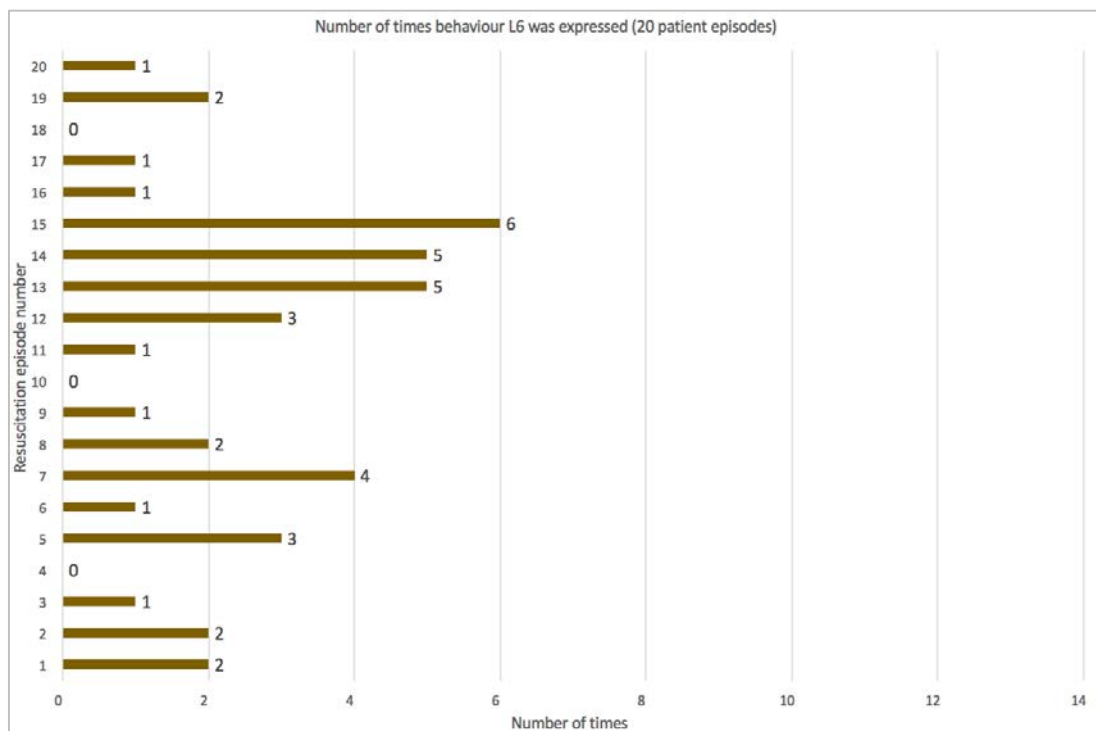


Figure 8.20f. Number of times per resuscitation episode that behaviour L6 'Supports/teaches other team members' was expressed (n = 20 patient episodes)

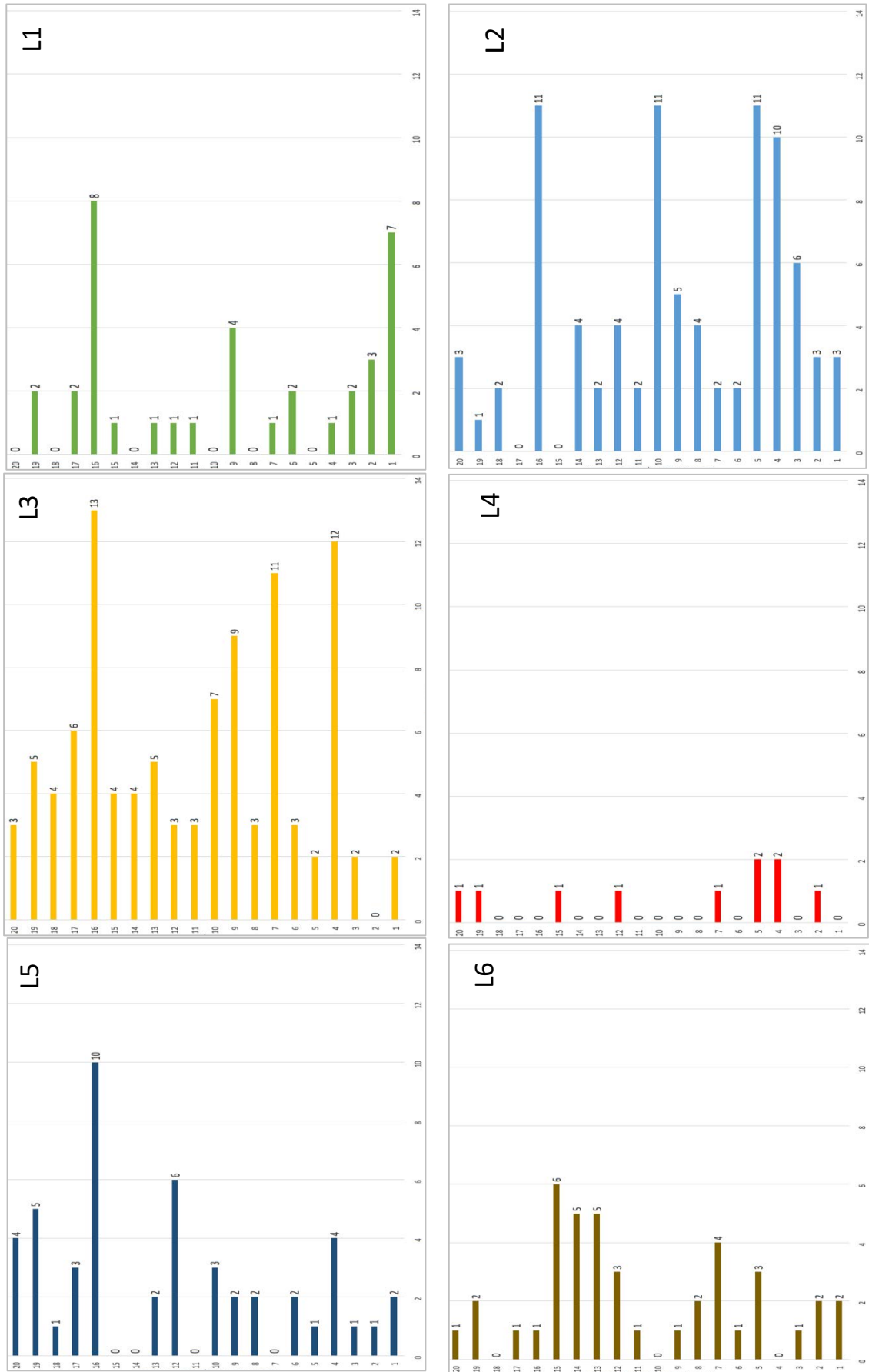


Figure 8.20g. Summary graph of behavioural categories in each case

The final quantitatively-orientated result from using the leadership taxonomy whilst observing the resuscitation cases relates to the order in which team members exercised their leadership. Reporting the order or sequence of overt leadership expressions communicates the manner in which individuals step in and out of a leadership role. For instance, scoring a sequence of 10 discrete leadership behaviours in a row from a Nurse followed by a sequence of 8 discrete behaviours from a Registrar would suggest that a formal handover of leadership has taken place. However, if the sequence measures as individual behaviours from multiple team members, this would suggest that the resus staff are dynamically contributing an element of leadership and then withdrawing to allow another team member to exercise their form of leadership.

Following the same profession colour coding system that has been used so far, an example of this sequencing is provided in Figure 8.21a. The graph illustrates that the 16 expressions of leadership that were scored during episode 1 were shared between the Nurse, Consultant and Registrar, and that multiple exchanges of leadership took place. Contrasting this, episode 2 had 10 leadership expressions which were exchanged less frequently, suggesting that the Consultant centralised leadership as the resus case progressed.

The final graph in this section presents the results of sequencing the order of every leadership behaviour that was scored during the 20 resuscitation cases. This figure highlights the extent of leadership variation between resuscitation cases. First, the divisions in each bar column signal a wide range in the number of times leadership was expressed; case 16 is divided into its 43 separate markers of leadership whilst in case 11 there were only 7. Similarly, different patterns of leadership can be seen to develop during these cases. For example, in case 9 the Nurse clustered their leadership skills at the start of the episode, transitioning to the Consultant as the case progressed. This is markedly different from case 19, where 4 of the first 6 leadership markers were exhibited by 4 different team members. In summary, this graph depicts the reality of leadership as observed in the context of ED resuscitation.

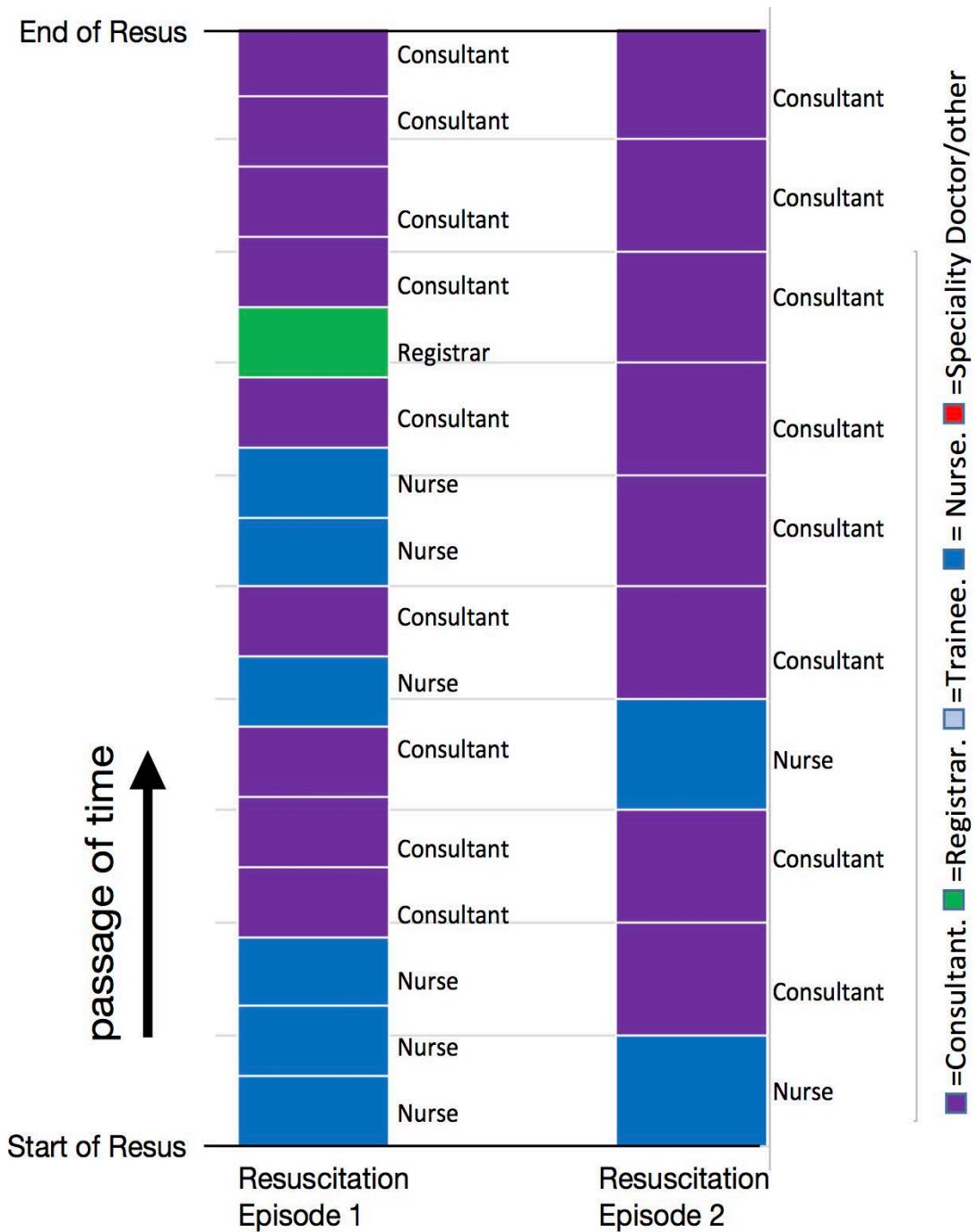


Figure 8.21a. Sequence of leadership expressions by profession group during resuscitation case 1 and 2.

Coloured rectangles show the order in which team members exhibited a leadership behaviour. The colour of each rectangle denotes the profession group. The height of each rectangle shows the leadership behaviour as a fraction of all the behaviours scored in that episode.

Episode 1 = 16 behaviours observed. Episode 2 = 10 behaviours observed



Figure 8.21b. Sequence of leadership expressions by profession group for all resuscitation cases (n=20 patient episodes)

#### 8.4.1.1 Analysis

Building on the previous findings sections, using the taxonomy to measure the extent to which leadership is shared illustrates that in the majority of resuscitation scenarios multiple people contribute their leadership skills, thus supporting the first global result that leadership is shared (Theme 1). Whilst some resuscitation scenarios are fairly centralised towards the Consultant's leadership, 75% of cases observed had 3 staff seamlessly enacting leadership.

This finding is an important point in terms of reflecting on the theoretical implications of these results. As outlined in the literature review chapter, Dinh and colleagues' (2014) review of extant theoretical categories in published studies highlighted that approximately 75% of theories use the individual as their variable unit. Here, this thesis has found that the majority of leadership is not individualistic; rather, it is best conceived theoretically as a collective team effort.

The more detailed graphs of Figure 8.19a-e, 8.20a-f, and particularly 8.21b, provide evidence to support the second global finding that leadership is contingent (Theme 2). The contingencies here are evidenced by the variation in these graphs. First, there is variation in the type and frequency of expressed behaviours (Figure 8.19a-e). Supported by the interviewees responses, some resus scenarios may require very directive leadership, whilst others may require more supportive and educational behaviours. Second, different staff members organically step in and out of the leadership role, providing more or less leadership as the situation requires (Figure 8.20a-f). Last, the initiation of leadership has been observed here in granular detail, tracking the step-by-step expression of specific behaviours by different team members (Figure 8.21b). Of the 323 leadership markers observed, 114 (35%) were initiated by someone who had not scored the previous leadership marker, signalling that an

exchange of leadership had taken place. This provides further evidence of the contingencies that staff respond to when delivering resuscitative care.

#### 8.4.2 Stage 2 – Field notes during observations of resuscitation

The second stage of providing the ethnographic findings will be presented here using field notes. In keeping with this thesis being framed as a modern ethnography, key excerpts from the field notes will be used rather than simply reporting all field notes akin to historic manuscripts; over 15,300 words have been written as live field notes during the observation of 20 resuscitation episodes. These data are being triangulated with the other data sets to provide a comprehensive ethnography of leadership.

##### *8.4.2.1 Theme 1 – Leadership is plural*

A cardiac arrest exemplified the sharing of leadership, highlighting that this can be done through implicit co-ordination rather than explicit verbalisation between two people stating they are assuming the leadership role.

##### Event:

*Case 9 – Major Trauma 1 at 23:33*

##### Clinical handover as described in resuscitation room:

*Medic One trauma patient. Initial handover before patient arrival is 40 year old, was in cardiac arrest after falling 3 floors. They have done bilateral thoracostomies and now have an output back. They have requested initiation of Code Red, CT ready and 2 chest drains set up. When Medic One arrives they clarify that the patient was in cardiac arrest for about 20 minutes and got ROSC just as they were about to PLE.*

##### Note 1

*In this case, within the first minute of the team assembling in the resus room, the Charge Nurse has tasked two people to activate the code red protocol, asked another staff member to prepare 2 chest drains, asked for the rapid infuser to be set up and given a briefing to the medical staff. When the Registrar arrives, who is the formal leader in the room now, the Charge Nurse still appears to retain her leadership role, by pointing to the Registrar and the Trainee and saying 'can one of you do code red and one of you do CT'. This is said with an air of an order, rather than a suggestion.*

### Note 2

*The senior Nurse in this trauma case is providing the main direction for the team. This is a good example of when the case 'feels' as though there is Nurse leadership. How does this translate into our tool? The more videos I watch, the more I reflect that our tool is not necessarily 'who is the formal leader', but 'who is displaying leadership'.*

### Note 3

*As in interesting example of the subtly of sharing leadership, when the Consultant arrives in the room he instantly clocks which Charge Nurse is in the room and can see she is leading the team's efforts. Without verbalising that he is now going to direct the team, within 30 seconds of being in the room he gives a series of orders that show the team he expects the functioning of the team to be controlled by him:*

*23:43:12 'can you start the clock please'*

*23:43:21 'forget that we've got it over here'*

*23:43:23 'ok if we could go across on the scoop and then if we could lose the scoop'*

*23:43:35 'can we just leave (name of Registrar) in charge of the airway for now' 23:43:41 'right let's get hold of a bit of scoop everybody please'*

*23:43:43 'gentleman (anaesthetic help) can we just focus on getting him across first' 23:43:52 'can we get this scoop off asap'*

23:43:56 'now then this tube just needs pulled back slightly'

#### 8.4.2.2 Theme 2 – Leadership is contingent

Two resuscitation cases highlighted the fundamental influence of situational factors on the expression of leadership. The first case was a cardiac arrest patient which, in theory, should induce centralised and directive leadership as there is a requirement for clinical interventions to be delivered quickly and in the right order. The second case was patient who had a tibia/fibula fracture which, in theory, should induce a less prescribed form of leadership as the presentation is not a life-threatening emergency. The contingencies of the scenarios, however, illustrate the effect of situational factors.

##### Event:

Case 12 – Cardiac arrest 126 at 12:23

##### Clinical handover as described in resuscitation room:

62 y/o who was out for a run this morning. About 10 minutes after he got back from his run, their partner heard them making funny sounds. They went into the bedroom and found them floor not really breathing at 11:40. They were well before this episode, not complaining of feeling unwell then or immediately after their run. The crew arrived at 11:45, patient was in VF. They had 6 shocks, 2 lots of adrenaline and 300mg of amiodarone. The partner did bystander CPR. Received amiodarone after the 4<sup>th</sup> shock. ROSC at 12:00. They are now making respiratory effort through, so no intubation. The crew did a 12 lead ECG after ROSC. HR was about 80, respiration rate at about 18 per minute. BM was 4.7. BP 91/60. Patient had a mild MI 4 years ago. Patient was not aware that he had it. Generally fit and healthy. [Figure 8.21 is the patient's vital signs shortly after arrival].

##### Note 1

*Despite the severity of the patient's condition, the Registrar and Consultant are able to share leadership and actually have dialogue about how they can optimally do this.*

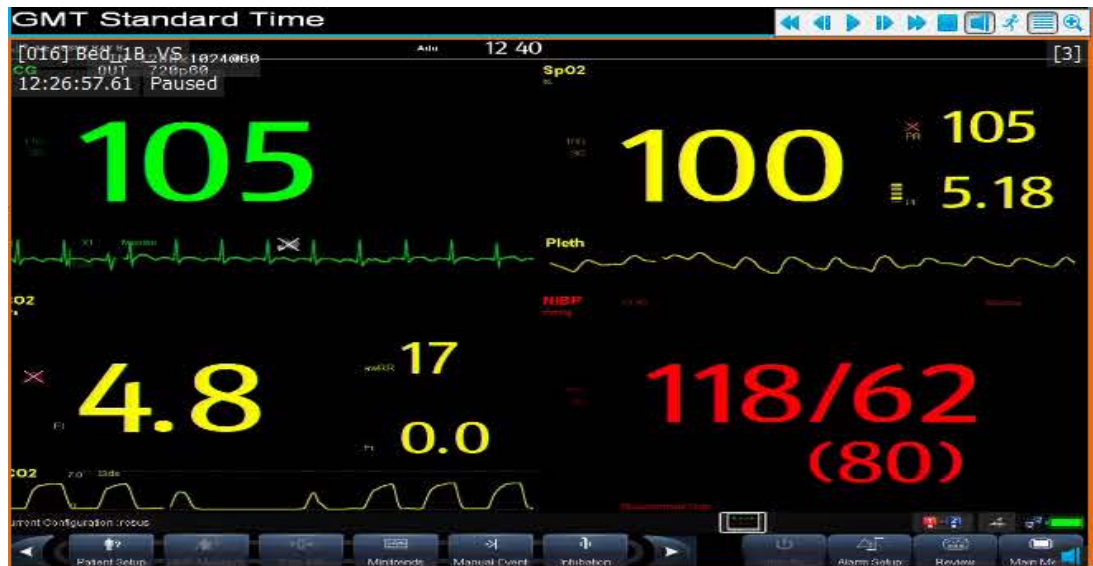


Figure 8.21. The patient's vital signs captured on the video system shortly after arrival at 12:26:57

### Note 2

*12:30:38 Consultant: 'so (name of Registrar), so what tends to happen at this stage, is that things can sometimes degenerate a little bit and lose focus. Because everybody kind of thinks the patient is reasonably stable. So at that point, I think it's very important from your leadership for you to kind of say '(name of Consultant) I need you to do this for me, (name of Nurse 3 I need you to do that' – very directive, you know what I mean – 'and how we can help you with the next steps'*

### Note 3

*This case is quite potent in terms of their ability to discuss their leadership during the care of a critically ill patient – the Consultant is leading (teaching) the Registrar about how to lead effectively.*

*Note 4*

*Such is the relaxed nature of this case that the team share some humour:*

*12:31:30 Consultant: 'you've Nurse 1 and Nurse 2. Nurse 1 is currently drawing up drugs'*

*Registrar: 'fantastic. Did you make the drugs choice yourself?'*

*Consultant: 'Nurse 1 is independent'*

*Everyone laughs.*

*Nurse 1: (whilst laughing) 'shout away'*

In contrast, the second case evolved from a non-life-threatening emergency into a situation that required very centralised leadership.

*Event:*

*Case 15 – Critical desaturation 1 at 22:17*

*Clinical handover as described in resuscitation room:*

*45 y/o attending their dad's funeral and missed a step. Felt a crack. Compromised skin on the medial malleolus, pedal pulses present. BP is high but it is normally high. Normally suffers from anxiety. Had 10mg of morphine with the crew to settle the patient down, which they had about 10/15 minutes ago. Patient can wiggle their toes.*

*Note 1*

*The start of this case is rather slow, essentially preparing for the procedural sedation. This involves liaising with orthopaedic doctors, ordering x-rays etc. In this sense, there is no overt leadership for a while during this case, but it is understood that the Registrar is leading. [See Figure 8.22 for the patient's vital signs at this point].*



Figure 8.22. The patient's vital signs prior to procedural sedation at 22:34:41

Note 2

*The patient receives the 1<sup>st</sup> dose of ketamine at 22:47:59*

Note 3

*The full dose of ketamine is given at 22:52:50*

Note 4

*Shortly after (22:54:07) the Consultant voices 'in her, I'd quite like to know she is not apnoeic'. He then adds to end-tidal CO<sub>2</sub> sensor to the O<sub>2</sub> mask.*

Note 5

*The Consultant looks at patient 22:55:59 – the monitor still reads the sats at 99%. At this point Nurse 1 notices that the patients hand has moved out the way, almost arching out of the bed. The arm appears stiff*

Note 6

*The Consultant looks again at the patient 22:56:19 and looks at the monitor. At this point the sats are now 96%. The sats then drop to 93% one second later and the Consultant looks a little more concerned. He speaks to the patient and does an airway manoeuvre. The Consultant is moving the patient's arm*

*and appears to be attempting to elicit a response. Consultant looks at the monitor again, sats are now 91% at 22:56:37.*

Note 7

*The sats then disappear of the monitor, returning exactly at the time when the Consultant looks at the screen again 22:56:55. Sats are still saying 91%, but the Consultant is clearly not happy. I feel like this is witnessing Type 1 decision making – this is the gut instinct in action. He can't quite put his finger on why he feels uneasy, but he does.*

Note 8

*At 22:57:05 the screen shows sats of 52%. The consultant sees this at 22:57:08. At this point there is marked change in tone in the room as the Consultant firmly, but calmly, directs the team:*

*22:57:11 'Two seconds guys. I need to make sure she is not in laryngospasm'*

*22:57:16 'can I please have the bag valve mask'*

*'bag valve mask. Yeah I think she has laryngospasm'*

*'full flow oxygen thanks. Can I get some sux drawn up'*

*'can I get some sux drawn up now thanks'*

*'ok no pulse, I need sux now thanks. Start CPR please'*

*'ok I need the sux right now please'*

*'ok I need the sux right now please'*

Note 9

*After a short period of CPR, the Consultant feels a pulse and intubates the patient. After discussing with ITU, they extubate the patient and explained what happened.*

These two resuscitation cases would usually be expected to prompt certain types of leadership. However, the contingencies of these episodes altered the pattern of expected behaviours, influencing who enacted

leadership and how they did this. Consider the sequence of leadership behaviours in Case 12 and 15 (Figure 8.23). Prior to the patient's deterioration in the latter, all-but-one behaviour was focussed on supporting and educating less experienced team members – how to best reduce a fracture, control the

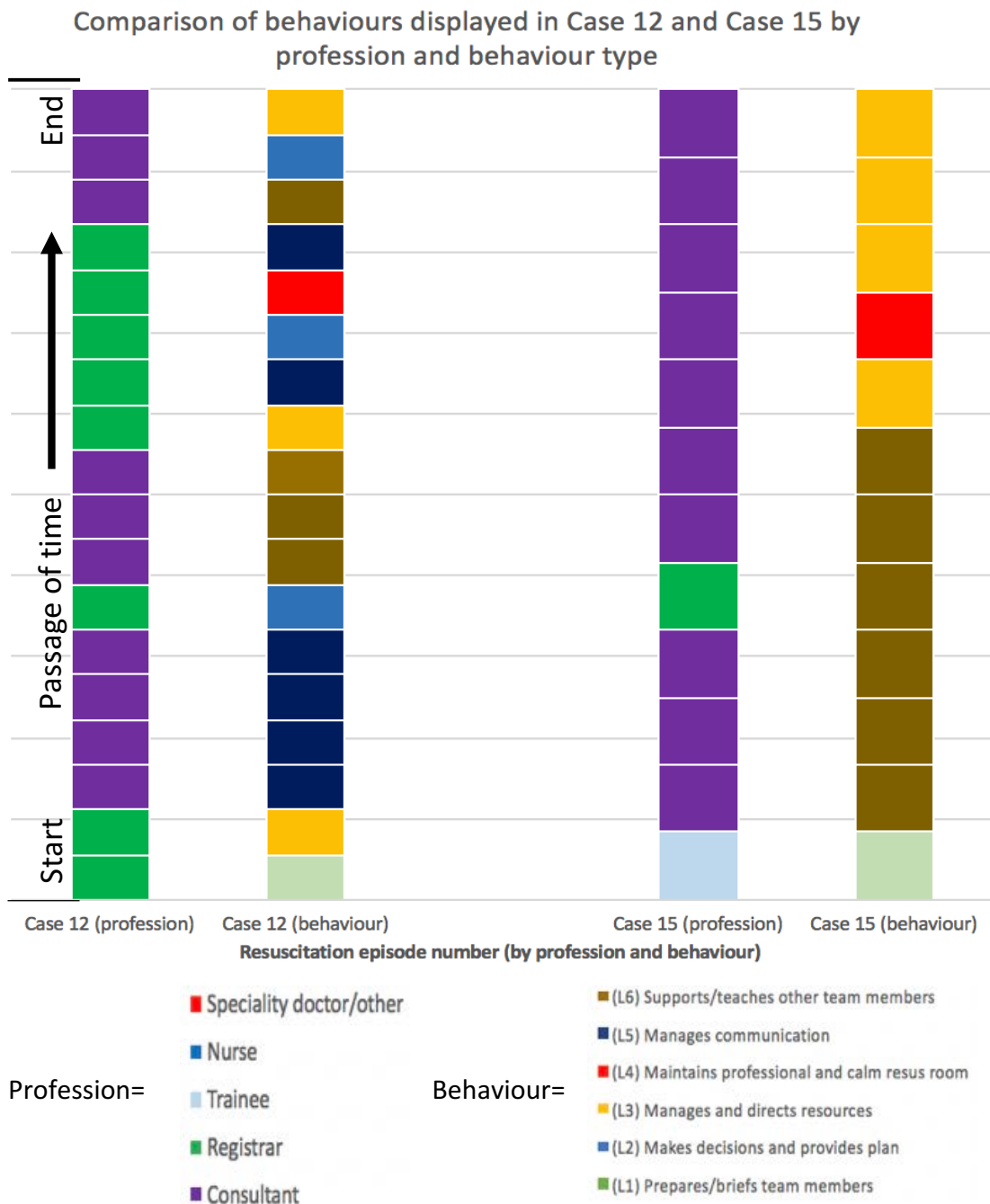


Figure 8.23. Comparison of behaviours displayed in Case 12 and 15 (by profession and behaviour type)

resus room and what drugs are best to use. When the patient became severely unwell, leadership became centralised to the Consultant who started providing immediate instruction to the team. Similarly, in Case 12, despite the patient's acuity the Registrar and Consultant were able to exchange leadership 5 times, express all leadership categories and bring some humour into the resus room.

As an interesting coincidence, the Consultant in Case 15 was one of the interviewees for this research study and, as quoted in the interviews section above, described some resus cases as a '*bit of a free-flowing soup of leadership*'. This was indeed the form that leadership took during the beginning of Case 15. However, as the situation changed, the requirements of leadership evolved in tandem, highlighting that leadership is contingent.

#### *8.4.2.3 Theme 3 – Distinction between nurse and physician leadership*

In most resus cases it was observed nursing and medical staff delivered their leadership differently. Specifically, nurses often assumed the role of a 'silent' leadership that was described in the interviews.

##### Event:

*Case 5 – Cardiac arrest 5 at 11:25*

##### Clinical handover as described in resuscitation room:

*77 y/o who was seen by his GP 3 days prior regarding bruising on his right flank. He is on warfarin. GP said the bruising was due to warfarin and no further action was taken. Last night they were breathless, and has COPD. They spent the night on the back step hunched over and vomited 5 times. Their spouse called the GP this morning as the bruising had moved from the right flank round the front of their chest. Pain score of 10/10 and acute abdominal pain. Abdomen is rigid. Pitting oedema around ankles which is new. HR of 160 and can't get a BP or a radial pulse. Respiratory rate was 40, now down to about 28 on arrival. Sats about 78% on 15L of O<sub>2</sub> but very cold. They had a PE last year which they have fully recovered from.*

### Note 1

*Throughout this entire resuscitation it is the Nurse who is continually prompting the Consultant. They are not saying 'I am the leader'. But they are certainly acting like one.*

### Note 2

*Even though the Consultant is gaining all the markers of leadership (i.e they are ticking the boxes of doing the behaviour), they are not doing this voluntarily. It doesn't feel as though they are leading. In fact, the continual prompts from Nurse 1 and the coordination of the resus bay gives off the impression tht they are in charge. It appears they are being courteous to the Consultant by asking whether they want various things done, when in fact they know it is needed and they are in the process of getting it prepared already.*

### Note 3

*The Nurse asks a series of questions, but they are not asked as literal questions – they are assertions posing as questions:*

*'do you want some nebs the now (name of consultant)?'*

*'shall I order abdomen just now?'*

*'shall I drop up some (holding out the morphine)...'*

*'what are you wanting, 10...5?' (in reference to non-invasive ventilation)*

*'do you want some steroids as well?'*

*'so you want another salbutamol yeah?'*

### Note 4

*Evidencing this even more, the Consultant asks the Nurse a series of questions about medication administration, further suggesting the Nurse is actually the one who is leading this case:*

*'it's 5mg per kg, right?'*

*'how quickly do I give this amoxicillin'*

*'(name of Nurse 1) amoxicillin full bolus yeah'. Nurse 1 responds: 'yeah'*

Event:

*Case 9 – Major Trauma 1 at 23:33*

*Clinical handover as described in resuscitation room:*

*Described above*

Note 1

*In this case, Nurse 2 is moving quickly around the bed space, gathering a lot of equipment and preparing a lot of items that are needed for the resus. She does this without being asked or prompted. She anticipates the need for them several steps ahead, maybe even a step ahead of the Consultant. Even though there are 15 staff involved in this case, when the blood is needed she is there with it. When the consultant asks for an IO device, she is there with it. She is pushing for 'group and save' bloods as she knows it is important for acquiring more blood. She prepares the rapid infuser device without any assistance. Yet at no point would she be classed as the leader, or even as leading, despite the fact that she has done numerous things to lead to the achievement of team goals. Is this 'silent' leadership?*

One interesting point that stems from this global theme was hinted at by one of the interviewees. REG0015 mentioned voiced that:

*"People go in and they recognise the purple suit or the green suit, like, it would be an interesting concept if you got 4 random people and gave them the same uniform. You know, maybe that is something you can do and said 'do as resus' and then watch them to see what's happens. Just 4 random people. You don't tell any of them what they do. You ban them from saying what they do and you give them a simulated scenario and you just watch them to see what happens because a lot of what goes on in our resus is based on – there's always going to be a hierarchy"*

This statement is imbued with tacit understanding that people can function in accordance with their position rather than their group actions. This is central to this third conclusive finding that Nurses, whilst displaying the markers of leadership, often do not have the title of the leader.

#### *8.4.2.4 Theme 4 – The meaning of leadership is heterogeneous*

Spending time in the clinical environment as a Nurse, then observing staff as a research student, meant that the different typologies of leadership that have been so frequently described became apparent. Heterogeneity was therefore not observed as verbalisations of 'I will do this type of leadership'; rather, the diversity was observed as leadership-in-practice.

##### Event:

*Case 3 – Cardiac arrest 3 at 05:44*

##### Clinical handover as described in resuscitation room:

*This patient began having chest pain the previous night at 10pm. He was unable to sleep with the pain and has gotten increasingly more severe. Received 16mg of morphine with the ambulance crew. PMH includes a previous heart attack 10 years ago and has one stent in situ. On route to the hospital the coronary care unit advised to give 300mg aspirin, 800mcg of GTN and 300mg clopidogrel. Patient has since vomited so may have also vomited drugs. On arrival the patient lost consciousness and had a witnessed VF cardiac arrest. They received CPR for 45 seconds and then regained a pulse. Remains bradycardic so received atropine. Regained consciousness as wheeled into the resuscitation room.*

##### Note 1

*This case starts off quite chaotic. I wouldn't say tempers are being frayed, but staff are being a bit shorter with each other than they usually are.*

### Note 2

05:37:02 Nurse 1: *“what I don’t understand is they’ve gone from query STEMI to intubated. Why did they have to try to intubate him?”*

05:37:28 Registrar: *“Is she on a thingy-bob...does anyone know if she is on the autopulse? [mechanical CPR device]”*

05:43:33 Nurse 2: *“So he’s been shocked once and now – oh it’s a ‘he’. I thought it was a ‘she’”*

### Note 3

05:38:11 Nurse 1 is fiddling with the bed. Nurse 2: *“Is it working? Ok I’ll go and get another one”*

05:39:06 Nurse 2: *“The bed isn’t going down flat, should report that but I don’t know who you speak to about that”*

Nurse 1: *“This is the sort of thing that’s getting filmed by the way – us pissing around with trolleys covered in blood”*

05:43:20 Nurse 1: *“...so this is exactly the sort of thing we are getting filmed for people. So one person talking and the rest shutting up and listening”*

### Note 4

*The mild chaos, if there is such a thing, continues. The 4 team members who are most active are the Registrar, the Trainee, Nurse 2 and Nurse 3. Nurse 1 does something really powerful. As all the staff are rushing around the bed space, she calmly walks into the middle of the room and starts holding the patient’s hand. She speaks so quietly as first that I can’t make it out what she is saying, but I presume it is comforting by the way she is holding herself. She slows the room down. Her quietness leads to other quietness. It’s as if she has reminded the team that at the end of all this activity there is someone who is scared and vulnerable. I remember Jen (pseudonym) used the phrase ‘leadership from the middle’ once, and this is certainly leading from the middle.*

Contrast this with a resuscitation event that was similar in terms of presentation, number of resus staff and initial activity, but very different in terms of how leadership was expressed:

Event:

*Case 13 – Cardiac arrest 131 at 12:04*

*Clinical handover as described in resuscitation room:*

*This 50 y/o patient was being transferred to the Royal Infirmary from the Western General Hospital for some cardiac investigation. The patient has severe pulmonary oedema so it is likely linked to that. As they were on their way over the WGH they had a cardiac arrest in the back of the ambulance. The paramedics reported an oxygen saturation drop of 79% to 55% in a matter of seconds. Initial rhythm was reported as PEA with one to two minutes downtime. Patient has been aspirating throughout. Has an oropharyngeal airway in situ. No medication given as the cannula has fallen out. Has been in PEA throughout.*

Note 1

*What happens in this case, unfortunately, is that the patient arrests outside A&E, meaning that all the paramedics in the ambulance bay at the time drifted over to try and help. This leads to 20 staff being in the resuscitation room. Some of them are actually wedged against each other as they all enter the resus room together with various pieces of equipment.*

Note 2

*This is a really difficult case. Because there are so many people around the bed, there is discoordination. Too many voices are being heard, and it means that different clusters of people are suggesting a course of action within their cluster, which then contradicts another group's idea of what should be happening. It is like there is a 'top half' team who are all talking to one another, and a 'bottom half' team who are talking to one another. This is most evident*

*when the leading paramedic speaks quietly with Registrar 1 about how they are going to move the patient across. The consultant appears to have already decided this with people at the bottom end of the bed. The Consultant starts to countdown for the move ‘and on 3...’, to which the Registrar urgently shouts ‘can everyone just...we are going to need some more people on that side’*

#### Note 3

*Even a simple question of ‘do you want a stool?’ (asking the paramedic currently doing CPR) prompts 6 different people to discuss where the stool is and where it should go.*

#### Note 4

*Three open ended questions in five seconds from different parts of the room symbolise the difficulty of this case.*

*12:06:41 Nurse 2: ‘Can somebody give me a hand on this side’*

*12:06:43 Registrar 1 ‘Can somebody come down by the head end’*

*12:06:46 Nurse 1: ‘Can somebody hold the autopulse’*

#### Note 5

*The team are having difficulty starting the autopulse (mechanical CPR device). In one 65 second epoch, the patient did not receive CPR for 45 seconds. The paramedics have largely done their part and they turn to each other in the room, slightly sweaty and flustered, and give us each other a pat on the back. The Consultant is clearly not happy with what is happening in the room and directs his frustration at the paramedics, which is uncharacteristic of him. He is normally ‘unflappable’, to use ED vernacular. He barks at the paramedics – ‘CAN we all please be quiet, please’. That extra ‘please’ appears to be because the room is now silent.*

These two resuscitation episodes followed a similar pattern. They were both cardiac arrests. The teams were not optimally prepared which lead to

challenging team performance. And they both ended up with one person signalling to the team that they were taking charge. But they achieved this in entirely different ways. The Nurse in Case 3 used the 'affect' mechanism of leadership (to feel leadership), whilst the Consultant in Case 13 used the 'trait and behaviour' mechanisms (to 'be' and 'do' the leader role) (Hernandez et al 2011). These distinct ways of exercising leadership attest to the heterogeneous way in which it is conceptualised and acted out.

#### 8.4.3 Reflexive point

This final reflexive point stems from a number of field note entries that highlight my own dispositions towards the subjects and situations that have been observed over the last three years. The most candid field note entry came as I sat down to review a resuscitation episode with a particular Consultant as the most senior clinician. I wrote:

*"This observation is about researcher bias. This case involves a Consultant who is reportedly (that is, reported by my colleagues) someone who doesn't actively lead. And I think this is affecting my judgement. I too do not enjoy my clinical interactions with this Doctor all that much. This is probably the first time that I have sat here and felt that I have already made my mind up about how leadership will pan out, based on who the Consultant is. Am I now not neutral, or is this ok?"*

Even more subtly, I recognise that whilst describing the Consultant in Case 13 in the previous section, I judged his behaviour as uncharacteristic of a man who is normally *"unflappable"*. What I have come to realise is that this is the essence of the interpretive form of ethnographic inquiry, particularly when investigating an inherently social behaviour such as leadership. As Atkinson (2015) voices, *"Because our research topics consist of human*

*conduct, and because those phenomena are produced by social actors, we are inevitably and inextricably implicated in what we study”* (p 26). Should this degree of subjectivity therefore dampen the validity of leadership findings or insights?

Reflecting on this question, I referred back to my onto-epistemological position of critical realism (Maxwell 2012). Ethnographic inquiry, even this line of inquiry with a critical realist stance, does not seek to produce a universal truth or infallible knowledge. The knowledge produced here will peak and trough at various points, and flow between shades of subjectivity and objectivity at various stages.

Atkinson (2015) summarises by saying *“We cannot eliminate reactivity, but we can be conscious, self-aware of what we are doing. We cannot wish away or control out of existence the effects or reactivity. What we can do is to acknowledge, as far as we can, the essential character of social research as a series of social, interpersonal events”* (p 27). The work produced here does indeed acknowledge the essential social form of the research and points to areas of strength, such as data triangulation and the mixing of qualitative and quantitative methods, as steps to improve the robustness of the thesis.

## 9.0 Discussion

The findings of this research raise several salient discussion points that apply to (1) resuscitation teams (2) healthcare (3) the study of leadership. This chapter begins by discussing the results of this thesis in the first context – resuscitation teams – which will be followed by a discussion about the clinical applications of this research. The results in the broader contexts of healthcare and the study of leadership will then be discussed. The chapter will conclude by presenting the strengths and limitations of the study.

### 9.1 Leadership in resuscitation teams

The results of the questionnaires, interviews and observations portray leadership differently than the majority of resuscitation studies published by the medical community. This is not only due to an interpretive line of inquiry being used in a what is a predominantly positivist area of research, it is also *what* is being inquired about. Alvesson and Jonsson (2018) point out that when the term leadership is used there is

*“the often taken for granted assumption that there are stable, cohesive, and unambiguous forms of leadership that correspond to certain categories or ideologies...It is typically assumed that that managers or others doing leadership have a particular disposition – personality, ideals, values, competencies, interests – and that this guides them in practice in a coherent, integrated way”* (p 41).

But this assumption is fundamentally questioned in the design and conduct of this thesis by determining conclusions based on leadership as it is enacted and observed in people’s actual work. Throughout this research no prior assumption has been made about a clinician’s positionality and their

ability to influence their colleagues and employ leadership as they understand it. Barley and Kunda (2001) further point out that the “*dearth of data on what people actually do – the skills, knowledge, and practice that comprise their routine work – leaves us with increasingly anachronistic theories and outdated images of work and how it is organized*” (p 90). These results reflect an interpretive inquiry about leadership – not leaders determined by a fixed ideology – in the actual work of resuscitation teams.

This point is also important for understanding how this doctoral work differs from positivist forms of research at the theoretical level. As the results here gained momentum towards a more pluralistic and adaptive conceptualisation of leadership, it was hypothesised that extant research would explain their findings through a different theoretical lens, if through any explicit lens at all. To evidence this, as well as to show re-engagement with the literature several years after the initial literature review, a smaller review of current literature was conducted to inform this discussion chapter.

### 9.1.1 Leadership theories in resuscitation studies

The aims of this smaller literature review are to (1) review the extent to which leadership theories are applied in resuscitation studies (2) identify which leadership theories are prominent in resuscitation research (3) evidence re-engagement with the literature. The first two aims in particular can shed light on why the results of this study are at odds with traditional resuscitation research where the Consultant is often the focus of the research.

The top 10 general critical care and resuscitation journals were identified using the 2017 Thomson Reuters Journal Citation Reports index: *Critical Care Medicine, Resuscitation, Annals of Emergency Medicine, Critical Care, Critical Care and Resuscitation, Journal of Trauma and Acute Care Surgery, Current Opinion in Critical Care, Academic Emergency Medicine, Journal of Critical Care and the Scandinavian Journal of Trauma,*

*Resuscitation and Emergency Medicine*. The search term 'leadership' were entered as a medical subject heading (MeSH) or keyword in all journals in Week 3 April 2017; no date restrictions were set.

This yielded 3917 results. The title and abstracts of all 3917 articles were hand searched and any empirical study that measured or observed leadership during resuscitation was included for full text review. This included quantitative and qualitative research, as well as studies based in the simulation and real environment.

A total of 97 articles satisfied the initial screening criteria and were included for full text review. Of these, 22 measured or observed leadership during resuscitation. Using Meuser and colleagues network approach to leadership theory (2016), articles were assessed for reference to theory and the theory that was used. Articles were graded as fully referencing theory, partially referencing or not referencing theory. This would allow inference of the different 'theoretical neighbourhoods' in resuscitation – which theories are prominent and which are not.

Of the 22 articles published in the top 10 critical care and resuscitation journals that measured or observed leadership, 20 made no reference to any leadership theory to inform their study (Table 9.1). Two articles partially referenced a theory that related to the conception or design of the leadership focus of their study.

There was considerable methodological heterogeneity in terms of the focus of the studies and their designs. In seven studies leadership was the primary focus, whilst the remaining fifteen measured leadership as a component of a larger team assessment. Eight studies reported observational findings, seven were for training purposes, four were conducted for the development of a behavioural rating tool and three were qualitative investigations. The majority of studies – fourteen – were based in the simulation environment, with five in clinical settings and three being in an interview context. Of the nineteen studies that were quantitative investigations, thirteen (68%) used a behavioural rating tool in their analysis of leadership.

Study	Primary focus or component	Design				Tool used	Leadership theory informed study
		Aim	Context	Participants			
1. Yeung et al. (2012)	Primary focus	Training	Simulation	40 Advanced Life Support instructors	Yes – Leadership Behaviour Description Questionnaire	No	
2. Hunziker et al. (2010)	Primary focus	Training	Simulation	237 medical students – 79 teams of 3	No	No	
3. Frengly et al. (2011)	Component	Training	Simulation	160 clinicians – 40 teams of 4	Yes – Teamwork Behavioural Rater	No	
4. Kim et al. (2006)	Component	Training	Simulation	60 doctors	Yes - Ottawa Crisis Resource Management Rating Global Rating Scale	No	
5. Cooper et al. (2016)	Component	Tool development	Clinical	106 emergency department teams	Yes – Team Emergency Assessment Measure	No	
6. Stone et al. (2014)	Component	Training	Simulation	20 teams of 3 doctors	Yes – Simulation Team Assessment Tool	No	
7. O’Leary et al. (2014)	Component	Observational	Simulation	270 doctors, 235 nurses and 11 students in 73 simulations	Yes – study specific tool	No	

8. Lambden et al. (2013)	Component	Tool development	Simulation	45 simulations with 52 paediatric and anaesthetic trainees	Yes – Imperial Paediatric Emergency Training Toolkit	No
9. Grant et al. (2012)	Component	Tool development	Simulation	30 doctors in 2 scenarios	Yes – study specific tool	No
10. Andersen et al. (2010a)	Component	Qualitative	Interview	11 Advanced Life Support instructors	N/A	No
11. Andersen et al. (2010b)	Component	Tool development	Simulation	Video of 5 cardiac arrests on DVD, followed by 5 simulations	Yes – study specific tool	No
12. Mäkinen et al. (2007)	Component	Observational	Simulation	150 nurses from 2 sites	Yes – study specific tool	No
13. Marsch et al. (2004)	Component	Observational	Simulation	Teams of 3 in 16 simulations	No	No
14. Cooper (2001)	Primary focus	Training	Simulation	3 Advanced Life Support courses with 68 doctors, nurses and health professionals	Yes – Leadership Behaviour Description Questionnaire	No

15. Cooper and Wakelam (1999)	Primary focus	Observational	Clinical	20 resuscitation teams	Yes – Leadership Behaviour Description Questionnaire	No
16. Gregg et al. (2016)	Primary focus	Training	Clinical	32 doctors	Yes – study specific tool	No
17. Hoff et al. (1997)	Primary focus	Observational	Clinical	425 resuscitations	No	No
18. Sugrue et al. (1995)	Primary focus	Observational	Clinical	50 resuscitations	No	No
19. Taylor et al. (2017)	Component	Qualitative	Interview and Focus group	11 nurses, 7 doctors and 6 respiratory therapists	N/A	Partial
20. Hjortdahl et al. (2009)	Component	Qualitative	Interview	12 interviews at 4 sites – one nurse, team leader and anaesthetist at each site	N/A	No
J21. acobsson et al. (2012)	Component	Observational	Simulation	96 staff in 16 teams of 6	No	Partial
22. Hårgestam et al. (2016)	Component	Observational	Simulation	108 staff in 18 teams of 6	No	No

Table 9.1. Overview of the 22 resuscitation studies reviewed

Using the top 10 resuscitation journals as a proxy for the resuscitation literature, it is evident that one of the main reasons why the results of this thesis diverge from conventional leadership discourse is that these discourses are often not grounded in established leadership theories. Alvesson and Kärreman (2016) described this, somewhat firmly, as research that is strong on ideology and weak on intellectual precision. There is broader support for this assertion as even in the niche field of resuscitation leadership, published taxonomies identify 67 different behaviours that are all supposed to represent leadership (Leenstra et al 2016). This does suggest a lack of precision – from epistemology, to theory, to methodology – which this thesis reports to avoid by adhering to a cohesive and interpretive approach.

As further evidence of engagement with current literature, one final study that is important to note whilst discussing the results of this thesis is a systematic review published in June 2018, immediately prior to the submission of this research (Janssens et al 2018). The publication, titled ‘Shared Leadership in Healthcare Action Teams: A Systematic Review’, is the most up-to-date appraisal of literature that specifically measures the plural idea of leadership in ‘healthcare action teams’. Including 33 studies, the review found 3 forms of shared leadership that are emerging in research: spontaneous collaboration – emergent sharing of leadership functions beyond the hierarchical leader; intuitive working relationships – some team members share leadership with the hierarchical leader in a consistent manner; institutionalised practices – organisational structures prescribing formal shared leadership structures. The authors’ conclusions firmly echo the findings of this thesis:

*“Relatively few descriptions of shared leadership are present in the HCAT [healthcare action teams] literature in contrast to the business and management literature. Perhaps shared leadership has only recently emerged in HCATs, which have traditionally been led by a single hierarchical leader.*

*Alternatively, shared leadership may have been present for some time but not been acknowledged as such. Physician-centered norms of healthcare may have failed to recognize or report leadership functions performed by nurses or other non-designated leaders in action teams” (p 7).*

Their conclusion potentially signals a shift towards re-evaluating how team leadership in dynamic healthcare teams is approached, corroborating the arguments made throughout this research study.

## 9.2 Translation of the research findings – clinical application

Translating the research findings into actionable clinical outcomes is challenging. The main reason for this is that the scale of efforts by researchers and clinicians to improve leadership practices is vast. Few areas of potential improvement have been left untested. Rosenman et al (2015) found that 61 leadership tools have been developed focussing on acute care teams. Havyer et al (2014) found 73 general medical teamwork tools in their systematic review, all of which are designed to improve – or aid the improvement of – clinical team performance. Some form of intervention is likely to have a positive effect on clinical teams, but the exact benefit to patients is difficult to measure. McEwan et al (2017) conducted a large meta-analysis and systematic review of 72 team interventions, finding that almost all have significant effect sizes when compared with controls.

It would be simple to conclude, then, that any translation of results into the resuscitation room would yield benefit. Yet, this may be too simplistic. McCulloch (2016) observes that too many team interventions struggle to account for the realities of clinical care, stating: *“The limitations in the evaluations of many teamwork interventions are very difficult to avoid, given the challenges of conducting quasi-experimental studies in a complex social environment where many influences remain completely beyond the control of*

*investigators*” (p 563). This thesis has argued a similar sentiment in that the realities of leadership – being enacted in different ways by different personalities – is not reflected in individualistic theories that are applied in extant research. Another team intervention of this typology would, therefore, not be optimum.

### 9.3 Conceiving leadership as a team activity

Instead, the translation of results here is informed by the literature on quality and safety science, particularly from the field of psychology (Flin et al 2008). Most clinicians and healthcare staff are now familiar with the work done on human factors and non-technical skills (Brown et al 2015). Large scale changes have come about as a result of national reports which recognised where medicine could learn from other safety-critical industries on quality and safety issues (Dekker 2011, Pronovost et al 2016). Most commonly clinicians are now *au fait* with checklists, protocols and electronic safety functions that seek to optimise clinical care (Grout 2006).

With this in mind, it is prudent to acknowledge the individual and team psychology that has come to light having interviewed and observed resuscitation teams. It is short sighted to target an intervention that aggregately proposes a new way of working without taking into account the temporal dynamism of leadership, the subconscious professional hierarchies, or the adaption of behaviours based on who is in the room – all of which are evident in the interview transcripts and the observations. The suggestion here is to re-structure the team composition and the environment, thus influencing the conceptual understanding of resuscitation leadership, to promote optimum team dynamics.

#### 9.3.1 The inner loop and outer loop of resuscitation

Research has started to emerge in the last few years that supports a new approach to team interventions based on the realities of clinical care. Calder et al (2017) conducted an informative observational study where they compared the input of team members in simulated and real resuscitation episodes. It can be seen from their network communication analysis of simulations that nurses appear to have minimal input in the direction of the team (Figure 9.1). Contrast this with the input of nurses during real resuscitations and there is a considerable mismatch (Figure 9.2) that initially downplays the magnitude of actual nursing input. Furthermore, the authors found that 39% of the 2128 information exchanges during live resuscitations were by nurses – the most observed during the study.

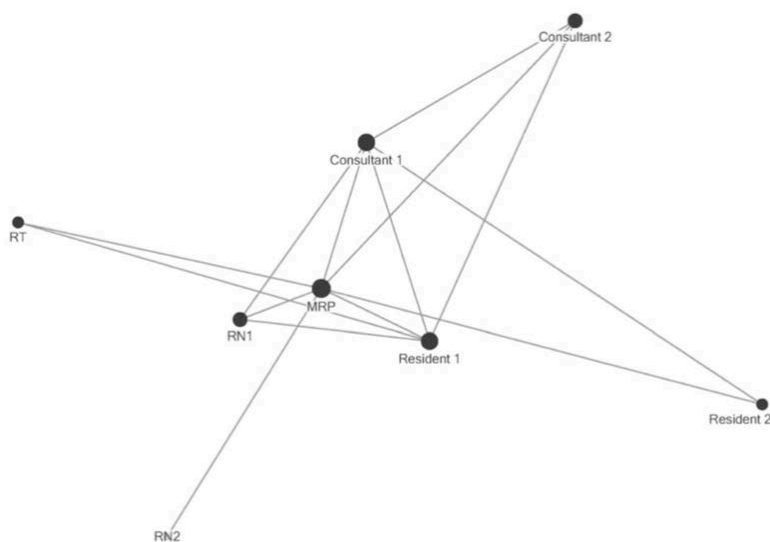


Figure 9.1. Social network of resuscitation communication based on simulated episodes of care (Calder et al 2017, p 6)

A similar study by Härgestam et al (2016) audio and video recorded 18 simulated trauma resuscitations with 108 staff, finding that the nominal team leader – the doctor – is silent for up 94% of the resuscitation episode. Another study by Taylor et al (2014) confirmed this finding. They observed team interactions during CPR and found that that 65% of team members

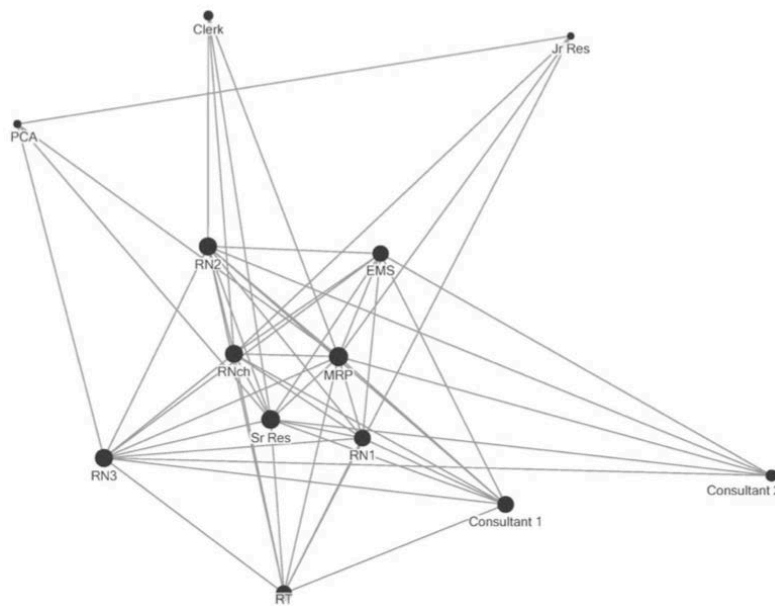


Figure 9.2 Social network of resuscitation communication based on real episodes of care (Calder et al 2017, p 6)

communication does not involve the team leader.

Taking these issues into account, a conceptual model of resuscitation as an ‘inner loop and outer loop’ is put forward, building on the work of Taylor et al (2017) (Figure 9.3). The inner loop encompasses the staff that are immediately at the patient’s bedside providing hands-on interventions. The outer loop is composed of all other personnel and equipment that are introduced during the course of the resuscitation. The inner loop contains the traditional team leader who can action immediate clinical tasks and direct bedside staff. As the Consultant or senior doctor in the room they are the central leadership node around the bed space. However, as the interviews and observations described here have demonstrated, the other clinicians as well as potential drugs and equipment have to be co-ordinated and utilised in the right order at the right time. The deficits in leadership that have been observed occur when these responsibilities fall on one nominal leader whilst other staff are attempting to enact leadership to augment team performance, often without explicit communication. Accordingly, the outer loop has a separate team leader, acting as a leadership node to connect the inner loop with the wider resuscitation environment.

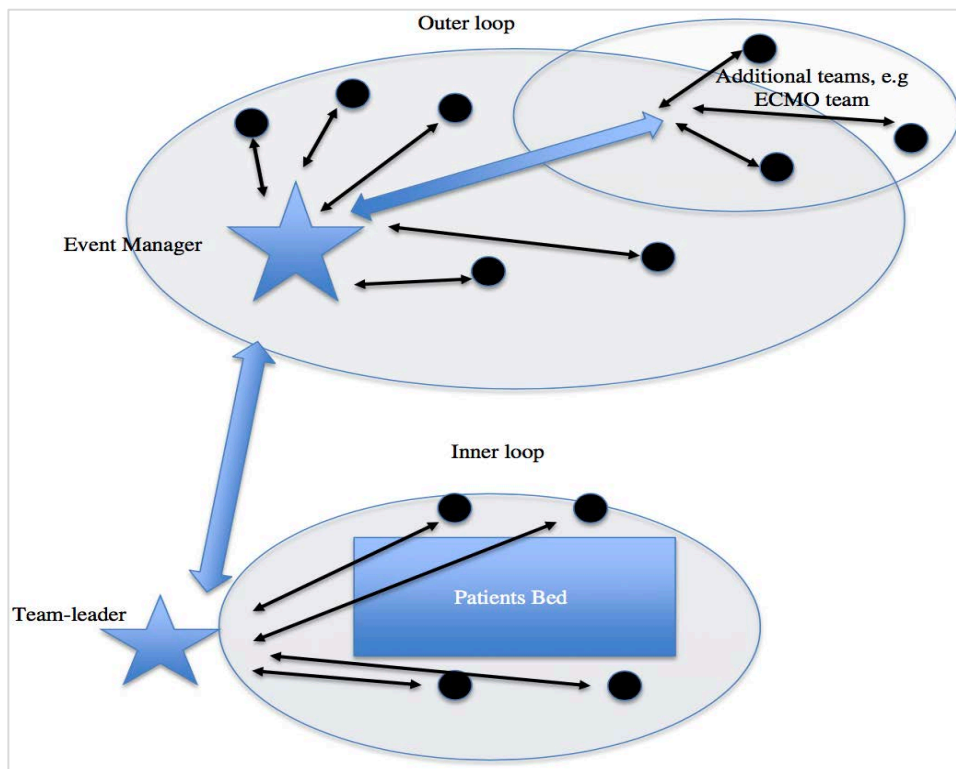


Figure 9.3. A conceptual model of resuscitation as two interconnecting groups called the inner loop and outer loop (Taylor et al 2017, p 255)

Taylor et al (2017) initially calls this person the ‘event manager’ and describes their role as including the management of timeliness, managing complexity, managing space, protecting and enabling the team leader, filtering of information, environmental control, supporting education and supporting families. The view that this outer loop leader should be a nurse put forward by Taylor et al. is supported here, for reasons outlined in the following section.

An appetite for such a role was organically mentioned during the interviews. One Charge Nurse, without prompting, described this role almost perfectly having temporarily introduced what she called a ‘resus co-ordinator’ in the resus rooms:

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*“I think it works, like we’ve already said, it’s the teamwork. I think if the doctor that’s on for resus or you know, the resus setting, the resus coordinator has been a great addition to the environment in that the doctor knows who to*

*communicate with. Ehm, although he communicates with everybody, there's a focal point and that resus coordinator can then, you know, send other information to the other members of staff and the environment"*

### 9.3.2 Rationale of the inner and outer loop model

The inner and outer loop model aims to target what Lindsay et al (2011) refer to as a group's "*underlying social architecture*" (p 533). Day and Antonakis (2012) suggest that there are three strands of social architecture that influence the sharing of leadership: low power distance, high psychological safety and strong learning orientation.

Power distance refers to the nature of power distribution amongst organisational members. When there is a high power distance there is unequal power distribution weighted towards members higher in the hierarchy. Conversely a low power distance creates power which is evenly spread amongst multiple levels of an organisation. This low power distance is conducive to shared leadership.

Psychological safety describes how comfortable team members are with expressing their thoughts and interpersonal skills with one another. This can take a number of forms, from suggesting the team's next action to questioning a colleague. A large cross-sectional survey of 92 hospitals mapped hospital safety climate against 12 negative patient safety indicators and found that hospitals with low psychological safety are significantly more likely to increase their patient safety indicators (Singer *et al* 2009). A large systematic review recently showed this relationship exists across different healthcare settings (Braithwaite et al 2017). There is further research from acute ad-hoc groups such as anaesthetic teams (Kolbe *et al* 2012) and aviation teams (Bienefeld & Grote 2014b) that psychological safety is associated with team dynamics and outcomes. High psychological safety, therefore, is conducive to the sharing of leadership.

Last, a strong learning orientation refers to a conscientious move towards mastery of a task and the acceptance of reasonable risk whilst in the process of learning. This contrasts this with performance orientation which is an outcome-orientated dynamic focused on the completion of a task in unchallenged environments.

Carson *et al* (2007) furthered this work by empirically describing the antecedent conditions that promote shared leadership as well as its effect on performance. The authors studied the dynamics of 59 different teams and measured variables of the internal and external team environment. They found that both the internal team environment, consisting of social support, shared purpose and voice, and external support from outside the immediate team positively predict the emergence of shared leadership. Furthermore, teams that have positive internal and external team environments are perceived to perform better by external raters.

This research suggests that if a group's underlying social architecture is optimised, then leadership can be mutually distributed amongst team members for the benefit of the team as well as the patient. This emerging research on interdisciplinary health teams shows that if the team identify as a team of equals – as opposed to a fixed hierarchy – then they are more likely to promote the principles of shared leadership.

There are several reasons why a nurse in this outer loop leader is optimal. Consider the Staff Nurses who voiced that *“I would always personally be looking to my senior nurse if I was training up”* SN0013 and *“I would just follow what my charge nurse was saying”* SN0011. These nurses would benefit from a formalised outer loop leader with whom they felt psychologically safe, as well as a reduced power distance that they may otherwise feel because of the professional hierarchies between doctors and nurses. Similarly, consider the Junior Doctor who withdraws from group discussion with certain medical staff *“because it just makes me feel unhappy when I'm made to feel like an*

*idiot*" JDS0018, and when certain team leaders don't *"listen to the rest of the team, or creates an atmosphere that makes you feel like you can't say what you think is going on"*. Having a nurse as the outer loop leader can offer staff who find a leader's approach challenging an alternative avenue to share their thoughts and create a sense of shared voice amongst the team.

A senior nurse in the outer loop leader role, then, achieves several things. It flattens the team's hierarchy which is one of the strongest predictors a team's willingness to share their thoughts and offer input (Tarrant et al 2017). This psychological safety ascends into a node of social support in the resuscitation room – a second leader who can filter information and co-ordinate group activity whilst the inner loop leader directs immediate hands-on care delivery. In addition, a nurse in the outer loop leader role can mitigate the effects of power distance and physician variability that have been so evident in the interviews and observations; staff may feel less inclined to collectively adapt their practices to satisfy one consultant leader's 'style' if some aspects of team leadership rest with another senior colleague.

In summary, the suggestion made here recognises that people's opinions of how leadership operates is often engrained, particularly in healthcare with its strong cultures and traditions. Structuring a team with an inner loop and an outer loop accounts for these professional expectations and offers a mechanism of support, both for the nominal team leader and those other staff who exercise their informal leadership. A useful next stage to continue this line of work will be to test whether this model of care delivery yields better outcomes than standard care delivery.

#### 9.4 Leadership in healthcare

The findings of this ethnography lend weight to existing calls for more pluralistic approaches to leadership (West et al 2014). It is unlikely that this will be achieved through more realist-positivist research; rather, qualitative inquiry

is more suitable for understanding the nuances of leadership, particularly in complex and fast-paced work environments such as resuscitative care. As more leadership studies are being published in healthcare, systematic reviews of medical (Berghout et al 2017) and nursing (Cummings et al 2010) leadership are increasingly calling for greater application – or generation – of theory. Using a naturalistic observational technique such as the one demonstrated in this work is one way in which theory and methods can be used to refine the concept of leadership in healthcare.

### 9.5 The study of leadership

This third section of the discussion chapter is written at an interesting time for leadership research. As more disciplines argue the importance – or even fundamental necessity – of leadership (Daly et al 2014), so too are more researchers and academics writing about the inconsistencies and contradictions of leadership literature (Sveningsson and Larsson 2006, Crevani et al 2010). Empirical studies from out with healthcare are highlighting that narratives of leaders are often fraught with confusion and ambiguity (Alvesson and Sveningsson 2003, Carroll and Levy 2008). The two previous sections have highlighted how some of the findings of this ethnography are symbolic of these inconsistencies, with entire swathes of research approaching the same issue with different philosophies and methodologies.

This thesis falls naturally in line with those who call for parsimony (Alvesson and Blom 2015); more focussed research should seek to refine the current literature base rather than simply adding more conjecture. Blom (2016) summarises the core challenges of leadership research as addressing the hegemonic ambiguity problem (that leadership can mean almost anything), the idyllic problem (that everything associated with leadership is good) and the methodological problem (that there is a lack of continuity of research approaches). The work reported here has attempted to mitigate these issues by defining the parameters of leadership, focussing on the team rather than

idealise the nominal leader, and providing a clear link between philosophy, theory and methodology.

## 9.6 Strengths and limitations

### 9.6.1 Strengths

There are several aspects of this doctoral thesis that are considered here to be areas of strength. First and most important is the judicious use of epistemology and theory to inform how the research has been approached. From the outset, the aim has been to conduct an ethnography that acknowledges the contributions of all team members, not just the senior doctor in the room who is the responsible clinician. In making this theoretical choice early on, it has promoted the collection of questionnaire, interview and ethnographic data about resuscitation as it experienced as a team activity and not through an individualistic lens.

Second, the triangulation of three discrete sets of data has offered a more complete understanding of leadership which departs from the normative approach of surveying staff about good leadership qualities, or observing the nominal team leader. These research methods have been used iteratively, with each step informing the next.

Third, actual patient cases have been observed which further grounds this thesis in the reality of clinical ED care. An alternative route of using simulated scenarios was a viable option, yet the limitations of the 'sim' environment to replicate authentic stimuli and performance is well recognised (Issenberg et al 2005).

Fourth, the use of a video system to capture resuscitative episodes has meant that teams' behaviours have been viewed in granular detail. Attempting to document a range of inter-personal networks overlaying expressions of leadership on paper during a dynamically changing resus case would not have yielded the same data. When considering that 323 leadership behaviours were

recorded using the video footage of 20 resuscitation episodes, a reasonable conclusion is that the same accuracy would not have been achieved if these had to be coded in real-time using the historic ethnographic technique of hand-written field notes.

The fifth and final point relates to the contributions of this work throughout the doctoral process. Publications in *International Emergency Nursing*, *Emergency Medicine Journal*, *International Journal of Clinical Practice*, *Resuscitation*, *Nursing Times* and *Emergency Nurse* all highlight active outputs that have stemmed from this research.

### 9.6.2 Limitations

Notwithstanding the methodological and practical benefits of using video to observe clinical care, one of the main areas of critique to address is that this doctoral work has departed from the traditional anthropological roots of first-person participant observation 'in the field'. Whilst this has been a carefully considered decision as outlined in the methods chapter, there are prominent voices who argue that this is diluting the practice of ethnography.

The most cogent argument for maintaining the conventional values of ethnography comes from Paul Atkinson, an author whose work informed the choices made here. In writing his 2015 book *For Ethnography*, Atkinson states that he is

*“motivated by something a bit more thoroughgoing than the need to simply give readers some useful analytic pointers, based on a reaction to contemporary fashions in social research. I am not alone in thinking that there are some profound and widespread problems in contemporary methodological thought and research practice. That can be summed up as a loss of social-scientific imagination, and a divorce of ethnographic research from its disciplinary roots. As a consequence, key features of ethnographic research are being lost to view and need to re-stated and re-emphasised”* (p 11).

Atkinson goes on to describe some of these watered-down features, such as short periods of data collection, observations without reference to the social world in which they take place, a preference for other qualitative methods and a lack of theoretical interrogation.

An illustrative example of this line of critique came from an article published in *BMJ Quality and Safety* in 2014. Lamba and colleagues (2014) published an 'ethnographic study' focussing on the identification of patient safety issues during ward rounds. The study used one ethnographer who observed team ward rounds, shift changes, case conferences and other meetings across three different wards. They used a data collection form to extract patient safety issues that were categorised according to a protocol of themes. The findings were summarised using descriptive statistics.

In response, Jowsey (2016) suggests that this as an example of 'watering down ethnography', asking "*What is it that makes this piece of research ethnographic? On what grounds might we consider it to be any different from a generic descriptive approach to an observational study? Are all observational studies necessarily ethnographic?*" (p 554). This line of questioning is useful and the editors largely concede that the paper is at the boundary of ethnography in their response (Dixon-Woods and Shojania 2016).

They do, however, point out several contemporary arguments, that "*Quantification of observational data does not by itself disqualify a study as ethnographic*" and "*In recent years, the value of close observation of organisational and clinical practices has becoming increasingly recognised*" (p 555). Jowsey herself acknowledges that "*In the last century, ethnography has moved in a few directions*" (p 554).

Reflecting on these concerns, this thesis takes seriously the dubiety of Atkinson and other classical ethnographers, and recognises that methodological purists could point to the modern tone of this ethnography as

another example of dilution. But there are several important issues to consider when this critique is put forward. As Sales and Iwashyna (2016) voice, *“insistence on purity of method can lead to a guild-enforced set of requirements”* (p 558), meaning that work which does not conform to these prescriptions is labelled as erosive. As such there needs to be a *“middle ground that embraces the depth of traditions in the social sciences and allows methods to evolve and respond to new contexts in our disciplinary field”* (p 558).

Of equal importance is the notion that all ethnographies require the same level of methodological and theoretical interrogation; do all studies have to describe the same degree or richness to be considered suitable of the title? For example, Malinowski studying the everyday harmonies and discords of 20<sup>th</sup> century Melanesian people necessarily meant deep cultural immersion and extended periods of observation. But studying prescribing errors or nursing shift changes may not require the same depth of symbolism, or the same level of Malinowski-richness. It is, perhaps, more fitting that the area of study determines the ‘degree’ of ethnography needed.

The final issue reflects the need to balance potentially competing priorities between clinical healthcare staff and academic researchers. Sales and Iwashyna (2016) note that *“ethnography is not the exclusive intellectual possession of anthropologists”* (p 558) and that healthcare staff pursue research that is accessible and useable by their professional community, and often has to be delivered in a defined timescale. To prioritise orthodox academic rituals over clinical relevance, therefore, may not be in the best interests of healthcare research. Redressing these scales is important as it means that research like this thesis can apply ethnography in the modern healthcare context.

Weighing up this overall critique as a limitation is necessary. Malinowski certainly would not have used an inter-rater reliability score to communicate an element of his results, yet he would not have had to consider issues such

as validity and generalisability as part of a contemporary doctoral study. Whilst this thesis does indeed depart from the classic anthropological ethnography, this has been a carefully considered decision to find the middle ground between a robust ethnography and actionable health research.

The second main limitation of this thesis is that the data have been collected from a single site. Generalisability could have been improved if other EDs were observed, particularly EDs serving other populations or in different countries. That said, the rationale for using focussed ethnography is primarily to understand a social or cultural phenomenon in its natural context and allows for deeper immersion in that context. The chosen epistemology of constructivism aligns with the interpretive stance of ethnography, thus seeking to generate a universal truth of leadership during resuscitation was not an aim of this work. Instead, as highlighted from the outset, the onto-epistemological position applied here recognises locally produced knowledge that is not infallible.

A third critique to acknowledge is that although a range of resuscitation staff were surveyed and interviewed, other staff who may be present during resuscitation episodes were omitted. For example, CSWs were invited to take part in the questionnaire, but they were not interviewed as a profession group. Similarly, visiting speciality doctors such as surgeons and anaesthetists were observed during the ethnography but were not interviewed as professional groups. These staff undoubtedly influence leadership when they are present in resus room, particularly surgeons and anaesthetists who likely become the default leaders for the speciality when they are requested to attend a patient case. Furthermore, these staff could have offered different leadership perspectives and insights not reported by medical and nursing staff who form the core resuscitation team.

The rationale for not including these staff is that a balance between breadth and depth of data had to be found. It was decided that surveying and

observing all staff, as well as interviewing the five resuscitation staff who make up the core team, was most appropriate. Surgeons and anaesthetists typically practice in contexts and cultures that are distinct from the ED resuscitation room, thus their leadership opinions – informed by experiences in the operating theatre and anaesthetic room – could have diluted the salient themes identified in this thesis.

## 10. Conclusion

Leadership is an important non-technical skill that augments the clinical performance of ED resuscitation teams. In recognition of its importance, leadership is now a common topic of academic study in the field of emergency care. As outlined throughout this thesis, the current literature base is characterised by applications of individualistic and linear theories of leadership, as well as a focus on defining what makes effective or ineffective leaders.

This study set out a different approach, based on an ideology that conceptualises leadership as a team-level construct. The literature reviewed as part of this research study highlighted that there are a limited number of published studies which do not use *a priori* leadership models that fixed, hierarchical and focused on the senior doctor figure. In addition, the review revealed academic equipoise; that leadership can be formalised or informally expressed, and that it can evolve into more or less plural forms.

Set against this backdrop, and extending on the initial findings of the literature review, this research designed a video ethnography with the aim of studying leadership during emergency department resuscitation using a team-level approach. This aim was supported by two objectives: (1) to develop a team leadership behavioural marker tool that can be used as a framework to identify who displays leadership and how they do this; (2) using a team behavioural marker tool as a framework, conduct a video-based ethnography of leadership based on observations of real patient care episodes.

Critical realism was adopted as the onto-epistemological position, allowing an interpretive analytic framework to guide the research process whilst also collecting more objective tranches of data. To address some of the challenges present in existing research, this study applied shared team leadership theory which changed the unit of analysis from the individual to the collective team.

Within the ethnographic methodological framework, three research methods were chosen to allow the study to achieve its objectives – questionnaire, semi-structured interview and video observation of real patient resuscitation episodes. Opting for a mixed-methods ethnography has provided complementary qualitative and quantitative data.

Designing this research study with video observation of the resuscitation room environment rather than the traditional first-person observation meant that there was an extended approval process. This thesis has offered a narrative account of how the ethical, legal and data protection issues were addressed, and outlined a roadmap for other EDs or clinical services to utilise a system in their setting.

Part 1 of the findings presented the development of the leadership taxonomy (Objective 1). Developing the taxonomy involved three iterations, with each version being refined as the study progressed through the 5 phases of the research process. Version 1 was informed by a review of existing leadership literature, questionnaire respondents identifying 510 markers of leadership and observation of the first 5 resuscitation cases. The findings from the first 10 interviews with Consultants and Charge Nurses were coupled with a further 5 resus observations for Version 2. Version 3, the final iteration, was input with data from the final 10 interviews and a further 5 video observations.

To test for inter-rater, this final iteration was then used whilst reviewing a separate corpus of 5 resuscitation videos with a second blinded reviewer. This process yielded substantial inter-rater reliability ( $\kappa = 0.72$ , 95% CI: 0.62–0.82). Validity of the leadership taxonomy is reported through the criteria of data triangulation, respondent validation primarily with interviews and questionnaires, and reflexivity.

It is concluded, therefore, that the leadership taxonomy developed in this research study has substantial inter-rater reliability, is valid, and is a

clinically relevant tool that can be used to understand how leadership is expressed by teams performing ED resuscitation.

Part 2 of the findings reported the ethnography of leadership (Objective 2) comprising of four main themes: (1) leadership is plural; (2) leadership is contingent; (3) distinction between nursing and medical leadership; (4) the meaning of leadership is heterogeneous. The three tranches of data collected – questionnaires, interviews and video observations – each supported the four main themes.

(1) Theme 1 – The majority of questionnaire respondents identified a plurality to leadership. For example, 90% reported that more than one person can display leadership at any one time, and 69% reported that the active leadership role can be shared. This sentiment was also consistently expressed during the interviews, with staff of all grades and professions voicing the idea that *“almost all of the team members can show leadership qualities and have leadership roles”*. The sharing of leadership was also observed during video review of resus cases, where staff seamlessly stepped in and out of a leadership role multiple times, often without explicit verbalisation. Using the leadership taxonomy whilst observing the 20 patient care episodes revealed that 42% of leadership is actioned by someone other than the senior doctor in the room, and that about one-third of all leadership involves an exchange of the leadership role between different team members.

(2) Theme 2 – All-but-three of the questionnaire respondents (96%) stated that leadership is dependent on situational factors, whilst 80% of respondents stated that leadership is determined more by who the specific is/their personality rather than the professional position. That leadership is contingent as opposed to a linear and positional phenomenon was further evidenced in the interviews, where one interviewee summarised the following – *“So it’s the mix of people – it’s the case, it’s the mix of people that are there and then the personalities of those individual people”*. The video tranche of data corroborated these findings, where similar resuscitation cases in terms of

aetiology and resource were observed to manifest markedly different patterns of leadership expressions. For example, whilst some cardiac arrest cases required preparatory and communicative leadership, the unique elements of comparable cardiac arrest cases required far more directive and decision-maker forms of leadership.

(3) Theme 3 – When asked whether they identify their actions as leadership, 68% of questionnaire respondents positively. However, when this was matched against profession group, it was found that 65% of nurses believe they display leadership whilst 100% of qualified ED doctors believe they do. This initial finding was explored during the interviews where it was found that nurses, whilst recognising their leadership contributions, enact these in ways that avoids challenging established leadership hierarchies. Furthermore, nurses described a holistic depth to their leadership that extends beyond archetypal leadership behaviours to include aspects such as providing dignity during a patient's death, and being their advocate when they are vulnerable. This was voiced as doctors' leadership as overt and nurses' leadership as *"hidden"*, *"silent"*, and *"in the background"*. The tempering of nurses' leadership set against these professional expectations was observed during video review, where nurses provided the actual actions of the leader role whilst not occupying the leader role due to their professional position.

(4) Theme 4 – Evident throughout the series of interviews was that leadership means different things to different people; despite the confined context of ED resuscitation, leadership was voiced as heterogeneous in terms of its definition, its scope and how it is actioned. Viewing patient resuscitation episodes further highlighted the heterogeneity of leadership where different mechanisms of leadership were observed to affect team performance in different ways. No single typology of leadership was applied uniformly. Rather, team members responded to expressions of leadership organically on a case-by-case basis.

The discussion chapter set out the theoretical and clinical relevance of this study. First, the findings have posited that leadership can – and should – be conceived as a team construct. The smaller updated review of leadership theories in this chapter highlighted that few leadership studies in the medical discipline apply recognised theories. Normative leadership studies often lean towards positivist explanations of leaders and the optimum traits these individuals should possess. Second, the clinical implications of this research centre around restructuring resus teams' conceptualisations of leadership to one of an 'inner loop' and 'outer loop', where there can be conscious and purposeful recognition of sharing leadership amongst different team members. This, in turn, can help address many of the challenges of clear and consistent leadership that has been readily identified in interviews and video observations.

In conclusion, this research study presents a team leadership taxonomy that can be used to better understand leadership during resuscitation, as well as an ethnographic manuscript of leadership. Rather than being a singular and linear phenomenon, leadership is reported here to be informally shared amongst different team members, contingent on a range of patient and personnel factors, ambiguous in its meaning, and influenced by inter and intra-professional issues within medicine and nursing.

This research has acknowledged the importance of theory-informed methodology and the effect that this has on interpreting the results. Specifically, that this study has extended the current understanding of leadership during resuscitation by applying a constructivist epistemology, a team-level theory, and a mixed-method observational methodology to develop findings that highlight the complex and adaptive processes that characterise leadership.

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## Appendices

### Appendix A – Video Audit Governance Framework

#### **RIE Emergency Department Resuscitation Video Audit - Governance Framework v 2.1, 12-05-15**

##### **1. Key elements of the program:**

- a. Video is continuously recorded in all of the ED resuscitation bays using the built-in SMOTS system. Data is sent to secure server in a card-entry protected location in the ED. The vast majority of video recorded will not be viewed, and automatically deleted after 7 days.
- b. 'Episodes of interest' will be identified from the charge nurse daily record of resuscitation room activity by the **video audit team** in the ED. These segments of video will be transferred to the secure video manager system for analysis. A software based secure deletion policy will be in operation with automatic removal of video recordings after a maximum of 180 days.
- c. Audit findings will be fed back into the **ED Oversight Team** and existing education, service improvement and patient safety teams in the ED.
- d. Regular reports detailing the activity of the system will be forwarded to the **Clinical Management Group**.
- e. There will be clear standard operating procedures (SOPs) for the video analysis workflow, designed to ensure data protection and provide a clear policy for reporting incidents viewed by the VAT which present 'cause for concern'.

##### **2. Allowed uses of the video:**

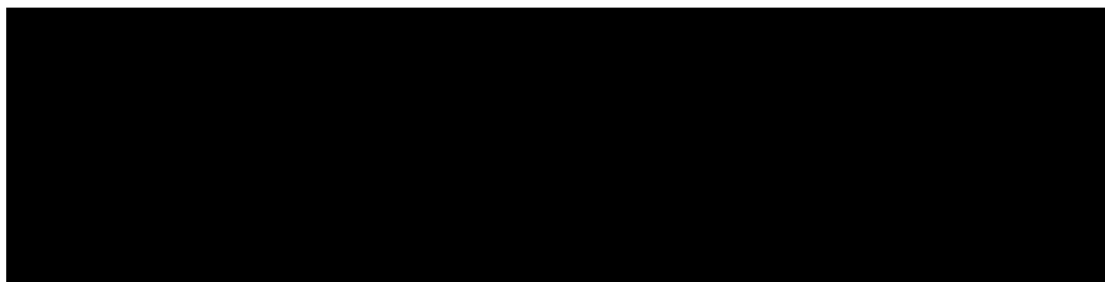
- a. Video is to be used for audit and service development purposes.
- b. Early review of video recording by the team who were present in the resuscitation room at the time of recording is permissible for a 'hot debrief' if this can be facilitated by a designated and trained individual.
- c. Recordings will only be viewed by the pre-specified audit team (and also by the ED Oversight Team in the case of a 'cause for concern'). Video data will **not** be available for scrutiny in any other contexts - including M&M meetings, case review etc.
- d. Video will **never** be used for individual assessment.
- e. Video recordings will **not** form part of the patient clinical record for any individual patient.

##### **3. The Video Audit Team (VAT):**

A team of between four and six individuals, agreed with the Emergency Department oversight team, will have explicit permission to view footage. Appropriate training will be delivered by the project lead. This team will have understood and signed an agreement to operate within written SOPs for the proper use of video.

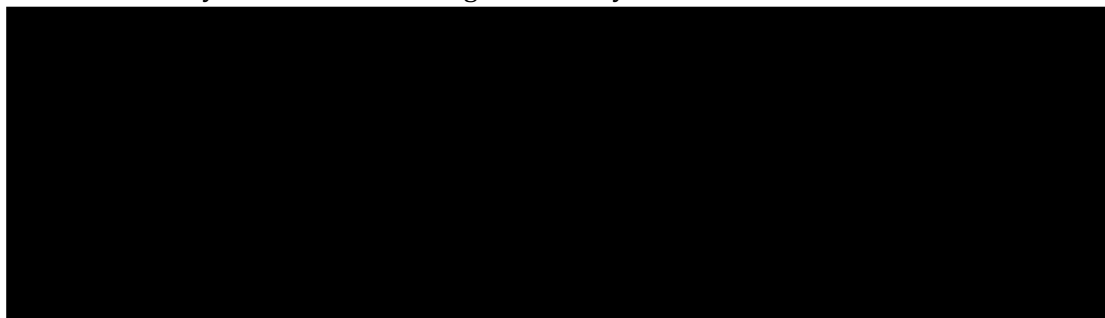
Applications to view footage for additional audit purposes, for example, by

postgraduate students, would be submitted to the ED Oversight Team, and considered on a case-by-case basis. These applicants would be granted temporary status, and assigned a supervising member of the VAT, responsible for their induction, training and adherence to SOPs.



#### **4. Emergency Department Oversight Team:**

This group will oversee the use of video recording in the ED. They will determine which audit projects are appropriate and who will be permitted to gain access to the video as part of the VAT team. The Oversight team will also be the point of contact for the escalation of any 'cause for concern' generated by video audit.



#### **5. Cases of interest:**

Segments of resuscitation room footage containing data earmarked for audit constitute 'cases of interest'. These will be exported from the SMOTS system into a video manager environment. This secure environment will allow analysis of the footage before application of an automatic deletion policy after a maximum of 180 days. The only circumstances under which video material would be retained are when the patient (or relative if the patient is deceased) along with all staff recorded on the video have given explicit written consent for the material to be used for purposes other than audit (e.g. teaching and training).

#### **6. Audit:**

Video will be used for auditing the following types of process:

- a. Technical performance - skills and drills
- b. Non-technical performance or team performance such as communication, decision making, team working, task allocation and situation awareness.
- c. Protocol testing
- d. Assessment of the use of equipment
- e. Ergonomic analysis of the resuscitation rooms

**7. 'Cause for Concern':**

This is defined as any incident contained on video footage reviewed by the VAT which unexpectedly raises a serious and significant issue. Examples of such issues would include: serious criminal activity, significant violation of the GMC or GNC codes of practice, reckless behaviour deemed to pose a significant risk of harm to patients or staff - irrespective of whether harm actually occurred. These cases will be confidentially referred by the VAT reviewer to the ED oversight team for investigation. The ED oversight team will gather relevant information about the incident with a view to taking one of the following actions:

- a. No further action required as the incident is already being dealt with, or is deemed by the ED oversight team not to warrant further action.
- b. Escalation of the incident through existing governance processes.

The Clinical Management Group will be notified of 'cause for concern' incident investigations.

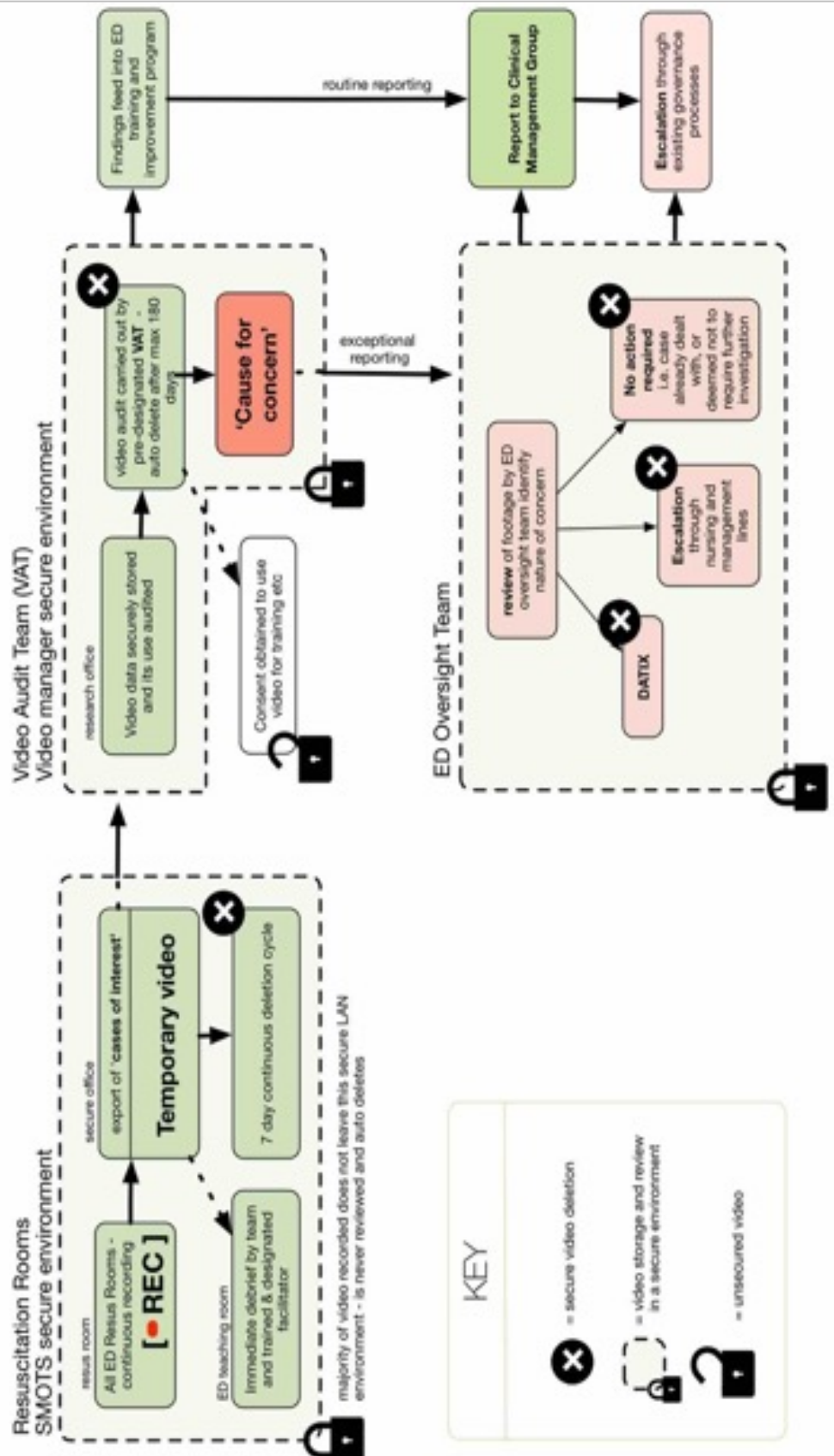
**Note**

Footage cannot be used to investigate any concerns raised during normal clinical practice. Concerns raised by staff about resuscitation room practice will be dealt with in the usual way with no recourse to trawling video footage for additional evidence.

**8. Clinical Management Group - Reporting Arrangements:**

Regular reports of outputs from the VAT program of work, along with all 'cause for concern' incident investigations will be made available to the Clinical Management Group.

RIE Emergency Department Resuscitation Video Recording - Governance Framework v 2.0, 10-03-15



**DRAFT ADMIN SOPs  
VERSION 1. 30/07/2015**



**Resuscitation Research Group**

**NHS Lothian**

**Escalation Policy**

This document sets out what staff should do if they have a 'cause for concern' whilst accessing the video-audit data. The RIE Emergency Department Resuscitation Video Audit - Governance Framework (Version 2.1, 12-05-15) defines this as any incident contained on video footage reviewed by the VAT which unexpectedly raises a serious and significant issue. If there is a cause for concern, staff should:

1. Record the details of the incident including the date, time, location and the individual(s) involved, as well as recording a description of the incident

incident should be referred to the ED Oversight Team. Should the incident be referred to the ED Oversight Team, they will gather the relevant information with a view to taking one of the following action:

1. No further action required as the incident is already being dealt with, or is deemed by the ED oversight team not to warrant further action
2. Escalation of the incident through existing governance processes

South East Scotland Research Ethics Service

Waverley Gate  
2-4 Waterloo Place  
Edinburgh  
EH1 3EG



**Project Title: RIE Emergency Department Resuscitation Video Audit**

You have sought advice from the South East Scotland Research Ethics Service on the above project. This has been considered by the Scientific Officer and you are advised that, based on the submitted documentation (email correspondence and Video Governance Framework v 2.1-12-05-), it does not need NHS ethical review under the terms of the Governance Arrangements for Research Ethics Committees (A Harmonised Edition).

The advice is based on the following:

- *The project is an evaluation limited to using data obtained as part of usual care, but note the requirement for Caldicott Guardian approval for the use or transfer of person-identifiable information within or from an organisation*

**If the project is considered to be health-related research you will require a sponsor and ethical approval as outlined in The Research Governance Framework for Health and Community Care. You may wish to contact your employer or professional body to arrange this. You may also require NHS management permission (R&D approval). You should contact the relevant NHS R&D departments to organise this.**

**For projects that are not research and will be conducted within the NHS you should contact the relevant local clinical governance team who will inform you of the relevant governance procedures required before the project commences.**

This letter should not be interpreted as giving a form of ethical approval or any endorsement of the project, but it may be provided to a journal or other body as evidence that NHS ethical approval is not required. However, if you, your sponsor/funder feels that the project requires ethical review by an NHS REC, please write setting out your reasons and we will be pleased to consider further. You should retain a copy of this letter with your project file as evidence that you have sought advice from the South East Scotland Research Ethics Service.

Yours sincerely,

## South East Scotland Research Ethics Service

### Differentiating clinical audit, service evaluation, research and usual practice/surveillance work in public health

RESEARCH	SERVICE EVALUATION*	CLINICAL AUDIT	SURVEILLANCE	USUAL PRACTICE (in public health)
The attempt to derive generalizable new knowledge including studies that aim to generate hypotheses as well as studies that aim to test them.	Designed and conducted solely to define or judge current care.	Designed and conducted to produce information to inform delivery of best care.	Designed to manage outbreak and help the public by identifying and understanding risks associated.	Designed to investigate outbreak or incident to help in disease control and prevention.
Quantitative research – designed to test a hypothesis. Qualitative research – identifies/explores themes following established methodology.	Designed to answer: "What standard does this service achieve?"	Designed to answer: "Does this service reach a predetermined standard?"	Designed to answer: "What is the cause of this outbreak?"	Designed to answer: "What is the cause of this outbreak?" and treat.
Addresses clearly defined questions, aims and objectives.	Measures current service without reference to a standard.	Measures against a standard.	Systematic, statistical methods to allow timely public health action.	Systematic, statistical methods may be used.
Quantitative research – may involve evaluating or comparing interventions, particularly new ones. Qualitative research – usually involves studying how interventions and relationships are experienced.	Involves an intervention in use only. The choice of treatment is that of the clinician and patient according to guidance, professional standards and/or patient preference.	Involves an intervention in use only. The choice of treatment is that of the clinician and patient according to guidance, professional standards and/or patient preference.	May involve collecting personal data and samples with the intent to manage the incident.	Any choice of treatment is based on clinical best evidence or professional consensus.
Usually involves collecting data that are additional to those for routine care but may include data collected routinely. May involve treatments, samples or investigations additional to routine care.	Usually involves analysis of existing data but may include administration of interview or questionnaire.	Usually involves analysis of existing data but may include administration of single interview or questionnaire.	May involve analysis of existing data or administration of interview or questionnaire to those exposed.	May involve administration of interview or questionnaire to those exposed.
Quantitative research – study design may involve allocating patients to intervention groups. Qualitative research – uses a clearly defined sampling framework underpinned by conceptual or theoretical justifications.	No allocation to intervention: the health professional and patient have chosen intervention before service evaluation.	No allocation to intervention: the health professional and patient have chosen intervention before audit.	Does not involve an intervention.	May involve allocation to control group to assess risk and identify source of incident but treatment unaffected.
May involve randomisation.	No randomisation.	No randomisation.	No randomisation.	May involve randomisation but not for treatment.
Normally requires REC review. Refer to <a href="http://www.nres.npsa.nhs.uk/applications/apply/">www.nres.npsa.nhs.uk/applications/apply/</a> for more information.	Does not require REC review.	Does not require REC review.	Does not require REC review.	Does not require REC review.

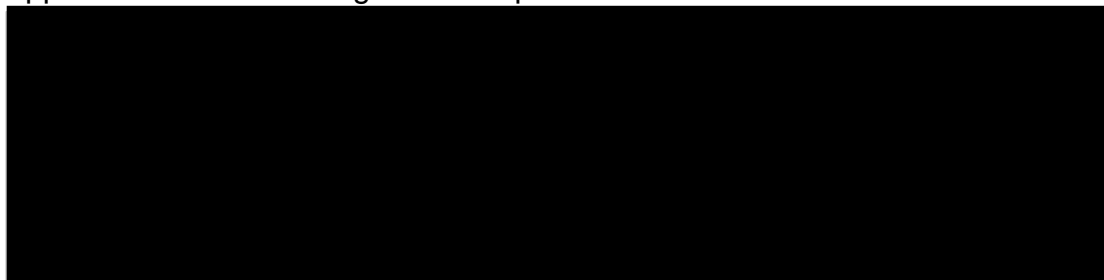
\* Service development and quality improvement may fall into this category.



2

Headquarters  
Waverley Gate, 2-4 Waterloo Place  
Edinburgh EH1 3EG  
Chair: Mr Brian Houston  
Chief Executive: Tim Davison  
*Lothian NHS Board is the common name of Lothian Health Board*

## Appendix D – Central Legal Office opinion



It was good to meet up with you all today and to look round the location of the resus areas.

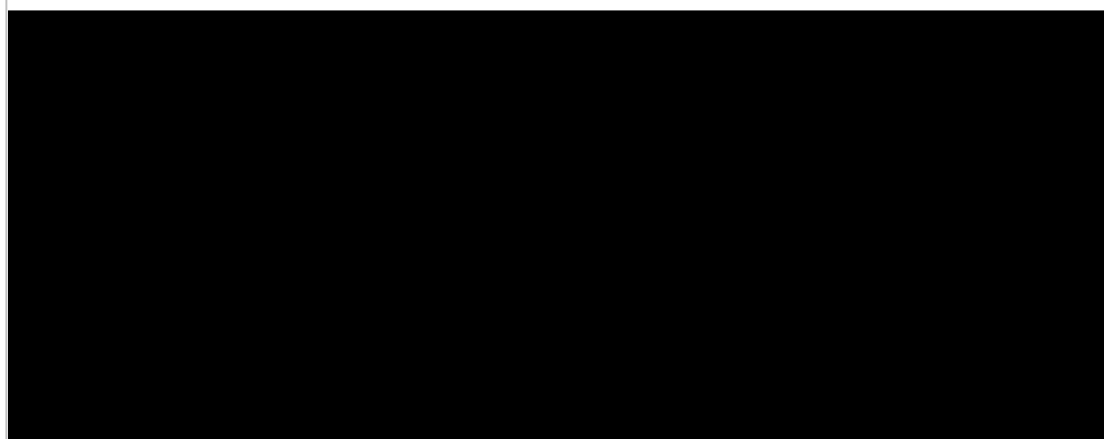
My view having considered what you have told me about the planned use of video evidence for audit and learning is that I am supportive of the scheme. I do consider that there is a risk that the material might be called for in a court action or Fatal accident inquiry but it would be one piece of evidence and might in fact strengthen your position in working out exactly what happened and when. As I also said, I have been in this job for 30 years and in that time have never actually had a claim about a major resuscitation – although of course I now expect to have several! Claims tend to be about missed fractures or brain injuries and this video footage would not be relevant. Claims are covered, as you know, by the CNORIS scheme and this would be the case here.

We discussed the IG aspects and you explained that the Caldicott guardian was happy with the proposal. You have put safeguards into the scheme to protect the interests of clinicians who might have individual concerns about their actions being recorded.

Finally ,in my view the biggest risks are incurred by not learning from our experience!

Hope this is helpful.

Best wishes



## Appendix E – Ethical review committee opinion



Ref: NURS010

**Adam Lloyd**  
Doctoral Research in Nursing Studies  
School of Health in Social Science  
Medical School  
Teviot Place  
Edinburgh  
EH8 9AG

SCHOOL OF HEALTH IN SOCIAL SCIENCE

The University of Edinburgh  
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Medical Quad  
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EH8 9AG

30 July 2015

E-mail: k.melia@ed.ac.uk

Telephone: 0131 650 3893

Fax: 0131 650 3891

Dear Adam

### APPLICATION FOR LEVEL 2/3 APPROVAL

**PROJECT TITLE: Non-technical skills in the resuscitation room: an empirical model of leadership to describe resuscitation performance**

Thank you for submitting the above research project for review by the Section of Nursing Studies Ethics Research Panel.

I can confirm that the submission has been independently reviewed and was approved on 29 July 2015.

Should there be any change to the research protocol, it is important that you alert us to this as this may necessitate further review.

Yours sincerely

*Kath Melia*  
P.P. Kath Melia  
Professor of Nursing Studies

The University of Edinburgh is a charitable body, registered in Scotland, with registration number SC005336

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Contemporary issues

### Leaders, leading or leadership?: A taxonomic need for emergency care

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We outline how the traditional ideologies and methodologies of leadership research have intersected with the study of leadership in healthcare – with a particular focus on emergency care teams. Due to the lack of a clear, shared understanding of leadership and its variants, we argue that the absence of common leadership taxonomies is leading to suboptimal research at a theoretical and clinical level. We suggest a refinement of the popular leadership discourse of the last century and call for an approach to research which captures the dynamic complexity of emergency care.

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**1. Introduction**

Few areas of social enquiry have received as much attention as the phenomenon of leadership. Leaders and leadership are everywhere, in all variety of professions and industries – from team managers, to heads of department, to CEOs and Prime Ministers. As Grint [7] recognised, “Leadership, or the lack of it, seems to be responsible for just about everything these days” (p. 5).

Despite its ubiquity, there is little consistency of thinking about how the processes and mechanisms of leadership occur. Initiation, structure and maintenance of leadership in different situations is not well understood. Often the shortcomings and successes of healthcare are ascribed to either a failure or triumph of leadership, without providing an ontological or epistemological context for why any range of behaviours and practices should be defined as ‘leadership’.

Bennis recognised this over five decades ago, observing that: “Of all the hazy and confounding areas in social psychology, leadership theory undoubtedly contends for top nomination... Probably more has been written and less is known about leadership than about any other topic in the behavioral sciences” ([3], p. 259). The common lay perception is that leadership is axiomatic in nature; it is implicit, in common with other socio-behavioural concepts such as teamwork and communication. But despite literally thousands of empirical and theoretical studies “there are no generally accepted definitions of what leadership is, no dominant paradigms for studying it, and little agreement about the best strategies for developing and exercising it” ([8], p. 43). This challenge is the central theme of this contemporary issue article.

**2. Leadership research in healthcare**

The common approach to understanding leadership has been socialised to focus on individuals who occupy archetypal leader roles and identify those characteristics or behaviours that can plausibly explain their success. This has led to a phenomenon that is heavily leader-centric.

To a large extent, healthcare has adopted the historical ideologies of leadership and carried these into the design and conduction of research. Alvesson and Sveningsson [1] observed that “There are perhaps too many studies assuming and producing leadership through designs with inbuilt “proofs” of leadership, carried out by researchers ideologically and commonsensically committed to this idea” (p. 379). This has meant that healthcare has had to rationalise a plethora of disparate terms, ideas and meanings into research that extends across multiple settings – from ‘the board to the ward’.

However, in simply adopting the prevailing language of leadership without applying a necessary critique, healthcare has not addressed the difficult question about what being a leader actually entails. Is a leader the “the strong and decisive decision maker, the superior technician or professional, the team builder and coach, the educator and developer of people or the results-oriented number cruncher carefully monitoring and putting pressure on people to perform?” ([1], p. 365). Currently, the tendency in healthcare has been to group these questions under a general umbrella term of ‘leadership’, meaning that the leadership requirements for individuals, teams, services and organisations are treated as if they were the same.

Similarly, the semantic difference between leaders, leading and leadership are challenging to unpack in any meaningful way. Where should the boundaries be drawn when there are over 65 theoretical domains of leadership? [4]. Until a common language is developed, leadership thinking in healthcare will continue to

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be confounded by a lack of agreed definitions. As Souba [13] has argued: *"By and large, our view of leadership tends to center around individuals and their talents, contributions and achievements. This view of leadership is not wrong, but it is no longer adequate"* (p. 177).

### 3. Leadership in emergency care

At the level of patient care, the absence of standardised clinical leadership taxonomies has resulted in a range of methodologies being used in healthcare. This is most apparent in acute care teams, where a recent systematic review found that team leadership has been assessed using 61 different tools [12]. Tools which have assessed leadership as the primary focus, such as the Campbell Leadership Descriptor or modified versions of the Leadership Behaviour Description Questionnaire, have measured the performance and behaviours of a single team member who 'ought' to be the leader. In doing so the authors suggest that this type of team leader should be able to display 37 different leadership functions. It is incumbent on clinicians and academics to ask whether any one individual can achieve this view of leadership that is imbued with leader-as-hero ideology.

In contrast to this work, a number of ethnographic studies have observed leadership in its natural setting in the emergency care environment, without limiting this to the behaviours of a specific individual [16,10]. These studies have found that the dynamics of leadership are far more nuanced than the hierarchical, unidirectional form which is championed in the majority of research. Leadership is viewed as a process that is malleable to patient, team and cultural factors, all of which influence how leadership operates in challenging resuscitation situations [15]. This leads us to ask, can the inner workings of adaptive, highly-skilled teams working in ambiguous situations simply be explained as the function of one individual 'leader'? Without tools and taxonomies that are sensitive to context and reflect the reality of leadership in different settings, leadership research will continue to yield very limited outcomes.

### 4. Towards leadership taxonomies

Historically, attempts have been made to classify leadership research in terms of how leaders and followers interact [6]. A more exhaustive classification was devised by Hernandez et al. [9] who suggest two fundamental principles for measuring leadership – locus and mechanism. They posit that the locus of leadership can arise from the leader, the follower, the dyad of the leader–follower, the collective group and the context. The mechanism of leadership – how it is applied – can be through traits, behaviours, affect and cognition.

When studying emergency care teams, the importance of context, the interactions between group members and the interplay of complex leadership mechanisms has largely gone unnoticed in favour of approaches that attempt to measure the skills and competencies of one individual. This was highlighted in the review by Rosenman and colleagues (2015) where the tools used to assess leadership, such as those mentioned above, asked such siloed questions as whether a team member was considered 'a great leader'. We argue that this is, in part, due to the absence of a leadership taxonomy that is suitable for the emergency care environment, inclusive of all team members and sensitive to the temporal changes in team functioning. As yet, "...empirical research has often relied on "traditional" leadership models when discussing the role of team leadership. . . As such, there are considerable gaps in our understanding of the unique interplay between teams and leadership processes. . ." ([11], p. 6).

Pursuing a taxonomy for emergency care teams that is fit for purpose could lead to two important outcomes. Firstly, by conducting more research that observes leadership in its natural context, models of leadership can gain meaningful clinical credibility with nurses, doctors and other clinicians who work in emergency care, rather than be pushed to the margins by staff who feel it is not relevant for them at the bedside. Secondly, the processes of developing a leadership taxonomy for emergency care teams will subject leadership to the same academic and clinical scrutiny that is often demanded in other areas of healthcare. In doing so, a more integrative approach to practice and theory can be achieved [2]. This effective symbiosis [17] will allow clinical practice to shape leadership theory building as opposed to shoe-horning an unsuitable theory into resuscitation team practice.

### 5. Conclusion

Healthcare is now at a crossroads, where the 'one size fits all' approach to leadership is no longer suitable. At this juncture, leadership appears key to optimising healthcare whilst continually being met with crises at local and national level [5,14]. The pendular nature of leadership may, in part, be due to the difficulty in defining and measuring the concepts of leaders and leadership, which is particularly evident in emergency care research. Emergency care has applied theories and tools that are inherently focussed on one individual leader whilst trying to capture the dynamics of fluid teams working in uncertain, challenging emergency situations. Our understanding of leadership loci and mechanisms is incomplete. If we are to measure and improve our leadership, a taxonomy for emergency care teams that better reflects this unique area of care is needed.

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What makes good leadership in healthcare? This is much debated, but team interactions seem at least as important as who the designated leader is

# From leader to leadership in emergency care

## In this article...

- › Problems in forming clinically relevant definition of leadership
- › How leadership is traditionally conceptualised in health
- › Why the focus has moved from leader-centric approaches

**Author** Adam Lloyd is a nurse at NHS Lothian and PhD student at the Resuscitation Research Group, University of Edinburgh; Gareth Clegg is an honorary consultant in emergency medicine at NHS Lothian and a senior clinical lecturer at the University of Edinburgh, where he leads the Resuscitation Research Group.

**Abstract** Lloyd A, Clegg G (2016) From leader to leadership in emergency care *Nursing Times*; 41/42: 10-12.

Historically, leadership research has focused on the qualities of people in formal leadership positions, not the processes of leadership itself. However, leader-centric approaches are unhelpful in healthcare, as good team performance is often the result of interactions between individuals, rather than the work of one person. This is particularly the case in emergency care, as shown by studies exploring how resuscitation teams work. This article discusses how shortcomings in the leadership discourse have permeated healthcare and are hindering the study of leadership. The authors suggest that focussing on what makes good leadership, as opposed to what makes good leaders, will provide a way forward.

The lack of a standardised, cohesive approach to leadership in healthcare is problematic. Leadership in nursing has long been recognised as an important part of practice, education and policy (Pickering, 1921). It used to be the domain of senior figures occupying archetypal leader positions. However, in recent years, some have argued that leadership “is an essential part of nursing practice and that all nurses’ roles are, in one way or other, leadership

roles” (Curtis et al, 2011). Leadership is a ubiquitous term whose semantic boundaries have become blurred: it is referred to as something that resides with a group of select individuals, while simultaneously being a necessary attribute of all. Indeed, it is often said that failings in healthcare at individual, ward, organisational and national level are due to failures in leadership (Francis, 2013).

Additionally, the different contexts and circumstances in which leadership is required have not been properly defined. How can the long-term strategic needs of an organisation be equated with the needs of an emergency care team, even though they are all cast under the banner of ‘leadership’?

For most, leadership carries with it an implicit set of beliefs and assumptions. Everyone has their own theory about what leadership is and how it is enacted. However, the meanings attached to leadership are often treated as if they were part of a shared understanding. As Luthans (1979) argued, “Too often theorists forget that leadership or ‘influence’ are merely labels that are attached to hypothetical constructs. Too often, the hypothetical construct is treated as the empirical reality”. In other words, leadership is not a universal concept but is shaped by local, social and cultural dimensions. It means different things to different people.

## Leadership in healthcare

The struggle to develop a consensus on what leadership is has lasted decades (see Box 1) and its manifestations are evident in a number of areas, most notably healthcare. Similar to leadership in general, leadership in healthcare has been

## 5 key points

**1** Traditionally, literature on leadership has favoured leader-centric approaches

**2** Reducing leadership to the acts of a few does not reflect its fluid and interactive nature

**3** In resuscitation teams, there is a complex interplay of processes that is not captured by historical concepts of leadership

**4** Nurses who do not see themselves as leaders may nevertheless perform leadership functions

**5** By exploring leadership rather than leaders, researchers have a roadmap to describe how highly-skilled people work in adaptive teams

**BOX 1. THEORISING LEADERSHIP: AN ELUSIVE QUEST**

Scholars worked on a general theory of leadership for over 10 years, yet the authors described their efforts as an “enduring and elusive quest” (Sorenson et al, 2011). They concluded that the connotations and values of leadership were too disparate to produce a unified theory. This lack of a common understanding of leadership has been abundantly highlighted in literature. Fiedler (1971) argued “there are almost as many definitions of leadership as there are leadership theories – and there are almost as many theories of leadership as there are psychologists working in the field”. Day and Antonakis (2012) pointed out that “leadership researchers have struggled for most of the last century to put together an integrated, theoretically cohesive view of the nature of leadership, invariably leading to disappointment in those who attempted it”.

predominantly understood as focused on the individual. The rationale of research has been to uncover the qualities of ‘good’ leaders and how these relate to staff performance (Hartley and Benington, 2010).

Popular rhetoric, as highlighted by Collins-Nakai (2006), is that leadership is “about taking risks” and “about having the courage of one’s convictions” and “the will to act even in the face of powerful conventional wisdom, or strong opposition”. Such narratives are what Meindl et al (1985) referred to as the romance of leadership. They propose that leadership offers people a tangible explanation of complex social and organisational machineries. Bligh et al (2011) asked whether we can even “generate a theory of leadership that does not highlight leaders as the most important object of study”.

So far, the theories and methodologies used in healthcare have produced leader-centric conceptualisations – such as transactional, transformational and trait theories – of leadership, which have become the norm. This has encouraged clinicians and academics alike to seek out those who are perceived as effective leaders and idealise their attributes, often negating the contextual or systemic factors that have allowed their leadership to become effective in the first place. This has, in turn, created the impression that health services are run by the charismatic doctor, the robust ward sister, the skilled surgeon or the inspirational manager, rather than by a collective of people and teams.

As The King’s Fund (2011) recently argued, there needs to be a “move beyond the outdated model of heroic leadership to recognise the value of leadership that is shared, distributed and adaptive”. Leadership occurs through a complex interaction of people, behaviours, socio-cultural norms and organisational factors; to reduce it to the acts of a few individuals does not reflect its fluid nature (West et al, 2014).

**Leadership in emergency care**

Although present in all areas of healthcare, the manifestations of leader-centric models of leadership are most evident in emergency care, and even more so in resuscitation teams. Traditional leadership theories have filtered down from organisational and management sciences and have been applied to clinical care without an appreciation of the contextual and environmental differences.

Kozlowski et al (1996) argued this two decades ago, stating: “It is difficult to apply prescriptions from existing leadership research to teams operating in complex and dynamic decision-making environments. The primary limitations of existing frameworks include their lack of conceptual grounding in the defining characteristics of the team context, relative insensitivity to team developmental processes that unfold over time, and neglect of team-level, cyclical dynamics in task complexity and workload.”

In support of this, studies observing leadership in real resuscitation episodes (Klein et al, 2006; Sarcevic et al, 2011; Xiao et al, 2004) have repeatedly found that leadership does not always take strict hierarchical, formal modes. Rather, the who, when and how of leadership depends on circumstances, such as the severity of patient illness, the experience of team members in the room, how well they know each other, and a whole range of sociobehavioural factors. During emergency resuscitation, there is a complex interplay of leadership and team processes that is not captured by historical conceptualisations of leadership.

Research is now moving away from focusing on the individual who occupies the position of leader towards who in the team is displaying leadership. Leadership thus becomes something functional and clinically relevant, rather than a collection of loose concepts. This aligns with McGrath’s functional theory, which proposes that the leadership role “is to do, or

get done, whatever is not being handled by group needs” (McGrath, 1962). By exploring leadership rather than leaders, researchers have a roadmap for conducting studies that empirically describe how highly skilled people function in complex-adaptive teams.

**Informal nurse leadership**

Recent studies – conducted in the simulated (Sadideen et al, 2016) and real environment (Rydenfält et al, 2014) – have observed the leadership behaviours of all team members. They have found that senior nurses often display leadership without being in designated leader roles. When recognising the needs of the team, nurses can transiently display leadership functions that resonate with their peers and colleagues (Lloyd et al, 2015). This creates a sense of followership that pulls team members towards these nurses. Leadership, in that sense “is co-created in social and relational interactions between people” (Uhl-Bien et al, 2014).

This is conceptualised in the social identity theory of leadership (Hogg et al, 2012), which proposes that people who engage in prototypical leadership behaviours have disproportionate influence over the group’s identity and actions. In practice, this means that senior nurses who fit the group’s leadership prototype will function as leaders without being named as such.

**QUICK FACT**

**Recent studies** found that senior nurses often display leadership without being in designated leader roles

In a large ethnographic study at a trauma centre, Klein et al (2006) observed that “nurses are lower in the formal hierarchy.. but nurses exert considerable informal influence”. Their rich interview data reveals how nurses exercise leadership when dealing with professional norms and hierarchies: “We can gently tell the docs what we think. Nurses have more autonomy here than in other areas of the hospital. The nurses are very experienced here, and there’s usually so much going on that you’re left to handle things by yourself.”

Such a sentiment is likely to be expressed by nurses who may not see themselves as leaders, but perform leadership functions nevertheless. This is a silent form of leadership, one that is not captured when focusing on the individual who is the leader on paper. In many circumstances, this hidden work of nurses

## Nursing Practice Discussion



Leadership is one of the strongest predictors of how health services perform

goes unnoticed (Wolf, 1989), despite the fact that their informal acts of leadership will shape team performance. These subtle dynamics should be further investigated using more varied methodologies in order to bring balance to the literature, which is currently leader-centric.

### Future research

This critique of leadership should not undermine its importance, as leadership – or the lack of it – is one of the strongest predictors of how health services perform. In the United States, the Joint Commission (2016) found that failings in leadership were the second highest root cause of significant adverse events, contributing to over 1,900 errors during the preceding three years. In the UK, the Mid-Staffordshire public enquiry cited over 850 times ‘leaders’ or ‘leadership’ as being central to good care (Francis, 2013).

In its 2015 annual report, the Care Quality Commission concluded that 94% of services rated as ‘good’ or ‘outstanding’ also had good or outstanding leadership, whereas 84% of services rated as ‘inadequate’ also had inadequate leadership. This suggests a causal relationship: poor leaders equal poor leadership, which equals poor performance. Researchers and clinical staff have to question this: is it possible for an individual to be a good leader but see their efforts suppressed by a negative culture? Can a team provide high-quality care even if leadership is suboptimal? Can good performance be explained by mechanisms other than the actions of a good leader?

Leadership is undoubtedly important, so these difficult questions need to be asked. The main barrier, paradoxically, is that those who have responsibility for asking them are nurses, doctors and

academics who themselves are leaders and, as such, are likely to have internalised the leader-as-individual paradigm.

### Conclusion

Despite a huge amount of empirical and theoretical work, the study of leadership is “curiously unformed” (Hackman and Wageman, 2007). Healthcare has inherited a leader-focused approach, which means our understanding of the phenomenon remains shallow. This is likely to contribute to the regular pattern of failings caused by poor leadership. The inadequacy of the leader-centric approach is most evident when studying emergency care: here, solely observing the formal team leader risks neglecting the dynamic, adaptive processes that are behind high-performance team functioning.

We suggest refocusing the enquiry lens on leadership – who is displaying leadership, how leadership is adapting over time, and which team dynamics promote or discourage good leadership – rather than on leaders. Reframing investigations in this way will not only better reflect how resuscitation teams function, but also provide a template for understanding leadership in other areas of healthcare. **NT**

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## Video recording in the emergency department: a pathway to success

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At the Royal Infirmary of Edinburgh in Scotland, we video record all patients who are admitted into the ED resuscitation rooms as part of our continuous video audit system. Since installation in late 2015, numerous EDs from across the UK and abroad have repeatedly asked us the same questions: how did you do this; how did you 'get past ethics'; how do you get consent.

The consistent problem for EDs wishing to integrate video is not the lack of supportive studies reporting video use; video-based studies have assessed the full spectrum of ED care, including communication during consultations,<sup>1</sup> family-staff interactions<sup>2</sup> and time-critical resuscitations.<sup>3</sup> The problem is that there is scarce guidance on how EDs can navigate the processes that will allow them to progress with their own programme of work.<sup>4</sup>

Here, we report on our experience of the practical issues associated with video implementation, such as legality, ethics, data protection and staff acceptance, as these are the issues that are regularly cited as reasons why video is not used.<sup>5-6</sup> By focusing on these, we can start to answer the questions above that are pertinent to all EDs that pursue video audit and move towards video becoming an essential part of care delivery.

### WHY VIDEO?

Video assessment has consistently shown to be a precise method of improving in clinical practice,<sup>7,8</sup> as well as offering a level of

analytical detail that is difficult to achieve with traditional observational techniques. For example, a study measuring the standard of paediatric trauma resuscitations found that compared with video assessment, routine medical record review only detected 20% of errors.<sup>9</sup> Similarly, while video review of airway management in 48 patients identified 28 performance deficiencies, standard anaesthetic records coupled with an anaesthesia quality assurance report only identified 2.<sup>10</sup> Video is the next step in measuring how we deliver care.<sup>11</sup>

### Managing staff concerns

The prospect of video recording clinical care in a busy ED is daunting for most staff. Prior to implementation, we found that staff initially reported that they would feel exposed, particularly in challenging resuscitation situations. Video recording will only be supported by staff and approval groups if its intended use, implementation and governance frameworks ensure its focus is departmental learning as opposed to individual or punitive assessment.

To ensure this, we organised a series of presentations to the clinical teams in the department, covering all clinical and non-clinical staff. Furthermore, we reached out to other specialities that visit the department, such as critical care, cardiology and stroke. Drop-in sessions gave staff the opportunity to voice any concerns in private. If the views of staff are thoroughly canvassed and their concerns addressed, video is generally accepted as a useful tool.<sup>12,13</sup>

We set out a video policy that aligned with our department's ongoing quality improvement work, whereby a small group of ED staff would form a video audit group (4–6 people) and review cases of interest, either individually or as a team. These were defined as cases where specific learning points could be fed back into department meetings or training days, informed by national and local priorities, such as the standard of stroke, cardiac arrest and trauma care. Each clinician initially set aside approximately 2 hours per week for video review.

### How to manage video data

In the UK, video systems and the data they collect are subject to the same comprehensive provisions of the Data Protection Act (DPA)<sup>14</sup> as other non-video sources, broadly set out in Schedule 1 of the Act. In short, data should be processed for specific lawful purposes, it should not be kept for longer than necessary and appropriate technical and organisational measures should be taken to ensure it is secure.

We proposed a fixed camera installation from Scotia UK called smots that would satisfy the provisions of the DPA (figure 1).<sup>15</sup> Video data are transmitted to a secure server behind two card-entry door systems within the ED that feeds footage into a locked viewing room. As this is on an isolated 'offline' network, only members of the department's video audit group can access footage through a password-protected viewing terminal. An automatic deletion loop is set for 7 days, with a secondary deletion loop set for 180 days to allow specific learning cases to be analysed within smots. This formed part of a governance framework that was provided to the Caldicott Guardian and Data Protection Officer who were satisfied that an appropriate data handling system was in place.

Outside the UK, other countries have equivalent data protection laws that require the same degree of careful consideration, otherwise video implementation will fail. For example, after the passing of stricter privacy legislation in the USA, combined survey data reveal that the number of EDs and trauma centres that were video recording dropped from 45% to 13%.<sup>16,17</sup> This, however, should not be viewed as a permanent barrier to video; 98% of centres that reported video recording traumas in the USA obtained no form of patient or family consent, yet no site had any subsequent patient confidentiality, consent or medico-legal problems.<sup>5</sup> Similarly, in Australia, 96% of parents were satisfied with the provisions put in place to video record challenging neonatal resuscitation.<sup>18</sup> If a robust data system is put in place, approval committees, staff and patients are supportive.

### ETHICO-LEGAL ISSUES

A common theme that we have heard from across the UK is that when presented with a proposal for a live video system, ethico-legal services respond negatively. We found it helpful to have sensitising conversations with the ethico-legal departments long before we set out any documentation.

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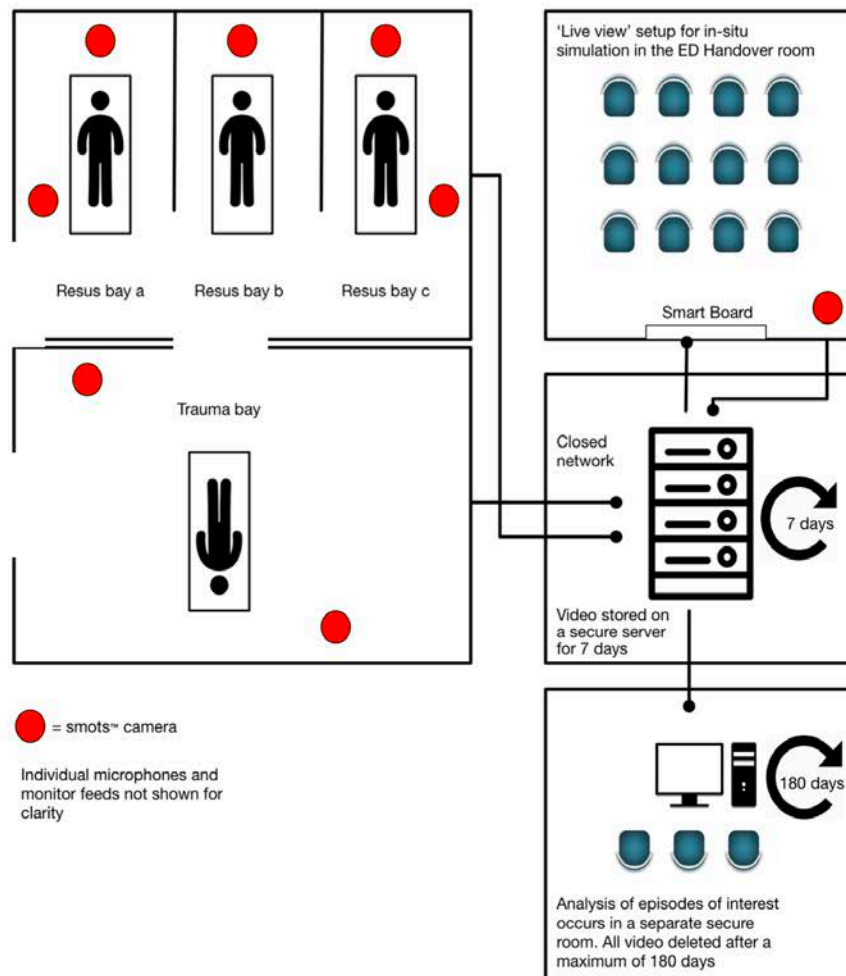


Figure 1 Diagram of video audit system infrastructure.

We asked our approval groups for their input and amended our governance documents accordingly. We attended executive level meetings to share our vision and hear their thoughts. These conversations lasted about 12 months; however, at the end of this process, we had a department and hospital that were far more receptive to a video system.

Our robust governance documents detailed what video would be used for, how it would be collected and stored, who would have access and what safeguards were in place. These were then discussed with the Research Ethics Service and the Central Legal Office (CLO) who are the in-house solicitors to the Scottish public sector.

Our Research Ethics Service advised that as our system would solely be used for service evaluation and audit; further ethical review would not be required. This aligns with guidelines administered by NHS Health Research Authority, which stipulate that service evaluation and audit do not require ethical approval.<sup>19</sup> Internationally, groups who are video recording have reported being subject to the same processes.<sup>20</sup> In Australia and the USA, for example, ethical committee approvals have not been required to video record emergency care when it used for quality assurance and clinical audit.<sup>21 22</sup> Our experience, coupled with international

work, suggests that video does not need to equate with research. Ensuring a video system aligns with service evaluation or audit, and building this into existing departmental improvement efforts, will influence how a proposal is received.

Locally, we outlined that video did not form part of the patient record to comply with the DPA, thus we would not require consent. The CLO was satisfied with the legality of the system, highlighting the overlap between video audit systems and existing continuous CCTV. In total, the process of implementation—from idea conception to video camera installation—took approximately 18 months.

## The view from here

### Video in routine care delivery

Video use in medicine is 70 years old.<sup>23</sup> Despite its evident advantages, EDs struggle to implement this as part of standard care delivery. Our view from here is not a prescription, nor is it the only path to success. We offer this as a much-needed practical guide for EDs and other clinical services who can use this as a template for embedding video within their department.

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# Dynamic nurse leadership in high-pressure situations

Adam Lloyd and colleagues assess the value and application of non-technical skills among emergency nurses working in resuscitation rooms

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## Abstract

Traditionally, healthcare professionals have been expected to acquire technical skills while minimal attention has been paid to the non-technical skills (NTS) they require to work in complex health environments, such as resuscitation rooms. This article explains the importance of NTS in improving patient outcomes and why a model of dynamic nurse leadership is useful in resuscitative care.

## Keywords

Resuscitation, non-technical skills, human factors, leadership, work

SINCE THE publication of Kohn *et al*'s (2000) landmark book about patient safety, *To Err is Human*, there has been a greater appreciation of the factors that affect professional performance in dynamic, complex healthcare environments. One subject of academic discussion in this context is practitioners' non-technical skills (NTS), which can be defined as the 'cognitive, social and personal resource skills that complement technical skills, and contribute to safe and efficient task performance' (Flin *et al* 2008).

Practitioners in some specialties, including anaesthesia and surgery, have developed a vocabulary for the skills they require, such as situation awareness, teamwork and task management (Flin *et al* 2008). Emergency care practitioners have been slower to engage with NTS, however, and NTS for paramedics (Shields and Flin 2013), emergency helicopter services (Abrahamsen *et al* 2014) and emergency physicians (Flowerdew *et al* 2013) were explored only recently. Yet, these studies suggest that core NTS are necessary across healthcare professions.

This article explains the importance of NTS among nurses who work in the most acutely dynamic area of the emergency department (ED), the resuscitation room, and sets out a model of dynamic leadership for senior members of resuscitation teams.

## Non-technical skills

Although nurses have the primary role in emergency care delivery, there has been little research into the repertoire of skills they possess. Such nurses are faced with unique challenges, including an enormous variety of clinical presentation, gender, sex, age and past medical history among patients, which make predictions of which patients require emergent care almost impossible.

Nurses who are members of multidisciplinary teams in resuscitation rooms must undertake investigations, interventions and clinical procedures urgently, and so have little time for planning and evaluation. Moreover, team members tend to work at different times of day and days of the week, and are unlikely to be familiar with each other. If patients have acute illnesses, staff from other parts of the hospital may be called to resuscitation rooms to give specialist input, and this further changes the team structure.

Because of these characteristics, team NTS are crucial determinants of clinical outcomes in resuscitation rooms (Andersen *et al* 2010a), and poor NTS often contribute to errors during cardiopulmonary resuscitation (Andersen *et al* 2010b, Yeung *et al* 2012) and trauma resuscitation (Lubbert *et al* 2009, Sarcevic *et al* 2012).

Yet, compared with the traditional leadership roles of physicians, the role of nurses in multidisciplinary teams is undefined. Surveys of

ED staff suggest that, during resuscitative care episodes, roles and responsibilities form a hierarchy (Porter *et al* 2014), which is reflected in resuscitation team assessment. This suggests that team dynamics are informed by individuals' perceptions of their roles (McKay *et al* 2012).

Empirical evidence suggests, however, that team members' roles are more nuanced (Tschan *et al* 2014), while observational studies indicate that nurses often assume transient leadership roles (Yun *et al* 2003, 2005, Klein *et al* 2006). This evidence suggests that a model of dynamic leadership may be developed in which nurses who are not labelled 'team leader' nevertheless 'lead from the middle'.

This model raises questions of clinical competency and the maintenance of professional boundaries during resuscitative care (Currie and Crouch 2008). The former has largely been addressed through qualitative (Clements *et al* 2015) and experimental (Gilligan *et al* 2005) research, which demonstrates that resuscitation room nurses can be trained in the technical skills and NTS they require to optimise patient outcomes. Owing to the novelty of the resuscitation nurse leader role, the latter issue is yet to be addressed.

### Nurse leadership

During complex resuscitations, designated physician leaders usually provide emergent, task-complex

care. However, such care provision can lead to impaired decision making (Schull *et al* 2001), task fixation (Driskell *et al* 1999) and poor team co-ordination (Moon *et al* 2005). Consequently, hands-on leaders are less likely to build structured teams and resuscitation tasks are performed less effectively (Cooper and Wakelam 1999). It is during these clinical episodes that resuscitation nurse leaders can have a crucial role in orchestrating team performance.

Frakes *et al* (2009) propose in their quality improvement case report the development of the role of senior nurse resuscitation leader to augment team performance in a hands-off capacity. This would probably involve coaching and mentoring less experienced staff, organising clinical procedures and equipment, managing resuscitation room environments and asking for or dismissing extra resuscitation staff depending on clinical necessity.

Exploration of this type of nursing leadership role will require identification of nurses' NTS and an ethnographic study of leadership during high-performance resuscitation. Clarifying how nurses' professional values, attitudes and beliefs shape their roles in resuscitation rooms, a process known as the socialisation of nursing (Royal College of Nursing 2013), will prompt further research into nurses' NTS.

### Online archive

For related information, visit our online archive and search using the keywords

Conflict of interest  
None declared

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# Optimising clinical performance during resuscitation using video evaluation

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## ABSTRACT

Video evaluation of resuscitation is becoming increasingly integrated into practice in a number of clinical settings. The purpose of this review article is to examine how video may enhance clinical care during resuscitation. As healthcare and available therapeutic interventions evolve, re-evaluation of accepted paradigms requires data to describe current practice and support change. Analysis of video recordings affords creation of a framework to evaluate individual and team performance and develop unique and tailored strategies to optimise care delivery. While video has been used in a number of non-clinical settings, there has been a recent increase of video systems in the prehospital and other clinical areas. This paper reviews the key opportunities in the emergency department-based resuscitation setting to enhance ergonomics, technical and non-technical skills—at both team and individual level—through video-assisted care performance analysis and feedback.

## INTRODUCTION

Resuscitation within the clinical environment can occur in a wide range of settings but it is most frequently delivered prehospital and in the emergency department (ED).<sup>1–2</sup> These environments may be chaotic and the exchange of information is challenging as clinicians seek to gain control of the situation, gather knowledge and ultimately treat patients.<sup>3</sup> Assessing the quality of care delivery during resuscitation is traditionally achieved by case note review or post hoc debriefs.<sup>4–5</sup> The use of video within the clinical setting offers the opportunity to objectively and repeatedly examine the team interactions and clinical processes that occur during these high-acuity and complex events. Studying experts within a naturalistic setting may enable development of education interventions designed to enhance both novice performance and promote high-quality team interaction.<sup>6</sup>

The purpose of this narrative review is to explore the potential opportunities created by the use of video recording within the clinical setting, in light of the more obvious challenges. Objective, structured analysis across a range of performance indices can inform future developments in education, ergonomics and team interventions. Real-world study of clinical performance within the medical setting remains challenging due to methodological and resource constraints.<sup>7</sup> Video review also offers an opportunity to identify variations in practice and translate these into revised strategies leading to improved clinical outcomes.<sup>8</sup>

## BACKGROUND

The use of video recording for education within the medical domain was first reported by Peltier *et al*<sup>9</sup> within the ED. Hoyt *et al*<sup>10</sup> reported its effective use during trauma resuscitation and demonstrated that video-facilitated debriefs could enhance team performance. Similarly, Weston *et al*<sup>11</sup> were able to observe deficiencies in cardiac arrest management through analysis of video data. In these contexts, video is used to enhance systematic feedback by promoting recall and enabling analysis by multiple observers, especially when used in conjunction with validated and reliable performance rating tools.<sup>12</sup>

A number of studies have examined the usefulness of video in a variety of clinical settings,<sup>13–15</sup> highlighting how diverse use of video can be. A focus on team performance and the science of human factors is increasingly applied to resuscitation; video offers a unique insight into the interactions between humans and other elements in this context. Effective resuscitation requires the synergy of both technical and non-technical abilities of individuals, as well as the capacity for a high-performance team to function to their high standard within the resuscitation environment.<sup>16</sup> Data generated from video review of these routine clinical performances may be qualitative or quantitative, but there exists a need to create reliable and valid matrices to evaluate the quality of care being delivered.

The Resuscitation Research Group (RRG) in Edinburgh has employed video capture since 2012 to audit their Resuscitation Rapid Response Unit (3RU). Paramedic 3RU team leaders who attend out of hospital cardiac arrests (OHCA) are fitted with a lapel-mounted body camera (figure 1). Review and analysis of footage has enabled RRG to devise strategies to enhance the delivery of care during OHCA targeted at areas identified from video review.<sup>17</sup> In the initial phase, naturalistic observations enabled a discovery process, which has subsequently generated a work stream aligned to the events observed. Our group has recently completed a study evaluating the use of paramedics of prehospital ultrasound<sup>18</sup> as well as installing fixed cameras within our ED at the Royal Infirmary of Edinburgh. This has allowed us to begin studying the full chain of survival in OHCA and generated a number of parallel streams of work, such as evaluating a new rapid sequence intubation checklist, enhancing ergonomics and metrics of team performance from the prehospital environment to the ED.

## BENEFITS OF VIDEO OVER DIRECT OBSERVATION

Direct observation or assessment can often be challenging for clinicians who have the dual roles of



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**Figure 1** Resuscitation Rapid Response Unit with badge camera on lapels running simulated out of hospital cardiac arrests.

supervision and involvement in the episode of care. Oakley *et al*<sup>8</sup> found that compared with video review, traditional medical note review only captured 20% of paediatric resuscitation errors. The ability to retrospectively review the event multiple times offers the opportunity to identify subtle errors of omission as well as commission, discern communication cues and analyse for a potential error 'pathway'.<sup>19 20</sup> Video-enhanced guidance also identifies successes of clinical care, which are essential for improving performance and disseminating its impact. While a video camera in the clinical setting may contribute to a Hawthorne effect, this is likely to be less significant than that of direct human observation with a 'mark sheet'.<sup>21</sup> While both strategies enable observers to understand the complexity of the situation, video facilitates forensic analysis at a level of abstraction that promotes scientific enquiry.<sup>22</sup>

#### ERGONOMICS

Creating an efficient work environment that aids delivery of care requires a detailed understanding of the tasks and key processes, which take place at the front line.<sup>23</sup> Improved ergonomics based on observation of real-life performance may provide a more cogent justification for change.<sup>24</sup> Within the trauma setting, creation of space, equipment placement and extraction strategies may be enhanced following video review.<sup>24</sup>

Introduction of new equipment is fraught with challenges as clinicians attempt to integrate these items into clinical practice and workflow. For example, positioning of equipment or even its regular availability may be constrained by dogma or long held practices: video ensures that the optimal approach is

achieved and does not cause unintended detrimental changes to delivery of care.<sup>25</sup>

#### TECHNICAL SKILLS

During high-acuity situations, cognitive bandwidth of clinicians may be exceeded as they try to resolve their current practice and adapt to new care processes.<sup>26</sup> Promoting development and assessing application of technical skills is perhaps the easiest and most widespread application of video technology in the clinical setting. Within resuscitation, there are a wide range of practical procedures performed that are often time critical and successful completion depends on skilled implementation of a number of discrete tasks.<sup>27</sup> There exist widely accepted checklists or protocols from life-support courses and learned organisations designed to aid task completion.<sup>28</sup>

Enhancing performance after a clinical event through constructive feedback from observers facilitated by video may appear initially challenging. However, video-enabled task analysis offers multiple assessors the chance to review clinical performance data and, following a period of calibration, provides developmental feedback.<sup>29 30</sup> Rapid sequence induction is a readily accessible example in which the task can be deconstructed into a number of discrete stages, which need to be ordered and achieved for safe, reliable task completion.<sup>31</sup> The use of defined 'episodes of care' for analysis enables short episodes of video to be identified and the analysis compared between separate events.

The use of timings may also enable objective assessment of a number of technical skills.<sup>32</sup> The deployment of a mechanical chest compression device for OHCA requires minimisation of interruption to chest compressions. Reducing 'hands off the chest' time is widely recognised as essential to optimal cardiac arrest delivery. While speed of task completion does not represent a perfect corollary of effective care, it is recognised that ability of experts to complete tasks is more rapid than novices.<sup>33</sup>

#### NON-TECHNICAL SKILLS

A number of non-technical skills (NTS) matrices have been developed for use within resuscitation to measure individual or team performance. The proliferation of scoring systems reflects the ongoing search for an effective tool that can be robustly applied to this clinical setting. Jeffcott and MacKenzie<sup>34</sup> identified a number of justifications for the creation of metrics within the setting of teamwork:

- ▶ creating a common language for defining team behaviours and performance;
- ▶ identifying possible areas of concern and implementing changes;
- ▶ assessing how teamwork affects patient outcomes and defining potential areas for improvement;
- ▶ assessing how team input factors, such as new technology, affect teamwork;
- ▶ contributing to team training development and evaluation (in both reality and simulation).

The purpose of these matrices is to benchmark performance and to facilitate feedback and future iterative assessment. These tools have been developed by either direct observation of team performance or within simulation but to the knowledge of authors, no frameworks have yet been developed primarily by the use of real-world observation using multiple observers. There is a real need for the development of robust psychometric tools to assess performance.<sup>35</sup>

The use of video to develop and validate NTS matrices for resuscitation offers the opportunity to produce reliable measures

that reflect actual clinical practice. Video enables multiple assessors to view the same video to develop a scoring system based on observed behaviours. A critical element is their ability to observe non-verbal communications that may influence team performance and the delivery of care.<sup>36</sup>

There is also an opportunity to embark on other forms of ethnographic enquiry using video.<sup>37</sup> Cognitive task analysis uses a set of tools and techniques focused on describing the knowledge and strategies employed by experts to execute tasks.<sup>38</sup> Video can enhance this process by reducing recollection bias by moving beyond limitations of perceived actions to analysis of recorded events.<sup>39</sup> Expert performance is often difficult to access and decision-making processes are often opaque to colleagues.<sup>40</sup>

Exploring cognitive workload and team situational awareness through video-prompted recollection with participants may identify strategies to optimise team performance and leadership. There is currently limited opportunity to review actions and integrating video review may provide a conduit to enhance the resilience of resuscitation teams.<sup>41</sup> Aligning situational awareness of teams during complex and dynamic resuscitation is critical for team performance. Enabling individuals and teams to review video may enhance shared understanding of team goals and yield significant care improvements during future events.<sup>42</sup>

#### DIRECT TEACHING

Video review enables creation of targeted teaching interventions designed to enhance performance through optimising behaviours or practices.<sup>43</sup> This is especially important in clinical environments in which supervision opportunities are reduced, such as prehospital or outwith standard working hours. Creation of standard operation procedures can be operationalised during teaching and may have added impact as adherence can be monitored following a teaching intervention.

While life-support courses or clinical simulation opportunities seek to give learners basic skills to apply within the clinical setting, the successful translation of these skills into the actual clinical environment is critical. As an education intervention, video facilitation may promote deliberate practice and aid clinicians to develop mastery in their specific domain.<sup>44 45</sup> Time and resource constraints may determine the educational intervention, which can vary from provision of reading material to high-fidelity simulation. Simulation events constructively aligned with learning objectives created following video review enable specific deficits of performance to be addressed in a safe learning environment.<sup>46</sup>

#### FEEDBACK

The use of video-facilitated feedback to aid reflection and enhance future performance<sup>47 48</sup> is well established within medical simulation but widespread adoption in the clinical field has been slow. Following a resuscitation event, there is often a paucity of information on the performance of the team. Irrespective of outcome, clinicians often seek feedback on how they can optimise their performance in future occasions.<sup>49</sup> This may prove challenging, as identifying the route cause for delays in treatment or a poorly performed procedures may be lost in the melee of a noisy, chaotic resuscitation event. The coordination of multiple, often high-risk tasks, is a key quality of successful leadership. Ineffective communication may be a barrier to the delivery of good care, and video review may help teams develop strategies to ensure effective transfer of instructions or information.<sup>50</sup> Encouraging reflective enquiry using video as the basis for this conversation has clear resonance with adult

learning theory and also provides a conduit for other clinicians to share experiences and develop their practice.<sup>51</sup>

#### SAFETY OF PATIENTS

The elements discussed above are inherently driven by a desire to enhance clinical outcomes. It is, however, important to explore the impact that video review can have in reducing error and optimising safety of patients.<sup>52</sup> Within a trauma setting, video analysis has shown that errors of omission occur at a frequency of 2.4 errors/case.<sup>53</sup> Themes of error can be identified and interventions created, which aim to ameliorate these errors, either through direct error correction or more indirectly through bespoke teaching interventions. Repeated episodes may be recorded to evaluate performance and the impact of quality improvement initiatives.<sup>15</sup>

#### CHALLENGES

Reviewing video of clinical performances can be time-consuming and may be tedious. Identifying senior clinicians who have the available time and expertise is problematic. However, creating carefully defined audit signposts or research questions and applying validated scoring systems may ameliorate these difficulties.

Outputs from video analysis must be handled sensitively and securely.<sup>54</sup> Observations of 'real-world' clinical practice may be challenging to staff who will continue to work together after the event has been analysed. Despite the clear educational value, there is considerable anxiety with regards to its use in the clinical setting.<sup>55</sup> Impact on clinician performance of the use of videotape has not been established.<sup>56</sup>

Establishing inter-rater reliability within matrices or analytical tools generated during video review is also challenging and requires substantial time to align expectations of experts with supporting training materials. Evaluating tools at other sites is critical to establish their usefulness and generalise their application.

#### ETHICAL AND LEGAL ISSUES

While a detailed discussion of these issues is outwith the purview of this review, the ethico-legal issues of video recording are paramount.<sup>57</sup> Departments who pursue use of video should engage with their ethics service, data protection officer, Caldicott Guardian, legal departments and information technology staff to ensure that the intended collection, storage and use of video data fall within robust governance structures that are agreed by all committees prior to any recordings.<sup>58</sup> These conversations may be initially challenging and require creation of bespoke governance frameworks that will safeguard the sensitive data. Within our own unit, video does not form part of the medical record and is erased following an agreed period of time. Access to the video system is through a secure, offline network with a viewing behind a locked door. There are clear confidentiality and privacy concerns and any proposed video-capture system requires careful engagement with the healthcare professionals and groups of patients involved. It is important to set a clear tone of departmental learning, framed within the context of quality improvement, to ensure that staff members are aware that video is not for individual assessment.

#### FUTURE

The continued use of video can only to be supported within the clinical community if demonstrable benefits can be achieved.<sup>59</sup> Clear metrics must be established to monitor impact, similar to those employed in other quality improvement initiatives. Video

analysis enables robust evaluation of clinical performance but this must be linked to established objective outcome measures such as mortality or error frequency, or be situated within existing quality improvement initiatives such as sepsis management, catheter-related blood stream infections or checklist compliance.

The cognitive elements of team and individual performance lend themselves to further analysis. Exploring decision making or distributed team situational awareness in high-acuity resuscitation may generate novel approaches to team training.

### CONCLUSIONS

Resuscitation is a complex, often chaotic event and optimisation of team performance requires a multimodal approach to enhance clinical outcomes and the care experience (for patients and staff). Integration of video review and analysis into clinical systems wishing to improve patient care offers the opportunity to enhance delivery. This may be achieved at an individual, team or process level but requires creation of robust governance to guide its implementation. Quality improvement interventions derived from video review must be managed sensitively and seek to support inherent drive of clinical staff to improve patient outcomes and experience.

### Main messages

- ▶ Video can be introduced into the clinical setting with robust clinical governance and sensitive handling of data.
- ▶ Video analysis during resuscitation offers the opportunity to observe challenging time pressured episodes of care.
- ▶ Video may improve both technical and non-technical performance in addition to iterative improvement in the environment and equipment during resuscitation.

### Current research questions

- ▶ Can video enhance the analysis of team performance during resuscitation?
- ▶ Can video provide evidence of translational outcomes following education interventions?
- ▶ Can video promote effective changes to the delivery of care during resuscitation?

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HOW TO ...

# How to implement live video recording in the clinical environment: A practical guide for clinical services

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**Abstract**

**Background:** The use of video in healthcare is becoming more common, particularly in simulation and educational settings. However, video recording live episodes of clinical care is far less routine.

**Aim:** To provide a practical guide for clinical services to embed live video recording. **Materials and Methods:** Using Kotter's 8-step process for leading change, we provide a 'how to' guide to navigate the challenges required to implement a continuous video-audit system based on our experience of video recording in our emergency department resuscitation rooms.

**Results:** The most significant hurdles in installing continuous video audit in a busy clinical area involve change management rather than equipment. Clinicians are faced with considerable ethical, legal and data protection challenges which are the primary barriers for services that pursue video recording of patient care.

**Discussion:** Existing accounts of video use rarely acknowledge the organisational and cultural dimensions that are key to the success of establishing a video system. This article outlines core implementation issues that need to be addressed if video is to become part of routine care delivery.

**Conclusion:** By focussing on issues such as staff acceptability, departmental culture and organisational readiness, we provide a roadmap that can be pragmatically adapted by all clinical environments, locally and internationally, that seek to utilise video recording as an approach to improving clinical care.

## 1 | BACKGROUND

Being able to measure the diverse factors that affect quality of care is the starting point for improving clinical practice.<sup>1</sup> Traditional approaches predominantly rely on service level metrics or surrogate markers of quality, yet these are often insensitive to the subtleties of clinical care and the complexity of interactions between staff and their environment.

The Emergency Department (ED) epitomises the dynamism of clinical care. Similar to other clinical environments, there is considerable variation in ED care. For example, in Scotland, only 43% of patients with a stroke are thrombolysed within the recommended time window,<sup>2</sup> and

less than 40% of major trauma patients with a severe head injury receive a computed tomography (CT) scan within the one hour national target.<sup>3</sup> Furthermore, 38% of major trauma patients do not receive the recommended Consultant lead care on initial assessment,<sup>3</sup> whilst patients with severe sepsis and septic shock receive inconsistent care.<sup>4</sup> The particular characteristics of a clinical service and its processes of delivering care can have a significant effect on clinical outcomes.<sup>5,6</sup>

In this article, based on our experience of continuous video-audit within the ED Resuscitation Room, we describe the implementation of a system to overcome the challenges of measuring clinical care processes. In doing so, we provide a "how to" guide for clinicians and services who wish to pursue video audit.

## 2 | INTRODUCTION

The first recorded use of video by physicians can be traced back as far as 1947.<sup>7</sup> However, it was not until the late 1960s that Peltier et al. described the use of video as an educational tool in emergency medicine.<sup>8</sup> Since then many authors have used video as a method of assessing clinical care in diverse settings, such as psychiatry,<sup>9</sup> general family practice<sup>10</sup> and surgery.<sup>11</sup> In the emergency medicine speciality, it has been used to audit resuscitation,<sup>12–15</sup> including neonatal,<sup>16,17</sup> paediatric<sup>18,19</sup> and trauma resuscitation.<sup>20,21</sup>

These studies continually highlight the clear educational and clinical benefits of such systems. They predominantly report the degree to which their clinical practice rates have improved, but there is often little-to-no explanation of system set-up.<sup>22</sup> In particular, studies rarely acknowledge the ethical, legal and cultural hurdles which are the main barriers to implementation. In a cross-sectional survey of 221 trauma centres in the USA, for example, Ellis et al. found that although 95% of centres who used video found it to be an effective quality improvement tool, 80% of centres were not videotaping.<sup>23</sup> Problems cited as preventing video audit included medico-legal, patient confidentiality and lack of staff support for such a program.

Here, we address this gap in the literature. We do not intend to focus this article on our local practice outcomes as this would be repeating extant literature and provide the reader with little actionable information. Rather, by outlining the approach we used to navigate the technical and change-management challenges required to implement a video-audit system in our ED, we seek to provide a "how to" guide that can be pragmatically adapted by other clinical services.

## 3 | SITE

The ED at the Royal Infirmary of Edinburgh in Scotland serves a population of approximately 800,000. The hospital is a large 900-bed site with academic affiliation. In 2012 there were 113,000 adult patient attendances, with a majors: minors ratio of approximately 1:1. There are roughly 350 out-of-hospital cardiac arrest cases and 700 trauma cases annually, with approximately 6–7% of patients requiring immediate assessment in the Resuscitation Rooms after pre-alert by the Scottish Ambulance Service.

## 4 | "HOW TO" SET-UP VIDEO AUDIT: A FRAMEWORK

Soon after Peltier set up a video system to teach emergency medicine in 1969 he described the issues associated with its implementation: "What is the legal status of the videotapes?... do they become part of the patient record? Can they be used in the courtroom... Can such television videotapes be used legitimately to evaluate the performance of emergency room personnel for the purposes of promotion or dismissal?" (p 823).<sup>24</sup> Although written nearly 50 years ago, these

reflections illustrate that although installing a video recording system has become technically straightforward, its use raises important ethical, legal and personnel issues.

Accordingly, we have described our process of introducing a continuous Resuscitation Room video audit system using John Kotter's 8-step template for leading change.<sup>25</sup> Using Kotter's structure emphasises the fact that the most significant challenges in installing video audit in a busy clinical area involve change management rather than equipment; the success of introducing video audit depends on influencing local culture and nuancing the initiative to resonate with local clinical needs. As has been demonstrated in other initiatives involving change management, ignoring these organisational and cultural dimensions will likely lead to stalled progression.<sup>26</sup>

### 4.1 | Step 1. Create a sense of urgency

Before embarking on video recording in the clinical environment, it is incumbent those involved to consider the reasons why video audit is necessary. The novelty of video recording real patient episodes is appealing for clinicians who seek to improve patient care, but staff at all levels of the organisation will ask whether video audit is needed, especially when most clinical services measure care processes through a range of performance and patient indices already. Our emergency department setting, akin to other acute specialities, has to deal with complexity that spans disease, patient, staff and organisational factors.<sup>27</sup> In keeping with high-reliability organisations, we viewed video audit as a way of understanding this complexity rather than oversimplifying these factors.<sup>28</sup> Video audit offers a unique window into how service processes unfold, as well as giving insight into the behavioural aspects of clinical care that underpin team performance.

When hearing about the possibility of continuous video recording taking place, it is understandable that some staff will have a visceral reaction of unease. Addressing this was arguably the most important step in the process of implementation. This involved fundamentally shifting the tone of video-audit discussions from one of hesitation to one of opportunity—video can "help drive quality improvement to the next level" (p 1592).<sup>29</sup> Clinicians and managers need to hear that video offers a level of analytical detail that is unmatched through traditional observational methods.<sup>30,31</sup> Video-based studies have demonstrated that routine audit measures, by comparison, only capture about 10%–20% of performance deficiencies.<sup>18, 32</sup>

A clear argument should be articulated consistently, from early discussions right through to system implementation. Kotter suggests that for change to be successful, 75% of an organisation needs to buy into any proposed change. In other words, you have to work really hard on Step 1, and spend significant time and energy building urgency, before moving onto the next steps. In clinical settings, it is equally important to build a sense of safety. Whilst we were able to capture imaginations by enthusiastically articulating the benefits of continuous video audit, we also needed to allay fears by being clear about the proposed "rules of engagement"—being explicit about exactly what video would be used for (see Step 3 below).

#### 4.2 | Step 2. Build a guiding coalition

Creating a sense of urgency allowed supporters and early adopters from within the organisation who were receptive to the “big opportunity” to come forward. As more discussions were had, more people engaged with the conversation around video-audit. This took several months, however, at the end of this process we were in a position to build what Kotter describes as a “Guiding Coalition”. A guiding coalition including a range of expertise, status and organisational influence is essential to institute the attitudes and practices necessary to launch and, most importantly, to sustain change.

Our initial Coalition included individuals from within the ED—the Clinical Director, Clinical Nurse Manager and senior clinical staff. Of equal importance, however, was the need to reach out to other divisions and levels of the organisation. During our implementation, we found that multi-level engagement with the hospital’s clinical management team as well as the Medical Director allowed us to canvas the views of staff from the bedside to executive level. The ED Resuscitation Room is not only the domain of ED staff, but is also frequented by a range of clinicians from acute specialties. These non-ED clinicians would also be a part of our continuous video audit. Expanding our guiding coalition to include personnel from outwith the immediacy of ED allowed the message of change to diffuse throughout the organisation as a whole.

#### 4.3 | Step 3. Form a strategic vision

Before outlining what this involves, it is important to recognise that the previous steps required continual attention and re-evaluation. No matter how powerfully the strategic vision is set out, should the message behind the big opportunity be lost, the project will inevitably lose traction. A strategic vision goes beyond simply installing a video audit system. The work that goes into—and results from—video implementation is achieved through a series of interconnected value adding frontline clinical processes; the vision is to make those processes visible to all staff and then empower them to make change.

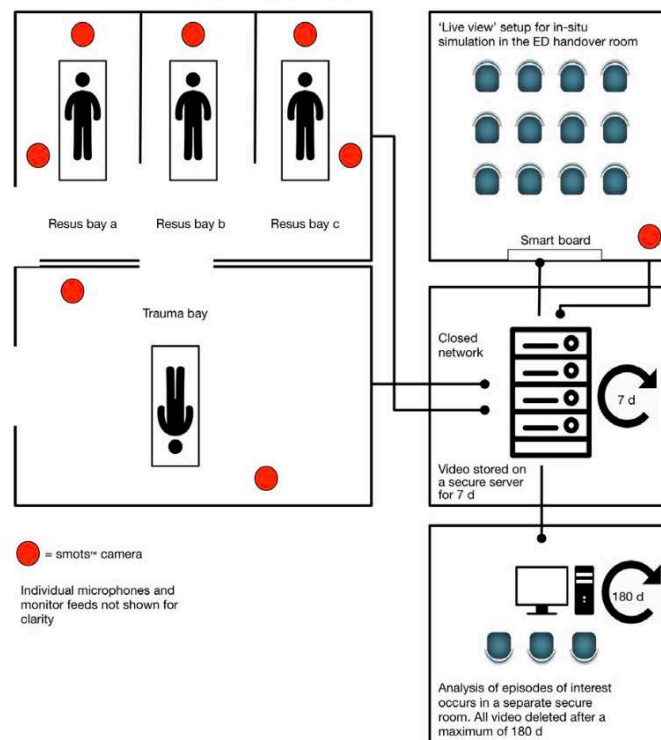
There are several pillars that are foundational to the strategic vision of our video-audit system. These centre around practical questions such as: what is the purpose of the video-audit system; how will the video be used; who will have access to the footage; what governance measures are in place; what data management system is in place; what about patient privacy and confidentiality; will individual performance be assessed. These questions should be answerable in a clear and consistent manner. There is an imperative to be honest about the challenges that exist, but also to create a sense of trust that the system is intended to improve patient outcomes and benefit staff.

At this stage it was necessary to formalise the strategic vision, including addressing the questions above. Our approach involved production of several key documents:

1. *Video Audit Framework*. This is considered the master document which detailed our approach to many of the key issues associated with video audit. Our document had several distinct

sections. The main section describes the allowed uses of the video. Our system is designed solely for audit and service evaluation purposes. It does not form part of the patient record and it is never used for individual assessment or feedback; this is a strictly non-punitive system. Similarly, it is never used for teaching purposes or Morbidity and Mortality meetings. Furthermore, the video footage can only be viewed by a member of the department’s Video Audit Team (VAT) who are a small group of ED staff (4-6 people). It is allowable for an individual member of staff to request to review video of an episode they were directly involved in. In this case, a member of the VAT who has training in video debrief facilitates the viewing. Video review is used for auditing technical and non-technical aspects of care as well as ergonomic evaluations of the room and equipment. Output from video-audit is fed back at a service level. The second section of the Framework documents the chain of accountability and what to do should there be a cause for concern while reviewing a section of video footage. The VAT report to a Departmental Oversight Team which includes senior clinical and managerial staff as well as the Medical Director of the hospital. From here, regular reports of activity are provided to the hospital’s Clinical Management Group. This group contains the heads of nursing and medical directorates as well as the clinical leads from all hospital divisions. Furthermore, within this section of the *Video Audit Framework* we have an explicit escalation policy. Should any member of the VAT witness behaviour on the video that is a cause for concern, for example, professional misconduct or criminal activity, then they report this through an escalation policy. This is reviewed by the Departmental Oversight Team in the first instance and the Clinical Management Group should the situation require.

2. *Data Management Framework*. This document outlines how the video will be collected, stored and accessed. We used a fixed camera installation from Scotia UK PLC called smots™ (Figure 1). This combination of cameras and microphones allows continuous 24-hour audio-visual recording of our four resuscitation bays, as well as the screen display from our vital signs monitors (Figure 2). Video data is sent to a secure server behind two card-entry door systems within the ED. An automatic 7-day deletion loop is set on this server, meaning that the vast majority of footage is never viewed. Members of the VAT consult a prospectively maintained log of patients treated in the Resuscitation Room, identifying cases fulfilling audit criteria. These files are transferred through a secure, offline network connection to a video viewing room which is locked at all times—key access is controlled using a delegation log. We created a separate LAN within our hospital building between the ED and viewing room to ensure data security. Once within the video viewing room, footage comes under an automatic deletion policy of 180 days to allow time for video analysis within smots™ which allows footage to be studied and tagged with metadata. Standard Operating Procedures govern the workflow for the collection and analysis of video and create an audit trail of what resuscitation episodes were being viewed and for what purposes.



**FIGURE 1** Diagram of video audit installation

Summary information is reported back to the Departmental Oversight Team.

3. **Audit programme.** Decisions about what to audit and who should be involved in video review are taken by the Departmental Oversight Team. We wished to ensure that process of selection of audit projects is transparent and reflects the needs and concerns of all of the groups working in the Resuscitation Room. The Departmental Oversight Team are also apprised of audit findings and provide a conduit for positive feedback to staff, and ensuring that training needs and process refinements are fed into the educational and operational activity planning of the ED.

#### 4.4 | Step 4. Enlist a volunteer army

The ability to enlist a volunteer army will be dependent on how successful a sense of urgency has been created, how well constructed the guiding coalition is and how clearly the strategic vision has been communicated. The volunteer army needs to come from within the clinical department's own ranks, including doctors, nurses, clinical support workers, porters, radiographers and visiting specialities; the staff must feel this initiative is happening "with them" rather than "to them". The concerns of staff will have been verbalised by this point and these should be addressed in the strategic vision. Failure to acknowledge

the broad range of people's apprehensions will lead to pockets of negativity which can permeate throughout the department and the hospital more widely.

Our approach was to engage with staff in a variety of locations and formats. We presented the initiative to all medical and nursing staff at clinical handovers. This took approximately 1 month to ensure we covered the full staffing rota. Other groups of ED staff including Radiographers and Porters were visited opportunistically by the project team or by requesting an audience at their team meetings. Following this, a series of open "drop-in" sessions were advertised throughout the hospital, where staff could come to the ED and ask about the proposed system in more detail. Providing this opportunity was a vital part of wider hospital staff engagement. We recognised that staff may feel hesitant about voicing their anxieties in the open forum of clinical handovers. Offering this type of session gave the opportunity for individuals to address their specific concerns in a one-to-one capacity.

The final strand of staff engagement involved speaking with groups who are not permanently based in the ED, but who will be observed on the video-audit system nevertheless. This includes visiting specialities (eg, Anaesthetics, Critical Care, Surgery, Cardiology). Importantly, staff partnership representatives were included in these conversations from the outset. Transparency in these interactions was important in



**FIGURE 2** View of clinical department from viewing terminal

building safety into communication with staff. Enlisting this volunteer army took a considerable amount of time. However, ensuring that this group was large and diverse helped the initiative succeed.

#### 4.5 | Step 5. Enable action by removing barriers

According to Kotter,<sup>33</sup> leading change is "less about finding or generating brand-new good ideas than about knocking down the barriers to making those ideas a reality" (p 97). Embedding video cameras in the Resuscitation Room has, broadly, two categories of obstacles. Thus far we discussed the first category—the change management hurdles—in detail. The second category is procedural hurdles, such as the ethical, legal and data protection approvals that are needed to implement video-audit. By thoroughly addressing steps 1, 2, 3 and 4,

these procedural challenges were far easier to overcome. At this stage we had the support and backing of the guiding coalition and a growing acceptance from our volunteer army. A sense of urgency and a powerful strategic vision were beginning to transform general concerns into excitement about the clinical impact of video data. This created a sense of readiness within the organisation.

The momentum gathered up to this point was harnessed when seeking ethical, legal and data protection approvals. The purpose and vision of the initiative, as well as its robust security, was communicated as clearly to the approval groups as it was to the staff. Opinions and written permissions were sought and received from the local Caldicott Guardian and Data Protection Officer. Their input helped to further shape our Framework documents. Our Research Ethics service was consulted to ensure that our planned audit and service improvement

projects would not require further ethical review or that patients and staff would not need to give consent to video being utilised in this way. We posted signage around the ED to explain to all visitors that video footage recorded in the Resuscitation Rooms would be used for audit purposes. The Central Legal Office—the in house solicitors to the Scottish Public Sector—were also contacted for advice. They were satisfied that in the unlikely event of Resuscitation Room video footage being requisitioned by the courts, it would be likely to aid timely settlement or, in fact, admonition where appropriate.

#### 4.6 | Step 6. Generate short term wins

Completing the steps up until this point should enable a clinical service to implement video-audit. This will be a notable achievement for any clinical department and it may be tempting to rest on the laurels of success. Yet this phase is arguably the most fertile in terms of evolving the video system from one which is merely active to one which is truly embedded. The catalyst for this evolution is what Kotter terms “short term wins”.

Wins must be collected, categorised, and communicated—early and often—to energise staff. Kotter argues that “Action here also ensures that the wins are as visible as possible to the entire organization and that they are celebrated, even if only in small ways. These wins, and their celebration, can carry great psychological power...” (p 32).<sup>33</sup> What form these wins take will depend on what data is being captured. From our experience it is sensible to focus on practices of care that staff currently perform well. Providing detailed feedback from these areas of good practice will put that staff at ease and lay the groundwork for more critically constructive feedback further down the line.

Our department used video to augment the implementation of a new Rapid Sequence Intubation (RSI) checklist. We video recorded 25 RSIs and found that the team leader was not clearly verbalised in any of the 25 cases. Similarly, the emergency “can’t intubate, can’t ventilate” airway plan was only verbalised in 5/25 cases. A new checklist, informed by these findings, has been implemented. We video recorded 25 RSIs using the new checklist and found that the team leader is now verbalised about 75% of the time (16/25), whilst the emergency airway plan is verbalised in about 60% of cases (15/25).

#### 4.7 | Step 7. Sustain acceleration

All new initiatives run the risk of losing momentum after start-up. To sustain acceleration, it is necessary to build on initial change and look for deeper, more long-term improvements. Here, it will appropriate to seek ideas from staff about which aspects of care they believe are in need of improvement. There needs to be a strong sense of usefulness and clinical relevance which can only come from within departmental teams; this creates a sense of ownership over the system from the doctors and nurses “on the ground”.

We have begun work mapping our stroke and major trauma pathways by video recording 25 patients who received thrombolysis and 25 trauma patients who required an urgent CT scan, respectively. This involved constructing a critical path of activities that must be

completed prior to intervention, as well as the length of time these activities take. Our preliminary findings suggest that a combination of clinical tasks (eg, duplication of patient examination by the stroke and ED physician) and service processes (eg, time of ordering scan) both contribute to avoidable delays in care pathways. Findings from video audit should be coupled with existing service evaluation metrics to optimally improve patient care.

#### 4.8 | Step 8. Institute change

The end goal of initiatives such as these is to institute change over the long-term, change that effects clinical practice as well as institutional norms. Benefits to clinical practice will be felt almost immediately and be visible to staff. The process of change will occur when these improvements are communicated in such a way as to represent a broader, more systemic institutional behaviour rather than just isolated pockets of work. Change should be anchored within the organisational culture so that efforts to improve clinical practice becomes “business as usual”.

## 5 | CONCLUSION

Embedding a continuous video-audit system within a clinical environment is a challenge of culture change rather than technological innovation. The technology for implementing 24/7 video-audit has existed for decades, but despite the power of video as a tool for measurement and improvement, it is not commonplace in clinical settings. Furthermore, accounts of video use in patient care describe the deployment of equipment or its use, rather than how the system was developed and accepted. By mapping our experience against Kotter’s 8 steps for leading change, we present a “how to” roadmap that recognises the primacy of change issues, such as acceptability to staff, departmental culture regarding use of sensitive data and organisational readiness. It is only by carefully addressing these factors that there can be a move towards video-audit becoming a routine part of clinical practice.

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#### DISCLOSURES

No disclosures or conflict of interests declared by the author or co-author(s).

#### AUTHOR CONTRIBUTIONS

AL, AD, SE, DC and GC contributed to the design/concept of the manuscript. PG contributed to drafting and critical revisions of the

manuscript. All authors revised and approved the final draft for submission.

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Letter to the Editor

Resuscitating leadership research

Sir,

Clinicians who are involved in the delivery of resuscitative care are acutely aware of the influence that team dynamics can have on how effectively clinical tasks are carried out. We read with interest the recent publication by Cooper et al. who validated their TEAM assessment tool with clinical resuscitation teams.<sup>1</sup> The tool assesses the three domains of leadership, tasks and teamwork to produce one composite measure of team performance. One notable conclusion is that the leadership scores were consistently rated lower than teamwork and task performance scores.

This fits an emerging pattern in the resuscitation literature where there is considerable variation in how leadership is conceptualised, measured and rated. A recent systematic review revealed that team leadership in health care action teams, defined as "interdisciplinary teams performing complex, critical tasks under high-pressure conditions" (p. 1408), has been assessed using 61 tools.<sup>2</sup> The authors of the paper identified 37 distinct functions that can constitute leadership. With such an inordinate range of behaviours and actions that can signal someone as the leader, isolating a single individual who occupies the overall leader position within highly adaptive teams is challenging.

This may, in part, explain why leadership scores are hard to benchmark. Poor team performance may not necessarily be the consequence of poor leadership. Factors such as the experience and familiarity of staff, severity of patient illness and room ergonomics will all influence how well individuals function within a team. Similarly, optimum team performance may occur in spite of an inadequate leader. Viewing leadership as a singular, linear phenomenon risks negating the subtleties of team interactions in the complex environment of resuscitation.

The discrepancy in rating leadership was highlighted by Robinson et al. who surveyed 102 medical and nursing staff who were part of cardiac arrest teams.<sup>3</sup> The authors found that whilst 90% (9/10) of registrars agreed or strongly agreed that there was clear leadership at all cardiac arrests, only 24% (5/21) of nurses, 33% (12/36) of SHOs and 49% (17/35) of FY1s responded in kind. This has led to Sakran et al. asking whether it is the perception of leadership from within the team that drives the reality of how lead-

ership is enacted<sup>4</sup>; do people who display leadership out with the formalised leader role become surrogate leaders of the team?

Constructing leadership as a concept that is fixed to one individual may overlook the dynamic interactions that allow teams operating in pressured, time-critical scenarios to adapt to situational needs.<sup>5</sup> Resuscitation requires different individuals to lead at different times, particularly when the named team leader is unable to remain 'hands-off' and risks becoming task fixated.

We echo the call by Cooper et al. for more research to study how leadership is taught and learned during resuscitation. Without such work, the phenomenon of leadership will continue to be in need of resuscitation.

Conflict of interest statement

None.

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# Feasibility of EEG to monitor cognitive performance during venous cannulation: EEG Distracted Intravenous Access (E-DIVA)

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## ABSTRACT

**Background** The feasibility study aims to evaluate the use of EEG in measuring workload during a simulated intravenous cannulation task. Cognitive workload is strongly linked to performance, but current methods to assess workload are unreliable. The paper presents the use of EEG to compare the cognitive workload between an expert and novice group completing a simple clinical task.

**Methods** 2 groups of volunteers (10 final year medical students and 10 emergency medicine consultants) were invited to take part in the study. Each participant was asked to perform 3 components of the simulation protocol: intravenous cannulation, a simple arithmetic test and finally these tasks combined. Error rate, speed of task completion and an EEG-based measure of cognitive workload were recorded for each element.

**Results** EEG cognitive workload during the combined cannulation and arithmetic task is significantly greater in novice participants when compared with expert operators performing the same task combination. EEG workload mean measured for novice and experts was 0.62 and 0.54, respectively ( $p=0.001$ , 95% CI 0.09 to 0.30). There was no significant difference between novice and expert EEG workload when the tasks were performed individually.

**Conclusions** EEG provides the opportunity to monitor and analyse the impact of cognitive load on clinical performance. Despite the significant challenges in set up and protocol design, there is a potential to develop educational interventions to optimise clinician's awareness of cognitive load. In addition, it may enable the use of metrics to monitor the impact of different interventions and select those that optimise clinical performance.

## INTRODUCTION

Understanding clinical performance requires a multimodal approach due to the complex nature of the underlying cognitive processes. Expertise is the synergy of knowledge, skills and experience but performance is dependent on the mental processes that enable their application. Simple clinical tasks such as intravenous cannulation may challenge a novice but put little demand on the expert. Education interventions rely on metrics to monitor the impact on an individual's acquisition of skills.<sup>1</sup> Capturing and measuring performance remains the mainstay of clinical skills assessment but increasing the focus has moved to identification of underlying mechanisms and investigating how expertise develops.<sup>2</sup>

Cognitive load theory (CLT) has been proposed to explain of how an individual's ability to learn and perform is impaired when cognitive load exceeds capacity.<sup>3</sup> The effort required to use 'working memory' during the performance of a task has been described as 'cognitive load' and is the proportion of cognitive capacity in use at any time.<sup>4</sup> Cognitive load is dependent on the task performed and the individual.<sup>5</sup> CLT states that there are three elements that contribute to cognitive load:

- ▶ Intrinsic—the demand of executing the current task;
- ▶ Extraneous—the demand to process information that are unrelated to the current task;
- ▶ Germane—the demand to resolve the task into genuine learning.

The implication is that when a learner is exposed to events that exceed working memory capacity then their ability to perform or learn is degraded. When designing educational interventions, it has been suggested that training efficiency may be optimised by controlling cognitive load.<sup>6</sup>

A number of studies have started to link cognitive workload within the medical setting to emotional state and work performance.<sup>7–8</sup> Traditionally, pupillary dilation, heart rate, eye blinking, response times or cortisol levels have been used as physiological proxies for cognitive load. Workload has also been examined by the use of self-reported questionnaires completed following the task.<sup>9</sup> Developing strategies to reduce unnecessary cognitive load and support development of enhanced clinical performance requires reliable metrics.

The advent of EEG has enabled development of novel approaches to objectively measure cognitive load.<sup>10–11</sup> EEG workload levels have been shown to correlate with objective and subjective workload ratings in a variety of tasks.<sup>12</sup> This study reports the novel use of EEG within the medical simulation setting. EEG may hold the potential for a more objective, real-time measurement of cognitive load—offering the ability to quantify the effects of education interventions.<sup>13</sup> Signatures in the EEG signal can be used to identify sensory and cognitive processes<sup>14</sup> and EEG enables measurement of variations in task load depending on the nature of the task being undertaken. These data may be recorded and analysed in real time with signal processing and statistical techniques to create a number of performance parameters. Real-time EEG analysis has been applied successfully in a number of settings including the training of archers and pilots.<sup>15–16</sup>

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ASPIH 1

## Original research

'Safe and effective' peripheral vein cannulation is one of the core technical skills acquired by medical students. This is often cited as a challenging task and considerable educational resources are invested to facilitate acquisition of this skill. Emergency medicine (EM) consultants may be considered experts at this skill and have acquired a high degree of automaticity: one of the features of 'expertise' is the ability to perform a task without significant cognitive demand.<sup>17</sup>

**Aim**

This pilot study aims to evaluate the feasibility of using EEG to measure workload during a simulated cannulation task.

**Objectives**

1. Can EEG be used to assess cognitive load during a simple clinical task?
2. Compare EEG findings against previously reported Distracted Intravenous Access (DIVA) study.

**METHODS****DIVA protocol**

The study uses the DIVA protocol previously published by Smith *et al*<sup>18</sup> (table 1). Paced auditory serial addition test (PASAT) is an established cognitive distraction test which has been shown to directly measure attention.<sup>19 20</sup> Participants were asked to listen to a continuous series of single-digit numbers and state the sum of the last two numbers from a recording at 4 s intervals. The intravenous cannulation was performed on a manikin and assessed using the checklist focused on performing the correct stages in the correct order (figure 1). During this study, data were collected on errors on cannulation (compared with their checklist), speed of completion and number of arithmetic errors during PASAT.

The original DIVA study demonstrated a difference in the performance of novices (fourth-year medical students), intermediates (1 year postgraduate) and experts (anaesthetic and EM consultants and novices) when performing the combined simulated peripheral vein cannulation and simultaneously a PASAT. We sought to repeat the DIVA study while measuring surface EEG of participants in an attempt to make an objective measurement of cognitive load during the task.

**Participants**

We recruited 10 final year medical students (novices) and 10 EM consultants (experts) to the study. Recruitment was on an opportunistic basis and candidates were tested by DJL, SAJ or

AL following consent. Ethical approval was granted by the Edinburgh University Ethics Committee.

**EEG**

The study used the B-Alert X10 Bluetooth wireless system (Biopac). The system enabled wireless recording of EEG waveforms to a study laptop running Acqknowledge V4 software (Biopac) for data analysis. Workload during each task was recorded and averaged over the duration of each task. Each participant went through a calibration to ensure the impedance of nine-channel EEG, which would ensure real-time monitoring of engagement and cognitive workload. The EEG workload index ranges from 0 to 1.0, which rises with increasing demand.

**EEG Distracted Intravenous Access**

Before starting the study, each candidate was familiarised with both PASAT and the checklist for cannulation and given the opportunity to practice each, following set up and calibration of the EEG system. A trial information sheet detailing the protocol was also provided. All episodes were recorded in a clinical skills laboratory, with standardised equipment.

The protocol involved three stages as detailed in the original DIVA study and utilised the same checklist for the cannulation task.<sup>17</sup> Participant's EEG workload was measured during each of the three stages:

1. Insertion of intravenous cannula;
2. During a PASAT;
3. Insertion of intravenous cannula while completing PASAT.

Completion of the tasks was timed and arithmetic errors were recorded when PASAT was administered. Data were collected on time to complete task, errors in cannulation, error in PASAT and EEG workload. EEG data were extracted from the

**Table 1** Scoring of the distracted intravenous access (DIVA) test

Score component	How score component is derived	Range of possible scores (%)
Cannulation	Percentage of checklist items completed correctly (out of a possible 16)	0–100
Cognitive distraction	Percentage of possible answers given correctly in PASAT (total possible varies according to time taken), as a percentage score	0–100
Speed score	$=(\text{maximum: time allowed} - \text{actual time taken}) / (\text{maximum: time allowed} - \text{minimum time possible}) \times 100$	0–100
Overall score	Mean of cannulation, cognitive distraction and speed scores	0–100

DIVA, Distracted Intravenous Access; PASAT, paced auditory serial addition test.



**Figure 1** Candidate completing cannulation task with EEG monitor.

AcqKnowledge software. Analysis was performed using Graph Pad Prism (GraphPad Software, California) with unpaired Student's t-test to detect statistical significance.

**RESULTS**

**DIVA protocol**

Table 2 presents the results recorded using the standard DIVA protocol. PASAT scores were similar between novice and expert groups but experts completed the cannulation task significantly more rapidly and accurately (63–155 s (106.5 s) vs 128–300 s (198.9 s),  $p=0.0015$ ).

Figure 2 displays the scores for each of the elements of the DIVA protocol and the comparison between the expert and novice group. The two groups differed in all components of the test, and the difference was statistically significant (at the 5% level) in all components apart from the cognitive distraction. The results here are consistent with those found in the original DIVA study.<sup>18</sup>

**EEG results**

Figure 3 presents mean cognitive workload as measured by EEG during each of the elements of the study protocol. The mean workload average value during each stage was analysed for all groups. There was no significant difference between the workload average of the novices versus experts during either the cannulation ( $p=0.41$ , 0.45 to 0.71 (0.57) vs 0.27 to 0.67 (0.52); 95% CI -0.07 to 0.16) or PASAT ( $p=0.19$ , 0.39 to 0.66 (0.54) vs 0.21 to 0.63 (0.44); 95% CI -0.05 to 0.24) tasks when performed separately. During the combined DIVA protocol, we found a significant result in workload average between the novices and experts ( $p=0.001$ , 0.49–0.73 (0.62) vs 0.32–0.72 (0.43); 95% CI=0.09 to 0.30).

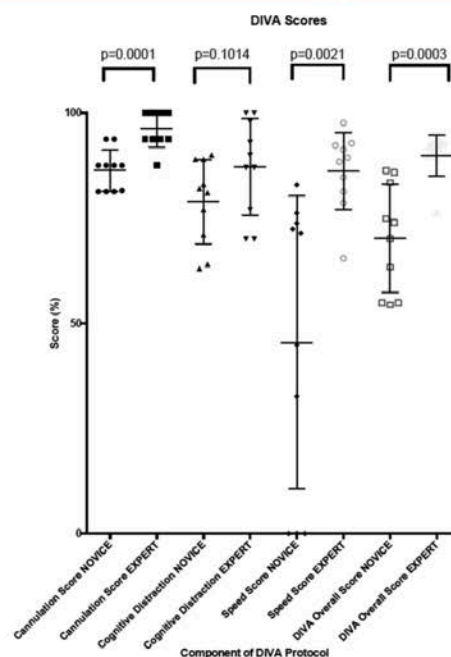
**DISCUSSION**

With regard to our first objective, we found that collecting data on cognitive workload using EEG was achievable using the methods and equipment detailed above. The study demonstrates that collecting EEG data on clinician's cognitive load within a simulation environment is feasible, although there are challenges in terms of the time required to set up and calibrate systems ~30 min for each participant. Each participant required creation of a baseline individual EEG profile, which enables comparison of data between individuals. In addition, placing the sensor strip and establishing reliable scalp contact and therefore low impedance required practice; there was a learning curve to successful application. The computer interface was relatively intuitive but creation and interpretation of data files and initial set up for the study required manufacturer support.

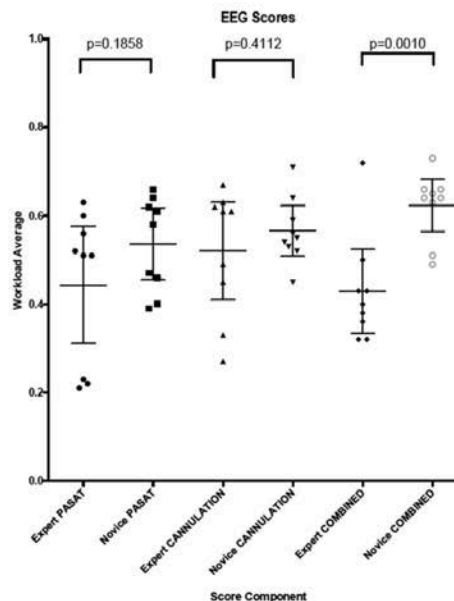
The addition of a secondary task (PASAT) increases the cognitive workload of the participants. This extra task causes an additional cognitive demand which impacts on task performance. For the experienced clinician, the increased workload did not degrade the completion of the primary task (cannulation) to the same extent as for the novice. It would be expected that placing

**Table 2** Mean (95% CIs) for each component of the test for each group

Group	Cannulation score	Cognitive distraction score	Speed score
Novice	86.28 (82.77 to 89.78)	78.90 (71.75 to 86.05)	45.41 (20.50 to 70.32)
Expert	96.25 (93.12 to 99.38)	87.2 (79.00 to 95.40)	86.18 (79/57 to 92.79)



**Figure 2** Means and 95% CIs for the DIVA scores. DIVA, Distracted Intravenous Access.



**Figure 3** Means and 95% CIs for the EEG scores. PASAT, paced auditory serial addition test.

## Original research

a cannula for an expert is a relatively automatic task. This may reflect the extent to which the extraneous load is not increased to the same extent as novices. It is unsurprising that EEG workload for the PASAT task was not significantly different between groups, and it was only when PASAT was added to a clinical task—in which the expert group revealed a difference in cognitive demand. It would be expected that each of the study group's abilities to complete an arithmetic task would be similar, irrespective of age or clinical experience.

Our second objective of this study was to compare our findings to the previously reported findings of the DIVA study. We chose an existing protocol (DIVA) as our initial foray into measuring cognitive load to provide a comparison with an established validated objective score. While the addition of a subjective score was considered, no validated score existed. In any case, from the trial, it was apparent that the combined task was sufficiently challenging to all participants.

The finding of a significant difference between novice and expert during the combined task reflects the results from the DIVA study. The lack of significant difference when completing the cannulation task between the two groups was unexpected. There are a number of possible explanations for this. First, completion of the task within study conditions, that is, with the addition of an EEG monitor and observers increased the workload for both groups irrespective of task familiarity for the experts: these additional demands resulted in a task of equivalent difficulty for both groups. Second, medical students are more experienced in completing simulated intravenous cannulation tasks than experts, fulfilling criteria on a checklist and being observed than experts: these experiences reduced the competence differential. Third, the expert's usual degree of automaticity was reduced as they were completing the task following a defined and unfamiliar checklist. Finally, sample size may not have been sufficient to detect a significant difference. The addition of the arithmetic task may have provided sufficient cognitive load to expose the spare capacity that experts possessed to complete the protocol as their focus reverted to completion of the arithmetic element. Further testing during different protocols or for longer tasks may clarify this.

An alternate approach considered was simulated scenario for the two groups of increasing complexity and asking the participant to maintain a leadership role rather than combining a manual task with cognitive task. EEG workload may therefore be useful tool to delineate between workload during clinical tasks and provide insight into the development of competency, expertise and leadership beyond observation and checklists. This opens up the possibility of a number of avenues of research and application for which further work is required.

EEG workload analysis may provide valuable insight into team performance and the impact of leadership on cognitive performance. Combining EEG analysis with video review offers the opportunity for the development of enhanced metrics to monitor the impact of new clinical information, defined tasks or the deteriorating patient on the individual and the team.

The study has a number of limitations. Small numbers of volunteers were enrolled and we did not investigate the impact of wearing the EEG technology on task completion. Further testing with larger numbers would strengthen the conclusions of the study. The study does, however, use an established protocol and within a similar type of setting. A standardised mark sheet for arithmetic and cannulation task was used, and was scored by a single individual. Some participants appeared to selectively ignore the PASAT element to ensure rapid completion of the cannulation task rather than attempt to multitask, perhaps

recognising that they had exceeded capacity. We elected not to utilise a subjective workload questionnaire to correlate to EEG but, with hindsight, this may be useful addition. Participants' awareness of headset and being part of study may have influenced the EEG workload activity recorded.

#### Future applications

There are a number of potential applications within both the clinical and education domain. The term 'neuroergonomics' has been coined to describe the development and design of work environments that are optimised according to enhanced understanding of cognition and human behaviour.<sup>12</sup> Providing a cognitive aid may enable clinicians to respond to overload and potential task completion degradation to enhance patient safety. EEG offers the opportunity to examine cognitive load within the clinical domain while other strategies such as fMRI are anchored to the laboratory. Further iterations of the technology and validation in other studies would help determine the utility of EEG application within the clinical environment. Real-time measurement of cognitive load may allow development of feedback mechanisms, for example, haptic warning of approaching overload. Simulation-based education has consistently been challenged to prove efficacy and, while limited translational outcomes have been established, metrics on the individual's cognitive improvement remains elusive.<sup>21</sup> Measuring cognitive load may provide a tool to assess the effectiveness of different teaching modalities, for example, the impact of repeated exposure to challenging scenarios in increasing the threshold for cognitive overload.<sup>22</sup>

#### CONCLUSION

EEG may provide a greater understanding of the cognitive load during task completion. Its application may not just be limited to completion of technical tasks but applied to clinical situations in which decision-making is challenged by extraneous distraction. Design and evaluation of educational interventions may be aided by identifying which strategy has the greatest impact on reduction of cognitive load or raise clinician's threshold for cognitive overload. Creation of metrics using EEG to assess efficacy of teaching interventions and provide clinicians with real-time feedback on cognitive load is feasible. We hope to extend the use of EEG into simulation and ultimately clinical settings. The use of EEG to measure cognitive load and its relationship to clinical performance is an interesting area that deserves further exploration. Optimising education interventions to individual cognitive capacity could lead to enhanced clinical performance and ultimately improved patient outcomes.

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**Contributors** DJL, SAJ, GC designed the study, collected the data and wrote the manuscript with substantial input from each. GC designed the study and substantially reviewed the manuscript.

**Competing interests** None declared.

**Ethics approval** NHS Lothian.

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