

August Macdonald

M.D. 1912

61537

Anti-streptococcic Serum. Its exhibition in
eleven successful cases.

In the course of five years, spent partly in Hospital, some months at sea, but mainly in general Practice I have been at a loss as to what subject I might ^{adopt} one that should be comparatively fresh and concerning which I might speak to greatest purpose.

In venturing to bring these cases to your notice I am filled with misgiving - I have chosen the wrong time? At present the schools are gone Vaccination-mad. Everything can and is to be treated with vaccine one has only to read the current Chronicles to become imbued by the glowing accounts that are to hand in connection with vaccine therapy.

I have used vaccines frequently; and while in the more chronic conditions their praise has been merited, in the light of my experience, e.g. Staphylococcal infections - gonorrhoeal arthritis, yet I cannot speak to any real success in major condition particularly secondary (Tubercle, infections Septicaemia &c.



one profits by another's losses, and I may say that this impression of mine has been strengthened rather, in cases under the care of other men, which I have been luckily able to follow.

I have seen two cases of puerperal fever treated by other men with vaccine to no purpose. I frequently have heard of similar failures one only so recently as last month.

Such then being the status in the Capital of Devon perhaps I shall be allowed to present these cases treated by polyvalent anti-streptococcal serum for your consideration, in the teeth of present "van" opinions, and in opposition to the findings of many men of great experience.

They were all important cases - some indeed critical and as they were the only occasions on which I used the serum I am inclined to regard them as something more than lucky - so much so that I will go further and say the serum has always been successful in my hands - I feel, therefore I have a small claim in placing on record my experience of Anti-streptococcal serum.

In the light of these case I shall endeavour to show that given judiciously at the right time, and in sufficient amount the serum is an agency of real value in the combating of septic processes; and also as a remedy quickly and easily introduced that will not only determine but will cut short, in fact, the latent period between spreading infection and the localisation thereof:

That will upset the balance in the interests of one's patient's life in the struggle between infection and resistance, at a time when one has reached one's limit and can think of no further remedy and in a manner whose brilliancy is likened only by the action of the anti toxin of Diphtheria on the false membrane. I shall instance its use in the following cases:—

Puerperal Fever

Puerperal Sepsaemia

Puerperal Thrombosis

cellulitis. & whitlow.

Trochanteritis (septic.)

Ludwig's Angina

Thus it will be seen that I have extended the use of the serum freely, and without an exclusive regard for the etiological Bacterium. This will of course damn me straightaway as a Charlatan in the eyes of the Bacteriologist. If it must be so - and I am not prepared to admit it without proof being lead - I humbly suggest it is cleaner than swallowing gallons of antitoxin - or normal horse serum, methods advocated by eminent & successful men of to-day -

But I am not a Bacteriologist - and as I am compelled to seek my morrow's bread as a general Practitioner, it will readily be understood, that the cure of the condition must be to me the first essential. These were cures. It will be seen that they were timely cures - They represent the only occasions I have used serum and they brought relief to my patients - It is with reluctance I believe that "such a mixture has done my patients' cough much good": In my belief many "cures" are spontaneous (if not retarded by medicine) but about these cases there could be no doubt.

Case I.

Mrs W.T. Hotel Keepers wife aet 28 was confined on May 7/09, by a midwife on May 11th the Doctor was called in and pronounced her to be suffering from puerperal Septicaemia (High Fever Rigors + Sweats -) The lochia had stopped and the breasts secreted no milk. as his previous experience of these cases warranted a bad prognosis he readily assented to my request for Carte Blanche & handed her over to my care.

The same evening on Admission to Hospital her Temp recorded 105° pulse 140.

Fluctuating and thready it exhibited periods of 130 beats per min steady; at other times delirious and irregular 150. It struck me at the time and I have noticed it since in other cases of profound toxæmia the peculiar variations of the pulse.

It is possible some day we may be able to establish a connection between the output of toxins, and this peculiar fitful character of the pulse - or perhaps it represents disorder of cardiac innervation only; or cardiac muscle intoxication?; for I have seen it in

a case of Diphtheria with cardiac vomiting

At 10 P.M. The Patient was anaesthetised with ether and I proceeded to examine the genital tract.

The uterus was about 7 inches long and admitted two fingers - saving the presence of two or three small clots was empty.

The cervix was slightly torn and nothing could be felt in the fornices.

Being obsessed at the time by the results of Bouney I scraped her thoroughly with a blunt spoon and swabbed the whole cavity with pure Cyllin (a procedure that was responsible for a severe excoriation of the vagina & nates that took some days to yield)

The following is a statement of the temp and pulse with dosage of Serum.

Midnight T 102. Pulse. 130

2 A.M. T 103.8 " 132.

Here I injected 30 cc of Polyvalent Serum.

6 A.M. T 103 P 132. 10 cc of serum.

10 A.M. T 101.2 P 114. 10 cc of serum.

2 P.M. T. 101.8 P 120. 10 cc of Serum.

12th

	6 P.M.	Temp	102.4	Pulse	128	10 cc of Serum
	10 P.M.	"	104	Pulse	140	" " "
13 th	2 A.M.	"	104.8	"	138	" " "
	6 A.M.	"	102.8	"	130	" " "
	10 A.M.	"	102	"	130	" " "
	2 P.M.	"	103.6	"	138	" " "
	6 P.M.	"	102	"	127	" " "
	10 P.M.	"	103.2	"	130	" " "
14 th	2 A.M.	"	103.6	"	136	" " "
	6 A.M.	"	103	"	127	" " "
	10 A.M.	"	101.2	"	120	" " "
	2 P.M.	"	Maintained	"	"	" " "
	6 P.M.	"	100	"	110	" " "

Hereafter the Temp never went above 100.8 and in three days time dropped to normal the patient making an uninterrupted recovery.

I should further add that the serum was given night & morning until 17th when it was stopped.

In considering the merits of this case, as in all cases of puerperal Fever, the natural question that arises may be put "was the infection general or localised - Blood infection or not?"

In my mind the history of the case, the records

of the pulse. Skin & temp are conclusive but if further proofs needed I will banish all doubt for at 10 AM on the 12th inst when she had been under my care some 14 hours, I abstracted with every care 20 minims of blood from the right median-basilic vein and inoculated a slope agar tube in the usual manner.

This was undertaken really for the purpose of procuring an auto-genic vaccine should such be required.

The growth was delayed but in three days time presented a classical culture of strepto-coccus pyogenes.

I should further add that the patient was plied industriously with quinine sulph grains 5 whisky $\frac{3i}{4}$ every four hrs - vaginal irrigation four hourly - and the usual fever hygiene.

Clearly then this was a true puerperal septicæmia and the successful issue was attributable to the serum - in vivid contrast to those cases associated with swinging temperature sweats & rigors, lasting from five days to five weeks, passing into the typhoid state, and dying eventually from exhaustion.

case II. This was a case in the hands of another doctor -

Mrs A. was confined at Wiltshire Launce August '09 (second labour) by midwife who has since been removed from the rolls.

On the second evening her temperature rose with a shiver to 103° pulse 120

Dr Duguid who had booked the case, on being called in ascertained that the labour had been normal, and suspecting intoxication from constipation enjoined a brisk purge and gave her a quinine and ergot mixture.

On the following morning her temp registered 104° pulse 140 p.m.

He douched her that morning, but with no result.

In the evening the temp remaining high I gave ether, and he examined the uterus which was empty.

He then swabbed the entire surface with Izal.

Her temp remained up and she had several rigors

Next morning she looked worse matters

being complicated by the fact that she was 4 miles in the country.

I saw him the same evening and suggested serum as a last resource.

He accordingly gave her 10cc that night but it did not prevent rigors + sweatings.

Next morning he gave her another 10cc and contracted with the District nurse to let her have 10cc every four hours in the day time.

On the fifth evening of the disease - that evening - her temp dropped to 103°

on the following morning her temp was 103 maintained. Evening 104 , but the rigors had now ceased.

on the seventh day temp recorded 103 in the evening to 101.8

on the eighth morning her temp fell to 100 remaining the same in the evening we now reduced the dosage of serum to 10cc's night + morning as we considered that the tissues were now able to do their share.

On the eleventh day of the disease she was normal + the serum was discontinued.

Her convalescence was rapid on the evacuation of a parametric abscess, that burst on the 15th day and the temp which had again risen to 102° fell once more to normal.

I have no doubt that this case would have ended fatally had the serum been withheld.

Case iii.

This was a case that occurred in this town in June 1911.

Mrs X "booked" a Doctor friend of mine for her confinement.

at the 4th month of pregnancy she went to visit her husband a naval Lieutenant in Portsmouth, and returned with an acute gonorrhoea.

she miscarried a macerated foetus at the 7th month but everything came away clean.

on the third day of the puerperium her temp: shot up to 103 -

The Doctor douched her & explored the uterus which was empty, & nothing in the way of placenta or membranes could be found.

He scraped her thoroughly & douched but the temp instead of abating reached 105 swinging, and accompanied by rigors & sweating.

on the 5th day he gave her 30 cc - 12. three lots of 10 ccs.

from the 5th to the 10th day he persevered with this dosage accompanied by douching of the uterus & brandy & quinine four hourly. by the 10th the temp had dropped to 100° and thence the patient made a steady recovery.

Case IV.

This was a case I saw last November. A doctor friend of mine was called to a confinement in a woman suffering from whitlows.

He was seedy at the time being an asthmatic, and matters were complicated from an adherent placenta.

Being seedy & in a hurry he admits his hand sterilisation was not as complete as it might be.

48 hours after the labour her pulse shot up with a rigor. T 102 pulse 130 he douched & examined the uterus

which was quite empty - next day she was no better and he called in his Partner who pronounced the case as bad on account of her already septic state (whitlows)

The same night I met the Doctor in charge of the case and he gave me the facts. I urged generous doses of serum as my own experience warranted and suggested no delay.

This was done & the treatment continued for 3 days (30 cc per diem) when the temp & pulse dropped to 100 & 120 respectively

The patient thereafter gave symptoms of parametritis and the temp again rose to 102° - a big collection formed and could be felt easily depressing the right fornix. It took about 7 days before fluctuation was apparent and eventually it was opened with blunt dressing forceps -

The temp. steadily came down and she was able to be on her feet with three weeks of the labour, a satisfactory ending to a doubtful case.

It is the occurrence of this parametritis (not only in the cases I have cited but in cases one has seen in Hospital, or with other men,) that has led me to wonder what is the origin of these localised processes.

We are told that they spread from lacerations; that they can spread through the uterus direct, but I am not satisfied.

In the cases I cite, they were not present to begin with - they came on in the "wake" and were only secondary.

I do not doubt infection spreads from the passages. But all cervixes tear and yet parametritis is not a common sequel. I maybe wrong but is it not possible that all puerperal sepsis may have a similar origin, and that the parametritis in some, an evidence of resistance, corresponds with puerperal fever in others, where that resistance is lacking.

I feel sure puerperal parametritis is a subject that has been explained on general grounds, and will be considerably elucidated in the future.

Case V This is a curious case I treated successfully in Wales last year.

Mrs Davis ystrad Mynach was confined on a Monday a normal labour where I did not interfere - The Placenta was expressed with membranes, entire.

4 days after she was running a Temp: of 102° constant. I diagnosed Sepsaemia and blamed a W.C. in the proximity.

I purged - douched - and eventually curetted the uterus. absolutely nothing pathological could be found and it seemed to me as if my luck was up against me.

My principal was away - the temp remained up - I decided therefore to give her the benefit of three ampoules of the serum an amount I have by me always.

I gave it on the 6th day (30 cc in tot). on the 7th her temp dropped to 100° and thence to subnormal in forty eight hours from the initial injection.

Sepsis there undoubtedly was somewhere but to this day I do not know where.

if my use of the serum in this case was questionable I think the result justifies the means -

It was not a critical case and perhaps would have yielded to expectant treatment in time as my Principal on returning suggested -

The case is important, however, as another illustration of the uses of the serum.

Case VI

In submitting to your notice this case and the one following, both cases of severe phlegmasia alba dolens I am not able to say why the serum worked. I shall merely state what actually took place.

I have seen, altogether, some six cases of this disease and I find that while it usually ends favourably yet sometimes the spreading septic thrombosis may be very dangerous and after the process has been stayed, lymphatic oedema and "neuralgia" render the patient's existence very unhappy. In both these cases treated by serum the sequelae were not marked, and saving some oedema the patient has no other complaint to make.

I was called on June 24/1911 to a woman ~~to a woman~~ who had been confined by a "nurse" some 10 days previously.

I found the woman in a serious state
temp 103 pulse 124 small & empty.

The breath was foul and the tongue fleshy
and coated with a thick yellow fur
a putrid foetor filled the room

She complained of pain in the right
iliac region and groin shooting down
the right lower limb and, as well, intense
frontal headache.

On examining the vagina a putrid
mucopurulent discharge covered the
fingers - a boggy exudate could be
felt in the right lateral fornix.

I diagnosed puerperal cellulitis and
injected hot corrosive douching and glycerine
plugs.

25th general condition was the same. I gained
the first evidence of thrombosis - The right
leg was slightly larger than the left

26th swinging temp & sweats continued - The
right leg was now twice the size of the left
and the veins stood out in bold relief.

27. The patient was looking worse. temp 104
she complained very much of intense
pain in her thigh and of cramps in her
Calf muscles

28th inst There was no change in the general condition though the tongue was becoming dry at the edges.

The nurse and Relatives besought me to send her to Hospital: I however demurred pointing out the danger and futility of such a course.

29th I gave the patient 10cc of serum at 10 A.M. and 10cc at 4 P.M. and at 9 P.M.

Choosing the right groin & Poupart's as the site.

30th Temp still up in the morning. In the evening it dropped to 102° and pulse to 126.

1:7/11. Temp 100° in the morning - 102° in the evening - The tongue was more moist and was commencing to clear.

By the 4th inst her temp had dropped to normal and the swelling in her leg had completely subsided after two months convalescence she got up, and beyond a slight oedema at the ankle her leg gives her no trouble or pain. She has nine children and is able to attend to her household duties without external support.

28. 19

case vii. Mrs. Stamford act 36. Miscarried 7 months
marginal placenta praevia. 5th Jan'y 1912.
practically no interference was necessary
as the head came down + checked the
bleeding which had been very severe.
Delivery took place naturally and I ex-
pressed the placenta.

On Jan'y 15th her husband asked me to come
down & see her as "she was bad". (I should explain
that this was not a patient of mine and I
had been called in by the nurse on account
of the bleeding - I had been paid my Fee Cash
after Delivery & had terminated my connection
with the case.)

On exam I found her temp 104° pulse 135
and the patient looked very ill. her canines
teeth were responsible for an offensive breath.
She had as well a recrudescence oforrhoea -
Her conjunctiva lips & cheeks were almost
exsanguine - pus was present on the diaper.
There was a general tenderness of the lower
third of the abdomen, but the uterus could
not be felt and its site was not particularly
tender to the touch.

The P.V. exam was unsatisfactory for while
my hand was bathed in mucopus, yet I could
distinguish

Jan. 20

no pathological focus - The uterus presented no abnormal feature and diagnosis I could not make. I suspected cellulitis but could not find it, and as is my custom in these cases - if in doubt irrigate - I douched her & gave her a quinine & strychnine mixture. The following day brought no relief to the symptoms, but that evening the leg started to swell and by the 18th inst it was twice the size of the other. I continued with the hot douchings & followed them with plugs of glycerine & Icthyol.

Having in my mind the marvellous results I had got from the last case I gave her 3 injections of the serum - This was on the 19th - Within 24 hrs the temp began to fall, and she was normal within a week - The fall was not quite so quick as in case D where it dropped in 48 hours to normal but dallied a little time at 100° & 99°. But the result was equally satisfactory; and I think if Doctors realized what a potent weapon against sepsis the serum really is, they would trust more to it, and rely less on the patient's vitality.

I have dealt with these puerperal cases first as I believe it is in those conditions the serum will be found most useful.

Many Doctors I have met, bear out my experience, yet text books and teaching centres are mostly against it -

cases VIII & IX.

J. Arnold a hotel keeper in this town infected a "ragnail" in the second left finger. It gave him a lot of pain and his axillary glands were enlarged & tender. He tried various methods - e.g. dipping it in very hot water, poulticing, but without avail.

He shewed it to me and asked what he should do. I suggested a Bier's bandage but this only aggravated the pain.

He was opposed to any "knifing" but was willing to submit to injection of Serum. (The condition seemed unsatisfactory as his vitality must have been lacking and yet the infection was not virulent for there was only moderate systemic disturbance).

I accordingly injected ice all round the finger - It was difficult to do, and gave him a lot of pain

The next day I gave him ice into the upper arm

The condition yielded rapidly; some slight suppuration was manifested which did not burrow under the nail, and a week of peroxide soaks cleared up matters completely.

Case 18.

a collier came to my surgery giving the usual symptoms of commencing Whitlow - The finger was enlarged hyperaemic & tender - I gave him instructions to soak it in very hot water and to return twice daily to let me see it.

In four days a deep whitlow had formed on the terminal phalanx (middle finger left hand) - I opened it under Ethyl Chloride and it discharged freely; under. It discharged so long that I began to suspect necrosis - nothing however could be felt with the probe I gave him ice daily for three days and the condition rapidly improved & soon healed without any necrosis

Case F. Army pensioner act 56 had suffered some years from Hallux rigidus & tertiary ulcers in foot - The latter had healed when I saw him and he came for advice re the toe. The metatarsophalangeal joint was much enlarged and hyperplastic changes had rendered it practically immovable. He was unable to walk with it - He was of intemperate habits and had contracted syphilis in the service. I recommended amputation which was duly performed.

Owing to a glycosuria that was discovered too late, the flap went dead and in three weeks time left the stump with insufficient skin to granulate.

It was decided to pare the stump to allow the skin to grow over.

Whether it was due to faulty dressings or infection from granulation tissue I am unable to say, But a fulminating cellulitis attacked the tissues & spread to the sheath of the flexors of the big toe.

This was brought down by moist dressings for two days, but it proceeded to spread up the leg and then nothing would check

it. There was profound systemic intoxication temp 103 & pulse 120.

I tried three injections of streptococcal vaccine. with each injection a lowering of the temp was recorded which was not however maintained.

I was worried very much, and next tried multiple incisions. This step was accompanied with free bleeding which lowered the temperature only for a short time. In 12 hours it was as high as ever and the pulse worse.

In despair I put him on anti-streptococcal serum 10cc every eight hours within twelve hours the temp dropped to 100° and the treatment was discontinued in three days time.

It is with great humility I publish this case, a chain of horrible misfortunes in a case I never should have touched.

all praise therefore to this most excellent serum - failing it, amputation at the hip was the last resource and the verdict would have been "The operation was successful but the patient died". !!

Case XI. E Cobishley aet 64 by trade a butcher. had been under the care of his family Doctor for his throat - indurated ulceration of the pharynx + left right tonsil. the submaxillary glands were much enlarged. The Doctor treated the case as syphilitic but suspected malignant disease. He phoned me on August 10 1918 that the man had developed Ludwig's angina + was very bad -

I gave chloroform + The Doctor made several incisions - at the sides of the trachea - into the right submaxillary glands which, with the sheath of the carotid were involved in acute necrosis. Incisions to relieve the jaw were made on the right side.

The next morning the patient was looking very bad temp high breathing stertorous and to complicate matters he developed D.T.'s.

Every hour we anticipated fatal haemorrhage the man struggling in a straight jacket with maniacal fury.

I gave him that day however ~~3~~³ doses, of 10 cc's of serum and next day the temp had

dropped - The D.T.'s slowly passed off and in a week's time the Patient returned to normal.

No secondary haemorrhage occurred and the respiratory embarrassment gradually subsided.

I took a swab from this case and inoculated a slope agar - I got a mixed growth of strepto- & staphylococci. This fact however did not militate against the utility of the serum and to its benign influence do I attribute the complete and rapid recovery of the patient.

General Commentary.

In considering the merits of the foregoing cases, it will be noticed that I used the serum sometimes specifically, sometimes, empirically.

I think in the first four cases the infection was truly streptococcal, (judging by the clinical features) likewise in cases 8, 9, 10, & 11. Cases 6 & 7 (phlegmasia) I can not explain - Their results have strengthened my determination to use ^{the serum} freely in such cases.

In submitting these cases for your consideration I think it will be conceded that they were important cases - Take the puerperium. At a time when every man outdoes his brother in specialising the minutest details of antiseptic, I am compelled to pause and ask them where they would lead us.

In their endeavour to preserve the status quo of the genital tract they employ all possible and impossible methods - The changing of rubber gloves frequent lavage this method of ending the first stage - That method others will laud as having made their bank balance.

I wonder if 1% of general Practitioners use gloves?

and yet the results of general Practitioners as regards sepsis are as good as the great lying-in centres. A Doctor dares not loose a case from Fever nowadays, and yet some of them are not even clean -

I have seen a Doctor remove a placenta without previously washing his hands. I have seen an intra-uterine douche given from a very old rectal syringe.

and reverting to the other extreme, the men who attend in white ducks - wear aprons, gloves; shave the labia. Do they escape all sepsis? - Not for one moment do I think so.

I am no believer in dirty methods, and in the manner I sterilize my hands & the genitals of the patient, & boil my blades I yield to none in thoroughness.

But I have learnt to respect many brilliant accoucheurs in general practice men thirty & forty years my seniors, who have trained in a different way to us. They learnt by experience and their understanding is good - They realise that a firmly contracted uterus is of far greater importance than the dexterous shifting of this glove to that hand.

It is not they who have the septic accidents - rather, it is the younger man who misses the main issue in paying too great attention to detail - This, I think, explains the inexplicable accidents that occur sometimes with men, whose aseptic regime in the conduct of labour is above suspicion.

I have known of two or three such cases, particularly in Blackburn.

and passing next from the Doctor to the Patient I have been impressed by the number of cases that show a rise in Temp within 48 hours of delivery - It was called milk fever because it reached its acme within a few hours of the onset of the milk - I have seen a rigor + temp in a woman whose baby, ~~bab~~ + placenta had been born before my arrival. Intestinal sluggishness is I believe, very important, but it ~~they~~ will not explain the case I have cited - I have seen similar cases - rubber gloves will not prevent them.

The point I should like to make clear is the waywardness of the genital tract to septic infection - The most careful of men have had 'bad luck' - The most careless of men get off scot free.

and considering in the next place puerperal parametritis + abscess formation it will be noted that in cases ii^{ii} & iv^{iv} the patients started with out any local symptoms or signs; and the symptoms and signs only developed when they had been under

The action of the serum some time.

I believe the serum assisted in the localisation of the septic infection in both cases just as it checked the spread in the cases of cellulitis & tenosynovitis I have above described. There is some evidence therefore for holding this view -

That being so how is one to look upon puerperal parametritis where there is little evidence of local laceration? (we are taught that local laceration is the channel through which infection spreads) I suggest in the light of these cases that parametritis & abscess may sometimes if not always represent an imperfect attempt made by nature to short circuit the septic process -

In abortion cases where there is no tearing yet the condition frequently obtains.

It is not a common complication of the puerperium, and if tearing of the cervix or vagina were the sole cause then the condition should be much more prevalent. The automatic appearances of these pelvic conditions has profoundly impressed me and has set me a thinking as to the real

Character of puerperal parametritis.

and now I would like to ask why has the serum enjoyed so bad a reputation in the past - many deny it has any merit whatsoever.

I think this is due to several reasons:-

firstly It is not given soon enough.

So frequently one sees a case slip where as a 'dernier resort' two or possibly three injections were given - "Antitoxic serum was utterly useless" was the report.

If it is important that the anti diphtheria toxin be given early so as to prevent the poison becoming fixed to the tissues, to their destruction, Equally as much, it is important that the anti streptococci serum be given early and of course for exactly the same reason - and it is the neglect of this precaution that has hitherto been the cause of the inefficient character of the serum. It is common sense. The vitality of the patient is still unknown. Some can kill a septicaemia in hours; my own brother is a most brilliant example of this fact where a profound septicaemia raging for a week with ileus and other

Significant complications supervened, and the whole condition ended by Crisis and the appearance of a big septic rash. In other cases the septicaemia kills in the same length of time - we cannot standardise our patients' vitality, for practical purposes, and therefore it behoves us to have recourse to "artificially acquired immunity" and as soon as possible.

When is one to give the serum then? I should urge it's being given as soon as there is the slightest suspicion of blood infection or, putting it another way, the serum should be given, the worse the possible prognosis, the sooner the dose -

This holds good particularly with Fever in the puerperium either severe, or lasting longer than the third day over 100° . but it is a good rule in all cases, and particularly those where one is in doubt. In such a case it acts as a prophylactic and as such was used by Dr Guy Hughes Maclefield with a successful result. as such it is recommended by the Hospital men in abdominal + gynecological work notably Hermann and Bidwell.

given soon in a febrile puerperium or before operation where there is a risk of septic contamination it will assist the patient's vitality & enable the tissues to ingest the bacteria.

as to the amount that should be given 30ccs per diem is the stated dose. This dosage i.e. 10cc every eight hours will be found of quite sufficient amount in spreading local infections, notably cellulitis, septic tenosynovitis & lymphangitis. but it is not sufficient where the infection is general and I think that state will be met efficiently by double that amount that is to say 10cc every four hours. This dosage should be maintained until the infective process has reached its ~~to~~ height and the patient's tissues are beginning to respond - demonstrated sometimes by the cessation of rigors, sometimes by the appearance of a septic rash (which can appear without the use of any antiserum) and usually by the temp chart changing its character & showing greater falls -

When the temp has definitely fallen to 100° (the pulse in ratio) then it can be reduced to eight hourly and thereafter to night & morning.

It maybe said to produce ill effects - well, I have never seen them - a rash may as easily be septic as due to serum particularly when the patient begins to improve on its appearance - (I have seen this in two cases - one with serum - the other, without -) Rheumatism and the other quoted sequelae have never met in the use of this serum.

The serum should be given systematically and in these doses early in the disease. Given early it is acting on a vital organism that will respond to chemical irritant.

In the later stages of the disease the tissue protoplasm has been rendered worthless by the poisons of Septic Fever, and not all the serum in the world will take its place. But given early the story would have been quite different, and the tissues would have had their task considerably diminished by the use of the serum.

But where is it to be given? Some urge it should be given as near to the primary focus as possible - really, I do not think it matters in the least - If a sufficiency is administered under the skin say of the breast or abdomen or under scapular region the remote effect will be equally apparent.

In general infections at any rate any loose cellular tissue, will suit - I feel sure this applies to "local" administration, as well - The general administration will check the local condition.

Another point about the serum is this, it is always at hand - unlike vaccines it does not ^{need} to be made - for autogenous vaccines take some days to make - good & valuable days wasted - The serum one has at hand & it can be given without any ado. As instance of this fact I make it my rule never to be without a case (30 cc) of the serum in case of need, and in the case of Sepsaemia I detailed above, it was of signal service.

The next important point I should wish to consider is, in choosing the case.

I say this advisedly, for while it has always done its work in my hands, yet such is not the case with other general Practitioners. I watched a case of puerperal cellulitis (treated by a Doctor in this town) which terminated fatally.

all forms of cellulitis & septic lymphadenitis that endanger a patient's life from their severity are suitable cases - I can bring the evidence of several medical men, working without ostentation, to bear with me on this point.

Mixed infections—where the severity of the symptoms & signs are maintained, not so much from inadequate vitality to deal with the irritant, as a lack of proper drainage measures, ~~then~~ such mixed infections are less suitable for the exhibition of the serum. And the reason is apparent.

If the serum's functions be studied it will be noticed that the serum raises the vitality of the patient, and frequently hurries the onset of pus. I have noticed this and feel convinced about it.

But that surely is quite a different situation to a case where the patient's tissues fully respond to the poison + pus is formed but cannot escape. due to mechanical reasons. One thinks of cases like pelvic cellulitis, Burrowing ischio-rectal abscess, appendix abscesses, where the pus collects in pockets + cannot escape.

In this category, therefore, pyogenic processes whose involution is prevented by anatomical or "cicatricial" barriers such processes will not show much response to serum treatment unless complete local measures be undertaken also.

In our present imperfect knowledge of the factors that determine immunity it is wise to supplement all cases with complete local measures. It was primarily ordained that nature got rid of suppurative Bacteria by the formation of pus - we may eliminate the bacteria in time from earth, we may check the formation of pus (though in my attempts to do so I am usually unsuccessful) but an acute abscess will burst somewhere if the patient lives long enough, and so I make a plea for complete drainage.

The dose must be sufficient - It must be given early - It must be a suitable case - these are the three cardinal principles that direct its use - It but remains for me to say the ^{Polyvalent} brand I favour and that is Parke Davis & Co Manufactured under the care of the Vaccinating Sir A Wright! It is neatly put up easily procured and is exchangeable at a certain date free of charge - It is not cheap and perhaps this is a consideration that will hinder materially a more extended use - The confidence I have in the production has amply repaid any money I have not been refunded by my patients -

Of interest, is the work of contemporary men on the subject. Raw⁽¹⁾ suggests giving it by the rectum, some 60 cc. per diem maintaining it is rapidly absorbed and quickly overcomes the symptoms & signs of Septicaemia. He concurs in the importance of local measures.

Saller of this town gave rectal injections for acute gonorrhoea and his practical findings are much the same as mine

that is to say it fortifies the ^{latent} vitality
 in the manner of a chemical antidote
 P. H. Bridge instances a case of gonorrhoeal
 Rheumatism that refused vaccine
 and yielded to rectal doses of anti-
 Streptococcic serum. (S. Devon Hoop)

Wright believes any virtue in the serum
 is due to a small amount of vaccine it
 contains - ("Studies in immunisation")

most Bacteriologists condemn it on
 the verdict of the Opsonic index.

Some base their statements on the results
 of experiments on lower animals -

They are contradictory - and in any case
 are beside the issue -

In approaching this subject, I have
 based my remarks on Clinical evidence
 only. I have explained that the serum
 has not yet become fashionable - It does
 not set off the Opsonic index which is
 an essential with Bacteriologists -

It ill becomes me to break lance with
 the Powers that be, but I think in their
 endeavour to exploit new theories, they should
 be more chary, more merciful to a means
 that has much to be said for it.

What need is there to have recourse to experimentation that is intended for destruction?— Who shall say they will not change their minds once again in another decade and consign as shibboleth the graceful ideas of Sir A Wright? Opsonic work & its' association with vaccine has not proved an all-round success!

I have had to contend with so much optimism in men of the London schools that it has shaken my confidence in a lot of modern progress— so much "accepted" notions have been theoretically suggested against clinical support.

My case of Tenosynovitis (with complete involution of the process) was accounted as being due to the presence of a small amount of vaccine in the serum, when vaccines (given without record!) had signally failed.

I wonder how many times I have injected vaccines, some autogenetic others standard, at the behest of my superiors without retarding the morbid processes in the slightest degree!

for those vaccines with which I have had fair measure of success, I have nothing but praise - But I have yet to discover standard vaccines that will give me so satisfactory results in classes of cases as I have had the honour to submit to you.

In conclusion therefore I would suggest that in polyvalent anti-streptococcal Serum you have a substance that is easy to procure, simple to inject, which exerts a splendid influence over the most important septic processes - over the most critical septic conditions; that neutralises the poisons which interfere with cells activity and by so doing permits the cell to manufacture the necessary antibodies: with the result that Septicaemia is aborted, cellulitis' spread is checked, septic Thrombosis & attendant oedema are checked and cured. It is a substance that is primarily to be used in acute cases, as opposed to vaccines which are exhibited to greatest advantage in subacute and chronic cases.

It is a substance whose use requires the ^{expert} knowledge of no laboratory technique

and is therefore at the command of Medical men engaged in general practice. Its use makes no call on the Subject's vital energy and is especially indicated when that energy is already being seriously Tapped.

In puerperal septicaemia its generous exhibition hypodermically is attended by reduction of fever & temp, cessation of rigors - The condition then may become a purely local process which ends in complete recovery - or the whole process may end by abrupt lysis.

In whitlows and critical cellulitis, the serum checks the poison production & the temp & pulse fall - The action is not sudden but is gradually produced (12-48 hrs). The spread of the cellulitis is absolutely checked, and is rendered, from being a serious general Toxaemia, a merely local process. The risks to life vanish. The local process is considerably simplified and if the balance of forces requires it pus formation is accelerated.

In as much as it is merely a vital energy

Supplement, its exhibition must be accompanied by complete local measures. Pus must be removed fresh infection must be prevented. Hence its use in puerperal fever is to be helped by uterine douching plugging (if necessary) Gummie & Alcohol. In ~~the~~ cases of cellulitis whitlows, septic tenosynovitis its use is to be enhanced by local dilution & drainage and by fomentations. For these cases 10cc eight hourly will usually be sufficient and its use can be discontinued when the temp has dropped to 100° & remained at that (or lower) twenty four hours.

In Septicaemia bigger doses are required and 10cc four hourly is a fair amount that will bring about the desired cure and will not be attended (in most cases at any rate) by unpleasant sequelae such as headache (usually already present), itching or erythema, or articulo-pains. Its power for ill is, Nil, Its power for good is great, and has no equal.