VACCINES IN DENTAL PRACTICE

I suppose you have wondered why I have not mentioned the question of vaccines in dental practice, and the pros and cons of vaccines in pyorrhoea and apical infections. The subject is too difficult, and to a certain extent too controversial, to deal with in a brief lecture, but I maintain that, given co-operation between the bacteriologist and a dental surgeon, who is also an expert in interpreting x-rays of the teeth, a great deal of most valuable salvage work can be done. Some teeth have to come out, others may be salvaged, and it is the expert dentist, accustomed to working with a bacteriologist, who, in my opinion, can do such useful work.

INTRAVENOUS METHOD OF GIVING VACCINES

All my remarks so far have referred to subcutaneous administration of vaccines, but to conclude my lecture I would mention one method of giving vaccines which may or may not be a method of producing a non-specific protein shock. I refer to the intravenous method of giving vaccines, and I hold that in many cases one is certainly giving a specific protein. One knows that large doses of T.A.B. have been given intravenously in cases of general paralysis of the insane, asthma, etc., also peptone solutions, and this, of course, is non-specific protein therapy. I have, however, had many cases of arthritis, in particular where there seemed to be definite foci of infection (either dental, intestinal, etc.), that have responded in a most striking manner to autogenous intravenous treatment when the subcutaneous method had failed. It is necessary to add a few words of caution about the intravenous adminis-

tration of vaccines. The initial dose must be small, at least half the dose that I should commence with in subcutaneous injection. The patient must be warned that he or she may feel quite uncomfortable about an hour or so after the injection, the symptoms being headache, shivering, and pains all over. Aspirin, bed, and hot bottles usually quickly ameliorate these symptoms, and after a fairly profuse sweating the patient recovers in a few hours, and feels none the worse, though possibly a little limp. Occasionally these symptoms may be very severe, but I assure you that, however severe, there is no cause for alarm. In extreme cases the reaction may last two to three days, and, although your patient may reproach you for causing such inconvenience, it is in these cases that I have seen the best results.

I had one patient with arthritis who, after each injection, had the most violent reaction; yet so impressed was she by the obvious improvement that followed each bout that she continued the treatment till a free movement of her joints was obtained, and all that remained was the existing bony and joint changes prior to treatment. I may add that she is now playing a very useful game of golf, and, while regarding me as her benefactor, does not properly apportion the credit due to herself for sticking it out.

Though one may get these violent reactions in susceptible cases, there is fortunately no cause for alarm, and the symptoms need only be treated. Once you have adjusted the dose you will find that on increasing your dosage the subsequent reactions tend to be of a trivial nature, and that the case I have just quoted is the exception rather than the rule.

THE ORGANIZATION OF TREATMENT
FOR INFANTILE PARALYSIS*

BY

G. MURRAY LEVICK, M.R.C.S., L.R.C.P.

CONSULTANT FOR PHYSICAL TREATMENT, EAST SUSSEX C.C.; MEDICAL DIRECTOR, HERITAGE CRAFT SCHOOLS; PHYSICIAN, VICTORIA HOSPITAL FOR CHILDREN

The organization of treatment for infantile paralysis may be divided under two distinct headings, the first dealing with the acute attack, the second with the after-effects of the attack. The object of this paper is to explain that the scope and variety of the special technique involved in each case are so wide that organization becomes a necessity.

Treatment of the acute attack is of importance because it may greatly influence the subsequent degree of disability. This is a point on which emphasis should be laid, as it is too little realized. Unfortunately, owing to the infrequency of its occurrence and the unexpected way in which single cases or epidemics occur in out-of-the-way places, the acute attack often goes undiagnosed until after its subsidence; the signs of paralysis follow what was thought to be a case of influenza or something of that sort, and are not discovered until the patient is allowed to get up.

In the orthopaedic scheme of the East Sussex County Council, we have complete preparations for acting promptly at the onset of the disease, but we are, of course, dependent upon the alertness and co-operation of the general practitioners in every case.

With regard to early diagnosis I would emphasize the importance of examination for muscular tenderness in all

cases of acute pyrexia without obvious cause. A rapid passage of the hands over the four limbs and squeezing of the various muscle groups can be carried out in a couple of minutes. If acute tenderness is noted and for this and other reasons suspicion is aroused as to the diagnosis of acute anterior poliomyelitis, prompt investigation of any case rising in East Sussex may be secured by telephoning to the county M.O.H., Dr. Ashleigh Glegg at Lewes. If it is considered desirable, Dr. Glegg will then ring me up and I will proceed to the spot to meet the practitioner in consultation, with all dispatch.

By arrangement with the Lister Institute I have a supply of the new anterior poliomyelitis antitoxin always in readiness and, if we make the diagnosis, can administer it at once. This is considered to be the best procedure, but in case I might be unavailable with sufficient dispatch, I have in cold storage a supply at the Girls' Heritage School, Chailey, so that the R.M.O. can administer it without waiting for me. It should be given partly intrathecally and partly intravenously. For a favourable prognosis, the serum should be given, at any rate, in the first few hours of the attack, but in view of the pathological picture, it appears to me worth while to administer it at any time during the persistence of the pyrexia. Apart from this antitoxic treatment, special orthopaedic measures are important.

The correct posturing of the affected parts at the very outset of the disease is of paramount importance, and this should be secured without pressure from bandages, which tends to increase the atrophy of the affected muscles. The lumbar puncture carried out in the administration of the antitoxin affords an opportunity for withdrawing cerebrospinal fluid to relieve pressure, if desirable. The posturing of the limbs by the method of slinging, which I will shortly describe, should be carried out without delay as soon as the muscular pain has departed. There is no need to wait until tenderness to pressure has gone.

* Read in opening a discussion in the Section of Public Health at the Annual Meeting of the British Medical Association, Eastbourne, 1931.

The pathology of the disease being outside the scope of this paper, I will only allude to it so far as necessary in dealing with the after-treatment.

We must bear in mind that in the majority of cases, although there is complete obliteration of anterior horn cells to a variable extent, many of these are frequently put out of action by a disturbance which falls short of complete destruction. This disturbance may be the result of the toxin or of pressure from engorgement and extravasation of blood in the anterior cornua. After a time, many of these cells may recover but their axons may have perished. A year or more may elapse during which regeneration of these axons is taking place. If the muscles are ill treated or, in many cases, if they receive no treatment, they may lose their contractility, so that little or no muscular response can be elicited when the regenerated axons reach their destination. Therefore measures should be carried out with a view to preserving the contractility of all the affected muscles for at least a year before hope of recovery is abandoned.

These measures are partly the correct posturing of the affected groups, while protecting them from pressure, and partly other measures. It is, however, important to mention that the patient should be placed in the hands of those who are specially qualified to treat such cases. Properly administered electrical treatment is of great assistance in maintaining the contractility and nutrition of the paralysed muscles, but if improperly administered much harm may be done and is done, leading to opinions adverse to electrical treatment which are quite erroneous.

It is a surprising fact that physical treatment is not included in the examinations or curriculum of the medical student, consequently it is carried on as a general rule without the competent supervision of medical men. This supervision is needed not only to direct the treatment but to decide when it is needed and when it is no longer of any use. Much time and expense are wasted on the electrical treatment of muscles long after an electrologist with the requisite knowledge would have explained that recovery of function could not take place.

One of the greatest yet commonest of mistakes in giving electrical treatment for anterior poliomyelitis is excessive faradic stimulation. In fact, it should never be administered in the early stages of nerve recovery, when the faradic response is just returning. Only the single stimulus of the interrupted galvanic current should be used at this time. Massage, a very important part of the treatment, is less likely to cause damage, but even here harm may be done by deep effleurage, which is in my opinion a mistaken form of treatment for almost any condition.

There is yet another aspect of this disease which calls for special mention. We should never forget that the acute attack is a severe shock to the nervous system as a whole, and every patient who has been through it is left in a state of profound general neurasthenia demanding prolonged rest and constitutional treatment. I am convinced that if these facts were more generally realized the extent of recovery in many cases would be greatly improved. For this reason open-air nursing and heliotherapy should always be carried out and continued for some months or even years, according to the severity of the attack.

Heliotherapy is of decided value, though its effect varies greatly according to the type of radiation and the methods employed. At Chailey we have fourteen complete sets of lamps, each set being a complete unit for the production of the whole solar spectrum. As a result of comparative tests carried out at St. Thomas's Hospital and the Victoria Hospital for Children, I have not installed any carbon arc lamps at Chailey, and have in fact ceased

to use them anywhere. In their place I use a battery of four carbon filament lamps for the production of visible and infra-red rays and one mercury vapour tube for the ultra-violet rays, in each unit. The ultra-violet radiation can thus be adjusted to the tolerance of each patient, separately from the longer rays, which is very important. As a result of experiment with intense visible radiation I now attach great importance to this part of the spectrum.

This general radiation of the body is, of course, a measure for improving the general nutrition and recuperative powers of the patient. It is, I can assure you, a treatment of very high value. Its effect in the treatment of debilitated patients can hardly be overestimated. A couple of years ago, an adverse report on the subject of artificial heliotherapy was published by the Medical Research Council. You will be well advised to pay no attention to this astonishing document. It is only fair to the Medical Research Council's own special committee on light to say that this publication was issued without its authority.

For local treatment, I have for many years, as a routine, irradiated the paretic muscles with intense red light. The scientific rationale of this treatment I explained in a paper read before the International Congress of Radiology in London in July, 1925, and published in the *British Journal of Radiology* of May, 1926, and in a paper on the treatment of infantile paralysis published in the *Lancet* of August 15th, 1925.

Postural treatment is another measure demanding special care. When any of the trunk muscles are affected it may be needful to carry out prolonged treatment in the recumbent position to prevent the tragic spinal and costal deformities so often seen in these cases. Sometimes this recumbency should be maintained for several years in the case of growing children. It is the only way to prevent very serious spinal deformity if the abdominal or erector spinae muscles are affected to any practical extent. For such cases open-air nursing all the year round is very desirable. The patients remain strong, vigorous, and in excellent health if they are kept in the open air, whereas in hospital wards they would become weak. All these matters have been referred to, in order to explain the necessity for organized institutional treatment for infantile paralysis, because the many needs of these patients can be met economically in this way owing to the congregation of a large number of cases.

[Lantern slides were then shown depicting various methods of treatment carried out at Chailey.]

In summing up, it may be reiterated that many cases of infantile paralysis require institutional treatment extending over a number of years. When you come to think of it, this is far from being an unreasonable demand. No one hesitates to provide instruction for children in schools where they are taught lessons hour after hour every day, from the age of 5 until they are 14, therefore it is not asking too much to demand that a growing child, suffering from the effects of infantile paralysis should have daily treatment extending over some years; because this can be obtained concurrently with education at Chailey and other institutions throughout the country, and if the children can live at home many cases can receive this treatment at the out-patient clinics of the county orthopaedic organizations.

The reason that treatment is so important in the case of the growing child is that, as the limbs grow, paretic limb muscles are apt to become shorter than their twins on the opposite side, leading to postural deformity or further weakening by stretching. These affected muscles may need periodical treatment until the patient has ceased to grow. The need for operative treatment is in most cases brought about by lack of, or improper, physical treatment.

The county orthopaedic organizations are now spreading throughout Great Britain as the result of the original inspiration of Sir Robert Jones. East Sussex has its own county scheme on these lines, with Chailey and its marine hospital at Tidemills as its central hospitals and school, and out-patient clinics at Lewes, East Grinstead, Hailsham, Crowborough, and Burgess Hill, where after-treatment can be given to children discharged to their own homes under medical supervision from Chailey, and children attending these clinics can be admitted to Chailey as occasion demands for hospital treatment. In this way the whole East Sussex area is linked up with its central hospital.

I cannot conclude this paper without reference to the lack of organized treatment for paying patients of small or moderate means. To obtain privately the necessary treatment under the right conditions is impossibly expensive for any but rich people. If those institutions which offer resident treatment for paralysed poor children or adults wish to make their work complete they should certainly make separate provision at a little over cost price for those who can pay only small or moderate fees. The present institutions are unsuited for the children of the upper class, because there they must be educated with those who are by their upbringing and ideas unsuitable for them as companions. A vulgar accent is only one of the drawbacks that arise from such companionship. Only we doctors seem to realize the pitiable circumstances arising so often from lack of sympathy and enterprise in this matter.

Memoranda

MEDICAL, SURGICAL, OBSTETRICAL

OEDEMA ROUND THE EYES CAUSED BY TRICHINA SPIRALIS

Infection with *Trichina spiralis* in man may produce a variety of clinical pictures. The patient may present a pyrexia with no obvious cause, and enteric fever be simulated; or the fever may be accompanied by severe pains in the limbs and back, so that a diagnosis of acute rheumatism or of influenza may be suggested. But there is another group of cases in which the chief symptom is oedema round the eyes, with no other striking symptom; these cases are usually first seen at ophthalmic hospitals. The following case is an illustration of the last group.

HISTORY OF THE CASE

The patient was a female, aged 25, who lives in London and has never been abroad. Her husband is a french-polisher. She was quite well until July 26th, 1931. On that day she awakened with a feeling as though she were about to develop a "cold in the head," and in the afternoon noticed that her eyes seemed rather puffy underneath. On the following day the eyes were much more puffy; she had no other symptoms, and felt well in herself. On July 28th the eyes were almost closed by the swelling, and towards evening she felt tired and depressed, her appetite was lost, and she had slight diarrhoea. She felt thirsty, and drank a large amount of water. On July 29th she was unable to open the eyes on account of the swelling, and during the day vomited on several occasions. In the afternoon the temperature was 98.6°, when she was examined at Mr. G. G. Penman's clinic at the Royal Westminster Ophthalmic Hospital. The fundi and ocular movements were normal, and the urine contained no albumin. She was seen by me at the Royal Westminster Ophthalmic Hospital on the following day.

On July 30th the eyes were almost closed by oedema, and they appeared to be unduly prominent. The patient felt ill and sleepy and sick, though she did not vomit on this day.

There was no pain or tenderness in any muscle. As the urine did not contain albumin, as the blood pressure was normal, and as the fundi did not present any abnormality, a provisional diagnosis of infection with *Trichina spiralis* was made. A blood examination showed no eosinophilia. The patient was admitted to Charing Cross Hospital for investigation.

On admission in the afternoon of July 30th the temperature was 101.2° (see chart). There was fever for nine days. A

second blood examination made on August 5th (the eleventh day of the illness) revealed a high eosinophilia. The results of several blood counts are shown in the table. The patient vomited twice after admission, on August 2nd and 3rd. No other gastro-intestinal symptoms were noticed. The oedema round the eyes subsided during the first week after admission. At no time was any pain or tenderness noticed anywhere, and the patient made an uneventful recovery.

On August 10th (the sixteenth day of the illness) a small piece of the trapezius muscle was removed by Mr. R. A. Fitzsimmons; to the naked eye this did not present any abnormality, but in teased-out portions of the muscle many embryos of *Trichina spiralis* were clearly visible under the low power of the microscope. These embryos were not encysted, and for some time after the removal of the portion of muscle they were seen to be alive, coiling and uncoiling themselves among the muscle fibres. Under the high power the spiral arrangement of the worms could be clearly seen, as the whole length of the worm could be followed round the spiral by raising and lowering the lens. There appeared to be two and a half or three turns in the spiral. The adult worms were not recovered from the faeces.

The following table shows the blood changes. The total leucocytes varied between 6,000 and 9,000 per c.mm.

	July 30	Aug. 5	Aug. 7	Aug. 10	Aug. 12	Aug. 17
Neutrophil polymorphs...	78.0	55.5	51.0	46.0	38.0	45.0
Eosinophil polymorphs...	4.0	18.0	14.5	27.0	18.0	13.5
Lymphocytes	7.0	20.5	24.5	18.5	33.5	34.5
Monocytes	10.5	4.5	9.5	8.5	10.0	6.5
Basophils	0.5	1.5	0.5	—	0.5	0.5

COMMENTARY

The following are the interesting features of this case. The first and, for two or three days, the only symptom was oedema round the eyes. There was a high fever which did not appear until five days after the first symptom; at no time was pain felt in the muscles, nor could tenderness be elicited; eosinophilia was absent five days after the first symptom also, but appeared between the fifth and eleventh days. Living embryos of *Trichina spiralis* were found in a piece of muscle on the sixteenth day of the illness.

It is generally assumed that the oedema round the eyes in cases such as this is due to invasion of the muscles round the eyes by the embryo worms. If this is so, it is interesting that neither fever nor eosinophilia appeared until five days had elapsed after the first appearance of swelling round the eyes.

R. A. HICKLING, M.D.Cantab., M.R.C.P.,
Assistant Physician, Charing Cross Hospital; Physician,
Royal Westminster Ophthalmic Hospital.