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DIPHThERIA:-A NEW METHOD OF TREATMENT.

OZONE  
IN THE TREATMENT OF  
DIPHThERIA

WITH REPORTS OF SEVEN CASES.

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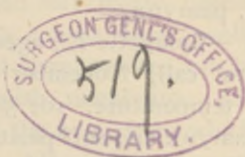
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## OZONE IN THE TREATMENT OF DIPHTHERIA.

*WITH REPORTS OF SEVEN CASES.*

By IRVING S. HAYNES, PH. B., M. D.

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THE histories of the following cases are given for the reason that they are typical cases, that they recovered, and that their recovery, I consider, is due in great measure to the powerful germicidal action of a new ozone preparation—therapol—to which I wish to call the attention of the medical profession.

Of the seven cases, six were so severe that had death occurred in any one, or all, it would not have been unexpected. That such a termination did not result, I believe, is due to the action of the remedial measures employed.

A summary of the treatment in full follows the clinical reports of the cases.

The parts involved in the diphtheritic process, as shown by the production of membrane, were as follows :

Case I, right tonsil ; Case II, tonsils, pharynx, nose, and larynx ; Case III, tonsils, pharynx, and nose ; Case IV, larynx ; Case V, tonsils, nose, and larynx ; Case VI, tonsils and nose ; Case VII, pharynx.

CASE I.—Lafayette L., aged three years and a half. First call, November 29, 1892. Child feverish, temperature,  $101.5^{\circ}$ . On examining throat, pharynx and soft palate red and swollen ; tonsils also swollen and inflamed. Right tonsil covered with membranous patch, oval in shape, about half an inch in its long diameter.

*Treatment.*—By ordinary methods, fluid extract of gelsemium ; disinfectants, as menthol, carbolic acid, and spirits of turpentine in boiling water, renewed frequently, iron and glycerine internally ; Platt's chlorides for the room. The iron solution, turpentine in boiling water, and Platt's chlorides were used in all the cases cited.

*November 30th.*—Dr. Quimby, who had been physician to the family when they were living down town, called in consultation. He suggested the use of therapol, an ozone preparation of which I had heard nothing. Therapol was accordingly sent for and used, by swabbing the throat every hour and also syringing out the nose with same once in two hours. The case went rapidly on to recovery. Last visit was made on December 6th. Child had thoroughly recovered ; the membrane had disappeared from the throat in about forty-eight hours. At no time was there involvement of the nose or larynx.

CASE II.—Harold S., aged four years and a half. Called first on December 18, 1892. Child had been ailing for two or three days. Its parents

thought it nothing but a slight cold. On investigation of the case, found the child feverish; temperature was not taken. The face was flushed. The throat, on inspection, showed the fauces, pharynx, and soft palate deeply swollen and inflamed. The tonsils were swollen so as almost to meet, and were covered on both sides with a thick, grayish membrane. Child could not breath through the nose, from which a thick discharge escaped. All possible precautions were taken; the turpentine mixture with boiling water and Platt's chlorides as disinfectants; mixture of chloride of iron given internally and applied locally. This was all that was done at that time. Morning of the 19th, no change for the better. Nose completely blocked up, and foul crusts show protruding through the nostrils; whitish streaks in the pharynx; is getting hoarse. In addition to the foregoing remedies, therapol was sent for, throat was swabbed every hour, and the nose syringed with it every two hours. In syringing the nose a blunt-pointed glass syringe, holding about a drachm, was used. Half a syringe-ful of the therapol was injected into each nostril. Lime was also constantly slaked in the room.

*December 20th.*—Nose and throat clean. Child can breathe freely through the nose; patches entirely removed from the tonsils and pharynx, but both are red and inflamed. On account of the weak heart, whisky was given freely. Hoarseness increased so much that intubation was considered. Dr. Joseph O'Dwyer was called in consultation at 5. P. M. Dr. O'Dwyer suggested calomel fumigations, ten grains to be sublimated every two hours for the first twenty-four hours,

every three hours for the second, and every four hours for the third twenty-four hours, while the child was confined in a tent of blankets over his crib.

*21st.*—Nose and throat clean, breathes easier, and takes nourishment.

*22d.*—Steady improvement.

*23d.*—Made last visit; case convalescent.

CASE III.—Boy, about four years old. Seen with brother physician on January 21, 1893. History of the case: Child has been sick for about a week with scarlet fever; at present there is a profuse rash over the entire body. Throat, tonsils, and pharynx very much swollen and injected; very foul, grayish membrane covering nearly the entire surface, nose completely blocked by a similar membrane. Temperature between  $103^{\circ}$  and  $104^{\circ}$ ; pulse very rapid and weak.

*Diagnosis.*—Diphtheria complicating scarlet fever.

*Prognosis.*—Very bad, recovery not expected. Doctor has been using all the remedies, including peroxide of hydrogen, without any appreciable benefit. I suggested the use of therapol, to be used on a swab for the throat and to be injected into the nose. Saw the doctor after a few days, and he said that the therapol had promptly cleaned off the membrane from the throat and nose. Child recovered finally. In addition to the local treatment, the doctor had used every means for keeping up the strength of the child and combating the disease.

CASE IV.—Flora K., two years of age. First visit on February 14th. Has been sick two or three days with croup. Child is running around

the room, stopping every little while to lean up against a chair to rest; inspiration crowing can be heard in the adjoining room. Examination shows gland of the neck swollen, tonsils swollen, follicles are full, pharynx red and swollen; nose is fairly free, though somewhat occluded.

*Diagnosis.*—Tonsillitis, pharyngitis, and laryngitis; probably diphtheritic, although no membrane has appeared, but from the fact that her sister had just died of diphtheria after only three days' illness and lay in the next room, it is pretty sure to be diphtheria. Her mother said that the membrane had formed in the nose and throat of the sister, and finally suffocated the child, who had had croup like this one.

*Prognosis.*—Doubtful.

*Treatment.*—Calomel fumigations, as recommended by Dr. O'Dwyer in preceding case, poultices to the neck, therapol applied locally every hour with a swab to the throat, and the nose syringed every three hours with Carl Seiler's antiseptic pastils in an aqueous solution. Disinfectants and steaming were also used. Convalescence followed. Child entirely recovered by the 19th.

CASE V.—Ida B., aged four years, was taken sick on April 21st; was seen on the morning of April 22d. Child feverish, face flushed; temperature was not taken. Inspection of throat shows pharynx deeply inflamed, both tonsils swollen so as nearly to meet, and covered with a very thick, grayish membrane. Child can breath through the nose, but breathing is very difficult. Glands behind angle of jaw swollen.

*Diagnosis.*—Diphtheria.

*Treatment.*—Similar to the other cases. The administration of the iron solution every hour, swabbing the throat every half hour with therapol; injection into the nose of small quantity (fifteen to twenty drops) every two hours. The use of the disinfectants for the atmosphere—chlorides and turpentine in boiling water. Case progressed slowly; membrane cleared off from the right tonsil by the 25th. The nose was clear at this time, but, some hoarseness developing, calomel fumigations were resorted to.

*April 26th.*—Not quite so hoarse; calomel continued. Right tonsil clean.

*28th.*—A. M., patch very thin on left tonsil. At 3.30 P. M., only a little spot left. Patient was from this time much easier. Fumigated once in four hours; therapol used once an hour instead of every half hour. After the 26th the child was only wakened every hour at night, when she was given iron, and then the throat was swabbed and nose injected with the therapol. Nothing to drink was given for fifteen to twenty minutes after using the therapol, in order to have its local action as long as possible.

*30th.*—Child convalescent. She recovered completely.

CASE VI.—Ida D., aged five years. First call April 25th. Child was taken sick on the 23d. On the 24th the mother noticed patches in the child's throat.

*April 25th.*—First visit. Found the child's throat badly swollen, the tonsils and soft palate covered with a grayish membrane; cervical glands very much enlarged and painful. Child feverish, face flushed, and pulse rapid.

*Diagnosis.*—Diphtheria.

*Treatment.*—Iron solution internally and the therapol locally every hour alternating; turpentine mixture in boiling water also used, and disinfection with chlorides fully carried out. In the evening nose completely stopped up; right tonsil somewhat cleaner; left has a dark-greenish patch. Same treatment was continued; in addition, the therapol was injected into the nose every hour.

26th.—Tonsils clean below, but upper part of the throat looks about the same. The child's throat continued to improve more rapidly than her nose did. The nose was not completely clean until May 2d. Discharge from the nose was the foulest discharge I ever saw, and the odor from the patient's throat was offensive until I began the use of the therapol. The injection into the nose was kept up day and night. The nose bled very frequently and the therapol acted as a styptic to check the bleeding. The therapol was the only thing that seemed to relieve the nose at all. An alkaline antiseptic solution was tried at the commencement, but, as it only produced pain and did not have any effect upon the discharge, therapol was substituted. One of the beauties of therapol is that it can be used with children of any age, injected into the nose; and the throat is also reached without causing any suffering whatever; its use is absolutely painless. Children that are old enough to talk say that it does not hurt them at all.

CASE VII.—Blanche D., sister of the above named patient, was taken sick April 27th. Treatment the same as foregoing. The patches did not form on her tonsils, but on the posterior wall

of the pharynx, which, as far as one could see, was covered with patches, grayish white in color. Her nose was free, but, in order to prevent nasal complication, the treatment was carried out as in her sister's case, with the result that her nose at no time was affected, and the membrane did not reach further down the throat, but was kept right at that one spot until it was finally cleared off. She was entirely recovered by May 4th.

*Summary of Treatment.*—When possible, choose a medium-sized, well-lighted room that can be shut off from the rest of the house.

*Ventilate* the room by having a window open top and bottom at least three inches (more if possible).

Remove all useless furniture. Exclude all visitors. Allow only parties taking care of patient to remain in the room.

*Disinfection.*—Make a ten-per-cent. solution of Platt's chlorides in water. With this solution freely sprinkle the floor and bedding and keep some standing in the vessels used by the patient for purposes of defecation and expectoration. Handkerchiefs and all clothing from the patient are to be soaked in the above solution or boiled at once for half an hour. Hang up several towels wrung out of the solution, on cords stretched across the windows and doorways. Every two hours pass through the room waving one of these dampened towels, so as to thoroughly disinfect the atmosphere. Keep the air of the room moist and saturated with turpentine vapor by having a pan of water constantly boiling on a gas or oil stove and adding to the boiling water every hour

or oftener a teaspoonful of spirits of turpentine, or the following formula may be used instead :

R, Menthol..... dr. ss.;  
 Acid. carbolic..... dr. iv;  
 Spts. terebinth..... oz. iv.

M. Sig.: One drachm every half-hour or hour, in the boiling water.

*The diet* must consist of milk, beef tea prepared from fresh meat, eggs, and later the farinaceous foods, as rice, farina, and corn starch.

*Medication, Local.*—For the local treatment of diphtheria nearly everything having an antibacterial action has been tried, yet the death rate remains about the same, varying not far from thirty-three per cent.

The seven cases just mentioned are all that have come under my treatment during the past winter, consequently no fatal cases are suppressed.

Cases II, III, IV, V, and VI I expected might prove fatal, and so informed the parents, but, fortunately, none of them terminated in that way. I can only attribute this good result to thorough ventilation, disinfection, and the powerful local antibacterial action of an ozone preparation called therapol. Therapol is a vegetable oil carrying ten volumes per cent. of ozone, according to the analysis of Professor Witthaus. It does not attack healthy tissue, therefore causes no pain. Being perfectly unirritating, it can be applied to the most sensitive mucous membrane without causing discomfort. Consequently a child's throat may be swabbed and its nose syringed every half-hour if necessary. As there is no suffering, there is no screaming or strug-

gling, so exhausting to the child when it has no strength to spare.

To apply the therapol to the throat, a swab made of a pine splinter six inches long, wound with absorbent cotton on one end, answers every purpose. The cotton is to be thrown away after using and the stick kept in a solution of carbolic acid.

To syringe the nose, use a blunt, conical-pointed glass syringe holding about one drachm.

Inject from fifteen to twenty minims of the therapol into each nostril of the child, keeping the child on its back. This favors the running of the ozonized oil back into the throat, securing thorough disinfection of the entire nose and throat.

Small children will swallow the oil that reaches the throat, but, as the oil is not injurious, it does no harm; it is rather the reverse, and will help to keep the stomach aseptic.

In addition to the therapol it is well to have the older children gargle with the usual iron mixture:

R, Tr. ferri chlorid. . . . . dr. j to ij;  
 Glycerin. . . . . dr. iv;  
 Sat. sol. potass. chlor. . . oz. iv.

M. Sig.: dr. j gargle.

The foregoing comprises the local treatment in cases where the nose and throat are involved. By it the membrane will be dissolved and removed in from eight to forty-eight hours, depending upon the severity of the attack. The nose can be kept free if uninvolved; but if already infected, can be cleaned out in about the same time as the throat.

In those cases where the larynx is involved, in addition to the foregoing treatment, calomel fumigations, as recommended by Dr. O'Dwyer in Case II, must be used.

The symptoms that call attention to the larynx are hoarseness, loss of voice, croupy inspiration. In order to detect any hoarseness get the child to speak, if old enough; if too young, notice how it cries.

At the very first symptom (hoarseness) lose no time, but begin at once the calomel fumigations.

Ten grains of calomel should be sublimated every two hours for the first twenty-four hours, every three hours for the second, and every four hours for the third twenty-four hours.

Nothing elaborate is needed to carry out the fumigation. With a woolen blanket construct a tent over the child, in a crib or bed or on two chairs (placed front to front, with a pillow on the seats for the child to lie upon, and a broom handle across the top for a tent pole.)

Under the tent place a small alcohol lamp in a deep dish, across the top of which a strip of tin three inches wide is laid. Upon the tin place the calomel, and so adjust the flame that it will take about eight minutes to vaporize the calomel. Leave the child under the tent for five minutes longer.

The first fumigations will prove the most difficult. The child will scream and try to get away, but by coaxing or having a member of the family go under the tent with the child, the fumigation can be carried out successfully.

It is remarkable what relief follows the fumigation. After the first battle the children usually go to sleep while under the tent.

If, in spite of every measure, the larynx becomes so filled up as to obstruct inspiration to any extent, intubation must be performed and the same treatment continued.

*Constitutional Measures.*—Besides every means for keeping up the strength of the patient by concentrated nutriment, nothing gives any better satisfaction than the iron, glycerine, and potash solution before given. It has a powerful astringent local and tonic constitutional effect. A drachm of the solution may be given every one or two hours.

Whisky judiciously used is a sheet anchor in tiding over critical cases with threatened heart failure. It must be given in sufficient quantity to produce the desired effect without much reference to the age of the child. It is astonishing what quantities children need.

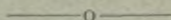
In Case II, a delicate boy four years and a half old, at one time took a teaspoonful of old Pepper whiskey every half-hour for one night. This only served to bring a weak, rapid, irregular pulse of 130 per minute down to a full regular pulse of 90 and keep it there. The following day the interval of time was doubled, and then finally the stimulant gradually stopped in the course of three days, and Tokay wine substituted.

Do not give whisky unless indicated, but when necessary use it freely.

One or two injunctions in closing. Keep up your treatment day and night ; in no case let an anxious parent's solicitude for its child's sleep interfere with your treatment. The child will sleep, but the bacilli are wide awake and the formation of ptomaines and membrane goes on uninterruptedly.

Another thing: Remember diphtheria is a giant. Do not waste valuable time in feints, but deal it as many and fast "knock-out" blows as possible.

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