

works on a different principle from that of diathermy. The patient is not connected directly with the electrodes, but an air space is allowed to intervene, thus the current does not pass between the electrodes by way of the patient. In order that the effect of the short-wave transmitter may be understood it is necessary to consider shortly some of the characteristics of electric currents. If in an electric circuit carrying an alternating current, a space is left between the two electrodes there pass between them what are called "lines of force," so that an electro-magnetic field is created. If an object is interposed so as to cut the lines of force and that object is a conductor, an electro-motive force is produced in it by induction. This electro-motive force opposes the current in the electric circuit. The object in which the secondary current is induced is called the dielectric. In short-wave treatment the human body is the dielectric and the field force passing between the electrodes induces great disturbance in the particles of which the cells are composed. When this disturbance takes place heat is generated through friction losses of the electro-magnetic particles. As there is no electric current passing directly through the body it follows that the more vascular tissues are not selected in preference to any other. It has been demonstrated by scientists that all the tissues are not heated equally, but that, by using selected wave lengths and frequencies, it is possible to obtain the optimum amount of heating wherever it is required. This does not mean that any one part is heated to the exclusion of all the rest of the body, but that there is a means of focusing the field so that the maximum amount of heat will be produced in the part which most requires treatment.

The diseases which would seem to benefit most from short-wave treatment are those in which there appear septic foci in the deeper tissues. It is valuable in cases of deep-seated abscesses which are very resistant to other forms of treatment on account of the wall of fibrous tissue which surrounds them. Such areas seem to be specially heated by the short-wave method, as there are no blood vessels to conduct away the heat. Lung abscess, bronchiectasis, pleural effusion, empyema, osteomyelitis, furunculosis and some infections of the liver appear to respond well to short-wave treatment. Phthisis is being investigated also. It is not certain whether the waves possess a definitely lethal effect on the bacteria, or whether the increased hyperæmia induced by the heating of the tissues is the means of increasing the body's resistance to the infection. As a means of inducing an artificial fever for the treatment of general paralysis of the insane, short-wave treatment has been used instead of the usual malarial treatment, and it is claimed that the results are good. For this purpose, of course, it is necessary to subject the whole body to the electric field. Some benefit in cases of allergic disorders such as migraine, asthma, epilepsy and eczema have been claimed for the short-wave method and, no doubt, many further uses will be found for the treatment. From the point of view of the patient the application of short-wave treatment is painless and is rather pleasant than otherwise.

Various sizes and shapes of electrodes can be fitted to the apparatus according to the part to be treated.

Some of these are flat, some concave, some conical and some shaped like a half cylinder. Not only the size of the electrodes, but also their shape varies the concentration of the field force. It is not always necessary to have the two electrodes placed opposite to each other, sometimes they are placed on the same plane. As a rule care has to be taken that the nerve centres are not involved in the area of strongest concentration. In order that the air space between the electrodes and the body may be preserved, they are fitted into glass cases, or shoes, which are also so shaped as to fit the hollows or rounded surfaces of the body. If special glass is used in the making of the shoes there is no effect on the field force between the electrodes. The shoes also allow for compression of the body where it is desirable to bring the electrodes as close together as possible in order to concentrate the field force on the deeper tissues.

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[previous page](#)

[next page](#)