BEDSIDE MEDICINE FOR BEDSIDE DOCTORS

An open forum for brief discussions of the workaday problems of the bedside doctor. Suggestions for subjects for discussion invited.

THE TREATMENT OF CASES APPARENTLY DEAD FROM ELECTRIC SHOCK

Felix L. Pearl, San Francisco.—Unconsciousness from electric shock may be due to either paralysis of the respiratory and vasomotor centers in the medulla, or ventricular fibrillation, or both.

Jellinek, from a vast experience in electric accidents, announced as early as 1912 that in many, if not a majority of such cases, the patient was not dead, but merely asphyxiated, due to the refractory state of the medullary centers. From the time of the passage of the current to the return of the eye reflexes the brain is insensitive to external stimuli and the usual tests of death do not obtain. The patient is cold and cyanotic, but the heart functions, as can be shown by palpation of the pulse and auscultation of the heart. By keeping the blood properly oxygenated until the centers again become sensitive, recovery is possible, some cases being revived after three and one-half hours, several after one and one-half hours.

On the other hand, Jeks-Blake, Borrutau, Levy, and others claim that the apparent death from electric shock is in the great majority of cases a real death from ventricular fibrillation. These patients are not cyanotic but livid, and there is no evidence of cardiac function.

It is possible that spontaneous recovery from ventricular fibrillation not uncommonly occurs in man (Gaby, Levy), but not after fibrillation has been established for more than two minutes. Nerve centers cannot be deprived of their circulation for more than ten minutes without becoming permanently damaged, and five minutes is the usual time allowed, although the life of a nerve cell under these circumstances is probably closer to two minutes.

Apart from spontaneous recovery, ventricular fibrillation occurring under the conditions of electrical shock appears to be hopeless. Artificial respiration is useless. In the cat direct cardiac massage nearly always restores normal rhythm to a ventricle in a state of experimental fibrillation, and it is possible that a similar result would follow in man; yet direct cardiac massage in a human subject, through an abdominal incision, is an operation which most medical men would hesitate to do. To be effective the heart must be massaged before the ten-minute period has elapsed.

Since the physician rarely sees a victim within the first few minutes after the shock, the responsibility for the most important part of the treatment falls upon those who are near the scene, usually coworkers or friends, who are unable to judge the nature of that particular case of electrical unconsciousness. For this reason the employees of large electric companies have been instructed to treat these victims as if each case were a case of respiratory paralysis, and to continue this treatment until a physician arrives. It is not to the credit of the profession that victims have been revived an hour and more after a physician has pronounced death. It indicates that further knowledge of the treatment of such cases can be disseminated with profit.

The victim is first freed of the electric current in the safest manner. If the charged victim must be touched, the foot should be used instead of the hand, remembering that currents from foot to foot are rarely fatal, whereas those passing through the chest frequently are. Jellinek has special kits with insulated instruments to break the current. Artificial respiration should then *immediately* commence.

The prone pressure method of Schäfer is without qualification the best method, and, properly performed, is superior to any mechanical device such as the pulmotor. Artificial respiration should be continued without interruption for four hours if necessary, until normal respiration is resumed, or death is certain. Despite his support of ventricular fibrillation as the cause of death in most cases, Jeks-Blake says, "Nothing less than cooling of the body or the onset of rigor mortis should be taken as evidence of death here."

The view is prevalent that if the victim is subjected to some physical countershock, his condition is benefited, and certain articles describe in detail the proper methods of inflicting this bodily chastisement. The experiments of Campbell and Hill on cats, however, fail to support this contention. Regarding the use of stimulating hypodermics, the opinion of those most familiar with this condition advises against their use, and some claim that they are even a drawback to a successful outcome.

During the resuscitation the patient should be kept warm. He should not be moved unless weather conditions make it imperative, and then only in the prone position, receiving artificial respiration all the while. Any local wound resulting

from the passage of the current or associated conditions may be dressed by an assistant worker. Open wounds are best treated with moist sterile dressings. It is well to splint injured extremities.

If normal respiration is restored the patient should be made to lie recumbent. The inhalation of O_2 95 per cent, and CO_2 5 per cent is now indicated until the patient is fully restored. The H. and H. inhalator is the apparatus of choice. Pure oxygen or air enriched with oxygen is not a respiratory stimulant, and may even be a depressant.

Between the onset of apparent and the moment of real death there is evidently a distinct interval of time which in some cases may be as much as fifteen minutes. If the physician pronounces the case one of ventricular fibrillation artificial respiration should be carried out for at least that period in the hope that spontaneous return of normal rhythm will occur.

The patient should then be moved to a hospital and kept in bed for at least two weeks. There is a tendency for such cases to have delayed cardiac dilatation which may result fatally. Other conditions overlooked during the initial excitement may appear during the convalescence.

Local electrical injuries heal remarkably well, but slowly. The final slough, however, may be several times the size of the original injury. Surgery is contraindicated until the final limits of the injury are determined, and should be approached with caution. Apparently normal areas are often the seat of widespread damage to vessels which may cause difficult postoperative complications.

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Edmund Butler, San Francisco.—All physicians must learn and instruct those who look to them for guidance that the pulmotor and the lungmotor are not essential equipment for resuscitation. The Bureau of Mines and the Commission on Resuscitation from Gas Asphyxiation do not advise their employment. Artificial respiration by the Schäfer method is the accepted procedure to oxygenate the blood until voluntary respiration has been established.

Persons suffering from electric shock are more frequently encountered at present than in the past. The common use of electric lights, electric cooking and laundry machinery, incineration and farm machinery, makes it necessary that the physician be prepared to give exact instruction over the phone, directing the resuscitation of a shocked person.

The shocked individual is not to be pronounced dead until at least two hours have been utilized in attempted resuscitation. Rigor mortis is the only positive evidence of death that is to decide that further resuscitation is futile.

The statement is sometimes made that physicians have interfered with the giving of artificial respiration by lay workers and pronounced the individual dead, when in the opinion of the experts all chances of resuscitation had not passed.

The lesson to be learned is that the usual signs of death are not to be relied upon following electric shock.

In thickly populated centers industries under the guidance of competent physicians will instruct laymen in the proper methods of resuscitation, but in the sparsely settled districts where a great amount of electricity is used the local physician should form classes and give instruction.

Artificial respiration by the Schäfer prone pressure method, for the patient that is not breathing following electric shock is the treatment of choice. The use of the H. H. inhalator to deliver oxygen 95 per cent and carbon dioxid 5 per cent to the patient instead of air is helpful and the carbon dioxid stimulates respiration, but the inhalator is only an adjunct and is not necessary. The inhalator does not attempt to give artificial respiration as the pulmotor is supposed to do; it only delivers "O and CO_2 to the patient instead of air.

Not all patients who are shocked are resuscitated, but many who were apparently dead have been revived.

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H. C. Stinchfield, Los Angeles.—Unconsciousness in electrical shock is due either to ventricular fibrillation, paralysis of respiratory and vasomotor centers of the medulla or a combination of all three.

If more cases were observed by well-trained physicians in electrical injuries this question would be settled. Unfortunately this is not the case. Most physicians have had little or no training in care of electrically injured persons and are therefore ill at ease when called to see them; whereas electrical workers are constantly being trained in what and how to do in rescuing the victim, performing artificial respiration and caring for the cases after breathing and heart action have been restored.

As the use of electricity is universally increasing it is time that medical colleges throughout the land give their undergraduates a thorough training in the care of these cases. It is astonishing how many physicians are deficient in performing artificial respiration. They waste valuable time preparing hypodermics when artificial respiration is the needed assistance.

The prone pressure or Schäfer method is the method par excellence, though there are cases of many fractured ribs and extremely fat abdomens where the Sylvester method can be used to advantage.

Those rescuing the victim from contact must be thoroughly insulated themselves, either by standing on dry boards, thick wads of dry hay, thick quantities of dry clothing or insulated stools; this is imperative. If this is impossible, then free the victim with dry broom, long dry wooden sticks,

pulling switches, plugs or shorting lines with chains or wire—anything to "kill" the line.

Never touch a victim in contact with electricity until you have done some of the above things, else you may be the death victim while the original victim recovers. Begin artificial respiration immediately while others can loosen all constrictions around the body. Remove shoes and, if victim is a lineman, his tool belt and spurs. If necessary keep up respiration for three to four hours. Assistants can massage legs toward the body to help superficial venous circulation. Keep head on level with body, face on arm, out of dirt. Keep body warm with hot rocks, bricks, bottles, etc. Be sure they do not burn the devitalized skin while patient is unconscious. Waste no time dressing wounds or arranging fractured bones if help is scarce. Do this after patient is properly revived, then remove to hospital or home.

Do not cover the face with a lot of stuffy dressings. Use bland ointment of some kind. The patient will appreciate this. The burns elsewhere can be covered with noncarbolized vaselin or nonsalted cooking compound in emergency. There is an ointment on the market now that is fairly cheap and is excellent for regular dressings.

Give patient plenty of water as soon as he can retain it to keep the kidneys well flushed. Do not force hot drinks until patient is conscious enough to swallow. Stimulants will be necessary after patient has recovered consciousness. Do little or no surgery at first; wait for line of demarcation to develop. Watch for sudden hemorrhages, and from deep wounds particularly. Always be guarded in prognosis. The most serious-looking and apparently hopeless cases will recover while cases that are seemingly little injured will die unexpectedly. Mechanical devices for artificial respiration in electrical shock are of little value.

University of California Research Checks Vaccination Efficacy.—As a further check on the value of vaccination for smallpox protection, and as a further proof that the smallpox epidemics of 1919-20 in the Philippine Islands were not caused by failure of vaccination, two research workers at the University of California have just completed a survey of mortality records in the Islands from 1898 to 1923.

The university workers, Eschscholtzia L. Lucia and Laura S. Haymond, worked out the correlations between the number of deaths from various diseases each year and the administration in charge of public health measures during that period. They find that there was a general increase in mortality from a number of unrelated diseases during the period 1914-21, during which the public health service was under native control, and that the high positive correlation between the many cases of death indicates a demoralization of health administration, while the Filipinos were in charge.

In confirmation of this finding they quote from a letter from Major-General Leonard Wood to Dr. W. O. Stillman, president of the American Humane Society, written in 1922. "Your letter of March 22 quoting statement from a correspondent in Florida, which would seem to throw some doubt upon the efficacy of vaccination, has just been received. The real facts are diametrically opposite; instead of there being any doubt as to the value of vaccination against smallpox it has been doubly confirmed—when the records are analyzed they show that something like 90 per cent of the deaths occurred in children, most of whom were born since 1913. The records show that vaccination has been steadily continued since 1913, but on investigation it was found that, owing to inefficient inspection, vaccination consisted mostly in destroying the vaccine and submitting reports to the main office that it has been applied. In brief a huge unvaccinated population had accumulated in the Philippines; it only required a spark to set it into conflagration, and in a short time a smallpox epidemic began among these unvaccinated children which assumed huge proportions and eventually gained such virulence that it affected persons who under ordinary conditions would have been safe."

Forthcoming Report on the Saunders Awards.—The offer of two prizes of $50,000 each by Mr. William Lawrence Saunders for an effective means of preventing and curing cancer expired on February 1, 1928. All of the applications, numbering 3529 up to May 1, have been placed before the Board of Reference consisting of a group of eminent medical men which the American Society for the Control of Cancer requested to act for it in an advisory capacity. At a recent meeting of this board held at Washington, D. C., the following report was made:

"1. None of the proposals submitted up to February 1, 1928, is worthy of an award either for the prevention or cure of cancer.

"2. While it is to be regretted that no effective preventive or curative agent has been discovered as a result of the offer of these awards, it is the opinion of the board that a great amount of the material submitted, if published, would be of great value to medical science.

"3. It is recommended, therefore, that a report be prepared by the American Society for the Control of Cancer upon the analysis of these applications in order that the information thus acquired may be placed permanently on record, together with such statement of the facts now established in regard to cancer as will serve to explain why the remedies advocated do not, and could not be expected to, serve as an effective preventive or curative agent.

"4. This report should be prepared for publication primarily for the medical profession, but the facts should also be made accessible to the general public."

The foregoing report has been ratified by the executive committee of the society and steps are now being taken to prepare such a report as the Board of Reference has recommended. Mr. Saunders is warmly in favor of producing a volume which shall express in readily understandable language the essential facts and opinions as proposed by the board.—*American Society for the Control of Cancer.*

Coronado Meeting Reservations.—Early reservation at Hotel del Coronado by northern members is urged by the Committee of Arrangements. The following are the rates which have been made for members at the Hotel del Coronado:

	Per Day
Rooms without bath, but near one	$ 9.00
Rooms with bath	10.00
Three persons in room with bath (each)	9.00

Rates above quoted include meals.