

Aversion Therapy by Electric Shock: a Simple Technique

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Aversion therapy has been used for many years in the treatment of alcoholism (Franks, 1960a). Apomorphine and emetine are the usual drugs used as the unconditioned stimuli for nausea and vomiting, with alcohol as the conditioned stimulus. More recently the same procedure has been used in the treatment of sexual perversions—for example, fetishism (Raymond, 1956), transvestism (Barker *et al.*, 1961; Glynn and Harper, 1961) and homosexuality (Oswald, 1962; James, 1962).

There are several disadvantages to the use of drugs in conditioning procedures. The time between the stimulus being presented and the nausea being produced is uncertain (Eysenck, 1963). The patient may not even feel nausea; and, further, the cerebral depressant effect of the drug may interfere with the patient's ability to form conditioned responses (Franks, 1960b). In addition, the treatment may have to be terminated prematurely because of its dangerous side-effects.

Alternative unpleasant responses can be used to produce aversion. In experimental psychology electric shock has been widely used both in animals and in humans (Solomon and Brush, 1956). In clinical treatment, however, it has been less often used (Kantorovich, 1929; Max, 1935; Wolpe, 1958, p. 182). The technique is simpler, more accurately controlled, and more certain in producing an unpleasant effect than drugs. This article describes a simple apparatus designed by one of us (R. J. McG.) and its use in the aversive treatment of sexual perversions, alcoholism, smoking, and neurotic symptoms.

Apparatus.—The components are cheap (under £1) and fit into a box approximately 6 in. (15 cm.) square and 2 in. (5 cm.) deep (Figs. 1 and 2). It is powered by a 9-volt battery and is therefore completely portable. The shock is administered through electrodes on a cuff around the patient's forearm. To construct the apparatus requires no special skill, and the technical details are given at the end of the article.

Treatment Procedure.—The use of the apparatus follows classical conditioning technique. The stimulus to which aversion is to be produced is presented, often by having the patient imagine the stimulus, and then a shock is administered. This procedure is repeated throughout the treatment session of 20 to 30 minutes, which can be held from six times a day to once a fortnight. The strength of the shock should be adjusted so that it is as painful as the patient can bear. Further adjustment of the voltage may be made during the session, if necessary. The patient himself decides how severe the shock should be. After initial instruction he can treat himself and may take the apparatus home to continue the treatment there. Besides saving the therapist's time and making frequent treatment possible, this arrangement is to be preferred when the symptom is one usually indulged in alone—for example, masturbation to perverse fantasies. While the patient can use the apparatus whenever he is tempted to masturbate, he should also each day deliberately carry out the treatment at a time when the desire to masturbate is not strong.

Case 1. Fetishism

A 25-year-old postgraduate student was referred after one year of analytically based psychotherapy. For 10 years he had been masturbating about three times a day to fantasies of himself dressed in blue jeans and a leather jacket, and to masochistic fantasies

of being bound. Conventional psychotherapy had altered neither his behaviour nor the considerable degree of guilt that he felt. He believed, however, that he had derived benefit from it.

The theory and practice of aversion therapy were explained to him, and he was told to conjure up his usual fantasies and to give a signal by raising his hand when the image was clear. When he did so the shock was administered. This was sufficient to dispel

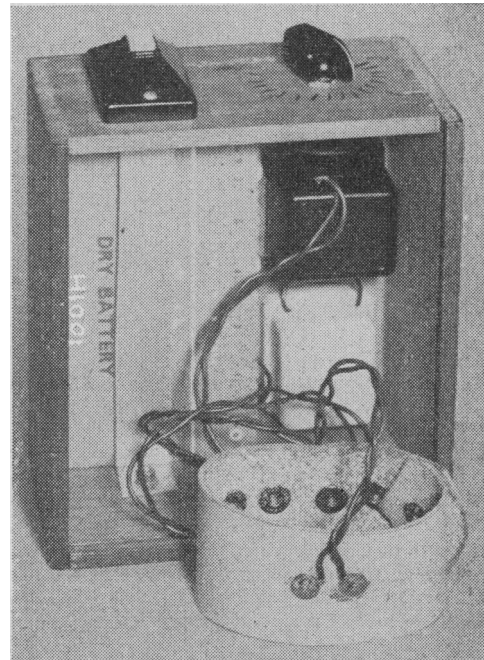


FIG. 1.—Photograph of apparatus connected to a cuff.

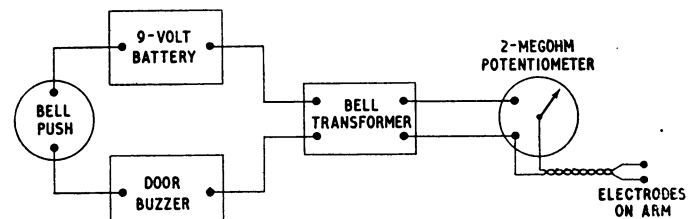


FIG. 2.—Wiring diagram for the apparatus.

the fantasy. The patient reported that he found it more and more difficult to conjure up the fantasy that was being treated. This was confirmed by an increased interval between shocks from 3 to 15 seconds. By the second session he was persuaded to use the apparatus himself.

At later sessions he was unable to conjure up his usual fantasies, and photographs of people dressed in his fetishist clothing were used as stimuli. At first these produced interest and excitement, but this also disappeared. By the tenth session the patient reported that he had entirely lost interest in his fetish and in his masochistic practices. From the day treatment started he had never masturbated to his fantasies, and this remained true during the one year of

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follow-up. At times of exceptional stress he was sometimes tempted to masturbate, but the temptation was weak enough to resist. The feelings of guilt persisted for about six weeks, and after eight weeks he masturbated to orgasm with heterosexual fantasies for the first time in his life. No positive steps had been taken in therapy to achieve this end.

Case 2. Obsessional Ruminations

A 29-year-old teacher complained of intrusive thoughts concerning his wife's character. These had started two years previously after a vague remark made by his mother about his wife. He did not believe that he had any reason to distrust his wife, but the thought continually recurred, although constantly resisted by the patient, and was accompanied by feelings of anxiety. In treatment he was asked to imagine his mother making the remark, to think of the remark and its implications, and to give a signal when he had done so, whereupon he was given an electric shock. At the second session he started giving himself the shock, and after the third took the apparatus home to use once daily. After about 10 more days he gave up using the machine as the thought no longer bothered him. It would still occasionally return accompanied by a slight tension, particularly when he was very tired. As he was a tense, anxious person he was instructed in relaxation techniques (Wolpe, 1958, p. 139) at this stage, and found this helpful. After five months he had shown no significant recurrence of the ruminations and was much less anxious in other situations.

Case 3. Smoking

A female schoolteacher of 37 who had smoked since the age of 18 was smoking 40 cigarettes a day. Despite several earnest attempts encouraged by her own doctor and aided by various "anti-smoking remedies," she had been unable to restrict her consumption of cigarettes for more than a few days at a time. She was seen several times a day and on each occasion was asked to smoke a cigarette in her usual way. She was given a shock as soon as inhalation was complete. Partial reinforcement was employed in that a shock was delivered after only three out of five inhalations. There is experimental evidence (Hilgard and Marquis, 1961) that this decreases the possibility of relapse. No cigarettes were permitted outside of the treatment situations.

Treatment was continued in this way for two weeks. She then attended weekly as an out-patient, and on each occasion she had one cigarette under similar conditions. Apart from this weekly cigarette she has now had none for six months and has no difficulty in abstaining.

Case 4. Writer's Cramp

A clerical worker of 47 had developed over the preceding four years progressive symptoms of writer's cramp. These symptoms were causing so much difficulty that he was on the point of losing his job. Liversedge and Sylvester (1955) had suggested an aversion treatment for this condition.

The apparatus was converted so that the circuit could be completed through a press-switch attached to a pen. The patient was asked to write a test-piece. Whenever his grip on the pen exceeded a certain pressure the switch closed and a shock went through the pen. The number of shocks delivered was recorded on a counter which was also operated by the switch. This record showed a reduction of errors per written page as treatment continued.

After attending twice a week for several weeks he was allowed to take the machine home, where he could practise each evening on work taken home from his office. His progress was assessed at the clinic monthly. In the past six months he had made excellent progress in that he writes much more quickly and his writing is now easily legible.

Case 5. Alcoholism

A business executive aged 48, whose alcoholism had reached a chronic phase with considerable social decline and repeated hospitalization, was referred for treatment of his drinking habits. After withdrawal, aversion therapy was begun. A row of 12 test-tubes was set up, nine containing whisky and three containing coloured water distributed randomly. The patient was asked to

sniff each tube in turn and at the end of each inhalation from a tube containing whisky he was given a shock. After several sessions partial reinforcement was used.

In the second half of each session a similar procedure was followed, using cards, some of which bore pictures of bottles containing various types of alcohol, or carrying various symbols relating to the drinking of alcohol. Other cards had neutral stimuli such as advertisements for coffee or soft drinks.

Three sessions were held each day for three weeks. Six months after leaving hospital he was abstinent, although his condition is recognized as being very far from stable.

Another alcoholic patient who had been given whisky to drink during aversion treatment accused the therapist of adding a chemical to the whisky to give it a bad taste. The same patient went into a bar against advice during treatment, but on trying to raise a glass of whisky to his mouth he had a panic attack and returned to hospital in an anxious state.

Preliminary Results

At the time of writing we have treated 39 cases in the Southern General Hospital by this aversive therapy. The only basis for selection had been that there appeared to be an application of the technique to the symptom. Results are given in Table I. In most cases the follow-up has been for only about one month, and therefore the cases cannot be presented as proof of the efficiency of the treatment but serve only as a guide. We and our colleagues are now undertaking controlled trials into (a) sexual perversion, (b) alcoholism, and (c) obesity due to overeating. Objective assessment of the treatment must await the result of these trials.

TABLE I.—Immediate Follow-up Results on 39 Cases Treated by the Aversion Technique Described

Symptomatic Improvement	Smokers	Alcoholics	Sex Perv.	Others	Total
Discontinued treatment	0	3	3	0	6 (15%)
None	3	2	0	1	6 (15%)
Mild improvement ..	0	1	1	3	5 (13%)
Good	1	1	4	3	9 (23%)
Symptom removed ..	6	0	6	1	13 (33%)
Totals ..	10	7	14*	8†	39

* There were 6 homosexuals (3 of whom discontinued treatment), 3 compulsive masturbators, 2 transvestists, 1 sadist, 1 fetishist, and 1 who interfered with children.
† 4 with obsessional ruminations, 3 with writer's cramp, 1 with compulsive behaviour.

Meanwhile it is hoped that others will find the preliminary results encouraging enough to test the treatment themselves. Large-scale studies are perfectly feasible with the technique here described, and the treatable conditions are such as to yield large numbers of prospective subjects.

Technical Details

Circuit.—The circuit (see Fig. 2) consists of a buzzer which interrupts a circuit from the battery through a switch and transformer. In this way the D.C. voltage (9 volts) provides an A.C. current, which is then stepped up by a transformer to provide an A.C. voltage (about 70 volts).

Components (see Table II).—The electrodes need only be metal studs about $\frac{3}{8}$ in. (1 cm.) in diameter, placed about 1 in. (2.5 cm.) apart. The most effective arrangement is to make a simple cuff of soft leather or elastic webbing. A snap-fastener with three or four alternative positions allows adjustment and two snap-fastener studs can be used as electrodes. Electrode jelly is unnecessary unless the patient has an extremely sensitive skin.

Adjustment.—If the circuit has been wired correctly the buzzer should sound when the button is pressed. No subject need be in the circuit at this stage. If this does not happen, check first that the transformer is correctly connected; secondly,

increase the voltage from the battery, or, thirdly, change the low-voltageappings on the transformer if a choice is provided. Start with the 5-volt tapping, but if the buzzing or the shock is too weak change to the 3-volt position. At its minimum the shock should be almost imperceptible and at its maximum it should be unbearable.

TABLE II.—Components Required and Their Approximate Cost

1 push-button switch	1s. 6d.
1 4-8-volt buzzer (miniature type)	5s. 0d.
1 small transformer, about 50 : 1 ratio	7s. 6d.
(The above three items are such as are used for a house door-bell)	
1 grid-bias battery, 9 volts	1s. 9d.
1 potentiometer, 2 megohms, log. track	2s. 6d.
1 knob for above	9d.
1 box (cigar-box ideal)	—
1 armband with electrodes	—
	19s. 0d.

The drain on the battery is about 300 mA as measured on a D.C. meter. This should allow several hours' operation, and as the buzzer is actually in operation for only about 30 seconds per session, battery wastage is no great problem.

Summary

A simple apparatus which can deliver a painful electric shock to the subject for aversion therapy is described. It has advantages over nausea-producing drugs, particularly in allowing

the patient to treat himself even at home. The use of the apparatus is illustrated by cases of fetishism, obsessional ruminations, smoking, writer's cramp, and alcoholism. Technical details are given of the components and their assembly which requires only the most rudimentary knowledge of electricity.

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Familial Sensitivity to Suxamethonium Due to Atypical Pseudocholinesterase*

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Soon after the introduction of suxamethonium ("anectine," "brevidil M," "scoline," etc.) into clinical anaesthesia in 1951, the occasional occurrence of prolonged paralysis, even in the absence of excessive dosage, was reported (Love, 1952; Gould, 1952; Harper, 1952). In some of the early cases the aetiology was obscured by factors such as the concomitant use of curare or what would now be considered heavy doses of central depressants. Hyperventilation may also have delayed the return of spontaneous respiration. The introduction of the dibucaine¹ test (Kalow and Genest, 1957; Kalow and Staron, 1957) has facilitated accurate diagnosis in the cases where the apnoea is due to the presence of an atypical form of pseudocholinesterase.

Types of Neuromuscular Block

Prolonged apnoea after suxamethonium may be due to central respiratory depression, to peripheral neuromuscular block, or to a combination of both. The peripheral neuromuscular block may be attributed to one or more of the following four mechanisms:

1. *Succinylmonocholine and Choline Block*.—Suxamethonium is normally broken down to succinylmonocholine and choline. The succinylmonocholine in turn is broken down to succinic acid and choline. The monocholine and to a less extent choline

have each a weak depolarizing action. However, effective concentrations of these substances are unlikely to accumulate unless massive doses of suxamethonium have been given—for example, 1.5 to 2 g. (Wylie and Churchill-Davidson, 1960).

2. *Dual Block*.—After an intravenous injection of suxamethonium, certain individuals develop a non-depolarizing block at the motor end-plate following the original depolarizing block. This is usually seen after multiple doses of suxamethonium, but occasionally it appears even after a single dose. Patients with myasthenia gravis are particularly prone to develop this type of response (Churchill-Davidson, 1955). This type of block is temporarily improved by edrophonium and is reversed by neostigmine.

3. *Deficiency of Normal Type of Pseudocholinesterase*.—As pseudocholinesterase is normally responsible for the rapid destruction of suxamethonium, any reduction in its activity will prolong the effect of the drug. The production of this enzyme is depressed by certain pathological conditions. These include liver disease, severe malnutrition, and hypoproteinaemia other than that due to renal disease. Its action is inhibited by organophosphorus compounds such as are used in nerve gases and

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¹ Cinchocaine (B.P.C.) ("nupercaine").