

Hazards of Enuresis Alarms

Sirs,

Enuresis blankets with buzzer alarms of a kind widely prescribed for bed-wetting children may occasionally cause ulceration and scarring.

Case 1. A boy of 8 years presented with lesions on the thighs and buttocks which had begun to appear 2 months previously. There was no irritation or discomfort of any kind. Each began as a red spot which later ulcerated and then finally scarred. Examination revealed 26 scars, nearly all of which were on the right thigh or right buttock. Each scar was circular, 2–10 mm. diameter, and depressed in the centre.

Case 2. A boy of 7 years, the brother of Case 1, presented with almost identical lesions consisting of 10 scars on the right thigh and right buttock which had appeared during the previous 2 months. The scars were preceded by the same changes as in Case 1. They were circular, 2–8 mm. diameter, and had not been noticed by the patient till his attention was drawn to them.

Case 3. A girl of 9 years was found to have a single depressed circular scar about 5 mm. diameter on the right thigh. This lesion had been noted by the patient just after the acquisition of an enuresis alarm, which was discontinued after a few nights' use.

Cases 1 and 2 used identical models (Fig.), consisting of two metal foil electrodes 41×71 cm. (16×28 in.), the upper of which was perforated by holes 1.9 cm. ($\frac{3}{4}$ in.) diameter and 3.8 cm. ($1\frac{1}{2}$ in.) apart. The electrodes connected with a box containing a 6-volt dry battery. A switch selected the alarm, which was either a buzzer or a small lamp. The circuit was completed when the patient wet the bed, moistening the sheet separating the two electrodes and permitting a current to pass between them. Either the buzzer or the lamp was activated, depending on the position of the switch. The third patient used a 4-volt model which had only a buzzer and no lamp, but was otherwise similar.

The following facts indicate that the scars in Cases 1 and 2 were due to prolonged contact of the patient's urine-soaked skin with the 'live' metal foil electrodes. The scars were limited to the

skin in closest apposition to the enuresis blanket, being localized to the side on which the patient habitually slept (the right side in each case). Nearly all the scars were below the waist. The shape and size of the scars corresponded with the perforations on the upper of the two foil electrodes. In some areas the pattern of the scars corresponded spatially with the perforations. Each patient stated that he frequently switched his buzzer off in order to spare his brother the inconvenience of being awakened by it. Thus he was not woken by bed wetting though the lamp glowed, and the current was able to pass continuously through those parts of the skin corresponding to the perforations of the upper foil electrode.

In Case 3 the battery of the apparatus had been allowed to run down and when the patient urinated the buzzer sounded too feebly to waken her, thus creating a situation identical to that of Cases 1 and 2.

P. Borrie and J. C. B. Fenton (*Brit. med. J.*, 1966, 2, 151) reported two cases of ulceration caused by enuresis blankets, and attributed the lesions in each instance to failure of the alarm due to a run-down battery. They emphasized the painless nature of the lesions, which was a feature of the patients reported here.

In all three of our cases the cause of the skin injuries was faulty design of the apparatus resulting

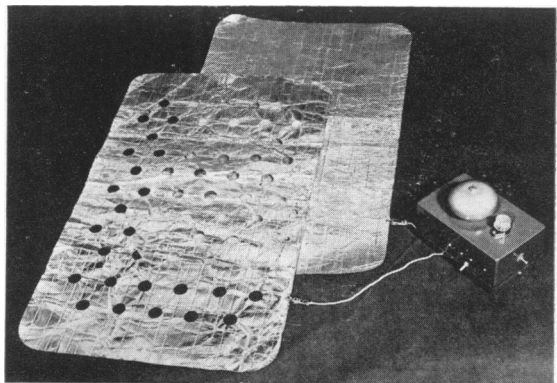


FIG.—Enuresis alarm unit as used by Cases 1 and 2.

in failure of the alarm to wake the patient despite flow of current due to bedwetting. Existing apparatus should therefore contain the following modifications. (1) Perforations in the upper foil electrode of a reduced diameter: these, while permitting seepage of urine and immediate completion of the electrical circuit, would prevent

contact of skin with the lower electrode. (2) An alarm system which cannot be put out of action by the user, except by switching off the *whole* electrical system.

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