Assessment of Recording Nappy

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During the 1971 meeting of the ICS an 'electronic nappy', developed in Exeter, was briefly described. The device is a comparatively simple electronic method of measuring the quantity of urine loss in incontinent subjects as well as the instant of time at which this loss occurs. Early versions suffered from a number of disadvantages, not least being the fact that cost would not allow it to be a disposable item since it was difficult to manufacture and material was expensive. Considerable effort has since gone into the design of a much cheaper disposable type which now appears to be satisfactory in most respects provided that a reduction in the overall accuracy of the nappy is tolerable. The loss in performance, with a measuring accuracy now of about $\pm 12\%$, is attributed almost entirely to the substitution of aluminium sensing electrodes for the original stainless steel. It will be appreciated that the electrodes come into contact with urine and electrochemical effects are very prevalent, this in fact being one of the fundamental problems in any measurement involving liquid-metal interfaces.

The number of clinical investigations using this instrument in the past year is considerably less than planned due to the difficulties encountered in its continued development. Nevertheless, the results from many patients have been sufficiently encouraging to justify this effort.

The majority of the results have been from patients wearing the nappy and attached via long wires to the monitoring equipment, although a telemetering link has been used in some cases. It has been found that the effective 'capacity' formed at the metal-urine junction can be used to change the frequency of an oscillator as a function of the quantity of urine

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in the nappy. This has greatly simplified the measuring equipment in whatever mode it is used. Bearing in mind the possible mass manufacture of this instrument it is considered that whilst telemetry enhances the psychological environment under which the patient is assessed it requires a fairly skilled operator.

To overcome this the use of a miniature 4-channel tape recorder is being currently investigated which makes 3 channels available for recording other relevant data including bladder pressure. The latter has been recorded simultaneously with urine loss and would appear to give useful information but the present methods of measuring bladder pressures are far from ideal and destroy what is otherwise a non-invasive measuring technique.