A New Simplified Peritoneal Dialyser

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Peritoneal dialysis is performed automatically to reduce the work of the staff, and thus the running costs, and to diminish the risk of contamination. We have made efforts to simplify automatic peritoneal dialysis as far as possible to make it easy, safe and economical in use.

The canisters containing sterile dialysis fluid and the waste container are attached to the same pole, hanging from the ceiling (Figure 1). The former are up near the ceiling and the latter just above the floor. The fluid runs by gravity from the canisters to the patient and from the patient to the waste container. The weight of the pole with canisters and waste container is monitored. During inflow there is weight loss in the fluid system and gain in the patient. During outflow the reverse applies.

Changes in the weight of the fluid system are transformed into electric signals by a strain gauge transducer sited between the fixation point in the ceiling and the pole. The electric signals are detected in an electronic unit and shown on a weight scale (Figure 2). The coupling is reversed so that the scale shows changes in the patient's fluid balance caused by peritoneal dialysis.

The flow of fluid is directed by a magnetic tube blocker, controlled manually or automatically. In the latter case the amount of inflow and outflow (0.2 - 2.0 kg) is determined by limits in the weight scale. After inflow there is a pause of five minutes for mixing the fluid in the abdominal cavity. Outflow then follows automatically. During outflow, the same amount of fluid is taken out as was put in during the inflow phase, unless 'prolonged draining' is used (middle knob in position 0).

If it is necessary to remove excessive fluid from the patient automatic prolonged draining can be used. After recovery of the amount of fluid put in, each draining phase can be continued for five or ten minutes to create a negative fluid balance. The cumulative influence of dialysis on the patient's fluid balance is shown on a special scale. The fluid in the inflow tube is
Figure 1. Weight monitoring of the fluid system. The supporting pole is attached to the weight transducer, hanging from the ceiling.
warmed by a solid state thermostat. Dialysis standstill is indicated by a red light and a sound signal.

One hundred and twelve dialyses have been carried out with this peritoneal dialyser on 12 patients. The average volume of fluid used during one dialysis was 37 litres, ie 1.6 litres an hour. The mechanism has been reliable in use. A proper dialysis catheter insertion technique for the uncomplicated course of dialysis seems to be important. Before insertion of the

Figure 3. Insertion of the dialysis catheter into the pelvic gutter
catheter it is advisable to insert fluid or gas (CO₂ or N₂O) into the abdomen through a pneumoperitoneum cannula (McDonald, 1969) to minimise the discomfort to the patient. The abdominal wall is then punctured with a stylet-catheter or a Tenckhoff-catheter (Tenckhoff & Schecter, 1968) and conveyed into the right or left pelvic gutter (Figure 3). Dorsal location of the catheter is essential.

REFERENCES