



DIALYSIS

Dialysis is the last event in a long chain of medical happenings in patients with long-standing kidney disease. I say medical events, because it will not be long now before the final chain in long-term management will undoubtedly be transplantation, but this does not concern us here. When one speaks of patients with "chronic renal failure" this means that the kidney is no longer completing its normal functions, the elimination of waste products and the regulation of the body's minerals and water.

In kidney failure, there is a damming back in the blood and body fluids of waste material, which in due course become poisonous. The solution to this problem, obviously, is to remove the poisons. This may be done by dialysis, the initial process of kidney function, which the normal kidneys are performing every day. Dialysis is essentially a process of filtration, removing water and small molecules from the blood and leaving behind the large molecules and the particulate matter, such as red and white blood corpuscles.

Dialysis involves one or two basic principles. Firstly, dialysis is performed across a membrane or skin which is perforated by a sieve of microscopic holes. The properties of this membrane are dependent upon the size of the holes, which are of such a diameter as to permit the passage of water and small molecules, and forbid the passage of large molecules. Secondly, if the membrane is used to separate two vessels of fluid, it is a law of physics that any material which is in a high concentration on one side of this membrane will move across to the solution in which it is in low concentration, until the two solutions are of equal strength. This movement can be induced in any substance whose molecules are small enough to pass through the membrane. These include the molecules in which we are particularly interested, for example, salt, sugar, waste products and water. There are two means available to us of dialysis, which only really differ in detail whilst the principle, i.e. the passage of salts and water across a membrane, remains the same. In one case we use the lining of the abdominal cavity, as the membrane (peritoneal dialysis) and in the other case use an artificial membrane, usually some form of cellophane (haemodialysis).

The dialysate is the fluid which is placed on the other side of the membrane from the blood. This is a synthetic solution which can be made to any desired composition. It is the absence of the substances with which we are concerned which allows the passage of those materials from the blood across the membrane into the dialysate. Its composition may be governed in such a way as to encourage the passage of materials in either direction across the membrane.

The three essentials of dialysis are brought together by using the membrane in a dialyser, a piece of apparatus that used to be called an artificial kidney. There are two basic patterns of dialyser. The blood is run through a tube which is wound into a coil in a compact unit and surrounded by dialysis fluid. This is a coil dialyser. Alternatively, blood is run between two layers of cellophane which are in their turn surrounded by dialysis fluid, producing a sandwich dialyser. The blood is passed to the dialyser from a small tube tied permanently into an artery. It flows from the artery through the dialyser to a returning tube, and re-enters the patient by a small tube which is inserted into a vein. When the patient is not being dialysed, these two tubes, which are inserted into the artery and vein, are connected so that the blood is short-circuited through a shunt.

Most people are aware that construction has begun upon the Dialysis Centre at Sutton. When completed this will have eleven beds for the dialysis treatment of long-term patients and for the treatment of patients who have acute and recoverable kidney disease which frequently complicates some entirely divorced illness or accident. There will be facilities for the working of the sandwich-type dialysers, as well as workshop for the maintenance of equipment and machinery. There will be a full nursing staff complement both night and day to look after the patients and their dialyses. In due course it is expected that most of the long-term dialysis work will be done overnight in order that the patients may be at work during the day.

The maintenance of the machines and of the tank supply system of the dialysate as well as the building and making of kidneys will be undertaken by technicians who will also have some knowledge of attending to the patients and their dialyses so that everybody is familiar with all procedures.

In due course we shall be sending our patients home with their own equipment and machinery, where after adequate training in the dialysis centre, they will be able to look after themselves. They should only require occasional visits to Out Patients for follow up. Rarely will they need re-admittance to the dialysis centre for dialysis, unless there are complications or technical breakdowns at home. Regular technical maintenance checks will be made at home on routine rounds by technicians.

Dr. A. G. HOCKEN.

NOV. 1969

No. 31

THE LINK

Hull (A) Group Magazine

NEW RENAL DIALYSIS UNIT - Hull Royal Infirmary (Sutton)

The official opening of the Renal Dialysis Unit took place in the Staff Recreation Hall at Sutton on October 6th, at 7 p.m. We were privileged to have Sir Ronald Tunbridge to carry out this function and it was with pleasure that Mrs Brocklehurst welcomed him and Lady Tunbridge.

For various reasons it was not possible for everyone to be at the Unit for the unveiling of the plaque so this was carried out before the officials proceeded to the Recreation Hall. Sir Ronald Tunbridge, in his address, pointed out the importance of selecting not only the right place for a Renal Dialysis Unit, but also the patients to be treated. Renal dialysis, he said, could save many lives and perhaps prepare patients for treatment which could cure their disease.



Photograph by Hull Daily Mail.

Once again, it was most gratifying to feel that Hull, in spite of its geographical isolation, as pointed out by Mrs Brocklehurst, was being placed firmly on the map as far as medical services were concerned and in many ways, she said, we had Sir Ronald to thank. He had always shown the greatest interest in the development of the Hull Hospitals.

Dr A. G. Hocken, Physician in Charge of the Unit, thanked Sir Ronald Tunbridge for his opening address and said that we had progressed far more quickly than he had ever anticipated, for not only would patients soon be able to receive their treatment at home, but that a transplant programme might not be too far away.

Dr Hocken thanked all who had been involved in the preparation of the Unit for receiving patients, especially the senior nursing staff. The operation throughout had been most uneventful and smooth.

After the official proceedings the guests enjoyed a happy and informal gathering and some most delightful refreshments were served.