PERIODIC DIALYSIS AT HOME, AT WORK, ON TRIPS.
A COMPLETELY AUTONOMOUS AND PORTABLE SYSTEM

E. ROTELLAR, J. C. CHACÓN and J. A. GUTIÉRREZ
Departamento de Regulación Humoral, Hospital de la Santa Cruz y San Pablo,
Barcelona, Spain

We shall report on the improvements made on the "glomerulus" presented in the last meeting of the E.D.T.A. The PVC outside tube was replaced with a polypropylene tube lighter in weight than the PVC tube and autoclavable.

Also, the PVC tubes for connection with the patient have been replaced by silicone tubes, so that the entire "glomerulus" is now autoclavable and can be kept ready for use in a closed polypropylene bag (Fig. 1).

This new "glomerulus" weighs 1,400 g and costs $15.——

In order to make this new dialyser as portable as possible, in some cases two 10 litre containers instead of the 50 litre containers are used (Fig. 2).

We put the dialysing solution in container No. 1. If desired it can be sterilized by autoclave and afterwards hermetically sealed and kept ready for use.

This dialysis fluid can be used at normal room temperature or heated to 40° centigrade. In the first case patients sometimes have a cold sensation during the first hour, but afterwards this sensation disappears.
In container No. 2, a vacuum of 700 mm Hg is made. We preserve this vacuum by clamping the tubes of the container, so that it can be kept ready for use at any moment.

After connection of this tube with the "glomerulus", we can open the clamp and make the dialysis fluid circulate. The entire device is carried in a case (Fig. 3) $82 \times 49 \times 29$ cm in size, and 20 kg in weight. In the rest of the case, we keep, sterilized and ready for use, the equipment necessary to connect and disconnect the patient. This device can be used in any place, for instance in a car (Fig. 4) or in other means of transportation since no connection with an electric outlet and no draining is required.
The waste extraction and clearances depend on the velocity of the flow of the dialysis fluid. To obtain the greatest velocity with the minimum amount of liquid, we have narrowed the space between the cellophane tube and the polypropylene tube as much as possible.

Figure 5 shows the extraction of urea during four hours in relation to the flow of the dialysis liquid. There is a linear relationship.

When greater extraction is necessary, the container must be replaced by a bigger one. When it is preferred to do the dialysis somewhere else, and if not much extraction is needed, only one 10 litre container is required.

Figure 6 shows the urea clearance in relation to the flow of the dialysis liquid. This relationship is also linear.

![Fig. 5. Total extraction of urea during 4 hours of dialysis.](image-url)
With respect to water extraction, with the vacuum made in advance in the second container, extraction is less than with a constantly maintained vacuum, because this vacuum decreases during the dialysis.

The total cost of the equipment is $145.— including the carrying case. The cost of everyday dialysis with a 10 litre container is $10.—.