Hemofiltration is a process by which solvent removal from blood occurs by ultrafiltration in the presence of transmembrane pressure, with a small amount of solute accidentally removed by convection and solvent drag.

**Hemofiltration apparatus**

Blood from patient pumped under pressure

**Ultrafiltration**

Ultrafiltration is the main effect of this process. Solute removal is a desirable side-effect.

**Improving the rate of convection**

So. Convective flux is a product of sieving coefficient, concentration and ultrafiltration rate. You can’t do much about the concentration, but the other two you can change by adjusting the pressure in the circuit and changing the type of membrane you use.

**Increase the transmembrane pressure**

This increases the ultrafiltration rate (which is determined by transmembrane pressure and ultrafiltration coefficient).

**Increase the membrane pore size**

This increases the sieving coefficient (which is determined by pore size). This also increases the ultrafiltration rate (because ultrafiltration coefficient depends largely on the porosity of the membrane).

Plus, clearance of larger molecules is possible through larger pores.

Thus, improving the rate of convection means increasing the ultrafiltration. Obviously, in order for solute to be removed at a usefully large rate, there must be a very large amount of ultrafiltrate removed.

If you allow this to continue without replacing some water, you will quickly deplete your patient of all extracellular fluid! Remember the dialyzer is sucking fluid at about 12 litres per hour. Thus, we need REPLACEMENT FLUID.

You can give it before or after the filter, and you can adjust its content to decide which electrolytes you want going back into your patient.

**Hemofiltration is fluid removal with some accidental solute removal.**

It more closely resembles the activity of the glomerulus, where ultrafiltration and convection are the means of solvent and solute transport, with membrane properties acting as the size and charge barrier.