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2. To advance knowledge in Critical Care Medicine in Hong Kong.
3. To provide expert advice, as and when required, to other organisations on matters pertaining to critical care medicine in Hong Kong.
4. To liaise with similar organisations overseas and to promote exchange of expertise and information.

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# RENAL REPLACEMENT THERAPY (RRT)

## Haemodialysis and Haemofiltration

Renal Replacement Therapy (RRT) can be carried out in form of haemodialysis or haemofiltration. It is a process of removing blood out of the body to a haemofilter which is used to filter away body wastes and fluid, just as what our kidneys do through the production of urine. Afterwards, the cleaned blood is returned to the body.



### When is RRT needed?

RRT is needed when kidney failure develops acutely or chronically, to the extent that the kidneys are unable to remove enough wastes and fluid from the body and toxic wastes accumulate to threaten life. Kidney failure can develop if there is kidney problem alone, or it can also develop during by another illness, most commonly severe infection.

### How is RRT done?

A tube called double-lumen catheter is inserted into a large vein on one side of the neck or groin areas, and less commonly the upper chest. Blood is let out of the body through the catheter to a machine with blood pumps and a haemofilter. After the fluid and waste is filtered out, the blood is then returned to the body, together with other clean fluid with the appropriate minerals if necessary.

The above process can be done for several hours, which we call intermittent haemodialysis, or it can be done continuously for one to several days, which we continuous haemofiltration. The nature of wastes and amount of fluid shift is different for the two methods, and exact choice depends on the patient's condition and necessity.

### What are the risks?

**Bleeding:** This occurs during attempt of insertion of the catheter into the vein. Occasionally, the artery may be inadvertently hurt, which can lead



to bleeding or decrease in blood supply. Also, bleeding risk is higher in kidney failure patients because the clotting function is usually poorer. Bleeding may lead to swelling and bruising around the insertion site. In extremely rare case, if bleeding in the neck region is severe, it will lead to compression onto the major airway.

**Catheter site or blood infection:** Germs may be introduced into the body during insertion. Also, the

longer the duration of the catheter inside the body, the higher is the risk of infection.

**Low blood pressure:** There can be some disturbance to blood pressure and pulse rate especially at the beginning of the procedure. If severe, sometimes the RRT procedure may need to be stopped. If such event repeatedly occurs, RRT may produce harm, and the overall condition is usually very poor.

### How does a haemofilter look like?

#### Q: Does it look like our kidneys?

A: The haemofilter functions as our kidneys, but it is actually made up of bunches of very slender fibres packed into a plastic container. Blood goes in from one side, and goes out from the other. Because the fibres contain a lot of small holes that only allow



waste and fluid to go through, toxins from our body can be removed, but blood cells and other larger protein contents are retained. When another fluid called dialysis fluid is also run through the filter, efficiency of toxin removal can be further increased.

## WHEN CAN RENAL REPLACEMENT THERAPY BE STOPPED?

RRT can be stopped when normal kidney function returns. However, sometimes the kidney function never returns if the kidney damage is severe. The damage can be preexisting or occur after the acute illness. In that case, the doctor will assess if long-term RRT is feasible.

RRT only replaces the excretory function of the kidneys. Whether a patient eventually recovers depends on a lot of other factors.

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