ADVANCED KIDNEY DISEASE

MOUNTAIN KIDNEY & HYPERTENSION ASSOCIATES

WHAT KIDNEYS DO

Regulate fluid balance

Regulate electrolytes (sodium, potassium, phosphorous)

Regulate acid

Regulate blood production

Remove many waste products

WHAT HAPPENS WHEN KIDNEYS GET SICK?

Electrolyte levels may get to damaging or dangerous levels

Blood may become too acid

Body may retain excess fluid

May develop anemia

May get sick from waste products

MANAGING CKD

Adjust diet to reduce burden of excess sodium, potassium, phosphorous, fluid

Take medicine to reduce phosphorous, acid, potassium

Take medicine to eliminate excess sodium/fluid

Take medicine for anemia

Take care of blood pressure, blood sugar

No smoking

IF CKD PROGRESSES

May reach a point at which diet and medicines are no longer able to keep electrolytes or fluid status safe, or the waste products may make the patient sick.

Symptoms may include nausea, fatigue, weakness, sleepiness, itching

Different people reach the point of feeling sick at different times.

Usually, GFR is under 15 ml/min (Stage 5 CKD)

Ultimately, death if kidney failure is not treated

A CHOICE NEED TO BE MADE

Natural course

Dialysis

- hemodialysis
- peritoneal dialysis

Transplantation

NATURAL COURSE

Rate of progression variable

Typically see nonspecific signs, symptoms as waste products accumulate – sleepiness, loss of appetite are common

If this path is chosen, we would often work with Hospice provider

DIALYSIS – TWO MAIN TYPES

Hemodialysis – blood is circulated through an artificial kidney

- Usually three or more treatments per week
- Can be done at night at kidney center or at home
- Requires some way to access the blood – either a surgically –created blood vessel, or else a large venous catheter

Peritoneal Dialysis – wastes diffuse into special solution in the abdominal cavity

- Requires a surgically-placed tube in the abdomen
- Can be done as several manual exchanges per day
- Can be done using a "cycler" that runs fluid in and out of the body

TRANSPLANTATION

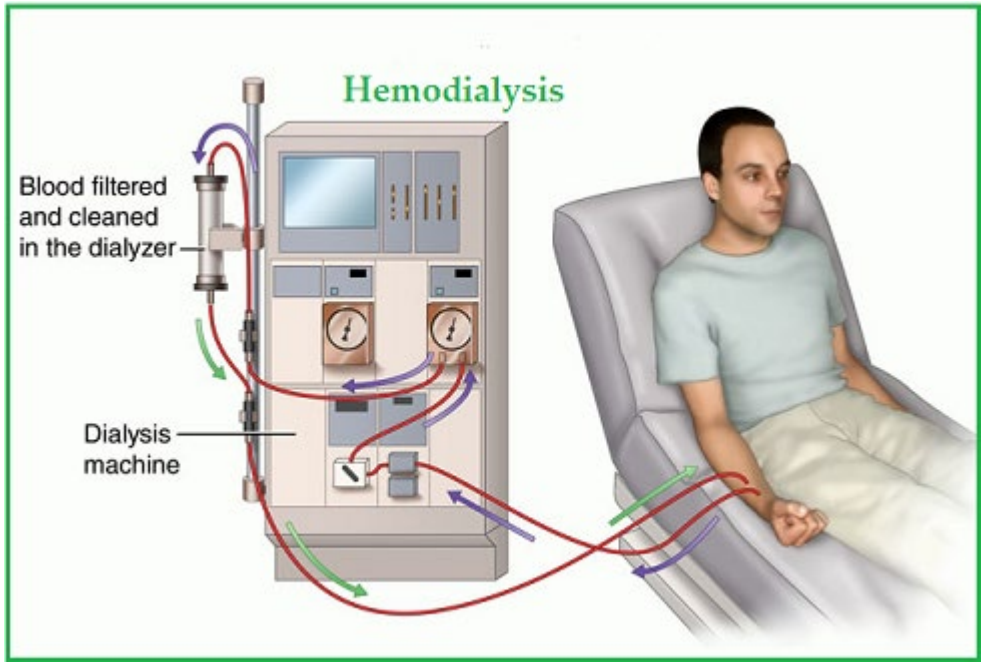
A donor's kidney is usually transplanted into the lower abdomen. The native kidneys are not removed.

Unless powerful medicines are taken to prevent it, the recipient's body is likely to attack, or "reject" the transplant, and cause it to fail. These anti-rejection medicines need to be taken so long as the transplant is in place.

If a donor is available, it may be possible to arrange a transplant in several months. Extensive testing is required of both the donor and the recipient.

If no donor is available, there is a waiting list for organ donor kidneys. The waiting time is often on the order of five years

HEMODIALYSIS



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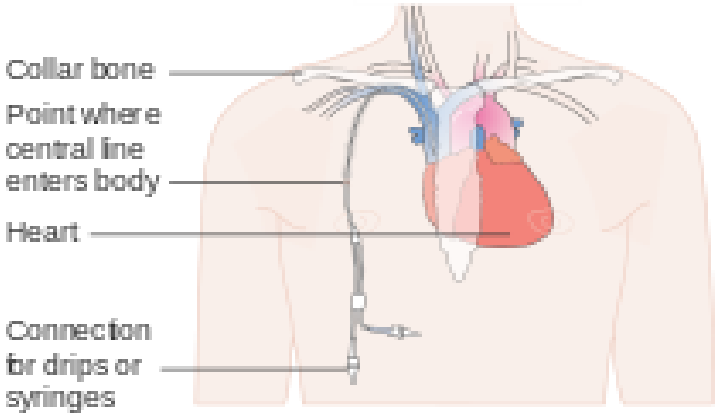
HEMODIALYSIS ACCESS - PERMCATH



PRACTICAL ISSUES WITH HEMODIALYSIS

If done in-center, then travel plans must work around this – arrange dialysis at facility elsewhere

If done using home hemo, it is possible to travel with the machine, but it is bulky

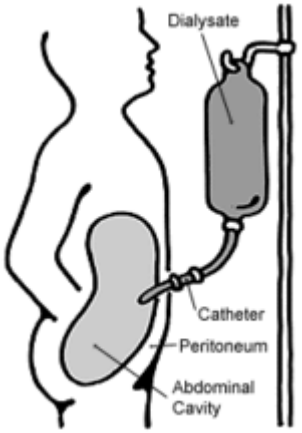
Venous catheters appealing because no needles, but are associated with higher rate of hospitalization and death compared to dialysis using a fistula or graft

Creation of fistula – usually requires waiting time of two months or more after surgery

Creation of graft – some are usable right away, but usually wait two weeks after surgery before using. Some increased risk of infection and malfunction compared to fistula, but better than catheter.

Catheter – can be used immediately, Risks increased for infection and malfunction

PERITONEAL DIALYSIS



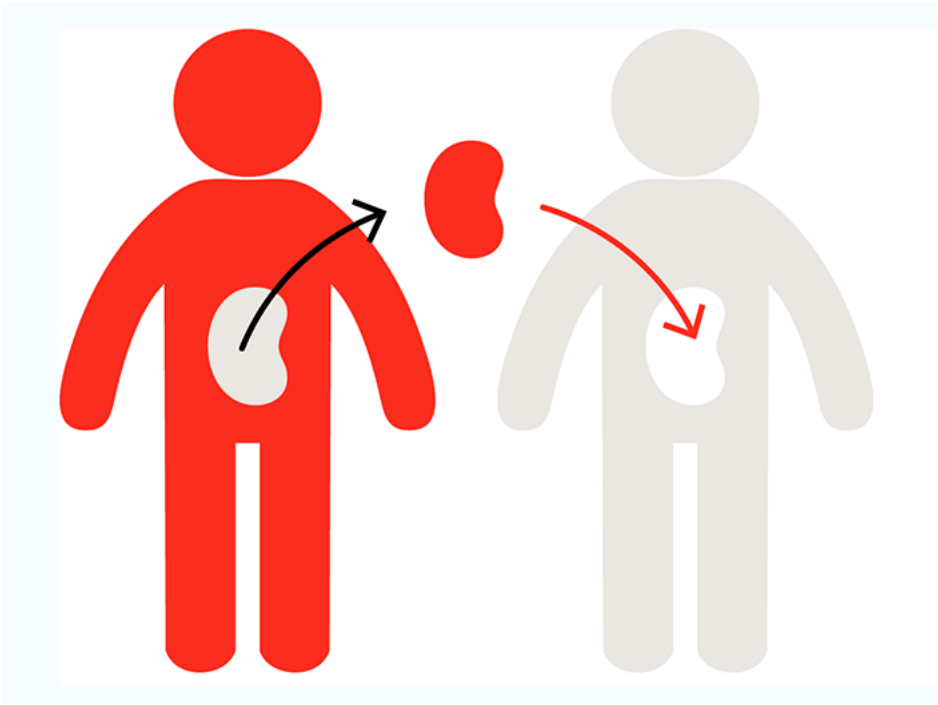
PRACTICAL ISSUES WITH PERITONEAL DIALYSIS

Travel entails taking adequate supplies – usually about 2 gallons a day of sterile solution – or else arranging for them to be shipped.

Main risks are of infection, and in some patients, clearance of waste products may not be adequate if the kidneys are not working much. Some risk of hernias

Need a clean place to store supplies, and to do exchanges

KIDNEY TRANSPLANTATION



PRACTICAL ISSUES WITH TRANSPLANTATION

Most liberating in terms of diet, and generally people feel better overall with functioning transplant compared to dialysis

Generally requires use of potent medications to suppress the immune system to prevent rejection

- expensive

- some increased risk of infections and cancer