HAEMODIALYSIS

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WHAT IS HAEMODIALYSIS ?

Haemodialysis , also spelled hemodialysis, or simply dialysis, is a process of purifying the blood of a person whose kidneys are not working normally.

This type of dialysis achieves the extracorporeal removal of waste products such as **creatinine** and **urea** and **free water** from the blood when the kidneys are in a state of kidney failure.

Hemodialysis is one of three renal replacement therapies (the other two being kidney transplant and peritoneal dialysis).

Hemodialysis can be an outpatient or inpatient therapy.

WHAT CAUSES KIDNEY FAILURE?

- In most cases, kidney failure is caused by other health problems that have done permanent damage (harm) to your kidneys little by little, over time.
- When your kidneys are damaged, they may not work as well as they should. If the damage to your kidneys continues to get worse and your kidneys are less and less able to do their job, you have chronic kidney disease. Kidney failure is the last (most severe) stage of chronic kidney disease. This is why kidney failure is also called end-stage renal disease, or ESRD for short.
- Diabetes is the most common cause of ESRD. High blood pressure is the second most common cause of ESRD. Other problems that can cause kidney failure include:
- Genetic diseases (diseases you are born with), such as polycystic kidney disease
- Nephrotic syndrome
- Urinary tract problems
- Sometimes the kidneys can stop working very suddenly (within two days). This type of kidney failure is called acute kidney injury or acute renal failure. Common causes of acute renal failure include:
- Heart attack
- Illegal drug use and drug abuse
- Not enough blood flowing to the kidneys
- This type of kidney failure is not always permanent. Your kidneys may go back to normal or almost normal with treatment and if you do not have other serious health problems.

HOW DOES HAEMODIALYSIS WORK?

- Create direct access to your bloodstream. This can be done in a few ways:
- ***Fistula (also known as arteriovenous fistula or A-V fistula):*** An artery and vein are joined together under the skin in your arm. Most of the time, this is done in the one you don't write with. An A-V fistula needs 6 weeks or longer to heal before it can be used for hemodialysis. Then, it can be used for many years.
- ***Graft (arteriovenous graft or A-V graft):*** A plastic tube is used to join an artery and vein under your skin. This heals in only 2 weeks, so you can start hemodialysis faster. This won't last as long as a fistula. You'll likely need another graft after a few years.
- The risk of infection is greater with a graft. You'll also have to see your doctor more often so he can make sure the graft stays open.
- ***Catheter (central venous catheter):*** This method is an option if you need to start hemodialysis very quickly. A flexible tube (catheter) is put into a vein in your neck, below your collarbone. It's only meant to be used for a short time.
- During hemodialysis, you'll sit or lie back in a chair. A tech will place two needles in your arm where the fistula or graft is located. A pump in the hemodialysis machine slowly draws out your blood, then sends it through another machine called a dialyzer. This works like a kidney and filters out extra salt, waste, and fluid. Your cleaned blood is sent back into your body through the second needle in your arm. Or, if there's a catheter, blood comes out of one port and then is returned via a second port.

MEDICAL USES OF HAEMODIALYSIS?

- Hemodialysis is the choice of renal replacement therapy for patients who need dialysis acutely, and for many patients as maintenance therapy. It provides excellent, rapid clearance of solutes.
- A nephrologist (a medical kidney specialist) decides when hemodialysis is needed and the various parameters for a dialysis treatment. These include frequency (how many treatments per week), length of each treatment, and the blood and dialysis solution flow rates, as well as the size of the dialyzer. The composition of the dialysis solution is also sometimes adjusted in terms of its sodium and potassium and bicarbonate levels. In general, the larger the body size of an individual, the more dialysis he/she will need. In North America and the UK, 3–4 hour treatments (sometimes up to 5 hours for larger patients) given 3 times a week are typical. Twice-a-week sessions are limited to patients who have a substantial residual kidney function. Four sessions per week are often prescribed for larger patients, as well as patients who have trouble with fluid overload. Finally, there is growing interest in short daily home hemodialysis, which is 1.5 – 4 hr sessions given 5–7 times per week, usually at home. There is also interest in nocturnal dialysis, which involves dialyzing a patient, usually at home, for 8–10 hours per night, 3–6 nights per week. Nocturnal in-center dialysis, 3–4 times per week, is also offered at a handful of dialysis units in the United States.

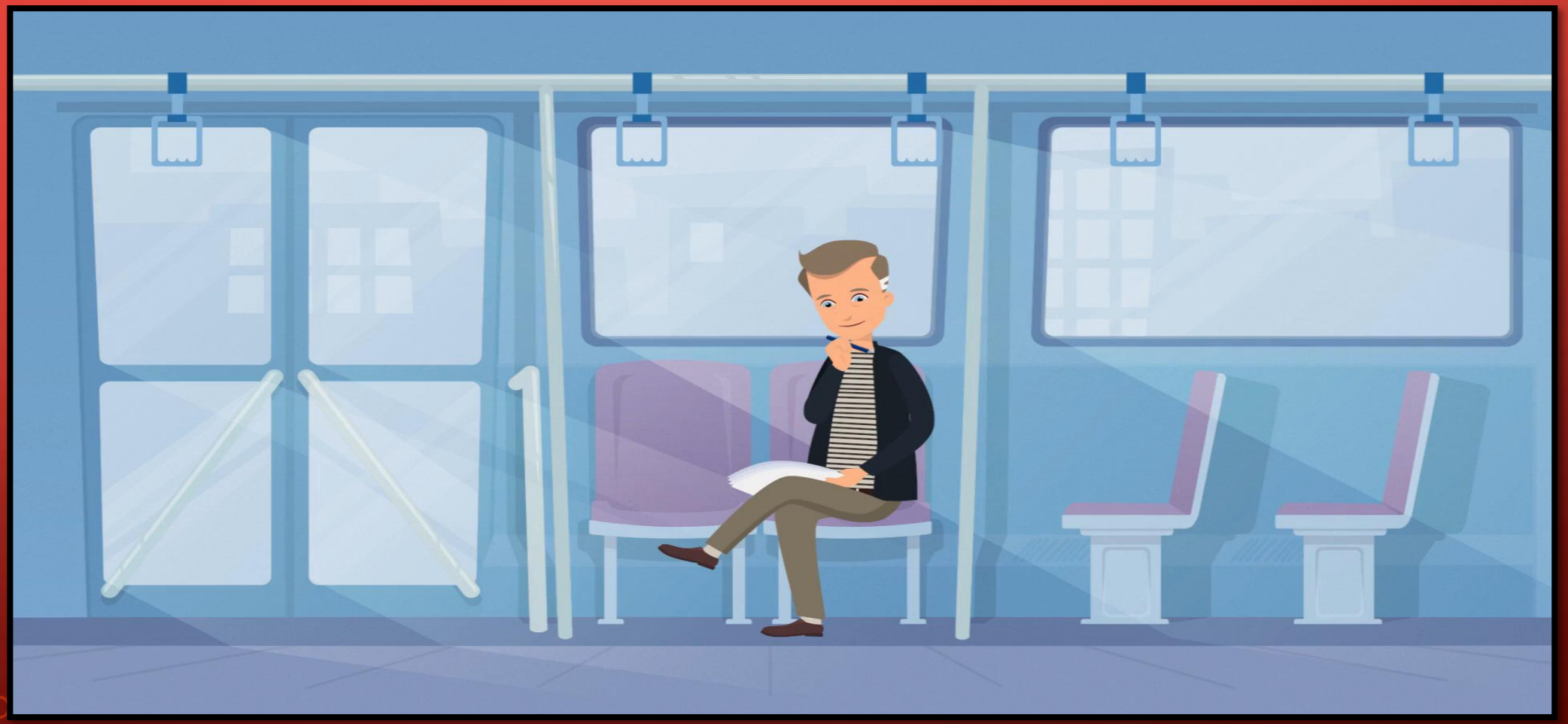
BENEFITS OF HAEMODIALYSIS.

- The primary benefit of hemodialysis is that it only involves a dialysis session three times a week, with four days each week without the need to go to a medical clinic for dialysis.
- Each session typically lasts approximately 4 hours, so at least 12 hours each week should be reserved for dialysis treatment and other activities should be planned around this.
- In most cases, hemodialysis is carried out in a medical clinic, so regular travel to receive dialysis may also be necessary. However, training for hemodialysis at home may allow the procedure to be undertaken in the home environment.
- Hemodialysis is recommended for people who are unable to carry out the dialysis procedure themselves, due to visual impairment, dementia, or other conditions.

RISKS OF HAEMODIALYSIS.

- A person with hemodialysis is monitored all the time and dialysis is done by trained health professionals. However, there are risks and people on dialysis often are already very ill and have other health issues. Some of the risks of hemodialysis include:
- ***Low blood pressure (called hypotension)***—A person can have low blood pressure during hemodialysis. This is more common in a person who is already very ill. Such drops in blood pressure can be life threatening. Low blood pressure can be a reason not to do hemodialysis or stop it early before it is completed. For some critically ill people, the risk of death from low blood pressure may be greater than the benefits of washing waste products from the blood.
- ***Abnormal Heartbeat***—While washing waste products from the blood in dialysis, the heart may develop an abnormal heartbeat or rhythm. Abnormal heart rhythms can be life threatening. Abnormal heartbeats may require emergency treatment to try to bring the heart back to its normal rhythm.
- ***Infection***—It is possible to develop an infection in the blood or catheter site while on dialysis. People who are very ill often are at higher risk of infection. Special care is needed to prevent infection of the catheter.
- ***Maintenance of life***—Dialysis is a form of life support. Although dialysis is effective at replacing sick kidneys, it is only one factor in whether a person recovers from a serious, sudden illness. Very often, doctors cannot tell if the use of hemodialysis will lead to a successful recovery. If a person is very sick, adding life-support therapies like dialysis may make the dying process longer and more uncomfortable. When a person is not showing any recovery or is continuing to get worse, a decision about whether to stop hemodialysis may come up. For chronic kidney disease, patients and their healthcare providers may choose to continue dialysis for as long as it is needed and is working. They can also consider its benefits and burden on quality of life. If a person's health and/or quality of life changes, a decision may be made together with the healthcare team to stop dialysis.

VISUALS OF HAEMODIALYSIS



SUMMARY

- There are two different types of dialysis: haemodialysis and peritoneal dialysis.
- Haemodialysis is the most commonly used treatment.
- Haemodialysis means that your blood flows outside of your body and through a special filter that removes wastes and extra fluids, the clean blood is then returned to your body
- The blood travels through tubes that are inserted into a fistula via needles. The fistula is prepared at least 8 weeks before starting haemodialysis via a small operation.
- Most people who have haemodialysis have it around 3 times a week for 3-5 hours at a time. This can be done in a hospital, a special unit or at home
- Home haemodialysis allows more flexibility (for example having a session for 2 hours every day rather than longer sessions spaced out throughout the week), although patients need 4-12 weeks training beforehand

REFERENCES

- www.kidneyfund.org/kidney-disease/kidney-failure
- www.webmd.com/a-to-z-guides/kidney-dialysis
- www.quora.com/what-is-the-process-of-haemodialysis
- https://en.wikipedia.org/wiki/Hemodialysis
- www.news-medical.net/health/Benefits-and-Disadvantages-of-Dialysis.aspx
- https://www.thoracic.org/patients/patient-resources/resources/hemodialysis.pdf

THANK YOU