

Renal failure refers to temporary or permanent damage to the kidneys that results in loss of normal kidney function, they are two different types of renal failure: ***acute and chronic***.

Acute renal failure has a speedy onset and is potentially reversible. Chronic renal failure progresses slowly over at least three months and can lead to permanent renal failure, this is also known as end-stage renal disease (ESRD). The causes, symptoms, treatments, and outcomes of acute and chronic renal failure are different. Some of the conditions that may lead to acute or chronic renal failure may include but are not limited to the following: ***Acute renal failure*** can be a consequence of the following health problems: ***Myocardial infraction*** (a heart attack may occasionally lead to kidney failure), ***Rhabdomyolysis*** (this is a kidney damage that can occur from muscle breakdown, it can also occur from severe dehydration, infection, or other causes), ***Decreased blood flow to the kidneys for period of time*** (this may occur from blood loss or shock), An obstruction or blockage along the urinary tract, Hemolytic uremic syndrome (this is usually by an E. coli infection, kidney failure develops as a result of obstruction to the small functional structures and vessels inside the kidneys), the intake of certain medications that may cause toxicity to the kidneys, ***Glomerulonephritis*** (this is a type of kidney disease that involves glomeruli, during glomerulonephritis, the glomeruli become inflamed and impair the kidney's ability to filter urine, glomerulonephritis may also lead to chronic renal failure in some individuals), any condition that may impair the flow of oxygen and blood to the kidneys such as cardiac arrest. (*The John Hopkins University, 2024*)

Chronic renal failure can be consequences of the following health problems: Diabetic nephropathy (diabetes can cause permanent changes, leading to kidney damage), hypertension (chronic high blood pressure can lead to permanent kidney damage), ***Lupus SLE***(this is chronic inflammatory/autoimmune disease that can injure the skin, joints, kidneys and nervous system), a

prolonged urinary tract obstruction or blockage, *Alport syndrome* (this is a inherited disorder that causes deafness progressive kidney damage, and eye defects, *Nephrotic syndrome* (a condition that has several different causes, is characterized by protein in the urine, low protein in the blood, high cholesterol levels and tissue swelling), Polycystic kidney disease (this is a genetic disorder characterized by the growth of numerous cysts filled with fluid in the kidneys), Cystinosis (this is an inherited disorder in which the amino acid cystine accumulates within specific cellular bodies of the kidneys known as lysosomes), Interstitial nephritis or pyelonephritis(this is an inflammation to the small internal structures in the kidney). Renal failure is diagnosed by a medical professional by conducting a physical examination, with the addition of blood tests, the labs will determine blood cell count, electrolyte levels and kidney function, urine test, renal ultrasound also known as sonograph, kidney biopsy and computed tomography scan also called CT scan or CAT scan. (The *John Hopkins University, 2024*).

In the United States the current prevalent population of adults with chronic kidney disease (CKD) exceeds 30 million individuals and continues to grow annually. In 2017, which was the last year for which national data from the U.S. Renal Data System (USRDS) are available, over 120,00 individuals with kidney failure initiated dialysis therapy with either in-center hemodialysis (HD), peritoneal dialysis (PD) or home hemodialysis. Conventional in-center hemodialysis is when patients attend to have dialysis done, most patients are treated three times weekly for between 3.5 and 4.5 hours per session, a typical HD prescription includes a polysulfide or other synthetic high flux dialyzer, blood flows between 500 and 800 mL/min. Dialysate electrolyte composition will generally include a potassium concentration of 2 or 3 mEq/L, a calcium concentration of 2.5 or 3 mEq/L and bicarbonate concentration of 30 to 35 mEq/L, dialysate electrolyte concentrations should be individualized for each patient based on

the extent of residual kidney function at dialysis initiation, to include the patients adherence and dietary factors. (Joanne D. Pittard, 2023)

Peritoneal dialysis is another option for patients with end stage renal disease, there are a variety of forms of PD such as automated PD (APD) and continuous ambulatory PD (CAPD) being the most common. Peritoneal dialysis is performed by surgically placing a special, soft, hollow tube into the lower abdomen near the navel. After the tube is placed, a special solution called dialysate is instilled into the peritoneal cavity. The peritoneal cavity is the space in the abdomen that houses the organs and is lined by two special membrane layers called the peritoneum. The dialysate is left in the abdomen for a designated period which your doctor will determine. (The *John Hopkins University*, 2024).

The initial dialysis prescription for PD should incorporate the patient's body size as well as residual kidney function in deciding on the volume and number of daily exchanges, the typical initial range volumes are from 1.5 to 2.5 L, and for patients initiated on dialysis through CAPD, the number of dwells per day is typically four. The PD prescription should be adjusted based on regular assessment of patient symptom burden, degree of metabolic and volume control, to achieve adequate solute clearance, Pd strategy either improves or worsens symptoms or other clinical outcomes for patients with incident chronic kidney failure. (Joanne D. Pittard, 2023)

One of many challenges for patients undergoing dialysis is the mental and emotional state aspect, the sense of life meaning (37.5%), and the patients' will to live (47.5%) were more often selected by patients receiving peritoneal dialysis than by patients receiving hemodialysis. Nonetheless, variables related to joy and the sense of life meaning as combined with the type of

received dialysis were not statistically significant. One variable assessed more highly by patients receiving peritoneal dialysis was the will to live. The biggest percentage of patients fearing for their future referred to patients receiving peritoneal dialysis: 22.5%, while patients receiving hemodialysis more often indicated aggression: 8% and anxiety: 4%. Variables such as the level of anxiety, aggression, and fear for the future did not show significant correlations, both in patients receiving hemodialysis and in those receiving peritoneal dialysis. (Dąbrowska-Bender, M., Dykowska, G., Żuk, W., Milewska, M., & Staniszewska, A. (2018).

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