

Renal failure: Acute Renal Failure

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Renal failure is a condition in which the kidneys are unable to remove accumulated metabolites from the blood, leading to alter fluid, electrolytes and acid base balance (Lemone & Burke, 2004). There are two types of renal failure which are acute renal failure and chronic renal failure.

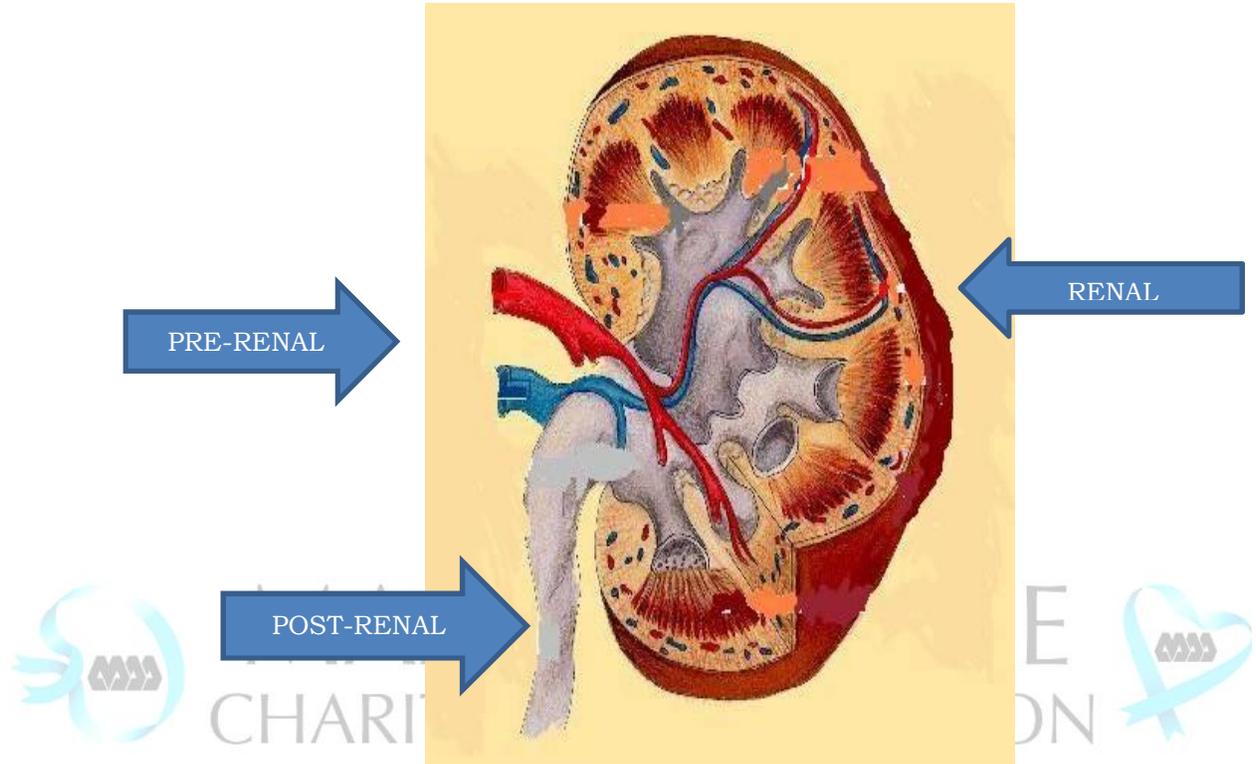
What is acute renal failure (ARF)?

Acute renal failure (ARF) defines as inability of kidney to maintain homeostasis leading to buildup of nitrogenous wastes. It's different to renal insufficiency where kidney function is deranged but can still support human life. 26 studies stated that the exact biochemical and clinical definition not clear.

ARF occurs over hours/days. ARF based on lab study showed that increase in baseline creatinine of more than 50%, decrease in creatinine clearance of more than 50% and deterioration in renal function that requiring dialysis treatment.

The causes ARF involved **Pre-renal**, **Renal-intrinsic** and **Post-renal**. **Pre-renal** occurred when inadequate perfusions of blood delivery to the kidney (e.g., ECF volume contraction and congestive heart failure) and need to check for volume status. Diseases which causes intrinsic injury to the kidney proper (e.g., glomeruli, tubules, interstitium, small blood vessels) are grouped under **Renal** causes of ARF and need to check urinalysis, FBC and autoimmune screening. Finally, condition which interfere the outflow of normal drainage and elimination of formed urine are classified as **Post renal** (e.g., prostatic outlet obstruction, bilateral ureteral obstruction) and need to check up the bladder, catheter and do ultrasound. The figure 1 below show the three condition causes involved in ARF. The table 1 and figure 1 below shows the summary about the causes of ARF.

Figure 1:



Pre Renal	Renal	Post Renal
i. Generalised reduction in tissue perfusion: <ul style="list-style-type: none"> • Volume depletion (e.g. blood loss or fluid loss) • Cardiac failure, cardiac tamponade ii. Selective reduction in renal perfusion <ul style="list-style-type: none"> • Bilateral renal artery stenosis, ACE inhibitors/ ARBs, NSAIDs 	i. Acute tubular necrosis (ATN) ii. Acute interstitial nephritis iii. Glomerulonephritis iv. Vasoconstrictive diseases v. Intratubular obstruction	i. Obstruction at renal pelvis, ureter or bladder neck.

Table 1: Cause of ARF (H.H. Soo, 2011)

The following symptoms may occur with ARF. Some people have no symptoms, at least in the early stages. The symptoms are decreased urine production called anuria, less than 100mls/24hours or no urine output; body swelling, fatigue, nausea, abdominal pain, confusion, metallic taste in the mouth and problem concentrating. Other than that, the seizure and coma may occur in very severe acute kidney failure. Chronic conditions such as diabetes, high blood pressure and high cholesterol must see the doctor to monitor the disease (John.P.C, & Melissa 2016).

The management for ARF which are needs immediate treatment for pulmonary edema and hyperkalaemia. Hyperkalemia should be treated promptly. Successful diuresis and dialysis are only definite methods of removing potassium from the body. Then remove offending cause or treat offending cause. Dialysis as needed to control hyperkalaemia, pulmonary edema, metabolic acidosis and uremic symptoms. The blood regimen needs to be adjusted for patient. Dosages of drugs excreted by the kidney must be adjusted for the level of renal function. The ARF patient needs to restrict water intake if fluid overload need to start IV frusemide, sodium, potassium intake (40mmol/day, if dialysed) but provision of adequate protein (0.8-1.2 g/kg/day). ARF patient also possibly needs phosphate binders and sodium polystyrene sulfonate (H.H. Soo, 2011)

References

1. Lemone, P. & Burke, K. (2004). *Medical Surgical Nursing*, New Jersey, Pearson education International
2. H.H. Soo. (2011). *Sarawak Handbook of Medical Emergencies* (3rd edition). C.E. Publishing : 2011.
3. John.P.C, & Melissa (2016).Acute Kidney Failure. Retrieved 15th February 2017 from http://www.emedicinehealth.com/acute_kidney_failure/page5_em.htm#acute_kidney_failure_symptoms