Indications for Urgent Dialysis (AEIOU)

Dialysis is a procedure that involve artificially filtering fluid across a semipermeable membrane in the setting of chronic or acute kidney injury. It is a lifesaving procedure, but is a limited resource in many hospitals, and thus specific criteria have been developed to determine the patients who require it. The indications for urgent dialysis can be remembered with the AEIOU mnemonic, which stands for: acidosis, electrolyte imbalances, ingestion, overload (volume), and uremia.



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Signs and Symptoms

AEIOU Mnemonic
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Acidosis
Acidic-lemon
When pH falls below 7.1, often seen with the various causes of metabolic acidosis, intracellular metabolism may cease to function and cell death can occur. Correction of the underlying cause is paramount, but dialysis can be used as a rapid stabilizing tool.

pH < 7.1
pH-strip Less-than Lucky (7) . (1) Wand
When pH falls below 7.1, often seen with the various causes of metabolic acidosis, intracellular metabolism may cease to function and cell death can occur. Correction of the underlying cause is paramount, but dialysis can be used as a rapid stabilizing tool.

Electrolyte Imbalances
Electric-lights Breaking
Imbalances in Na, K, Cl, and HCO3 among others, can lead to symptomatic changes. However, the most dangerous type of imbalance is hyperkalemia, and it is considered an absolute indication for dialysis.

Symptomatic Hyperkalemia
Hiker-banana
Hyperkalemia is considered an absolute indication for dialysis. At a potassium level above >5.0 mEq/L, patients can become symptomatic with palpitations, flaccid muscle paralysis and syncope. At a level above >6.5 mEq/L, EKG changes such as peaked T-waves, loss of P waves, and eventual devolution into a “sine-wave” pattern, can lead to cardiac arrest if not corrected.

> 6.5 mEq/L
Greater-than (6) Sax . (5) Hand
At a potassium level above >6.5 mEq/L, EKG changes like peaked T-waves, loss of P waves, and eventual devolution into a “sine-wave” pattern can lead to cardiac arrest.

Ingestion
Ingesting Toxins
Ingestible toxins are virtually endless, however, some of the more common and dangerous toxins include: toxic alcohols (methanol, ethylene glycol) and salicylates, like aspirin, lithium, sodium valproate and carbamazepine. Methanol, ethylene glycol and salicylates (aspirin) can also cause an anion-gap metabolic acidosis, in addition to direct cytotoxic effects.

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Overload (Volume)

Overloaded Volume-cup

Patients with congestive heart failure or chronic kidney disease can develop severe volume overload, which can lead to compromised respiratory function. If initial medical therapy with loop diuretics (like furosemide) fails, then dialysis is indicated to rapidly clear the excess fluid.

Uremia

U-rainbow

Urea is a nitrogen-containing byproduct produced by the liver and excreted by the kidneys. It is normally harmless when dissolved in the blood, but high concentrations of urea can lead to abnormalities, such as encephalitis, pericarditis, and coagulopathies due to platelet dysfunction.

Encephalitis

Brain-in-flames

Uremia leads to an excessive nitrogen load, which itself can cause CNS conditions, like encephalitis. Patients present with altered mental status, seizures and coma.

Pericarditis

Pear-heart-on-fire

Uremia causes both serous pericarditis and fibrinous pericarditis. Serous pericarditis involves fluid accumulating within the pericardial sac. Fibrinous pericarditis involves fibrin-rich exudate forming within the pericardial sac. Patients present with pleuritic chest pain and EKG changes, like global ST segment elevation.

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