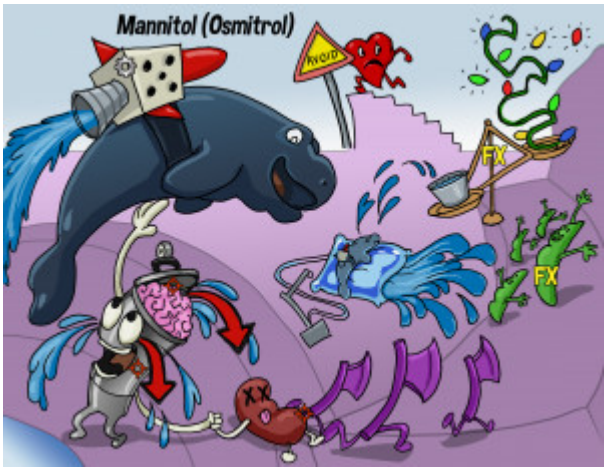
Mannitol (Osmitrol)

Mannitol, also known by its trade name Osmitrol, is an osmotic diuretic that filters easily through the glomerulus with minimal tubular reabsorption. Mannitol functions by producing an osmotic force inside the nephron that inhibits reabsorption of water. This drug is useful in reducing intracranial pressure and intraocular pressure.



PLAY PICMONIC

Mechanism

Osmotic Diuresis

Water Die-rocket

Mannitol, an osmotic diuretic, functions by creating an osmotic force within the nephron that inhibits the reabsorption of water, thus increasing diuresis.

Indications

Reducing Intracranial Pressure

Down-arrow Cranial Pressure-cooker

Mannitol is indicated for the treatment of increased intracranial pressure, as it pulls excessive fluid out of the cerebral tissue.

Reducing Intraocular Pressure

Down-arrow Draining Eyes

Mannitol is indicated for the treatment of increased intraocular pressure as it pulls excessive fluid out of the cerebral tissue to be excreted in the patient's urine.

Renal Failure Prophylaxis

Dead Kidney Purple-axes

Mannitol can prevent renal failure by preserving urine flow. When hypotension or dehydration occur, the kidneys stop producing urine leading to renal failure. Mannitol prevents this process from happening by reinstating urine flow by it's osmotic diuretic properties.

Side Effects

Edema

Edamame

Mannitol is able to pass freely through the capillaries within the body. When mannitol moves through the capillaries, water follows. This mechanism can result in increased fluid build up and edema.

Fluid and Electrolyte Imbalance

Fluid and Electric-lights Unbalanced

Mannitol may cause fluid and electrolyte imbalances due to rapid fluid excretion. As fluid decreases, the concentration of electrolytes may increase.

Considerations

Avoid Use in Cardiac Patients

Avoid-sign Heart

The patient with cardiac issues is at risk for the development of congestive heart failure because mannitol is capable of leaving the capillaries and pulling water with it. This process can result in fluid overload and congestive heart failure. If the patient exhibits signs of pulmonary edema or congestive heart failure, mannitol must be stopped immediately.

IV Administration

IV-bag

Mannitol is drawn up with a filter needle from the vial and then is administered with an in-line filter to prevent crystals from entering the bloodstream. Carefully inspect the infusion prior to administration and check for crystal precipitate. If crystals are present, the vial can be warmed to redissolve the crystals, and then cooled prior to administration. The infusion rate is set to promote a urine output of 30-50 mL/hour. With IV administration, diuresis begins within 30-60 minutes and lasts for 6-8 hours.