Heparin (Unfractionated)

Heparin is a fast acting anticoagulant that works by heightening the action of antithrombin. Antithrombin is a protein responsible for inactivating thrombin and factor Xa, which are two major clotting factors within the body. When factor Xa and thrombin is absent, fibrin production is decreased thereby suppressing coagulation.



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Mechanism of Action

Suppresses Coagulation
Suppressing Clog
Heparin activates antithrombin, which inactivates thrombin and factor Xa to suppress the formation of fibrin. Fibrin is the main component of thrombi found in the veins; therefore, heparin can be very effective in the management and prevention of venous thrombosis.

Indications

Deep Vein Thrombosis (DVT)
Deep V-neck Trombone
Heparin suppresses the production of fibrin, the backbone in thrombi; therefore, suppressing the formation of thrombi. Is it often used as a prophylactic agent against thrombosis or clots in cases where patients are immobile, hypercoagulable or susceptible to serious complications of thrombosis. Examples include patients with risk of or previous DVTs, patients undergoing surgery, and immobile patients.

Pulmonary Embolism
Lungs Elmo
Pulmonary embolism is a result of a thrombi traveling to the lungs. Heparin aids in preventing the formation of thrombi, which prevents the formation of a pulmonary emboli.

Side Effects

Hemorrhage
Hemorrhage-hammer
Hemorrhage is the main complication related to heparin therapy because of heparin’s anticoagulation properties. By decreasing the normal anticoagulation production, heparin predisposes the patient to hemorrhage.

Heparin-Induced Thrombocytopenia (HIT)
Hippie-heron HITS Trombone-side-toe-peanut
HIT is due to IgG antibodies against PF4-heparin complexes, which activate platelets, leading to paradoxical thrombosis. Vascular “damage” is not the main mechanism. Platelet count drops, but the key risk is thrombosis, not just low platelets.

Considerations

Monitor aPTT
Monitor with Partial PTT-hourglass
Patients taking heparin should have their activated partial thromboplastin time (aPTT) closely monitored to make sure they are on a therapeutic dose. Expected range of aPTT is 25-35 seconds in patients not under anticoagulation therapy, and a potential institutionally-based therapeutic range is 60-100

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seconds for patients taking anticoagulation therapy such as Heparin.

Preferred (Safe) During Pregnancy

Safe with Pregnant-lady

Pregnant women requiring anticoagulant therapy should be given low-molecular weight heparin over unfractionated heparin or warfarin (Coumadin), though unfractionated heparin is a suitable alternative. Both low-molecular weight and unfractionated heparin does not cross the placenta or cause harm to the developing fetus. Heparin should be used cautiously, as maternal osteoporosis and thrombocytopenia are possible side effects.

Antidote

Protamine Sulfate

Potato-man with Sulfur-matches

Protamine Sulfate is used as the antidote to heparin, because it combines with the heparin molecule to form a complex that negates the anticoagulant action.