



ศูนย์พิษวิทยารามาธิบodi

คณะแพทยศาสตร์โรงพยาบาลรามาธิบodi มหาวิทยาลัยมหิดล
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RAMATHIBODIPOISONCENTER

Faculty of Medicine Ramathibodi Hospital, Mahidol University
Sukho Place Building, Sukhothai Rd., Bangkok 10300 Hotline 1367

PROTAMINE SULFATE

● Common Tradenames

- ◆ PROTAMINE SULFATE: 5-mL vial = 10 mg/mL

● Indications

- ◆ Reversal of the anticoagulant effect of heparin
- ◆ Overdose of a low-molecular-weight heparin (LMWH)

Important note: Protamine is indicated for the treatment of heparin overdose when there is hemorrhage or an increased risk of hemorrhage. The drug is not indicated in cases of minor bleeding as withdrawal of heparin will generally result in correction of bleeding within several hours.

● Contraindications

- ◆ hypersensitivity to protamine products

● Adverse Effects

- ◆ Anaphylactoid reaction
- ◆ Circulatory collapse, capillary leak, noncardiogenic pulmonary edema
- ◆ Anaphylaxis
- ◆ Bradyarrhythmia
- ◆ Hypotension



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● Dosage

Administer protamine by slow intravenous injection over at least 1-3 min, not to exceed 50 mg in a 10-min period. The onset of action after IV protamine administration is nearly immediate (30-60 sec) and lasts up to 2 h.

◆ For reversal of the anticoagulant effect of Heparin

- Give 1-1.5 mg of protamine for each 100 units of heparin if immediately after heparin administration.
- Give 0.5-0.75 mg of protamine for each 100 units of heparin if 30-60 min after heparin administration.
- Give 0.25-0.375 mg of protamine for each 100 units of heparin if 2 h or more after heparin administration.
- 25-50 mg of protamine IV over 15 min should be given immediately after the discontinuation of a continuous infusion of heparin.
- In case of unknown amount of heparin, give 25-50 mg of protamine IV over 15 min. The activated partial thromboplastin time (aPTT) are usually performed 5-15 min and for up to 2-8 h after protamine administration to determine the need for additional doses.

◆ For an overdose of a LMWH

- **Enoxaparin overdose:** Give 1 mg of protamine for each 1 mg of enoxaparin.
- In case of unknown amount of LMWH, give 25-50 mg of protamine IV over 15 min. The activated partial thromboplastin time (aPTT) value is usually not completely reversed, but the hemorrhagic effects may be neutralized.
- LMWHs have longer half-lives (4 – 6 h) and accumulate with renal insufficiency; therefore, coagulopathies may persist and protamine should be considered even several hours after the overdose.