

Tirofiban (Aggrastat®)

For treatment of acute coronary syndrome

Indications for Use (see sidebar for contraindications)

Tirofiban (Aggrastat), in combination with unfractionated heparin (UFH) and aspirin (ASA) (if not contraindicated), can be considered in the treatment of acute coronary syndrome (ACS), including patients who are:

- To be managed medically
- Undergoing a percutaneous coronary intervention (PCI) such as percutaneous transluminal coronary angioplasty (PTCA) or atherectomy

Appropriate conditions where tirofiban should be considered include:

- Definite unstable angina (UA) or prolonged chest pain at rest with associated ECG change
- Both non-ST-elevation acute myocardial infarction (NSTEMI) and ST-elevation acute MI (STEMI)

Dosage and Administration (see Table 1)

- 1. Determine the appropriate dosing regimen** before administration. FDA-approved dosing is the same for medically-managed patients and those undergoing PCI.
 - Use the standard dose if creatinine clearance (CrCl) is ≥ 60 mL/min.
 - Use the renal dose if CrCl is < 60 mL/min.
- 2. Check lab results prior to treatment**, including platelet count, hemoglobin, and hematocrit.
- 3. Follow the bolus with continuous infusion given in Table 1.** The duration will vary depending on the patient.
 - Tirofiban may be continued for up to 18 hours after intervention, or until P2Y12 agent has a clinical effect. Tirofiban may be discontinued:
 - 2 to 4 hours after prasugrel (Effient) or ticagrelor (Brilinta) load is given.
 - 4 to 6 hours after clopidogrel (Plavix) load (300 mg or 600 mg) is given.
 - There are off-label circumstances when the maintenance infusion may last longer than 18 hours (e.g., bridge to coronary bypass surgery).
- 4. Start ASA and UFH or enoxaparin (Lovenox)**, if not previously done and not contraindicated for patients who have not been revascularized.
 - For UFH, see the [Heparin, Unfractionated for Acute Coronary Syndrome \(ACS\)](#) clinical guideline. Follow the adjustment algorithm given in the guideline for a target activated partial thromboplastin time (aPTT).
(Note: For UFH management with PCI, test the activated clotting time (ACT) before proceeding with the intervention. Give an initial bolus of heparin IV, aiming for a target ACT of 200–230 seconds. Test the ACT after the bolus to ensure ACT is in the target range. Give additional heparin as required.)
 - For enoxaparin, see the [Low-Molecular-Weight Heparin \(enoxaparin\)](#) clinical guideline.
- 5. Continue monitoring labs.** Once bolus is administered, check platelet count 3 hours later. Check platelet count, hemoglobin, and hematocrit 6 hours later and then daily thereafter. See [Table 2](#) for management considerations based on platelet count.
- 6. Historically, there was an off-label dosing regimen** sometimes used for pre-angiography patients (called the “ACS regimen”). That dose was 12 mcg/kg/min bolus over 30 minutes, then 0.1 mcg/kg/min if CrCl ≥ 30 mL/min or 0.05 mcg/kg/min if CrCl < 30 mL/min. If this regimen is desired, the pump settings will allow for the regimen to be programmed.

Contraindications

- Known hypersensitivity to any component of the product
- Active internal bleeding or a history of bleeding diathesis within the previous 30 days
- History of intracranial hemorrhage, intracranial neoplasm, arteriovenous malformation, or aneurysm
- History of thrombocytopenia following prior exposure to tirofiban
- History of stroke within 30 days or any history of hemorrhagic stroke
- Major surgical procedure or severe physical trauma within the previous month
- History, symptoms, or findings suggestive of aortic dissection
- Severe hypertension (systolic blood pressure > 180 mmHg and/or diastolic blood pressure > 110 mmHg)
- Concomitant use of another parenteral glycoprotein IIb/IIIa receptor (GP IIb/IIIa) inhibitor
- Acute pericarditis

About tirofiban

- Tirofiban is manufactured in 100-mL premixed vials and 250-mL premixed bags (concentration 50 mcg/mL). The same bag will be used for bolus and maintenance infusion rates. The Intermountain Healthcare pump library is programmed to infuse both bolus and maintenance infusion from the same bag.
- Tirofiban can be infused in the same line as heparin, nitroglycerin, furosemide, amiodarone, and/or lidocaine.

These guidelines apply to common clinical circumstances, and may not be appropriate for certain patients and situations. The treating clinician must use judgment in applying guidelines to the care of individual patients.

Dosing for ACS or PCI Treatment

Table 1. Tirofiban (Aggrostat®) Dosing for ACS or PCI Treatment

Creatinine clearance	Dosing regimen name	Bolus dose ¹	Infusion dose
≥ 60 mL/min	Standard dose	25 mcg/kg over 2 minutes ²	0.15 mcg/kg/min
< 60 mL/min	Renal dose	25 mcg/kg over 2 minutes ²	0.075 mcg/kg/min

1. The pump library is set up to deliver the bolus and maintenance infusion.

2. For patients weighing more than 99 kg, bolus duration is 5 minutes; maximum dosing at 153 kg.

Management Post-Cardiac Cath Procedure

- Do not place patient on immediate post-procedural IV heparin.
- Remove sheaths when ACT <150 seconds while still on tirofiban.
- Continue tirofiban for up to 18 hours after the procedure or until P2Y12 agent has clinical effect.
- Continue ASA (and P2Y12 inhibitor if stent placed).
- Only if necessary, restart IV heparin or subcutaneous enoxaparin 4 hours after sheath removal.

Table 2. Management of Special Circumstances When Using Tirofiban

Situation	Management guidelines	
Major bleeding complication	• Discontinue tirofiban immediately. Perform platelet transfusions (10-pack initially) as required to control bleeding. • Consider dialysis in the first 4 hours after discontinuing tirofiban if clinically needed. • Discontinue heparin or enoxaparin immediately. Administer protamine as required to control bleeding. • Activate massive transfusion protocol team if needed.	
Cardiac surgery (duration of platelet inhibition is 4 to 8 hours)	• Discontinue tirofiban 3 to 6 hours prior to surgery or as close to that time as possible. • Perform platelet transfusions only as required to control bleeding after surgery. • Consider dialysis if <4 hours since discontinuing tirofiban.	
Post-tirofiban thrombocytopenia	Platelet count	Action
	>100,000	• Do not alter treatment.
	40,000–100,000	• Redraw platelet count STAT using green-top tube. • DISCONTINUE tirofiban immediately if similar count of <100,000. • Perform platelet transfusions only as required to control bleeding. • Repeat platelet count every 12 hours until >100,000.
	<40,000	• DISCONTINUE tirofiban immediately. • Perform platelet transfusion as required to control bleeding or consider administering to maintain platelet count ≥40,000. • Repeat platelet count every 12 hours until >100,000. Consider stopping heparin.