

# BIVALIRUDIN (ANGIOMAX)

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<b>Title:</b>	Bivalirudin (ANGIOMAX)		
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<b>Guideline #</b>	ANES: University of Michigan Protocol		

## Overview

Heparin induced thrombocytopenia can be a life threatening complication of long-term heparin therapy. An alternative to heparin must be used in these patients in order to perform cardiopulmonary bypass safely. Bivalirudin is one such alternative.

Bivalirudin is a direct thrombin inhibitor that has no neutralizing agent. Despite its reported fast renal elimination and relatively short half-life (30 minutes), quick hemostasis following cardiopulmonary bypass should **not** be expected. The anesthesiologist should be prepared to resuscitate the patient with large amounts of blood products after termination of cardiopulmonary bypass.

## Formulation

Bivalirudin is supplied as a sterile powder in vials of 250 mg. Reconstitute two (2) vials with 5 ml of sterile water in each vial. Then, draw up the two vials of bivalirudin into a 50 ml syringe containing 40 ml of sterile water, for a total of 250 mg bivalirudin in 50 ml D<sub>5</sub>W (ten milligrams per milliliter.)

- Final concentration: 10 mg/ml

## Anticoagulation Management

### Pre-CPB

#### Loading

1. Bivalirudin bolus to CPB prime: 50 mg bivalirudin (Angiomax)
2. Loading dose to patient: 2.25 mg/kg IV bivalirudin (Angiomax) to patient
3. Start a constant infusion of bivalirudin (Angiomax) at 1.25 mg/kg/hr
4. Wait 5 minutes before checking ACT
5. Do not initiate CPB until ACT is > 550 seconds or a minimum of 20 minutes has elapsed from the time that the initial loading dose was administered
6. If initial ACT is < 550 seconds, re-bolus patient with 1.125 mg/kg bivalirudin (Angiomax)
7. Repeat the ACT after 5 minutes. Repeat step #6 as necessary following consultation with the staff surgeon and staff anesthesiologist.

### During CPB

The perfusionist will:

1. Just prior to CPB initiation, transfer the bivalirudin (Angiomax) bivalirudin constant infusion to the heart and lung machine. The bivalirudin (Angiomax) constant infusion is inserted into the venous blood temp probe site.
2. Measure an ACT a minimum of every 10 – 15 minutes using the Hemochron Jr. II
3. If the ACT falls below 480 seconds, re-bolus with 0.25 mg/kg and increase constant infusion rate by 0.5 mg/kg/hr
4. If the ACT is over 600 seconds, lower constant infusion rate by 0.5 mg/kg/hr

### ***Preparation for CPB Termination***

The perfusionist will:

- Discontinue bivalirudin (Angiomax) infusion 30 minutes prior to CPB termination. Consult the staff surgeon and staff anesthesiologist regarding the exact timing of infusion termination
- Discontinue pericardial sucker usage 15 – 30 minutes prior to CPB following consultation with the staff surgeon
- Ultrafiltrate to lower bivalirudin (Angiomax) concentration. Consult staff surgeon and anesthesia regarding target ACT for CPB termination.

### ***Post-CPB***

- Maintain a vigorous diuresis.

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