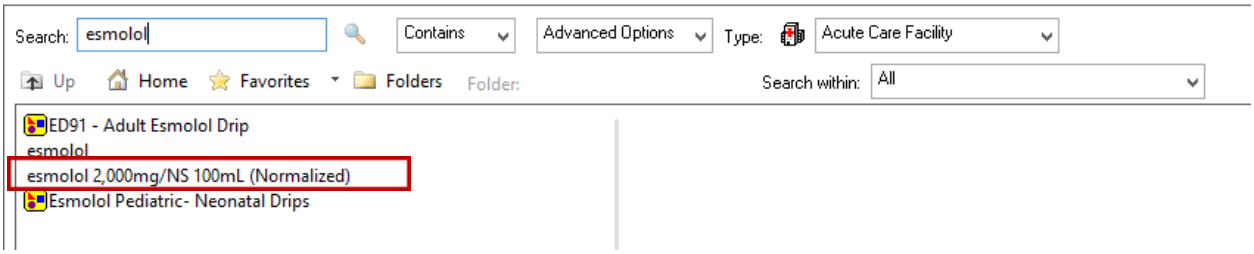
# Weekly Pharmacy Pearl: CMC First Line Anti-Impulse Control Medications in Medically Managed Acute Aortic Dissection

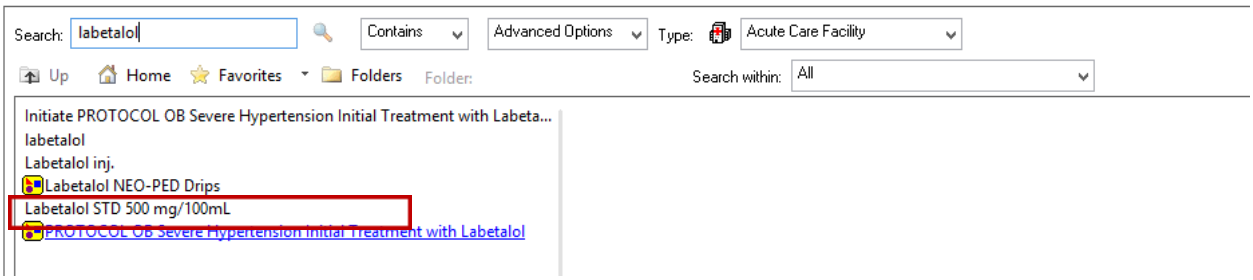
For acute aortic dissection, most emergency medicine providers are familiar with using esmolol as first-line. However, the 2010 guideline on Thoracic Aortic Disease states that IV propranolol, metoprolol, labetalol, or esmolol are all excellent choices for initial management. Due to potential cost savings, PCC, SHVI and Vascular at CMC have established that labetalol and nicardipine are the preferred agents for the **medical management of aortic dissections**.

- Labetalol $15.33 per bag vs. esmolol $213 per bag
- Labetalol has the added benefit of targeting blood pressure in addition to impulse control
- Propranolol and metoprolol do not have drips available
- If a patient is on an esmolol drip from an outside facility, continue esmolol until a clear decision for operative intervention is made. If the patient will be medically managed without operation, **transition to a labetalol drip with early addition of oral labetalol** to reduce drip requirements and minimize fluid volume.

**Orders**

When ordering, please make sure to select the options outlined in red below. These options have titration parameters built into the order comments for the nurses.




**Typical initial PO labetalol dose and frequency:** 200 mg Q 6 hrs

- Inpatient floor will continue to titrate Q 24 hrs to wean off labetalol drip

**Example to illustrate potential cost savings and fluid considerations**

70 kg patient requiring max rate of esmolol drip (300 mcg/kg/min)

- Would require a new bag of esmolol every hour
- If left on esmolol for medical management (~ 2-3 days), would add up to **$15,336** in drug cost
- 1 ml/min which is 1 L fluid/day

Same patient on max dose labetalol drip (8 mg/min)

- Would require a new bag of labetalol every hour
- If left on labetalol for medical management (~2-3 days), would add up to **$1,100** in drug cost
- 2.3 L fluid/day

**Medication Table**

| | Labetalol | Esmolol | Nicardipine |
|---|---|---|---|
| **Mechanism of Action** | Non-selective β-blockade **AND** Selective α-1 blockade | Selective β-1 blockade | Non-DHP CCB |
| **HD Effects** | ↓BP + ↓HR | ↓HR | ↓BP, may ↑ HR if started before BB |
| **Bolus** | Yes: 20-80 mg IV push via labetalol stick in Omnicell. Can do this while waiting for bag to come from pharmacy. | Yes: 500-1000 mcg/kg IV pump will not allow to bolus. Must be drawn from IV line. | No |
| **Initial Rate** | 1-2 mg/min | 50 mcg/kg/min | 5 mg/hr |
| **Max Rate** | 8 mg/min | 300 mcg/kg/min | 15 mg/hr |
| **Titration Instructions** | 0.5 mg/min Q 10 min | 50 mcg/kg/min<br>Q 4 min<br>Give 500-1000 mcg/kg boluses with each rate increase | 2.5-5 mg/hr Q 5 min until target BP reached |
| **Weaning Instructions** | 0.5 mg/min Q 10 min | Reduce rate by 50% following initiation of alternative agent. If BP stable for 1 hour following 2nd dose of alternative agent, discontinue esmolol.<br><br>If no alternative agent added, reduce rate by 25 mcg/kg/min Q 10 min. | 2.5-5 mg/hr Q 5 min until target BP reached |
| **Location of Medication** | Bolus stick: ED Omnicells<br>Drip: 2nd floor pharmacy (can be tubed) | Bolus: calculate and draw bolus from drip<br>Drip: Rm 3 Omnicell | ED Omnicells |