

# Inotropic Agents (Infusion) on Cardiology Ward (5A): Administration

## Site Applicability

SPH Cardiology Ward (5A)

## Practice Level

### Specialized:

Only registered nurses who have completed a recognized post-graduate Cardiac Step-Down course or have equivalent education and experience (including St. Paul's Hospital Inotrope Education) may be assigned to manage patients receiving inotropic agent infusions on the cardiology ward.

## Requirements

- All patients requiring inotrope infusions require cardiac monitoring
- The inotropic medication must be administered on an infusion pump as a primary infusion
- Only hemodynamically stable patients may be admitted to the cardiac ward for this therapy
- **If a patient becomes hemodynamically unstable** (drop in blood pressure from baseline, associated with decreased level of consciousness, shortness of breath, angina and/or other signs of poor perfusion), **or requires greater than 2 up-titrations/shift, or reaches maximum dose therapy for this unit** (see [Appendix A](#)) **they must be transferred to a critical care area**
- Patients who require loading (bolus) dose need to be in critical care
- Patients who require BOTH milrinone and DOBUTamine infusions CONCURRENTLY need to be in critical care
- milrinone and DOBUTamine may be delivered via a peripheral IV in stable heart failure patients
- Do not insert extra peripheral IV catheters for the purpose of “back-up” or “just in case”. If long-term therapy is required or if limited peripheral access is available, a PICC line may be required
- If different diluent is needed, contact pharmacy for assistance

## Need to Know

Inotropic agents are used on the cardiology ward in the context of heart failure with low cardiac output. milrinone and DOBUTamine are vasoactive medications with inotropic properties. These agents improve the contractility of the myocardium but may also impact heart rate, rhythm, and blood pressure. Inotropes are used to temporarily maintain hemodynamic stability in patients while other therapy is planned, such as ventricular assist device (VAD), heart transplant, or as a palliative treatment

to improve symptoms. Inotropic agents have differing properties, including onset of action, time to peak effect and side effect profiles (See [Appendix B](#)).

## Guideline

### Initiating Vasoactive Medication

- Conduct a complete Head-to-Toe Assessment prior to initiation of infusion (See [B-00-13-10096](#) – Physical Assessment: Patients on Cardiac or Cardiac Surgery Inpatient Units)
- Analyze and document a baseline rhythm strip prior to initiation of infusion
- In Cerner, ensure the dosing weight matches the daily weight today
- Perform a Double Check of medication order, MAR, prepared medication bag, medication calculation, and IV pump programming with a second RN. Use the witness field in medication charting window to document
- Closely monitor patient's response, visualizing the cardiac rhythm and IV site. Assess vital signs every 5 minutes X 3 after initiation of medication
- Repeat vital signs and IV site assessment again in 15 minutes

### Ongoing Assessment, Care and Management

- Perform a Double Check of medication, pump programming, and MAR at the start of each shift with a second RN
- Weigh patient daily in the morning; after voiding and before breakfast
- Assess TID and PRN:
  - Head-to-Toe Assessment [B-00-13-10096](#) at the start of each shift
  - Focused Mini Assessment per [B-00-13-10096](#) mid-day shift and prior to the patient going to sleep at night
  - Update Intake and Output with each assessment and at the end of shift
- Assess IV site and dressing Q4H for redness, swelling or pain. For an IV restart, page IVT 'urgently'

### Interventions

Notify physician **immediately** if any of the following occur:

- Vital signs or other clinical signs outside set parameters
- Symptomatic arrhythmia
- Decreasing level of consciousness
- Signs of decompensated heart failure (shortness of breath, especially when supine; SpO<sub>2</sub> less than 93% despite oxygen administration of 5 L/min for 10 to 15 minutes; coughing; anxiety/restlessness; pale skin; diaphoresis)

- If VT or PVCs are more frequent than specified by physician's orders

Call **CODE BLUE** for any sudden or extreme deterioration in condition (symptomatic hypotension; decreasing level of consciousness; respiratory distress; tachycardia).

Change IV bag and tubing during the day shift. There is no pharmacist on at night to check the medication bag.

Drug	Change Medication Bag	Change IV Tubing
milrinone DOBUTamine	72h	Every 72h for continuous infusions. 24h if infusion interrupted.

Clear volume infused (VI) on infusion pump at the end of each shift.

When discontinuing the vasoactive infusion, cap the line and keep sterile. Do not discard solution immediately. It can be restarted if the total maximum hanging time does not exceed 24 hours.

### Titration (increase or decrease)

- Titrations require a physician's order and must include parameters
- Conduct a complete Head-to-Toe Assessment and vital signs prior to titrating
- Perform a Double Check of medication order, MAR, prepared medication bag, and medication calculation with a second RN. Adjust medication to dose ordered – checking IV pump programming with a second RN. Use the witness field in medication charting window to document the Double Check
- Monitor patient response and assess vital signs 5 minutes after change to dose
- Assess vital signs an additional time in 15 minutes and then TID and PRN
- Up titrations should occur no more than one titration every 15 minutes to a maximum of 2 titrations/shift or a maximum dose ([Appendix A](#))

### Documentation

- Interactive View and I&O:
  - Adult Quick View and Adult Systems Assessment: Vital signs, daily weight, patient assessment, interventions, and patient responses
  - Continuous Medication Infusions: Document medication dose and rate every hour
  - Intake and Output: Fluid volume infused and urine output

- Adult Lines – Devices: IV site assessment
- Narrative note for any adverse /unexpected events, clinical deterioration or transfer to critical care
- Shift Report/Handoff: Lines traced site to source
- Document initiation of medication infusion and medication bag changes using the Medication Administration Wizard and Medication Administration Record (MAR)

### **Patient and Family Education**

- Purpose of infusion
- Reporting IV site pain or redness
- Activity allowed
- Reporting feelings of shortness of breath, dizziness, coughing, anxiety, restlessness, chest discomfort, nausea, rapid heartbeat or sweatiness immediately
- When and how to press the call bell system
- Reporting if they plan to leave the unit

### **Related Standards & Resources**

1. [PDTM](#) – DOBUTamine, milrinone
2. [Lexicomp](#) – DOBUTamine, milrinone
3. [B-00-13-10011](#) - Cardiac Monitoring, protocol
4. [B-00-13-10096](#) - Physical Assessment: Patients on Cardiac or Cardiac Surgery Inpatient Units
5. [B-00-13-10115](#) - Inotrope Intravenous Infusions for Patients in Palliative Care
6. [B-00-07-10098](#) - Independent Double Check (and Double Check) of Medication
7. [BD-00-12-40045](#)/[BD-00-12-40067](#) - Central Venous Catheter (CVC): Basic Care and Maintenance (Non-Tunneled/Tunneled)
8. [BD-00-12-40054](#) – CVC: Peripherally Inserted Central Catheter (PICC) – Basic Care and Maintenance (Adult)
9. [BD-00-12-40080](#) - IV Therapy, Peripheral: Insertion, Care and Maintenance

## References:

1. Allen, J. (2014). Understanding vasoactive medications: Focus on pharmacology and effective titration. *Journal of Infusion Nursing*, 37(2), 82-86.
2. Bistola, V., Arfaras-Melainis, A., Polyzogopoulou, E., Ikonomidis, I., & Parissis, J. (2019). Inotropes in Acute Heart Failure: From Guidelines to Practical Use: Therapeutic Options and Clinical Practice. *Cardiac failure review*, 5(3), 133–139. <https://doi.org/10.15420/cfr.2019.11.2>
3. Ginwalla, M., & Tofovic, D. S. (2018). Current Status of Inotropes in Heart Failure. *Heart failure clinics*, 14(4), 601–616. <https://doi.org/10.1016/j.hfc.2018.06.010>
4. Lexicomp Online. Lexi- Drugs: Dobutamine, Milrinone. Hudson, Ohio: Lexi-Comp, Inc. Accessed April 26, 2023. <http://Online.lexi.com>
5. Perpetua, E. M., & Keegan, P. (2020). *Cardiac Nursing* (7th ed.). Wolters Kluwer Health. <https://wolterskluwer.vitalsource.com/books/9781975106348>
6. Tomasoni, D., Vishram-Nielsen, J. K. K., Pagnesi, M., Adamo, M., Lombardi, C. M., Gustafsson, F., & Metra, M. (2022). Advanced heart failure: guideline-directed medical therapy, diuretics, inotropes, and palliative care. *ESC Heart Failure*. 9(3). 1507-1523. <https://doi.org/10.1002/ehf2.13859>

## Appendices

[Appendix A](#): Maximum Inotrope Doses for the Cardiac Ward

[Appendix B](#): Intravenous Vasoactive Medication Indications and Effects

**Appendix A      Maximum Inotrope Doses for the Cardiac Ward**

Drug	Concentration	Maximum Dose
DOBUTamine	500 mg in 100 mL D5W (5 mg/mL)	7.5 mcg/kg/min
milrinone	20 mg in 100 mL D5W (0.2 mg/mL)	0.5 mcg/kg/min
milrinone	40 mg in 100 mL D5W (0.4 mg/mL)	0.5 mcg/kg/min

## **Appendix B      Intravenous Vasoactive Medication Indications and Effects**

<b>Drug</b>	<b>Mechanism of Action</b>	<b>Common Uses</b>	<b>Onset/Duration of Action</b>	<b>Adverse Effects</b>
DOBUTamine	Beta-1 adrenergic receptor agonist	Cardiogenic shock, decompensated heart failure	Onset: 1 to 10 minutes Duration: 2 to 10 minutes	Hypotension, increased myocardial oxygen demand
milrinone	Phosphodiesterase-3 inhibitor	Cardiogenic shock, decompensated heart failure	Onset: 5 to 15 minutes Duration 2 to 3 hours	Hypotension, thrombocytopenia, arrhythmias

**Persons/Groups Consulted:**

Clinical Nurse Leaders, Cardiology Ward  
Clinical Pharmacist  
Cardiologist  
Clinical Nurse Specialist, Heart Failure

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