

PROTOCOL FOR: Milrinone (Primacor): Continuous Infusion

POLICY: This drug is to be administered in areas only where patient is on a cardiac monitor.

DESIRED PATIENT

- OUTCOMES:**
1. In patient with depressed myocardial function, Milrinone produces a prompt ↑ in C.O. ↓ in PCWP and vascular resistance without a significant increase in heart rate or myocardial oxygen consumption. Improvement in LV function in patients with ischemic heart disease has been observed without increasing myocardial ischemia.
 2. Patient will not suffer negative side effects of Milrinone.

**CLINICAL
ASSESSMENT AND**

CARE: A. PRIOR TO STARTING INFUSION:

1. Validate solution concentration per MD order:
Suggested Concentrations:
Single: Milrinone 40 mg/200 ml of D₅W (pre-mixed), or 40 mg in NS or 0.45 NS, to be prepared by pharmacy (0.2 mg/ml).
2. Check baseline VS - BP, HR and rhythm and hemodynamic parameters. Also assess LOC, skin color, peripheral perfusion, heart and lung sounds and urinary output.
3. Use frequent vital sign sheet during titration.
4. Refer to dosage in mcg/kg/minute. A recent patient weight is necessary.
5. Attempt to correct hypovolemia before starting infusion.

B. BEGINNING THE INFUSION, DOSAGE IS DETERMINED BY MD ORDER:

1. Milrinone may be administered with an intravenous loading dose followed by a continuous IV infusion (maintenance dose).
2. Loading dose, if ordered, is usually 50 mcg/kg administered over 10 minutes (pharmacy to prepare).

C. CONTINUOUS INFUSION / MTITRATION: Begin the maintenance infusion at 0.25 mcg/kg/min and increase by .005 mcg/kg/min every 5-10 minutes until desired effect or clinical response is reached. If a loading dose was given, begin the maintenance infusion within 15-30 minutes of the loading dose. Usual dose range is 0.25 mcg/kg/min - 0.75 mcg/kg/min for treatment of advanced CHF and low output status following cardiac surgery. The infusion rate should be adjusted according to hemodynamic changes and clinical response, including BP, HR, heart rhythm, fluid status, and renal function. See package insert for dosage adjustment in renally impaired patients. Dosage adjustments for renal insufficiency are necessary because 85% of the drug is excreted unchanged in the urine within 24 hrs.

D. DURING INFUSION:

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1. Monitor / document HR and BP q 5-10 minutes during the loading dose and initial infusion.
 2. Document dosage and vital signs on ICU flowsheet or frequent vital sign record.
 3. Check BP, HR q 1° until stable, then q 2-4°.
 4. Monitor urine output q 1-2 hours.
 5. Monitor hemodynamic parameters for desired effects (↑ in C.O. ↓ in PCWP and vascular resistance) per hemodynamic monitoring protocol or MD order for hemodynamic parameter frequency. (Increased cardiac output (CO), decreased pulmonary artery wedge pressure (PAWP) and vascular resistance often occurs within 5-15 minutes in the majority of patients.)
- E. DISCONTINUATION OF INFUSION: Begin downward titration with physician order. Titrate off in same manner as drug started. Assess VS, HR, BP, SG readings and urine output. Monitor BP, HR q 2° for 8° after drug discontinued.

**POTENTIAL
COMPLICATIONS/
ADVERSE SIDE**

EFFECTS:

1. Cardiovascular:
 - a. The principal adverse effect is change from baseline rhythm, most commonly ↑ ventricular ectopic activity. Dysrhythmias include ventricular tachycardia, ventricular fibrillation and supraventricular tachycardia.
 - b. Hypotension and angina/chest pain may occur.
 - c. Milrinone may aggravate outflow tract obstruction thus use with caution IHSS and aortic and pulmonic valve disease.
2. CNS: headaches (responds to withdrawal of the drug).

PATIENT

TEACHING:

1. Reinforce rationale for therapy.
2. Review potential side effects of therapy.
3. Review the importance that patient report any side effects.

REPORTABLE

CONDITIONS:

1. Notify physician of any complications or if no response noted to drug.
2. Notify physician of adverse effects.

APPROVAL:

Nursing Standards Committee
Intensive Care Standards Committee
Cardiac Step-Down Unit Standards Committee

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REFERENCES:

EFFECTIVE DATE: 1/95

REVISION DATES: 3/96, 1/00, 8/02, 10/03, 12/05, 3/08