SARASOTA MEMORIAL HOSPITAL
NURSING DEPARTMENT POLICY

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<th>TITLE:</th>
<th>NURSING AND PHARMACY GUIDELINES FOR THE ADMINISTRATION OF IV EPOPROSTENOL (FLOLAN®, VELETRI®)</th>
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<td>POLICY #:</td>
<td>129.060(Pharmacy) 126.207(Pt. Care)</td>
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<td>EFFECTIVE DATE:</td>
<td>10/2004</td>
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<td>10/17</td>
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<td>POLICY TYPE:</td>
<td>DEPARTMENTAL INTERDEPARTMENTAL DEPARTMENTS PROVIDING NURSING CARE</td>
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Job Title of Reviewer: Director, Pharmacy

PURPOSE: To provide guidelines for the safe and uninterrupted administration of intravenous EPOPSOTENOL.

POLICY STATEMENT: EPOPROSTENOL, a prostacyclin, is a potent, vasodilator used for the treatment of refractory pulmonary hypertension (PH). To ensure patient safety, EPOPEOSTENOL will be prepared and administered within the guidelines established by this policy.

EXCEPTIONS: Intermittent outpatient infusion for scleroderma are permitted on DTC

DEFINITIONS: Nanograms: 1 million Nanograms = 1mg
A nanogram is designated as “ng” and must not be confused with “mg” (milligrams).

High alert medication: drugs that carry a higher risk of causing significant patient harm when used in error, or drugs involved in a high percentage of medication errors and/or sentinel events.

Independent verification: a process whereby a second licensed nurse verifies the correct dosage and rate of a medication based on the physician order independent of the primary RN caring for the patient.

Dosage weight: the patient’s weight in kilograms at the time the medication was initiated. Unless otherwise specified by MD, a patient’s dosing weight NEVER changes and may not correlate with their current weight. The dosing weight is indicated on the solution bag label and on the comment section of the eMAR.

PROCEDURE: EPOPROSTENOL (FLOLAN®, VELETRI®): General Information

1. Infuse via a dedicated, central line using electronic pump
   a. In an emergency, a peripheral line may be used until central access can be restored.
b. Half-life (3 minutes). Back up supplies of reconstituted drug and infusion pump must be readily available.
   i. The backup infusion bag will be kept in the medication room refrigerator

c. New bag is hung every 24 hours. Once the new bag arrives on the unit, the bag stored in the refrigerator should be hung. In an emergency, a peripheral line may be used until central access can be restored.
   i. Flolan® must be kept cold to have 24 hour stability. Hang Flolan® with ice packs. Change ice packs every 4 hours or as needed to keep medication cold. (exception: Veletri® does not need ice packs)

2. Approved units:
   a. Initiation: Patient must be admitted to critical care unit.
   b. Maintenance Therapy: Critical Care and CP2/8ET.

1. **DO NOT INTERRUPT INFUSION**
   Abrupt withdrawal or interruption of medication delivery can result in rebound pulmonary hypertension, which can be life threatening.
   
   **NOTE:** DO NOT change the tubing every Sunday and Thursday as per the standard tubing changes procedures. Each new bag is sent from Pharmacy primed with new tubing.

3. **DO NOT FLUSH**
   No portion of the delivery system (catheter, catheter port, tubing or pump) is to be flushed. **Flushing the line will result in the patient receiving a bolus dose and may cause excessive hypotension.**


5. Do not draw blood from the same line (infusion must not be interrupted).

6. EPOPROSTENOL is **not** compatible with heparin

7. For initial priming of the tubing **or** when switching from one central line to another, refer to section titled “Special Medication Administration Requirements”.

8. Two brand names of epoprostenol are available: VELETRI® AND FLOLAN®. Patients admitted on VELETRI® should not be interchanged to FLOLAN® or generic EPOPROSTENOL or vice versa without a physician order. (Note: FLOLAN® and generic epoprostenol are not compatible with VELETRI®)

**VELETRI®**

1. **Stability**
   a. Protect from light
   b. Room temperature: stable for 48 hours
   c. Refrigerator: stable for 5 days (solution)
   d. Stable only when reconstituted as directed using
FLOLAN® (both brand and generic)

2. Stability
   a. Protect from light
   b. Room temperature: stable for 8 hours
   c. Refrigerator: stable for 48 hours
   d. Wrapped in ice packs: stable for 24 hours
      i. Pharmacy will supply 4 ice packs at the initiation of therapy
      ii. Ice packs should be exchanged every 4 hours or as needed to keep medication chilled
   e. Stable only when reconstituted with STERILE DILUENT for FLOLAN.

Initiation of Therapy: New patients

1. Upon receiving an order, the patient care pharmacist will contact the prescribing MD to determine if insurance coverage has been approved for subsequent continuous outpatient administration.
2. Treatment must be initiated in the ICU
   a. Patients may undergo a vasodilator challenge with EPROSTENOL (FLOLAN®, VELETRI®) in the cardiac lab (CCL). Insurance verification not required for this trial.

2. DOSING
   a. EPROSTENOL (FLOLAN®, VELETRI®) is initiated at 1-2 ng/kg/min and increased in increments of 1-2 ng/kg/min every 15 minutes or as specified by MD until the goal maintenance dose is reached or dose limiting pharmacologic effects are elicited, whichever comes first.

Maintenance therapy

1. Patients admitted to the hospital on a continuous infusion of EPROSTENOL (FLOLAN®, VELETRI®), using their own pumps, are to be converted as soon as reasonably possible to the hospital supply of drug and the hospital provided electronic pumps.
2. When possible, the concentration of drug provided in the hospital will be the same as the home concentration.
   a. If the hospital concentration differs from the patient’s home concentration, the drug must be aspirated from the line first and then primed with the new concentration. Aspirating the medication from the line and priming the line will be done under the direction of the Pharmacist or Intervention Nurse.
3. Unless specifically ordered by physician (intentionally wants to switch brands), patients admitted on VELETRI® should not be converted to FLOLAN® or generic EPOPROSTENOL and vice versa. Likewise, patients admitted on FLOLAN® or generic epoprostenol should not be converted to VELETRI®. The 2 brands are not compatible in the same line. Drug must be aspirated from IV line. Contact pharmacy for additional instructions.

4. Pharmacy or Intervention Nurse will be at bedside for transition of medication from home to hospital supply and at discharge for the transition from hospital supply to home supply.

5. In a patient being transitioned from one agent to the other such as epoprostenol to treprostinil:
   a. Two dedicated central lines are needed as both drugs will be infusing simultaneously during the transition (via separate sites)
   b. The physician must provide specific dosing parameters for weaning one agent and initiating the other.

**Nursing Monitoring/Safety:**

1. Independent verification is required when a new bag is hung or for any changes in dose

2. The patient must receive an UNINTERRUPTED continuous IV infusion. If EPOPROSTENOL (FLOLAN®, VELETRI®) is interrupted for any amount of time, patients can develop life-threatening rebound pulmonary hypertension and right ventricular failure.

3. **Critical Care:** Upon initiation and for each dosing adjustment in the critical care setting, vital signs (BP, pulse, respiratory rate) and a pulse oximetry reading will be obtained and documented:
   - every 15 minutes for one hour every 30 minutes for two hours and then every hour if the patient is stable.

4. For non-critical care patients on a maintenance therapy (no titrations needed), vital signs (BP, pulse, respiratory rate) and a pulse oximetry monitoring are done every 4 hours or per MD order.

5. For non-critical care patients on maintenance therapy who require a dose titration:
   - every 15 minutes for one hour
   - every 30 minutes for two hours
   and then every hour if the patient is stable.

**NOTE:** If the patient is exhibiting adverse reactions (overdosing or under-dosing) or increased respiratory distress, additional monitoring and/or increased in the level of care may be required. The patient may need to transfer to a higher level of care or the Rapid Response Team (RRT)/Code Blue Team may need to intervene.

6. Due to their short half life, an additional pump needs to be at the patient's bedside in the event of pump failure.
7. If possible, the patient should be placed in a room close to the nurse's station so the nurse can be alerted if the pump alarms. To keep the pump alarms audible, avoid closing the patient's door.

8. If the patient needs to leave the nursing unit for a procedure, a nurse needs to accompany the patient receiving EPOPROSTENOL (FLOLAN®, VELETRI®) to the procedural area so the patient's care can be “handed off” directly to the Nurse/MD/CRNA.
   a. Send “backup” EPOPROSTENOL (FLOLAN®, VELETRI®) bag and the backup pump with the patient

9. Monitoring for Adverse Reactions:
   Overdosing signs and symptoms: Facial flushing, jaw pain, hypotension, nausea and vomiting, abdominal cramping, headache, diarrhea, tachycardia, musculoskeletal pain, rash and thrombocytopenia. If the patient develops side effects related to therapy, dose modification, additional monitoring or an increase in the level of care may be required.
   Under-dosing signs and symptoms: Fatigue, worsening dyspnea, pallor and chest pain.

Special Medication Administration Requirements:

Initial priming of tubing or how to switch from one central line to another:

1. Switching of one central line to another will be done under the direction of the Pharmacist or Intervention Nurse at bed side. Drug must be aspirated from the old line (if applicable). After the new line has been primed, the unit based nurse will connect hospital infusion to the patient and turn on the pump. Independent nurse verification is required.

2. To avoid interruptions in therapy, it is recommended that the new site be primed with drug.
   a. To determine the priming volume for a central line or PICC line always aspirate the line first to ensure no medication is in the line.
   b. Only after the drug has been aspirated from the line, can the line be flushed with normal saline.
   c. Using a 3ml syringe, aspirate the saline until first sign of blood. The volume aspirated will be the priming volume.
   d. Withdraw the same volume as was aspirated from the epoprostenol infusion bag. This will be used to prime the new line.
   e. After priming the line, attach the infusion bag.
   f. Aspirate any remaining EPOPROSTENOL (FLOLAN®, VELETRI®) from the “old” site. Always aspirate the line prior to flushing.
   g. DO NOT flush the old line prior to aspirating any
remaining drug as this could result in a bolus dose of the drug being administered to the patient.

h. Avoid using an Introducer side port. These catheters have a large diameter which makes it impossible to accurately determine a priming volume.

**Discharge:**

1. Immediately prior to discharge, the Home Health Care nurse (new patients) or the patient (established patients) will prepare EPOPROSTENOL (FLOLAN®, VELETRI®) using the patient's own drug supply and the patient will connect themselves to their own pump.

2. If the home drug concentration differs from the hospital concentration, the drug must be aspirated from the line and the line re-primed using the patient’s own supply. As before, this will be done under the supervision of the pharmacist or Intervention Nurse.

**Nursing Documentation**

1. Vital Sign Flowsheet
2. Medication Administration Record (eMAR)
3. Patient Education Record: Education to patients, families, and significant others regarding EPOPROSTENOL (FLOLAN®, VELETRI®) therapy, procedure, and equipment.

**RESPONSIBILITY:**

It is the responsibility of the Department of Pharmaceutical Care Services leadership to ensure that all appropriate pharmacy staff members are aware of, and adhere to, this policy.

It is the responsibility of Nursing leadership to ensure that all appropriate nursing staff members are aware of, and adhere to, this policy.

It is the responsibility of all appropriate pharmacy and nursing staff members to be aware of, and adhere to, this policy.

**REFERENCES:**

Adapted from “Shands at the University of Florida Department of Nursing and Patients Services: EPOPROSTENOL (EPOPROSTENOL Protocol”. Policy #17-75 Revision date 2004


SMH Policies.
Transportation and Monitoring of Patients (01.PAT.23)
Handoff Communication Guidelines (01.PAT.25)

Nursing and Pharmacy Protocol for the Administration of IV Remodulin® (Treprostinil) (126.226)


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ATTACHMENT(S):
NONE
APPROVALS:

Signatures indicate approval of the new or reviewed/revised policy

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**Title:** Dave Jungst, Director, Pharmaceutical Services

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**Committee/Sections (if applicable):**

- Pharmacy and Therapeutics Committee: 9/27/17
- Clinical Practice Council: 10/12/17

**Vice President/Administrative Director (if applicable):**

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**Name and Title:**

- Lorrie Liang, Chief Operating Officer

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**Name and Title:**

- Connie Andersen, Vice President/Chief Nursing Officer