

Department of Pharmacy Guidelines

SUBJECT: EPOPROSTENOL (FLOLAN[®]) INFUSION IN ADULTS

PURPOSE: To provide guidelines for the safe and appropriate transition from home-supply to hospital supply of the pulmonary hypertension medication epoprostenol. These guidelines will also cover the safe initiation of epoprostenol for chronic use.

INFORMATION:

- I. According to hospital policy, it is preferred that epoprostenol intravenous continuous infusions only be initiated or continued in an adult intensive care unit (preferably MICU, CCU, or CTICU) or 6 North telemetry bed.
- II. Initiation (for chronic use):
 - A. Initiation should be performed under the direction of a pulmonary hypertension specialist or with direct consultation from a cardiologist or pulmonologist (required upon admission in patients already on therapy).
 - B. Before any epoprostenol doses may be sent from Pharmacy, appropriate paperwork must be completed and reimbursement approval must be obtained from the home infusion service supplying epoprostenol (ACCREDITO or CuraScript IP). Copies of the application process may be obtained by contacting [1-800-9FLOLAN](tel:1-800-9FLOLAN) or [1-866-474-8326](tel:1-866-474-8326). Once approval is obtained provide a copy of approval confirmation to Pharmacy IV Admixtures. In situations deemed life threatening by the attending physicians exceptions to this enrollment criteria are allowed.
 - C. The decentralized pharmacist will review each order and document the following in the SCM order and in the patient's medical record:
 - i. Dose in nanograms/kilogram/minute (ng/kg/min)
 - ii. Patient's dosing weight (The weight when first initiating epoprostenol will serve as the dosing weight for **all** future epoprostenol dosing, IT DOES NOT CHANGE).
 - iii. The concentration (ng / mL) of the epoprostenol bag.
 - iv. The rate to be administered in mL / hour and mL / 24 hours.
 - v. All dose calculations require a double check by another pharmacist
 - D. 24-hour dose prepared by Pharmacy:
 - i. Standard starting concentrations are 5,000 or 10,000 nanograms / mL.
 - ii. Concentration is selected based on the patient's weight and planned titration schedule. But bags should last a full 24 hours and use no more than 84 mL from the 100 mL bag.
 - E. Ice-packs will be provided by pharmacy (entered as a medication order) and should be charted on the MAR when changed (every 8 hours).
 - i. **See Administration section for additional comments**
 - F. Initiate epoprostenol at no more than 2 nanograms / kg / min
 - G. Increase in increments of 2 nanograms / kg / min every 15 minutes until dose-limiting pharmacologic effects occur: nausea, vomiting, diarrhea, anxiety, headache, abdominal or jaw pain, hypotension, dizziness, flushing, bradycardia, chest pain, and or dyspnea.

- H. Once symptoms occur, call physician to report symptoms and decrease infusion by 2-4 nanograms / kg / min.
- I. If the maximum tolerated dose is ≤ 5 nanograms / kg / min, then begin chronic maintenance dose at one-half the maximum tolerated infusion rate.
- J. Epoprostenol bottles may not last 24 hrs during titration. Doses above 5 ng / kg / min or for patients weighing greater than 90 kg a change in epoprostenol concentration will be required for maintenance infusion.
- K. A change in concentration may be warranted at any time that daily infusion is greater than 86 mL / 24h.
- L. The rate of epoprostenol in ng / kg / min, ml / 24 hours, and mL / hr, as well as the patient's dosing weight will all be documented on the MAR and within the SCM order.

III. Maintenance/Continuation of Therapy:

- A. Patients may use own Continuous Ambulatory Delivery Device (CADD) pump and medication for up to 24 hours after admission.
- B. **Do not** discontinue existing epoprostenol infusion until new drug supply from Pharmacy is available.
- C. Determine home epoprostenol prescription by calling 1-800-9FLOLAN (Clinical support desk for epoprostenol available 24 hours, 7 days a week). Obtain the following information for the patient.
 - i. Dose on file in **nanograms / kg / min**
 - ii. Dosing weight in kg (Note: this weight may differ from current weight but infusion calculations are ALWAYS based on the initial dosing weight)
 - iii. Concentration of CADD pump cassette in **nanograms / mL**
 - iv. Rate of CADD infusion per day in **mL / 24 hours**
 - v. Number of 0.5 mg epoprostenol vials used per day (blue)
 - vi. Number of 1.5 mg epoprostenol vials used per day (red)
 - vii. Number of diluent vials (50 mL) used per day
- D. **Always confirm this information with the patient/caregiver** by speaking with them and documenting the infusion settings on the CADD pump. The prescription on file at the specialty pharmacy may not reflect current dosing.
- E. The rate of epoprostenol in nanograms / kg / min, ml / 24 hours, and mL / hr, as well as the patient's dosing weight will all be documented in the SCM order and in the patient medication record.

IV. Administration:

- A. Obtain a secondary means of IV access, either central or peripheral line prior to initiation. This is also necessary on admission for maintenance / continuation of home therapy.
- B. **Do not interrupt epoprostenol infusion.**
- C. Do not FLUSH central line containing epoprostenol.
 - i. Label epoprostenol IV tubing and central line lumen with "Do not flush" sticker.
- D. No other medications should be administered through the same line.
- E. Do not change dose based on daily weights.
 - i. Use dosing weight determined at initiation of epoprostenol (on file with ACCREDO). **Note** – this weight may be significantly different than patient's current weight.
- F. Patients may use own CADD pump and medication for up to 24 hours after admission. If their hospital stay is anticipated to be greater than 24 hours, they will be converted within that 24 hour time period to hospital supply of epoprostenol and administered with hospital infusion pumps.

- i. A secondary infusion pump must be available in the patient's room at all times in case of primary pump failure.
- G. If the patient was receiving epoprostenol prior to admission, the patient's home concentration and infusion rate will be used.
- H. Change IV tubing every 96 hours.
- I. Change epoprostenol bag at every 24 hours at the "Universal Flolan Time of 10:00am".
- J. Medication will be in an insulated bag with ice packs cooling it (insulated bag provided by pharmacy).
 - i. Change ice pack every 8 hours and chart on eMAR.
 - ii. Ice packs will be delivered by pharmacy.
- K. Epoprostenol stability information
 - i. 8 hours at room temperature.
 - ii. 24 hours when cooled with ice packs.
 - iii. In the refrigerator for 48 hours.
 - 1. Bags should come from pharmacy with a 48 hour expiration and indication of which day the dose is due
 - 2. The first 24 hours on the floor the dose is in the refrigerator as a back-up bag, and the next day at 10:00 am the bag is hung.
- L. There will be a backup dose of epoprostenol in the refrigerator at all times due the very short half-life of epoprostenol and the possibility of life-threatening rebound pulmonary hypertension if infusion is abruptly discontinued.
 - i. This back-up bag will be the same concentration as the bag currently being administered **and** will serve as the next day's dose **or** for use in the event of unanticipated depletion or interruption of current epoprostenol infusion.
 - ii. This back-up bag should be located and documented at the beginning of each nursing shift change.
 - iii. Please let pharmacy know about anticipated discharges by 2pm to avoid the loss of an additional dose. Verify that the patient has home supply to transition to.

V. Calculations:

- A. Verify the concentration of the patient's home CADD cassette (This concentration should correlate with the concentration provided by the specialty pharmacy):
 - i. Patients is instructed to mix based on the number of vials:
 - 1. Number of 0.5 mg (red) epoprostenol vials/day x 0.5 mg = **A**
 - 2. Number of 1.5 mg (blue) epoprostenol vials/day x 1.5 mg = **B**
 - 3. Total dose (**C**) = **A + B**
 - ii. Concentration (mg/mL) = **C** ÷ by volume (mL) of diluent in CADD cassette (usually 100 mL) = **D** mg / mL
 - iii. **D** x 1,000,000 (ng/mg) = **E** ng / mL
- B. Convert Patient's CADD pump rate (**mL / 24 hours**) to a dose in **ng / kg / min** (This rate should correlate with the rate provided by specialty pharmacy and/or the way the patient is currently administering the medication).
 - i. **E** (ng / mL) x CADD pump rate (mL/24 hours) = **F** ng / 24 hours
 - ii. **F** (ng / 24 hours) ÷ by 24 hours in a day = **G** ng / hour
 - iii. **G** (ng / hour) ÷ 60 (min / h) = **H** ng/min
 - iv. **H** (ng / min) divided by patients dosing weight (kg) = **I** ng / kg / min
- C. Convert CADD pump rate which is in **mL / 24 hours** to the standard infusion pump which is mL / hour.
 - i. CADD pump rate of mL/24 hours ÷ 24 hours = **J** mL/hour (round to one decimal place, ex. 1.76 mL/h ~ 1.8mL/h)

VI. If additional questions, please contact:

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VII. Approved: _____ Authorized: _____
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