PAIN MANAGEMENT THERAPY:

INTRAVENOUS PATIENT CONTROLLED ANALGESIA (PCA);
INTRAVENOUS CONTINUOUS INFUSION ANALGESIA
by Alaris Module™

POLICY:

On initiation of the PCA module or any time there is a change in prescription (i.e., rate change, bolus ordered), two (2) RNs must verify module settings with the Physician Orders. Signature of both RNs on the IV Patient Controlled Analgesia Alaris™ PCA Module Form verifies the module settings and medication dose have been reviewed.

Assessment of the respiratory rate, level of consciousness, and pain intensity rating is to be done immediately prior to initiation of the IV PCA module, every 30 minutes x 2, then every four (4) hours throughout the administration of the IV PCA or more frequently, as indicated by the patient’s condition.

Assessment of the respiratory rate, level of consciousness, and pain intensity rating for non-patient controlled analgesics administered as a continuous infusion is to be performed immediately prior to initiation of the IV infusion, every 30 minutes x 2, then every four (4) hours throughout the administration of the IV infusion or more frequently, as indicated by the patient’s condition.

The respiratory rate and pain intensity level are to be documented in the electronic medication system (MAC), on the Pain and PRN Medication and Response Form, or electronic form as applicable.

Assessment of the patient is to be done and documented at the time the patient is transferred to another unit and upon arrival to the new unit. The nurse from the sending unit documents assessment needs at the time of transfer. The nurse on the receiving unit assesses the patient and documents when the patient arrives on the unit.

The IV PCA medication expiration date is labeled by the Pharmacy on the syringe. (Refer to MedProc 13 – IV Medication Administration.)

Intravenous PCA tubing must be changed every 72 hours.

The RN responsible for the patient must document the controlled substance count at the end of each shift. The nurse must record the amount of medication infused and the amount of medication remaining. These amounts are to be recorded on the IV Patient Controlled Analgesia Alaris™ PCA Module Form. The beginning shift RN (or permanent assigned RN) must review and verify module settings. Both RNs will sign the IV Patient Controlled Analgesia Alaris™ PCA Module Form to verify module settings and medication dose.

A new IV Patient Controlled Analgesia Alaris™ PCA Module Form must be started with each new syringe.
Waste of a controlled substance must be physically observed by a witness and recorded with signature of the witness on the **IV Patient Controlled Analgesia Form**. (Refer to MedProc.15, Waste and Disposal of Controlled Substances.)

A patent IV site must be established prior to initiating Peripheral Pain Management Therapy. It may be necessary to establish a separate infusion site if drug compatibility is of concern. An IV rate rapid enough to keep the vein open and serve as a carrier fluid is recommended (i.e., 20 mL / hr. for an adult) or as ordered by the physician. **(Intravenous Patient Controlled Analgesia Orders For Use with the Alaris™ PCA Module.)**

Patient Controlled Analgesia (PCA) module settings must be verified with the physician’s order by two (2) Registered Nurses when:

1. PCA module is initiated
2. shift changes
3. change in permanent nursing assignment
4. medication changes including:
   A. additional bolus
   B. continuous infusion rate change
   C. one-hour maximum limit change
   D. PCA dose change
   E. End of syringe / Begin new syringe

Both the RN and RN witness must sign the **IV Patient Controlled Analgesia Alaris™ PCA Module Form** to verify PCA module settings.

**Only** the following individuals may witness and sign for PCA controlled substance waste:

- Registered Nurses
- Licensed Practical Nurses
- Pharmacists
- Physicians

**PERSONNEL:**

- Registered Nurses

After additional education and training, an RN may:

- Verify solution
- Regulate flow
- Maintain infusion
- Adjust PCA Dose
- Change IV PCA syringe
- Administer medication as ordered
**DEFINITIONS:**

**Bolus** – A one-time additional dose, as ordered. The patient receives this dose in addition to the PCA dose or basal rate.

**Continuous Rate** – The on-going consistent rate (continuous) that the patient receives per physician order.

**Cost Center** – Both the hospital/facility and department numbers* of the unit where the PCA pump is in use. GHS hospital/facility numbers are:

- 03 – Hillcrest Memorial Hospital
- 04 – Greer Memorial Hospital
- 05 – Cottages at Brushy Creek
- 07 – Marshall I. Pickens Hospital
- 08 – Greenville Memorial Hospital (including Ambulatory Infusion Center)
- 10 – Roger C. Peace Rehabilitation Hospital
- 18 – Cross Creek Surgery Center
- 27 – North Greenville Hospital
- 33 – RCPRH Subacute
- 43 – Patewood Outpatient Surgery Center
- 46 – Patewood Memorial Hospital

* Obtain the department number from the Nurse Manager.

**Lock Out Interval** – The minimal time allowed between PCA doses (minutes). The patient cannot receive a dose during this time.

**Maximum Limit (One-Hour)** – The amount of medication the patient can receive in one hour per physician order. The one-hour limit cannot exceed continuous rate plus the total possible doses the patient can self-administer within that one hour.

**PCA Dose** – The patient-activated dose that the patient receives when using the PCA control device (e.g., presses the button).

**Priming Amount** – Amount of medication used to prime the PCA tubing to expel air.

**SUPPORTIVE DATA:**

- GHS Medical Staff By-Laws, Rules and Regulations
- GHS Medical Staff Policies – Patient Management, Medical Record: Section 15: Orders Following Procedures/Surgery; Section 16, Rewrite of Orders
- GHS Nursing Staff Policies and Procedures:
  - IVD Device 1 – Administration, Insertion and Maintenance of Intravenous Therapy
  - IVD Device 10 – Intravenous Catheter, Insertion of
  - IVD Device 11 – Intravenous Therapy and Maintenance
• Physician Orders: **Intravenous Patient Controlled Analgesia (PCA) Orders** – For use with Alaris™ PCA Module Pain

• Pain and PRN Medication & Responses Form

• **IV Patient Controlled Analgesia Alaris™ PCA Module Form**

**DESired Outcome:**

• Appropriate management of acute postoperative pain, acute pain, chronic pain, and/or advanced cancer pain.
• Safe patient care including prevention of respiratory depression during analgesic infusion therapies using a PCA module.
• Proper documentation of control substance usage/wastage.

**Infection Control:**

Follow standard precautions.

**Equipment:**

1. Physician order: **Intravenous Patient Controlled Analgesia (PCA) Orders – For Use with Alaris™ PCA Module**
2. Lockable infusion device (i.e., PCA module) or IV Syringe module (i.e., Pediatrics and Critical Care Units)
3. PCA Administration Set for Alaris™ PCA module (obtain from Omni Cell or Material Services)
4. Prescribed medication syringe (from Pharmacy or Pyxis Medstation, as applicable)
5. **IV Patient Controlled Analgesia Alaris™ PCA Module Form** (Pharmacy sends with Controlled Substance syringe)
6. Pain and PRN Medications & Responses Form (or other electronic form)

**Possible Side Effects of IV PCA Infusions:**

1. Nausea/vomiting
2. Pruritus
3. Excessive drowsiness
4. Respiratory depression
5. Hypotension
**PROCEDURE:** Setting up an IV PCA Module

<table>
<thead>
<tr>
<th>STEPS</th>
<th>KEY POINTS</th>
</tr>
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<tbody>
<tr>
<td>1. Review the physician order and gather equipment. Review written instructions provided by the manufacturer to program the module.</td>
<td>1. Carefully check the physician’s order and verify drug concentration to be administered since the concentration varies from drug to drug. If preprinted orders are used, these may include orders for control of side effects, i.e., excessive sedation, pruritus, nausea, vomiting, urinary retention, and mental status changes.</td>
</tr>
<tr>
<td>2. Wash hands in view of patient.</td>
<td>3. It is important that patient and family understand that the PATIENT is to be the only one to control the medication administration by pressing the PCA button.</td>
</tr>
<tr>
<td>3. Identify the patient and explain the pain management therapy to the patient/family.</td>
<td>4. Frequent assessment provides data for early diagnosis of complications such as respiratory compromise so interventions may be implemented.</td>
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<tr>
<td>4. Assess patient per policy</td>
<td>A decrease in respiratory rate and/or depth, and/or excessive drowsiness may precede respiratory depression. A manual resuscitation bag ( Ambu) and narcotic reversal agent, i.e., naloxone (Narcan) must be immediately available at all times.</td>
</tr>
<tr>
<td>5. Use the PCA Administration Set to connect pain medication syringe to a compatible IV fluid.</td>
<td>5. A primary infusion must be connected to the IV PCA therapy. An IV rate of at least 20 mL per hour is recommended unless otherwise ordered for fluid restricted patients. This ensures continuous delivery of the medication.</td>
</tr>
<tr>
<td>6. Connect the compatible IV fluid to the short tubing with the white anti-siphon valve. Prime the IV fluid portion of the PCA administration set.</td>
<td>6. The PCA Administration Set has a anti-siphon valve in the short tube to prevent the medication from being routed/mixed into the primary IV fluid.</td>
</tr>
<tr>
<td>7. The pain medication syringe is connected to the longer tubing with a purplish connector end. After expelling air from the syringe, clamp the PCA tubing before placing the syringe in the lockable infusion device. Release the clamp and prime the infusion tubing according to the</td>
<td>7. The patient must not be connected to the infusion set during the priming steps.</td>
</tr>
</tbody>
</table>

To ensure an accurate controlled substance count, prime the tubing using the infusion device. Document the “Total Volume” as listed on the PCA syringe. Document the priming amount on the
**STEPS**

manufacturer's guidelines.

8. Program the infusion module as prescribed. When initiating therapy or placing a new syringe, clear the previous history.

When changing syringes (e.g., end of syringe or syringe empty), ensure that the patient history is **obtained and documented** before clearing the pump.

9. Program the infusion module as prescribed, including drug concentration, mode*, PCA dose, lock out interval; Continuous Dose (Basal); maximum limit; and loading dose, if ordered.

*PCA Dose only, Continuous Infusion, PCA Dose + Continuous, or Loading Dose Only

**KEY POINTS**

Patient Controlled Analgesia Alaris™ PCA Module Form.

8. Clearing the previous history provides an accurate intake for the patient and documentation of controlled substances.

This history is required for appropriate / legal record keeping. When the pump is cleared, retrieval of this data is not possible.

9. **Loading Dose** – A one-time dose the patient receives when the module is started.

**PCA Dose** (intermittent dose) – The patient-controlled dose that the patient receives when he/she presses the PCA button (control device).

**Continuous Dose** – The continuous, on-going rate that the patient receives (also called basal).

**Lock Out Interval** – The minimum period of time allowed (minutes) between PCA doses. The patient will not receive a dose during the lock out interval even if the PCA button is pressed by the patient during this time.

**Maximum Limit** – The amount of medication the patient can receive in a designated period of time (i.e., one hour). The maximum limit may be equal to the continuous rate plus the total possible PCA doses the patient can self-administer within that time.

**NOTE:** The maximum one-hour limit cannot exceed the possible maximum dose of the continuous rate plus the total possible PCA doses the patient can self-administer within that time.

**Example order:**

Continuous rate: 1 mg / hour
PCA dose: 1 mg / 6-minute delay
Total hourly dose: 11 mg
Total maximum 1-hour doses = 1 + 10 = 11 mg
**STEPS**

10. Verify the drug, dose and settings with another Registered Nurse, connect to the patient, confirm, and start the infusion. Document verification on the [IV Patient Controlled Analgesia Alaris™ PCA Module Form](#).

11. Continually assess for side effects and administer ordered medications as needed (i.e., for nausea, vomiting, pruritus).

12. Observe dressing, tubing and tubing connections every shift and PRN to ensure they are dry, intact and tight.

13. Observe skin around catheter site.

**KEY POINTS**

10. Do NOT program a pump with a maximum hourly amount greater than the possible sum of the maximum hourly rate ordered. A message screen will appear if this occurs.

A physician may order less than the maximum dose possible. Example:

Continuous rate: 1 mg / hour  
PCA dose: 1 mg / 6-minute delay  
Total maximum 1-hour dose = 8 mg.

Do NOT program the pump for more than the ordered maximum hourly dose. (In the example above, the physician does not want the patient to exceed 8 mg/hour even though the pump could deliver more based upon the calculation of PCA dose + time + continuous dose. Call the physician if more than 8 mg is needed to control the patient’s pain level.)

Verify the dose with the physician if there are any questions.

10. Two (2) RNs must visually witness and verify module settings and then document verification of the drug, dose and module setting, and signatures.

11. Be familiar with preprinted order sets, including medications that may be ordered for treatment of side effects.

12. Provides opportunity to observe for signs and symptoms of infection or IV site.

13. In case of unrelieved pain, reassess the catheter site and all connections to ensure intact connections and no crimping of tubing that would impede the flow of medication.

14. **How to administer a Bolus:**

14. Two (2) RNS must visually witness and verify module settings and then document verification
**STEPS**

- Press Channel Select
- Go to Guardrails Drug Set Up
- Press Bolus
- Program according the manufacturer’s guidelines
- Document each time a Bolus is given on the **IV Patient Controlled Analgesia Alaris™ PCA Module Form.**

**KEY POINTS**

- of the bolus dose, module settings and signatures.

15. The RN responsible for the patient during the shift and oncoming shift RN or change in the permanent assigned RN review, document, and clear the shift count at the change of shift or at the end of a syringe to ensure accurate programming and documentation.

The ending shift and beginning shift RNs or change in the permanent assigned RN must review, document and clear shift totals.

The detailed history maybe included in a Focus Note if appropriate.

16. Notify the physician of any problems (i.e., inadequate pain control, excessive sedation, severe hypotension) or other side effects uncontrolled by medications ordered on the PCA Order (i.e., pruritus, nausea).

16. The IV PCA is ordered and maintained by the surgeon/resident.

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15. At the end of each shift, or at the end of a syringe, collect the history data and document.

- Record VTBI (mL)
- Press channel select to review Summary
  - PCA Dose (mg)
  - Lockout time
  - Continuous (cont) dose (mg)
  - Max Limit (mg)
- Press Options
- Press Patient History
  - Last Cleared (Time)
  - Total Drug (mg)
  - Total Demands (number of times)
  - Delivered (number of times dose actually received by patient)
- Press Detail for more information regarding the history
- Press Main History

**TO CLEAR HISTORY:**

- Press **Clear History** key
  - A confirmation screen will appear.
  - Press YES to clear history.
  - To cancel, press NO

Document the history data before clearing the pump. After the pump is cleared, there is no mechanism for retrieval of the history data.
NOTES:

1. If the patient becomes very lethargic (difficult to arouse) or is experiencing **respiratory depression**, the following steps must be taken:

   **A. STOP THE INTRAVENOUS PCA INFUSION.** Stay with the patient, support ventilations, and call for assistance.

   **STEPS**

   If the patient has signs or symptoms of respiratory depression:

   1) Stop PCA infusion (Channel Off).
   2) Stimulate patient to breathe (follow BLS ABC’s—Airway, Breathing, and Circulation).
   3) Call a CODE if necessary.
   4) Ensure that the patient has a patent airway (jaw thrust, chin lift, head/neck position, etc.).
   5) Contact the physician who ordered the medication.
   6) Notify the Respiratory Care Practitioner for additional patient assessment/intervention.
   7) Administer reversal agents as prescribed by physician.
   8) Consider arterial blood gas (as ordered by physician).

   **KEY POINTS**

   Respiratory depression is characterized by:

   - Shallow breathing
   - Slow respiratory rate
   - Elevated EtCO₂
   - Difficult to arouse
   - Reduced response to verbal, tactile, and/or painful stimuli

   **7)** If a reversal agent must be given:

   Following administration of a reversal agent for narcotics (i.e., Narcan), the patient must be monitored for 90 minutes.

   **B. Administer Naloxone (Narcan) as ordered.** (May be titrated for effect until the patient’s respiratory status is improved. If given too rapidly, the patient may be returned to severe pain.)

   **C. Notify the ordering physician.**
2. If the patient becomes profoundly hypotensive (i.e., systolic pressure < 90, or compared to the patient’s usual blood pressure), STOP INTRAVENOUS PCA INFUSION and notify the patient’s surgeon/resident/medical physician as appropriate. Place the patient in supine (flat) position and administer IV fluids as prescribed. Expect an order for IV fluid bolus.

3. Patients who are opioid naïve or sensitive to sedating medications may require closer observation. Use nursing judgment in assessment and administration of medications when this type of patient is ordered / receiving multiple medications with sedative effects.

**CHANGING THE PCA SYRINGE:**

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<tbody>
<tr>
<td>1. Obtain a new syringe of medication and check the medication and concentration against the physician’s order.</td>
<td>1. Ensure a new syringe is available in a timely manner when needed by patient. This will prevent increased pain as a result of having to wait for replacement medication. The module will sound a warning when the syringe has 25% remaining solution.</td>
</tr>
<tr>
<td>2. Obtain the history from the old syringe and document. Remove the old syringe and replace with the new syringe, following the manufacturer’s recommendations.</td>
<td>2. To ensure appropriate documentation. Ensure sterile technique is used when connecting the new syringe. Also ensure that the tubing is not crimped or clamped to impede flow.</td>
</tr>
<tr>
<td>3. Complete the <strong>IV Patient Controlled Analgesia Alaris™ PCA Module Form</strong> by recording the amount infused and the amount remaining. Waste any remaining medication per waste procedure.</td>
<td>3. With a witness, note the amount of solution remaining and waste it in the sink with running water or by flushing waste into a toilet. Both the RN wasting and the RN or LPN witnessing the wastage must sign the Patient Controlled Analgesia form in the space provided at the bottom of the form.</td>
</tr>
<tr>
<td>4. Clear the history each time a new syringe is started. Verify module settings with a second RN and continue as appropriate.</td>
<td>4. Clearing the module at the beginning of each new syringe ensures appropriate counts.</td>
</tr>
<tr>
<td>5. If the prescription has changed, reprogram he module according to physician’s order.</td>
<td>5. Review the new module settings to verify the continuous rate, PCA dose, Lock Out interval, and maximum one-hour limit.</td>
</tr>
<tr>
<td>6. Verify the drug dose and settings with another Registered Nurse.</td>
<td>6. Document verification on the Patient Controlled Analgesia or Controlled Substance form with signatures of the two Registered Nurses who verify the settings.</td>
</tr>
</tbody>
</table>
7. Confirm and restart the infusion.

8. Start a new **IV Patient Controlled Analgesia Alaris™ PCA Module Form** with each new syringe of medication.

9. **END of Syringe Accountability** –

   The nurse will verify the drug totals on the PCA form at the end of the syringe to ensure these numbers correspond to the amount delivered by pharmacy. Report any problems.

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**TRANSFER OF PATIENT TO ANOTHER UNIT for Transfer of Care with an IV PCA**

When a patient is transferred to another patient care unit /level of care, the RN on the receiving unit will be responsible for checking and changing the patient profile and the cost center. The programming module must be powered down and turned back on to change a profile and the IV PCA must be reprogrammed.

**Transfer of patient using the same pump as in the previous area:**

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<tr>
<td>1. Obtain history and document on the <strong>IV Patient Controlled Analgesia Alaris™ PCA Module Form</strong>.</td>
<td>1. To prevent loss of IV PCA medication totals. The nurse from the sending unit and admitting unit will do this procedure together.</td>
</tr>
<tr>
<td>2. Power down all channels.</td>
<td>2. Must be done to change patient care unit and/or level of care.</td>
</tr>
<tr>
<td>3. Press “System ON” on the Alaris™ pump.</td>
<td></td>
</tr>
<tr>
<td>4. At the New Patient screen press NO.</td>
<td>4. NO retains previous Patient Data.</td>
</tr>
<tr>
<td>5. Select appropriate care unit/ level of care (refer to IVDevice 4 Alaris™ IV Infusion Pump, Use of.)</td>
<td>5. Entering hospital number and unit cost center will ensure there is a change in the care unit/ level of care. (Refer to “Definitions” section of this procedure for Cost Center definition.)</td>
</tr>
<tr>
<td>6. Program the IV PCA module according to “Setting Up a PCA Module” section on page 5.</td>
<td></td>
</tr>
</tbody>
</table>
Transfer of patient and changing to a new Alaris™ pump:

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<td>1. Obtain history and document on the IV Patient Controlled Analgesia Alaris™ PCA Module Form.</td>
<td>1. To prevent loss of IV PCA medication totals. The nurse from the sending unit and admitting unit will do this procedure together.</td>
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<td>3. Press “System ON” on the Alaris™ pump.</td>
<td></td>
</tr>
<tr>
<td>4. At the New Patient Screen, press Yes.</td>
<td>4. History from a previous patient will be deleted.</td>
</tr>
<tr>
<td>5. The care unit and level of care remain the same.</td>
<td></td>
</tr>
<tr>
<td>6. Program the IV PCA module according the Setting Up an IV PCA Module section on page 5.</td>
<td></td>
</tr>
</tbody>
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NOTES:

The amount of controlled substance must be accounted for by the nurse responsible for the patient during infusion of the medication. The IV Patient Controlled Analgesia Alaris™ PCA Module Form must be completed at the time of patient transfer, including the following information: amount of drug remaining, amount infused, and current module settings. Also document, “Patient transferred to room # ___.

Documenting the patient room number allows the pharmacy to track the drug.

Send the Patient Controlled Analgesia Form with the patient.

When a patient is transferred from one unit to another for a permanent change in caregiver (transfer of care), an RN from the sending unit will accompany the patient and an RN from the receiving unit will accept the patient. These two RN’s will verify module settings together and document on the Controlled Substance Form, then clear the module settings.

Note: The RN on the receiving unit should make every effort to be ready and available to accept the patient on arrival to the unit to minimize the time the sending unit nurse is away from her/his unit.

At the time of transfer, the sending RN and the receiving RN will document a patient assessment, including pain intensity rating, respiratory rate, and a level of consciousness on the appropriate pain assessment / medication response nursing forms, computerized documentation form, or other unit specific form as applicable.

DOCUMENTATION:
1. Document the controlled substance count at the end of each shift and at the end of a syringe on the IV Patient Controlled Analgesia Alaris™ PCA Module Form. Document each syringe on a separate form specific to that syringe.

2. Document the patient assessments every four (4) hours on the Pain and PRN Medication and Responses Flow Sheet or computerized documentation system.

3. Document any changes as ordered in infusion rate, bolus given, etc., on the IV Patient Controlled Analgesia Alaris™ PCA Module Form; or computerized documentation system.

4. Document the education and instruction provided to the patient and family on the Interdisciplinary Patient/Family Education Form, other appropriate unit-specific form, or computerized documentation system.

PATIENT TRANSFER TO SURGERY:

When a patient transfers to Surgery, the PCA must be discontinued prior to the patient leaving the unit. *(This practice is directed by the GHS Medical Staff policy “Patient Management” (p. 39, 15 and 16), which indicates that medications are discontinued when a patient goes to surgery; and “following surgery or a procedure . . . shall require a rewrite of the orders by the responsible practitioner”.)*

Any remaining controlled substance must be wasted with a witness visually witnessing the waste. The waste must be recorded on IV Patient Controlled Analgesia Alaris™ PCA Module Form.

Documentation of the waste must include the date, amount of the waste, explanation of why and location (i.e., sink with running water or flushing toilet), medication wasted, signature of person wasting and the signature of the person witnessing the waste.

REFERENCES:


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