POLICY: ANALGESIA: PATIENT-CONTROLLED ANALGESIA MEDICATION (PCA)/END-TIDAL CO2 MONITORING

POLICY SUMMARY/INTENT:

A. To provide an outline for nursing management of adult patients receiving self-administered analgesia via intravenous infusion.

B. To provide a non-invasive method of measuring End-Tidal CO2.

DEFINITIONS:

ETCO2: End Tidal CO2.

AFFECTED DEPARTMENTS/SERVICES:

RN, MD, Pharmacist, and Respiratory Care.

POLICY: COMPLIANCE – KEY ELEMENTS

A. When ordered by a physician, parenteral analgesics may be delivered for pain control via PCA Pump on any adult unit.

B. Maintenance of PCA and Patient Education is the responsibility of the MD or the RN who has received in-service training in the operation of the PCA Pump.

C. An LVN or NA may care for the patient but it is the RN's responsibility to monitor the effectiveness and proper functioning of the PCA Pump.

D. Patient education should occur pre-operatively.

E. The PCA Pump settings shall be set and changed only by an RN, as ordered by a physician.

F. A PCA Vial may not remain in use beyond 72 hours. After 72 hours, a new PCA Vial must be used.

G. PCA tubing set will be changed within 72 hours at the time of PCA vial change.

1. *See Alaris System Operating manual for Operational Instructions.

https://www.lucidoc.com/cgi/doc-gw.pl?ref=ahwmmc:18732

6/14/2016
H. PATIENT SELECTION CRITERIA:

1. Patient should meet the following criteria to be eligible for PCA:
   a. Require parenteral analgesia.
   b. Require pain relief, e.g.:
      i. Post-operatively,
      ii. as a result of trauma, and/or
      iii. Due to chronic pain, e.g., terminal cancer.
   c. Mentally alert, with a clear sensorium.
   d. Mentally and physically capable of understanding and operating the PCA Infuser.
   e. No history of allergy to the proposed analgesic.
   f. Specialized patient selection will be made by the attending physician on an individual basis.

2. PCA Therapy may require special attention for patients in the following categories:
   a. History of chronic narcotic addiction, alcoholism or other substance abuse.
   b. Chronic use of sedatives, tranquilizers or alcohol.
   c. Having neurological or psychological conditions, which limit their ability to self-administer medication.
   d. Respiratory impairment or disease which could be exacerbated by narcotic analgesia.

I. PROCEDURE:

1. To order Patient Controlled Analgesia for a patient, the physician will fill out the Patient Controlled Analgesia Order Sheet.
   a. Order sheets may be obtained from Stock Room.

2. Verify patient identification.

3. Make sure patient has a well-established IV line.

4. Instruct patient on proper use of PCA.

5. Order PCA Infuser and tubing from Central Service.
   a. Double-check medication vial with Doctors' order.

6. Obtain prescribed analgesic from Pharmacy.
   a. PCA Infuser key is kept on the unit key ring

7. Plug power cord into the outlet

8. Attach PCA Infuser to IV pole and unlock security door

9. Take analgesic out of box and screw plunger onto vial. Expel air from injector

10. Attach PCA tubing to medication vial.
11. Prime PCA tubing with medication solution from vial and close slide clamp.
12. Disconnect IV tubing from IV device at catheter site and connect IV tubing to lower Y site of PCA tubing
13. Use IV Solution to prime remaining portion of PCA Y site.
14. Connect PCA tubing to IV catheter and resume IV administration.
15. Load Vial/Injector into PCA Infuser. (See System Operating Manual for complete pump instructions including warning and cautions).

J. CARE OF THE PATIENT:

1. Follow order for (PCA) Patient-Controlled Analgesia (see attached sample).
2. Assess patient every 4 hours and pm for the following:
   a. Patient's vital signs (T.P.R. & BP). Check V.S. more often if patient's condition warrants it or if the physician orders more frequent V.S. checks
   b. Pain severity (see scale in Pain Management), level of sedation and allergic reactions.
      i. a. IV may be occluded or infiltrated, tubing may be kinked or patient may not be pressing the button.
   c. If patient persistently complains of inadequate analgesia, check integrity of IV site and number of doses administered.
      i. a. Notify physician of inadequate pain relief.
   d. Excessive somnolence, nausea and vomiting, and urinary incontinence.
3. Have Narcan and Ambu bag readily available at all times.

K. DOCUMENTATION BY RN:

1. Chart on PCA Record the loading dose given and by whom.
2. At the end of the shift, record on the PCA Record the total volume (number of mg/shift total of medication received including loading dose that may have been given during the shift.
3. Chart in Cerner System V.S., level of sedation, effectiveness of analgesia, and time PCA is discontinued.

L. END TIDAL CO2 MONITORING:

1. RT will monitor these patients Q4h; RNS to assess Q4h while patient is on pump.
2. Used with PCA infusion of pain medication unless contraindicated, to evaluate trends in End Tidal CO2. The goal is to provide ongoing assessment of patient physiological response to PCA therapy and prevent harm from over-sedation.
3. Decreasing End Tidal CO2 indicates an increasing respiratory rate. Sudden loss of End Tidal CO2 indicates apnea. Evaluation of waveforms may be used to further interpret numerical values.
4. End tidal CO2 trending upwards - consider the following interventions:
   a. Ensure open airway
   b. Stimulate patient to breathe
c. Check cannula positioning

d. Consider decreasing to stopping PC

e. Notify physician

f. Administer reversal agents as ordered.

g. Consider ABG's as ordered by physician.

5. End Tidal CO2 is trending downward – consider the following interventions:

a. Check disposable End Tidal CO2 cannula is correctly attached to unit/patient.

b. Notify MD of change in patient condition.

6. End Tidal CO2 monitoring is not used:

a. In the terminally ill, DNR, patient for which PCA is utilized and/or indicated for comfort
   or symptom management.

7. End Tidal CO2 Alarm Settings:

a. Alarms should be set at appropriate levels per patient age and condition.

8. PROCEDURE: Set up of End Tidal CO2.

9. Non-Intubated Patient:

a. Apply the device as you would a nasal cannula.

b. Attach the O2 end to the oxygen source, as needed. If patient is receiving >5 liters of
   O2, use an O2 mask to deliver O2.

c. DO NOT cover the Nafton filter with tape or any other item.

10. Intubated Patient:

a. Attach the device between the ventilator and the ETT by firmly connecting the small
   end of the device to the female end of the Y piece; then firmly connect the patient's
   ETT connector into the larege end of the disposable airway adapter.

11. Humidified oxygen is CONTRA-INDICATED while monitoring ETCO2.

12. Troubleshooting:

a. Occlusion Alarm – Excessive patient secretion or a build-up of liquids in the airway
   tubing may occlude the sampling line.

b. First; attempt to disconnect the nasal tubing, and then re-attach.

c. If the alarm persists, change the nasal cannula tubing.

d. Consult RT if additional troubleshooting is required.

1. ** Staff is encouraged to refer to the Alaris System Directions for Use
   manual located on the Intranet or on the Nursing unit, as needed. Staff
   may also refer to the reference cards attached to the Alaris pump(s).

13. Alarm Settings Default:

a. High ETCO2 – 60mmHg
b. Low ETCO2 – 10mmHg  
c. High RR = 35  
d. Low RR = 6  
e. No Breath – 30 second

M. DOCUMENTATION:  
1. Respiratory will document in patient’s chart the following:  
   a. RR  
   b. ETCO2 reading  
   c. Will document any conversations with RN/Physician regarding ETCO2 concerns.  
2. Infection Control:  
   a. Use single patient sample kits.  
   b. Remove from patient room and place in soiled utility room when ordered to discontinue.  
   c. Clean per manufacturer’s suggestions.

REFERENCES:

CALIFORNIA:  
HAWAII: Not applicable  
OREGON: Not applicable  
WASHINGTON: Not applicable  

CORPORATE AUTHOR: Not applicable  
SITE SPECIFIC POLICY OWNER: Mgr Nursing Svc  
COLLABORATION:

APPROVED_BY: Not applicable  
CORPORATE:  
HOSPITAL: (03/14/2016) Quality Improvement Committee, (03/30/2016) Medical Executive Committee, (04/16/2016) Clinical Quality & Patient Safety (Sub-Committee of Governing Board),  
INDIVIDUAL:  
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