PATIENT POPULATION

Continuous cardiorespiratory monitoring is required for patients of any age who are deemed to be at high risk for apnea episodes. They may or may not be on a continuous opioid infusion. Respiratory depression in a patient with a continuous opioid infusion is often gradual in onset and accompanied by increasing sedation with or without changes in pulse oximetry. Apnea episodes however are often sudden in onset with little or no warning signs, may be worsened by opioid infusions, are often associated with oxygen desaturation and/or bradycardia (heart rate less than 100 for infants) and can be life threatening. For these reasons patients who require continuous cardiorespiratory monitoring must have a clinician assigned who is able recognize an alarm within 30 seconds and respond within 1 minute of the alarm sounding. Patients need to be monitored for 24 hours post-anesthetic. At 24 hours the patient must be assessed by the ordering physician to determine the need for ongoing apnea monitoring. Monitoring may ONLY be discontinued by a physician.

DEFINITIONS

Apnea — Apnea is defined as the cessation of respiratory airflow for 20 seconds.

Periodic Breathing: Periodic breathing is a pattern of respiration characterized by three or more respiratory pauses of three seconds or longer separated by normal breathing for less than 20 seconds. This is a normal occurrence in the newborn sleep cycle.

Symptomatic Apnea: Cessation of respirations for greater than 20 seconds with the presence of bradycardia (heart rate less than 80 beats per minute) and/or oxygen desaturation (less than 90% for 10 seconds or more)

<table>
<thead>
<tr>
<th>Problem/Potential Problem</th>
<th>Objectives</th>
<th>Anticipatory/Therapeutic Nursing Interventions</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Potential impaired gas exchange related to:</td>
<td>1. Child will maintain adequate gas exchange as evidenced by:</td>
<td>• Ensure immediate availability of emergency equipment including high flow oxygen, ABC box with appropriately sized airways, masks and bags for patients aged newborn to adult</td>
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<tr>
<td>• apnea episode</td>
<td>• Pink colour</td>
<td>• Ensure competence in providing bag/mask ventilation</td>
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<tr>
<td>• bradycardic episodes</td>
<td>• VS within normal limits</td>
<td>• VS with blood pressure every 4 hours and as needed</td>
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<td>• operative procedure and anesthetics</td>
<td>• Quality of respirations maintains SpO₂ &gt; 95%</td>
<td>• Assess respiratory status every hour and with all VS checks, this includes:</td>
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<td>• Arterial Blood Gases within normal limits</td>
<td>o respiratory rate</td>
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<tr>
<td></td>
<td>• Absence of bradycardia (heart rate less than 80 beats/minute)</td>
<td>o respiratory depth</td>
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<td></td>
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<td>o patency of airway</td>
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<td></td>
<td></td>
<td>o oxygenation</td>
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<td>• Maintain apnea monitoring continuously</td>
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<td>In the event of a:</td>
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<td>Apneic Episode</td>
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<tr>
<td></td>
<td></td>
<td>– Rouse the patient (i.e. stimulate)</td>
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<td></td>
<td></td>
<td>– Encourage breathing</td>
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Established: SEP 1992
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- Reposition patient using jaw thrust or small flannel roll underneath shoulder blades
- Check SpO₂; if less than 95% apply oxygen at 6-10 litres by face mask
- Auscultate heart rate; determine if patient is bradycardic
- Stop opiate infusion (if present)

- If patient continues to have apneic episodes, but responds to interventions:
  - Call RT to come and assess the patient
  - Call the most responsible physician to inform them of the patient’s status

**Symptomatic Apneic Episode**

In the event of desaturation or bradycardia during an apnea episode:

- Rouse the patient
- Encourage breathing
- Reposition patient using jaw thrust or small flannel roll underneath shoulder blades
- Stop opiate infusion (if present)
- Check SpO₂; if less than 95% apply oxygen at 6-10 litres by face mask;
- Auscultate heart rate; determine if patient is bradycardic
- Call RT to come and assess the patient
- Call the most responsible physician (according to the PEWS algorithm) to inform them of patient status and initiate a PICU consult

**If you are unable to rouse the patient and/or oxygen saturations are less than 90% on 6-10 litres of oxygen by facemask:**

- Call CODE Blue
- Begin Resuscitation Procedures
- If receiving an opiate infusion, give Naloxone as ordered

**NOTE:** Infants with *any* symptomatic episode of apnea require consultation with the PICU to discuss the most appropriate monitoring location.

**Assess and Document:**

- All apneic events, including duration, oxygenation, response to intervention as well as any associated characteristics or predisposing triggering events such as:
  - occurs during feeds
  - coughing
  - seizure
  - temperature instability
  - hypoxemia
  - sepsis
  - metabolic disturbance

- Response to interventions aimed at alleviating above triggers such as:
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<tr>
<td></td>
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<td>- Maintaining upright posture post-feeds</td>
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<td>- Response to medications</td>
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</tbody>
</table>
| 2. Actual or potential anxiety and loss of control, ineffective coping related to:  
  • hospital environment  
  • medical/ surgical procedures  
  • illness  
  • pain  
  • new diagnosis  
  • developmental stage  
  • past experience | 2. Refer to “Psychosocial Care Reference Care Plan” | Refer to “Psychosocial Care Reference Care Plan” |
| 3. Actual or potential ability to care for child at home by discharge from hospital related to:  
  • history or risk of apnea  
  • history of choking/ blue spells  
  • history of upper airway obstruction | 3. Family and primary caregiver(s) will demonstrate ability to provide care for patient in the home/ community as evidenced by:  
  • Demonstrated ability to effectively problem-solve an apneic episode in the home  
  • Ability to perform effective CPR if required  
  • Having appropriate equipment for apnea monitoring in the home as needed | • If ordered, complete Respiratory Therapy referral form for training in apnea management in the home  
• Ensure parents understand that irregular or periodic breathing is normal in infants and how this is different from apnea  
• Provide family with education about responding to apnea episodes at home  
• Collaborate with discharge planning nurse/ nurse coordinator, social worker and respiratory department to secure appropriate equipment for home monitoring |

**CROSS-REFERENCES**

- 3 -
REFERENCES

Castiglia, P.T. & Harbin, R.E. Child Health Care (1992) p. 542


