## PROCEDURE (TASK): CONTINUOUS DISTENDING PRESSURE THERAPY (CPAP)  
### (NEONATAL/PEDIATRICS)

### I. KEY PERFORMANCE ELEMENTS

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<th>Procedural Element (Step):</th>
<th>Description of Satisfactory Performance:</th>
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</table>
| 5. Obtains baseline physiological profile | Collects/calculates (where available) pertinent data on adequacy of oxygenation and cardiovascular performance, to include: \[ \text{PaO}_2, \text{P(A-a)}\text{O}_2, \text{Oxygenation Index}, \text{SaO}_2 \]
| \[ \text{Shunt estimate (table)} \] \[ \text{Blood pressure, cardiac rate} \] | |
| 9. Insures appropriate pressure level (adequate flow/sensitivity) | Adjusts flow (in continuous flow systems) Confirms ventilator cycling/demand valve function by observing manometer/spontaneous breath indicators. Adjusts flow or sensitivity to minimize work, while maintaining appropriate pressure level. |
| 10. Adjusts alarms/indicators. | Adjusts low pressure alarm to level below pressure selected. |
| 11. Observes patient response/assesses cardiopulmonary status. | Observes patient for subjective signs of discomfort, anxiety. Observes changes in subjective signs of hypoxemia or hypercapnea. Determines (subjectively) changes in the work of breathing (accessory muscle use/retractions, rate of breathing, etc.). Observes changes in heart rate or rhythm. Measures blood pressure, \text{SaO}_2, notes changes from baseline. Auscultates thorax. |
| 13. Readjusts distending pressure to optimum level. | Provides for satisfactory oxygenation without cardiovascular depression and a minimal likelihood of oxygen toxicity. |

II. REQUISITE PERFORMANCE VARIABLES:

PEDIATRIC/NEONATAL CPAP/PEEP. The student is expected to demonstrate proficiency in the application/management of continuous distending pressure applied to either the spontaneously breathing pediatric/neonatal (CPAP) or pediatric/neonatal patients receiving mechanical ventilation (PEEP). Applicable systems may include the following:

CPAP
A. Demand flow/threshold resistor
   examples: SERVO 900C
B. Continuous flow/flow resistor
   examples: Sechrist
C. "in-house" system not attached to mechanical ventilation

III. ADDITIONAL EVALUATION CRITERIA: None

IV. ORAL REVIEW QUESTIONS

A. PEDIATRIC/NEONATAL CPAP/PEEP

1. What are the clinical indications, desirable and undesirable physiological effects, contraindications and hazards of continuous distending pressure therapy in pediatric or neonatal patients?

2. Describe the mechanism by which PEEP/CPAP is developed and maintained with the system being employed. Explain any/all alarm functions/indicators.


4. State various application devices used for neonatal CPAP and give benefits/risks for each.

5. What signs of infant, respiratory distress would indicate a potential need for CPAP?

6. Describe the mechanism by which PEEP/CPAP is developed and maintained with the system being employed. Explain any/all alarm functions.

7. List the hazards and complications of infant CPAP.

8. What would determine whether you should use a nasopharyngeal tube, nasal prongs, or a face mask to deliver CPAP to an infant?

9. List at least three goals of CPAP therapy.
V. SCENARIO QUESTIONS

1. The oximetry saturation readings of an infant receiving CPAP via nasal prongs with an F\textsubscript{IO2} of 40% drop substantially during frequent episodes of crying. What action would you recommend in this situation?

2. An infant with respiratory distress syndrome is placed on 5 cm H\textsubscript{2}O nasal CPAP at an F\textsubscript{IO2} of 50%. After five minutes, grunting, retractions, and cyanosis are still present. A peripheral ABG cannot be obtained, so blood gas analysis will have to await umbilical artery catheterization. What action would you recommend in this situation?

3. Assuming other elements of the patient's clinical assessment support discontinuation, which of the following infants is the best candidate for removal from CPAP?

   a. CPAP 8 cwp - F\textsubscript{IO2} 60% - PO\textsubscript{2} 58 torr
   b. CPAP 6 cwp - F\textsubscript{IO2} 50% - PO\textsubscript{2} 62 torr
   c. CPAP 3 cwp - F\textsubscript{IO2} 40% - PO\textsubscript{2} 55 torr
   d. CPAP 7 cwp - F\textsubscript{IO2} 40% - PO\textsubscript{2} 61 torr
   e. CPAP 3 cwp - F\textsubscript{IO2} 60% - PO\textsubscript{2} 54 torr
### STEPS IN PROCEDURE OR TASK:

**EQUIPMENT AND PATIENT PREPARATION**

1. Selects, gathers, and assembles appropriate equipment. Insures asepsis
2. Verifies, interprets and evaluates physician’s order
3. Identifies patient, self, and department
4. Explains procedure and confirms patient understanding

**IMPLEMENTATION AND ASSESSMENT**

5. Obtains baseline physiologic data
6. Performs operational check of equipment function/alarms/safety systems
7. Selects/inserts appropriate airway appliance
8. Initiates distending pressure (PEEP/CPAP)
9. Insures appropriate pressure level (adequate flow/sensitivity)
10. Adjusts alarms
11. Observes patient response/assesses cardiopulmonary status
12. Collects pertinent physiological data
13. Readjusts distending pressure to optimal level
14. Reassesses patient response/cardiopulmonary status
15. Reassures patient

**FOLLOW-UP**

16. Provides for appropriate monitoring/management
17. Records pertinent data in chart and departmental records
18. Notifies appropriate personnel
STUDENT'S COMPREHENSION OF COGNITIVE OBJECTIVES RELATED TO THE PROCEDURE: CONTINUOUS DISTENDING PRESSURE

Upon completion the student will be able to answer oral review questions and discuss clinical scenarios related to the following cognitive objectives:
1. Identify the goals of CPAP and describe how CPAP increases FRC.
2. List the clinical indications, contraindications, and hazards of CPAP therapy in pediatric or neonatal patients.
3. Explain the method by which PEEP/CPAP is developed and maintained with the system used in this performance evaluation.
4. List and recognize the signs of hyperinflation in the neonatal population.
5. List the possible delivery systems for CPAP (e.g., NPCPAP, nasal prongs, etc.) and give specific clinical situations where each may be appropriate.
6. Explain how a neonatal patient is weaned from CPAP.

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<thead>
<tr>
<th>Skill evaluation</th>
<th>Oral Review</th>
<th>Specify Deficiencies:</th>
<th>Evaluator Data</th>
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<tbody>
<tr>
<td>Ability to perform applicable steps in procedure as listed on the front of form without error or omission.</td>
<td>Knowledge of the cognitive objectives listed above.</td>
<td>Specify applicable skill steps that were omitted or done erroneously. Also note any errors in discussing cognitive objectives. Please give enough detail to allow the student to work on specific remediation.</td>
<td>Please sign your name and state your affiliate name.</td>
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<tr>
<td>Date</td>
<td>Satisfactory</td>
<td>Unsatisfactory</td>
<td>Satisfactory</td>
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<tr>
<td></td>
<td>□ Ready for minimally supervised clinical application</td>
<td>□ Unsatisfactory</td>
<td>□ Satisfactory</td>
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<td>□ □ Answers oral review and other theory questions correctly</td>
<td>□ □ Requires repeat oral review.</td>
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<td>□ □ Requires additional clinical practice. Repeat skill evaluation. See deficiencies.</td>
<td>□ □ Requires repeat oral review. See deficiencies</td>
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Proficiency Eval. #4/Continuous Distending Pressure Therapy (Neonatal/Pediatrics) - 95