I. **KEY PERFORMANCE ELEMENTS**

<table>
<thead>
<tr>
<th>Procedural Element (Step)</th>
<th>Description of Satisfactory Performance:</th>
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<tbody>
<tr>
<td>5. Determines appropriate of ventilation.</td>
<td>Selects pressure control, pressure support, or IMV mode according to physician order or appropriate clinical indications.</td>
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<tr>
<td>6. Determines and sets appropriate ventilatory parameters: mode, $V_T$ or peak pressure, $F$, $F\text{IO}_2$</td>
<td>Utilizes body weight formula or equivalent to estimate tidal volume. (if appropriate) Selects frequency appropriate for mode. Selects $F\text{IO}_2$ necessary to insure adequate oxygenation without hazard.</td>
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<tr>
<td>11. Sets all alarm functions.</td>
<td>Insures disconnect indicator(s) operative. Limits pressure at appropriate level. Provides accessory alarm functions where indicated or necessary.</td>
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<tr>
<td>13. Inspects and assures patient status (vital signs, physical assessment).</td>
<td>Records pertinent observations.</td>
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</table>

II. **REQUISITE PERFORMANCE VARIABLES:**

The student is expected to demonstrate proficiency in the preparation and application of the following ventilators:

- **Pediatric/Neonatal**
  - BabyBird (Discussion only)
  - BP200 (Discussion only)
  - Healthdyne 200
  - Sechrist
  - Servo 900C
  - Infant Star

and any others as specified in the course objectives.

III. **ADDITIONAL EVALUATION CRITERIA:** None
IV. ORAL REVIEW QUESTIONS

1. For the ventilator in question:
   a. Classify the ventilator
   b. Specify the range of available parameters/modes/functions applicable to the unmodified ventilator
   c. Describe how the ventilator controls the following:
      Time parameters (rate, I:E ratio, etc.)
      Sensitivity
      Delivered volume
      F\textsubscript{IO2}
      Waveform modifications (EIP, PEEP, expiratory retard, etc.)
      Spontaneous ventilator modes (IMV, SIMV, CPAP, etc.)
   d. Describe the function and mechanism of adjustment or setting any and all alarm/indicator system.

2. Describe the clinical indications, contraindications and hazards of the mode of ventilation employed.

3. In order to ensure adequate ventilation and elimination of CO\textsubscript{2} in a newborn infant receiving time-cycled, pressure-limited ventilation, what initial breathing frequency or rate would you recommend?

4. What initial range of peak inspiratory pressure (PIP) would you suggest for a newborn infant being placed on time-cycled, pressure-limited ventilation?

5. A patient presents with neonatal asphyxia and intracranial hemorrhage. What type of respiratory failure might you expect in this patient and what primary clinical sign would you look for?

6. Describe the neonatal patient in respiratory failure which would be better ventilated using volume-controlled ventilation instead of pressure-controlled (i.e., time-cycled, pressure-limited) ventilation.

7. List the phase variables (i.e., triggering, limiting, and cycling factors) that are being utilized on the ventilator and mode of ventilation for this particular performance evaluation.

V. SCENARIO QUESTIONS:

1. A full-term neonate with a possible history of aspiration presents with severe cyanosis, retractions, barrel chest, and tachypnea. Preductal vs. postductal arterial blood gases show a 20 torr difference in PaO\textsubscript{2}. What is probably causing the respiratory difficulty and what initial vent settings would you recommend?

2. A neonate has just been placed on a time-cycled, pressure-limited ventilator when she suddenly becomes hypotensive, bradycardic, and cyanotic. The nurse removes the infant from the ventilator and ventilates with a resuscitation bag and manometer. What would you do now to determine what the problem is and, once found, to fix the problem?
PROFICIENCY EVALUATION

PROCEDURE (TASK): VENTILATOR PREPARATION AND INITIATION FOR PEDIATRICS AND NEONATES

<table>
<thead>
<tr>
<th>THERAPEUTIC PROCEDURE</th>
<th>NON THERAPEUTIC PROCEDURE</th>
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<tbody>
<tr>
<td>CLINICAL</td>
<td>COLLEGE LABORATORY</td>
</tr>
<tr>
<td>NEW PATIENT</td>
<td>PEER APPLICATION</td>
</tr>
<tr>
<td>REPEAT PROCEDURE</td>
<td>MANIKIN/ANALOG</td>
</tr>
</tbody>
</table>

EQUIPMENT UTILIZED: SERVO 900C

### STEPS IN PROCEDURE OR TASK:

#### EQUIPMENT AND PATIENT PREPARATION
1. Verifies, interprets and evaluates physician's order.
2. Selects, gathers, and assembles ventilator and circuitry. Insures asepsis.
3. Fills humidifier with sterile distilled water.
4. Completes operational check of ventilator function (alarms)
5. Determines appropriate mode of ventilation.
6. Determines/sets appropriate ventilator parameters: mode, VT, F, F\textsubscript{O2}
7. Sets initial flowrate for proper minute ventilation.
8. Identifies patient, self and department.
9. Explains procedure and confirms understanding (to parents if present).

#### IMPLEMENTATION
10. Attaches patient to ventilator during exhalation.
11. Sets all alarm functions.
13. Assesses patient status: vital signs, ventilatory parameters.
14. Readjusts flowrate or equivalent for required I:E ratio or insp. time.
15. Draws or has drawn ABG's after 20-30 minutes.
16. Readjusts parameters according to ABG's.
17. Repeats steps 13-16 until patient is stable.

#### FOLLOW-UP
18. Maintains and processes equipment.
19. Records pertinent data in chart and departmental records.
20. Notifies appropriate personnel of ventilator parameters and patient status.

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Proficiency Eval. #3 (Ventilator Preparation/Neonates) - 69
STUDENT’S COMPREHENSION OF COGNITIVE OBJECTIVES RELATED TO THE PROCEDURE: VENTILATOR PREPARATION AND INITIATION FOR PEDIATRICS AND NEONATES

Upon completion the student will be able to answer oral review questions and discuss clinical scenarios related to the following cognitive objectives:

1. Explain hypercapnic respiratory failure in neonates including the primary clinical sign and the conditions with which it is usually associated.
2. Explain hypoxemic respiratory failure in neonates including the primary clinical sign and the conditions with which it is usually associated.
3. Explain the basic design and gas flow patterns of the ventilator being prepped during this performance evaluation.
4. Describe how the following initial neonatal ventilator parameters are determined:
   - PIP
   - PEEP
   - F1O2
   - Frequency
   - Flow
   - Inspiratory time
5. Compare and contrast volume-controlled and pressure-controlled ventilation in neonates with regard to their advantages and disadvantages.

<table>
<thead>
<tr>
<th>Skill evaluation</th>
<th>Oral Review</th>
<th>Specify Deficiencies:</th>
<th>Evaluator Data</th>
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<tbody>
<tr>
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<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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- Satisfactory
  - Ready for minimally supervised clinical application
  - Requires oral review and other theory questions correctly
- Unsatisfactory
  - Requires repeat oral review. See deficiencies.

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Proficiency Eval. #3 (Ventilator Preparation/Neonates) - 70
# Proficiency Evaluation

## Procedure (Task):
Ventilator Preparation and Initiation for Pediatrics and Neonates

<table>
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<tr>
<th>Therapeutic Procedure</th>
<th>Non Therapeutic Procedure</th>
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<td>Clinical</td>
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<td>Repeat Procedure</td>
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### Equipment Utilized:
Sechrist

### Steps in Procedure or Task:

#### Equipment and Patient Preparation

1. Verifies, interprets and evaluates physician's order.
2. Selects, gathers, and assembles ventilator and circuitry. Insures asepsis.
3. Fills humidifier with sterile distilled water.
4. Completes operational check of ventilator function (alarms)
5. Determines appropriate mode of ventilation.
6. Determines/sets appropriate ventilator parameters: mode, peak pressure, F, F\textsubscript{I}O\textsubscript{2}
7. Identifies patient, self and department.
8. Explains procedure and confirms understanding (to parents if present).

#### Implementation

9. Attaches patient to ventilator during exhalation.
10. Sets all alarm functions.
12. Assesses patient status: vital signs, ventilatory parameters.
13. Readjusts controls to maintain ordered settings.
14. Draws or has drawn ABG's after 20-30 minutes.
15. Readjusts parameters according to ABG's.
16.重复步骤13-15until patient is stable.

#### Follow-up

17. Maintains and processes equipment.
18. Records pertinent data in chart and departmental records.
STUDENT'S COMPREHENSION OF COGNITIVE OBJECTIVES RELATED TO THE PROCEDURE: VENTILATOR PREPARATION AND INITIATION FOR PEDIATRICS AND NEONATES

Upon completion the student will be able to answer oral review questions and discuss clinical scenarios related to the following cognitive objectives:

1. Explain hypercapnic respiratory failure in neonates including the primary clinical sign and the conditions with which it is usually associated.
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3. Explain the basic design and gas flow patterns of the ventilator being prepped during this performance evaluation.
4. Describe how the following initial neonatal ventilator parameters are determined:
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