I. KEY PERFORMANCE ELEMENTS

<table>
<thead>
<tr>
<th>Procedural Element (Step):</th>
<th>Description of Satisfactory Performance:</th>
</tr>
</thead>
<tbody>
<tr>
<td>11. Confirms all parameters of ventilation.</td>
<td>Insures correspondence between physician's orders and preset values. Correlates preset values with those monitored. Accounts for discrepancies in values. Solves problem or provides interim solution.</td>
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<tr>
<td>12. Assesses patient status (physical assessment, vital signs, airway).</td>
<td>Records pertinent observations.</td>
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<tr>
<td>15. Isolates old ventilator circuit in plastic bag.</td>
<td>Employs double bag technique if isolation patient.</td>
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</table>

II. REQUISITE PERFORMANCE VARIABLES:

The student is expected to demonstrate proficiency in changing either disposable or permanent ventilator circuits in both pediatric and neonatal situations with the following mechanical ventilators:

- Sechrist
- Servo 900C
- Infant Star

III. ADDITIONAL EVALUATION CRITERIA:

None
IV. ORAL REVIEW QUESTIONS:

1. What is the rationale for frequent changes of ventilator circuitry on patients receiving mechanical ventilatory support?

2. How often should ventilator circuits be changed? Why?

3. What are the 4-5 major functions of a ventilator circuit designed for continuous mechanical ventilation? Differentiate between the key design considerations of a pediatric/neonatal ventilator circuit vs. an adult ventilator circuit.

4. State methods used to detect proper neonatal ventilator function.

5. What detrimental effect would a large drop in the humidifier water level have upon infant ventilation?

6. Why is the oxygen analyzer placed before the heated humidifier in an infant ventilator circuit?

7. List two advantages of wick humidifiers over a cascade humidifier when used during infant ventilation.

8. Imagine a garden hose with water continuously running through it which has a large leak in the middle of it. When you try to occlude the open end of the hose, more water escapes from the leak. How is this phenomenon analogous to time-cycled, pressure-limited ventilation?

9. Explain why it isn't necessary to have heated wires in that portion of the infant ventilator circuit which is inside the isolette.

V. SCENARIO QUESTIONS:

1. You are in the process of changing circuits on an infant ventilator. The nurse is ventilating the patient with a manual resuscitator and manometer while you make the final switch from the old circuit to the new one. When you place the new circuit on the patient, you quickly determine that the patient is not being ventilated. What is your most immediate action and what troubleshooting sequence would you follow to figure out the problem?

2. You have just switched a patient over to a new infant ventilator circuit and are performing a ventilator check. You see that the manometer is registering pressure but the pressure is considerably less than the previous PIP. What troubleshooting sequence would you follow to determine the cause of this problem?
STUDENT:  

COURSE:  

KALAMAZOO VALLEY COMMUNITY COLLEGE  
RESPIRATORY THERAPY PROGRAM  
PROFICIENCY EVALUATION  

PROCEDURE (TASK): VENTILATOR CIRCUITY CHANGE - PEDIATRIC  

<table>
<thead>
<tr>
<th>THERAPEUTIC PROCEDURE</th>
<th>NON THERAPEUTIC PROCEDURE</th>
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</thead>
<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. Selects, gathers, and assembles ventilator and circuitry. Insures asepsis  
2. Identifies patient, self, and department  
3. Explains procedure and confirms patient understanding  

IMPLEMENTATION AND ASSESSMENT  
4. Sets up, confirms proper function of manual resuscitator  
5. By-passes ventilator circuit from humidifier  
6. Removes humidifier and replaces sterile humidifier  
7. Fills humidifier with sterile distilled water  
8. Disconnects ventilator alarms, reassures patient  
9. Removes old circuit and replaces with new circuit during exhalation  
10. Checks complete system for leaks and calculates compliance factor  
11. Confirms all parameters of ventilation  
12. Assesses patient status (physical assessment, vital signs, airway)  
13. Resets, verifies all alarm functions/settings  
14. Reassures patient  
15. Isolates old ventilator circuit in plastic bag and properly disposes  

FOLLOW-UP  
16. Maintains and processes equipment  
17. Records pertinent data in chart and departmental records  
18. Notifies appropriate personnel
Upon completion the student will be able to answer oral review questions and discuss clinical scenarios related to the following cognitive objectives:
1. Give and explain the proper placement of the oxygen sensor.
2. Explain how continuous flow ventilators can deliver inadvertent PEEP to the neonate.
3. Explain the advantages of wick humidifiers over other humidifiers when used during neonatal ventilation.
4. Explain how heated wires prevent rain-out and give the rationale behind the placement of the wires (two-limb vs. one-limb, up to the patient connection vs. up to the isolette, etc.)
5. Explain the danger of compressed volumes in ventilator circuits for neonates and how compressed volumes are minimized.
6. Explain how the exhalation valve facilitates ventilation in a time-cycled, pressure-limited ventilator.
## KALAMAZOO VALLEY COMMUNITY COLLEGE
### RESPIRATORY THERAPY PROGRAM
### PROFICIENCY EVALUATION

**PROCEDURE (TASK): VENTILATOR CIRCUITRY CHANGE**

- **THERAPEUTIC PROCEDURE:**
- **NON THERAPEUTIC PROCEDURE:**

- **CLINICAL:**
  - NEW PATIENT
  - REPEAT PROCEDURE

- **COLLEGE LABORATORY:**
  - PEER APPLICATION
  - MANIKIN/ANALOG

**EQUIPMENT UTILIZED:** SECHRIST

### STEPS IN PROCEDURE OR TASK:

#### EQUIPMENT AND PATIENT PREPARATION
1. Selects, gathers, and assembles ventilator and circuitry. Insures asepsis
2. Identifies patient, self, and department
3. Explains procedure and confirms patient understanding

#### IMPLEMENTATION AND ASSESSMENT
4. Sets up, confirms proper function of manual resuscitator
5. By-passes ventilator circuit from humidifier
6. Removes humidifier and replaces sterile humidifier
7. Fills humidifier with sterile distilled water
8. Disconnects ventilator alarms, reassures patient
9. Removes old circuit and replaces with new circuit during exhalation
10. Checks complete system for leaks and calculates compliance factor
11. Confirms all parameters of ventilation
12. Assesses patient status (physical assessment, vital signs, airway)
13. Resets, verifies all alarm functions/setting
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<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>Satisfactory</td>
<td>Unsatisfactory</td>
<td>Satisfactory</td>
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<tr>
<td>Ready for minimally supervised clinical application</td>
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<tr>
<td>Requires additional clinical practice. Repeat skill evaluation. See deficiencies.</td>
<td>Answers oral review and other theory questions correctly.</td>
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