Simulation activity running sheet

About the simulation

Title: Physiotherapy management of an intubated and ventilated child requiring suctioning
Date: Duration: 4 hours
Venue:

Faculty

Facilitator/s: Simulated patient/s: Confederate/s:

Learning objectives

By the end of this simulation, participants will be able to:

1. Demonstrate safe and effective assessment of an acutely unwell child who is intubated and ventilated in a CICU including subjective and objective assessment.
2. Demonstrate safe and effective treatment of an acutely unwell child who is intubated and ventilated in a CICU including manual techniques and suctioning.
3. Demonstrate re-assessment during and after treatment, and modification of treatment as appropriate.
4. Demonstrate effective skills in communication, teamwork and role delineation.

Scenario

The CICU registrar has paged the physiotherapist on an evening shift, asking them to review a 7 year old girl, Millie, who has been admitted during the afternoon with likely aspiration pneumonia. The physiotherapist is advised that Millie has chest x-ray (CXR) changes and thick secretions that are difficult to clear with suctioning. Millie has a background of Cerebral Palsy, seizures, reflux (has had a fundoplication & feeds via jejunostomy), scoliosis, poor swallow and global developmental delay (GDD). She has had recurrent admissions with similar presentations. Millie’s parents have declined palliative care involvement when suggested in the past and she is for full CPR in the event that she deteriorates.

Resources required

<table>
<thead>
<tr>
<th>Access</th>
<th>Drugs &amp; Fluids</th>
<th>Monitoring</th>
<th>Equipment</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Arterial line</td>
<td>• Morphine at 20mcg/kg/hr</td>
<td>• SpO2</td>
<td>• SimJunior</td>
</tr>
<tr>
<td>• Peripheral Intravenous Catheter (PIVC) X 2</td>
<td>• Midazolam at 2mcg/kg/min</td>
<td>• ECG</td>
<td>• Bed</td>
</tr>
<tr>
<td>• Jejunostomy</td>
<td>• Maintenance fluids at vent maintenance rate</td>
<td>• Arterial BP</td>
<td>• Ventilator</td>
</tr>
<tr>
<td></td>
<td>• Nil by mouth (NBM)</td>
<td>• CO2</td>
<td>• Small pump stacker</td>
</tr>
<tr>
<td>Airway</td>
<td></td>
<td></td>
<td>• Syringe drivers X 4</td>
</tr>
<tr>
<td>• Endotracheal tube (ETT)</td>
<td></td>
<td>(eg. Alaris ® CC syringe pump)</td>
<td></td>
</tr>
<tr>
<td>• Ventilator – SIMV</td>
<td></td>
<td></td>
<td>• Infusion pumps X 2</td>
</tr>
<tr>
<td>• PC+PS 14/7 X 15;</td>
<td></td>
<td></td>
<td>(eg. Alaris ® GH syringe pump)</td>
</tr>
<tr>
<td>• FiO2 0.45</td>
<td>• Chest x-ray (CXR) with (R) UL collapse / consolidation</td>
<td></td>
<td>• Bedside trolley</td>
</tr>
<tr>
<td>• Laerdal bag valve mask (BVM)</td>
<td>• Observation chart</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Anaesthetic bag</td>
<td>• Resus chart</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Suction unit</td>
<td>• Medical admission note</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Suction catheters</td>
<td>• Bunny, rugs, pillows, towels</td>
<td></td>
<td></td>
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<tr>
<td>• Stethoscope</td>
<td>• Pager</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
**State 1: Assessment of patient**

**States**

<table>
<thead>
<tr>
<th>A:</th>
<th>ETT</th>
</tr>
</thead>
</table>
| B: | Vent 14/7 X 15 X 45% 
*SpO₂*: 97% 
*ETCO₂*: 50mmHg – slope up |
| C: | Decreased AE to right lung and inspiratory crackles (R) UL |
| D: | *Sinus rhythm*: 95bpm |
| BP: | 110/74 |
| Temp: | 37.2 |
| Colour: | Pale |
| Perfusion: | Warm |
| CRT: | 2 secs |
| Sedated on morphine and midazolam |
| Maintenance fluid running |
| Other: | Patient positioned on back |

**Faculty actions**

**Nurse (Confederate):**

Answer questions if asked. Responses to questions:

*Availability of CXR*

State “Yes” and direct participant to the screen in simulation room.

*Last ABG*

State ABG results and provide analysis and interpretation.

**Physiotherapist (Participant):**

- Retrieves and effectively interprets relevant information from medical notes, observation charts, chest x-ray and nursing staff.
- Reviews and interprets objective information – ventilation mode/settings, attachments, WOB.
- Effectively auscultates chest – decreased AE (R) lung and inspiratory crackles R (UL).
- Identifies precautions/contraindications to manual techniques and suctioning (minimal) eg. stability of patient, awareness of resuscitation orders.
- Communicates treatment plan to nurse and effectively communicates with partner throughout the scenario.
- Prepares environment safely and appropriately – infection control procedures and organisation of equipment.
- Positions patient safely and effectively – may leave in supine or turn so right side up

**Expected participant actions**

**Cardiovascular stability and handling tolerance**

State “fairly stable and doing OK with handling”

**Secretions**

State “ETT & nasal/o/p are thick and creamy”

*If due for turn and if tolerating position change* 

State “Yes”

*If patient needs sedation bolus pre-treatment* 

State “No”

*If patient coughing* 

State “Yes – weak. Coughing spontaneously when secretions need to be suctioned”

Nurse to assist with moving patient if requested to do so.

**ABG**

| pH 7.25 |
| PaCO₂: 50 mmHg |
| PaO₂: 60 mmHg |
| HCO₃: 33mEq/L |

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## State 2: Commencement of Treatment

8-12 minutes

<table>
<thead>
<tr>
<th>States</th>
<th>Faculty Actions</th>
<th>Expected Participant Actions</th>
</tr>
</thead>
</table>
| **A:** ETT | Nurse (Confederate):  
- Leave the room to collect some medication. Inform the physiotherapist that you will be right back. | Physiotherapist (Participant):  
- Depending on experience, physiotherapist may request nurse to remain present or wait until nurse returns.  
- Performs safe & effective manual techniques.  
- Re-assesses patient as appropriate – upon commencement of manual techniques, acknowledges change in ECG trace ie artefact. |
| **B:** Vent 14/7 X 15 X 45%  
- \(\text{SpO}_2\): 97%  
- \(\text{ETCO}_2\): 50mmHg – slope up | | |
| **C:** Decreased AE to right lung and inspiratory crackles (R) UL  
- \textit{Sinus rhythm}: 95bpm | | |
| **D:** BP: 110/74  
- \textit{Temp}: 37.2  
- \textit{Colour}: Pale  
- \textit{Perfusion}: Warm  
- \textit{CRT}: 2 secs  
- Sedated on morphine and midazolam  
- Maintenance fluid running  
- Patient positioned on back | | |
| **Other:** | | |
### State 3: Patient desaturation

#### 12-20 mins

<table>
<thead>
<tr>
<th>States</th>
<th>Faculty actions</th>
<th>Expected participant actions</th>
</tr>
</thead>
</table>
| A: ETT | Nurse (Confederate):  
- Hint to the physiotherapist that the patient is coughing.  
- If the physiotherapist doesn’t identify change in SpO2, then the nurse may hint at this trend.  
- The nurse assists with bag/suction as requested.  
- If the physiotherapist asks about the medical staff, inform them that the medical staff are attending to a patient who is acutely unwell. | Physiotherapist (Participant):  
- After approximately 5 minutes of manual techniques, the physiotherapist either changes patient position with assistance from nursing staff and SpO2 drop or SpO2 drop anyway and patient starts coughing – the physiotherapist acknowledges and re-assesses patient.  
- Call for nurse if nurse not aware.  
- Physiotherapist decides that suction probably required and communicates this to the nurse. Physiotherapist may suggest bag/suction + vibes depending on assessment findings & handling tolerance.  
- Performs safe and effective suction +/- vibes. If patient remains on ventilator for suction, the physiotherapist to suggest /use suction support/O2 breath if indicated. |
| B: Decrease at approximately 12 minutes once the physiotherapist has performed some manual techniques.  
  SpO2: 88-91%  
  Patient starts coughing |  
| C: ECG trace: turn on artefact  
  HR: ↑110bpm over 1 minute  
  BP: ↑118/82 over 1 minute  
  Patient slightly restless with coughing. |  
| D: |  

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**State 4: Completion of treatment – return to baseline observations**

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<th>Faculty actions</th>
<th>Expected participant actions</th>
</tr>
</thead>
</table>
| A: ETT | Nurse (Confederate):  
- If the physiotherapist does not provide advice for nursing staff at the completion of treatment, the nurse to ask.  
- If asked about the repeat ABG, the nurse to state repeat ABG results. | Physiotherapist (Participant):  
- Re-assesses – vital signs, ausc., palpation, tidal volumes etc.  
- Appropriate advice communicated to nurse – positioning, suctioning, review the next day but on call available via switch.  
- Advise that they would like to contact (face-to-face or phone) registrar and provide feedback.  
- Physiotherapist acknowledges that they would document the review. |
| B: Vent: 14/7 X 15 X 45%  
SpO2: 98%  
RR: 15bpm (as per ventilator)  
Lung sounds bilaterally normal  
Back to baseline upon completion of treatment.  
*Sinus rhythm*: 95bpm  
*BP*: 110/74  
*Nil change.* | |
| C: | | |
| D: | | |

**ABG2**  
pH 7.31  
*PaCO2*: 43 mmHg  
*PaO2*: 75 mmHg  
*HCO3*: 33mEq/L  

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