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

Access	Drugs & Fluids	Monitoring
• Arterial line	• Morphine at 20mcg/kg/hr	• SpO2
• Peripheral Intravenous Catheter (PIVC) X 2	• Midazolam at 2mcg/kg/min	• ECG
• Jejunostomy	• Maintenance fluids at vent maintenance rate	• Arterial BP
	• Nil by mouth (NBM)	• CO2

Airway	Other	Equipment
• Endotracheal tube (ETT)	• Arterial Blood Gas (ABG) result	• SimJunior
• Ventilator – SIMV	• Chest x-ray (CXR) with (R) UL collapse / consolidation	• Bed
• PC+PS 14/7 X 15;	• Observation chart	• Ventilator
• FiO2 0.45	• Resus chart	• Small pump stacker
• Laerdal bag valve mask (BVM)	• Medical admission note	• Syringe drivers X 4 (eg. Alaris ® CC syringe pump)
• Anaesthetic bag	• Bunny, rugs, pillows, towels	• Infusion pumps X 2 (eg. Alaris ® GH syringe pump)
• Suction unit	• Pager	
• Suction catheters		• Bedside trolley
• Stethoscope		

State 1: Assessment of patient

0 - 8 minutes	States	Faculty actions	Expected participant actions
	A: ETT 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 Other: Maintenance fluid running Patient positioned on back	<u>Nurse (Confederate):</u> 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. **ABG[1]** pH 7.25 $PaCO_2$: 50 mmHg PaO_2: 60 mmHg HCO_3: 33mEq/L *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.	<u>Physiotherapist (Participant):</u> • 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

State 2: Commencement of treatment

States	Faculty actions	Expected participant actions
A: ETT	Nurse (Confederate):	Physiotherapist (Participant):
B: Vent 14/7 X 15 X 45% SpO_2: 97% $ETCO_2$: 50mmHg – slope up	• Leave the room to collect some medication. Inform the physiotherapist that you will be right back.	• Depending on experience, physiotherapist may request nurse to remain present or wait until nurse returns.
C: Decreased AE to right lung and inspiratory crackles (R) UL		• Performs safe & effective manual techniques.
D: Sinus rhythm: 95bpm BP: 110/74 Temp: 37.2 Colour: Pale Perfusion: Warm CRT: 2 secs Sedated on morphine and midazolam		• Re-assesses patient as appropriate – upon commencement of manual techniques, acknowledges change in ECG trace ie artefact.
Other: Maintenance fluid running Patient positioned on back		

8-12 minutes

State 3: Patient desaturation

12-20 mins

States	Faculty actions	Expected participant actions
A: ETT	**Nurse (Confederate):**	**Physiotherapist (Participant):**
B: Decrease at approximately 12 minutes once the physiotherapist has performed some manual techniques.	• Hint to the physiotherapist that the patient is coughing.	• 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.
SpO2: 88-91% Patient starts coughing	• If the physiotherapist doesn't identify change in SpO2, then the nurse may hint at this trend.	
ECG trace: turn on artefact C: *HR:* ↑110bpm over 1 minute *BP:* ↑118/82 over 1 minute	• The nurse assists with bag/suction as requested.	• 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.
Patient slightly restless with D: coughing.	• If the physiotherapist asks about the medical staff, inform them that the medical staff are attending to a patient who is acutely unwell.	• Performs safe and effective suction +/- vibes. If patient remains on ventilator for suction, the physiotherapist to suggest /use suction support/O2 breath if indicated.

State 4: Completion of treatment – return to baseline observations

20-25 mins	States	Faculty actions	Expected participant actions
	A: ETT B: *Vent:* 14/7 X 15 X 45% *SpO2:* 98% *RR:* 15bpm (as per ventilator) Lung sounds bilaterally normal C: Back to baseline upon completion of treatment. *Sinus rhythm:* 95bpm *BP:* 110/74 Nil change. D:	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. <table><tr><td>**ABG2** pH 7.31 PaCO2: 43 mmHg PaO2: 75 mmHg HCO3: 33mEq/L</td></tr></table>	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.

END OF SIMULATION