

Simulation scenario development

About the simulation

Title:	Physiotherapy management of an intubated and ventilated child requiring suctioning	
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Identified need

What is the issue and the need for training?

Physiotherapists working in the acute paediatric respiratory setting are expected to accurately conduct a subjective and objective assessment of patients with respiratory conditions, use this information in combination with clinical reasoning skills to formulate an appropriate management plan for these patients, perform treatment techniques effectively and demonstrate sound rationale for choice of interventions. Provision of an acute care respiratory service may require physiotherapists to work after hours shifts, including on-call, whereby physiotherapists work in isolation. Therefore, there is a need for competency maintenance and training standardisation amongst physiotherapists involved in this service (Gough and Doherty, 2007). One particular example demonstrating a need for this requirement is in the physiotherapy management of an intubated and ventilated child requiring suctioning.

Suctioning is described as the mechanical aspiration of pulmonary secretions from a patient with an artificial airway in position (AARC, 1993). Suctioning is a procedure used regularly in the paediatric intensive care unit (Morrow Argent, 2008). Effective suctioning is an essential aspect of airway management in the critically ill. However, there are many associated risks and complications (Day, Farnell & Wilson-Barnett, 2002). Staff who are required to perform this procedure need then to be aware of the principles of safe, effective suctioning (Dean, 1997). It is essential that health care professionals are taught correct suctioning techniques and that clinical guidelines are in place to ensure that practice is up to date (Day et al, 2002).

In the training of healthcare staff in this specific skill, Day et al. (2009) found that there was a statistically significant improvement in knowledge maintenance and tracheal suctioning practice in nurses and physiotherapists when practical interventions were followed by observer tailored performance feedback. Day et al. (2009) found that these improvements appeared to be greater when based in simulated practice. An ever-increasing body of healthcare evidence supports the use of simulation-based education, particularly since it enables repetitive supervised practice without compromising patient safety (Gough, Yohannes, Thomas & Sixsmith, 2013). In combination, this evidence suggests that the use of high fidelity simulated ‘patients’ to practice suctioning skills with the provision of observed performance feedback against up to date clinical guidelines is a viable modality for teaching Physiotherapists this advanced skill.

American Association for Respiratory Care (1993). AARC clinical practice guideline. Endotracheal suctioning of mechanically ventilated adults and children with artificial airways. *Respiratory Care*, 38(5), 500-504.

Day, T., Farnell, S. & Wilson-Barnett, J. (2002). Suctioning: A review of current research recommendations. *Intensive and Critical Care Nursing*, 18(2), 79-89.

Dean, B. (1997). Evidence-based suction management in accident and emergency: A vital component of airway care. *Accident and Emergency Nursing*, 5(2), 92-98.

Gough, S. & Doherty, J. (2007). Emergency on-call duty preparation and education for newly qualified physiotherapists: A national survey. *Physiotherapy*, 93, 37-44.

Gough, S., Yohannes, A.M., Thomas, C. & Sixsmith, J. (2013). Simulation-based education (SBE) within postgraduate emergency on-call physiotherapy in the United Kingdom. *Nurse Education Today*, 33(8), 778-784.

Morrow, B.M. Argent, A.C. (2008). A comprehensive review of pediatric endotracheal suctioning: Effects, indications, and clinical practice. *Pediatric Critical Care Medicine*, 9(5), 465-477.

DISCLAIMER

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Target audience

Who is this simulation activity designed for?

This particular simulation is targeted towards qualified physiotherapists who are novice in performing manual techniques and suctioning on children with respiratory problems. While this simulation has a particular focus on physiotherapists working with children, clinical specialists and educators may also find that they can adapt this simulation to suit physiotherapists treating adult patients.

Learning objectives

What do you intend for participants to learn?

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.

Background

List the background knowledge which needs to be reviewed or taught as well as any reference materials

As policy, equipment, and scope of practice may differ between facilities, a locally-relevant PowerPoint presentation will need to be prepared by a physiotherapist who is appropriately experienced in performing manual techniques and suctioning. Topics to be covered should include:

- i) Review of relevant Local Health District/Specialty Health Network policies.
- ii) Review of theory and evidence on suctioning, mechanical ventilation, and manual techniques.
- iii) *Suctioning*: Indications and contra-indications.
- iv) *Mechanical ventilation*: Parameters and modes.

There should also be practical training on manual techniques and suctioning. Participants should be shown how to perform techniques, and then have the opportunity to practise.

Simulation activity

Modality (select more than one if applicable):

Simulated patient (or standardised patient) Task trainer Manikin/human patient simulator
 Computer based Role play Animal or cadaveric Hybrid Virtual reality Objective Structured Clinical Examinations (OSCEs)

Two participants will work together in the simulation. The other 4 participants will be observing the simulation. There will be 3 repetitions of the simulation so that each participant will have an opportunity to actively participate in the simulation.

During the simulation, it is expected that participants will review and interpret information, identify precautions / contraindications for treatment, and interact safely and effectively with the patient, treating team and the environment. They will also be required to perform manual techniques and suctioning on the patient (SimJunior). There will be a CICU nurse (confederate) present who can answer questions, and assist with providing treatment.

The simulation will last for 25 minutes. Following the simulation there should be a short debrief. Both the simulation and the debrief are repeated for each pair of participants.

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Setting/environment

In what context is the simulation occurring in? e.g. ward/home visit/acute/rehab/metro/rural/regional.

The simulation will take place in the context of a simulated Children's ICU. A CICU nurse is present, and the CICU registrar is onsite but attending to an acutely unwell patient, so is not available for contact. The simulation should take place in a simulation centre and requires three spaces:

- i. Briefing/debriefing room (Multipurpose room)
- ii. Simulated patient room
- iii. Observation room

Participants

Participants should all be qualified physiotherapists.
There can be up to 6 participants in this simulation.

Staff/faculty/confederates

List the staff/faculty/confederates required including tasks.

The required faculty for this simulation includes:

- i. Facilitator 1 A physiotherapist who is highly experienced in performing manual techniques and suctioning.
- ii. Facilitator 2 Another health professional/educator who can provide feedback on communication / non-technical aspects of simulation.
- iii. Confederate Preferably a Clinical Nurse Educator who can assume the role of CICU nurse.
- iv. Technician Person who can operate SimJunior and the simulation environment.

Equipment, tools and resources

List the equipment and resources required for the activity including details of what needs to be prepared prior to the simulation?

<u>Access</u> <ul style="list-style-type: none"> • Arterial line • Peripheral Intravenous Catheter (PIVC) X 2 • Jejunostomy 	<u>Drugs & Fluids</u> <ul style="list-style-type: none"> • Morphine at 20mcg/kg/hr • Midazolam at 2mcg/kg/min • Maintenance fluids at vent maintenance rate • Nil by mouth (NBM) 	<u>Monitoring</u> <ul style="list-style-type: none"> • SpO2 • ECG • Arterial BP • CO2
<u>Airway</u> <ul style="list-style-type: none"> • Endotracheal tube (ETT) • Ventilator – SIMV • PC+PS 14/7 X 15; • FiO2 0.45 • Laerdal bag valve mask (BVM) • Anaesthetic bag • Suction unit • Suction catheters • Stethoscope 	<u>Other</u> <ul style="list-style-type: none"> • Arterial Blood Gas (ABG) result • Chest x-ray (CXR) with (R) UL collapse / consolidation • Observation chart • Resus chart • Medical admission note • Bunny, rugs, pillows, towels • Pager 	<u>Equipment</u> <ul style="list-style-type: none"> • SimJunior • Bed • Ventilator • Small pump stacker • Syringe drivers X 4 (eg. Alaris® CC syringe pump) • Infusion pumps X 2 (eg. Alaris® GH syringe pump) • Bedside trolley

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Costs

List the cost required for the activity including details of individual charges, *in kind* support or not applicable.
Note: check with LHDs and Specialty Health Networks regarding appropriate approval process

Venue
Faculty/staff
Actor hire
Equipment hire
Consumables
Catering
Other – Details
Total

Subject details (profile of simulated patient, details of task trainer, details of confederate, etc.)

e.g. Condition, presentation, history, age, demographic.

The patient (SimJunior) is a 7 year old girl, Millie, who has been admitted during the afternoon with likely aspiration pneumonia. 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.

Timing

Introduction (Introductions; learning objectives; confidentiality; housekeeping; fiction contract)	20 mins
Background/ teaching session	50 mins
BREAK	15 mins
Briefing	10 mins
Simulation activity	105 mins
BREAK	10 mins
Debriefing	20 mins
Evaluation	10 mins
TOTAL	240 mins (4 hours)

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Briefing of participants

What needs to be discussed before the activity?

In the simulation, participants will work together in pairs. The other 4 participants will be observing the simulation. There will be 3 repetitions of the simulation so that each participant will have an opportunity to actively participate in the simulation.

Participants need to be orientated to the simulation environment.

During the simulation, it is expected that participants will be able to:

- review and interpret information,
- identify precautions / contraindications for treatment,
- interact safely and effectively with the patient, treating team and the environment,
- perform manual techniques and suctioning.

There will be a CICU nurse present who can answer questions, and assist with providing treatment.

Each repetition of the simulation will last for 25 minutes followed by a short 10 minute debrief.

Debriefing and reflection

What needs to be discussed after the activity? Think about specific questions.

- What did you learn from the interactions you had with the other team members during the simulation?
- What technical competencies were you aware of demonstrating during the simulation?
- How did your interactions with the patient and their family (if family members present) influence your ability to complete your clinical tasks?
- How did the order in which you participated in the simulation influence your approach to the case?

Evaluation

How might you evaluate the simulation?

Competency self-checklist

- Participants could complete the competency self-checklist following the simulation, and then again 3 months post simulation.

Participant evaluation

- Provide participant evaluation form to participants to fill out prior to leaving.

Observer checklist

- Participants could complete the observer checklist whilst watching their colleagues perform the simulation. It would be anticipated that by the final repetition of the simulation, participants would find that almost all objectives would be met, due to an expected learning effect.

Faculty debriefing

- Debrief with the faculty after the participants have left covering:
What went well? What did not go well? What might we do differently?

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