MANUAL

Simulation for ICU Transition

Assessment and Re-evaluation Manual

NSW GOVERNMENT

Simulation for ICU Transition: Assessment and Re-evaluation Manual

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Glossary

ABG	Arterial Blood Gas
Abx	Antibiotics
ACI	Agency for Clinical Innovation
ADLs	Activities of daily living
AE	Area
AEDT	Australian eastern daylight time
AF	Atrial fibrillation
AKI	Acute kidney injury
ALS	Advanced life support
ALSi	A medical training system that simulates emergency conditions
AOLS	Activities of living status
ARC	Australian Resuscitation Council
ART	Arterial
ASB	Acute services building
AVR	Aortic valve replacement
BAL	Bilateral Alveolar Lavage
BP	Blood pressure
BSL	Blood sugar level
CABG	Coronary artery bypass grafting
CAP	Community acquired pneumonia
Cath lab	Catheterization laboratory
CC0	Continuous cardiac output
CCTV	Closed circuit television
CERS	Clinical Emergency Response System
CF	Cubital Fossa
COPD	Chronic obstructive pulmonary disease
CPP	Cerebral perfusion pressure
CPR	Cardiopulmonary resuscitation
CT	Computerised tomography
CVC	Central venous catheter
CVP	Central venous pressure
CVS	Central venous system
CVVHDF	Continuous venovenous hemodiafiltration
CXR	Chest X-ray
DOB	Date of birth
DVT	Deep vein thrombosis
ECG	Electrocardiograph
ECHO	Echocardiography
ECMO	Extracorporeal membrane oxygen
ED	Emergency department
ENT	Ear nose and throat
ETC02	End tidal carbon dioxide
ETOH	Ethanol
ETT	Endotracheal tube
EVD	External ventricular drain
FFP	Fresh frozen plasma
FIO2	Fractional inspired oxygen
GA	General anaesthetic
GCS	Glasgow coma score

GIA	Gastrointestinal anastomosis
GORD	Gastro-oesophageal reflux disease
GP	General practioner
GTN	Glyceryl trinitrate
HAP	Hospital acquired pneumonia
Hb	Haemoglobin
HCO3	Bicarbonate
HDU	High dependency unit
HFMEA	Healthcare failure mode and effect analysis
HFNP	Hi flow nasal prongs
HIPEC	Hyperthemic Intraperitoneal Chemotherapy
HME	Heat moisture exchange
HR	Heart rate
Hx	History
I/C	In charge
IABP	Intra aortic balloon pump
IAP	Intra aortic pressure
ICC	Intercostal catheter
ICP	Intracranial pressure
ICU	Intensive care unit
IDC	Indwelling catheter
IM	Intramuscular
INR	International normalised ratio
ISBAR	Introduction, situation, background, assessment, request
IVABx	Intravenous antibiotics
IVF	Intravenous fluid
JVP	Jugular venous pressure
KCL	Potassium chloride
LAD	Left anterior descending coronary artery
LFTs	Liver function tests
LM	Left main coronary artery
LP	Lumbar puncture
LSTs	Latent safety threats
LUCAS	Lund University Cardiac Assist System
LV	Left ventricle
MAP	Mean arterial pressure
MMC	Mucosal mast cells
MRI	Magnetic resonance imaging
MRN	Medical record number
MTP	Massive transfusion protocol
MVA	Motor vehicle accident
NBP	Non invasive blood pressure
NG	Nasogastric
NGT	Nasogastric tube
NOK	Next of kin
NUM	Nursing unit manager
OT	Operating theatre
P&D	Position and drape
P/F	PaO2 / FiO2 ratio

PACU-A	Post anaesthesia care unit - A
PCI	Percutaneous coronary intervention
pCO2	Partial pressure carbon dioxide
PEA	Pulseless electrical activity
PEEP	Positive end-expiratory pressure
PE's	Pulmonary embolism
PIVC	Peripheral intravenous cannula
PLTs	Platelets
PMP	Pseudomyxoma peritoneum
pO2	Oxygen partial pressure
PRBC	Packed red blood cells
PS	Pressure support
Pt	Patient
RMO	Resident medical officer
RN	Registered nurse
ROSC	Return of spontaneous circulation
RR	Respiratory rate
RRT	Renal replacement therapy
RV	Right ventricle
Rx	treatment/medication/prescription
SDMH	Shoalhaven District Memorial Hospital
SGH	St George hospital
SIM	Simulation
SITAR	Simulation for ICU Transition: Assessment and Re-evaluation
SN	Swedish nose
SOB	Shortness of breath
SPO2	Peripheral capillary oxygen saturation
STEMI	ST elevation myocardial infarction
STG	St George Hospital
T2DM	Type 2 diabetes mellitus
TBI	Traumatic brain injury
TEMP	Temperature
TF	Transfer
TOE	Transoesophageal echocardiogram
TWB	Tower Ward Block
TWH	The Wollongong Hospital
UO	Urine output
USS	Ultrasound scan
UWSD	Underwater seal drain
VBG	Venous blood gas
VF	Ventricular fibrillation
VT	Ventricular tachycardia
VV	Veno-venous
WH&S	Work health and safety

Contents

Simulation database

Introduction

The *Simulation for ICU Transition: Assessment and Re-evaluation (SITAR) Manual* is designed to give clinical teams in NSW ideas for planning a safe move into a new intensive care unit (ICU). Such planning should involve representation from all the ICU multidisciplinary team. The manual contains background information, an outline of the method used in a SITAR project and a series of scenarios. The method and cases described should be adapted to suit local ICU function and design.

A SITAR project is designed to maximise staff orientation to the new clinical environment, while reviewing key aspects of daily practice and workflow to ensure the mitigation of latent safety threats (LSTs) in both building design and ICU operational structure. This process will be undertaken through the use of in-situ clinical simulation, replicating the day to day activities associated with current and projected clinical practice and procedure of the ICU.

Appendices in this manual include a generic simulation scenario instruction sheet, simulation scenario database, participant LST evaluation form.

Background

New health infrastructures are always welcome and exciting to plan. It is important to note that transitioning to a new clinical environment can represent numerous challenges, with clinical specialities experiencing extensive change in all aspects of operational structure and patient care delivery. To ensure the long-term viability of such services, care must be taken to make a smooth transition, with focus not only on patient safety but also staff and organisational support. There are many major health infrastructure projects currently underway in NSW with the majority involving a new ICU.

Planning and collaboration, as well as education for staff and a comprehensive transition training plan are integral to a safe transition into a new facility. It is identifying the unforeseeable risks or LSTs that are not necessarily overcome by planning and education prior to commissioning a new ICU that is challenging. The ACI partnered with The St George Hospital Department of Intensive Care, through a competitive grant process, to develop a systematic simulation approach for early detection of design and operational safety issues that may arise in a new ICU. With the aim that the resolution of these issues would translate to system-wide improvements.

The SITAR project method demonstrated an effective method for LST detection that is outlined in this manual.

Latent safety threats

Latent safety threats are errors in design, organisation, staff training, or processes that may contribute to clinical errors and have a significant impact on staff or patient safety. When

viewing this in the context of transitioning into a newly developed clinical environment LSTs often occur within certain themes or aspects, typically related to:

- the administration and storage of medications
- the storage, use and functionality of healthcare equipment
- personnel management
- building design and its associated utilities and infrastructure.

A SITAR project uses simulation, incorporating the multidisciplinary team, to explore the daily operation and core business of the clinical environment. Through this practice, users will identify LSTs, demonstrating the LST potential implications within a safe and controlled environment. This allows mitigation of such errors prior to opening the new facility. During the planning and undertaking of the simulations staff become more familiar with their new ICU. As a result, users can be reassured as to the functionality and safety of their clinical environment, while policies and procedures can be updated to account for identified changes required in daily operations and patient care delivery.

Objectives

1. Improve staff orientation and facilitate a safe transition.
2. Identify issues associated with workflow and LSTs in both building design and operational structure.
3. Engage hospital management and project teams in ensuring issues can be corrected prior to transition.

SITAR project design and implementation

The time leading up to a clinical transition is a complex one, while clinical areas are designed, commissioned and ultimately signed off for clinical use. Implementation of this project can be divided into six main stages. Depending on the clinical speciality in question and the proposed level of changes to the clinical environment and logistical processes all steps may or may not be necessary. This process offers a foundation to build on where project members can alter and modify any stage to ensure the program meets the demands of their particular development.

Project stages

Stage	Description
1. Planning	• Incorporate your assessment of scope and considerations relating to the logistical implementation of such a project
2. Design	• Develop objectives in line with current and projected practice, formulating a simulation base of scenarios for testing • Develop a structured process for identifying LSTs and associated risk • Agree on the process for escalation
3. Engagement	• Seek input from relevant stakeholders • Develop a participant base
4. Implementation	• Schedule test and analyse simulation scenarios and format LST reports
5. System testing	• Undertake the scenarios • Debrief • Analyse • Document findings
6. Evaluation	• Post-project follow up. Revisit participants to review further LSTs identified as appropriate

Stage 1 – Planning

The planning stage incorporates early logistical considerations of what needs reviewing prior to developing the core project. It is these considerations that will lay the foundation of the project and determine its overall feasibility.

Considerations

- Identify personnel required to develop a faculty with the appropriate skill set capable of implementing and executing scenarios and analysis.
- Access to funding, as required to support hours in excess of typical clinical duties and responsibilities.
- Access to staff and participants to undertake simulation.
- Access to the new clinical site prior to the proposed transition date. Limitations of access may interfere with the objectives of this project.

Faculty development

Develop a faculty of clinicians and support staff with a variety of skills and experience. The faculty should reflect the specific objectives of each scenario and may involve engaging outside personnel e.g. orderlies, cardiologists, switch board staff, anaesthetic staff. It is important to involve junior medical staff rather than rely purely on senior clinicians as they bring a unique and often very practical view to the analysis.

It is recommended to appoint of a project manager for the duration to schedule simulations, to liaise with external personnel (e.g. switchboard, emergency department, radiology) and coordinate each SITAR simulation. Have a medical and nursing lead ideally with simulation experience and identify senior champions from among medical, allied health and nursing staff to participate in scenarios. The aim is not to test their knowledge but use them to articulate the perceived LSTs as they are revealed.

Access to funding

Consideration must be given to staff availability. Project money should be allocated for additional staff during the transition phase allowing nursing staff non-clinical days to participate**.** Strategic scheduling of the scenarios can minimise the salaries and wages required.

Access to clinical participants

While the simulation and associated objectives will not have been finalised, determining access to staff as participants will ultimately determine the viability and feasibility of the project. Management engagement in the project from the outset as this is a patient safety project will help alleviate any barriers to access to clinical staff.

Access to participants should be discussed with relevant stakeholders, identifying periods in which staff can be relieved from clinical duties to allow uninterrupted participation in simulation without impacting on the organisation’s routine function.

Access to the new clinical environment

Access to the new clinical environment will be required to undertake in-situ simulation. A timeframe needs to be identified between building handover and transition of the clinical service.

To conduct meaningful in-situ simulation, participants will require unrestricted access to the facility, infrastructure, equipment, clinical stock and appropriate orientation to the clinical area. Because of the complexity of the phases of building completion and commissioning there are small windows of opportunity whereby in-situ simulations can be conducted. Commissioning and patient movement is often staggered in a new building so multiple opportunities may exist. It is recommended that the project faculty consult with redevelopment stakeholders to identify appropriate times for simulations. The agreed timeline will ultimately affect the number of simulations that can be achieved.

The typical build process

- Prior to handover of the completed facility, the site will be classified as a construction zone with access controlled as per the relevant legislation. Clinical personnel cannot access the site without direct supervision from a representative of the construction company or rebuild project team.
- Once the construction company has officially handed over the facility, commissioning starts whereby third-party vendors not directly associated with the construction company install their relevant infrastructure and equipment. This may include all telecommunication infrastructure, patient care devices, overhead pendant systems, etc. In reality, the construction company representatives are still very present addressing any defects.
- Upon signoff of the third-party vendors, the facility will be assessed for clinical use readiness (not usually a functional assessment as projects like SITAR provide), and clinical transition into the new clinical setting will be undertaken shortly thereafter.

Stage 2 – Design

After the planning phase, program design should start. The project faculty will need a thorough understanding of the current clinical and managerial practice across relevant specialties (models of care) with an idea of what future projected practice will represent. Meeting with key stakeholders to identify such factors may be required. For example, if you are testing the ICU response to an event in the cardiac catheter laboratory, cardiologist, technicians, orderlies, possibly switchboard and of course, ICU staff will all be involved.

The key components

- Identification of the current clinical specialties and projected clinical practice.
- Development of a relevant and institutionally supported simulation database.
- Development of a structured approach to LST identification and documentation.
- Agreement on a structured model of LST escalation, whereby issues can be mitigated or corrected.

Identifying current and projected practice (simulation objectives)

To ensure relevance of this project to the new facility, in-situ simulation scenarios and objectives should be guided by what is considered standard procedure. Projected changes in practice should also be accounted for. To ensure an adequate cross section of clinical practice and logistical management is studied in the new facility, key concept areas are listed below. Within each sub-category key stakeholders should be identified. This will ensure a multidisciplinary approach to identifying what is considered ‘typical practice’.

Key concept areas

Concept	Description	Examples
Emergencies	Typical medical emergencies which can or have occurred within the specialty area. Review of clinical incident reports or logged calls for medical assistance may be of benefit.	• Cardiac or respiratory arrest • Cardiac tamponade requiring resternotomy • Airway emergencies
Outreach activities	Will consist of activities typically undertaken by the clinical specialty outside of its identified clinical environment.	• Assisting in management of cardiac arrests or emergency calls • Patient transports
Patient flow activities	Processes involved with the admission and discharge of patients, both clinically and at a logistical level.	• Admission and discharge of patients (planned and emergency)

		• Handover processes
Procedures	Clinical procedures which are common in the clinical specialty or require specialised set-up or access to specialised equipment.	• Intubation of a patient • Central line insertion • Starting renal replacement therapies • Extra-corporeal membrane oxygenation
Family and visitor interaction	Include processes and procedures associated with the interaction between patient visitors and families with the facility and staff.	• Management of patient visitors • Security procedures • Managing aggressive patients and families

Developing a simulation scenario database

Upon identification and mapping of what is considered typical practice with the speciality, a draft list of proposed simulation scenarios can be developed. From these concepts, each potential simulation scenario will require review to identify the specific objectives for assessment. This manual contains 23 generic intensive care based scenarios for reference. These can be modified or adapted. The recommended simulation scenario structure sheet is also included to assist in formulating new scenarios.

LST identification and documentation process

Healthcare failure mode and effect analysis (HFMEA) is a systematic approach to identifying and preventing product and process related errors before they occur. The LST analysis was based on this method.

LSTs will be identified through a multidisciplinary process of observation and review. Relying on impartial observers, participant feedback and review of video evidence will ensure all processes and practices as outlined in the SITAR simulation scenario database are thoroughly examined. These LSTs should be recorded for further discussion. Each simulation participant should be asked to complete a LST code form.

A description of the filming review process is outlined in "*Study protocol for a framework analysis using video review to identify LST's: trauma resuscitation using in-situ simulation team training. (TRUST)*" [1]

Upon the completion of each simulation, the faculty and impartial observers should convene, reviewing any video evidence and LSTs identified. The faculty will group the LSTs identified into key themes then apply an individual LST code and associated hazard score. Using this process ensures a structured approach to LST review and escalation. An example of a key theme and associated LST codes is outlined below.

Example theme and associated LST codes

Theme: Equipment complication or issue	
Code	Description
2.1: Malfunction	An LST occurring as a direct result of equipment failing to operate as designed within its intended use
2.2: Design limitation	Despite equipment working as designed an LST or limitation is identified during its intended function
2.3: Missing equipment	An LST occurring as a result of missing or poorly located equipment
2.4: User or equipment interaction failure	An LST occurring as a result of operator error while using the equipment

LST identification and management process

LSTs identified	• Each individual participant completes a feedback form to avoid influence of other participants • Faculty reviews any video record to list their LSTs
Faculty discussion	• LSTs from participants and faculty are combined • Consensus approach to reach agreement on coding • Remediation recommendations made
LST coding	• LSTs are themed and coded according to predetermined HMFEA score
Hazard score applied	• By applying the hazard score a level of severity of the LST is determined
Escalation for mitigation	• All LSTs identified are documented for escalation • Discussion with relevant stakeholders • LSTs with a hazard score of 8 and above prioritised for immediate review • Follow up of actions taken is required to ensure LSTs are addressed

Grading and escalation of individual LST codes and events

Upon completion of LST coding, each LST is allocated a hazard score using the HFMEA hazard scoring matrix. This technique of scoring takes into consideration both potential frequency of occurrence and severity allowing LSTs to be prioritised on a scale from 1 to 16. LSTs which receive a hazard scoring of one are proposed to occur in remote circumstances with minor severity, while an LST categorised as a 16 has the potential to occur frequently with

catastrophic severity. A consensus approach to the scoring ensures multidisciplinary input to the LST score and prioritisation.

All identified LSTs, irrespective of their HFMEA score should be documented and discussed with relevant stakeholders, including but not limited to the medical director and nurse manager of intensive care services. LSTs identified as having a score greater than eight or identified as having the potential to result in a total system or process failure will be prioritised during this process.

Stage 3 – Engagement

To achieve a higher degree of fidelity when undertaking in-situ simulation it may be beneficial to incorporate services external to the core speciality. For example; if undertaking a simulation where a patient requires specialist intervention, the addition of anaesthetics or cardiothoracic teams may offer further insight into the relevant procedures and processes. Upon completion of the simulation database, each simulation should be reviewed with the possibility of adding external representatives. Note that individuals should receive the same pre-brief as standard participants and orientation to the new clinical setting would also be beneficial.

Moving beyond the simulation component of the project, completed reports outlining identified LSTs and recommended actions for mitigation require review at a higher level. To ensure these reports can be effectively implemented engage key stakeholders overseeing the redevelopment and the clinical environment itself. As discussed previously to ensure effective escalation and engagement of individuals, a documented and agreed upon process of escalation is required with feedback on the progress of LST mitigation.

Stage 4 – Implementation

Despite extensive planning, the implementation phase of any project often poses numerous issues. To ensure implementation goes smoothly the SITAR team should review the project plan just prior to starting the scenarios. This will identify any last minute issues and enable adjustments as a new building program is often changing. Advertise the final schedule widely among the among the key stakeholders Then schedule, test and analyse simulation scenarios and format LST reports.

Pre-brief

Prior to undertaking each simulation, participating individuals need to attend a pre-brief. This brief will incorporate an overview of the simulation to be performed, including relevant objectives of the scenario as well as the fundamental concepts and clinical progression. This process of briefing alters the focus of the scenario for participants, moving from the traditional threat and management concept of simulation towards a more dynamic challenge and problem-solving basis. This is more conducive to identifying LSTs in the clinical environment.

Individual participant performance and practice during simulation will not be reviewed. This should be highlighted to participants prior to simulation, encouraging them to act within their typical scope of practice.

Debriefing
Debriefing is undertaken as per the outlined objectives of each scenario, with participants reviewing the scenario and identifying issues with workflow or LSTs that could affect patient or staff safety. To assist with this process, each participant is supplied with a LST identification form allowing them to express concerns or limitations experienced during the simulation.

It is important to note, that while this program is based on the identification of LSTs in the clinical environment and not that of the clinical performance of each individual, simulation remains a stressful exercise, with participant experiences differing greatly. Take this into consideration, to ensure the ongoing support and safety of participants and offer an opportunity for individual clinical debrief as required.

Stage 5 – System testing

This is the exciting phase, the culmination of all the preparation! Undertake the scenarios, debrief, analyse and document findings. With good planning and preparation this phase should progress smoothly and genuine LSTs will start to emerge. Complete each scenario with a debrief and analyse LST documentation. Suggest solutions to the LSTs. Ensure all LST's are escalated through the agreed process. Escalate LSTs at the end of each scenario analysis to allow early rectification. Produce a final report summarising all the learnings from the simulations at the end of the whole project.

To test both the new environment and ICU model of care a 'virtual ICU day' using a number of scenarios and patient flows to test a day in the new ICU is very useful to provide an overview. A detailed plan for the day will be required including number and mix of participants. While it is quite labour intensive it is very rewarding both in detection of LSTs and increasing confidence of staff in their new environment. Modify the plan and objectives provided in this document this to reflect the environments and processes of care being used.

Sitar project simulation day

Five hour simulation, incorporating the day to day running and logistics of the acute services building (ASB) ICU.

Simulation day summary

The simulation day represented an opportunity to explore the projected day to day running and logistical management of the ASB intensive care services, while also contributing to the orientation of ICU and allied health staff. This process can be undertaken via a five hour simulation, incorporating six patients, six registered nurses from ICU, four medical participants and an array of allied health and support staff.

Start day with participants receiving a thorough pre-briefing, highlighting the aim of the day while orientating participants to the clinical areas where they would be working. Upon starting the

simulation, bedside staff receive handover and a morning round starts. Throughout the course of the day the following SITAR simulations can be conducted. Develop a run sheet specific for the environment.

Upon completion of the exercise a thorough debrief is needed, allowing individuals to discuss their experience and identify issues they had encountered throughout the day. Collate feedback with the agreed identified LSTs.

Example scenario list

- Scenario #12 – Transport of the ICU patient to CT (with intra-aortic balloon pump)
- Scenario #19 – PACE call: ASB haematology ward requiring admission to ICU
- Scenario #21 – Urgent discharge of cleared ICU patient to facilitate emergency admission
- Scenario #8 – ICU patient requiring bronchoscopy
- Scenario #3 – Multiple, simultaneously deteriorating, high acuity patients
- Scenario #1 – Cardiac arrest (hypovolemic)
- Scenario #25 – Patient visitors; navigation to bedspace
- Scenario #24 – Dealing with aggressive families
- Scenario #23 – Family conference in the ICU quiet rooms
- Scenario #7 – Intubation of the hypoxic BiPAP patient

Scenario objectives

1	Replicate the day to day routine and procedure as projected to occur in the new unit, examining associated processes, including but not limited to; emergency procedures, ICU outreach activities, patient flow and logistics, and management of patient families and visitors.
2	Acknowledge the nursing and medical structures and models of care within the new intensive care services. With team members acknowledging their relevant roles and scopes, while identifying individuals and support personnel able to assist in the clinical management of patients.
3	In the event of deteriorating patients or the need for urgent assistance. Ensure escalation of care through the ASB communication system and infrastructure, i.e. arrest and staff call buttons, hospital paging system and/or bedside communication devices.
4	During periods of high cognitive and physical workload ensure the adequate provision of resources (equipment, staff and skill set) to meet the clinical need of the environment.
5	Ensure clinical staff, are familiar with the location of emergency stock and equipment, including specialist devices, and can facilitate its prompt access to the bedspace when required.
6	Examine the clinical processes and workflow required to effectively manage high acuity patients within the new ASB. Identify LSTs or factors of which may limit the effective management of such patients.
7	Identify a reliable and efficient method of ordering urgent blood products and facilitating their prompt delivery to the bedspace for administration.
8	Access specialist assistance, e.g. ENT, anaesthetics, biomedical engineering, if required using the ASB communications infrastructure, i.e. arrest and staff call buttons, hospital paging system and/or bedside communication devices.
9	Facilitate the safe transport of a level 1 patient, accessing stock and equipment as required so as to meet the clinical needs and outcomes of the identified patient.
10	Explore the role and structure of the ICU cardiac arrest team, ensuring its ongoing viability within the adapted nursing and medical model of care. While ensuring prompt review and admission of patient requiring ICU level care.
11	Facilitate the prompt and safe discharge of a cleared patient so as to facilitate an emergency admission from the ward. Addressing considerations in relation to: work health and safety procedures, infection control policy and the ICU model of care.
12	Explore the projected management of patient family and visitors, including management of aggressive and combative individuals and the implementation of a family conference.

Stage 6 – Evaluation

Hold a meeting of hospital management, building team, project team and key ICU staff to review all LSTs and rectification strategies and evaluate readiness to proceed with occupation of the new ICU. It may be that some rectifications are ongoing but the safety of work-arounds and acceptance of limitations should be agreed and documented.

Post-project follow up

If possible revisit participants to review any further LSTs and any further ideas participants may have as they have reflected on the simulations. Also take the opportunity to reflect on the ‘go live’ or occupation process, including the impact of conducting the scenario based approach on LST detection. Those involved in the SITAR project should be well prepared for building occupation.

Appendices

Generic simulation scenario structure sheet

Scenario #__: short description on scenario

Learning objectives

As identified in the design phase: outline the objectives to be tested in this scenario.

1	
2	
3	
4	
5	

Faculty required

Faculty required to undertake simulation. Roles may be added of removed as appropriate.

Director	
Technician	
SIM Liaison	

Participants

Participating individuals and specialities required to undertake simulation.

Scenario summary

Brief overview and context of simulation scenario.

Scenario setting

Location/s for scenario to be undertaken (include time and location, equipment available, nearest phone, computer etc.).

Patient's back story

Relevant patient medical and social history

Scenario start

How the scenario will start

In-scenario handover

Handover used for briefing participants

Scenario transition states

- Outlines progression of simulation and expected participant responses.
- Numerous states may be required for complex scenarios.
- Last state should include scenario ending, outlining at what stage the scenario will be completed.

STATE __	**Vital signs**	**Expected behaviours**	**Prompts** *(When and if needed)*
Brief description of expected event	*Associated patient observations*	*Expected participant response. Criteria to transition to next state.*	*May be required to assist in state transition*

Equipment and set-up

Equipment and stock required to undertake simulation

Technical equipment	**Clinical stock**
Simulation and clinical based equipment	*Clinical stock required*

Appendix

Include associated reference material. Including any required observation charts, blood results, etc.

Scenario database

Scenario #1: ICU cardiac arrest (hypovolemic)

Learning objectives

1	Ensure prompt and effective escalation of care through the ASB communication system, (i.e. arrest and staff call buttons, hospital paging system and/or bedside communication system).
2	Ensure clinical staff are familiar with the location of emergency stock and equipment, and can facilitate access to emergency resources at the bedspace.
3	Examine the clinical processes and work flow required to effectively manage a cardiac arrest within the new ASB.
4	Ensure the projected medical and nursing models of care allow for the provision of clinical management and intervention, meeting the needs of high acuity patients, without limitation or impact on core business and associated services.
5	Identify LSTs or factors which may limit the effective management of a cardiac arrest within the new ASB intensive care services.
6	Identify a reliable and efficient method of ordering urgent blood products and facilitate their prompt delivery to the bedspace for administration.

Faculty required

Director	Responsible for overseeing simulation and ensuring ongoing safety of participants and faculty. Will oversee the running of the structured debrief, ensuring clinical objectives are met.
Technician	Responsible for running simulation, including monitoring. Will supply participants with information as required or requested, without limiting potential outcomes of simulation. Will assist the director in undertaking debrief of participants.
SIM Liaison	Responsible for ensuring simulation has limited effect on active clinical environment and involved specialities.

Participants

ICU Senior Registrar
ICU Registrar
ICU Resident
ICU Registered Nurse x3
ICU Orderly

Scenario summary

Brett Tompkins was admitted to the ICU after an extensive peritonectomy with HIPEC for pseudomyxoma peritonei (PMP). Documented PCI of 15. The procedure was reported to have been uneventful, requiring minimal correction of coagulation upon conclusion of the case. Approximately two hours after arriving in the ICU, Brett develops a severe abdominal bleed with blood visible in one of his Blake drain canisters. He deteriorates rapidly with a resulting hypovolemic arrest.

Brett requires urgent management as per the ARC guidelines with activation and administration of a massive transfusion protocol (MTP). ROSC will be achieved post administration of the MTP.

Scenario setting

ASB Intensive Care Unit, Level 4 Pod 2 – Patient single room
Standard ICU bed area set-up and bedside emergency equipment available

Patient's back story

Brett Tompkins (MRN: SIM-005)
DOB: 02/11/1990
Nil Known Allergies

History
Diagnosed with PMP in October
Colonic polyps
Mild exercise induced Asthma
GORD

Social
Estranged from family – minimal contact over last two years
Next of kin (NOK) declared a sister on hospital paperwork

Scenario start

Participants will be supplied with operation report and given brief handover as per above. Bedside registered nurse (RN) to take over care of patient, undertaking safety checks and performing head to toe assessment. Blood filled Blake drain canister may be discovered during head to toe assessment, progress as per transition states.

In-scenario handover

Brett Tompkins (MRN: SIM-005)
DOB: 02/11/1990

Nil Known Allergies Two hours post peritonectomy with HIPEC for PMP. PCI 15 Extensive procedure, with numerous resections – Operation report attached Sedation has continued post-op with propofol and fentanyl – GCS 3 Otherwise stable – 2x abdominal Blake drains in-situ

Scenario transition states

STATE 1	**Vital signs**	**Expected behaviours**	**Prompts** *(When and if needed)*
Patient returned from theatre ~2 hours ago. Hypotensive with fresh frank blood in abdominal Blake drain	HR: 125bpm BP: 85/50 (ART) SPO2: 93% ETCO2: Normal trace	• Conduct A-G assessment (A) ETT (B) Standard ventilation (C) CAP refill 6 sec, cold, peripherally shutdown (D) GCS 3 – sedated (E) Fresh frank blood in abdominal Blake drain (F) CVC with Hartmann's infusion @ 80ml. PIVC – nil infusions attached (G) BSL 4.6mmol/L • Escalate for assistance – senior nursing staff or medical assistance o If nursing – assessment as above o If medical – progress to state 2	
STATE 2	**Vital signs**	**Expected behaviours**	**Prompts** *(When and if needed)*
Medical team arrives, conducts assessment and plan management	HR: 140bpm BP: 70/50 (ART) SPO2: 90% ETCO2: Normal trace	• ISBAR handover and review (A) ETT (B) As per ventilator (C) Pale, cold, shutdown (D) GCS 3 – sedated (E) Blood in Blake drain • Acknowledge bleeding and need for urgent fluid resuscitation	If medical team do not initiate plan – progressively decrease blood pressure

		• Plans for immediate blood transfusion – staff allocated to liaise with blood bank • Bloods, ABG, IVF as appropriate	
STATE 3	**Vital signs**	**Expected behaviours**	**Prompts** ***(When and if needed)***
Cardiac arrest (PEA) Loss of arterial trace and ETCO2 on monitor	HR: PEA Rhythm: PEA BP: No output SPO2: Un-recordable ETCO2: No trace	• Identify arrest – PEA • Start compressions • Remove from ventilator and hand bag patient • ALS management • 1mg adrenaline stat after first rhythm check – preferred administration via CVC • MTP ordered by staff member • Staff member allocated to collect blood from blood bank • Preparation of IV pump sets for arrival of blood products	If request ABG results: Hb 54
STATE 4	**Vital signs**	**Expected behaviours**	**Prompts** ***(When and if needed)***
Remains in PEA - Multiple cycles Arrest run as per ALS algorithm - non shockable arrest.	HR: PEA RHYTHM: PEA BP: No output SPO2: Un-recordable ETCO2: No trace	• Continue ALS algorithm • Arrival of MTP – units checked as per administration policy • Initiate blood transfusion	
STATE 5 - RETURN	**Vital signs**	**Expected behaviours**	**Prompts** ***(When and if needed)***
ROSC	HR: 100bpm RHYTHM: ST BP: 90/40 SPO2: 92% ETCO2: Normal trace	Post resuscitation care: • Reassess patient • Need for theatre • ECG • Bloods • ISBAR handover to surgical team	

Equipment and set-up

Technical equipment	Clinical stock
Simulation manikin	ETT with closed system suction. Secured with cotton tapes.
ALSi (Bedside monitoring and defibrillation)	Sedation • Propofol infusion • Fentanyl infusion
Standard ICU bed area set-up • Including emergency equipment • Ventilator with attached dry circuit	IV access • CVC - 4 lmen device • PIVC
ICU cardiac arrest trolley	Infusions • Hartmann's for maintenance IVF
Massive Transfusion Protocol Esky with following units: • PRBC x4 units • FFP x4 units • Pooled PLTs x1 unit • Apheresis cryoprecipitate x4 units Include blood product check list Use simulation MTP esky	Monitoring • Central Venous Pressure • Arterial Line
	Insertions • IDC with drainage bag • ICC on UWSD canister (right side) • Tenkoff catheter • Blake drains x2 on medivac canister – filled with frank blood
Modified transfusion pump set for administration of simulated blood products	Surgical midline dressing

Appendices

1. Operation report

Result type: Operation report
Result date: 07 November 2017 20:00 AEDT
Result status: Modified
Result title: Operation Report
Verified by: Surgeon (RMO) on 07 November 2017 20:00AEDT
Visit Info: St George Public Hospital

Patient: **TOMPKINS, Brett** **MRN: (SIM-005)**
Age: **26 years** Sex: **Male** DOB: **02/11/1990**
Associated diagnoses: **None**
Author: **Surgeon (RMO)**

Operative information

Date of Operation: 07-NOV-2017

Surgical Case Number: Case Number: SIMULATION – SIM005

Facility/Surgical Area/Operating Room: St George Hospital / OpSuite SGH / SGH OR 05

Type of anaesthetic: Spinal and General

Procedure type: Elective

Operative note

Planned procedure: Peritonectomy + HIPEC

Indications for procedure

Comment: Pseudomyxoma peritonei (PMP)

Procedure information

Peritonectomy with heated intraperitoneal chemotherapy, right hemicolectomy, right diaphragm strip, omentectomy, cholecystectomy and insertion of tenkoff catheter

Operation description

Informed consent / Supine / GA / IVABx / IDC / P&D / Time out

Incision: Xiphisternum to pubis

Findings: Mucinous jelly malignant disease in the abdomen. Gall bladder sludge

PCI 15

3/0/2

3/1/0

3/1/0

0/0/0/2

CC0 achieved

Peritonectomy and HIPEC with MMC at 41.5 degrees for 90min

Procedure:

Incision xiphisternum to pubis

Gallbladder removed

Bladder oversown

Omentectomy to stomach and spleen

Diaphragmatic nodules removed with strip on right side

Pelvic peritoneal strip

Peritoneum strip of duodenum

Spleen posterior surface cleared of tumour

GIA to terminal SI and proximal transverse colon

Distal small bowel mesentery cleaned

HIPEC with MMC for 90mins @ 41.5 degrees celcius

Hand sewn side-to-end colorectal anastomosis in two layers

Abdominal leak test performed

Washout with 3L saline, 1L with Genta

2 x 24 Blake drains
Insertion of tenckoff catheter.
Closure with PDS/Vicryl/Clips to skin
Dressings

Postoperative information

Surgeon's note: post procedure instructions and follow up

1. ICU
2. NGT on free drainage
3. Strict fluid balance. Monitor UO. Aim: 0.5ml/kg/h
4. Routine postoperative observations (hourly BP/PR/UO/NG)
5. NO IAP – Bladder resection
6. DVT prophylaxis (s/c heparin and TEDS)
7. IV Abx for 24h
8. Check fibrinogen, platelets, INR and correct as required
9. Keep INR <1.3 for first 24 hours
10. EPIC tomorrow if stable

2. ABG result – Brett Tompkins

Blood Gas	
Arterial Blood pH POCT	7.360
Arterial Blood pO2 POCT	H 171.0 mmHg
Arterial Blood pCO2 POCT	44.4 mmHg
Arterial Blood O2 Saturation POCT	99.4 %
Arterial Blood HCO3 POCT	24.4 mmol/L
Arterial Blood Base Excess POCT	-0.3 mmol/L
Arterial Blood Oxyhaemoglobin POCT	96.9 %
Arterial Blood Inspired Oxygen POCT	31 %
Arterial Blood Haemoglobin POCT	L 54 g/L
Arterial Blood Reduced Haemoglobin POCT	0.6 %
Arterial Blood Methaemoglobin POCT	0.8 %
Arterial Blood Carboxyhaemoglobin POCT	H 1.7 %
Arterial Blood Creatinine POCT	63 umol/L
Arterial Blood Sodium POCT	138 mmol/L
Arterial Blood Potassium POCT	3.8 mmol/L
Arterial Blood Chloride POCT	107 mmol/L
Arterial Blood Calcium Ionised POCT	L 1.11 mmol/L
Arterial Blood Glucose POCT	H 7.1 mmol/L
Arterial Blood Lactate POCT	0.6 mmol/L

Acknowledgements

Benjamin Wood - SGH - Intensive Care Services CNC

Scenario #2: Cardiac tamponade in the ICU

Learning objectives

1	Ensures prompt and effective escalation of care through the ASB communication system (i.e. arrest and staff call buttons, hospital paging system and/or bedside communication system). Including identification of emergency as 'Emergency Resternotomy'.
2	Ensures notification and prompt arrival of required staff, ensuring adequate skill mix and specialist assistance available within the projected medical and nursing models of care to safely perform the procedure if required.
3	Ensure clinical staff, are familiar with the location of emergency stock and equipment, and can facilitate bedside access to the resternotomy trolley.
4	Examine the clinical processes and work flow required to effectively manage a cardiac tamponade and resulting emergency resternotomy within the new ASB.
5	Identifying LSTs or factors of which may limit the effective management of such a scenario.

Faculty required

Director	Responsible for overseeing simulation and ensuring the ongoing safety of participants and faculty. Will oversee the running of the structured debrief, ensuring clinical objectives are met.
Technician	Responsible for running the simulation, including monitoring. Will supply participants with information as required or requested, without limiting the potential outcomes of simulation. Will assist the director in undertaking debrief of participants.
SIM Liaison	Responsible for ensuring simulation has limited effect on active clinical environments and involved specialities.

Participants

ICU Senior Registrar
ICU Registrar
Cardiothoracic Registrar
Theatre nurse x1
ICU RN x4
ICU Orderly

Scenario summary

Tony Andrews was admitted to the ICU post coronary artery bypass grafting (CABG) times four. There where nil complications reported during the procedure. Post-operatively the patient develops a cardiac tamponade, deteriorating quickly with a resulting cardiac arrest. The patient should be managed as per ARC guidelines and will require urgent re-sternotomy, with evacuation of the tamponade and internal defibrillation for ongoing ventricular fibrillation. ROSC will be achieved and the patient should be prepared for an urgent transfer to theatre for ongoing intervention.

Scenario setting

ASB Intensive Care Unit, Level 5 Pod 3 – Patient single room
Standard ICU bed set-up (cardiothoracic) and bedside emergency equipment

Patient's back story

Tony Andrews (MRN: SIM-200)
55 year old male
Nil known allergies

History
PCI with stenting 3 years ago
Peripheral vascular disease
Diabetes – Type 2
High cholesterol
Obstructive Sleep Apnoea
Hypertension
COPD

Social
Smokes 2 packs per week
NOK – mother

Scenario start

Director playing role of bedside RN will handover to a participating RN, requesting that the nurse covers while the bedside RN goes for a lunch break. Handover delivered as per above, answering any further questions the participating nurse may have. Once handover has been completed the bedside RN will no longer be contactable, with the participating nurse being responsible for further care.

Upon completion of handover, the participating RN may attend their standard bedside emergency checks and undertake a head to toe assessment. Progress will then be undertaken as per transition states.

In-scenario handover

Tony Andrews (MRN: SIM-200) 55 year old male Nil Known Allergies CABG x4 approximately 4 hours ago – nil issues intra-op Sedation of Propofol and Fentanyl – GCS 3 CVS stable. Aiming for ART SYS <110mmHg. CVP 15 Pericardial and mediastinal drains in-situ – minimal output Bloods just back – INR 3.5, awaiting RV by ICU

Scenario transition states

STATE 1	**Vital signs**	**Expected behaviours**	**Prompts** *(When and if needed)*
Patient nursed semi-fowlers in bed. Bedside nurse (director) gives handover to ICU RN to cover for lunch break. Can answer questions as asked, although will not stay to assist with patient.	HR: 110 RHYTHM: ST BP: 105/60 CVP: 15 SPO2: 95% ETCO2: Normal trace	• Receive handover • Assessment of patient (A) ETT (B) Standard ventilation (C) Cool peripheries, difficult to hear heart sounds (D) GCS 3 – sedated (E) Large clot in pericardial/mediastinal drain lines, nil output for some time (F) CVC – 5% Dex @ 80ml/hr (G) BSL 4.3mmol/L • Attempts to trouble shoot drain • Escalate for assistance – senior nursing staff or medical o If nursing – assessment as above with progression to state 2 o If medical – progression to state 2	

STATE 2	**Vital signs**	**Expected behaviours**	**Prompts** ***(When and if needed)***
Developing tamponade with peri-arrest	HR: 140 RHYTHM: ST BP:60/25 CVP: 32 SPO2: 90% ETCO2: Normal trace	• Urgent medical assessment – verbalise finding of cardiac tamponade. • Escalation and need for assistance • Resternotomy call through 777 – contacts appropriate team • Emergency trolleys to bedside	
STATE 3	**Vital signs**	**Expected behaviours**	**Prompts** ***(When and if needed)***
Cardiac arrest	HR: 150 RHYTHM: PEA BP: Nil output SPO2: un-recordable ETCO2: nil trace	• Verbalises need for resternotomy in ICU, cannot transfer to theatre • ALS as per ARC guidelines • Prompt emergency resternotomy	If attempts to transfer to theatre – nil theatre available. Over 20 minute wait
STATE 4	**Vital signs**	**Expected behaviours**	**Prompts** ***(When and if needed)***
Emergency resternotomy	HR: >200 RHYTHM: VF BP: Nil output SPO2: un-recordable ETCO2: nil trace	Resternotomy underway, requiring internal defibrillation.	
STATE 5 - RETURN	**Vital signs**	**Expected behaviours**	**Prompts** ***(When and if needed)***
Resternotomy completed – ROSC. Follow up plan	HR: 115 RHYTHM: ST BP: 90/45 SPO2: 96%	• Plan for transfer to theatre. • Transfer equipment collected and bed prepared	Prompt to set-up for OT transfer

	ETCO2: normal trace		

Equipment and set-up

Technical equipment	Clinical stock
Simulation manikin	ETT with closed system suction. Secured with cotton tapes.
ALSi (Bedside monitoring and defibrillation)	Sedation • Propofol infusion • Fentanyl infusion
Standard ICU bed area set-up • Including emergency equipment • Ventilator with attached dry circuit	IV Access • CVC – 4 Lumen device • Large bore PIVC
ICU Cardiac Arrest Trolley	Infusions • 5% Dextrose with 50mmol KCL
ICU Resternotomy Trolley	Monitoring • Central venous pressure • Arterial line
Resternotomy Simulation Set-up • Artificial rib and sternum set • Artificial skin and tissue • Porcine heart • Sleek dressing	Insertions • IDC with drainage bag • Pericardial and mediastinal drains on atrium canister via Y-connector – large clot obstructing tubing
	Surgical midline dressing
	Surgical dressing to donor sites

Acknowledgements

- Alicia Montague – SGH - Intensive Care Services NE
- Benjamin Wood – SGH - Intensive Care Services CNC
- Sarah Jones – SGH - Intensive Care Services CNC

Scenario #3: Multiple simultaneously deteriorating, high acuity patients within the same ICU pod

Learning objectives

1	Ensure the projected medical and nursing models of care allow for the provision of clinical management and intervention, meeting the needs of high acuity patients, without limitation or impact on core business and associated services.
2	Ensures prompt and effective escalation of care through the ASB communication system, i.e. arrest and staff call buttons, hospital paging system and/or bedside communication system, ensuring notification of key stake holders.
3	Ensure the adequate provision of resources and equipment between clinical scenarios, i.e. equipment, staff and skill set, to meet the clinical needs of the deteriorating patients.
4	Identify an appropriate method of sourcing external and/or specialist assistance to facilitate a safe workload and meet key clinical goals as required by the situation.
5	Identify LSTs of factors which may limit the effective management of multiple, high acuity, deteriorating patients within the new ASB intensive care services.

Faculty required

Director	Responsible for overseeing simulation and ensuring ongoing safety of participants and faculty. Will determine appropriate timing and initiate second scenario. Will assist the technicians is the debriefing of participants.
Technician (Two required)	Responsible for running simulation, including monitoring. Will supply participants with information as required or requested, without limiting potential outcomes of simulation. As a team will undertaking the structured debrief of participants.
SIM Liaison (Two required)	Responsible for ensuring simulation has limited effect on active clinical environment and involved specialities. Liaise with external services as appropriate to encourage participation.

Participants

Ensure adequate participants to run each selected scenario. Dependant on scenario selection, further participants may be required, including external specialists as appropriate, e.g. anaesthetics, etc.

Scenario summary

The scenario will be conducted within one ICU pod, with no direct line of sight between patient rooms. The scenarios run may be selected from the remaining scenarios in this manual.

Scenario setting

ASB Intensive Care Unit, Level 4 Pod 1 – Patient single room x2 Standard ICU bed area set-up and bedside emergency equipment

Scenario start

First scenario will start, while underway a second patient will begin to deteriorate, prompting bedside nursing staff to escalate for review. The second patient will require immediate assessment and medical intervention, requiring the medical team to divide resources.

Scenario transition states

STATE 1	**Vital signs**	**Expected behaviours**	**Prompts** *(When and if needed)*
Start first scenario	As per selected scenario transition states	Teams should be managing first patient	
STATE 2	**Vital signs**	**Expected behaviours**	**Prompts** *(When and if needed)*
Introduction of second scenario	As per selected scenario transition states	• Nursing and medical team should re-evaluate, allocating resources as appropriate. • External assistance should be sought as appropriate	

Equipment and set-up

Technical	Clinical stock
Scenario dependant Ensure adequate resources to complete both scenarios	

Scenario #4: Blocked tracheostomy in the ICU

Learning objectives

1	Ensure prompt and effective escalation of care through the ASB communication system, i.e. arrest and staff call buttons, hospital paging system and/or bedside communication system.
2	Ensure clinical staff are familiar with the location of emergency stock and specialist airway equipment, and can facilitate its access at the bedside.
3	Examine the clinical processes and workflow required to effectively manage a blocked tracheostomy, ensuring the ASB ICU single room layout allows safe and proficient management of emergency situations.
4	Identify and discuss LSTs or factors identified as limiting the effective management of a blocked tracheostomy within the new ASB intensive care services setting.

Faculty required

Director	Responsible for overseeing simulation and ensuring ongoing safety of participants and faculty. Will oversee the running of the structured debrief, ensuring clinical objectives are met.
Technician	Responsible for running simulation, including monitoring. Will supply participants with information as required or requested, without limiting potential outcomes of simulation. Will assist the director in undertaking debrief of participants.
SIM Liaison	Responsible for ensuring simulation has limited effect on active clinical environment and involved specialities.

Participants

ICU Registrar ICU RMO ICU RN x3

Scenario summary

Paul Matthews was admitted 19 days ago with severe pneumonia requiring intubation and mechanical ventilation, his hospital stay has since been complicated by bilateral pulmonary embolism (PE's). To facilitate the weaning of ventilator support a surgical tracheostomy was inserted nine days ago. Paul has been sprinting well over the last few hours. However upon assessment by the bedside nurse he is noted to be in respiratory distress, with the nurse unable to pass the

suction catheter secondary to an obstruction. This scenario does not progress to a respiratory arrest, but instead focuses on the processes associated with managing an airway emergency.

Scenario setting

ASB Intensive Care Unit, Level 4 Pod 1 – Patient single room
Standard bed area set-up and basic emergency equipment
Bedside tracheotomy equipment as per local protocol

Patient's back story

Paul Matthews (MRN: SIM-400)
51 year old man
Nil known allergies

History
Cardiovascular disease requiring PCI with stenting three years ago
High cholesterol
Diabetes – Type 2

Social
Smoker (?1 pack/day)
Not married – lives alone
NOK – sister (minimal contact over last 6 months)

Scenario start

Bedside RN will be supplied with brief handover as per above. They are to take over care of patient, undertaking safety checks and performing a head to toe assessment. Patient will develop respiratory distress over proceeding minutes.

In-scenario handover

Paul Matthews (MRN: SIM-400)
51 year old male
Nil known allergies
Admitted 19 days ago with severe community acquired pneumonia
Complicated by bilateral PE's – Heparin infusion running at 12ml/hr
Long wake and wean – surgical tracheostomy 9 days ago. Currently sprinting (SN @ 4L/min)
Small amount of blood stained sputum from tracheostomy on suctioning

Scenario transition states

STATE 1	**Vital signs**	**Expected behaviours**	**Prompts** *(When and if needed)*
Patient upright in bed, nurse unable to pass suction catheter. Blood in suction line	HR: 120 RHYTHM: ST BP: 120/80 SPO2: 94% ETCO2: Dampened trace	• Handbag patient to assess airway • Unable to bag, no ETCO2 – troubleshoot cause • Escalate for assistance – senior nursing staff or medical	
STATE 2	**Vital signs**	**Expected behaviours**	**Prompts** *(When and if needed)*

Resistance when bagging patient. Unable to pass suction catheter	HR: 140
	RHYTHM: ST
	BP: 110/70
	SPO2: 90%
	ETCO2: No trace
		• Deflate cuff
		• Apply supplemental oxygen
		• Call for help
		  • Medical assistance
		  • ?ENT
		  • ?Anaesthetics	

STATE 3	**Vital signs**	**Expected behaviours**	**Prompts** *(When and if needed)*
Medical assistance arrives Look to establish definitive airway	HR: 145 RHYTHM: ST BP: 100/60 SPO2: 80% ETCO2: No trace	• Unable to ventilate • Deflate cuff • Apply supplemental oxygen • ISBAR handover and verbalises ‘unable to ventilate’ • Removal of tracheostomy and re-cannulation of stoma or oral intubation as appropriate	
STATE 4	**Vital signs**	**Expected behaviours**	**Prompts** *(When and if needed)*
Airway secured	HR: 130 RHYTHM: ST BP: 115/65 SPO2: 94% ETCO2: Normal trace		

Equipment and set-up

Technical	Clinical stock
Simulation manikin (tracheostomy compatible)	Portex tracheostomy size 8.0 (occluded) with inner cannula (clots)
ALSi (Bedside monitoring and defibrillation)	Tracheostomy closed suction setup (old blood in line)
Standard ICU bed area set-up • Including emergency equipment • Including tracheostomy emergency equipment	Swedish nose with trache HME and O2 setup
ICU Cardiac Arrest Trolley	IV Access • CVC – 3 Lumen device • PIVC
ICU Emergency Airway Trolley	Infusion • Normal saline maintenance IVF • Heparin infusion
	Monitoring • Arterial line setup

Acknowledgements

Benjamin Wood – SGH - Intensive Care Services CNC

Scenario #5: Hypoxic patient requiring ECMO in the negative pressure room

Learning objectives

1	Examine the current process of starting a patient on VV ECMO in the ICU, ensuring its ongoing appropriateness for the new clinical environment. Document the time required for set up of the ECMO circuit, cannulation team mobilisation, surgical team mobilisation, etc.
2	Using the ASB communication infrastructure, ensure notification of key stakeholders and required personnel to access required equipment and specialist assistance.
3	Ensure clinical staff are familiar with the location of emergency stock and equipment, and can facilitate its prompt access when required. Including specialist equipment required from theatre and external clinical areas.
4	Explore the logistics, time and ability to mobilise three teams and their equipment into the negative pressure room via the ante room. Observing correct practice and procedure.
5	Examine the clinical process and workflow required to effectively manage a patient in the negative pressure rooms requiring complex procedural intervention by the multidisciplinary team.
6	Identify LSTs or factors of which may limit the effective management or completion of this procedure, as impacted by the new clinical environment and changing clinical structures.

Faculty required

Director	Responsible for overseeing simulation and ensuring ongoing safety of participants and faculty. Will oversee the running of the structured debrief, ensuring clinical objectives are met.
Technician	Responsible for running simulation, including monitoring. Will supply participants with information as required or requested, without limiting potential outcomes of simulation. Will assist the director in undertaking debrief of participants.
SIM Liaison	Responsible for ensuring simulation has limited effect on active clinical environment and involved specialities. Will liaise with involved specialities as required to ensure their timely arrival without impacting on reportable objectives.

Participants

ICU Consultant

Cardiothoracic Proceduralist
ICU Medical
Perfusionist
ICU RN x3
OT RN x2
Radiographer

Scenario summary

Bart Kubisa was admitted to the ICU after an acute deterioration on the respiratory ward. He has since been diagnosed with Influenza A (H5N1) and isolated in a negative pressure room. Despite maximal therapy he has continued to decline; FIO2 requirements continue to increase (P/F ratio of <300mmHg) with a PEEP of 15cmH20. In light of this continuing deterioration the patient is to be commenced on VV ECMO. The medical and nursing staff should follow local procedure, notifying relevant stake holders with mobilisation of the theatre and cardiothoracic cannulation team.

Scenario setting

ASB Intensive Care Unit, Level 4 Pod 1 – Patient single room (negative pressure)
Standard ICU bed area set-up and bedside emergency equipment

Patient's back story

Bart Kubisa (MRN: SIM-001)
DOB: 22/06/1992
Nil know allergies

History
Previously well
Exercise induced asthma

Admission
Initially admitted to the respiratory ward and then diagnosed with H5N1
X-ray: Extensive bilateral shadowing on the lower lung fields
Extensive IV antibiotic therapy offered nil improvement

Respiratory ward (5 days)
Ongoing deterioration
ABG: pH 7.48, pCO2 68.5, pO2 41.9, spO2 75.6%
X-ray: Extensive bilateral consolidation
Transferred to ICU for ongoing management

Intensive Care Unit
Intubated and ventilated
Deep sedation with paralysis (Midazolam, Fentanyl, Cisatracurium)
Bronchoscopy with BAL – IV ABx adjusted

- Day 10 (ICU)
- X-Ray: Bilateral inflammatory changes involving the lower and middle lobes
- Day 14 (ICU)
- Despite maximal therapy – further deterioration
- Decision to commence patient on VV ECMO

In-scenario handover

Handover as outlined in the patient back story can be given to the medical and nursing participants. The decision to start ECMO has already been made, requiring the team to start planning and notification of required personnel and stakeholders.
Staff will need to be allocated to specific roles within their respective models of care. This will ensure an accurate review of the projected structure and its versatility in such a scenario.

Scenario transition states

STATE 1	**Vital signs**	**Expected behaviours**	**Prompts** *(When and if needed)*
Patient has deteriorated over the last three hours with the consultant stating he wants to proceed with ECMO	HR: 128 RHYTHM: ST BP: 105/75 Norad 22ml/Hr SPO2: 91% ETCO2: Normal trace Temp 38.3 degrees UO: 35mls/Kg/Hr	Initiate pathway with pod coordinator and NUM to begin preparations for the start of ECMO	
STATE 2	**Vital signs**	**Expected behaviours**	**Prompts** *(When and if needed)*
Set-up Entry of room Cannulation	As above	Patient cannulation undertaken and start of ECMO	

Equipment and set-up

Technical equipment	Clinical stock
Simulation manikin	ETT with closed system suction. Secured with cotton tapes
ALSi (Bedside monitoring and defibrillation)	Sedation or paralysing agents • Midazolam infusion • Fentanyl infusion • Cisatracurium infusion
Standard ICU bed area setup • Including emergency equipment • Ventilator with attached wet circuit	IV Access • CVC – 4 Lumen device • PIVC
ICU Cardiac Arrest Trolley	Infusions • Normal saline maintenance IVF • Noradrenaline infusion
Ultrasound and TOE machines	Monitoring • Central venous pressure • Arterial line
Perfusionist • Rotaflow and primed ECMO circuit	
Surgical team • Cannulation trolleys and associated equipment	Insertions • IDC with drainage bag

Acknowledgements

Sarah Jones – SGH - Intensive Care Services CNC

Scenario #6: Cardiac arrest in ICU shower room (super-ensuite)

Learning objectives

1	Ensure the prompt and effective identification of a cardiac arrest and facilitate escalation of care through the ASB communication system, i.e. arrest and staff call buttons, hospital paging system and/or bedside communication system.
2	Ensure clinical staff are aware of the procedures related to the use of the ICU super-ensuite and, in the event of acute patient deterioration, can provide high level care in line with best available evidence and relevant safety requirements and procedures.
3	Ensure clinical staff are familiar with the location of emergency stock and equipment, and can facilitate access as required.
4	Examine the clinical processes and workflow required to effectively manage a cardiac arrest within the new ICU super-ensuite.
5	Identifying LSTs or factors of which may limit the effective management of a cardiac arrest within this clinical area.

Faculty required

Director	Responsible for overseeing simulation and ensuring ongoing safety of participants and faculty. Will oversee the running of the structured debrief, ensuring clinical objectives are met.
Technician	Responsible for running simulation, including monitoring. Will supply participants with information as required or requested, without limiting potential outcomes of simulation. Will assist the director in undertaking debrief of participants.
SIM Liaison	Responsible for ensuring simulation has limited effect on active clinical environment and involved specialities.

Participants

ICU Registrar ICU RMO ICU RN x3 ICU Orderly

Scenario summary

Billy Adams was admitted to the ICU two months ago for management of his Guillain Barre. His management has consisted of intravenous immunoglobulin and plasmapheresis, with the insertion of a tracheostomy to support his respiratory function. He has started showing

evidence of improvement and this morning the ICU team has approved his transfer, using the shower trolley, to the ICU super-ensuite for a shower.

During the shower Billy will experience a VT arrest, requiring urgent management in line with facility policy and ARC guidelines. Due to the high risk nature of this simulation, it is recommended that a simulation based defibrillator of which does not deliver any current be used.

Scenario setting

ASB Intensive Care Unit, Level 5 Pod 3 – Patient single room and Patient super-ensuite
Standard ICU bed area set-up and bedside emergency equipment
ICU Patient super-ensuite – Only equipment bought with patient during transfer

Patient's back story

Billy Adams (MRN: SIM-600)
30 years old
Nil known allergies

History
Diagnosed with Guillain Barre
Has otherwise been well

Social
Lives at home with his wife and two kids

In-scenario handover and scenario start

Billy Adams MRN: (SIM-600)
30 Year old male
Nil Known Allergies
Diagnosed with Guillain Barre and managed with Intravenous Immunoglobulin and Plasmapheresis
Tracheostomy 1 month ago and is now sprinting (tolerating well the last few days)
The ICU team has cleared him for a shower in the super-ensuite. The orderly is at the bed space with the shower trolley to assist with transfer and shower.

Scenario transition states

STATE 1	**Vital signs**	**Expected behaviours**	**Prompts** *(When and if needed)*
Preparation and transfer of patient to super-ensuite with orderly. Start patient shower	HR: 110 RHYTHM: ST BP: 110/65 (NBP) RR: 15 - settled SPO2: 98% Sprinting on Swedish nose @ 4L/minute	• Notify in charge of patient transport to shower • Start patient shower • Maintain 2:1 ratio, to facilitate safe working procedure • Ensure electrical devices are safely removed from the shower environment and kept dry • Ensure access to linen and emergency equipment if required	
STATE 2	**Vital signs**	**Expected behaviours**	**Prompts** *(When and if needed)*
Patient losses consciousness and VT is displayed on the monitor	HR: >200 RHYTHM: VT RR: Nil trace BP: Nil output SPO2: Un-recordable	• Immediate assessment of patient • Compressions commenced • Assistance sought • Drain shower trolley and commence drying patient • Prep for immediate transfer to patient single room for advanced life support procedures	
STATE 3	**Vital signs**	**Expected behaviours**	**Prompts** *(When and if needed)*

Patient is moved to unoccupied ICU single patient room for management, work area is dry and safe for patient and staff RHYTHM CHECK: VT	HR: >200 RHYTHM: VT BP: Nil output RR: Nil trace SPO2: Un-recordable	• Arrest managed as per ALS algorithm – shockable • Shock is delivered and at next rhythm check, output has been restored	May prolong required cycles prior to ROSC if further testing required
STATE 4 – RETURN	**Vital signs**	**Expected behaviours**	**Prompts** *(When and if needed)*
Return of spontaneous output	HR: 145 RHYTHM: ST Pulse: YES SPO2: 98%	Conclusion of scenario	

Equipment and set-up

Technical equipment	Clinical stock
Simulation manikin (suitable for submersion)	Tracheostomy size 7.0 with blue tapes
ALSi (Bedside monitoring and Defibrillation)	Swedish nose with Trache HME
Standard ICU bed area set-up • Including bedside emergency equipment • Tracheostomy bedside emergency equipment	IV Access • PICC Line – 2 Lumens
ICU Cardiac Arrest Trolley	Insertions • IDC with drainage bag
ICU Shower Trolley	
Appropriate transport setup to allow a safe transfer to and from the super ensuite.	

Acknowledgements

Sarah Jones – SGH - Intensive Care Services CNC

Scenario #7: Intubation of the hypoxic BiPAP patient

Learning objectives

1	Ensure prompt and effective escalation of care through the Acute Services Building (ASB) communication system, i.e. arrest and staff call buttons, hospital paging system and/or bedside communication system.
2	Ensure clinical staff, are familiar with the location of emergency stock and equipment, and can facilitate its prompt access to the bedspace when required.
3	Examine the clinical processes and work flow required to facilitate the prompt and safe intubation of a hypoxic patient requiring BiPAP within the new ASB ICU.
4	Ensure the projected medical and nursing models of care allow for the safe completion of such a procedure in line with current evidence based research, while ensuring adequate staffing ratios are maintained throughout the remaining clinical environment.
5	Identifying LSTs or factors which may limit the effective management or completion of this procedure, as impacted by the new clinical environment and changing clinical structures.

Faculty required

Director	Responsible for overseeing simulation and ensuring ongoing safety of participants and faculty. Will oversee the running of the structured debrief, ensuring clinical objectives are met.
Technician	Responsible for running simulation, including monitoring. Will supply participants with information as required or requested, without limiting potential outcomes of simulation. Will assist the director in undertaking debrief of participants.
SIM Liaison	Responsible for ensuring simulation has limited effect on active clinical environment and involved specialities.

Participants

ICU Registrar ICU RMO ICU RN x3

Scenario summary

Bettsy Jones was admitted to the ICU for management of her community acquired pneumonia (CAP). She has been managed on BiPAP over the last 2 days; however she

continues to deteriorate showing extensive consolidation on X-ray with increasing oxygen requirements.
After the morning round, Bettsy becomes profoundly short of breathe with worsening saturations despite increases in FIO2 and support. During the scenario she will continue to deteriorate, prompting the ICU team to intubate.

Scenario setting

ASB Intensive Care Unit, Level 4 Pod 2 – Patient single room
Standard ICU bed-are setup and bedside emergency equipment

Patient's back story

Bettsy Jones (MRN: SIM-003)
DOB: 06/01/1952
Nil known allergies

History
Smoker last 30 years – 1 pack per day
Emphysema
Cardiovascular disease
Diabetic
COPD

Social
Lives at home with her husband (NOK)
Independent in ADLs

Scenario start

Participating RN will be covering for bedside nurses (Director) lunch break, should be given handover as per in-scenario handover and patient back story, answering any further questions as required. Patient nursed in high fowler's position with BiPAP in-situ. Patient is notably distressed and anxious. Observations as per scenario transition state 1.

In-scenario handover

Bettsy Jones (MRN: SIM-003)
DOB: 06/01/1952
Nil known allergies
Admitted with CAP some days ago
Has been on BiPAP for last 2 days – managed with IV ABx
Chest X-rays are worsening with increased FIO2 and support requirements

Scenario transition states

STATE 1	**Vital signs**	**Expected behaviours**	**Prompts** *(When and if needed)*
Patient nursed in high fowlers, BiPAP in-situ. Patient is notably anxious with laboured breathing BiPAP settings: FIO2 0.8 EPAP 10 IPAP 20	HR: 110 RHYTHM: ST BP: 130/60 RR: 32 – laboured SPO2: 85%	• Undertake bedside assessment (A) Patent (B) Tachypnoea with laboured breathing noted 'air hunger'. AE R=L but globally poor (C) Cool, clammy (D) Slightly confused (E) Nil relevant findings (F) 1x PIVC (G) BSL 5.4mmol/L • Management: • Increase FIO2 to 1.0 – nil improvement • Send for ABG • Call for urgent assistance (medical)	
STATE 2	**Vital signs**	**Expected behaviours**	**Prompts** *(When and if needed)*
Medical team responds, conducts bedside assessment ABG results: pH: 7.45 pCO2: 30 pO2: 55 HCO3: 24 sPO2: 82%	HR: 120 RHYTHM: ST BP: 145/72 RR: 40 – distressed SPO2: 82%	• Conducts medical assessment – findings as above. • Management: • ABG if not completed • Urgent X-ray • Plan for intubation • Seek further assistance as appropriate – verbalises plan • Assemble team for intubation	
STATE 3	**Vital signs**	**Expected behaviours**	**Prompts** *(When and if needed)*
Preparing for intubation	As above – nil further clinical deterioration to	• Intubation performa used	

	ensure proper procedural setup	• Roles allocated – acknowledging appropriate skill sets • Required equipment set-up or readily available at bed space • Team plan verbalised, including plan for escalation if required • Notify anaesthetics if required	
STATE 4	**Vital signs**	**Expected behaviours**	**Prompts** *(When and if needed)*
Successful intubation	HR: 110 RHYTHM: SR BP: 120/50 SPO2: 94% ETCO2: 35	• Intubation undertaken as well-structured team, following performa. • ETT placement is confirmed via auscultation and ETCO2 • ETT secured and patient started on ventilator	

Equipment and set-up

Technical equipment	Clinical stock
Simulation manikin	IV Access • PIVC • PIVC insertion equipment – with associated manikin setup
ALSi (Bedside monitoring and defibrillation)	Infusions • Normal saline maintenance IVF • Pump set with normal saline for intubation meds
Standard ICU bed area set-up • Including emergency equipment • Ventilator with attached dry circuit	Monitoring • Arterial line
ICU BiPAP machine with circuit and mask set-up	Insertions • IDC with drainage bag
ICU Airway Trolley	

Acknowledgements

- Ben Wood – SGH - Intensive Care Services CNC
- Sarah Jones – SGH - Intensive Care Services CNC

Scenario #8: ICU patient requiring bronchoscopy with BAL

Learning objectives

1	Facilitate the completion of a bronchoscopy with BAL in a high acuity ICU patient.
2	Ensure clinical staff are familiar with the location of specialist equipment and stock within the ASB intensive care services, and can facilitate its prompt access to the bedside as required.
3	Introduce staff to equipment newly acquired for the ASB ICU, highlighting any changes in practice or principal from previously employed equipment or stock.
4	Examine the clinical processes and workflow required to safely and effectively complete a bronchoscopy with BAL in the new ASB ICU.
5	Identify LSTs or factors of which may limit the effective execution of such a procedure within the ASB ICU.
6	Access specialist assistance, e.g. ENT, anaesthetics, etc., if required using the ASB communications infrastructure, i.e. arrest and staff call buttons, hospital paging system and/or bedside communication devices.

Faculty required

Director	Responsible for overseeing simulation and ensuring ongoing safety of participants and faculty. Will oversee the running of the structured debrief, ensuring clinical objectives are met.
Technician	Responsible for running simulation, including monitoring. Will supply participants with information as required or requested, without limiting potential outcomes of simulation. Will assist the director in undertaking debrief of participants.
SIM Liaison	Responsible for ensuring simulation has limited effect on active clinical environment and involved specialities.

Participants

ICU Senior Registrar ICU RN x2

Scenario summary

Bart Kubisa has been admitted from the Respiratory ward approximately 20 minutes ago following a PACE call for increased respiratory rate and desaturation. He was promptly intubated and admitted to ICU for management. As part of his management plan, the consultant has requested an urgent bronchoscopy and BAL.

Scenario setting

ASB Intensive Care Unit, Level 4 Pod 1 – Patient single room
Standard ICU bed area set-up and bedside emergency equipment

Patient's back story

Bart Kubisa (MRN: SIM-001)
DOB: 22/06/1992
Nil known allergies

History
Previously well
Exercise induced asthma

Admission
Admitted with Influenza A (H5N1)
Managed with IV antibiotics and BiPAP

Respiratory ward (5 days)
Acute deterioration with PACE TIER 2 call
ABG: pH 7.48, pCO2 68.5, pO2 41.9, SPO2 75.6%
X-ray: Extensive bilateral consolidation
Admitted to ICU for ongoing management – intubated with mechanical ventilation

Scenario start

If staffing permits this scenario can be run consecutively with scenario #19.
Admitting or bedside RN will receive handover as per in-scenario handover. Upon being notified of planned bronchoscopy the bedside RN should start logistical planning, involving the pod coordinator as required and access required equipment and stock.

In-scenario handover

Bart Kubisa (MRN: SIM-001)
DOB: 22/06/1992
Nil known allergies
Admitted with Influenza A (H5N1) – 5 days ago
Managed with IV antibiotics and BiPAP, however continued to deteriorate requiring intubation
Planned for bronchoscopy with BAL

Scenario transition states

STATE 1	**Vital signs**	**Expected behaviours**	**Prompts** *(When and if needed)*
Pre-procedure and upon start of procedure Vent settings: FIO2 0.8, PEEP 20, PS 18,	HR: 120 RHYTHM: ST BP: 120/65 SPO2: 92% ETCO2: Normal trace	• General pre-procedure patient assessment • Plan procedure – required staff and resources • Plan to handbag through procedure or ventilate	
STATE 2	**Vital signs**	**Expected behaviours**	**Prompts** *(When and if needed)*
Desaturation during procedure	HR: 125 RHYTHM: ST BP: 108/60 SPO2: 86% ETCO2: Normal trace	• Review ventilation • Pause procedure to stabilise patient - seek extra assistance if required	
STATE 3	**Vital signs**	**Expected behaviours**	**Prompts** *(When and if needed)*
Collecting BAL	HR: 120 RHYTHM: ST BP: 120/65 SPO2: 92% ETCO2: Normal trace	• Sample collected as per facility policy • Procedure concluded • Patient returned to ventilator when appropriate	

Equipment and set-up

Technical equipment	**Clinical stock**
Simulation manikin (ventilation equipped)	ETT with closed system suction. Secured with cotton tapes.
ALSi (Bedside monitoring and defibrillation)	Sedation or Paralysing agents • Propofol infusion • Fentanyl infusion

ICU ventilator with dry circuit and simulation test lung.	IV access • CVC – 4 Lumen device • PIVC
Standard ICU bed area set-up • Including emergency equipment • Ventilator with attached dry circuit	Infusions • Normal saline maintenance IVF
ICU airway trolley	
Bronchoscope setup will be dependent on device utilised – ensure access to: • Adequate suction tubing • Irrigation fluids • Compatible syringes • Adaptor valve (if required)	

Acknowledgements

Anil Ramnani – SGH- Intensive Care Services

Scenario #9: Starting dialysis in the ICU

Learning objectives

1	Access required stock and equipment, in line with the current work health and safety (WH&S) procedure and policy, ensuring its timely arrival at the clinical bed space.
2	Implement the projected medical and nursing models of care ensuring adequate supervision and bedside monitoring of patients is maintained while equipment and stock is accessed.
3	Employ the ASB communication infrastructure, (i.e. hospital paging system and/or bedside communication system, to seek assistance in facilitating patient supervision and the acquisition of stock.
4	Examine the clinical processes and workflows required to effectively set up and start renal replacement therapy (RRT) within the ASB ICU.
5	Identify LSTs or factors of which may limit the effective management and implementation of RRT in the ASB ICU.

Faculty required

Director	Responsible for overseeing simulation and ensuring ongoing safety of participants and faculty. Will oversee the running of the structured debrief, ensuring clinical objectives are met.
Technician	Responsible for running simulation, including monitoring. Will supply participants with information as required or requested, without limiting potential outcomes of simulation. Will assist the director in undertaking debrief of participants.
SIM Liaison	Responsible for ensuring simulation has limited effect on active clinical environment and involved specialities.

Participants

ICU RMO ICU RN x2

Scenario summary

Bart Kubisa was admitted 13 days ago with severe Influenza (Type A – H5N1). Despite aggressive intervention he has developed an acute kidney injury (AKI) and after being review by the Intensive Care Team it has been decided to start him on RRT, in the form of CVVHDF.

Scenario setting

ASB Intensive Care Unit, Level 4 Pod 1 – Patient single room
Standard ICU bed area set-up and bedside emergency equipment

Patient's back story

Bart Kubisa (MRN: SIM-001)
DOB: 22/06/1992
Nil known allergies

History
Previously well
Exercise induced asthma

Admission
Diagnosed with Influenza – Type A (H5N1)
Extensive IV antibiotic therapy offered nil improvement

Respiratory ward (5 days)
Ongoing deterioration
X-ray: massive atelectasis of both lungs
Transferred to ICU – Intubated

Intensive Care Unit
Deep sedation with paralysis (Midazolam, Fentanyl, Cisatracurium)
Ventilation: FIO2 0.8, PEEP 20, PS 18,
Bronchoscopy with BAL – IV ABx adjusted

- Day 10 (ICU)
- X-ray: Bilateral inflammatory changes involving the lower and middle lobes
- Progression of multi-organ failure – resulting AKI

Scenario start

Patient is intubated and ventilated, nursed in semi-fowlers.
Morning ICU team round has just been completed and the team has requested the start of CVVHDF as soon as possible.

In-scenario handover

Bart Kubisa (MRN: SIM-001)
DOB: 22/06/1992
Nil known allergies
Diagnosed with severe Influenza type A (H5N1), progressing to multi-organ failure
More recently developed AKI – planned for RRT (CVVHDF)

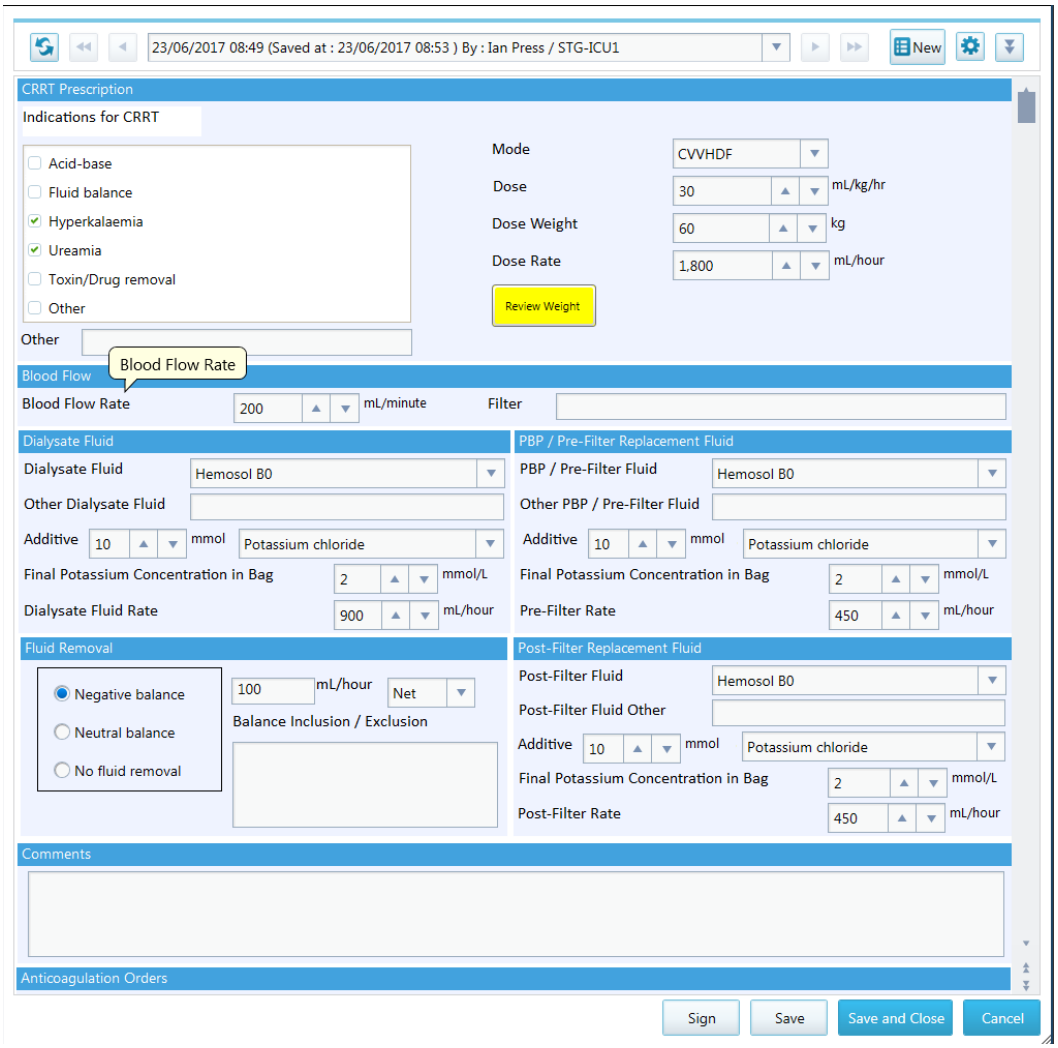
Scenario transition states

STATE 1	**Vital signs**	**Expected behaviours**	**Prompts** *(When and if needed)*
Morning ward round has concluded, ICU team has requested that the RRT starts as soon as possible	HR: 110 RHYTHM: ST BP: 110/65 SPO2: 92 ETCO2: Normal trace As this simulation is process based – no change in observations are required	Liaise with in charge and access nurse to facilitate adequate supervision while stock and equipment is collected	
STATE 2	**Vital signs**	**Expected behaviours**	**Prompts** *(When and if needed)*
Set-up RRT Requested settings for RRT	Vital signs as per above	Sets up RRT while maintaining safe patient environment and complying with WH&S requirements	
STATE 3	**Vital signs**	**Expected behaviours**	**Prompts** *(When and if needed)*
Starting dialysis	Vitals as per above	Vascath accessed and dialysis is started as per policy, using two accredited RN's	
STATE 4	**Vital signs**	**Expected behaviours**	**Prompts** *(When and if needed)*
Discontinuing and disconnection of dialysis	Vitals as per above	Blood is returned to patient with vascath de-accessed and heparin locked as per policy.	

Equipment and set-up

Technical equipment	Clinical stock
Simulation manikin	ETT with closed system suction. Secured with cotton tapes
ALSi (Bedside monitoring and defibrillation)	Sedation or paralysing agents • Midazolam infusion • Fentanyl infusion • Cisatracurium infusion
Standard ICU bed area set-up • Including emergency equipment • Ventilator with wet circuit	IV access • CVC – 4 lumen device • PIVC • Vascath – heparin locked
Dialysis machine (Prismaflex) Including setup: • Circuit • Priming solution • Haemosol bags x3	Infusions • Normal saline maintenance IVF • Noradrenaline infusion
Bag lifter or transporter	Monitoring • Central venous pressure • Arterial line
Effluent bag stand	Insertions • IDC with drainage bag
	Stock as required for connection and disconnection of circuit to vascath. Follow local procedure and policy

Appendix 1: Dialysis order



Scenario #10: Percutaneous tracheostomy insertion in the ICU

Learning objectives

1	Ensure medical and nursing staff are aware of the location of procedural equipment and stock required for the insertion of a percutaneous tracheostomy.
2	Ensure clinical staff can access emergency airway equipment and facilitate its access to the bedspace as required.
3	Examine the clinical processes and work flow required to effectively setup and insert a percutaneous tracheostomy within the new ASB ICU.
4	Identifying LSTs or factors of which may limit the effective management and implementation of such a procedure.

Faculty required

Director	Responsible for overseeing simulation and ensuring ongoing safety of participants and faculty. Will oversee the running of the structured debrief, ensuring clinical objectives are met.
Technician	Responsible for running simulation, including monitoring. Will supply participants with information as required or requested, without limiting potential outcomes of simulation. Will assist the director in undertaking debrief of participants.
SIM Liaison	Responsible for ensuring simulation has limited effect on active clinical environment and involved specialities.

Participants

ICU Senior Registrar ICU RMO ICU RN x2

Scenario summary

Bart Kubisa was diagnosed with Influenza type A (H5N1) ultimately requiring intubation and mechanical ventilation. Despite ongoing management with IV antibiotics and extensive chest physiotherapy, the Intensive Care Medical Team have been unable to effectively wean Mr Kubisa from ventilator support. To facilitate this weaning process an elective percutaneous tracheostomy is to be inserted. The procedure will be undertaken at the bedside as per local procedure and policy.

Scenario setting

ASB Intensive Care Unit, Level 5 Pod 4 – Patient single room
Standard ICU bed area set-up and bedside emergency equipment

Patient's back story

Bart Kubisa (MRN: SIM-001)
DOB: 22/06/1992
Nil known allergies

History
Previously well
Exercise induced asthma

Admission
Diagnosed with Influenza – Type A (H5N1)
Extensive IV antibiotic therapy offered nil improvement

Respiratory ward (5 days)
Ongoing deterioration
X-ray: massive atelectasis of both lungs
Transferred to ICU – Intubated

Intensive Care Unit
Deep sedation with paralysis (Midazolam, Fentanyl, Cisatracurium)
Ventilation: FIO2 0.8, PEEP 20, PS 18,
Bronchoscopy with BAL – IV ABx adjusted

- Day 10 (ICU)
    - X-Ray: Bilateral inflammatory changes involving the lower and middle lobes
    - Planned for elective insertion of percutaneous tracheostomy

In-scenario handover and scenario start

Participating RN to receive handover from simulation technician as per patient back story. They should be notified of the ICU team's intention to insert a percutaneous tracheostomy in the following half hour and encouraged to begin logistical planning and gathering of required equipment.

Scenario transition states

STATE 1	**Vital signs**	**Expected behaviours**	**Prompts** *(When and if needed)*

	HR: 90 RHYTHM:SR BP: 118/78 SPO2: 98 ETCO2: 42	Proceed with tracheostomy	Desaturation – Call for help
STATE 2	**Vital signs**	**Expected behaviours**	**Prompts** *(When and if needed)*
	HR: 85 RHYTHM:SR BP:105/60 SPO2: 97 ETCO2: 45	Complete tracheostomy. Confirm it with passage of suction catheter and bronchoscopy. Order CXR	Desaturation – call for help
STATE 3	**Vital signs**	**Expected behaviours**	**Prompts** *(When and if needed)*
	HR: RHYTHM: BP: SPO2: ETCO2:		
STATE 4	**Vital signs**	**Expected behaviours**	**Prompts** *(When and if needed)*
	HR: RHYTHM: BP: SPO2: ETCO2:		
STATE 5 - RETURN	**Vital signs**	**Expected behaviours**	**Prompts** *(When and if needed)*
	HR: RHYTHM: BP: SPO2: ETCO2:		

Equipment and set-up

Technical equipment	Clinical stock
Simulation manikin (ventilation compatible)	ETT with closed system suction. Secured with cotton tapes
ALSi (Bedside monitoring and defibrillation)	Sedation or paralysing agents • Midazolam infusion • Fentanyl infusion • Cisatracurium infusion
Standard ICU bed area set-up • Including emergency equipment • Ventilator with attached wet circuit	IV Access • CVC – 4 Lumen device • PIVC • Vascath – heparin locked
Bedside emergency tracheostomy equipment	Infusions • Normal Saline maintenance IVF • Noradrenaline infusion
Portex Tracheostomy insertion kit	Monitoring • Central Venous Pressure • Arterial Line
Sterile setup as required to complete procedure in line with current facility policy	Insertions • IDC with drainage bag
ICU airway trolley	
Access to bronchoscope as requested by proceduralist	

Scenario #11: Bedside ECHO and line insertion in unstable patient

Learning objectives

1	Ensure prompt and effective escalation of care through the ASB communication system, i.e. arrest and staff call buttons, hospital paging system and/or bedside communication system.
2	Integrate and use ECHO at the bedside as per the patient management model of care.
3	Ensure clinical staff are familiar with the location of stock and equipment and can facilitate access as required at the bedside.
4	Examine the clinical processes and workflow required for the insertion of central venous access and arterial access devices, identifying LSTs or factors which may limit this process within the new ASB ICU patient single rooms.

Faculty required

Director	Responsible for overseeing the simulation and ensuring ongoing safety of participants and faculty. Will oversee the running of the structured debrief, ensuring clinical objectives are met.
Technician	Responsible for running simulation, including monitoring. Will supply participants with information as required or requested, without limiting potential outcomes of simulation. Will assist the director in undertaking debrief of participants.
SIM Liaison	Responsible for ensuring simulation has limited effect on active clinical environment and involved specialities. Will also fill the role of cardiothoracic representative; confirm findings of ICU team and facilitate return of the theatre for management. Although due to delay in available theatre, encourages the immediate insertion of a CVC and arterial line**.**

Participants

ICU ECHO Fellow ICU Registrar ICU RN x2

Scenario summary

Todd Smith is day five post CABG x3 and had his mediastinal and pericardial drains removed this morning. Observations since are congruent with a slowly developing cardiac tamponade. Using the bedside ECHO cardiac tamponade should be confirmed and workup

for surgical intervention should be started, including involvement from the surgical team. To meet the outlined objectives of this simulation, the cardiac tamponade will not eventuate beyond the initial parameters. Allowing the surgical team to encourage the insertion of central venous access prior to transfer to theatre.

Scenario setting

ASB Intensive Care Unit, Level 5 Pod 3 – Patient single room
Standard cardiothoracic bed area set-up and bedside emergency equipment

Patient's back story

Todd Smith (MRN: SIM-110)
65 year old male
Nil known allergies

History
Cardiovascular disease requiring PCI and stenting 2 years ago
Hypertension
High cholesterol

Social
Married with 2 kids
Denies smoking or ETOH
Works as a labourer
NOK – wife

Scenario start

Participating RN to receive handover on patient as per patient back story and in-scenario handover. If expresses concerns during handover, encourage to seek medical assistance. Otherwise nurse can progress to head to toe assessment.

In-scenario handover

Todd Smith, 65 year old male
Day 5 post CABG x3 – Pericardial drains were removed this morning. Over following hours has become more tachycardic with 'labile' blood pressure. Despite this finding patient is otherwise stable.

Scenario transition states

STATE 1	**Vital signs**	**Expected behaviours**	**Prompts** *(When and if needed)*
Patient in bed; diaphoretic, hypotensive and tachycardic.	HR: 120bpm RHYTHM: ST BP: 100/45 RR: 30 - SOB SPO2: 95%	• Receives handover • Conducts A-G assessment (A) Own (B) Tachypnoea. Air entry equal bilaterally (C) Cold, peripherally shutdown, raised JVP (D) Slightly confused, pupils equal and reactive (E) Diaphoretic (F) PIVC x1 only (G) BSL 5.2mmol/L • Escalated to ICU team for immediate review	
STATE 2	**Vital signs**	**Expected behaviours**	**Prompts** *(When and if needed)*
ICU team attend bedspace and conduct review	As above	• Medical assessment and plan; • ECHO • Diagnosis of small cardiac tamponade. Escalation of management • Cardiothoracic review	Cardiothoracic representative to prompt for line insertion and prepare for theatre
STATE 3	**Vital signs**	**Expected behaviours**	**Prompts** *(When and if needed)*
Prepare for theatre OT encourage the insertion of CVC and Arterial line to facilitate management	HR:115 RHYTHM: ST BP: 100/50 RR: 30 - SOB SPO2: 95%	• Insertion of CVC and arterial line with nurse assistance • Ongoing assessment of patient	

STATE 4	**Vital signs**	**Expected behaviours**	**Prompts** *(When and if needed)*
Lines completed – OT available	As above	Conclude scenario	

Equipment and set-up

Technical	Clinical stock
Simulation manikin	Hudson mask
ALSi (Bedside monitoring and defibrillation)	IV Access • PIVC
Standard ICU bedside set-up • Including emergency equipment	Monitoring • NBP cuff
ECHO machine	CVC insertion kit
Ultrasound machine	Arterial line insertion kit
Theatre transport setup • Bed-end table • Spare oxygen cylinder • Defibrillator (LIFEPAK 20)	

Acknowledgements

Dr Anil Ramnani St George ICU services

Scenario #12: Transport of ICU patient to CT (inc. LABP)

Learning objectives

1	Undertake a safe and efficient transfer of the correct ventilated ICU patient to CT.
2	Identify and locate the equipment and specialist personnel available to assist in a safe transfer to CT, acknowledging the safety requirements related to such equipment and the CT process.
3	Map and time the transfer from set up to arrival at the CT scanner. Identify appropriate areas of which clinical assistance could be sought in the event of clinical deterioration during transfer.
4	Identify LSTs or factors of which may limit the effective management or completion of this transfer, as impacted by the new clinical environment and changing clinical structures.
5	Explore the emergency procedures and available equipment associated with the CT facility and ensures it meets the requirements of a high acuity ICU patient.

Faculty required

Director	Responsible for overseeing simulation and ensuring ongoing safety of participants and faculty. Will oversee the running of the structured debrief, ensuring clinical objectives are met.
Technician	Responsible for running simulation, including monitoring. Will supply participants with information as required or requested, without limiting potential outcomes of simulation. Will assist the director in undertaking debrief of participants.
SIM Liaison	Responsible for ensuring simulation has limited effect on active clinical environment and involved specialities.

Participants

ICU Registrar ICU RN x2 Biomedical Engineer Radiology RN Orderly

Scenario summary

Mr Patrick Turner is day two post CABG x3 secondary to a STEMI

He had an IABP inserted pre-operatively for diffuse coronary artery disease. He returned to ICU post-operatively with the IABP still in-situ, otherwise the procedure was reported to have been straight forward with nil major issues.
He remains intubated and ventilated with a GCS of 11 (E4-VT1-M6) interacting with staff and is being worked up for extubation. On the morning round it is noted that the patient is experiencing left sided weakness (new onset) and fluctuating neurology. The ICU team assesses the patient and decides for an urgent CT.

Scenario setting

ASB Intensive Care Unit, Level 5 Pod 3 – Patient single room
Standard cardiothoracic bed area set-up and bedside emergency equipment
Radiology Department (located within Emergency) – scanner and waiting rooms

Patient's back story

Mr Patrick Turner (MRN: SIM-301)
DOB: 23/03/1951
Nil known allergies

Admission
Presented with STEMI to SDMH – TF to TWH for angiogram (see results below) – SGH for CABG
Angio – complex diffuse LM & proximal LAD disease; ghosting of circumflex system; multiple lesions in right system
Other issues as inpatient:

- HAP – consolidation right base
- AF – secondary to sepsis

History
Non-Hodgkins lymphoma (Rx completed 4 years ago)
Hypertension
Gout
T2DM – Poorly controlled; non-compliant with meds

Social
Lives with wife

Scenario start

The bedside RN is informed on the ward round that a CT is scheduled and to prepare the patient for urgent transfer to CT.

In-scenario handover

Mr Patrick Turner (MRN: SIM-301) DOB: 23/03/1951 Nil Known Allergies Day 2 post-op CABG x3 due to STEMI Required pre-operative IABP for extensive cardiovascular disease and poor ejection fraction IABP remains in-situ post-operatively – has been on autopilot with nil issues New finding of left sided weakness and fluctuating neurology ICU team request urgent CT scan

Scenario transition states

STATE 1	**Vital signs**	**Expected behaviours**	**Prompts** *(When and if needed)*
Preparation for CT IABP: Autopilot 1:2 ratio	HR: 110 RHYTHM: ST BP: 105/70 (80) GTN 12ml/hr SPO2: 98% ETCO2: Normal trace	Set-up for CT and safety checklist: • Correct screening assessments • Identifies need for assistance with IABP – contacts biomed • Packs adequate safety equipment	
STATE 2	**Vital signs**	**Expected behaviours**	**Prompts** *(When and if needed)*
Transfer to CT	As above	• Brings appropriate emergency equipment • Uses safe route with identified assistance points • Oversees safe transport with assistance of medical officer	
STATE 3	**Vital signs**	**Expected behaviours**	**Prompts** *(When and if needed)*
Set up and conduct scan	As initial observations	• Transfers patient to CT bed • Sets up patient –noting appropriate placement of oxylog and IABP	
STATE 4	**Vital signs**	**Expected behaviours**	**Prompts** *(When and if needed)*

Transfer – return to ICU. En route patient deteriorates	HR: 125 RHYTHM: ST BP: 65/40 GTN 12ml/hr SPO2: 98% ETCO2: Normal trace	Plan to expedite patient from hallway to ICU or back to cardiac arrest trolley in CT waiting room? Or stop in hallway and stabilise. All necessary transport equipment is available for ALS	
STATE 5 - RETURN	**Vital signs**	**Expected behaviours**	**Prompts** *(When and if needed)*
Pt stabilised and transfer completed	HR: 110 RHYTHM: ST BP: 105/70 (80) GTN off SPO2: 98% ETCO2: Normal trace	Patient safely returned to ICU	

Equipment and set-up

Technical	Clinical stock
Simulation manikin	ETT with closed system suction. Secured with cotton tapes.
ALSi (Bedside monitoring and defibrillation)	Sedation: • Propofol infusion • Fentanyl infusion
Standard cardiothoracic ICU bed area setup • Including emergency equipment • Ventilator with attached dry circuit	IV Access • CVC – 4 Lumen device • PIVC
Intra-aortic balloon pump • Including simulator control box and balloon simulator • Battery power source for running of simulation equipment during transport	Infusions • 4% dextrose 1/5 normal saline maintenance IVF • GTN infusion
Standard CT transport equipment • Bed-end transport tray • Spare oxygen cylinder • Defibrillator (LIFEPAK 20)	Monitoring • Central venous pressure • Arterial line

• Transport bag	
Oxylog with attached circuit and test lung for circuit test	Insertions • Pericardial and mediastinal drains attached to atrium drainage canister • IDC with drainage bag

Acknowledgements

Sarah Jones – SGH - Intensive Care Services CNC

Appendix 1: Operation report

Result type: Operation Report
Result date: 6 November 2017 12:01 AEST
Result status: Auth (Verified)
Result title: Operation Report
Verified by: Cardiothoracic DR – 6 November 2017 12:05 AEST
Visit Info: St George, Inpatient, 06/11/2017

Patient: **TURNER, Patrick MRN: (SIM-301)**
Age: **66 years** Sex: **Male** DOB: **23/03/1951**
Associated Diagnoses: **None**
Author: **Cardiothoracics**

Operative information

Date of Operation: 06-NOV-2017
Type of anaesthetic: General
Procedure type: Elective

Operative note

Planned procedure: Coronary artery bypass

Procedure information

Coronary Artery Bypass Grafts x 3 using left and right long saphenous vein.
Intraoperative transoesophageal echocardiogram
supine ga iabp via rcfa 1:1
time out - prepped and drapped
median sternotomy
gsv harvested from right and left legs
pericardotomy and stays - gelatinous pericarditis consistent with recent infarct
heparin and cannulation: asc ao and ra 3 stage
32 degrees
x-clamp, acp to arrest, then intermittent acp and down vein grafts. no lateral wall vessel grafts:

- ao to gsv to d1 to lad (reasonable targets)
- ao to gsv to pda(r) (reasonable target)

Rewarm - x-clamp off into sr
top ends performed with side biting clamp
weaned from cbp with iabp 1:1, imrpoved lv function on toe
protamine - decannulated
pericardium closed with drains: right is pericardial, left is mediastinal
sternum closed with wires.

Postoperative Information

Surgeons note: Post procedure instructions and follow up

ICU
cxr
iabp 1:1

Health status

No known allergies

Scenario #13: Transport of ICU patient to MRI

Learning objectives

1	Undertake a safe and efficient transfer of the correct ventilated ICU patient to MRI.
2	Identify and locate the equipment and personnel available for safe transfer to MRI, acknowledging the safety requirements related to such equipment and the MRI process.
3	Map and time the transfer from set up and identification of MRI safety to MRI scanner. Identify appropriate areas in which clinical assistance could be sought in the event of clinical deteriorating during transfer.
4	Understand the screening assessments both for patient and clinical personnel in the MRI facility.
5	Identifying LSTs or factors of which may limit the effective management or completion of this transfer, as impacted by the new clinical environment and changing clinical structures.

Faculty required

Director	Responsible for overseeing simulation and ensuring ongoing safety of participants and faculty. Will oversee the running of the structured debrief, ensuring clinical objectives are met.
Technician	Responsible for running simulation, including monitoring. Will supply participants with information as required or requested, without limiting potential outcomes of simulation. Will assist the director in undertaking debrief of participants.
SIM Liaison	Responsible for ensuring simulation has limited effect on active clinical environment and involved specialities.

Participants

ICU Senior registrar Bedside RN x1 Radiology RN x1 Orderly

Scenario summary

Tan Vann a 28 year old male was involved in a high speed MVA and has since been diagnosed with a traumatic brain injury. He has a Camino ICP monitor in-situ and external ventricular drain, however his clinical progression has been complicated by ongoing high intracranial pressures.

Upon initial imaging no cervical spine fractures were identified; however there is evidence of widening between the intervertebral discs at C3 and C4. An MRI is scheduled. This scenario will also incorporate a patient deterioration during transfer, a decision needs to be made identifying a safe place to properly stabilise the patient.

Scenario setting

ASB Intensive Care Unit, Level 4 Pod 1 – Patient single room
Standard ICU bed area set-up and bedside emergency equipment
Radiology Department – MRI facility

Patient's back story

Mr Vann (MRI: SIM-130)
28 year old male
Nil known allergies

History
Previously well

Social
Lives at home
Works as labourer

Scenario start

The bedside RN is informed on the ward round that an MRI is scheduled and to prepare the patient ready for transport. EVD is at 15cms above the tragus with ICP's stable around 17mmHg. The patient continues on noradrenaline infusion to maintain a CPP greater than 70mmHg.

In-scenario handover

Mr Vann (MRN: SIM-130) 28 year old male Nil known allergies Admitted post MVA – GCS 3 at scene Confirmed TBI – Camino ICP and EVD in-situ. Management complicated by high ICP's over last 5 days. Management undertaken as per TBI guidelines - Noradrenaline infusion for CPP >70mmHg Noted widening of intervertebral discs at C3 and C4 – requiring further investigation (MRI)

Scenario transition states

STATE 1	**Vital signs**	**Expected behaviours**	**Prompts** *(When and if needed)*
Preparation for MRI.	HR: 110 RHYTHM: ST BP: 105/70 (80) Norad 10ml/hr ICP:17 EVD: draining 6-12ml/hr (15cm above tragus) SPO2: 98% ETCO2: Normal trace	Set up for MRI and safety checklist: • Correct screening assessments – ideally radiology RN to attend ICU to undertake prior to transfer • Include MRI safety of transfer equipment and invasive patient devices • Extends IV lines and long mapleson circuit	
STATE 2	**Vital signs**	**Expected behaviours**	**Prompts** *(When and if needed)*
Transfer to MRI	As above	• Brings appropriate emergency equipment • Uses safe route with identified assistance points • Oversees safe transport with assistance of medical officer	
STATE 3	**Vital signs**	**Expected behaviours**	**Prompts** *(When and if needed)*
Set up and conduct scan	As initial observations	• Transfers patient to MRI bed • Sets up patient – removing any device not considered MRI safe	

		• Ensures adequate monitoring is established prior to patient entering MRI room • Ensures adequate ventilation established prior to patient entering MRI room	
STATE 4	**Vital signs**	**Expected behaviours**	**Prompts** *(When and if needed)*
Transfer – return to ICU En route patient deteriorates	HR: 125 RHYTHM: ST BP: 65/40 Norad 10ml/hr ICP:20 EVD: draining 6-12ml/hr (15cm above tragus) SPO2: 98% ETCO2: Normal trace	Plan to expedite patient from hallway to ICU or back to cardiac arrest trolley in MRI waiting room? Or stop in hallway and stabilise. All necessary transport equipment is available for ALS	
STATE 5 - RETURN	**Vital signs**	**Expected behaviours**	**Prompts** *(When and if needed)*
Pt stabilised and transfer completed	HR: 110 RHYTHM: ST BP: 105/70 (80) Norad 10ml/hr ICP:17 EVD: draining 6-12ml/hr (15cm above tragus) SPO2: 98% ETCO2: Normal trace	Patient safely returned to ICU	

Equipment and set-up

Technical equipment	Clinical stock
Simulation manikin	ETT with closed system suction. Secured with cotton tapes

ALSi (Bedside monitoring and defibrillation)	Sedation • Midazolam infusion • Fentanyl infusion
Standard ICU bed area setup • Including emergency equipment • Ventilator with attached wet circuit	IV access • CVC – 4 Lumen device • PIVC
Standard transport equipment • Bed-end transport tray • Spare oxygen cylinder • Defibrillator (LIFEPAK 15/20) • Transport bag	Infusions • Hartmanns maintenance IVF • Noradrenaline infusion
Special MRI transport equipment • Long mapleson circuit with three way adaptor (pre-assembled and tested prior to leaving ICU) • IV extension tubing for all IV lines – attached prior to transport	Insertions • EVD with Camino monitoring • IDC with drainage bag
Oxylog with circuit and test lung	
MRI checklist x3	

Acknowledgements

Sarah Jones – SGH- Intensive Care Services CNC

Scenario #14: Emergency department admission requiring pickup

Learning objectives

1	Convey relevant information to medical and nursing management personnel, so as to facilitate the admission of a patient from the emergency department (ED).
2	Collect required stock and equipment as needed for the patient to assist in a safe transfer from the ED and admission into the intensive care services.
3	Explore the use of BiPAP during prolonged transport scenarios, determining oxygen cylinder requirements and appropriate backup options.
4	Map and time the transfer from set up to arrival at the ED. Identify appropriate areas where clinical assistance could be sought in the event of clinical deteriorating during transfer.
5	Identifying LSTs or factors of which may limit the effective management or completion of this procedure, as impacted by the new clinical environment and changing clinical structures.

Faculty required

Director	Responsible for overseeing simulation and ensuring ongoing safety of participants and faculty. Will oversee the running of the structured debrief, ensuring clinical objectives are met.
Technician	Responsible for running simulation, including monitoring. Will supply participants with information as required or requested, without limiting potential outcomes of simulation. Will assist the director in undertaking debrief of participants.
SIM Liaison	Responsible for ensuring simulation has limited effect on active clinical environment and involved specialities.

Participants

ICU Registrar ICU RN ED Registrar ED RN ICU NUM (1) Orderly

Scenario summary

Andrea Smith was admitted to the ED with an acute exacerbation of asthma. She has been managed with salbutamol nebulisers and IV hydrocortisone. Before being started on BiPAP

30 minutes ago for increased work of breathing, since when she appears more comfortable. She is to be admitted to the ICU for ongoing assessment and management.

Scenario setting

ASB Intensive Care Unit, Level 5 Pod 4 – Patient single room
Standard ICU bed area setup and bedside emergency equipment
ASB Emergency Department – Resuscitation Room 1

Patient's back story

Andrea Smith
35 year old female
Nil known allergies

History
Asthma
Allergic rhinitis

Social
Lives with partner – NOK

Scenario start

Patient resides within the ED in resuscitation room 1, awaiting the overseeing ED registrar to notify ICU that the patient is ready for transfer to ICU. The participating ICU doctor should review the patient notifying the NUM of the patients need for ICU admission.

In-scenario handover

Andrea Smith (MRN: SIM-140)
35 year old female
Nil known allergies
Admitted to ED with an acute exacerbation of asthma
Managed with salbutamol nebulisers and IV hydrocortisone
BiPAP recently commenced for management of respiratory distress (EPAP 3cmH20, iPAP 7cmH20, FiO2 0.5) – notable improvement on last assessment.

Scenario transition states

STATE 1	**Vital signs**	**Expected behaviours**	**Prompts** *(When and if needed)*

Patient is in ED RESUS bay and has been accepted for admission into ICU. The ED team will contact ICU and organise for an urgent pickup.	HR: 110 RHYTHM: ST BP: 130/60 RR 25 bpm – improved WOB since going on BiPAP SPO2: 96% BiPAP Settings: EPAP 3cmH20 iPAP 7cmH20 FiO2 0.5	• ED medical team contacts ICU medical team to facilitate transfer • Notes patient is on BiPAP • Plan conveyed to ICU NUM (1) so as to plan staffing and facilitate an appropriate bed space	
STATE 2	**Vital signs**	**Expected behaviours**	**Prompts** *(When and if needed)*
ICU nurse and medical escort take ICU bed to ED and collect required patient	HR: 110 RHYTHM: ST BP: 130/60 SPO2: 96% BiPAP Settings: EPAP 3cmH20 iPAP 7cmH20 FiO2	• Correct transport equipment is brought to ensure a safe and timely transfer • ICU team arrives in ED and receives handover • Patient assessed by nurse and medical staff and is stable for transfer	
STATE 3	**Vital signs**	**Expected behaviours**	**Prompts** (When and if needed)
Transfer of patient to ICU	As above	Patient is safely transferred to the ICU	

Equipment and set-up

Technical	Clinical stock
Simulation manikin	IV Access • PIVC
ALSi (Bedside monitoring and defibrillation)	Monitoring • Arterial line

Standard ICU bed are setup • Including emergency equipment	
BiPAP machine and circuit with mask Include transport oxygen cylinders	
Standard transport equipment • Bed-end transport tray • Spare oxygen cylinder • Defibrillator (LIFEPAK 15/20) • Transport bag	

Scenario #16: PACE call – radiology department

Learning objectives

1	Initiate a 'cardiac arrest/PACE call' through the ASB paging and escalation systems, ensuring identification of correct clinical location and required assistance.
2	The Cardiac Arrest Team and its associated equipment promptly navigates to the identified clinical area; relying solely on the ASB paging and escalation system; gaining access to the radiology department as required for patient management.
3	Examine the clinical processes and workflow required to effectively manage a deteriorating patient within the radiology department, identifying LSTs or factors which may limit the effective implementation of care and transport of the individual into the intensive care setting.
4	Facilitate prompt and safe transfer of deteriorating patients into the intensive care Unit, while acknowledging appropriate areas to source required stock or assistance during transit.

Faculty required

Director	Responsible for overseeing simulation and ensuring ongoing safety of participants and faculty. Will oversee the running of the structured debrief, ensuring clinical objectives are met.
Technician	Responsible for running simulation, including monitoring. Will supply participants with information as required or requested, without limiting potential outcomes of simulation. Will assist the director in undertaking debrief of participants.
SIM Liaison	Responsible for ensuring simulation has limited effect on active clinical environment and involved specialities.

Participants

ICU Senior Registrar ICU Registrar Anaesthetic registrar PACE RN/CERS ICU Orderly

Scenario summary

Andrea Farrah presented to the ED after referral from her local GP, following a one day history of increasing abdominal pain. She was worked up for query appendicitis and referred for a CT scan with contrast. During the CT scan Mrs Farrah experiences an anaphylactic

reaction to the intravenous contrast and requires immediate management. A PACE/Cardiac Arrest call should be activated, once the patient is stabilised they will be retrieved to ICU for ongoing management.

NOTE: As highlighted in the objectives above, this simulation focuses on the functionality and capability of the systems and infrastructure associated with the ICU outreach program. Taking this into consideration, the clinical practice and management of the patient outside of these objectives will not be reviewed, as such this scenario may be run without a physical manikin or patient.

Scenario setting

ASB Intensive Care Unit, Level 4 Pod 1 – Patient single room
Radiology Department – CT scanner

Patient's back story

Andrea Farrah (MRN: SIM-160)
60 year old female
Nil known allergies

History
Previously well
Exercise induced asthma
Reflux

Social
Single – not married
NOK – brother

Scenario start

The PACE/Cardiac Arrest Team are undertaking 'normal' business within their defined specialities. A PACE/Cardiac arrest call is activated and the team should respond as per their normal protocol.
If a manikin is used they should appear diaphoretic and short of breath. An audible wheeze is noted from across the room.

In-scenario handover

Andrea Farrah - 60 year old female (MRN: SIM-160)
Presents with right lower quadrant abdominal pain - query appendicitis
Has received IV contrast in the context of her CT scan

Scenario transition states

STATE 1	**Vital signs**	**Expected behaviours**	**Prompts** *(When and if needed)*
PACE call activated Patient in CT scanner having just received IV contrast. PACE team arrive and assess patient	HR: 140 RHYTHM: ST BP: 90/50 (NBP) RR: 45 laboured with wheeze SPO2: 92%	• Immediate assessment of patient: (A) Hoarse voice with noted stridor (B) Short of breathe, wheeze (C) Pale and clammy (D) Anxious and slightly confused (E) Rash to shoulders and chest (F) IV contrast attached to peripheral IVC in the (R) CF (G) BSL 5.4mmol/L • Identification of anaphylaxis –Cardiac arrest call • Disconnect IV contrast ?cause	
STATE 2	**Vital signs**	**Expected behaviours**	**Prompts** *(When and if needed)*
Activation of ALS anaphylaxis algorithm	As above	• Oxygen support • IM adrenaline 0.5mg every 5 minutes • 500-1000ml fluid bolus • Hydrocortisone	
STATE 3	**Vital signs**	**Expected behaviours**	**Prompts** *(When and if needed)*
Settling of symptoms Admit to ICU for monitoring and ?pre-operative management	HR: 120 RHYTHM: ST BP: 100/80 SPO2: 95% RR 30bpm – wheeze improve	Arrange for immediate admission into ICU by contacting NUM	

STATE 4	Vital signs	Expected behaviours	**Prompts** *(When and if needed)*
Transport and admission to ICU	As above – nil progression of symptoms	Safe transport to ICU – facilitated by escort staff and necessary equipment	

Equipment and set-up

Technical	Clinical stock
Simulation manikin	IV Access • PIVC
PACE Trolley with ALSi (monitoring and defibrillation)	
CT arrest trolley Including anaphylaxis kit	

Scenario #17: PACE Call – ASB cath lab

ED admission requiring primary PCI, complicated by mid-procedure arrest with notification of arrest team and admission to ICU

Learning objectives

1	Triage an emergency presentation, prioritising clinical management while liaising with cath lab to facilitate timely interventions to improve patient outcomes.
2	Undertake a safe and prompt transfer to cath lab. Ensuring all relevant procedures and policies are met. Clinical handover and formal handover of care is undertaken.
3	On call cath lab team is available within required time frame, meeting the Cardiac Society of Australia and New Zealand recommendation of maximum 90 minutes between presentation and balloon inflation.
4	Primary PCI is conducted in line with current facility policy and best evidence based care principles.
5	Initiate a cardiac arrest call through the ASB paging and escalation systems, ensuring identification of correct clinical location and required assistance
6	The Cardiac Arrest Team and its associated equipment promptly navigates to the identified clinical area; relying solely on the ASB paging and escalation system; gaining access to the cath lab as required for patient management.
7	Identify an appropriate area within the cath lab for the storage of the PACE trolley, ensuring it does not hinder access to required stock or equipment or have a negative impact on the workflow associated with the cath lab lay out.
8	Identify procedures for access to required stock and equipment, lead aprons, ECHO machine, LUCAS compression device, etc. Ensure access to required equipment can be facilitated at the bedside, without compromising the workflow associated with the cath lab layout.
9	Using a structured approach and through interaction with the cath lab team, assess the deteriorating patient, facilitating clinical management and, if appropriate through liaison with the ICU NUM, admission to the ICU.
10	Examine the clinical processes and workflow required to effectively manage a deteriorating patient within the new ASB cath lab, identifying LSTs or factors which may limit the effective implementation of care in the clinical setting.
11	Facilitate prompt and safe transfer of deteriorating patients into the intensive care Unit while acknowledging appropriate areas to source required stock or assistance during transit.

Faculty required

Director	Responsible for overseeing simulation and ensuring ongoing safety of participants and faculty. Will oversee the running of the structured debrief, ensuring clinical objectives are met.
Technician	Responsible for running simulation, including monitoring. Will supply participants with information as required or requested, without limiting potential outcomes of simulation. Will assist the director in undertaking debrief of participants.
SIM Liaison	Responsible for ensuring simulation has limited effect on active clinical environment and involved specialities.

Participants

Emergency department	Cath lab	ICU and outreach services
ED Registrar ED RN x2 (bedside nurse) ED Orderly	On Call Team: CL Consultant CL Registrar CL Radiographer CL RN x2	ICU Senior Registrar ICU Registrar Anaesthetic Registrar PACE RN ICU Orderly

Scenario summary

Simon Bennet – DOB: 01/01/1967 – MRN: --SIM--
Presents to the ED at 03:20 hours with a 45 minute history of left sided chest pain extending into his shoulder, he is notably diaphoretic and anxious. He is triaged and diagnosed with an acute anteroseptal STEMI, the on call cath lab team is notified for immediate primary PCI. During stenting Mr Bennet experiences a sustained VF arrest resulting in the activation of a cardiac arrest call. The patient is eventually stabilised and transferred to ICU for ongoing management.

Scenario setting

Emergency Department – Triage and Resuscitation Bay
ASB Cath Lab – Procedure room
ASB Intensive Care Unit, Level 4 Pod 1 – Patient single room

Patient's back story

Mr Simon Bennet (MRN: -- SIM --)
DOB: 01/01/1967
Nil known allergies

History
Diabetes – Type 2 (now diet controlled)
High cholesterol – takes 1x tablet each night (unknown)
Hypertension
Mild asthma

Social
Lives with wife and two children
Office worker – accountant

Scenario start and in-scenario handover

Simon Bennet – DOB: 01/01/1967 – MRN: --SIM—
Nil known allergies
Presents to the ED at 03:20 hours with a 45 minute history of left sided chest pain extending into his shoulder, he is notably diaphoretic and anxious. For patient history, please refer to 'Patient Backstory'.

Scenario transition states

STATE 1 (03:20)	**Vital signs**	**Expected behaviours**	**Prompts** *(When and if needed)*
Patient self presents to ED triage with complaint as per above. Work-up is started as per local protocol. NOTE: 90 minute window from presentation to balloon inflation. • Start timer	HR: 100bpm RHYTHM: ST with ST elevation BP: 172/82 (NBP) MAP: 112 RR: 16bpm SPO2: 96% (RA) TEMP: 35.3	Initial assessment: (A) Own – patent (B) Elevated rate, slightly laboured. AE R=L (C) Cool, pale and clammy to touch, 12-lead as attached (D) Anxious (E) Nil relevant findings (F) Nil findings. Baseline bloods taken and sent (G) BSL 6.4mmol/L As per local protocol: • Aspirin 300mg PO • GTN for pain • Pain relief (?morphine) • Heparin 80 units/kg stat; Prasugrel 60mg PO • O2 for SPO2 >94% only • ?B-Blockade	12-Lead ECG Formal bloods and VBG

		• Contact cardiology o Activate on call cath lab team	
STATE 2	**Vital signs**	**Expected behaviours**	**Prompts** *(When and if needed)*
Cardiac cath lab team on site and ready for procedure.	Continue as per above	• Cath lab team readiness communicated to ED staff • Prompt transfer of patient to ASB cath lab for intervention • Handover of care from ED to cardiology cath lab team	
STATE 3	**Vital signs**	**Expected behaviours**	**Prompts** *(When and if needed)*
Primary PCI started as per local protocol.	As expected during procedure	PCI started and stenting performed	
VF arrest	HR: >200bpm RHYTHM: VF BP: nil output SPO2: un-recordable	• Management as per ALS algorithm and local protocol • Cardiac arrest call activated • Arrest team activated • Mobilise from their respective clinical areas with required equipment	
STATE 4	**Vital signs**	**Expected behaviours**	**Prompts** *(When and if needed)*
Arrival of Arrest Team and Intensive Care Team members. Handover received from cath lab staff Prolonged VF arrest • Continue cycles until required parameters	VF – as per above state	• Continue management as per ALS algorithm and local protocols • Establish LUCAS compression device to maintain adequate CPR • Intubation by anaesthetics as appropriate • In exploring causes of arrest: • Request ECHO machine	Prompt for intubation and use of ECHO machine where appropriate

adequately tested		o Machine retrieved from current storage location Identify need for ICU bed ?appropriate timing to call to facilitate a prompt transfer post events	
STATE 5	**Vital Signs**	**Expected behaviours**	**Prompts** *(When and if needed)*
Resolution of VF arrest with successful defibrillation Post procedure and arrest care as per protocol. Prep for transfer to ICU	HR: 85 RHYTHM: SR with extensive PVC's BP: 90/45 (ART) SPO2: 98%	• ALS algorithm followed • Post procedure and arrest care • Organise ICU bed with NUM if not already prepared	
STATE 6	**Vital Signs**	**Expected behaviours**	**Prompts** *(When and if needed)*
Transfer to ICU	As per above – state 5. Stable for transfer	• Transfer to ICU completed with adequate equipment and staff for escort • Arrival in ICU into prepared bedspace	

Equipment and set-up

Technical	
Simulation manikin	Vasculature simulation set – allow cannulation of venous and arterial systems
ALSi (Monitoring and Defibrillation)	
Emergency department	
ED bed x1	Access to: • 12-Lead ECG Machine • Blood taking equipment
Transport equipment	
Cardiac cath lab	

Primary PCI Kit	Arrest trolley
	LUCAS compression device
PACE team and ICU	
PACE trolley	

Acknowledgements

- Katharine Becker – SGH- Cardiac Cath Lab NUM
- Julie Beeson – SGH - Intensive Care Services Liaison/Case Manager
- Ben Wood – SGH - Intensive Care Services CNC

Scenario #18: Cardiac tamponade in the surgical ward

Learning objectives

1	Initiate a cardiac arrest call through the ASB and tower ward block paging and escalation systems, ensuring identification of correct clinical location and required assistance.
2	Escalate call through the ASB and tower ward block paging system, identifying need for emergency resternotomy.
3	The Cardiac Arrest Team and its associated equipment promptly navigates to the identified clinical area, relying solely on information supplied by the escalation and paging system.
4	Ensure clinical staff are familiar with the location of emergency stock and equipment, and can facilitate bedside access to the resternotomy trolley in the ward environment.
5	Examine the clinical processes and workflow required to effectively manage a cardiac tamponade and resulting emergency resternotomy in a ward setting. Identifying LSTs or factors which may limit effective management of this scenario.
6	Review availability of theatre and the time required to facilitate an emergency resternotomy, when ward based intervention would not be possible or appropriate.
7	Review other appropriate methods of facilitating an emergency resternotomy when limiting factors prevent the procedure from being undertaken in the ward environment or prevent an emergency transfer to theatre.

Faculty required

Director	Responsible for overseeing simulation and ensuring ongoing safety of participants and faculty. Will oversee the running of the structured debrief, ensuring clinical objectives are met.
Technician	Responsible for running simulation, including monitoring. Will supply participants with information as required or requested, without limiting potential outcomes of simulation. Will assist the director in undertaking debrief of participants.
SIM Liaison	Responsible for ensuring simulation has limited effect on active clinical environment and involved specialities.

Participants

ICU Senior Registrar ICU Registrar Cardiothoracic Registrar Anaesthetic Registrar

Theatre Nurse
ICU/Ward RN x4
ICU Orderly
ICU PACE Nurse

Scenario summary

Rebecca Ward is a 63 year old female who underwent CABG times four with aortic valve replacement (AVR) five days ago. Her post-operative period was uneventful and she has been on the ward for two days. After being reviewed on the morning cardiothoracic round, her atrial and ventricular pacing wires were removed with nil issues. Four hours later she is found to be unresponsive and a cardiac arrest call is activated by the ward staff.
A cardiac tamponade is identified as the cause of arrest and an emergency resternotomy is required.

Scenario setting

Cardiothoracic Ward, Main Tower Ward Block – Patient single room
Standard ward bed area set-up (cardiothoracic) and bedside emergency equipment

Patient's back story

Rebecca Ward (MRN: SIM-180)
63 year old female
Nil known allergies

History
PCI with stenting 3 years ago
Peripheral vascular disease
Diabetes
High cholesterol

Social
Smokes 2 packs per week
NOK – husband

Scenario start

Outside the room the participating nurse will be given handover as per patient back story, upon going to check on her patient she will be found unconscious in cardiac arrest. Escalation procedures should be activated.

In-scenario handover

Responding to cardiac arrest call on the ward Rebecca Ward (MRN: SIM-180) 63 year old female Nil known allergies Had a CABG x4 with AVR 5 days ago and had her pacing wires out today ~4 hours ago Nurse attended patient room for routine medications and found the patient unresponsive activating the arrest buzzer and a 777 call was made.

Scenario transition states

STATE 1	**Vital signs**	**Expected behaviours**	**Prompts** *(When and if needed)*
Activation of call Navigate to scenario	N/A	• Bedside RN identifies cardiac arrest and escalates as appropriate – Cardiac arrest team notified. • Identifies need for emergency resternotomy – starts protocol • Identify safe, prompt route to arrive at scenario. Ensuring access to required resources	
STATE 2	**Vital signs**	**Expected behaviours**	**Prompts** *(When and if needed)*
Diagnosis of cardiac tamponade and required resternotomy	HR: PEA RHYTHM: PEA BP: nil output SPO2: un-recordable	• Receive handover and connect patient to monitoring • ALS algorithm • Escalation of call 'Emergency Resternotomy' if not already completed– calls made as per flow chart and policy o Prep for resternotomy – access to trolley and appropriate skill mix	
STATE 3	**Vital signs**	**Expected behaviours**	**Prompts** *(When and if needed)*

Emergency Resternotomy – chest opened	HR: >200 RHYTHM: VT BP: Nil output SPO2: un-recordable	Organisation of team Resternotomy conducted with internal defibrillation	
STATE 4	**Vital signs**	**Expected behaviours**	**Prompts** *(When and if needed)*
Resternotomy completed – ROSC. Follow up plan	HR: 120 RHYTHM: ST BP: 95/62 (NBP) SPO2: 95% ETCO2: normal trace if intubated	If not already intubated - Intubate patient and facilitate transfer to OT	

Equipment and set-up

Technical	Clinical stock
Simulation manikin	Peripheral IVC – nil fluids running
PACE Trolley with ALSi (Bedside monitoring and defibrillation)	Dressing to sternum and pacing wire site
Standard ward bed area set-up • Including emergency equipment	
Ward Cardiac Arrest Trolley	
Ward Resternotomy Trolley	
Resternotomy simulation set-up: • Artificial rib and sternum set • Artificial skin and tissue • Porcine heart • Sleek dressing	

Acknowledgements

- Alicia Montague – SGH- Intensive Care Services NE
- Sarah Jones – SGH- Intensive Care Services CNC
- Ben Wood - SGH- Intensive Care Services CNC

Scenario #19: PACE call – respiratory ward

Learning objectives

1	Initiate a PACE call or cardiac arrest call through the ASB and tower ward block paging and escalation systems. Ensure identification of correct clinical location and required assistance.
2	The Cardiac Arrest Team and its associated equipment promptly navigates to the identified clinical area, relying solely on information supplied by the escalation and paging system.
3	Promptly navigate to the identified area relying solely on the information provided from the emergency paging and escalation system
4	Ensure clinical staff are familiar with the location of emergency stock and equipment, and can facilitate access as required at the bedside.
5	Examine the clinical processes and workflow required to effectively manage a deteriorating patient within a ward setting. Identify LSTs or factors which may limit effective management of this scenario.
6	Facilitate prompt and safe transfer of deteriorating patients into the intensive care eUnit, while acknowledging appropriate areas to source required stock or assistance during transit.

Faculty required

Director	Responsible for overseeing simulation and ensuring ongoing safety of participants and faculty. Will oversee the running of the structured debrief, ensuring clinical objectives are met.
Technician	Responsible for running simulation, including monitoring. Will supply participants with information as required or requested, without limiting potential outcomes of simulation. Will assist the director in undertaking debrief of participants.
SIM Liaison	Responsible for ensuring simulation has limited effect on active clinical environment and involved specialities. Will fulfil the role of the ward bedside RN until the PACE/Cardiac Team arrive – assist as prompted.

Participants

ICU Senior Registrar
ICU Registrar
Anaesthetics Registrar
ICU PACE RN

Mobile X-ray team
ICU Orderly

Scenario summary

Bart Kubisa is a 25 year old male admitted four days ago with progressive dyspnoea secondary to a severe a CAP. He has recently been diagnosed with Influenza type A (H5N1). He has been managed on the ward with respiratory support and intravenous antibiotics. The ward nursing staff have activated a PACE call (Tier 2) this morning secondary to a high respiratory rate and poor oxygen saturations. The patient will require urgent management and admission to ICU.

NOTE: As highlighted in the objectives above, this simulation focuses on the functionality and capability of the systems and infrastructure associated with the ICU outreach program and admission of a high acuity patient into the ICU. Clinical management occurring at the ward level is outside the scope of this program.

Scenario setting

ASB Intensive Care Unit, Level 4 Pod 1 – Patient single room
ASB Haematology/Oncology Ward, Level 7 Pod B – Patient single room
Standard ward bed area set-up and bedside emergency equipment

Patient's back story

Bart Kubisa (MRN: SIM-001)
DOB: 22/06/1992
Nil known allergies

History
Previously well
Exercise induced asthma

Admission
Initially admitted to the respiratory ward and then diagnosed with H5N1
X-ray: Extensive bilateral shadowing on the lower lung fields
Extensive IV antibiotic therapy offered nil improvement

- Respiratory ward (5 days)
    - Ongoing deterioration despite treatment

Social
Lives with wife, self-caring and independent

Non-smoker Drinks 1x bottle wine per night

Scenario start

Patient is nursed in a ward bed, positioned into high-fowlers. Patient is notably short of breath and anxious. Bedside nurse (role filled by Sim Liaison) is attempting to complete a further set of observation when the team arrives. Bedside nurse should deliver brief handover and supply the team with the clinical notes if prompted.

In-scenario handover

Bart Kubisa (MRN: SIM-001) DOB: 22/06/1992 Nil known allergies Admitted yesterday with a severe CAP – diagnosed Influenza Type A (H5N1) Managed with IV antibiotics and HFNP, however he has continued to deteriorate, started on BiPAP this morning. A PACE call has been activated for high respiratory rate and poor oxygen saturations.

Scenario transition states

STATE 1	**Vital signs**	**Expected behaviours**	**Prompts** *(When and if needed)*
Patient is in high-fowlers, notably anxious and short of breath. BiPAP in-situ, settings: FIO2 0.8 EPAP 10 IPAP 20 ICU team arrive and review patient	HR: 135 RHYTHM: ST BP: 106/63 (NBP) RR: 42 – short shallow breathes SPO2: 80%	• Introduce team and roles • Take handover from bedside nurse • Conduct assessment: (A) Patent (B) Short shallow laboured breathes despite BiPAP. AE severely decreased bilaterally (C) Cold peripherally (D) Orientated, anxious (E) Nil relevant findings (F) PICC Line – NSaline running @ 60ml/hr (G) BSL 5.2mmol/L Management plan: • Increase FIO2 on BiPAP	ABG Results: pH 7.286 pCO2 46.0 pO2 51.2 spO2 76.8%

		• Urgent ABG • Urgent chest x-ray • Seek airway guidance with airway support if required • Urgent intubation • Once stable urgent transfer to ICU	
STATE 2	**Vital signs**	**Expected behaviours**	**Prompts** *(When and if needed)*
Management plan started ABG results Urgent X-ray results Despite increased FIO2 on BiPAP – nil improvement noted in saturations	HR: 135 RHYTHM: ST BP: 106/63 (NBP) RR: 45bpm SPO2: 75%	Escalation of call to cardiac arrest Intubation on ward	
STATE 3	**Vital signs**	**Expected behaviours**	**Prompts** *(When and if needed)*
Set-up and intubation in ward setting	HR: 135 RHYTHM: ST BP: 100/45 RR: 40bpm SPO2: 80%	• Assemble team, allocation of roles with appropriate skill sets • Assistance sought if required	
STATE 4	**Vital signs**	**Expected behaviours**	**Prompts** *(When and if needed)*
Organise transfer to ICU – calling procedures Patient stabilised at current	HR: 120 RHYTHM: ST BP: 110/60 SPO2: 85% ETCO2: Normal trace	Notifies NUM in ICU to facilitate immediate transfer into ICU	
STATE 5 - RETURN	**Vital signs**	**Expected behaviours**	**Prompts** *(When and if needed)*

Transport	As above	• Set-up for transport, access require medications for safe transfer • Approval from NUM on timing and bed availability • Adequate support staff for safe transfer	

Equipment and set-up

Technical equipment	Clinical stock
Simulation manikin	IV Access • PIVC x2
Standard ward bed area set-up • Including emergency equipment	Infusions • Normal saline maintenance IVF
ICU PACE trolley with ALSi (Bedside monitoring and defibrillation)	
BiPAP machine with dry circuit and mask	
Ward Cardiac Arrest Trolley	
Patient paper work • Observation chart • Medication chart • X-ray • ABG results • General Exam Adult Note	

Appendices

Appendix 1. General Exam Adult Note

Result type: General Exam Adult Note
Result date: 7 November 20:00 AEDT
Result status: Auth (Verified)
Result title: General Exam Adult
Verified by: MR ED DOCTOR (Registrar) on 7 November 2017 23:24 AEDT
Visit Info: 1002924036, St George, Inpatient, 07/11/2017 -

Patient: KUBISA, Bart MRN: SIM-001 FIN: 1000000000

Age: 25 years Sex: Male DOB: 22/06/1992
Associated diagnoses: None
Author: MR ED DOCTOR

25 year old male
Self-presents with SOB, productive cough, arthralgia and malaise
Was seen in this department 5/7 ago with headache, diarrhoea and fever. Admitted to ED SSU. LP was performed - ?viral meningitis. Discharged home when comfortable. One episode of fever in department only.

3/7 ago started becoming increasingly SOB with cough productive of yellow sputum.
Noted by family to become increasingly unwell today. Some improvement with use of his wife's salbutamol inhaler.
On arrival at hospital SpO2 71% (RA). Improved to 93% on 15L NRB
ABG: SpO2 71 pCO2 33 pH 7.414

Noted that he has recently been working with potting mix in the garden.
No known avian exposure

Background
- Hypertension
- Reflux
- Slight exercise induced Asthma

Current medications
Perindopril/amlodipine 10/5 daily
Somac 40mg

Allergy nil known

Social Hx
- Living with wife, self caring, independent.
- Non-smoker.
- Drinks 1x bottle of wine per night

On examination
A: Own
B: Increased WOB, Initially speaking in words only. Improved with HFNP to short sentences
- Abdominal muscles of respiration
- Bronchial breathing bibasally. Sounds 'wet'
- CXR: Diffuse bilateral consolidation. Nil obvious effusion.

C: P95 BP 148/71
- HSDNAS
- Cool periphery
- Calves SNT

Nil pitting oedema

D: PEARL

Moving all limbs equally

Nil cranial nerve deficit

Abdomen SNT

E: WCC 10 Hb 116 Na 129 K 3.2 Cr 143 eGFR 44(note not derranged 4/7 ago)

LFTs mildly derranged - normal 4/7 ago.

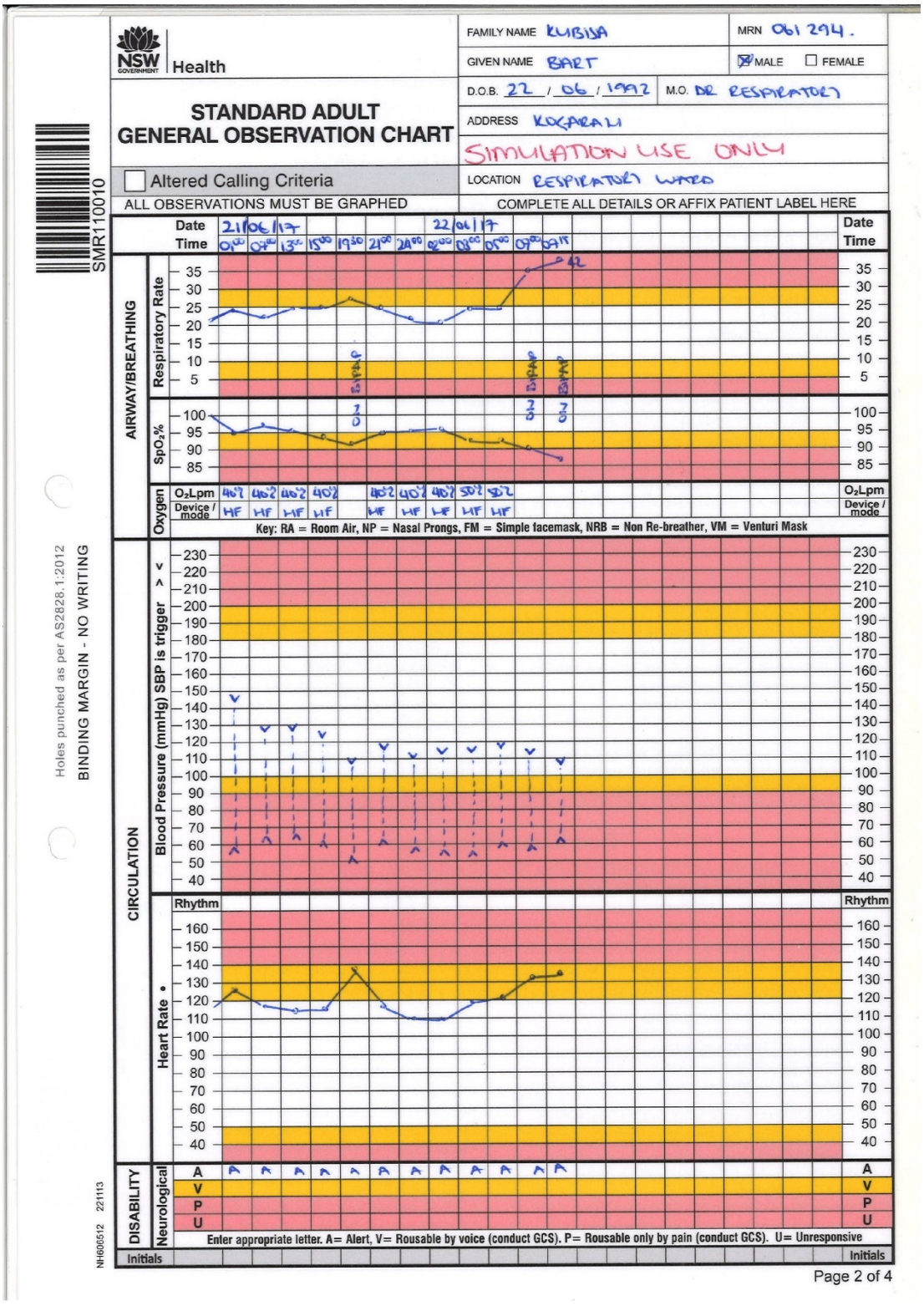
Imp: Atypical pneumonia. ? Legionella

Bedside USS - LV and RV ok.
Nil obvious pleural effusion

P

1. Titrate to SpO2 95% - BiPAP if required
2. Respiratory admission
   -Has kindly accepted care
3. HDU/ICU review
4. Atypical pneumonia serology
5. Viral swabs
6. Influenza swab
7. Urine dipstick + antigens
8. Early anaesthetics review.
9. Notify concerns

Appendix 2. Standard adult observation chart



NSW GOVERNMENT Health

STANDARD ADULT GENERAL OBSERVATION CHART

☐ Altered Calling Criteria

ALL OBSERVATIONS MUST BE GRAPHED

FAMILY NAME KUBISA | MRN 061294.

GIVEN NAME BART | ☒ MALE ☐ FEMALE

D.O.B. 22 / 06 / 1992 | M.O. DR RESPIRATORY

ADDRESS KOKARALI

SIMULATION USE ONLY

LOCATION RESPIRATORY WARD

COMPLETE ALL DETAILS OR AFFIX PATIENT LABEL HERE

SMR110010

Holes punched as per AS2828.1:2012

BINDING MARGIN - NO WRITING

NH600512 221113

Page 2 of 4

Appendix 3. Pre-intubation ABG

Arterial Blood pH POCT	L 7.286
Arterial Blood pO2 POCT	L 51.2 mmHg
Arterial Blood pCO2 POCT	H 46.0 mmHg
Arterial Blood O2 Saturation POCT	L 76.8 %
Arterial Blood HCO3 POCT	L 21.2 mmol/L
Arterial Blood Base Excess POCT	L -4.3 mmol/L
Arterial Blood Oxyhaemoglobin POCT	L 75.7 %
Arterial Blood Inspired Oxygen POCT	100 %
Arterial Blood Haemoglobin POCT	L 107 g/L
Arterial Blood Reduced Haemoglobin POCT	H 22.9 %
Arterial Blood Methaemoglobin POCT	0.9 %
Arterial Blood Carboxyhaemoglobin POCT	0.5 %
Arterial Blood Creatinine POCT	H 131 umol/L
Arterial Blood Sodium POCT	L 127 mmol/L
Arterial Blood Potassium POCT	L 3.1 mmol/L
Arterial Blood Chloride POCT	98 mmol/L
Arterial Blood Calcium Ionised POCT	L 1.07 mmol/L
Arterial Blood Glucose POCT	H 6.1 mmol/L
Arterial Blood Lactate POCT	2.1 mmol/L

Appendix 4. Post-intubation ABG

Arterial Blood pH POCT	L 7.210
Arterial Blood pO2 POCT	L 75.4 mmHg
Arterial Blood pCO2 POCT	H 54.2 mmHg
Arterial Blood O2 Saturation POCT	L 89.2 %
Arterial Blood HCO3 POCT	L 20.9 mmol/L
Arterial Blood Base Excess POCT	L -5.8 mmol/L
Arterial Blood Oxyhaemoglobin POCT	L 87.7 %
Arterial Blood Inspired Oxygen POCT	100 %
Arterial Blood Haemoglobin POCT	L 113 g/L
Arterial Blood Reduced Haemoglobin POCT	H 10.6 %
Arterial Blood Methaemoglobin POCT	1.1 %
Arterial Blood Carboxyhaemoglobin POCT	0.6 %
Arterial Blood Creatinine POCT	H 155 umol/L
Arterial Blood Sodium POCT	L 129 mmol/L
Arterial Blood Potassium POCT	3.3 mmol/L
Arterial Blood Chloride POCT	98 mmol/L
Arterial Blood Calcium Ionised POCT	L 1.10 mmol/L
Arterial Blood Glucose POCT	H 6.5 mmol/L
Arterial Blood Lactate POCT	1.7 mmol/L

Scenario #20: Post operative patient requiring pickup from PACU

Learning objectives

1	Understand patient flow procedures and the required processes for admission of a patient from PACU into the ASB Intensive Care Services.
2	Collect required stock and equipment as needed for the patient to assist in a safe transfer from PACU.
3	Map and time the transfer from set up to collection of the patient and return to the ICU. Identify appropriate areas of which clinical assistance could be sought in the event of clinical deteriorating during transfer.
4	Identifying LST's or factors of which may limit the effective management or completion of this procedure, as impacted by the new clinical environment and changing clinical structures.

Faculty required

Director	Responsible for overseeing simulation and ensuring ongoing safety of participants and faculty. Will oversee the running of the structured debrief, ensuring clinical objectives are met.
Technician	Responsible for running simulation, including monitoring. Will supply participants with information as required or requested, without limiting potential outcomes of simulation. Will assist the director in undertaking debrief of participants.
SIM Liaison	Responsible for ensuring simulation has limited effect on active clinical environment and involved specialities.

Participants

ICU Registrar ICU RN NUM (1) PACU RN Orderly

Scenario summary

Mr Raymond Forrester, a 60 year old male has undergone an extensive liver resection for cholangiocarcinoma. His procedure was completed without issue. He was extubated in

theatre and sent to recovery for post-operative management. Due to the extensive nature of his procedure he is intended for admission to ICU for ongoing observation and management.

Scenario setting

ASB Intensive Care Unit, Level 5 Pod 4 – Patient single room
Standard ICU bed-are setup and bedside emergency equipment
ASB PACU-A, Level 2 – Patient single room

Patient's back story

Raymond Forrester (MRN: SIM-201)
60 year old male
Nil known allergies

History
Cholangiocarcinoma – diagnosed Dec 2017
GORD
Hypertension
Hypercholesterolemia
Asthma
Type 2 diabetes mellitus

Social
Lives with wife and 2 sons
Self-caring in AOLS
Denies tobacco use – occasional ETOH

Scenario start

PACU RN will contact ICU NUM to notify of a patient requiring pick-up and admission into ICU.

In-scenario handover

Raymond Forrester (MRN: SIM-201)
60 year old male
Post-op: right hepatectomy, adhesiolysis, and intra-op ultrasound for 6cm cholangiocarcinoma with involvement of the IVC.

(A) Extubated in OT – nil issues
(B) Nasal prongs 2L – RR stable – SPO2 stable
(C) HR and BP as per monitor – cool to touch
(D) Slightly drowsy, otherwise appropriate. Noted post-op pain – fentanyl PCA
(E) Dressings all intact – nil ooze

(F) NBM post-op till review (G) BSL 6.7 mmol/L stable

Scenario transition states

STATE 1	**Vital signs**	**Expected behaviours**	**Prompts** *(When and if needed)*
Patient in PACU recovery. Notify NUM (1) of pending admission	HR: 110 RHYTHM: ST BP: 110/65 (ART) RR: 16 - settled SPO2: 98%	• NUM plans admission – notifying pod co-ordinator and bedside RN • ICU nurse and orderly navigate to recovery unit • Identify patient for ICU and receive handover • Undertake head to toe assessment. Confirm patient is stable for transfer – identify if medical support required for safe transfer • Sign handover form – takeover of care	
STATE 2	**Vital signs**	**Expected behaviours**	**Prompts** *(When and if needed)*
Transfer patient back to ICU	As per above	Safe and prompt transfer of patient back to ICU	

Equipment and set-up

Technical	**Clinical stock**
Simulation manikin	Nasal prongs
ALSi (Bedside monitoring and defibrillation)	IV Access • CVC – 3 Lumen device
Standard ICU bed area set-up • Including emergency equipment	Infusion • Hartmanns maintenance IVF
PACU pickup equipment • Bed-end transport tray • Spare oxygen cylinder • Defibrillator (LIFEPAK 15/20)	Monitoring • Central venous pressure • Arterial line

• Transport bag	

Scenario #21: Urgent discharge of cleared patient for emergency admission

Learning objectives

1	Facilitate the prompt and safe discharge of a cleared ICU patient to ensure the timely admission of a patient requiring ICU level care.
2	Ensure WH&S and infection control procedures are met in the relation to discharging a patient from ICU and preparation of bedspace for new admission.
3	Measure the minimum time required to properly discharge a patient, including restocking, cleaning and system procedures.
4	Ensure adequate staffing so as to maintain appropriate staff to patient ratio without compromising the care of current ICU patients or patients of which require urgent admission.
5	Examine the clinical processes and workflow required to safely and effectively discharge a patient. Identify any LSTs or factors which may limit the effective implementation of such a management plan.

Faculty required

Director	Responsible for overseeing simulation and ensuring ongoing safety of participants and faculty. Will oversee the running of the structured debrief, ensuring clinical objectives are met.
Technician	Responsible for running simulation, including monitoring. Will supply participants with information as required or requested, without limiting potential outcomes of simulation. Will assist the director in undertaking debrief of participants.
SIM Liaison	Responsible for ensuring simulation has limited effect on active clinical environment and involved specialities.

Participants

ICU Registrar ICU RN x2 ICU Orderly

Scenario summary

A cleared patient has to be discharged to the ward to allow for an emergency admission into the ICU (same bedspace).

Scenario setting

ASB Intensive Care Unit, Level 4 Pod 1 – Patient single room
Standard ICU bed-are setup and bedside emergency equipment
TWB, In-patient ward, Level 3 – Patient single room

Patient's back story

Raymond Forrester (MRN: SIM-201)
60 year old male
Nil known allergies

History
Cholangiocarcinoma – diagnosed Dec 2017
GORD
Hypertension
Hypercholesterolemia
Asthma
Type 2 diabetes mellitus

Social
Lives with wife and 2 sons
Self-caring in AOLS
Denies tobacco use – occasional ETOH

Scenario start and in-scenario handover

Mr Raymond Forrester (MRN: SIM-201)
60 year old male
Nil known allergies
Post-op day 3 – extensive liver resection
Cleared for ward – paperwork incomplete
Patient is awaiting bed on 3 East. PACE call has been activated in an ASB inpatient ward. Patient requires urgent transfer to ICU. The bedside nurse will begin the discharge process and prepare for a new admission into the same bed area**.**

Scenario transition states

STATE 1	**Vital signs**	**Expected behaviours**	**Prompts** *(When and if needed)*
Bedside nurse undertaking daily cares and duties.	Non-clinical simulation	• Notify ICU team if not aware of urgent need for discharge paperwork	

Notified of urgent need for DC		• Notify ICU I/C and support staff for assistance in discharge process • Pack patient belongings	
STATE 2	**Vital signs**	**Expected behaviours**	**Prompts** *(When and if needed)*
Undertake discharge process and transfer patient to ward	Non-clinical simulation	Prompt and safe transfer to TWB, 3E assisted by orderly Prompt return to ICU	
STATE 3	**Vital signs**	**Expected behaviours**	**Prompts** *(When and if needed)*
Bedspace cleaned and restocked for next patient to arrive	Non-clinical simulation	• Bed area is cleaned according to infection control procedure • Area is restocked and ready for patient arrival	

Equipment and set-up

Technical equipment	Clinical stock
Simulation manikin	Nasal prongs
Patient belongings	Peripheral IVC to right CF – capped
Transport equipment – (ward transfer)	Surgical dressing
Discharge paperwork	

Scenario #22: Family conference in ICU rooms

Learning objectives

1	Understand the role and booking requirements for the ICU family conference rooms.
2	Identify any safety issues or LSTs with the use of such resources and which may compromise staff or visitor safety.
3	Explore access to the ICU family conference rooms, ensuring knowledge of access requirements and security procedures associated with visitor access.

Faculty required

Director	Responsible for overseeing simulation and ensuring ongoing safety of participants and faculty. Will oversee the running of the structured debrief, ensuring clinical objectives are met.
SIM Liaison	Responsible for ensuring simulation has limited effect on active clinical environment and involved specialities.
Confederate	Patient visitors x2 Consist of patient sister and her husband. Not overly close to patient but still listed as NOK. Confrontational and accusatory of staff.

Participants

Patient visitors x2
ICU RN
ICU Social Worker
ICU Registrar

Scenario summary

Following the clinical deterioration of their relative, the patient visitors became confrontational and accusatory at the bedside. They were reassured by the bedside nurse with assistance from the social worker and medical teams. A family conference was suggested to ensure the family is up to date and can have any questions answered in a more formal setting.

Scenario setting

ASB Intensive Care Unit, Level 4 - Family Conference Rooms
Standard ICU bed area set-up and bedside emergency equipment

Patient's back story

Brett Tompkins (MRN: SIM-005)
DOB: 02/11/1990
Nil known allergies

History
Diagnosed with PMP in October
Colonic polyps
Mild exercise induced Asthma
GORD

Admission
Post Peritonectomy with HIPEC for PMP
Procedure was uneventful – however patient experiences hypovolemic arrest in ICU
ROSC is achieved and family are notified

Social
Estranged from family – minimal contact over last two years
NOK declared as sister on old hospital paperwork

Scenario transition states

STATE 1	**Vital signs**	**Expected behaviours**	**Prompts** ***(When and if needed)***
Patient family has been shown into the family conference room. Social worker, ICU registrar and ICU RN are also in attendance.	Non-clinical scenario	Undertake family conference	

Equipment and set-up

Technical	**Clinical stock**
Nil required	

Scenario #23: Dealing with aggressive patient visitors

Learning objectives

1	Employ de-escalation techniques, reassuring patient relatives and visitors while maintaining safety of staff and hospital personnel.
2	Use the ASB communication infrastructure to notify surrounding staff of potential or current issue and seek assistance as appropriate to the circumstances. Use fixed or mobile duress alarms, etc.
3	Understand security procedures in relation to threats to staff and procedures related to securing the ASB ICU during an internal emergency.

Faculty required

Director	Responsible for overseeing simulation and ensuring ongoing safety of participants and faculty. Will oversee the running of the structured debrief, ensuring clinical objectives are met.
SIM Liaison	Responsible for ensuring simulation has limited effect on active clinical environment and involved specialities. Will assist the director in undertaking debrief of participants.
Confederate	Patient visitors: Will receive handover as per faculty brief and patient backstory and supplied within scenario #1.

Participants

ICU RN
ICU Receptionist
ICU Social worker
Patient visitors – confederate roles

Scenario summary

Following on from scenario #25, patient family is notably concerned with patient's current condition and care received. They become notably confrontational and accusatory towards bedside staff and medical personnel. The scenario should be managed in relation to local facility policy and procedure.

This simulation is conducted with a physical manikin however is non-clinical and does not require changes in patient status.

Scenario setting

ASB Intensive Care Unit, Level 4 Pod 1 – Patient single room Standard ICU bed area set-up and bedside emergency equipment

Patient's back story

Brett Tompkins (MRN: SIM-005)
DOB: 02/11/1990
Nil known allergies

History
Diagnosed with PMP in October
Colonic polyps
Mild exercise induced Asthma
GORD

Admission:
Post Peritonectomy with HIPEC for PMP
Procedure was uneventful – however patient experiences hypovolemic arrest in ICU
ROSC is achieved and family are notified

Social
Estranged from family – minimal contact over last two years
NOK declared as sister on old hospital paperwork

Scenario transition states

STATE 1	**Vital signs**	**Expected behaviours**	**Prompts** *(When and if needed)*
Patient family arrive at bedspace. Initially quite friendly, wanting to know what has happened, although slowly become more and more irritated, confrontational and accusatory towards staff.	Non-clinical scenario	• Greeted by bedside nurse • Morning event explained in brief – offer to get doctor and social worker to assist in explanation of events.	
STATE 2	**Vital signs**	**Expected behaviours**	**Prompts** (*When and if needed)*

Confrontational towards staff	Non-clinical scenario	• De-escalation techniques • Escalate for assistance • Use of duress alarms as appropriate	
STATE 3	**Vital signs**	**Expected behaviours**	**Prompts** *(When and if needed)*
Assistance arrives	Non-clinical scenario	• Family is de-escalated and offered a family conference, to which they agree • Family is lead to the family conference rooms	

Equipment and set-up

Technical	Clinical stock
Simulation manikin (tracheostomy equipped)	Portex tracheostomy size 8.0 - secure
ALSi (Bedside monitoring and defibrillation)	Swedish nose with trache HME and O2 setup

Scenario #24: Locating an ICU patient - visitors

Learning objectives

1	Staff are able to navigate the new ASB intensive care Unit noting the general layout and positioning of key resources.
2	Understand the numbering system for patient bed areas, including how to distinguish between level 4 and 5 and their respective pods.
3	Understand the procedures related to patient visitation, waiting rooms and visiting hours. Test communication systems between reception and bedside staff, ensuring visitors are permitted through at appropriate times.
4	Be able to direct, through leading and instruction, a patient visitor to their required clinical area or bedspace.
5	Identify appropriate waiting areas for patient visitor use, ensuring adequate availability of building infrastructure, e.g. duress alarm, CCTV.

Faculty required

Director	Responsible for overseeing simulation and ensuring ongoing safety of participants and faculty. Will oversee the running of the structured debrief, ensuring clinical objectives are met.
SIM Liaison	Responsible for ensuring simulation has limited effect on active clinical environment and involved specialities. Will assist the director in undertaking debrief of participants.
Confederate	Patient visitors: If simulation conducted in conjunction with scenarios #24 and #23 – Family members should be briefed using the patient back story supplied in scenario #1.If conducted as a standalone simulation, no patient knowledge is required.

Participants

ICU RN ICU Receptionist Patient visitors – confederate roles.

Scenario summary

This simulation was designed to be run in conjunction with scenarios #24 and #23 respectively. Patient family for Brett Tompkins attends the waiting room after being contacted by the ICU medical team and notified of a deterioration in his overall condition. The patient visitors

should present themselves to the reception desk and request visitation, this will be their first visit to the ICU.

Scenario setting

ASB Intensive Care Unit Level 4 – Visitor waiting room
ASB, Intensive Care Unit, Level 4 Pod 1 – Patient single room

Patient's back story

Standalone simulation
Nil patient backstory required.

In conjunction with scenarios #24 and #23
Brett Tompkins (MRN: SIM-005)
DOB: 02/11/1990
Nil known allergies

History
Diagnosed with PMP in October
Colonic polyps
Mild exercise induced Asthma
GORD

Admission:
Post Peritonectomy with HIPEC for PMP
Procedure was uneventful – however patient experiences hypovolemic arrest in ICU
ROSC is achieved and family are notified

Social
Estranged from family – minimal contact over last two years
NOK declared as sister on old hospital paperwork

Scenario start and in-scenario handover

Patient family will attend reception desk in ICU waiting area, requesting to see their relative. They have been contacted by the doctors and notified that the patient has deteriorated this morning. This will be their first visit to ICU.

Scenario transition states

STATE 1	**Vital signs**	**Expected behaviours**	**Prompts** *(When and if needed)*
Pt family arrives at ICU reception	Non-clinical scenario	• Identify visitors and patient they wish to visit • Liaise with nurse as to availability for visitation • Offer directions to patient family to ensure arrival at correct bedspace	
STATE 2	**Vital signs**	**Expected behaviours**	**Prompts** *(When and if needed)*
Pt family arrives at bedspace	Non-clinical scenario	Greeted by bedside nurse	
IF LOST	**Vital signs**	**Expected behaviours**	**Prompts** *(When and if needed)*
If patient family does not arrive	Non-clinical scenario	• Contact reception • Determine location of visitors within service. • Redirect to patient bedside.	

Equipment and set-up

Technical equipment	Clinical stock
Visitor brochure for ICU	Nil
Visitor map	

St George Hospital ICU latent safety threat form

SITAR - LATENT SAFETY THREAT IDENTIFICATION FORM		
NAME:	SPECIALTY:	YEARS EXP:
SCENARIO UNDERTAKEN:		
THEME		

1	**Medication Administration Failure**		4	**Design**	
	Storage Issue	YES / NO / NA		Ergonomics Failure	YES / NO / NA
	Comment:			Comment:	
	Human Factor	YES / NO / NA		Ambiance Failure	YES / NO / NA
	Comment:			Comment:	
2	**Equipment Failure**			Utility Issues	YES / NO / NA
	Malfunction	YES / NO / NA		Comment:	
	Comment:		5	**Transport**	
	Design Limitation	YES / NO / NA		Preparations	YES / NO / NA
	Comment:			Comment:	
	Missing	YES / NO / NA		En-suite Issues	YES / NO / NA
	Comment:			Comment:	
	User/Equipment Interaction Failure	YES / NO / NA	6	**Communication**	
	Comment:			Devices	YES / NO / NA
3	**Personel**			Comment:	
	Missing	YES / NO / NA		Resources Not Available	YES / NO / NA
	Comment:			Comment:	
	Inadequate Preparation	YES / NO / NA		**FOR ADDITIONAL COMMENTS, PLEASE TURN OVER →**	
	Comment:				

Additional resources

US Dept of Veterans Affairs National Center for Patient Safety. NW Washington DC. Healthcare Failure Mode and Effect Analysis (HFMEA). Available from: https://www.patientsafety.va.gov/professionals/onthejob/hfmea.asp

References

1. M Fan et al BMJ Open Access BMJ Open 2016;**6**:e013683. doi:10.1136/bmjopen-2016-013683.