

SIMULATION SCENARIO PLAN

Title: ICU patient admitted with coronavirus (Covid19) requiring intubation

Author: Chris Nickson

Personnel

- Instructors: Facilitator/ Lead Debriefers and Co-debriefer, Confederates
- Participants: medical staff; ICU nurses; PCAs
- Participant Roles:
 - team leader
 - airway doctor
 - airway assistant
 - drugs doctor and nurse
 - scribe

Objectives

- To develop a safe approach to ICU transfer and/or subsequent emergency intubation of a patient with suspected Covid19 and ARDS:
 - Maintain transmission-based precautions
 - Process testing of Alfred Health Covid19 guidelines
 - Optimise ergonomics (people, place, equipment, systems)
- To demonstrate effective teamwork

Storyboard

- **Information provided to participants:** Jesse Higgins is a 40 year-old man/ woman who presented to ED with 2 days of cough, fever, and breathlessness. They have no previous medical problems. CXR in ED showed bilateral patchy opacities, consistent with early ARDS. COVID19 screening test is positive. In the ED, transmission-based precautions were applied, antibiotics given empirically for CAP (ceftriaxone 1g IV daily and azithromycin 500mg IV daily), and oxygen applied. Remdesivir and dexamethasone was started. Prior to transfer to ICU the patient can speak sentences, has ongoing dyspnoea, and the following vitals: T38.5 P110 R30 BP 110/70 SpO2 94% on high flow oxygen. Plan is for insertion of an arterial line and ongoing monitoring in ICU.
- **Scenario events:** Team to maintain respiratory precautions, allocate roles, develop plan and transfer the patient to an isolation cubicle and then perform a safe approach to intubation when the patient deteriorates.

Requirements

- ICU simulation cubicle and ICU isolation cubicle
- Simulated patient (if available, otherwise use mannikin)
 - Wear mask/ HFNP (etc) but do not apply oxygen (e.g. disconnect tubing from mask)
 - Simulated IV line with fluids connected
 - Do star jumps before scenario to increase heart rate and respiratory rate
 - Attach to real monitoring
- Resusci Anne manikin
 - iSimulate monitors (preprepared monitor kit with 2 ipads using iSimulate software)
 - peripheral line in both arms
 - Administer saline as medications (but walk to drug cupboard, etc)
- Use actual airway trolley and equipment for intubation of mannikin (including checklist)
- Use actual PPE
- Teaching ventilator
- Use laptop/ scribe sheets on BMW stations (will not be entering patient data)
- Apply glow-germ to mannikin
- AV equipment as required (e.g 360 camera, portable video cameras, photography, AV link to seminar room)

Progression (see table)

Phase 1 - Transfer to ICU (with simulated patient or mannikin)

- Stage 1 (this stage may be skipped if objective is to focus only on intubation)
 - Monitoring is attached, vitals as per simulated patient
 - Patient remains stable during transfer to ICU cubicle

Stage	A	B	ETCO2	SpO2	ECG	BP	Neuro
1. Start	patent	actual	not on	actual on 15L via HM (or other High flow device)	SR actual	actual	GCS15

Phase 2 - Intubation (with mannikin)

- Stage 1
 - requires intubation for respiratory fatigue and worsening hypoxia
 - Monitoring is attached, including a recently inserted arterial line
 - team leader states plan and allocates roles
 - SpO2 90% with 15L O2 via HM (or CPAP via test lung and assistant squeezing)
- Stage 2
 - after administration of drugs (e.g. ketamine or propofol safe intubation approach e.g. C-MAC)
 - b. hypotension if wrong induction drug/ excessive dose
 - c. hypoxia if inadequate preoxygenation
- Stage 3
 - confirmation of placement e.g. ETCO2, auscultation
 - initial BVM then Mechanical Ventilation

Phase 2 - intubation

Stage	A	B	ETCO2	SpO2	ECG	BP	Neuro
1. Start	patent	RR 45, shallow	not on (60 if on)	SpO2 90% on 15L via HM (or HFNP/ NIV)	SR 120	120/80	GCS10 (E3V2M5)
2. Apnea	patent	no chest movement	0	SpO2 90%	SR 130	100/60	GCS3
2b. If excessive induction drugs	patent	no chest movement	0	SpO2 90%	SR 140	80/60	paralysed
2c. If inadequate oxygenation	patent	no chest movement	0	SpO2 80%	SR 140	100/60	paralysed
3. post intubation	ETT	RR 16 (as set)	40	SpO2 100% on FiO2 1.0	SR 120	110/80	paralysed

Information for participants

- **Generic briefing** (see briefing plan)
- **Specific briefing for this scenario:** Team are told they are the ICU Nightshift team and given the 'information provided to participants' listed under 'Storyboard'.

- **If requested:** K . FBC, UEC, LFTs, CK, Coags were otherwise in normal range with BSL 6mM; chest x-ray showed early bilateral changes (see here: <https://radiopaedia.org/cases/influenza-a-h1n1-pneumonia>)
ABG: pH 7.30, pCo2 45, pO2 70, HCO3 20, BE -5, Lactate 1.6
- **If requested:** .No usual medications. Medications given in ED: ceftriaxone 1g IV, azithromycin 500mg IV, oxygen.

Information for Confederate

- Confederate to be helpful but not assertive
- Confederate to assist junior staff with their roles if inexperienced
- Confederate to use graded assertiveness if gross errors in plan
 - e.g. suggest role allocations
 - e.g. challenge gross errors in drug selection or dosing

Debriefing

- Maintain respiratory precautions
 - Use of PPE
 - Transfer of patient (simulated patient to provide their perspective)
 - entry/ egress
- Intubation
 - Use of checklist
 - Approach to optimisation of pre-oxygenation, laryngoscopy
- Ergonomics: people, place, equipment, systems
- teamwork: clear leadership (ideally hands off approach), role allocation, followership/ speaking up, sharing of mental model, closed loop communication, use of available resources
- Review Glow Germ distribution (e.g. time lapse photo with UV light at end of scenario) if available
- Refer to Alfred Heath guidelines on management of Coronavirus and COVID19 intubation protocol

Duration

- Preparation 30 min, Briefing 10 min, Simulation <10 min x 2, Debriefing 5-20 min x 2

Resources

- Radiopedia - novel coronavirus infection: <https://radiopaedia.org/articles/novel-coronavirus-infected-pneumonia>
- CXR (H1N1 influenza): <https://radiopaedia.org/cases/influenza-a-h1n1-pneumonia>

Coronavirus simulation preparation checklist

Key people notified?

- ☐ ICU medical and nursing team/ participants
- ☐ Spotless
- ☐ Key stakeholders
- ☐ Sim team

Scenario ready?

- ☐ Scenario written and reviewed
- ☐ Images
- ☐ Laboratory tests

Ready the day before?

- ☐ Confirm time and place
- ☐ AV equipment charged and packed
- ☐ Walk through (if needed)
- ☐ SMS key people
- ☐ Signage and name stickers
- ☐ Simulation drugs and stickers
- ☐ Check with Simulation team
- ☐ Print images
- ☐ Phone number list
- ☐ Attendance form
- ☐ Room bookings

Ready on the day?

- ☐ Announce at handover
- ☐ Notify Dr and Nurse in charge
- ☐ Check AV and attendance/ consent forms (if req)
- ☐ Check cubicles + setup
- ☐ Check sim team
- ☐ Assemble in prebrief room

Prebrief?

- ☐ Aims of simulation
- ☐ General rules of sim
- ☐ Environment and equipment briefing (meds)
- ☐ Expectations - time/ place/ debrief
- ☐ Phone calls
- ☐ Safety (no IVs, no defib, no shaving, empty pockets)
- ☐ Contingency plans ("no duff")
- ☐ Scenario briefing

Follow up?

- ☐ Thank you emails
- ☐ Simulation report and learning points
- ☐ Follow any simulation or clinical issues

