

Simulation: COPD

Title:

Learning Objectives: (enter - identify/demonstrate etc) - technical/non-technical

1. Diagnose and treat severe COPD exacerbation in the ED setting
2. Demonstrate appropriate use of NIV in setting of Type 2 respiratory failure (indications, contraindications, titration etc)
3. Demonstrate ability to troubleshoot clinical deterioration in the setting of severe COPD with NIV
4. Demonstrate save Intercostal Catheter Insertion in an emergency situation

Sim Brief - Introduction, Familiarisation, Ground Rules, Basic Assumption

Case Stem (for participants) – Read out to participant at the start.

Brief case history. Typically ambulance handover style (MIST - Mechanism/Medical Complaint, Injuries/Illness, Signs & Symptoms, Treatment so far)

66 year old male.

Brought to resus by paramedics. 2 day history of cough and increasing shortness of breath. Febrile this morning and wife noted him to be confused.

PMHx:

- COPD
- Hypertension
- Hypercholesterolaemia
- Smoker

Medications:

- Salbutamol inhaler
- Amlodipine
- Atorvastatin

Background Info (For instructors eyes only)

- 66 year old man
- Ideal progression of Sim
 - Pt. wheeled in conscious with significant increased work of breathing and mildly confused.
 - Ideally history taken at handover
 - Appropriate investigation, diagnosis and management of severe COPD
 - Appropriate application of BiPAP
 - Troubleshooting of BiPAP
 - Timely insertion of chest drain
 - Appropriate disposition planning

Settings for SIM Man/Woman

Significant moulage not required

Settings as per already on ALSi iPad

Equipment required

- Cardiac monitor/Defib
- ECG printouts – tachycardia
- VBG/ABG printouts – low/normal pH – 2 VBGs/ABGs
- Imaging printouts – CXR – pneumonia and emphysematous changes
- O2 +/- masks/NP
- IVC equipment
- Bipap/CPAP
- Chest tube
- Relevant specific medications – ventolin, atrovent
- Relevant products - colloids/crystalloids/blood

Participants required

- ED Registrars – Team Lead, Airway, Circ/Defib
- Nursing Staff – at least airway + drugs, ideally defib. and scribe

Scenario Outline

Brief outline in table form of step-by-step progression of SIM
Include possible alternatives and end-points

Scenario Outline (Outline of what should occur at each stage)	Participant Response (Expected or ideal response)	Outcome (what do participants do, what happens to SIM mannequin)
Stem given to team	Role allocation. Plan of approach.	
Patient arrives with Ambulance	Patient transferred over. Handover given to team. Begin to obtain a history	Mannequin has significantly increased WOB. Appears confused. Obs should begin to be taken.
Assessment of patient	ABCDE approach ED Reg. reviews charts <ul style="list-style-type: none"> - Notices vital signs - BP 128/90 - 130 - RR 35 - GCS 14/15 - Sats 75% 	A: Mumbles, confused words B: hyperventilating. Creps left base. C: Tachycardia and normotensive <ul style="list-style-type: none"> - IV access ensured - Bloods sent, ABG/VBG D: GCS 14-15/15 E: nil relevant
Initial Treatment Patient Deterioration	Notice: <ul style="list-style-type: none"> - ABG/VBG hypercarbia type 2 respiratory failure - Low saturations Begin to take steps to remedy this	<ul style="list-style-type: none"> - Appropriate inhaler/nebuliser therapy - Appropriate antibiotic choice - Appropriate oxygen therapy and considerations regarding this (CO2

SCGH ED Simulation Template

		retainer, saturation targets)
Resus	<ul style="list-style-type: none"> - Patient deteriorates despite adequate therapy - Decision for NIV 	<ul style="list-style-type: none"> - Team should display appropriate application of NIV
Ongoing Resus	<ul style="list-style-type: none"> - Pt has appropriate Bipap application with appropriate IPAP/EPAP pressures applied - Soon after this, pt. has increasing respiratory distress and drop in saturations 	<ul style="list-style-type: none"> - Team to display appropriate troubleshooting of low oxygen saturations - Determine pneumothorax secondary to NIV - Act quickly to place chest tube
Stabilization	<ul style="list-style-type: none"> - Patient stabilizes once chest tube in - Continue with COPD therapy 	<ul style="list-style-type: none"> - Disposition planning - ICU and Respiratory

Debriefing Objectives:

- Management of COPD exacerbation
 - Nebs/inhalers
 - Antibiotics
- Non-invasive ventilation in the setting of COPD exacerbation
- ABG/VBG interpretation
- Troubleshooting in COPD exacerbation
- Relevant Non-Technical Skills.

Blood Gas 1

Sample (ABG/VBG)	Value	Reference Range
pH	7.32	7.35 - 7.45
pCO ₂	65	35 - 45 mmHg
pO ₂	50	75 - 100 mmHg
HCO ₃ ⁻	21	22 - 26 mmol/L
Base Excess	0	-2 to +2 mmol/L
Hb	120	135 - 180 g/L
Na ⁺	140	135 - 145 mEq/L
K ⁺	3.5	3.5 - 5.0 mEq/L
iCa ²⁺	0.90	0.90 - 1.15 mmol/L
Cl ⁻	100	96 - 106 mmol/L
Anion Gap	24	22 - 26
Lactate	3	0.5 - 1.0 mmol/L
Bilirubin		
Creatinine	120	50 - 120 mmol/L

Blood Gas 2

Sample (ABG/VBG)	Value	Reference Range
pH	7.29	7.35 - 7.45
pCO ₂	78	35 - 45 mmHg
pO ₂	50	75 - 100 mmHg
HCO ₃ ⁻	28	22 - 26 mmol/L
Base Excess	0	-2 to +2 mmol/L
Hb	120	135 - 180 g/L
Na ⁺	140	135 - 145 mEq/L
K ⁺	3.6	3.5 - 5.0 mEq/L
iCa ²⁺	0.90	0.90 - 1.15 mmol/L
Cl ⁻	100	96 - 106 mmol/L
Anion Gap	26	22 - 26
Lactate	4	0.5 - 1.0 mmol/L
Bilirubin		
Creatinine	120	50 - 120 mmol/L

Blood Gas 3

Sample (ABG/VBG)	Value	Reference Range
pH	7.35	7.35 - 7.45
pCO ₂	56	35 - 45 mmHg
pO ₂	50	75 - 100 mmHg
HCO ₃ ⁻	20	22 - 26 mmol/L
Base Excess	0	-2 to +2 mmol/L
Hb	120	135 - 180 g/L
Na ⁺	143	135 - 145 mEq/L
K ⁺	4.0	3.5 - 5.0 mEq/L
iCa ²⁺	1.10	0.90 - 1.15 mmol/L
Cl ⁻	100	96 - 106 mmol/L
Anion Gap	24	22 - 26
Lactate	1.5	0.5 - 1.0 mmol/L
Bilirubin		
Creatinine	120	50 - 120 mmol/L

SCGH ED Simulation Template

CXR 1



SCGH ED Simulation Template

CXR 2



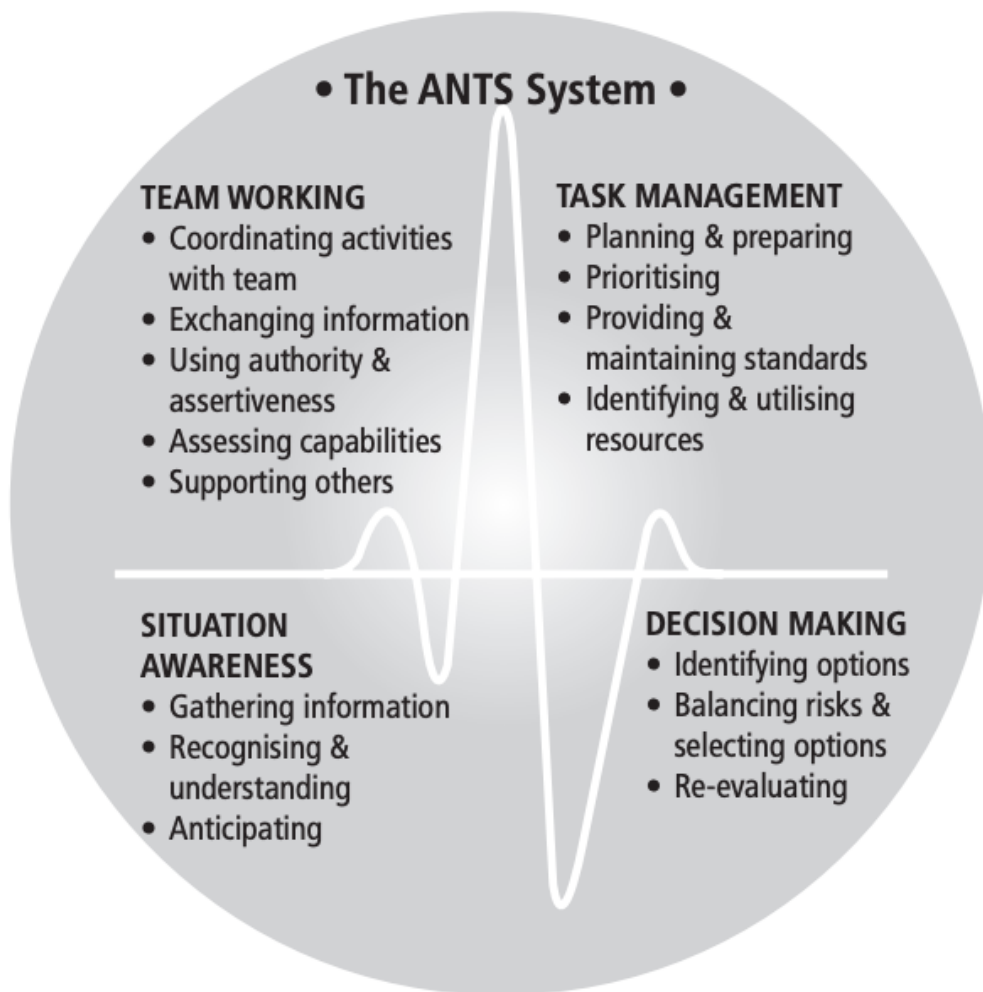
Non-Technical Skills

It is suggested to implement a consistent, frequent and repeated teaching of non-technical skills during SIM in order to entrain these skills.

The anaesthesia is a suggested framework that can be applied for the observation of SIM.

See below for a brief screenshot of the framework, and a link to the ANTS handbook for further information.

Feel free to choose your own approach here.



ANTS Framework

<https://www.abdn.ac.uk/iprc/documents/ANTS%20Handbook%202012.pdf>