

Course Title	IMT 3 Simulation	Scenario Title	Type 2 Respiratory Failure in COPD patient with pleural effusion
Patient	Name: Amina/Aman Patel Age: 78 Hospital number: SC13459		

Learning Outcomes	Technical	Non-Technical
	<ul style="list-style-type: none"> - Effective resuscitation of a deteriorating patient - Managing Type 2 Respiratory Failure using BTS guidelines - Managing pleural procedures out of hours – BTS guidelines best practice 	<ul style="list-style-type: none"> - Know the environment - Anticipate and plan - Mobilise all available resources - Use all available information - Call for help early - Re-evaluate repeatedly - Exercise leadership and followership
Scenario Overview	<p>Overnight, a patient on the Care of the Elderly ward with COPD has tipped into Type 2 Respiratory Failure (T2RF). They are hypoxic and on 40% oxygen via venturi mask, and are haemodynamically stable. They also have a moderate to large right-sided pleural effusion.</p> <p>ABG shows the patient is in T2RF, which will respond to nebulisers and steroids. NIV should be considered after best medical therapy. Pleural intervention (chest drain insertion or pleural aspirate) can also be considered but carries risks out of hours and is likely not the best option acutely.</p> <p>This scenario requires at least 2 faculty members: patient voice (can also be console/ phone advice if required), and ward nurse plant.</p>	
Set Up	<p>Manikin with wig sat up on trolley. Patient will be on venturi mask (40%). Small table nearby with drug chart (not on any anticoagulation) and an observations chart which demonstrates a rising oxygen requirement.</p> <p>If mannikin is able to be programmed – reduced air entry right base and mid zone with mild wheeze throughout.</p>	
Prop List	<p>Oxygen mask and tubing BP cuff Monitor Chest x-ray print out (given if asked for) ABG and blood results (given if asked for) BTS pleural guidelines algorithm print out Drug chart (lisinopril only regular med prescribed)</p>	

Console		A	B (post nebs/NIV)	C (If acute treatment not given)	D
	RR	24	20	28	
	SpO ₂	90 (40% venturi)	92 (40% venturi)	88 (40%)	
	HR	105	110	110	
	BP	130/82	135/86	122/73	
	Rhythm	Sinus	Sinus	Sinus	

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	Temp	37.3	37.3	37.3C	
	Eyes	Open	Open	Half closed	
Expected Actions	<p>The scenario is designed to push the candidate to manage a patient in Type 2 Respiratory Failure on a non-acute ward out of hours. This will involve nebulisers, steroids and knowledge of bed management issues (transfer to a more appropriate environment such as HDU for NIV).</p> <p>The scenario will challenge candidates to consider if chest drainage is appropriate in this patient, but in an out of hours situation with inexperienced nursing staff, this is likely not the best course of action. Pleural interventions should only ever be inserted by experienced individuals, in a setting with experienced nurses, and the debrief will consider this in more detail.</p> <p>This scenario requires at least 2 faculty members: patient voice (can also be console/ phone advice if required), and ward nurse plant.</p>				
End Point	End point is the patient being either commenced on NIV or handover to HDU team.				

Participant briefing	You are the night IMT3 and have been called from the take to review a 78 year old gentleman on the Care of the Elderly ward with a right-sided pleural effusion.
Patient Briefing	<p>You are breathless, and are understandably a bit frightened. You have underlying COPD and normally take an inhaler which you cannot remember the name of. You have been more short of breath the past 2-3 days with a bit of a cough.</p> <p>You will become more drowsy towards the end of the scenario if nebulisers/NIV are not started. You have previously been admitted for your breathing 2-3 times in the past year, but have never needed higher breathing support (NIV or intubation).</p>
Patient PMHx	<p>PMH: COPD (never previously had NIV), RA, OA</p> <p>Drug hx: Lisinopril, Anoro ellipta, methotrexate, vitamin D</p> <p>Social hx: Ex-smoker (30 pack year history), Walks with a stick, carers BD, rarely leaves the house</p>
Investigations & results	<p>Hb 110, WCC 11.5, PI 100, Na 140, Ur 8.3, CRP 4</p> <p>ABG (on 40%) – PH 7.30, PO2 8.0, PCO2 7.7, HCO3 28.5, Lac 2.1 ABG (post nebs on 40%) – PH 7.33, PO2 8.1, PCO2 7.4, HCO3 28.7, Lac 1.9 ABG (if nebs/steroids not given) – PH 7.25, PO2 7.6, PCO2 8.8, HCO3 29.0, lac 2.2.</p> <p>CXR: Moderate to large right-sided pleural effusion</p> <p>ECG: Sinus tachycardia</p>
Plant Briefing	Nurse is the plant in the room and you are relatively experienced. You are helpful for getting observations, but have little experience of managing chest drains.

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On Examination		A	B	C	D
	Colour	Normal			
	Skin	Slightly sweaty			
	CRT	2 seconds			
	GCS	15			
	Pain Score	0			
	Abdomen	Soft, non-tender			
Life Savers	If the candidate wants to insert a chest drain, the plant nurse will express their concerns. Ask if they have used ultrasound before (as you have seen other doctors using this) and point out that the nurses on the ward are not experienced managing chest drains. Can direct to speak to seniors if unsure.				
Telephone Assistance	<p><u>Possible roles played by one faculty member (dictated by who the candidate wishes to call)</u></p> <p>Medical Consultant (phone advice): You are helpful but have just been woken up. The patient is not safe to be managed on the Care of the Elderly ward overnight so you suggest they are moved to the HDU ward. You suggest that CCOT would be useful to call to help with this. If asked regarding pleural aspiration/ chest drain insertion, you are not sure, and your advice is that the candidate can insert if they are experienced in doing so and if nursing staff are happy with this.</p> <p>ITU/CCOT registrar (phone advice): You are busy at an airway emergency, but will come to review the patient if asked and are helpful. You do not have any HDU beds available and suggest that the patient be transferred to AMU to facilitate NIV. CCOT can help to set-up NIV and stay with the patient in the meantime. If asked specifically if pleural intervention should be performed, reply with: "you are the medical registrar and you can use your expert judgement. I do not have the patient in front of me".</p> <p>Respiratory Registrar/ Consultant: This is a role only if you have a respiratory physician on call in your hospital which does not apply to many hospitals. You are non-resident and can offer advice. You suggest that medical therapy (nebulisers and steroids) should be commenced, and NIV should be commenced on HDU if the patient remains acidotic, with a repeat ABG after 1 hour. You would start at pressures of 12/4 and aim to increase the IPAP to 20 over 15 - 20 minutes. Aim for chest drain insertion during daylight hours with use of ultrasound.</p> <p>ED Registrar (phone advice): ED is really busy. You have put in chest drains on the wards before, but at the moment you are very busy with a trauma call.</p>				

Debriefing	Technical Managing Type 2 Respiratory Failure – In a patient with COPD and a likely exacerbation this should be managed with optimum medical therapy which
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	<p>includes: nebulisers, steroids, aiming oxygen saturations 88-92% and considering antibiotics if an infective exacerbation. If they remain acidotic with PCO₂ >6.5 then consider use of NIV (see algorithm for how to commence).</p> <p>Managing pleural procedures out of hours – There is a convenient BTS (British Thoracic Society) algorithm to help with decision making. Unless significant respiratory compromise then this should wait until an experienced operator is available during daylight hours. If pleural procedure fails and causes a pneumothorax, this will then preclude the use of NIV.</p> <p>Non-technical (CRM) Know the environment Anticipate and plan Mobilise all available resources Use all available information – Local/BTS guidelines Call for help early - Referring to CCOT, speaking to on-call teams Re-evaluate repeatedly Exercise leadership and followership</p>
References	<p>BTS/ICS Guidelines for the Ventilatory Management of Acute Hypercapnic Respiratory Failure in Adults. British Thoracic Society/Intensive Care Society Acute Hypercapnic Respiratory Failure Guideline Development Group 71 S2 Volume 71 Supplement 2 Pages ii1–ii35 THORAX</p> <p>Pleural procedures and thoracic ultrasound: British Thoracic Society pleural disease guideline 2010</p>
Curriculum mapping	<p>CiP Descriptors (Internal Medicine Curriculum Stage 1):</p> <ul style="list-style-type: none"> - Managing medical problems in patients in other specialties and special cases - Delivering effective resuscitation and managing the deteriorating patient - Communicates effectively and is able to share decision making, while maintaining appropriate situational awareness, professional behaviour and professional judgement
Written by: Date: Review date:	<p>Ewan Mackay, reviewed by William Ricketts (Consultant Respiratory Medicine) and Paula Lee (Acting Director of Simulation)</p> <p>21/06/22 21/06/24</p>

ED Medical clerking – FY1 Watson

PC: Shortness of breath

HPC:

- 2 day history of cough with some sputum
- Sputum green and a little thick
- Been feeling “generally off” and decreased appetite
- Felt hot at home (not measured temperature)

PMH: COPD, RA, OA

Drug hx: Lisinopril, Anoro ellipta, methotrexate, vitamin D

Allergies: NKDA

Social hx: Ex-smoker (30 pack year history), Walks with a stick, carers BD, rarely leaves the house

Ix:

Bloods: Hb 110, WCC 11.5, PI 100, Na 140, Ur 8.3, CRP 4

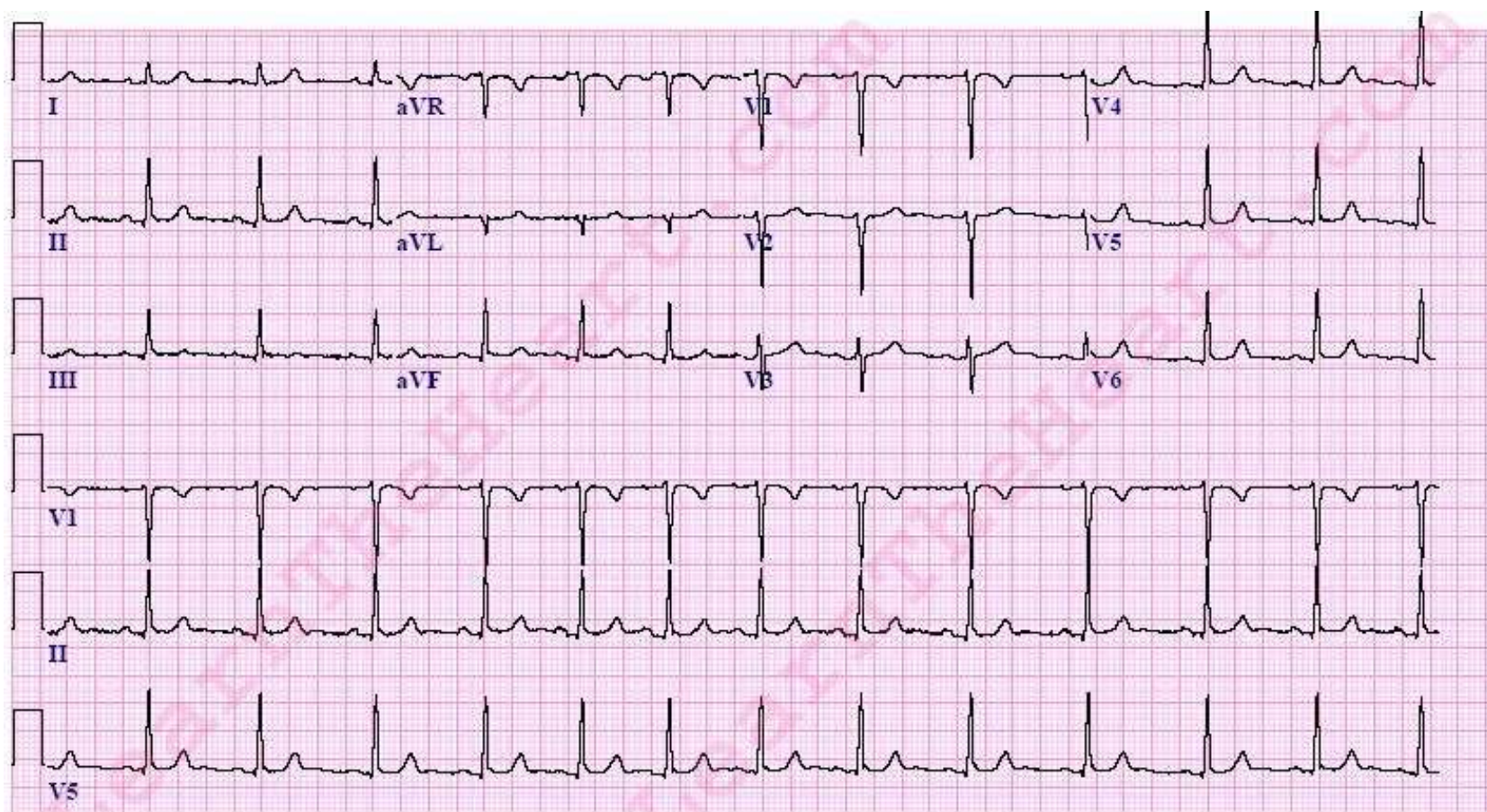
Plan:

Sputum MCS

Oxygen

Consider antibiotics if spikes

Senior review mane



25mm/s 10mm/mV 150Hz 005C 12SL 250 CID:1

EID:615 EDT: 09:31 23-SEP-2005 ORDER:

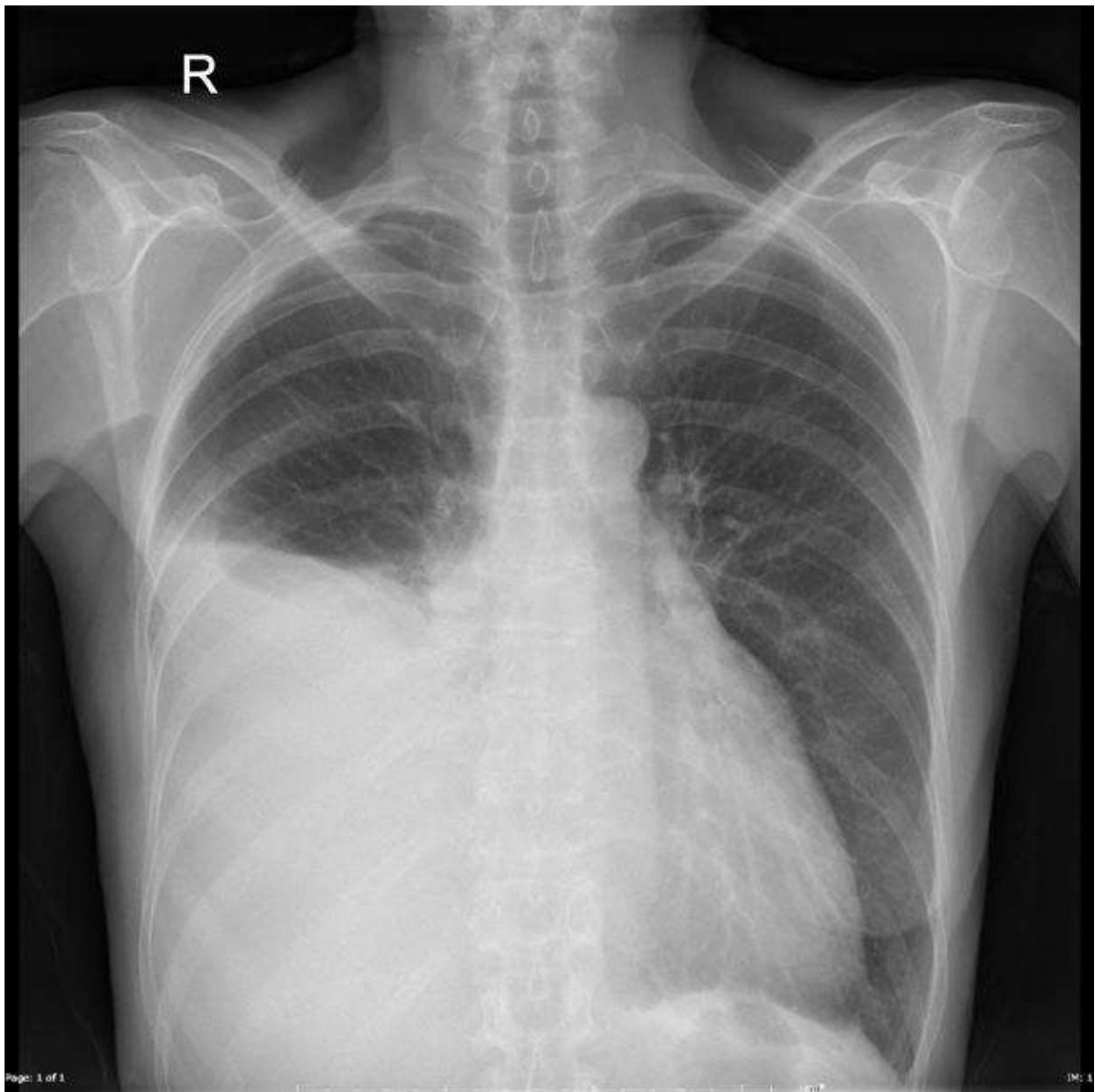


Image courtesy of radiopaedia.org

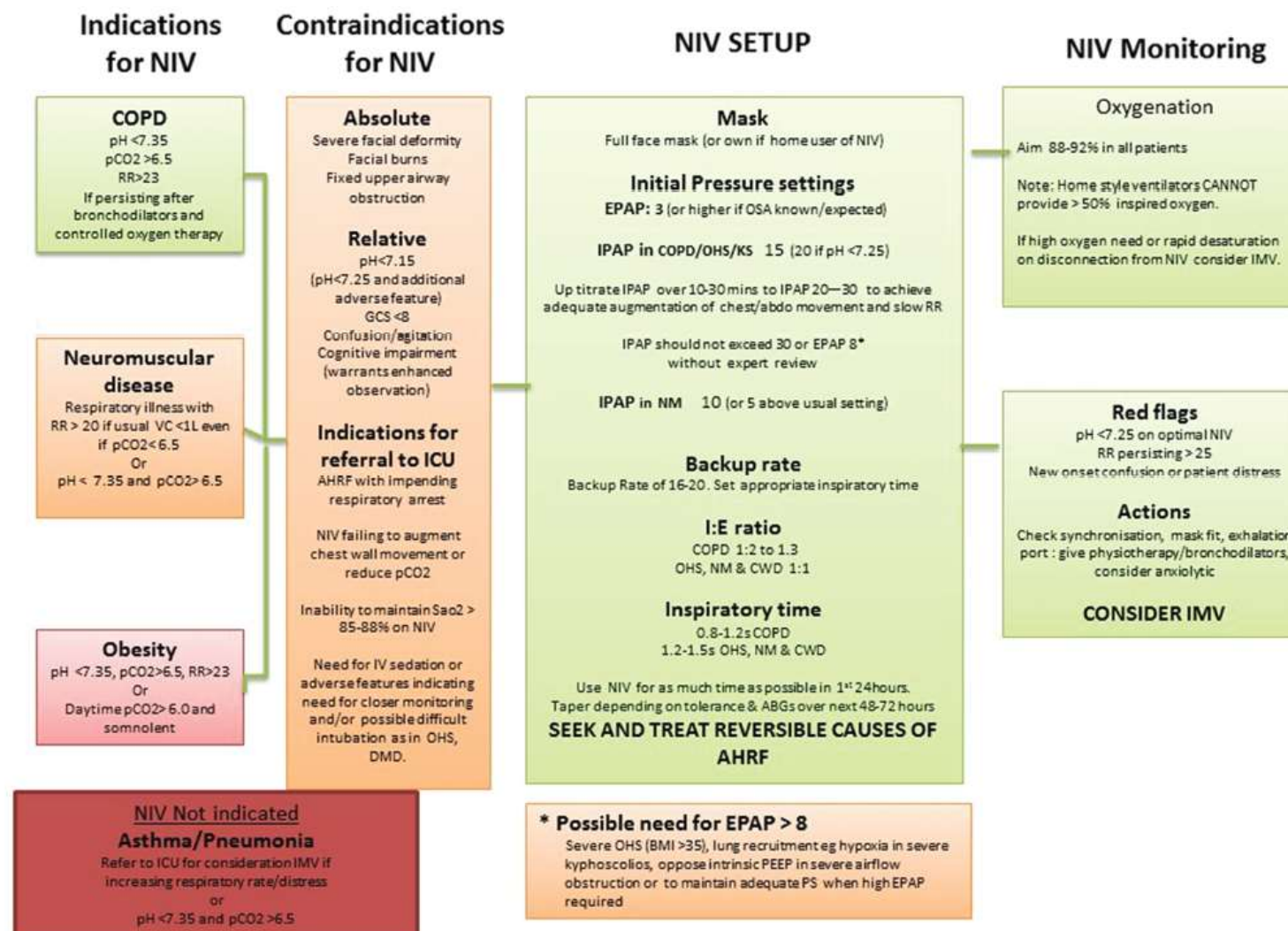
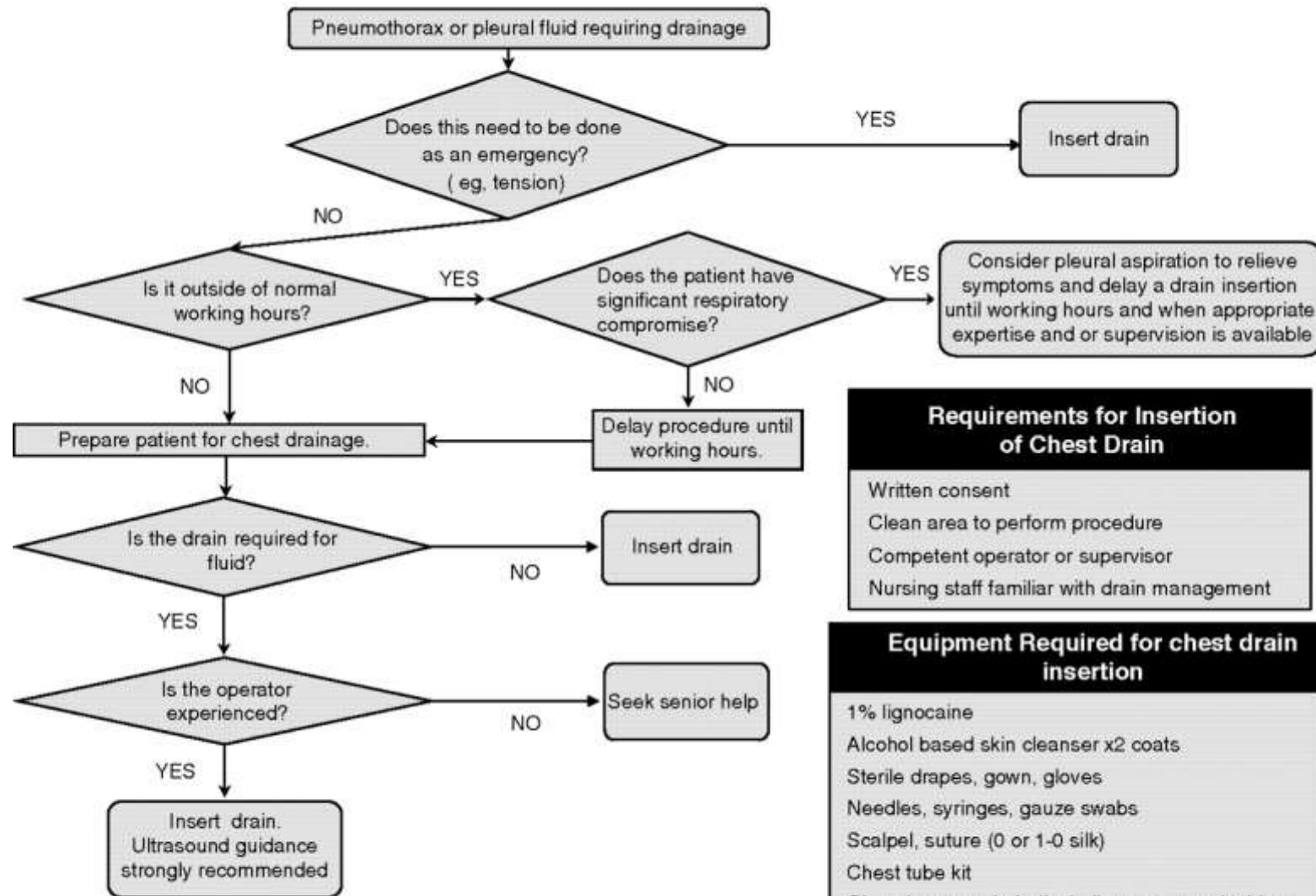


Figure 1 Summary for providing acute non-invasive ventilation.

Insertion of Chest Drain



Requirements for Insertion of Chest Drain

- Written consent
- Clean area to perform procedure
- Competent operator or supervisor
- Nursing staff familiar with drain management

Equipment Required for chest drain insertion

- 1% lignocaine
- Alcohol based skin cleanser x2 coats
- Sterile drapes, gown, gloves
- Needles, syringes, gauze swabs
- Scalpel, suture (0 or 1-0 silk)
- Chest tube kit
- Closed system drain (including water) and tubing
- Dressing
- Clamp

