

ARRHYTHMIAS 2° TO HYPERKALAEMIA

MODULE: CRITICAL INCIDENTS

TARGET: ANAESTHETISTS, INTENSIVISTS, EMERGENCY, ACUTE PHYSICIANS

BACKGROUND:

Management of arrhythmias according to up to date guidelines is a learning objective in the 2010 Anaesthetic Curriculum. Safe defibrillation practice is an essential skill for doctors caring for acutely ill patients. This scenario also allows discussion of hyperkalaemia management, a life-threatening electrolyte abnormality.

RELEVANT AREAS OF THE ANAESTHETIC CURRICULUM

IG_BS_08	In respect of intravenous induction: <ul style="list-style-type: none"> • Makes necessary explanation to patient • Demonstrates satisfactory preparation of drugs for induction of anaesthesia • Demonstrates proper technique in injecting drugs for induction of anaesthesia • Manages the cardiovascular and respiratory changes associated with induction of general anaesthesia
RC_BS_07	Monitor cardiac rhythm using defibrillator pads, paddle or ECG leads
RC_BS_08	Uses a manual or automated defibrillator to safely defibrillate patient
CI_BK_11	Arrhythmias: <ul style="list-style-type: none"> • ST Segment changes • Sudden tachyarrhythmias • Broad complex tachycardia • Ventricular fibrillation
CI_BS_01	Demonstrates good non-technical skills such as: [effective communication, team-working, leadership, decision-making and maintenance of situation awareness].
CI_BS_02	Demonstrates the ability to recognise early a deteriorating situation by careful monitoring
CI_BS_03	Demonstrates the ability to respond appropriately to each incident listed above
CI_BS_04	Shows how to initiate management of each incident listed above
CI_BS_05	Demonstrates ability to recognise when a crisis is occurring
CI_BS_06	Demonstrates how to obtain the attention of others and obtain appropriate help when a crisis is occurring
1.1	Adopts a structured and timely approach to the recognition, assessment and stabilisation of the acutely ill patient with disordered physiology
3.1	Manages the care of the critically ill patient with specific acute medical conditions
4.8	Recognises and manages electrolyte, glucose and acid-base disturbances
5.2	Performs emergency airway management
5.11	Performs defibrillation and cardioversion
CT_IS_07	Demonstrates the ability to provide anaesthesia for procedures in cardiac intensive care including re-sternotomy, re-intubation, tracheostomy and cardioversion
CT_IS_01	Demonstrates leadership in resuscitation room/simulation when practicing response protocols with other healthcare professionals
CT_IS_02	Demonstrates appropriate use of team resources when practicing response protocols with other healthcare professionals

INFORMATION FOR FACULTY

LEARNING OBJECTIVES:

- Management of broad complex tachycardia according to Resus Council guidelines
- Providing anaesthesia during the practical management of broad complex tachycardia
- Medical management of hyperkalaemia

SCENE INFORMATION:

- Location: Resus
- Expected Duration: 20 mins
- Expected Debriefing: 35-40 mins

This scenario takes place in ED resus. It can form the basis of a joint training scenario for foundation, ED, ICU, anaesthetic or ACCS trainees. The initial patient assessment could be performed by a Foundation or ED trainee, who would be expected to call for anaesthetic or ICU support to perform emergency DC cardioversion.

EQUIPMENT & CONSUMABLES

Manikin – On resus trolley.
Stocked Airway trolley
- Laryngoscopes (2 x Macintosh)
- ET Tubes (Various Sizes)
- OP, NP and Advanced Supraglottic airways (iGels, LMAs)
Simulated Anaesthetic drugs
Defibrillator trolley and working defibrillator

PERSONS REQUIRED

Anaesthetic/ICU Trainee
Resus nurse
Anaesthetic Senior Trainee
ED Trainee (Optional)

PARTICIPANT BRIEFING: (TO BE READ ALOUD TO PARTICIPANT)

Foundation/ED/ACCS Trainee:

- This patient has been brought in by ambulance with an extreme tachycardia. The patient is in ED Resus. Please perform the initial assessment of the patient and proceed as you feel appropriate.

Anaesthetic Trainee:

- You are the on-call anaesthetic/ITU SHO. You have been called to see a patient in ED Resus.

'VOICE OF MANIKIN' BRIEFING:

You are breathless and find it difficult to speak in full sentences, but are able to give a history. During the acute pulmonary oedema phase of the scenario, you are unable to speak in more than single word sentences.

You are 72 years old.

You started to feel unwell earlier this evening (about 2 hours ago) when you started to feel breathless with a fluttery sensation in your chest. There was no chest pain. You took some GTN, but there was no improvement. You were starting to feel increasingly breathless at home, and decided to call the ambulance when you felt dizzy on your way to the bathroom.

You have a past medical history of a heart attack 3 years ago (treated with clot busting medications, no stents). Since then your doctor has been treating you for heart failure as you have become breathless when walking to the shops, and in recent months, when climbing up the stairs in your home.

You take aspirin, ramipril, frusemide, simvastatin and were started on spironolactone 5 days ago. No allergies.

You've never had any previous problems with general anaesthetics. You've previously had bowel cancer treated with an operation, and several sinus procedures when you were young.

OTHER IN-SCENARIO PERSONNEL BRIEFING:

- Whoever operates the defibrillator must have been safely trained to do so.

ADDITIONAL INFORMATION

RADIOMETER ABL

ABL725 ICU 00 00 CO 08-12-2013
PATIENT REPORT Syringe - S 195uL Sample# 90396

Identifications

Patient ID
Patient First Name
Patient Last Name
Date of Birth
Sample type
Fi O₂ 1.0
Department ED
Operator Emergency Dept

Blood Gas Values

pH	7.34		[7.340 - 7.450]
pCO ₂	4.2	kPa	[4.70 - 6.00]
pO ₂	11.2	kPa	[10.0 - 13.3]

Oximetry Values

dHb	11.2	g/dL	[12.0 - 16.0]
sO ₂	95	%	[95.0 - 98.0]
F O ₂ Hb		%	[94.0 - 99.0]
FC OHb		%	[-]
FHHb		%	[-]
FmetHb		%	[0.2 - 0.6]
Hctc	34.1	%	

Electrolyte Values

cNa+	146	mmol/L	[136 - 146]
cK+	7.8	mmol/L	[3.0 - 5.0]
cCa ²⁺	1.04	mmol/L	[1.15 - 1.29]
cCl-	102	mmol/L	[98 - 106]

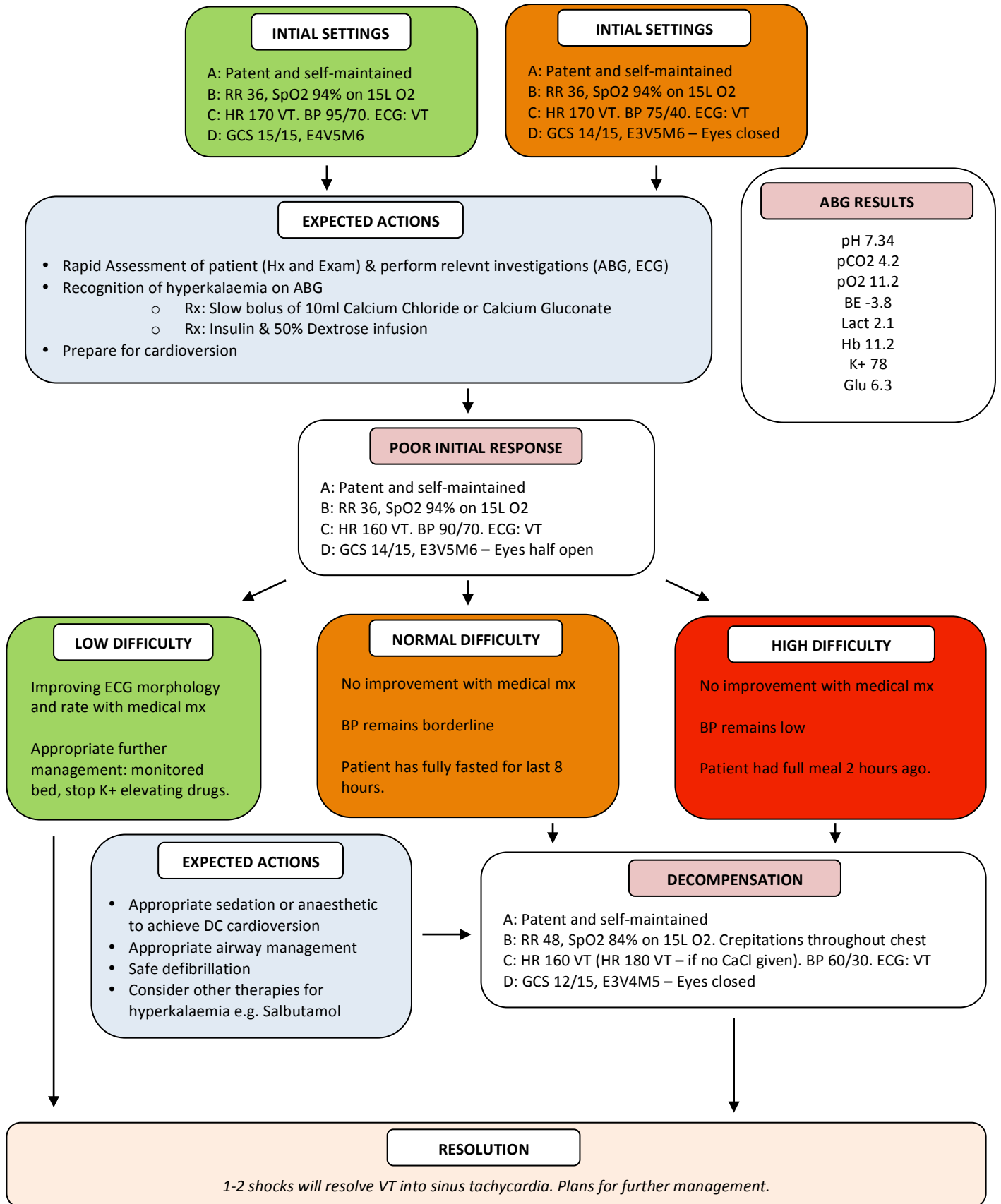
Metabolite Values

cGlu	6.2	mmol/L	[3.5 - 10.0]
cLac	2.1	mmol/L	[0.5 - 1.6]

Acid Base Status

cBase(Ecf)c	-3.8	mmol/L	
cHCO ₃ ⁻ (P,st)c	21.2	mmol/L	

CONDUCT OF SCENARIO



DEBRIEFING

POINTS FOR FURTHER DISCUSSION:

Technical:

- ALS tachyarrhythmia algorithm
- Management of hyperkalaemia
- Options for anaesthesia for emergency DC cardioversion

Non-technical:

- Situation awareness
- Prioritisation
- Team-working and task management
- Leadership

DEBRIEFING RESOURCES

1. Resuscitation Council (UK) 2010 guidelines. Adult tachycardia algorithm.
<http://www.resus.org.uk/pages/tachalgo.pdf>
2. GAIN Guidelines for the treatment of hyperkalaemia in adults. Dec 2008.
http://www.gain-ni.org/Publications/Guidelines/hyperkalaemia_guidelines.pdf
3. M Stoneham. Anaesthesia for Cardioversion. Anaesthesia 1996, 51:565-570
<http://deepblue.lib.umich.edu/bitstream/2027.42/73622/1/j.1365-2044.1996.tb12566.x.pdf>

INFORMATION FOR PARTICIPANTS

KEY POINTS:

- Management of broad complex tachycardia according to Resus Council guidelines
- Providing anaesthesia during the practical management of broad complex tachycardia
- Medical management of hyperkalaemia

RELEVANCE TO AREAS OF THE ANAESTHETIC CURRICULUM

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WORKPLACE-BASED ASSESSMENTS

FURTHER RESOURCES

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PARTICIPANT REFLECTION:

What have you learnt from this experience? (Please try to list 3 things)

How will your practice now change?

What other actions will you now take to meet any identified learning needs?

PARTICIPANT FEEDBACK

Date of training session:.....

Profession and grade:.....

What role(s) did you play in the scenario? (Please tick)

Primary/Initial Participant	<input type="checkbox"/>
Secondary Participant (e.g. 'Call for Help' responder)	<input type="checkbox"/>
Other health care professional (e.g. nurse/ODP)	<input type="checkbox"/>
Other role (please specify):	<input type="checkbox"/>
Observer	<input type="checkbox"/>

	Strongly Agree	Agree	Neither agree nor disagree	Disagree	Strongly Disagree
I found this scenario useful					
I understand more about the scenario subject					
I have more confidence to deal with this scenario					
The material covered was relevant to me					

Please write down one thing you have learned today, and that you will use in your clinical practice.

How could this scenario be improved for future participants?
 (This is especially important if you have ticked anything in the disagree/strongly disagree box)

FACULTY DEBRIEF – TO BE COMPLETED BY FACULTY TEAM

What went particularly well during this scenario?

What did not go well, or as well as planned?

Why didn't it go well?

How could the scenario be improved for future participants?