

BLOCKED ANAESTHETIC CIRCUIT

MODULE: PATIENT SAFETY

TARGET: ALL ANAESTHETISTS

BACKGROUND:

Numerous case reports have described incidents where anaesthetic breathing circuits have become blocked by foreign objects either from the manufacturing stage or at the time of use in the anaesthetic room or operating theatre. Formal, careful and thorough machine checking before each list, and appropriate checks between cases, are critical steps in the safe conduct of anaesthesia, and anaesthetic training must continue to reflect this.

In 2012 the AAGBI updated its safety guideline for checking anaesthetic machines and equipment prior to use. The first step in this updated checklist is checking that a self-inflating bag is available – thus ensuring a method of isolating the patient from the anaesthetic machine while maintaining ventilation at all times.

This scenario has been designed for use during the Oxford Novice Anaesthetist Training Course. However, it is suitable for delivery to anaesthetists at all stages of training and practice.

RELEVANT AREAS OF THE ANAESTHETIC CURRICULUM

IG_BS_02	Demonstrates appropriate checking of equipment prior to induction, including equipment for
	emergency use
	In respect of the equipment in the operating environment:
IG_BK_03	 Demonstrates understanding of the function of the anaesthetic machine including
	 Performing proper pre-use checks
	 Changing/checking the breathing system
	In respect of monitoring:
IG_BS_06	 Manages monitors appropriately e.g. set alarms; start automatic blood pressure
	Demonstrates proficiency in the Interpretation of monitors
IO_BS_09	Able to respond in a timely and appropriate manner to events that may affect the safety of patients
	[e.g. hypotension, massive haemorrhage] [S]
CI_BK_02	Unexpected fall in SpO₂with or without cyanosis
CI_BK_03	Unexpected increase in peak airway pressure
CI_BK_18	Difficulty with IPPV, sudden or progressive loss of minute volume
CI_BS_01	Demonstrates good non-technical skills such as: [effective communication, team-working,
	leadership, decision-making and maintenance of high situation awareness]
CI_BS_02	Demonstrates the ability to recognise early a deteriorating situation by careful monitoring
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
CI_IS_01	Demonstrates leadership in resuscitation room/simulation when practicing response protocols with
	other healthcare professionals
CI_IS_02	Demonstrates appropriate use of team resources when practicing response protocols withother
	healthcare professionals

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INFORMATION FOR FACULTY

LEARNING OBJECTIVES:

• Rapid method of identifying and differentiating between equipment-related and patient-related causes of ventilatory failure during anaesthesia

SCENE INFORMATION:

Location: Anaesthetic Room
 Expected Duration of Scenario: 10-15 mins
 Expected Duration of Debrief: 30-35 mins

EQUIPMENT & CONSUMABLES

PERSONS REQUIRED

Manikin - Male.

Anaesthetic machine – Ensure that a self-inflating bag is present on the back of the machine.

Anaesthetic circuit – blocked at junction of catheter mount and angle piece by cellophane

Stocked airway trolley
Self-inflating bag
Infusion/TIVA pumps
(Simulated) Propofol for infusion ready to be drawn up into 50ml syringes
Simulated anaesthetic drugs

Anaesthetic Junior Trainee Anaesthetic Assistant Anaesthetic Senior Trainee

PARTICIPANT BRIEFING: (TO BE READ ALOUD TO PARTICIPANT)

Mr Levi Caine is a 60 year old man who is undergoing a right total knee replacement. He has hypertension, mild COPD and arthritis. His regular meds are amlodipine, seretide and salbutamol. There are no known allergies.

He has had a right femoral nerve block awake with 30ml of 0.25% bupivacaine.

Please continue his anaesthetic care by inducing general anaesthesia, inserting an LMA and continuing his peri- operative care.

'VOICE OF MANIKIN' BRIEFING:

Unresponsive. Under General Anaesthetic.

'IN SCENARIO PERSONNEL' BRIEFING:

ANAESTHETIC ASSISTANT

Support the anaesthetist during the scenario, but do not volunteer solutions.

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CONDUCT OF SCENARIO

INITIAL SETTINGS A: Patent and Self-maintained B: Spontaneously ventilating. RR 14. SaO2 98%. EtO2 does not increase despite pre-oxygenation C: HR 90. BP 138/90. D: GCS 15/15. Eyes open. E: Hospital gown. **INDUCTION** B: RR reduces to 0 as induction agent given. SaO2 trend **EXPECTED ACTIONS** falls to 60% over 6 mins. C: HR 110 transiently during induction. BP falls to 85/60. Insertion of LMA (before or D: GCS 3/15. Eyes closed. after attempting to ventilate) Attempt to ventilate - FAIL Recognise problem occurring Call for help Attempt to identify whether **ONGOING FAILURE TO VENTILATE** problem is machine-side or B: Ventilation restarts gradually after 4 mins delay. SaO2 patient-related falls to 60% over 4 mins if no effective ventilation takes place. C: Bradycardia on profound hypoxia. **EXPECTED ACTIONS** Attempting Bag-Mask Ventilation Once patient-related problem is excluded. Attempt to identify cause on 0 equipment side. If cause found, consider maintaining anaesthesia and continuing case 0 If cause not found, wake the patient up LOW DIFFICULTY **HIGH DIFFICULTY** Spontaneous ventilation restarts • Spontaneous ventilation restarts after 4 mins and SaO2 starts to after 5 minutes and SaO2 starts to rise - unless patient is still rise slowly unless patient is still attached to the blocked circuit attached to the blocked circuit. Help arrives early. **RESOLUTION** Either once alternative ventilation source has been established or it is clear that this is not going to occur

3

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		ANA	ESTI	HETIC	CRE	CORD SH	EET		
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SURNAME: (Block Letters)									**************************************
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DOB:		Sex: M / F		CEPOD				/ URGENT / EM	MERGENCY
		Anaesth	retist'	s pred		itive assess			
Name:					Grad	le: Cons C	AS LISG	☐Trainee	
Date:		Time:			Sign	ature			
Anaes / Surg	history	<i>'</i> :				O/E			ASA
Previous Ap	oprendic	ectomy				Unremark	able		BP:
Medical histo	ory:								HR:
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Arthritis		•				Airv Mouth Ope	<i>vay Assess</i> ning:	ment	Weight:
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☐ Haema	tology	Biochemistry	С	oag.		ECG		Other:	
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Plt 311			G	p. & Sa	ve	X - Ray			
Sickle:		Blood Sugar:	□×	- Match	1				
CONSENT:	GA	Sedation		Epidura	ıl	Spinal	Region	al Sup	pository
Notes / Discus	PCA	EPCA echnique propos		Other					
Consented to	for GA w	rith LMA + RHS fe	moral r	nerve					
Risks explai	ned and	consented							
Anaesthetic	Inform	ation leaflet rece	ived by	patient					
For attention	of ward	staff: (further in	vestiga	itions, fa	asting,	continue/omit	current medi	cation, etc.)	

All orders / information regarding medication & fluids must be entered on patient's drug prescription & administration record

Date:	Anaesthetist(s): Nam	e G	rade	Or	era	tion	/ Pr	oceo	lure	e(s):				Sur	geon	(s): N	lame	Grade
Location / Theatre:																			
Supervising Name: Anaesthetic Consultant (S-AC) AOD	Location In The	eatre [] In T		olex	Dis Wit	scus:	sed AC		Mas	sk		JN	Size asal MA		□ E	Bain		/stem T-Piec Tosorber
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N ₂ O / Air / Total Gas so / Sevo / Des /entilation Mode (SV	E _T %	L/min Mac																	
req Fidal Volume	/ min ml																		
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DEBRIEFING

POINTS FOR FURTHER DISCUSSION:

 Rapid method of identifying and differentiating between equipment-related and patientrelated causes of ventilatory failure during anaesthesia

DEBRIEFING RESOURCES

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- Breathing system obstruction: a continuing issue. Anaesthesia News. AAGBI Newsletter September 2012. http://www.aagbi.org/sites/default/files/September.pdf
- AAGBI Safety Guideline. Checking Anaesthetic Equipment 2012.
 http://www.aagbi.org/sites/default/files/checking_anaesthetic_equipment_2012.pdf
 Checklist for Anaesthetic Equipment 2012.
 http://www.aagbi.org/sites/default/files/checklist_for_anaesthetic_equipment_2012.pdf

Version 9 – May 2015 6

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Original Author: Dr P Shanmuha, Dr S Snyders



INFORMATION FOR PARTICIPANTS

KEY POINTS:

 Rapid method of identifying and differentiating between equipment-related and patient-related causes of ventilatory failure during anaesthesia

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- AAGBI Safety Guideline. Checking Anaesthetic Equipment 2012.
 http://www.aagbi.org/sites/default/files/checklist for anaesthetic_equipment_2012.pdf
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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?
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PARTICIPANT FEEDBACK	
Date of training session:	
Profession and grade:	
What role(s) did you play in the scenario? (Please tick)	
Primary/Initial Participant	
Secondary Participant (e.g. 'Call for Help' responder) Other health care professional (e.g. nurse/ODP)	
Other role (please specify):	
Observer	

	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)

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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?

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