

# DRUG ERROR: EPHEDRINE BOLUS

MODULE: PATIENT SAFETY

TARGET: ALL ANAESTHETISTS

# BACKGROUND:

Medication errors present a particular hazard to patients. Anaesthetists handle and administer numerous drugs with potentially significant adverse effects, often in a distraction-filled environment. There has been a relatively poor safety culture with regard to drug error prevention in anaesthesia although this is improving.





# RELEVANT AREAS OF THE ANAESTHETIC CURRICULUM

IG_BS_04	Demonstrates safe practice in selecting, checking, drawing up, diluting, labelling and administering
	of drugs
	In respect of airway management:
	<ul> <li>Demonstrates optimal patient position for airway management</li> </ul>
	<ul> <li>Manages airway with mask and oral/nasopharyngeal airways</li> </ul>
	<ul> <li>Demonstrates hand ventilation with bag and mask</li> </ul>
	<ul> <li>Able to insert and confirm placement of a Laryngeal Mask Airway</li> </ul>
IG_BS_10	<ul> <li>Demonstrates correct head positioning, direct laryngoscopy and successful nasal/oral</li> </ul>
	intubation techniques and confirms correct tracheal tube placement
	Demonstrates proper use of bougies
	<ul> <li>Demonstrates correct securing and protection of LMAs/tracheal tubes during</li> </ul>
	movement, positioning and transfer
	Correctly conducts RSI sequence
	Correctly demonstrates the technique of cricoid pressure
IO_BS_08	Communicates with the theatre team in a clear unambiguous style
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]
ES_BS_03	Manages rapid sequence induction in the high risk situation of emergency surgery for the acutely ill
	patient
CI_BK_09	Unexpected hypertension
	Arrhythmias:
CL DIV 44	<ul> <li>ST segment changes</li> </ul>
CI_BK_11	Sudden bradycardia
	Ventricular ectopics
CI_BK_22	Adverse drug reactions
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_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
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 with other
	healthcare professionals





# **INFORMATION FOR FACULTY**

# **LEARNING OBJECTIVES:**

- Learn how to approach the management of unexpected hypertension under anaesthesia
- · Understand the factors that can contribute to drug errors occurring
- · Understand how systems can be put in place to reduce the risk of harm to patients from drugerrors

#### SCENE INFORMATION:

• Location: Anaesthetic Room / Theatre

Expected Duration of Scenario: 20 minsExpected Duration of Debrief: 40 mins

#### **EQUIPMENT & CONSUMABLES**

#### PERSONS REQUIRED

Manikin
Stocked airway trolley
Simulated drugs for induction (thiopentone/propofol, suxamethonium, fentanyl, atracurium), anti-emesis (ondansetron, dexametasone), analgesia (paracetamol, diclofenac, tramadol) antibiotics (augmentin, gentamicin), emergency (suxamethonium, atropine, metaraminol, ephedrine)
Empty Ephedrine vial (30mg in 1ml)
Surgical drapes
Simulated surgical equipment (e.g. instrument trolley, diathermy, suction etc)

Anaesthetic Junior Trainee Anaesthetic Assistant Anaesthetic Senior Trainee Scrubs Nurse (Optional) Surgeon (Optional) Runner (Optional)

# PARTICIPANT BRIEFING: (TO BE READ ALOUD TO PARTICIPANT)

You are coming on shift to start a night shift and are taking over the care of the anaesthetic.

Please take over the anaesthetic care of the patient for their extubation and transfer to the recovery area.

# 'VOICE OF MANIKIN' BRIEFING:

No speech. Anaestheised.

### 'IN SCENARIO PERSONNEL' BRIEFING:

#### **OUT-GOING ANAESTHETIST**

You have been the emergency list anaesthetist during daylight hours. You are tired and irritated as this case has gone on much longer than planned, and there are several cases now stacked up and are waiting to be done. You are keen to handover quickly – if asked why, say that you've needed the loo for the last hourand the case has gone on much longer then expected.

Handover the information in character as described below:





Thanks for taking over the anaesthetic for this patient. He is James Davidson, 42 year old patient who hashad an appendicectomy. They are usually fit and well, but have had 5 days of right iliac fossa pain, with vomiting and fevers. They had a raised white cell count and CRP.

The patient is fasted, but has had vomiting in the last 2 hours. There are no allergies known. He is aheavy smoker – admits to 20-30/day but looks like he may smoke more. Their airway examination is unremarkable. Chest examination had scattered creps throughout. He's not previously been diagnosed as COPD.

His induction was an unremarkable RSI, but he was pyrexial and tachycardic preoperatively. He was given antibiotics on induction, but once they opened up and saw how much contamination there was from the perforation he was given additional gentamicin. He's also required quite a few boluses of metaraminol through the case.

It's been a very prolonged case. The operation started laparoscopically, but there was perforated and retrocaecal and due to technical difficulties was converted to open. There was some hypotension during the procedure and the patient has required several doses of metaraminol intraoperatively. In addition, an arterial line was inserted at the time of converting to open procedure.

The operation and the surgeon has just finishing suturing. You were planning to give some ondansetron and a further 5mg morphine before he wakes up and will likely need another 10mg in recovery. He'll need reversal as some attracurium was given a short while ago as he coughed on the table.

#### **SURGICAL TEAM**

The laparoscopic appendicectomy has proceeded uneventfully and you are just finishing suturing and dressing the wounds. After finishing suturing, you can leave theatre. Announce that you will be writing the op note in the coffee room.

# ANAESTHETIC ASSISTANT

The operation has finished and the patient needs to be extubated and transferred to recovery.

The patient is a bit slow to breathe and will require reversal of muscle relaxation. Hand them an unlabelled 2ml syringe with 1ml of clear fluid and tell them you've just drawn up the reversal – OR – this can be a labelled syringe that the outgoing anaesthetist drew up alongside some ondansetron and pain relief.

If administered, this leads to a drug error.





#### **CONDUCT OF SCENARIO**

# EXPECTED ACTIONS

- Run through A-E checks in order to orientate self
- Turn off vapour increase FiO2
- Suction airway

#### **INITIAL SETTINGS**

- A: ETT in situ
- B: RR 14. SpO2 94%. Ventilated FiO2 50%
- C: HR 95. BP 96/62
- D: GCS 3.Eyes closed. etAgent 1.6.
- E: Temp 36.6. Surgical drapes on, exposing abdomen.

# ADDITIONAL INFO

If there are faculty members acting as theatre staff, they should be acting as distractions – causing noise, having conversations and distracting the ODP.

#### A: ETT in situ.

- B: SpO2 96%. EtO2 100% No spontaneous breaths
- C: BP 90/60. HR 90.
- D: GCS 3/15. Eyes closed.
- E: Temp 38.6.

# BP RISE

B: SpO2 96%.

C: BP 240/130 over 1 min. HR 170 over 2 mins. ST depression develops 5 mins after BP surge, if appropriate management does not occur, ST elevation occurs after further 5 mins

#### **ADDITIONAL INFO 2**

If necessary, a few minutes after the BP increases, the ODP enters the theatre from the anaesthetic room, and shows an empty 30mg Ephedrine vial that can't be accounted for – it's possible it was drawn up accidently.

# **EXPECTED ACTIONS**

- · Give analgesia e.g. fentanyl/alfentanyl
- Increase anaesthetic depth
- · Call for help
- · Check for drug errors (check with ODP also)
- Consider hypotensive agents: GTN, labetalol/propranolol, clonidine, phentolamine, hydralazine, or nifedipine.
- · Consider invasive arterial BP monitoring

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### LOW DIFFICULTY

- Hypertension is transient and settles after 8 mins.
- ECG changes settle spontaneously

#### NORMAL DIFFICULTY

 With appropriate management, BP and HR settle but ECG changes persist.

# **HIGH DIFFICULTY**

- Persistent high BP throughout scenario despite all treatments
- ST elevation pattern suggestive of acute MI

#### RESOLUTION

Once BP starts the settle or once appropriate post-operative plan is made

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Version 9 – May 2015

Editor: Dr Andrew Darby Smith Original Author: Dr P Shanmuha



			ESTHETIC	CRE	CORD SHEET					
PATIENT DETA Hospital No.	AILS / AD	DRESSOGRAPH				M	15			
SURNAME: (Block Letters)	James	Davidson								
FORENAMES:	44 yea	rs old		Procedure(s) proposed:						
Address: Ward/Hosp.					-00 -000 -000 -000 -000 -000 -000 -000					
DOB:		Sex: M / F		CLASS	ic → Open Appendicectomy S: ELECTIVE / SCHEDULED	/ URGENT / EI	MERGENCY			
		Anaesth	etist's pre	opera	tive assessment by					
Name:				Grad	e: Ocons OAS OSG	☐Trainee _				
Date:		Time:		Sign	ature					
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No previou	ıs GAs				Pyrexial 38.5 Looks unv	well.	BP:			
Medical histo	ory:				Tachycardia 110		HR:			
No medica	l history	of note			Chest – scattered crep	s	Temp:			
5 days of p Vomited 2		ys of vomiting and go	d fevers		Airway Assess Mouth Opening:	ment	Weight:			
Heavy smo	ker – 20	-30/day			MP Score: 1 2 3		Height:			
					Jaw: Good mouth open Neck: Neck ROM OK	BMI:				
					TEETH	Smoke:				
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since Clear FI			_actation:		X = missing L = loose C = caps / crowns D = damag	B = bridge ged	Apfel Score			
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Nil					NKDA					
☐ Haema	itology	Biochemistry	Coag.		☐ ECG	Other:				
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Notes / Discu	ssion / T	echnique propos	ed:							
Consented block	for GA w	rith LMA + RHS fer	noral nerve							
Risks explai	ned and	consented					3.			
Anaesthetic	c Inform	ation leaflet recei	ved by patient	t						
For attention	of ward	staff: (further inv	estigations, f	asting,	continue/omit current medi	ication, etc.)				
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All orders / information regarding medication & fluids must be entered on patient's drug prescription & administration record SPG2299

Date:	Anaesthetist(s	): Nam	e G	rade	Or	era	tion	/ Pr	oceo	lure	e(s):				Sur	geon	(s): N	lame	Grade
Location / Theatre:																			
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# **DEBRIEFING**

#### POINTS FOR FURTHER DISCUSSION:

- Learn how to approach the management of unexpected hypertension under anaesthesia
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# **DEBRIEFING RESOURCES**

- 1. World Anaesthesia Tutorial of the Week: Hypertension in Anaesthesia http://www.frca.co.uk/documents/hypertensioninanaesthesia.pdf
- Paix A, Runciman W, Horan B et al. Crisis management during anaesthesia: hypertension. Qual Saf Health Care. 2005. 14 (3):e12 http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1744002/pdf/v014p00e12.pdf
- 3. Abeysekera A, Bergman IJ, Kluger MT, Short TG. Drug error in anaesthetic practice: a review of 896 reports from the Australian Incident Monitoring Study database. Anaesethesia 2005. 60 p220-227 http://onlinelibrary.wiley.com/doi/10.1111/j.1365-2044.2005.04123.x/pdf
- 4. Webster CS, Merry AF, Larsson L et al. The frequency of drug administration error during anaesthesia. Anaesthesia and Intensive Care 2001. 25 (5) 494-500 <a href="http://www.aaic.net.au/Document/?D=2000210">http://www.aaic.net.au/Document/?D=2000210</a>





# **INFORMATION FOR PARTICIPANTS**

# **KEY POINTS:**

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# RELEVANCE TO AREAS OF THE ANAESTHETIC CURRICULUM:

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# PARTICIPANT REFLECTION:

PARTICIPANT REFERENCE.
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	
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)





# **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?

