

Course Title	IMT 3 Simulation	Scenario Title	Resuscitation (advanced)
Patient	Name: Kim/Cam Gristoff		
	Hospital number: SC26798		

Learning	Technical	Non-Technical			
Outcomes	- Resuscitation of deteriorating	 Know the environment 			
	patient	- Call for help early: Medical			
	- Knowledge of how to treat common	emergency calls, ITU/CCOT			
	- Pattern recognition of agents that	- Use all available			
	can cause refractory shock (TCA	Toxbase NPIS (National Poisons			
	antidepressants, beta blockers.	Information Service)			
	calcium channel blockers,	- Use good teamwork			
	chloroquine, colchicine, toxins)	-			
Scenario	A 40 year old patient is in ED resus with	a possible overdose given previous			
Overview	history of suicidal ideation. On beta block	kers/calcium channel blockers. The			
	patient has been clerked by the SHO whe	o calls the candidate (IMT 3) as the			
	patient is more drowsy. The patient gives	a brief history and then quickly drops			
	medical emergency call is put out, and w	ill intubate the patient and try instronic			
	support which will not improve the situation	on			
	The scenario is designed to push the car	ndidate to think of other sources of help			
	(e.g. Toxbase, National Poisons Informat	tion Service, ECMO centre, Cardiology			
	etc.) and to instigate specific treatment for beta blocker/ calcium channel blocker				
	overdose (IV giucagon or nign dose insulin therapy).				
	This scenario requires minimum 3 faculty	members: natient voice (can also be			
	console and phone advice if required) F	D nurse plant and CCOT registrar who			
	arrives when a medical emergency call is	s put out.			
		1			
Set Up	Manikin with monitoring in place. IV fluids	s are set-up.			
	Defibrilleter eveileble with recirc				
	Bed/trolley				
	Ded/itoliey.				
	Drug chart will also be available (0.9% sa	aline prescribed only)			
	If mannikin is able to be programmed – h	eart sounds and chest sounds are			
	normal				
	ED pureo (plant) in room and is helpful fo	or actting obc			
		n geung obs.			
Prop List	Clinical equipment				
	Paperwork / EPR as per local				
	Drugs including atropine, glucagon, insul	in, infusion pumps, calcium, salbutamol			
	nebs / IV, lipid rescue therapy (intralipid)				
	Guidelines – resus council, Toxbase, tele	ephone			

Console		(Initial) A	B (Deterioration after 2 mins)	C (Intubated)	D (Post atropine/vasopressors)
	RR	12	12	I+V	I+V
	SpO ₂	94	98	95	96
	HR	60	38	35	38



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	BP	112/60	68/30	70/35	75/45
	Rhythm	SR	Sinus brady	Sinus brady	Sinus brady
	Temp	36.5C	36.1C	36.4C	36.4C
	Eyes	normal	normal	normal	normal
	Other				
Expected Actions	Candidates will be expected to perform a full A-E assessment and a short psychiatric assessment. The patient will give some information before quickly becoming more drowsy, hypotensive and bradycardic (systolic 68/30). Candidates will be expected to call for help early and put out a medical emergency call. The patient will be refractory to atropine and vasopressor therapy (vasoplegic), and the best candidates will then consider IV glucagon/ high insulin therapy, as well as thinking early about other interventions such as ECMO/intra-aortic balloon pumps.				
End Point	Speaking to National Poisons Service and commencing IV glucagon or high dose insulin treatment, or the candidate refers for consideration of ECMO.				

Participant briefing	A patient in their 40s was brought in to the Emergency Department after a friend informed emergency services that they had taken an overdose. The patient has a history of depression and hypertension, normally taking Amlodipine and Bisoprolol. Initial observations appeared stable; BP 111/56 mmHg, heart rate 68/min, SpO2 98% in air, respiratory rate 20 breaths per minute, bloods and ECG were initially unremarkable except for an elevated blood glucose of 12 mmol/L. Your SHO has clerked the patient and has asked you to review the patient as they are becoming more drowsy.
Patient Briefing	You have taken an overdose deliberately and are slightly drowsy. Your mood is low and you have no remorse – you would rather not be here. You wanted to die given loss of job and your social network recently. You took all your pills (infrequently take BP meds) – not sure how many exactly but 15-20 of each. You had a previous suicide attempt with paracetamol 5 years ago, which required admission for NAC. You are not diabetic, and feel sweaty and unwell. You become more drowsy as the conversation continues.
Patient PMHx	PMH: Previous suicide attempt 5 years ago, HTN Drug hx: Amlodipine 5mg OD, Bisoprolol 5mg Social hx: Recently lost your job, 30 units alcohol/week, no illicit drugs Family hx: Nil relevant
Investigations & results	Bloods: Hb 139, WCC 13 neuts 9, lymphs 2, monocytes 2, eosinophils 0.5, Platelets 192 CRP 7 ALT 80, AST 96 bili 20 ALP 222 Calcium corrected 2.04 (2.20 -2.60)



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	TFTs pending		

	Na 142 K 4.4 Urea 6 Cr 102 INR 1.3				
	Paracetamol 0, salicylates 0				
	ABG (RA): pH 7.35 CO2 3.2 O2 10.2 BE -6.0 Lactate 4.9, glc 11.0. Ketones 0.3				
	Urine dip: NAD, pregnancy test -ve				
	CXR normal				
	ECG: NSR initia	ally but will devel	op profound sinus	s bradycardia	
Plant Briefing	You are an experienced ED nurse and will follow what the candidate suggests. You are worried that the patient has become more drowsy and will alert the candidate that the observations have deteriorated (this will occur halfway through the history). You have never heard of treating beta blocker overdoses with high dose glucagon/ insulin therapy and will question such high doses being given. The "Medical Emergency team" will consist of a critical care outreach registrar (ICU trainee). You are competent, and will intubate quickly and seek further direction from the candidate. You are happy to be directed, and have knowledge of giving inotropes/chronotropes such as dobutamine/isoprenaline (exact dose values do not have to be mentioned in scenario) and will give these if suggested by candidate.				
On		А	B	C (Intubated)	D
Examination			(deterioration)		
	Colour	pale	pale	pale	
	Skin	pale	pale	pale	
	CRT	4 secs	8 secs	8 secs	
	GCS	14 initially,	8	3	
		dropping to			
		responding to			
		pain only			
	Pain Score				
	Abdomen	Soft, mottled			
Life Savers	The plant will highlight when observations change if not noticed, and if the candidate becomes stuck can suggest a medical emergency call or "if there is anyone else who might be able to help us treat this?"				
Telephone	Potential calls depending upon the candidate (can be played by one faculty				
Assistance	member):				,
A3313101100					
	Medical / ED c	onsultant – The	patient sounds ve	ery unwell. You a	re not aware of
	the latest guida	nce for treating n	nixed beta blocke	r/ calcium channe	el blocker
	overdoses. You	suggest that the	candidate calls t	he National Pois	ons Information
	Service (NPIS) and speak to intensive care.				



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National Poisons Information Service (NPIS) – There is limited evidence for using glucagon to treat beta blocker overdoses. High dose insulin therapy (1 unit/kg) should be given IV with concurrent 10/20% dextrose to prevent hypoglycaemia.
ECMO (Extra Corporeal Membrane Oxygenation) team – Thank you for calling the unit early. The patient will need to be an intensive care to intensive care transfer but the patient sounds as if they may be a candidate for retrieval. Please perform a repeat ABG and call them back with the results.
Cardiology SpR – You are able to perform an echocardiogram by the bedside if this is helpful but the lab is currently busy with a patient having an emergency angiogram. You could speak to your consultant regarding intra-aortic balloon pumps but these are not something you are very familiar with and the lab is unfortunately busy at the moment. Pacing only likely to be of use if patient is in sino-atrial/AV block, which is not the case here.

Debriefing	There are some situations when it is useful to look outside the hospital for help e.g. NPIS/ECMO in this scenario. In other situations – Catheter directed thrombolysis/embolectomy for PE, hyperbaric chamber (decompression sickness, carbon monoxide poisoning), High level isolation unit (high consequence infectious diseases), Liver Unit, Trauma centre, HASU, Primary PCI, Renal / dialysis etc.
	Toxbase is a useful first port of call for overdoses, but NPIS can be called for complex cases.
	Beta blocker overdose: Toxbase recommends atropine (0.5 - 1.2mg), and consideration of isoprenaline/dobutamine for symptomatic bradycardia. IV Glucagon (5 - 10 mg) is recommended as treatment of choice for severe hypotension, heart failure or cardiogenic shock. High dose insulin therapy (HIET) can be considered for cases with decreased myocardial contractility and particularly useful if patients are acidotic, as it can help improve systemic perfusion. This is given at a dose of 1 unit/kg as a bolus (IV) over 2-3 minutes, with an infusion then set at 1 unit/kg/hr. This can be uptitrated to aim for systolic BP>90. 10% dextrose is run concurrently to prevent hypoglycaemia.
	Calcium channel blocker overdoses: Calcium is not a specific antidote to CCB overdose but must be replaced alongside deficiencies of other electrolytes, particularly in patients with prolonged QTc on their ECG, which can cause Torsades de Pointes. Toxbase recommends giving IV calcium for mild-moderate drops in blood pressure. 10mls of 10% calcium chloride or 20 - 30mls of 10% calcium gluconate can be administered intravenously over 5-10 minutes and may be repeated every 10 - 20 minutes up to a maximum of 4 doses. High dose insulin therapy/IV glucagon is also recommended for impairment of mycocardial contractility and severe hypotension respectively.
	Mechanical cardiac support may be considered where other measures have failed. Veno-Arterial Extra-Corporeal Membrane Oxygenation (VA-ECMO) is an



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	invasive treatment that allows blood to be oxygenated through an extra-corporeal circuit and provides direct cardiovascular support by returning blood to the arterial system. Its use as a salvage treatment option for many causes of cardiovascular collapse is growing – need to consider early – local networks e.g. Royal Brompton / Barts – phone number availability etc.
	Managing conflicts in teams – ED nurse not wanting to start high dose glucagon/insulin therapy as unfamiliar with use in this scenario, and likely worried about the risk of hypoglycaemia.
References	https://www.toxbase.org (requires local trust login)
	National Poisons Information Service (NPIS): 0344 892 0111 Rotella JA et al, 2020, Treatment for beta-blocker poisoning: a systematic review. <i>Clinical toxicology</i> , 58(10):943-983
Curriculum	CiP Descriptors (Internal Medicine Curriculum Stage 1):
mapping	 Managing an acute unselected take Managing medical problems in patients in other specialties and special cases Delivering effective resuscitation and managing the deteriorating patient
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