

Syllabus	
Topic	Intra-arterial injection & extravasation injury

a)

Give 3 risk factors that can lead to an extravasation injury (3 marks)

- 1)
- 2)
- 3)

b)

List 3 pathophysiological mechanisms for tissue damage in extravasation injury (3 marks)

- 1)
- 2)
- 3)

c)

Name 3 steps involved in the initial management of an extravasation injury (3 marks)

- 1)
- 2)
- 3)

d)

Give 1 specific secondary management / specific antidote used to minimize the risk of permanent injury (1 mark)

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e)

List 3 pathophysiological mechanisms thought to be involved in intravascular injury (3 marks)

- 1)
- 2)
- 3)

f)

Give 3 acute clinical features of inadvertent intra-arterial (IA) drug injection (3 marks)

- 1)
- 2)
- 3)

g)

Give 2 patient factors that can predispose to inadvertent intra-arterial (IA) drug injection (2 marks)

- 1)
- 2)

h)

After the initial management of an intra-arterial (IA) drug injection, list 2 further steps that can be considered in the management of the problem (2 marks)

- 1)
- 2)

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	Answer	Marks	Guidance
a)	<p>Patient factors</p> <ul style="list-style-type: none"> • Elderly patients – fragile skin & veins • Neonates, infants & ex premature babies. • Cannulation of scalp veins • Unconscious or sedated patients • Obese patients • Oedematous patients • Patients with concurrent disease causing decreased peripheral sensation <p>Administration methods</p> <ul style="list-style-type: none"> • Automated syringe drivers • Use of pressure bags • Insufficient placement depth of CVC <p>Drug factors:</p> <ul style="list-style-type: none"> • Vasoactive drugs • Hyperosmolar substances • Highly acidotic/alkalotic solutions • Large drug volume 	1 mark for each point (Max. 3 marks)	
b)	<ul style="list-style-type: none"> • Vasoconstriction and ischaemic necrosis • Direct toxicity • Osmotic damage • Extrinsic mechanical compression by large volumes of solution • Superimposed infection 	1 mark for each point (Max. 3 marks)	
c)	<ul style="list-style-type: none"> • Stop the injection/ Stop and disconnect the infusion immediately • Aspirate as much drug as possible from cannula • Mark area of extravasation/Take photos • Elevate the limb • Consider plastics referral 	1 mark for each point (Max. 3 marks)	

d)	<ul style="list-style-type: none"> • Saline washout • Liposuction • Steroids • Hyaluronidase • Phentolamine • Regional sympathetic block 	1 mark for any listed answer	
e)	<ul style="list-style-type: none"> • Arterial spasm – resulting in distal ischaemia • Chemical arteritis – endothelial destruction • Release of harmful endogenous substances, e.g. thromboxane (causing endothelial damage and activation of platelets resulting in thrombosis) • Drug precipitation and crystal formation in microcirculation (leading to ischaemia and thrombosis) 	1 mark for each point (Max. 3 marks)	
f)	<ul style="list-style-type: none"> • Pain at site and distal to injection site • Failure of drugs expected effect • Pallor, cyanosis & coolness or hyperaemia/redness and warmth of affected limb • Paraesthesia 	1 mark for each point (Max. 3 marks)	Oedema & gangrene are later signs
g)	<ul style="list-style-type: none"> • Morbid obesity • Darkly pigmented skin • Hypotensive patients • Hypoxic patient • Unconscious/Sedated patient • Anatomically anomalous artery 	1 mark for each point (Max. 2 marks)	
h)	<ul style="list-style-type: none"> • Consideration of IA sympatholysis (iloprost, or local anaesthetics) • Pain control • Consideration of anticoagulation with heparin • Plastics referral • Documentation, Incident reporting, explanation and apology to patient. • Consideration of stellate ganglion/lower limb sympathetic block 	1 mark for each point (Max. 2 marks)	

References

- 1) Lake C, Beecroft CL. Extravastation injury and accidental intra-arterial injection. CEACCP (2010) 10(4)109-113 <https://academic.oup.com/bjaed/article/10/4/109/381097>
- 2) Combeer E. The final FRCA short answer questions – a practical study guide. Inadvertent intra-arterial injection. Masterpass (2013)