

Syllabus	CT_IS_02
Topic	Descending thoracic aortic aneurysms

a)

List 3 factors that increase the risk of aneurysm rupture (3 marks)

1.
2.
3.

b)

Describe 5 physiological changes associated with the application of an aortic cross-clamp (5 marks)

1.
2.
3.
4.
5.

c)

Describe 4 steps you would take to prepare and manage for the physiological changes associated with removal of an aortic cross-clamp (4 marks)

1.
2.
3.
4.

d)

List 2 advantages and 2 disadvantages for the use of distal perfusion technique (4 marks)

	Advantage	Disadvantage
1)
2)

e)

List 2 risk factors for developing renal failure postoperatively (2 marks)

1.
2.

f)

List 2 other post operative complications following thoracic aneurysm repair (2 marks)

1.
2.

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Q	Answer	Mark	Guidance
a)	<ul style="list-style-type: none"> • Aneurysm >5cm • Hypertension • Smoking • COPD • Pain • Chronic aortic dissection • Increasing Age 	Any 3	
b)	<p><u>Proximal hypertension:</u></p> <ul style="list-style-type: none"> • Cardiac filling pressures, myocardial wall stress and oxygen consumption (VO₂) increase • Cardiac output and ejection fraction decrease • To offset hypertension there is reflex slowing of HR, decreased contractility and peripheral vasodilatation • 40% increase in MAP above clamp <p><u>Distal hypoperfusion:</u></p> <ul style="list-style-type: none"> • Distal to clamp there is decreased oxygen consumption and conversion to anaerobic metabolism • Renal and hepatic hypoperfusion had reduced capacity to eliminate lactic acid • 85% decrease in MAP below clamp • Distal aortic pressures 11-30mmHg 	5	<p>Needs to appreciate:</p> <ul style="list-style-type: none"> • Differences in pressures around x-clamp • Changes in cardiac function • Organ hypoperfusion and anaerobic metabolism below distal clamp
c)	<ul style="list-style-type: none"> • During clamping intravascular volume must be maintained with crystalloids, colloids and blood to increase PCWP to above its baseline 2-4mmHG • All infusions should be stopped before removal of cross-clamp • Ventilation should be increased to offset increased acid load returning to circulation from distal areas • Vasopressors; phenylephrine, norad should be available before removal of clamp • General aim is to keep Hct >27% at end of surgery 	Any 4	

e)	<ul style="list-style-type: none"> • Increased clamp time >30mins is a risk factor • Other RFS include <ul style="list-style-type: none"> ○ Increased age ○ Pre-existing renal disease ○ Sustained perioperative hypotension ○ Low CO ○ Failure of atrio-femoral bypass intraop 	Any 2	
f)	<ul style="list-style-type: none"> • Acute/Delayed neurological deficit <ul style="list-style-type: none"> ○ Paraplegia • Mesentery ischaemia • Hepatic ischaemia • Massive blood loss • Coagulopathy 	Any 2	

References:

- 1) Puchakayala MR, Lau WC. Descending thoracic aortic aneurysms. CEACCP (2006) 6(2)54-59 [https://bjaed.org/article/S1743-1816\(17\)30392-X/pdf](https://bjaed.org/article/S1743-1816(17)30392-X/pdf)