

Syllabus	
Topic	Cardiomyopathy

A 55 year old man is listed for elective repair of a large incisional hernia. He has a background history of dilated cardiomyopathy.

a)

Complete the table (with low, normal or high) describing the pathological features of the three WHO-recognised types of cardiomyopathy. (3 marks)

	Dilated	Hypertrophic	Restrictive
Cardiac output	Low
Stroke volume	Low
Contractility	Normal

b)

Although most commonly idiopathic, list three other causes of dilated cardiomyopathy. (3 marks)

1.
2.
3.

At the preoperative clinic, the patient's symptoms of heart failure appear to be well controlled and his chest is clear on auscultation. He takes 10mg of Ramipril daily and last attended cardiology clinic more than 12 months ago.

c)

List three investigations you would request prior to listing the patient for his elective procedure. (3 marks)

1.
2.
3.

d)

State the principles by which you would manage his cardiovascular physiology intra-operatively. (4 marks)

1.
2.
3.
4.

e)

Your consultant suggests performing an epidural block for the surgery due to the size of the hernia. List one advantage and one disadvantage of neuraxial blockade specific to cardiovascular physiology in dilated cardiomyopathy. (2marks)

Advantage:

Disadvantage:

f)

If the patient instead had hypertrophic cardiomyopathy (HCM), how may it present? List three possible presenting features of HCM. (3 marks)

1.
2.
3.

g)

In a subset of high-risk patients with HCM, hypertrophy is most prominent in the interventricular septum. What could this specifically lead to? (1 mark)

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h)

Cardiovascular collapse in HCM is a special circumstance. What drug is best avoided? (1 mark)

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Q	Answer	Mark	Guidance
a)	<p><u>Dilated</u></p> <ul style="list-style-type: none"> • Stroke volume: low • Contractility: low <p><u>Hypertrophic</u></p> <ul style="list-style-type: none"> • Cardiac output: low • Contractility: high <p><u>Restrictive</u></p> <ul style="list-style-type: none"> • Cardiac output: normal or low • Stroke volume: low 	<p>1</p> <p>1</p> <p>1</p>	<p>Need both elements correct for 1 mark</p> <p>Systolic dysfunction is the predominant form of dysfunction seen in DCM, whereas diastolic dysfunction is the predominant feature in HCM and restrictive CM. DCM occasionally causes a mixed picture of both systolic and diastolic failure.</p>
b)	<ul style="list-style-type: none"> • Ischaemic • Valvular disease • Post-viral • Peri- and post partum • Alcoholism • Post-chemotherapy • Sickle cell disease • Muscular dystrophy 	Any 3	
c)	<ul style="list-style-type: none"> • Urea and electrolytes (due to ACEi therapy) • ECG • TTE 	<p>1</p> <p>1</p> <p>1</p>	
d)	<ul style="list-style-type: none"> • Avoid tachycardia • Maintain preload/normovolaemia • Avoid increases in SVR • Maintain afterload/MAP • Maintain sinus rhythm • Rapid correction of electrolyte disturbances/arrhythmias 	Any 4	
e)	<p><u>Advantage:</u></p> <ul style="list-style-type: none"> • Reduces afterload – can improve CO • Avoids increases in SVR + HR due to pain <p><u>Disadvantage:</u></p> <ul style="list-style-type: none"> • Reduction in diastolic BP leads to reduced coronary perfusion 	<p>Any 1</p> <p>Any 1</p>	<p>Dilated ventricles have an increased afterload</p> <p>No mark for just stating causes hypotension – need to</p>

	<ul style="list-style-type: none"> • Treatment of hypotension with IV fluids increases risk of pulmonary oedema 		state consequence of hypotension for mark
f)	<ul style="list-style-type: none"> • Shortness of breath • Chest pain on exertion • Syncope or pre-syncope • Arrhythmias • Sudden cardiac death 	Any 3	<p>Although often asymptomatic, the presenting features are as for heart failure.</p> <p>Major risk factors for sudden cardiac death are:</p> <ul style="list-style-type: none"> • Family history of sudden death • Extreme hypertrophy of LV wall >30mm • Unexplained syncope • Non-sustained VT • Previous cardiac arrest <p>Therefore, ICD's are commonplace in HCM.</p>
g)	<ul style="list-style-type: none"> • Left ventricular outflow tract obstruction 	1	<p>This is exacerbated in situations where there is under filling of the LV. The velocity of blood in the outflow tract draws the anterior MV leaflet towards the intraventricular septum. The result can be complete obstruction of the outflow tract coupled with MR (advise google for image).</p>
h)	<ul style="list-style-type: none"> • Adrenaline 		<p>Inotropic agents are contraindicated in HCM because these patients require a decreased inotropic and chronotropic state to mitigate outflow tract obstruction, diastolic dysfunction, and myocardial ischemia. Inotropic agents will only increase the obstruction. Alpha agonists, IV fluids and rapid correction of arrhythmias are more appropriate. Applying defib</p>

			pads before induction of anaesthesia is also recommended.
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References:

- 1) Davies MR, Cousins J. Cardiomyopathy and anaesthesia. CEACCP (2009) 9(6)189-193
<https://academic.oup.com/bjaed/article/9/6/189/378264>
- 2) Ibrahim IR, Sharma V. Cardiomyopathy and anaesthesia. BJA Education (2017) 17(11)363-369
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