Cert Cardiology(SA) Phys

THE COLLEGES OF MEDICINE OF SOUTH AFRICA

Incorporated Association not for gain
Reg No 1955/000003/08

Examination for the Subspecialty Certificate in Cardiology of the College of Physicians of South Africa

1 March 2018

Paper 1 (3 hours)

All questions are to be answered. Each question to be answered in a separate book (or books if more than one is required for the one answer)

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1 a) Describe how you calculate cardiac output using the Fick Principle. (10)
b) Describe how you calculate the size of intracardiac shunts like a VSD using oximetry/oxygen saturation. (10)
c) Discuss the pathogenesis of Warfarin embryopathy, its incidence, risk factors and steps that should be taken to prevent it. (15)
d) Discuss the genetic causes of cardiomyopathies. (10)
[45]

2 Examine the cardiac MRI values below from a patient referred to you with pulmonary oedema and answer the questions that follow relating to ventricular function assessment in general and interpretation of this data more specifically.

LV end diastolic volume (LVEDV) = 250ml
LV end systolic volume (LVESV) = 50ml
Phase contrast calculated Aortic flow: 100mls/beat
Phase contrast calculated Pulmonary flow: 125mls/beat
Phase contrast calculated Mitral inflow (LA to LV): 200mls/beat
Phase contrast calculated Tricuspid inflow (RA to RV): 100mls/beat

a) Using the available data, calculate the LV ejection fraction, demonstrating your formula. (8)
b) Explain Dumesnil's method (also called the Doppler method) of calculating LVEF echocardiographically and give a reason why it would not be a valid method to use for calculating LVEF in this case. (7)
c) Identify the lesion/s presented by this MRI data and grade their severity quantitatively. (8)
d) What is the Qp:Qs in this case? (4)
e) Discuss the problems inherent in using the Cubed method (or Teicholtz' method) for calculating LV volumes echocardiographically for the purpose of LVEF calculation. (8)
f) Echocardiographically, the ASE/ESC recommended method of choice for calculating LV volumes for LVEF calculation is Simpson's method of discs. What are the main pitfalls of this method and how would you overcome some of them? (10)
[45]

3 a) When new data is published, what important features of trial design do you consider to be important in influencing your practice? Discuss the above with specific reference to "The Objective Randomised Blinded Investigation with optimal medical Therapy of Angioplasty in stable angina (ORBITA) trial". Comment on the strengths and weaknesses of this trial and how might it change your practice and why? (15)

b) Discuss the physiological principles of FFR and iFR and explain the differences. Do you have a preference for one over the other? Explain and discuss the relevant trial data. (15)

c) Define and discuss the haemodynamics and management of "paradoxical low-flow, low-gradient aortic stenosis". (15)

[45]

4 a) Discuss the role of anti-inflammatory therapy for atherosclerotic disease with specific reference to therapy targeting the interleukin immunity pathway. (10)

b) Discuss the pathogenesis, risk factors, prevention and management of anthracycline cardiovascular toxicity. (15)

c) Discuss the left atrial appendage with respect to the following

i) Anatomy. (5)

ii) Role in the pathogenesis of disease. (5)

iii) Role of percutaneous left atrial appendage device closure. (25)

[45]

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2 March 2018

Paper 2 (3 hours)

All questions are to be answered. Each question to be answered in a separate book (or books if more than one is required for the one answer)

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1 a) Discuss the indications for Transcatheter Aortic Valve Implantation (TAVI) according to the latest European Society of Cardiology (ESC) treatment guidelines in the treatment of aortic stenosis. (10)

b) Discuss the management of culture negative infective endocarditis. (15)

c) Discuss the use of the following biomarkers in the Emergency department in the management of cardiovascular emergencies. Highlight cut-off values and confounding factors in their interpretation

i) Cardiac Troponin T.
ii) D-Dimer.
iii) BNP and NT-proBNP. (10)

d) Discuss the role of angiotensin receptor/neprilysin inhibitor in the treatment of heart failure. Support your argument with the findings of the PARADIGM trial. (10)

[45]

2 a) Discuss the cardiac catheterisation features of hypertrophic obstructive cardiomyopathy. Diagrams can be used. (15)

b) Discuss your approach to sudden cardiac death (SCD) risk stratification of a patient with a new diagnosis of hypertrophic cardiomyopathy with a view to the need for primary prevention implantable cardioverter defibrillator (ICD) implantation. Consider including the following information

i) Discuss all parameters you deem important for risk assessment and investigations you might need to derive them. (10)
ii) Discuss how you would use these parameters to calculate risk and the need for ICD implantation. (10)

c) Discuss the role of surgical septal myectomy and alcohol septal ablation in the management of hypertrophic obstructive cardiomyopathy. (10)

[45]

3 a) A 65-year-old female patient is admitted with her first acute inferior/lateral STEMI 4 hours after the onset of pain. Heart rate 120/min; BP 85/60; severely short of breath; arterial saturation 80% on 40% 0_2; heart sounds normal with no murmurs; extensive crackles in both lung fields

i) Briefly outline your management strategy. (10)

ii) Left ventricular ejection fraction is 50% with mild inferior wall hypokinesia. Discuss possible scenarios. (5)

iii) Which arterial access would you use and why? (5)

iv) Angiography reveals the culprit lesion to be a total occlusion of a proximal dominant left circumflex artery. In addition it reveals a 70% proximal left anterior descending and 90% proximal right coronary artery lesions. Discuss your revascularisation strategy and justify it. (15)

b) You are setting up a new cath lab and your budget restricts your choice between IVUS or OCT. Which would you chose and why? (10)

[45]

4 a) Discuss the potential causes and evaluation of a patient who has survived an unexplained sudden cardiac arrest with normal cardiac function on echocardiogram and no evidence of coronary artery disease on coronary angiography. (15)

b) Discuss the management of a patient with symptomatic palpitations and frequent premature ventricular complexes recorded on a 24 hour Holter monitor. (15)

c) Discuss the implications and management of subclinical atrial fibrillation documented by a cardiac implantable electronic device. (15)

[45]