Questions for this month's clinical challenge are based on articles in this issue. The style and scope of questions is in keeping with the MCQ of the College Fellowship exam. The quiz is endorsed by the RACGP Quality Assurance and Continuing Professional Development Program and has been allocated 4 CPD points per issue. Answers to this clinical challenge will be published next month, and are available immediately following successful completion online at: www.racgp.org.au/clinicalchallenge.

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SINGLE COMPLETION ITEMS

DIRECTIONS Each of the questions or incomplete statements below is followed by five suggested answers or completions. Select the most appropriate statement as your answer.

Case 1 – Renee Baker

Renee, age 22 years, has insulin dependent diabetes managed with 4 times per day insulin injections (usually 8 units of short acting before meals and 20 units of intermediate acting before bed).

Question 1

Renee calls to request a certificate for work. She has had severe vomiting overnight. She has been able to drink some water this morning without vomiting but doesn't want to eat anything yet. Her blood sugar level (BSL) is 14 mmol/L. She asks what she should do with her insulin dose. You advise her to monitor her BSL 2 hourly and:

A. cease her insulin until she is eating normally again
B. reduce her insulin dose by half until she is eating again
C. reduce insulin by about 25%
D. take her normal insulin dose
E. increase her insulin dose by about 25% as sugars tend to go up with illness.

Question 2

Renee has no fever and thinks the seafood she ate last night caused her symptoms. Her boyfriend ate the same and is also suffering! She asks you what fluids she should drink. You advise her:

A. to only drink water as diabetics should not drink lemonade
B. to drink water if her BSL is >15 and sweetened fluids if her BSL drops <15
C. to drink full strength lemonade irrespective of BSL
D. to avoid drinking at all for a few hours until she is sure the vomiting has settled
E. she needs hospital admission for IV fluids.

Question 3

You ask Renee to come and see you later in the day and in the interim to monitor her ketone levels. If Renee's urine shows small ketones or greater:

A. she should reduce her insulin dose
B. she requires a higher insulin dose
C. this is likely to be caused by dehydration and requires no change in insulin dose
D. she needs immediate hospital admission
E. the presence of urinary ketones is normal for diabetic patients.

Question 4

When Renee comes to see you later in the day her condition has deteriorated. She has had persistent severe vomiting and hasn't been able to tolerate oral fluids for 4 hours. She has moderate ketones and her BSL is 23.1. The best course of action at this stage is to:

A. arrange transfer to emergency department or local hospital admission
B. give a maxolon injection and send her home on usual therapy
C. give a maxolon injection and increase insulin dose by 20%
D. give a maxolon injection and decrease insulin dose by 20%
E. give sweetened oral fluids and double the insulin dose.

Case 2 – Courtney Mortensen

Courtney is 15 years of age and has had insulin dependant diabetes since the age of 6 years. Until the past 12 months her metabolic control has been good. She also has mild episodic asthma.

Question 1

Courtney attends for an URTI and exacerbation of asthma. From her records you note that her most recent HbA1c is 8.5%. Possible reasons for deteriorating control may include:

A. erratic meal and exercise patterns and poor adherence to therapy
B. risk taking behaviour
C. A and B
D. endocrine changes associated with puberty
E. all of the above.

Question 2

Choose the correct statement regarding physiological changes that may be affecting Courtney's diabetes.

A. insulin resistance increases during adolescence
B. there is no evidence that glycaemia is affected by the menstrual cycle
C. overnight growth hormone secretion decrease during adolescence making morning hypoglycaemia more likely
D. insulin resistance decreases during adolescence
E. insulin dosage requirement decreases relative to body weight.

Question 3

Courtney is a keen swimmer and does squad training three times per week. She tells you that sometimes she gets 'a hypo' toward the end of training. She also asks whether she can get you to sign a medical form for her to learn scuba diving. Choose the correct statement:

A. Courtney should be actively encouraged to go scuba diving as exercise is beneficial in managing diabetes
B. Courtney should not swim as a 'hypo' in the water is dangerous
C. reducing her insulin dose before her regular swim may be helpful
D. Courtney is at risk of hypoglycaemia during the swim but not after the swim finishes
E. exercise when ketotic is recommended to decrease associated hyperglycaemia.

Question 4

You undertake HEADSS screening with Courtney and find out that she 'usually' uses condoms but has had unprotected intercourse 'a couple of times' in the context of high alcohol consumption. She has also taken ecstasy at a dance party. She is sometimes unsure if she is 'out of it' or 'having a hypo'. Choose the correct statement:

A. the combined oral contraceptive pill (COCP) is contraindicated in diabetics
B. Courtney is at lowered risk of pregnancy because diabetes decreases fertility
C. telling Courtney not to drink alcohol or take drugs is likely to lead to a change in behaviour
D. you advise Courtney to have a meal before going out and check her sugars during the night and before bed
E. although Courtney needs contraception you can't prescribe the COCP because she is 15 years of age.

Case 3 – Stan Katsoris

Stan, 54 years of age, has recently been diagnosed with type 2 diabetes. He has done well in modifying his behaviour. He has given up smoking, walks for 30 minutes per day and is trying hard to eat low fat and low glycaemic index foods.

Question 1

At his 6 month review, Stan's HbA1c is 8.1, his blood pressure 150/90 mmHg and his BMI 29. You talk to him about commencing metformin. You tell him:

A. metformin is commonly associated with hypoglycaemic episodes
B. metformin improves glycaemia but does not reduce the risk of macrovascular complications
C. metformin increases insulin secretion
D. lactic acidosis is a serious but uncommon side effect
E. the usual starting dose is 1 g twice per day.

Question 2

Stan tolerates metformin well, and continues with his diet and exercise but his blood pressure remains around 150/90 mmHg and his total cholesterol 6.1 with an HDL of 1.2. Choose the correct statement:

A. an angiotensin converting enzyme (ACE) inhibitor will reduce blood pressure but not microvascular complication risk
B. Stan qualifies for statin therapy under PBS criteria
C. Stan should not be prescribed a statin as he does not qualify under the PBS
D. if Stan has microalbuniuria then an ACE inhibitor is contraindicated
E. if Stan has a heart attack he will then qualify for a statin under PBS criteria.

Question 3

Five years later Stan is taking metformin and a sulphonyluria, but his HbA1c has gradually crept up again and is now 7.9 %. Stan is not keen on insulin therapy. You decide to maintain both his current hypoglycaemic agents and add in glitazone therapy. Choose the correct response:

A. pioglitazone is available on PBS authority in Stan's situation
B. rosiglitazone is available on PBS authority in Stan's situation
C. peripheral oedema and weight gain are side effects and liver function needs to be monitored
D. B and C are correct
E. all of the above are correct.

Question 4

In patients such as Stan who go on to require insulin therapy:

A. all oral hypoglycaemic agents need to be ceased
B. a typical starting regimen would be 0.1–0.2 units/kg of intermediate acting insulin at night
C. as there is likely to be insulin resistance a starting dose of over 1 unit/kg/day is required
D. glitazones would usually be ceased but metformin and sulphonylurea continued
E. metformin would usually be ceased and sulphonylurea continued.

Case 4 – Indira Gupta

Indira Gupta, aged 36 years, attends for confirmation of third pregnancy at 8 weeks gestation. She has two children, both born in India before she moved to Australia, and she tells you they were both big babies. Her mother has type 2 diabetes.

Question 1

You would screen Indira for gestational diabetes (GD):

A. with a 50 g glucose challenge test (GCT) now
B. with a 75 g glucose tolerance test (GTT) now
C. with a 50 g GCT at 28 weeks
D. with a 75 g GTT at 28 weeks
E. only if she developed glucosuria or abnormal fetal growth.

Question 2

You discuss GD with Indira. She asks why she needs to be tested as she wasn't tested in either of her previous pregnancies. You tell her:

A. GD is associated with serious adverse perinatal effects
B. appropriate treatment of GD decreases perinatal risks
C. there is clear cut evidence about what degree of hyperglycaemia on a GTT is abnormal
D. all of the above
E. A and B are correct.

Question 3

Indira is diagnosed with GD at 26 weeks gestation. You discuss management with her. You tell her:

A. carbohydrates should be spread throughout the day and be of low glycaemic index
B. exercise, while beneficial, has no impact on blood glucose levels
C. the goal for fasting BSL is <6.7 mmol/L and for 2 hours postprandial is <8.0 mmol/L
D. metformin does not cross the placenta and is first line therapy
E. insulin is commenced only when dietary therapy and metformin have failed.

Question 4

What follow up is required for Indira after her pregnancy?

A. she should have a GTT 2–4 months postpartum
B. she should be encouraged to follow a healthy diet, maintain BMI of 20–25 and exercise regularly
C. she should be aware of and report symptoms of hyperglycaemia
D. all of the above
E. no follow up required.

ANSWERS TO MAY CLINICAL CHALLENGE

Case 1 – Ernest Henry

1. Answer E
While any patient with chest pain needs to be attended to urgently, a focused history followed by a targeted examination must still precede any intervention. The administration of oxygen, aspirin and glyceryl trinitrate might become appropriate as this is occurring, as might some of the actions that were specified in the question. Only a clinical assessment will determine what is indicated, however.

2. Answer E
Once again, proper clinical assessment must precede any special investigations. The presence of a pleural rub, for example, can greatly increase the clinical suspicion of a pulmonary embolus in this case and guide test selection appropriately.

3. Answer B
Of the options listed, multi-detector CT pulmonary angiography has the greatest yield. Ventilation/perfusion studies – not offered as an option in this question – are comparable. D-dimer tests have a high rate of false positives due to low specificity for pulmonary embolus, and MRI is too expensive and unreliable for this specific indication. Myocardial perfusion imaging only demonstrates blood supply to the myocardium, not the lung.

4. Answer B
One of the discriminators between MDCTPA and VQ scanning is that the CT based investigation delivers a lower radiation dose, which may be significant in the pregnant patient.

Case 2 – Ernest Henry continued

1. Answer D
Stable infarction is one cause of a fixed defect on a stress MPI study along with stress ischaemia, hibernating myocardium, or a combination of all three. Differentiation is made by comparing the resting study. MPI has a similar safety profile to exercise ECG, is suitable for diabetics, and has a low false negative rate. As it is noninvasive, however, there is no opportunity to dilate coronary stenoses.

2. Answer D
Dipyridamole (or adenosine) can be used to cause nondemand coronary hyperaemia when exercise is not possible. Both are contraindicated in asthma or second degree heart block. Dobutamine is a possible alternative.

3. Answer E
All food, drinks and medications containing xanthines such as caffeine and theophylline block the action of dipyridamole in causing nondemand coronary hyperaemia and thus they should be avoided for 24 hours before the investigation.

4. Answer A
As the MPI method relies on comparing resting myocardium with stressed myocardium, disorders of myocardial perfusion that restrict blood flow to all regions equally means that there is no normally perfused muscle for comparison. Coronary vasospasm or impaired vasodilatation are more likely to cause a false negative resting angiogram with a true positive MPI.

Case 3 – Ernest Henry continued

1. Answer B
Indications for intervention in abdominal aortic aneurysms include evidence of leakage, tenderness, complications, or size in excess of 5.0–5.5 cm. Virtually all aneurysms are due to atheromatous weakening of the vessel wall below the renal arteries. Femoral artery atheroma is usual.

2. Answer E
Australian law dictates that Dr Conrad has a duty to respond to Mr Henry's preoperative concerns with information that will help him to make an informed decision. This must include information that any reasonable person would need to know, as well as information specific to the particular patient. An empathic statement followed by an open ended question is the best strategy.

3. Answer A
Patients are often discharged 2–3 days following percutaneous aortic stent insertion, compared with approximately 5–10 days following surgery, depending on comorbidities. Endoleak is a recognised complication of the percutaneous method, as is buttock claudication; angiography is used at various stages of stent deployment.

4. Answer C
The selection of the correct graft (or manufacture of a custom fitted one) is crucial to the success of this procedure. CT angiography using a high resolution machine and experienced personnel is vital.

Case 4 – Andrea Christian

1. Answer E
All of the factors listed are likely to be important to a woman in Andrea's situation. Uterine artery embolisation has the shortest hospital stay and recovery time, but hysterectomy carries a better guarantee of success.

2. Answer A
Uterine artery embolisation appears to have similar fertility sparing effects as myomectomy, but long term data are lacking. Hysterectomy and endometrial ablation are both sterilising procedures, as would be clamping the uterine arteries. It is possible for fertility to be maintained after GnRH therapy but this is not freely available and is not definitive on its own.

3. Answer C
For the purpose of accessing a Medicare rebate for vertebroplasty, failure of medical therapy can be defined as minimal or no pain relief with the administration of prescribed analgesics, or adequate pain relief with narcotic dosages that produce undesirable side effects.

4. Answer A
The whole aim of vertebroplasty is rapid relief of symptoms. Although Mr Gilbert's malignant disease may result in a less satisfactory outcome than if he had an osteoporotic fracture, it is entirely feasible that he could be returned to Dr Conrad's care – with substantially less pain and more mobility – immediately after the procedure, depending on local circumstances.

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