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. Check clinical challenge online for this month's completion date. **Kath O'Connor**

## 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 – Marcus Grondman

Marcus Grondman, 52 years of age, is a CFA fire fighter. He presents to your rural general practice for a pre-fire season check up. He is a type 2 diabetic with a history of hypertension and hyperlipidaemia but no personal or family history of cardiovascular disease. You note on his file that he takes ramipril 5 mg, metformin 500 mg bd and atorvastatin 20 mg/day.

### Question 1

**Your history includes assessment of:**

A. physical activity
B. alcohol intake
C. smoking
D. past injuries
E. all of the above.

### Question 2

**Marcus smokes 15 cigarettes a day and drinks approximately 4–5 cans of beer on 2 nights of the week. Out of fire season he plays football once a week. He measures his blood sugar levels a couple of times a week and they are usually between 7 and 9. He has never had any major injuries and does not complain of any musculoskeletal pain. You perform a physical examination and find that his resting heart rate is 80, BP 135/80 and BMI 32. His visual acuity is 6/6 in both eyes and colour vision is intact. Peripheral sensation and pulses are intact. You order the following investigations EXCEPT:**

A. spirometry
B. fasting lipids
C. serum carbon monoxide
D. HbA1C
E. electrolytes, urea and creatinine (EU&C), and urinary microalbumin.

### Question 3

**Marcus returns for the results of his investigations. His kidney function is normal and urinary microalbumin is within the normal range. $FEV_1$ and FVC are 85% predicted. HbA1C is 7%. His lipid profile is within the normal range. You organise a diabetic eye check and discuss all of the following EXCEPT:**

A. smoking cessation
B. weight loss and regular exercise
C. fluid replacement during fireground shifts
D. avoidance of smoke inhalation on the fireground
E. a medically supervised maximal stress test.

### Question 4

**There is a bushfire raging in your local area and you are called to the fireground to treat Marcus Grondman. He is weak and light headed and complains of headache, muscle aches and pains and nausea. On examination he is hot to touch and has a pulse rate of 120. Tympanic temperature is 38.5. You diagnose heat exhaustion and admit him to the emergency department of the local hospital for cooling and fluid replacement. How long should Marcus wait before returning to the fireground:**

A. overnight
B. 48 hours to 2 weeks depending on severity
C. 2 months if severe heat exhaustion
D. nil unless he has fluid and electrolyte abnormalities
E. until his temperature returns to normal.

### Case 2 – Angelo Ricci

Angelo Ricci, 45 years of age, is a third generation fruit grower. He attends your rural general practice with a laceration to his right hand. He explains that he was drunk the previous night and fell, driving his hand through a window. You know that many local farmers are suffering from the effects of the prolonged drought. You stitch up Angelo's hand and ask him about his alcohol consumption and how the farm is going. He admits things are tough but says he is doing okay.

### Question 5

**Drought related anxiety and depression is:**

A. unlikely – if this was the problem Angelo would have presented earlier
B. unlikely – if this was the problem Angelo would have volunteered a history of low mood or anxiety
C. important to consider
D. unrelated to Angelo's problem
E. only important if Angelo is under significant financial strain.

### Question 6

**Angelo admits to drinking heavily and to feelings of hopelessness, low mood and irritability over the past few months. He has occasional thoughts of suicide but no plans. You provide psychoeducation, discuss his heavy drinking, start an antidepressant and plan to see Angelo in a few days. You give him information about local services. The following services are readily available in rural areas to help farmers with practical and financial issues EXCEPT:**

A. Centrelink rural support workers
B. Department of Primary Industries drought support workers
C. Department of Agriculture, Fisheries and Forestry rural financial counsellors
D. local specialist psychiatrists
E. Country Women's Association (CWA).

### Question 7

**Angelo comes back in a few days for review. You ask about his family. He has a wife and four children. Drought may affect family relationships in which of the following ways:**

A. social isolation
B. more farm work for family members
C. need for partners to move off the farm for additional income
D. families can no longer afford social outings
E. all of the above.

### Question 8

**Which of the following is true regarding the prevalence of depression, anxiety and suicide in rural versus urban areas:**

A. anxiety and depression is more common in rural areas but suicide is less common
B. anxiety and depression are equally common but suicide is more common in some patient groups in rural areas
C. anxiety, depression and suicide are more common in rural areas
D. anxiety, depression and suicide are more common in urban areas
E. none of the above.

### Case 3 – Van Nam Nguyen

Van Nam Nguyen, 36 years of age, runs a car battery recycling business. He presents to your suburban general practice complaining of tiredness, headache and nausea over the past few months.

### Question 9

**On examination Van Nam is pale, BP 140/95, and has a blue line on the dental margins of his gums. This blue line is a unique feature of toxicity of which of the following heavy metals:**

A. mercury
B. thallium
C. arsenic
D. lead
E. zinc.

### Question 10

**Which of following blood tests will help you diagnose and determine the effects of toxicity:**

A. zinc protoporphyrin (ZPP)
B. serum lead
C. FBE, reticulocyte count and Fe studies
D. EU&C and urate
E. all of the above.

### Question 11

**Van Nam returns for his results. His serum lead is elevated at 2.5 mcmol/L and ZPP is also elevated. He has a hypochromic microcytic anaemia with low iron stores and urate and creatinine are mildly elevated. This indicates:**

A. acute exposure to lead
B. chronic exposure to lead
C. lead and iron toxicity
D. lead and zinc toxicity
E. Van Nam is a smoker.

### Question 12

**Van Nam's business is located on the top floor of a warehouse and he employs five workers. Each of the following can increase exposure of Van Nam and his employees to lead EXCEPT:**

A. eating in the workplace
B. smoking in the workplace
C. vacuuming instead of sweeping
D. use of buffers and grinders
E. soldering with an oxacetylene torch.

### Case 4 – Penny Gross

Penny Gross is a local council member in the outback town of Dry Creek. Dry Creek has been severely affected by drought for many years. Penny asks you to attend a meeting of the Shire Council Water Working Group to discuss the public health impact of recycled water.

### Question 13

**At the meeting there is discussion of dual reticulation supplies. This refers to a system in which:**

A. recycled water is used to supplement drinking water
B. recycled water replaces nonrecycled water for drinking
C. two grades of water are distributed through separate pipe networks: higher quality for drinking and cooking, and lower quality for toilet flushing, garden watering and industrial use
D. two grades of water are distributed through separate pipe networks: lower quality for drinking and cooking, and higher quality for toilet flushing, garden watering and industrial use
E. two grades of water are distributed through the same pipe network for use in drinking and cooking, and for toilet flushing.

### Question 14

**The council is discussing the indirect potable reuse of recycled water. This refers to a system in which:**

A. highly treated wastewater is used to supplement drinking water supplies
B. untreated wastewater is used to supplement drinking water supplies
C. treated wastewater is introduced into a water distribution system without intervening storage in a dam or aquifer
D. recycled water is available for nondrinking use
E. rainwater is used on crops.

### Question 15

**The council is concerned regarding the health effects of indirect potable reuse. While recycled water for indirect potable reuse is considered safe, monitoring is required for which of the following potential health effects:**

A. acute infections from waterborne diseases
B. carcinogenic effects
C. heavy metals
D. hormonal and radiological effects
E. all of the above.

### Question 16

**The council is discussing how health risks of recycled water might be measured. Choose the BEST answer:**

A. assessment of notifiable diseases in a given population is adequate
B. epidemiological studies alone are used to assess risk
C. quantitative microbial risk assessment (QMRA) (including water quality monitoring and experimental studies) alone is used to assess risk
D. epidemiology provides information about water quality
E. epidemiological studies and QMRA are used to assess risk.

## ANSWERS TO NOVEMBER CLINICAL CHALLENGE

### Case 1 – Eleni Pappas

**1. Answer E**

Antiplatelet and anticoagulant therapy should not be given until Eleni has a CT scan to exclude intracerebral haemorrhage (ICH). Blood pressure (BP) management is also dependent on confirmation of diagnosis of ischaemic stroke or ICH. In the setting of ischaemic stroke BP up to 220/120 may be tolerated. If the patient is given alteplase a BP <185/110 is acceptable. In the setting of ICH MAP (mean arterial pressure = diastolic + 1/3 systolic) should be less than 130.

**2. Answer B**

There is compelling evidence that stroke units improve outcomes in patients with stroke. Key components include accurate and rapid diagnosis (of stroke, cause and risk factors), evidence based treatments, close monitoring of neurological and physiological parameters, prevention of complications and recurrent stroke, and early multidisciplinary rehabilitation.

**3. Answer A**

Aspirin 160–300 mg/day should be given within 48 hours of ischaemic stroke. In a confirmed ischaemic stroke in patients without contraindications and presenting within 3 hours of onset alteplase is a highly effective treatment.

**4. Answer C**

Eleni's clinical features suggest a partial anterior circulation infarct (PACI) on the left.

### Case 2 – Eleni Pappas continued

**5. Answer E**

A carotid endarterectomy is indicated in symptomatic high grade stenosis (>70%).

**6. Answer D**

Blood pressure medication is indicated in patients poststroke regardless of baseline BP. While the strongest evidence exists for the use of an ACEI +/- a diuretic, the choice of antihypertensive agent is less important than effective BP lowering. Greater adherence is likely if Eleni was started on secondary prevention in hospital.

**7. Answer A**

Eleni should be on an antiplatelet therapy. Aspirin is one option. Asasantin SR (aspirin + extended release dypyridimole) has been shown to be more effective for stroke prevention than aspirin, but has a common side effect of headache. Clopidogrel is modestly more effective than aspirin but much more expensive and is given when aspirin is not tolerated.

**8. Answer C**

Population data suggests that high cholesterol is associated with higher risk stroke and a lower risk of ICH. However, two large randomised controlled trials have provided evidence for the benefits of lipid lowering in all patients with stroke and TIA.

### Case 3 – Michael Graham

**9. Answer C**

Significant improvement can occur in the first 6 months poststroke and even after this. Even if Michael is significantly disabled at present, ongoing rehabilitation activity is important and a decision to cease preventive treatment is not appropriate at this stage.

**10. Answer C**

Depression, anxiety and emotionalism are common after stroke. Though evidence is lacking, pharmacological and psychological approaches are justified.

**11. Answer B**

Severe spasticity can be helped by dynamic splinting, stretch and vibration, and botulinum toxin. Blood pressure control is a secondary prevention measure.

**12. Answer E**

Incontinence is common poststroke. A nurse led functional approach can improve symptoms in many patients. Faecal loading and impaction may contribute and a rectal examination is mandatory.

### Case 4 – Skye Andrews

**13. Answer E**

Chicken pox may be complicated by transient damage to cerebral blood vessels leading to stroke. Skye does not require chicken pox vaccination if she has had the disease.

**14. Answer D**

Aspirin is indicated for 5 years due to the high risk of recurrent stroke. Antiepileptics are only indicated in the setting of seizures. LMWH or warfarin are only indicated there is evidence of a cardio-embolic source or vascular dissection.

**15. Answer B**

Traditionally it was thought that children's brains recover better than adults. However, it is now accepted that children affected by stroke may have disabling impairments which interfere with normal development and lifestyle. Long term neurological deficits occur in the majority of stroke survivors. Hand function is usually the most affected limb in children, with spasticity and dystonic hemiplegia.

**16. Answer C**

There are no randomised, secondary prevention trials in children. Treatment recommendations (including the use of aspirin) are based on consensus opinion because of a lack of evidence.

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