

CLINICAL CASES

MEDICAL- SURGICAL NURSING CASE STUDIES

Janine Bothe

MOSBY



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Janine Bothe

TABLE OF CONTENTS

About the author	viii
Case studies	
Cardiovascular 1	1
Cardiovascular 2	9
Endocrine 1	15
Endocrine 2	23
Gastrointestinal 1	32
Gastrointestinal 2	38
Haematological 1	47
Haematological 2	54
Integumentary 1	60
Integumentary 2	66
Musculoskeletal 1	75
Musculoskeletal 2	82
Neurological 1	89
Neurological 2	95
Reproductive 1	101
Reproductive 2	107
Respiratory 1	113
Respiratory 2	120
Urinary 1	127
Urinary 2	134
Visual/auditory 1	141
Visual/auditory 2	148
Answers and rationales	
Cardiovascular 1	153
Cardiovascular 2	157
Endocrine 1	161
Endocrine 2	165
Gastrointestinal 1	171
Gastrointestinal 2	175
Haematological 1	181
Haematological 2	185
Integumentary 1	189
Integumentary 2	193
Musculoskeletal 1	199
Musculoskeletal 2	203
Neurological 1	206
Neurological 2	210
Reproductive 1	214
Reproductive 2	217
Respiratory 1	221
Respiratory 2	224
Urinary 1	228
Urinary 2	231
Visual/auditory 1	235
Visual/auditory 2	238

About the author

Janine has been a nurse for more than three decades and has worked in a variety of clinical and academic settings in Australia and overseas. She has also held a number of positions including clinical nurse teacher, team leader, lecturer, manager, educator and clinical nurse consultant. Janine holds a Bachelor and Masters in Educational Studies and a Professional Doctorate in Nursing.

Janine works part time at St George Hospital & Community Health Service in Sydney as a surgical Clinical Nurse Consultant. She holds another part time role as a facilitator, researcher and educator in her consultancy service.



Case study

Cardiovascular 1

Introduction: presenting condition and symptoms

Cardiovascular disease is the leading cause of death in Australia (Australian Institute of Health and Welfare 2012) and New Zealand (New Zealand Ministry of Health: New Zealand Guidelines Group 2009). Of all of the diseases of the cardiovascular system, coronary artery disease (CAD) is the most common (Australian Institute of Health and Welfare 2012).

Rainey is a 64-year-old woman of Maori descent who has been married for 42 years and has two grown-up children. Both of Rainey's parents died when they were in their mid-60s of 'heart attacks'. Two of her four brothers have had heart attacks and have high blood pressure, and her remaining uncle has had 'two heart attacks and a stroke'. Rainey leads a sedentary life and her diet is moderately high in fat and sugar. Her body mass index (BMI) is 31 kg/m² and her waist measurement is 101 cm.

Rainey presented to her GP complaining of flu-like symptoms. The GP took her blood pressure and found that it was 160/100. He listened to her chest but found it to be clear. He did not prescribe antibiotics but wrote out a request slip for other tests to assist in further investigation of her elevated blood pressure. He asked her to return to the clinic in two days in order for the practice nurse to again check her blood pressure.

1. What non-modifiable risk factor would immediately have alerted the GP to investigate further?
 - a. Familial CAD history
 - b. Sedentary lifestyle

- c. Age group and Maori descent
 - d. Clear chest and high blood pressure
2. What pathology tests would assist in further assessing the risk of CAD?
 - a. LFTs and fasting triglyceride level
 - b. Calcium and haemoglobin
 - c. Serum cholesterol and fasting triglyceride levels
 - d. FBC and HB

Phase 1

There are some risk factors that Rainey cannot modify, such as her genetics and age. But there are some modifications she can make to her lifestyle that would reduce her risk. As the practice nurse at the GP clinic, you have been asked to educate Rainey on these modifications. Your aim is for her to reduce her risk of CAD.

Following your education session, Rainey leaves to have the rest of her investigations.

1. As the practice nurse, what lifestyle modifications would you coach Rainey in?
 - a. She should cease smoking.
 - b. She should modify her diet and increase her level of activity.
 - c. She should reduce her alcohol intake.
 - d. All of the above
2. What other investigations would the doctor order?
 - a. CXR and 24-hour urine collection
 - b. ECG and urine albumin
 - c. CT scan
 - d. Halter monitoring

Phase 2

When the GP was emailed Rainey's blood results four days later, he telephoned her and asked her and her husband to come to see him again. After reviewing the blood pressure measurement that the

practice nurse took (150/90), he took her blood pressure and again it was elevated at 165/100. Some of the results of her blood tests were as follows:

- Serum cholesterol level 7.2 mmol/L
- LDL 6.2
- HDL 0.7
- Fasting triglyceride 5.9 mmol/L

The GP reiterated that she needed to change her lifestyle. He also wrote a prescription for felodipine 5 mg daily and atorvastatin 40 mg daily. He asked her to return to see him in two weeks with a report on her progress in modifying her diet and exercise.

Rainey collected her medication from the chemist and went home with her husband. That night she took her medications before sitting in front of the television with her husband to eat a dinner of barbecued chicken with chips.

1. What do the blood results indicate?
 - a. Hypertension
 - b. Hypoglycaemia
 - c. Hyperlipidaemia
 - d. Hypocalcaemia
2. What adverse effects would the chemist have warned Rainey about when taking felodipine and atorvastatin?
 - a. Constipation, abdominal pain, nausea, headache, insomnia, muscular weakness; avoid grapefruit
 - b. Tingling, ringing in the ears, muscle and bone pain; avoid smoking
 - c. Constipation, profuse sweating, shortness of breath; avoid broccoli
 - d. Nausea, sensitivity to light, tremor, convulsions; avoid heavy lifting

Phase 3

One morning, five months later, a neighbour found Rainey lying on the lawn complaining of severe, crushing chest pain radiating to the neck and jaw. The neighbour was not sure how long she had been there and Rainey's husband was not at home. Rainey was admitted to

hospital by ambulance. At the time that Rainey was complaining of the pain she also vomited.

On admission to the emergency department the primary and secondary assessment was undertaken. During the assessment Rainey admitted to the nurse that she had been experiencing episodes of tightening in the chest followed by ear pain over the last three months. She rated the chest pain at 8/10. The nurse also used the Provokes, Quality, Radiates, Severity and Time (PQRST) method (<http://micunursing.com/pain.htm> (Nurse Bob 2010)) to further evaluate the chest pain. She confirmed that the pain was provoked by exercise, that it was a crushing feeling radiating to the neck and jaw, that it scored 9/10 at its most severe and that it lasted for more than 15 minutes.

After these assessments, the following were ordered:

- Electrocardiogram (ECG)
- Blood for serum cardiac markers
- Oxygen via mask
- Insertion of two large-bore intravenous cannulae
- Morphine 10 mg
- Aspirin 325 mg
- Anginine (400 microgram spray) 1–2 sublingual

The ECG showed ST elevation. Go to the following site and review the basics of ECGs: <http://www.clinicaljunior.com/cardiologyecg.html>.

The serum cardiac markers results showed slightly elevated creatine kinase (CK) and grossly elevated troponin I and troponin T. See <https://www.mja.com.au/journal/2003/179/2/troponin-testing-audit-three-metropolitan-hospitals>.

The ischaemia was not immediately reversed and so Rainey developed acute coronary syndrome (ACS), specifically an ST segment elevation myocardial infarction (STEMI) (Brown & Edwards 2011:874).

1. Why were morphine and aspirin ordered and by what route would they be given?
 - a. Used in conjunction, the effect of morphine is heightened by aspirin. For ACS both are given intravenously.

- b. Aspirin is given in case the patient's pain is not relived by morphine. For ACS both are given orally.
 - c. Morphine is given to relieve the chest pain while aspirin will relieve headache. Morphine is given intravenously and aspirin is given orally.
 - d. Morphine is given to relieve the acute pain and aspirin is given for its antiplatelet effect. Morphine is given intravenously and aspirin is given orally.
2. What is the main aim of treatment for somebody having an ACS?
 - a. Resting of the myocardium
 - b. Reperfusion of the myocardium
 - c. Hydration
 - d. Effective analgesia regimen

Conclusion: patient outcome

If the time of Rainey's collapse with chest pain had been known and if she were being treated in hospital within six hours of the onset of her chest pain, fibrinolytic therapy would have been administered (Brown & Edwards 2011:879–80). However, this time was not known and so fibrinolytic therapy was not considered.

Reperfusion of the myocardial tissue is paramount in a STEMI (Chew, Aroney, Aylward et al 2011). The reperfusion must take place as soon as possible after the damage to the myocardial tissue has occurred. The decision was made for the interventional cardiologist to perform an urgent PCI, specifically a coronary balloon angioplasty with the insertion of a stent. Watch this video to assist your understanding of how this procedure is done: http://www.youtube.com/watch?v=36_qHWLFzI0. Rainey's husband arrived at the emergency department and was very anxious about Rainey's condition.

Following the procedure, the nurses observed the patient at bed rest. Continuous cardiac monitoring was in place to detect any signs of further ischaemia and arrhythmias. In particular, the nurse was monitoring for further ST elevation, most effectively detected by leads III, aVL and V2 (Rolley, Salamonson, Wensley et al 2011).

The right groin puncture site was checked half-hourly for the first two hours and then hourly for four hours for any signs of bleeding,

haematoma or swelling. Limb observations were also performed each time assessing for warmth, capillary return, sensation and colour. Rainey's temperature, respiration rate, blood pressure, oxygen saturation and pain score were monitored and recorded one-hourly in order to detect any adverse change in condition, or any rupture or haemorrhage. Intravenous access was maintained in case complications arose and further fluid and/or drug intervention was required.

That evening Rainey was transferred to the medical ward for further recovery from the ACS and angioplasty. The nursing care given to Rainey over the next five days included the monitoring of any return of chest pain, her vital signs and her fluid balance status. In addition daily ECGs and blood sampling for cardiac markers and electrolytes were undertaken. Specific rest periods and gentle ambulation sessions were also scheduled and enforced. The nurses observed for any signs of anxiety and instructed Rainey and her husband on how to relax. The nurses also used many resources to educate Rainey and her husband on modifications she was to make once discharged. These included permanent modifications to her diet and temporary conservation of energy to minimise oxygen consumption. Read the nursing care plan (Brown & Edwards 2011:883–84) to gain a more in-depth knowledge of the nursing care required for patients who have had a myocardial infarct.

It takes approximately six weeks for the damaged/necrotic myocardial tissue to be replaced by scar tissue, at which time an exercise program would be established for Rainey as a cardiac rehabilitation outpatient. The rehabilitation team should be aware of any manifestations related to depression or anxiety in Rainey's thought patterns and/or behaviour. This is common in those who have experienced an ACS and requires interventions such as professional counselling strategies and consideration of medication (Heart Foundation and Cardiac Society of Australia and New Zealand 2012).

For an informative further overview of ACS, read 'Acute myocardial infarction' (Bolooki & Askari 2011).

Discussion

In 1998–99 the rate of hospitalisation in Australia due to coronary artery disease and ending in death was 47.1%. This declined to 44.3% in 2007–08. The increased use of early reperfusion treatment such as PCI, together with increased rates of transfer to specialist cardiac units and increased use of cardiac procedures, may have contributed

to this decline (Australian Institute of Health and Welfare 2011). During 2007–08 about 25% of all patients presenting to hospital with a myocardial infarct underwent a PCI (Australian Institute of Health and Welfare 2011).

Rainey's case is an example of the health trajectory of people with coronary artery disease. Further complications arise as the comorbidities of the person increase. This case demonstrates the need to assess the risk factors associated with coronary artery disease and then to educate the person on how to modify their lifestyle to reduce those risk factors.

Factors such as age, gender, ethnicity, family history and genetics cannot be changed. However, enormous benefits can be gained by reducing the modifiable risk factors of smoking, nutrition, alcohol and physical activity (SNAP) (Heart Foundation and Cardiac Society of Australia and New Zealand 2012) .

The cost to society, both financial and in terms of deaths due to coronary artery disease, would be greatly reduced if attention were paid to lifestyle changes to reduce risk.

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