

Mastering your Fellowship

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Abstract

The series, "Mastering your Fellowship", provides examples of the question format encountered in the written examination, Part A of the FCFP (SA) examination. The series is aimed at helping family medicine registrars prepare for this examination. Model answers are available online.

Keywords: FCFP (SA) examination, family medicine registrars

This section in the South African Family Practice journal is aimed at helping registrars prepare for the Fellowship of the College of Family Physicians (SA) Part A examination and will provide examples of the question formats encountered in the written examination: Multiple Choice Question (MCQ) and/or Extended Matching Question (EMQ), Modified Essay Question (MEQ) and the Critical Reading paper (Evidence based medicine). Each of these question types is presented according to a theme. The MCQs will be based on the ten clinical domains of family medicine, the MEQs will be aligned with the five national unit standards and the critical reading section will include evidence based medicine and primary care research methods. We suggest that you attempt to answer the questions (by yourself or with peers/tutors) before finding the model answers online: <http://www.safpj.co.za/>.

Please visit the Colleges of Medicine website for guidelines on the Fellowship examination: http://www.collegemedsa.ac.za/view_exam.aspx?examid=102

We are keen to hear about how this series is assisting registrars and their supervisors in preparing for the FCFP (SA) examination. Please email us your feedback and suggestions.

1. MCQ: anaesthesia

A 24-year-old woman at term needs an elective caesarean section. She has no medical problems, but the spinal anaesthetic fails despite numerous attempts. The doctor administering the anaesthetic decides to proceed with general anaesthesia, but fails to intubate the patient after giving the induction agent and the muscle relaxant. He starts to ventilate the patient with a bag-valve mask (BVM) while requesting help but notices that the monitor displays an oxygen saturation of 85%.

The next most appropriate step in the management of this patient is:

- Continue providing BVM ventilation and wake the patient up.
- Insert a laryngeal mask airway (LMA).
- Perform a cricothyroidotomy.
- Perform a jaw-thrust manoeuvre and insert an oropharyngeal airway.

E. Reposition the patient and attempt to intubate a second time.

2. MEQ: the family physician's role as care provider

You are the family physician working in a metropolitan community health centre. Your next patient enters the consultation room: a 36-year-old isiXhosa-speaking female who works as a shift manager at a nearby supermarket. She complains of a few weeks' history of headache and non-specific leg pains. She has no chronic illnesses. She is in a relationship, but her partner started working in a new position in a different province 3 months ago. Her 6-year-old daughter is attending a nearby school. She has missed a few days of work due to her symptoms and has requested a sick leave note. Her physical examination reveals a BMI of 33 kg/m², blood pressure of 140/80 mmHg, pulse rate of 85 per minute and blood glucose test of 4.8 mmol/l. You notice from her clinical record that she presented three times in the past month with the same symptoms. According to the notes, the primary care colleagues excluded tension-type headache, mental disorders and substance abuse. It appears that no clear diagnosis was evident during these previous consultations.

Please answer the following questions regarding this patient scenario.

- Which aspects of the patient's story would you like to enquire about? [6]
- What is the likely diagnosis of your patient? [1]
- Describe the pharmacological and nonpharmacological management options for your patient. [9]

3. Critical appraisal of research

Please answer the following questions.

3.1 Refer to the linked article and write a critical appraisal by referring to the rationale for the study, its validity, and its generalisability. [10]

Harnden A, Brueggemann A, Shepperd S, White J, Hayward AC, Zambon M, Crook D, Mant D. Near patient testing for influenza in children in primary care: comparison with laboratory test. *BMJ*.

2003 Mar 1;326(7387):480. Available online from URL: <http://www.bmj.com/content/326/7387/480> (Accessed 8 April 2016)

3.2 Use the data in the article (see 3.1) to answer the following questions:

- 3.2.1 What do you understand by the terms ‘sensitivity’ and ‘specificity’ in relation to this study? [2]
- 3.2.2 Refer to the 2x2 table to calculate the positive predictive value (PPV) of the near patient test (NPT), and explain what this means in plain English. [1]
- 3.2.3 What is the main factor which influences the PPV? [1]
- 3.2.4 Define and calculate the false positive rate (FPR) and the false negative rate (FNR). [4]
- 3.2.5 Calculate the likelihood ratio positive (LR+). [1]
- 3.2.6 Explain the meaning of the LR+ value for a positive NPT result. [1]

3.3 Please refer to the forest plot below (Figure 1) and write a brief appraisal and summary of the evidence provided by the meta-analysis below of the effect on asthma symptoms of RCTs for reducing house dust mite using different methods.[5]

Gøtzsche PC, Hammarquist C, Burr M. House dust mite control measures in the management of asthma: meta-analysis. *BMJ*. 1998 Oct 24;317(7166):1105-10. Available from URL: <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC28691/> (Accessed 8 April 2016).

Model answers to questions

Question 1

Short answer:

E

Long answer:

The failed intubation in obstetrics is the most common cause of maternal death due to general anaesthesia in South Africa. When evaluating a patient preoperatively, it is essential that the patient’s airway is assessed so that, if a difficult airway is identified, the option for referral to a regional facility exists. It is essential that the patient be ventilated adequately because it is failure to ventilate (oxygenate) the patient that leads to death or disability. A woman undergoes many physiological changes in pregnancy and the anatomy and physiology of the airway is altered resulting in the airway being always considered a difficult intubation option in pregnancy. The incidence of failed or difficult intubation is considered to be in the region of 1:250 to 1:300 although no recent data exists from South Africa. The response to a failed initial intubation is to maintain cricoid pressure on the trachea and continue ventilating the patient with a bag-valve mask (BVM) whilst requesting assistance. The depicted flowchart (Figure 2) needs to be followed when managing a patient whom you are unable to ventilate with a BVM.

Manipulating the head and shoulders to optimise visualisation of the airway is the next step that needs to be considered in this scenario, preferably with a senior who has anaesthetic skills. South African guidelines make recommendations on equipment

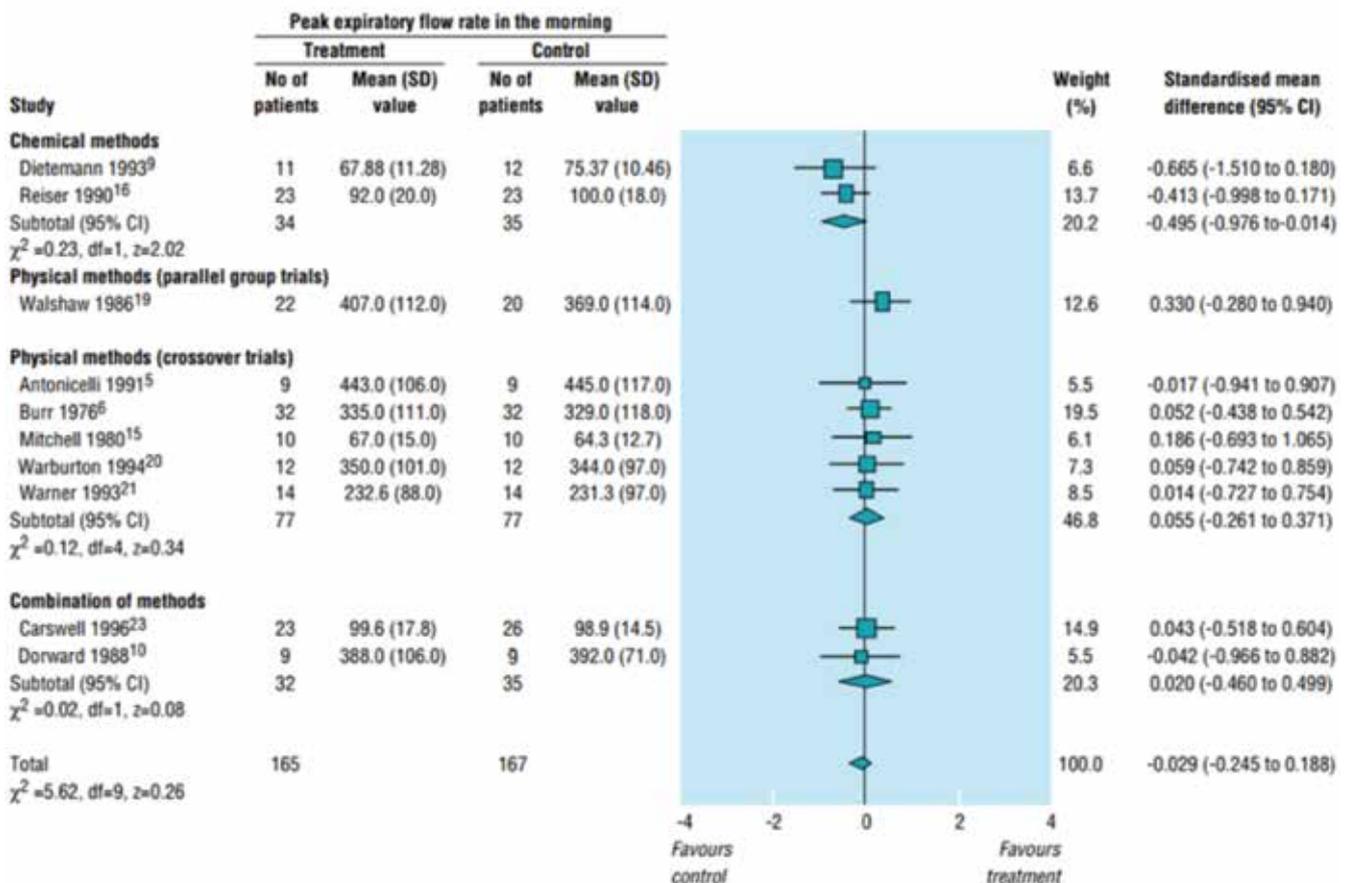


Figure 1: Standardised mean difference (95% confidence interval) of peak expiratory flow rate in the morning after the use of either chemical or physical methods to reduce exposure to house dust mites

needed for a difficult intubation trolley, and specific mention is made of district hospitals providing anaesthetic services. In addition, when attempting the second intubation, it is always useful to have a bougie (also called 'gum elastic bougie') available to facilitate endotracheal intubation. The flowchart lists the steps one then follows, if the second attempt at intubation fails.

Further reading:

- National Committee on Confidential Enquiries into Maternal Deaths in South Africa. Saving Mothers: Caesarean Section Monograph 2013. National Department of Health. Pretoria 2013 [cited 26 April 2016]. Available from: <http://www.hst.org.za/publications/saving-mothers-caesarean-section-monograph-2013>.
- Bishop D. Obstetric airway management. Southern African Journal of Anaesthesia and Analgesia. 2015;21(1):40-2.
- Hodgson R, Milner A, Barrett D, Alberts A, Joubert I, Hold A. Airway Management Resources in Operating Theatres Recommendations for South African hospitals and clinics. Southern African Journal of Anaesthesia and Analgesia. 2008;14(3):1-10.

Question 2

Model answers:

2.1 Which aspects of the patient's story would you like to enquire about? [6]

- Focus on the biological and psychological aspects from the start. [1]

- Encourage the patient to tell her story (ideas, fears, expectations). [1]
- Explore the patient's context (including her income, household members and a genogram depicting important relationships in her life). [1]
- Consider the red flag symptoms for headache and leg pains. [1]
- Screen for mental health conditions, including substance abuse. [1]
- Demonstrate your empathy with the patient, by acknowledging the distressing nature of her symptoms. [1]

2.2 What is the likely diagnosis of your patient? [1]

- Medically unexplained symptoms (MUS) or medically unexplained physical symptoms (MUPS): symptoms that remain unexplained after medical assessment. [1]
- Also called: psychosomatic or functional symptoms, as well as nomenclature on somatic symptom disorders from the Diagnostic and Statistical Manual of Mental Disorders, 5th Edition (DSM-5): somatisation/somatoform disorder, conversion disorder and pain disorder. The ICD-10 describes a number of subgroups of somatisation syndrome (International Statistical Classification of Diseases and Related Health Problems, 10th Edition).

2.3 Describe the pharmacological and nonpharmacological management options for your patient [9]

- Pharmacological: generally, one must be careful with prescribing medication in MUS, as the side-effects (such as medication overuse headache and those associated with psycho-active drugs) and costs of medication may outweigh the perceived benefit. [1] Those patients whose

Call for help
Maintain cricoid pressure

Able to mask ventilate ?

1. 100% O₂, mask ventilate
2. Optimise position - sniffing, wedge under right hip, pillow under head and shoulders
3. Change type or size of blade
4. Ask assistant to externally manipulate cricoid cartilage
5. Try again (once more only)

Still can't intubate ?

6. Jaw thrust, oropharyngeal airway
7. Insert LMA
8. Decide whether to continue with the procedure, or wake patient up and refer

Unable to mask ventilate ?

1. Insert LMA
- Still can't ventilate ?**
2. Surgical airway
3. Ventilate patient
4. Decide whether to continue with the procedure, or wake patient up and refer

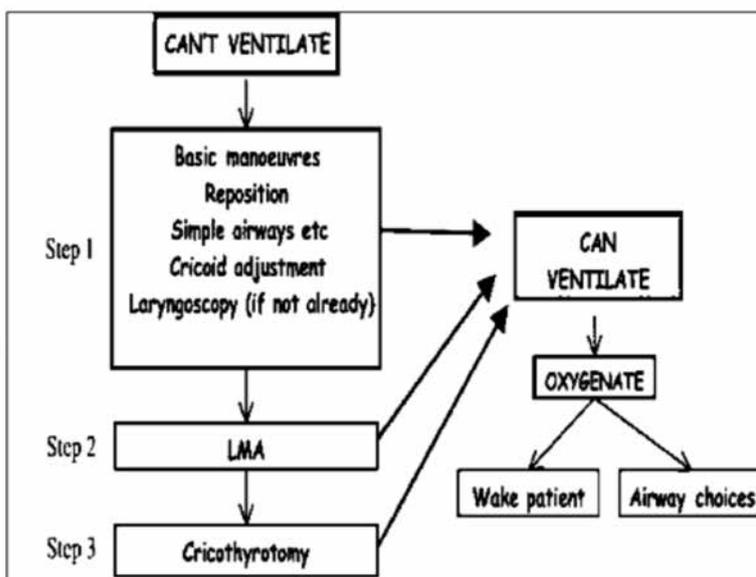


Figure 2: Flow diagram of immediate management if patient airway and mask ventilation cannot be achieved.

symptoms of MUS are associated with major depressive disorder have been shown to benefit from the use of antidepressants. [1]

- › Relevant reading (not part of model answer):
 - » A 2014 Cochrane review found very low-quality evidence for new-generation antidepressants, e.g. selective serotonin reuptake inhibitors (SSRIs), and low-quality evidence for natural products being effective in treating somatoform symptoms in adults when compared with placebo. These results had serious shortcomings such as the high risk of bias, strong heterogeneity in the data, and small sample sizes. The authors recommended further research.
- Nonpharmacological:
 - › The focus should be on developing a therapeutic, patient-centred relationship [1], as both doctor and patient will benefit from a stronger relationship.
 - › Doctors, especially those still in training, feel challenged and even frustrated when dealing with patients who experience MUS. However, unit standard 5.2 of the agreed unit standards and learning outcomes for South African family physicians encourages us to demonstrate professional values in interpersonal relationships and personal behaviour.
 - › Apply appropriate communication and consulting techniques [1] by listening attentively, validating concerns, exploring cues about psychological concerns and responding to emotions. When a patient gives an emotional cue or expresses an emotion directly, the doctor should ‘NURSe’ the emotion: Name it, Understand it, Respect it and Support it. Avoid too much reassurance or normalisation (“there is nothing wrong with you, as all the test results are normal”) – this has been shown to be ineffective and may even exacerbate symptoms.
 - › A careful assessment [1] by itself can have therapeutic effects and can lead to a change in patient beliefs about their illness.
 - » The PPP model is recommended, as it encourages the doctor to consider three types of factors that may initiate or maintain the process of MUS:
 - » Predisposing factors (such as chronic childhood illnesses, childhood maltreatment, chronic social stress and low social support)
 - » Precipitating factors (such as psychiatric disorder, social, fiscal, or occupational stress, changes in social support and change in routine)
 - » Perpetuating factors (such as decreased activity and weight gain, social isolation and decreased self-confidence)
 - › No single approach will suit all patients who experience MUS in primary care. The management plan should be tailored to the patient and should respect their biopsychosocial needs. [1]
 - › Reattribution, a form of cognitive behavioural therapy (CBT), is a patient-centred, structured intervention designed to provide patients with an explanation

that links their physical symptoms to psychosocial issues. [1]

- › A primary goal is to alter unhelpful patient attributions for symptoms and to broaden patient attributions. This form of CBT is supported by a Cochrane review (2014). Reattribution training has been viewed favourably by United Kingdom (UK) general practitioners (GPs). However, GPs trained in reattribution still find patients presenting with MUS complicated and resistant to change. Reattribution has four stages:
 1. enabling the patient to feel understood
 2. broadening the agenda of the person, and doctor, beyond physical symptoms
 3. making the link between physical symptoms and psychosocial issues
 4. negotiating further treatment.
- › Other psychological interventions [1], such as mindfulness and meditation, group therapy and brief dynamic psychotherapy may also be considered. Some of these interventions may be performed by family physicians with additional training. Referral to a mental health worker (psychologist, mental health nurse) in the local healthcare team will be appropriate.
- › Collaborative care within the healthcare team [1]: care should be characterised by health workers sharing the diagnostic and therapeutic agenda with each other, the patient and the family. It is very important to consider the impact of the patient’s MUS on his/her family.
- › The doctor should remain aware of his/her internal environment, as these consultations will challenge the traditional biomedical approach to assessment and treatment. Take the time to develop your competence and reflect on each encounter. Involve a peer or mentor to help encourage new perspectives. [1]

Further reading:

- Schweitzer BE. Medically unexplained symptoms. *Continuing Medical Education*. 2008 Jan 31;24(8):441.
- Rosendal M, Blankenstein N, Morriss R, Fink P, Sharpe M, Burton C. Enhanced care by generalists for functional somatic symptoms and disorders in primary care, a Cochrane systematic review. *Journal of Psychosomatic Research*. 2015 Jan 6;78(6):621.
- van Dessel N, den Boeft M, van der Wouden JC, Kleinstäuber M, Leone SS, Terluin B, Numans ME, van der Horst HE, van Marwijk H. Non-pharmacological interventions for somatoform disorders and medically unexplained physical symptoms (MUPS) in adults. *Cochrane Database of Systematic Reviews* 2014, Issue 11. Art. No.: CD011142. DOI:10.1002/14651858.CD011142.pub2.
- Kleinstäuber M, Witthöft M, Steffanowski A, van Marwijk H, Hiller W, Lambert MJ. Pharmacological interventions for somatoform disorders in adults. *Cochrane Database Syst Rev*. 2014 Jan 1;11.

- Cohen A. Not yet explained symptoms. Mental health in family medicine. 2010 Dec;7(4):189.
- Edwards TM, Stern A, Clarke DD, Ivbijaro G, Kasney LM. The treatment of patients with medically unexplained symptoms in primary care: a review of the literature. Mental health in family medicine. 2010 Dec 1;7(4):209.

Question 3

Model answers:

3.1 Refer to the linked article and write a critical appraisal by referring to the rationale for the study, its validity, and its generalisability. [10]

The purpose of the study is clear ("We compared a near patient influenza test in children in primary care with laboratory based reverse transcription polymerase chain reaction (RT-PCR) testing of nasopharyngeal aspirates") [1] and motivated by the importance of influenza as a cause of acute respiratory illness (ARI) in young children [1], and the need for a quick and accurate test to minimise unnecessary antibiotic prescribing due to common misdiagnosis of the signs and symptoms [1].

The near patient test was compared to a suitable reference standard (RT-PCR) [1] in all children from 40 GP practices in Oxfordshire [1]. The children were enrolled on the basis of whether the GPs thought they had more than a simple cold, which a non-specific but pragmatic criterion for this is setting [1]. We do not know how many eligible candidates refused participation and we only know the sex and ages of the children so it is not clear how representative they are of the spectrum of patients seen in usual practice [1]. The non-specific eligibility criteria would not have restricted participation though, which does enhance the study's generalisability [1]. A strength of the study is that all children received both tests [1], and the laboratory staff assessing the RT-PCR were blind to the results of the near patient test (NPT) [1].

3.2 Use the data in the article (see 3.1) to answer the following questions:

3.2.1 What do you understand by the terms 'sensitivity' and 'specificity' in relation to this study? [2]

Sensitivity: (Positivity in Disease) or in Bayesian terms – the $P[T+|D+]$ which refers to the probability of a Positive Test result $P[T+]$, given $[D+]$, Disease $[D+]$. The proportion of those with influenza, as measured by the RT-PCR reference standard, who are positive by the near patient test being studied. [1]

Specificity: (Negativity in Non-disease) or in Bayesian terms – the $P[T-|D-]$ which refers to the probability of a Negative Test result $P[T-]$, given $[D-]$, No Disease $[D-]$. The proportion of those without influenza, as measured by the RT-PCR reference standard, who are negative by the near patient test being studied. [1]

3.2.2 Refer to the 2x2 table to calculate the positive predictive value (PPV) of the near patient test (NPT), and explain what this means in plain English. [1]

$PPV = 27/30 = 90\%$; of 30 children with a positive NPT, 90% have influenza according to the RT-PCR reference. [1]

3.2.3 What is the main factor which influences the PPV? [1]

The prevalence of the underlying disorder. The higher the prevalence, the higher the PPV. The PPV drops significantly, if the prevalence decreases. [1]

3.2.4 Define and calculate the false positive rate (FPR) and the false negative rate (FNR). [4]

The false positive rate (FPR) refers to the proportion of patients with a positive test result who do not have the disease and will be falsely alarmed by a positive test result. (It refers to the complement of the Positive Predictive Value (PPV)). [1]

$$FPR = 1 - PPV = 100\% - 90\% = 10\% [1]$$

The false negative rate (FNR) refers to the proportion of patients with a negative test who have the disease and will be falsely reassured if the test result is negative. (It refers to the complement of the Negative Predictive Value (NPV)). [1]

$$FNR = 1 - NPV = 100\% - 73\% = 27\% [1]$$

3.2.5 Calculate the likelihood ratio positive (LR+). [1]

$$\text{Sensitivity}/1 - \text{specificity} = 44/100 - 97 = 44/3 = 14.2 [1]$$

3.2.6 Explain the meaning of the LR+ value for a positive NPT result. [1]

Children with a positive NPT are 14.2 times more likely to have influenza on the RT-PCR than children with a negative NPT. [1]

3.3 Please refer to the forest plot below and write a brief appraisal and summary of the evidence provided by the meta-analysis below of the effect on asthma symptoms of RCTs for reducing house dust mite using different methods.[5]

Studies are all RCTs [1], but they are old [1] small in size [1], and use heterogeneous methods and designs [1]

No overall effect is demonstrated [1] and no effect of physical methods or combination methods; however, meta-analysis of chemical methods significantly favours control [1], although only two studies were included.

Further reading:

- Pather M. Chapter 13: Continuing professional development. In: Mash B, editor. Handbook of Family Medicine. 3rd ed. Cape Town: Oxford University Press Southern Africa; 2011: p. 406-429.
- Studying a Study and testing a test. How to read the medical evidence. Fifth Edition. Richard K. Riegelman. Lippincott Williams & Wilkins 2005.
- Resources. Centre for Evidenced Based Health Care [homepage on the Internet]. c2015. Available from URL: <http://www.cebh.co.za/teaching-resources/>
- The Annals Journal Club of the journal, Annals of Family Medicine, encourages its readership to take a RADICAL approach to reading articles. RADICAL stands for Read, Ask, Discuss, Inquire, Collaborate, Act and Learn. See information available at URL: <http://www.annfam.org/site/AJC/> (accessed 8 April 2016).

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