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REGISTRARS

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 to prepare for this examination. Examples of these question types are presented according to a theme. The theme for this edition is infectious diseases. Model answers are available online.

Keywords: FCFP(SA) examination, family medicine registrars, infectious diseases

Introduction

This section in the *South African Family Practice* journal is aimed at helping registrars prepare for the FCFP(SA) Part A examination (Fellowship of the College of Family Physicians), and provides examples of the question format encountered in the written examination: Multiple Choice Question (MCQ), Modified Essay Question (MEQ) and critical reading paper (evidence-based medicine). Each of the question types are presented according to a theme. The themes for the MCQs are based on the 10 clinical domains of Family Medicine. The MEQs centre on the six family physician roles. The critical reading section includes evidence-based medicine and primary care research methods.

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

This edition's theme is infectious diseases, i.e. human immunodeficiency virus (HIV), acquired immune deficiency syndrome, tuberculosis and sexually transmitted infections.

1. MCQ (multiple-choice questions): infectious diseases

A 27-year-old man was diagnosed with pulmonary tuberculosis [GeneXpert® Mycobacterium tuberculosis (MTB) assay positive], and started on standard tuberculosis treatment six weeks ago. He was commenced on antiretroviral (ARV) drugs (a fixed-dose combination), comprising efavirenz (EFV), tenofovir disoproxil fumarate (TDF) and emtricitabine (FTC), four weeks ago. He now presents to the emergency room with vomiting and abdominal pain. He is alert, and his liver function tests show an alanine transaminase (ALT) of 135 IU/l and total bilirubin of 35 µmol/l. His blood glucose is 5.6 mmol/l, with an international normalised ration (INR) of 1.1. The next most appropriate step in his management is to:

A	Continue with tuberculosis treatment, and monitor his liver function tests
B	Stop his tuberculosis treatment, but continue with the fixed-dose combination
C	Stop the tuberculosis treatment, fixed-dose combination and co-trimoxazole
D	Stop the tuberculosis treatment, fixed-dose combination and co-trimoxazole, but continue with the tenofovir and emtricitabine
E	Substitute his standard tuberculosis treatment for ethambutol, streptomycin and moxifloxacin

2. MEQ (modified essay question): the family physician's role in clinical governance

You are chairing the morbidity and morality (M&M) meeting of your district hospital. One of the medical officers is presenting the previous month's admission statistics for the children's ward, using the monthly tally sheet report generated by the Child Healthcare Problem Identification Programme (Child PIP) software. Further investigation of the admission diagnoses reveals an increased incidence of children diagnosed with tuberculosis (both pulmonary and extrapulmonary sites of infection). Two deaths were audited and underlying malnutrition was reported in both.

2.1 Briefly discuss the aim of a morbidity and mortality meeting.

2.2 Discuss the planning of a morbidity and mortality meeting, with specific reference to identification of the participants and preparation of the cases for discussion.

2.3 Discuss the steps that should be followed during the morbidity and mortality meeting meeting with regard to developing a plan of action to address the increase in paediatric tuberculosis cases in your subdistrict. Also discuss a method with which to identify underlying health system issues which may have resulted in this problem in your subdistrict.

3. Critical appraisal of research

Answer the following questions on the methods used in the linked article:

Chabikuli ON, Gwarzo U, Olufunso A, et al. Closing the prevention of mother-to-child transmission gap in Nigeria: an evaluation of service improvement intervention in Nigeria. S Afr Fam Pract. 2013;55(1):96-102. Taylor & Francis [homepage on the Internet]. c2015. Available from: http://dx.doi.org/10.1080/20786204.2013.10874310

3.1 Discuss the rationale behind the following statement: "To be most beneficial and instrumental, evaluations should be conducted at all phases of the life of a programme." Which phase of programme evaluation is described in the article?

3.2 Describe the method of deciding upon an appropriate study design for programme evaluation in relation to this study.

3.3 Describe the selection of indicators, i.e. input, activities and outcomes, for programme evaluation in relation to this study.

Model answers to the questions

Question 1

Short answer: Option D.

Long answer: The consensus statement published by the South African Clinicians Society refers. The patient should first be recognised as having severe drug-induced liver injury (DILI) because he is symptomatic and has an ALT > 120 IU/l, despite not being in liver failure. Standard tuberculosis drugs, such as isoniazid, rifampicin and pyrazinamide, are all potentially hepatotoxic. In addition, co-trimoxazole, which is started as routine prophylaxis in patients diagnosed with tuberculosis, is also hepatotoxic, as is EFV (the nonnucleoside reverse transcriptase inhibitor component of the fixed-dose combination). Owing to the long half-life of EFV, the patient should continue with TDF and FTC for a further 5-7 days to preserve antiretroviral treatment options for this patient. If the patient was experiencing liver failure, all of the drugs would need to be stopped immediately. After instituting the cessation of drug treatment, as outlined previously, the clinician should start the patient on ethambutol, streptomycin and moxifloxacin, as this is a liver-friendly regimen. Once the ALT has dropped to below 100 IU/l, the bilirubin is normal and the patient is clinically well, the clinician may initiate treatment by introducing one drug (usually rifampicin) at a time, and monitoring the liver function tests.

Practice points are as follows:

- The diagnosis (severe drug-induced liver injury) was not given in this case, and needed to have been formulated by the student.
- The assessment covered the application of knowledge, rather than factual recall.
- Notice the homogeneity in the options, which all deal with drug management, and do not differentiate between treatment and investigations.
- As the patient was GeneXpert® MTB/RIF positive, alternative liver-friendly tuberculosis treatment would have to be continued. In the event of a doubtful diagnosis, the diagnosis should be reconsidered.
- EFV, like nevirapine, is hepatotoxic, and has a low potential for resistance developing. This compromises further options, but needs to be considered in the context of this scenario.

Further reading:

- Jong E, Conradie F, Berhanu R, et al. Consensus statement: management of drug-induced liver injury in HIV-positive patients treated for TB: guideline. Southern African Journal of HIV Medicine. 2013;14(3):113-119.

Some simple guidelines for answering the MCQ items in the FCFP(SA) Final Paper 1 follow:

- Block out the options with your hand or piece of paper, then read the question carefully, ensuring that you pay attention to detail, and that you understand the "vignette being painted".
- Read the lead in, and attempt to answer the question without looking at the options.
- Look at the options, and see if your answer correlates with a given option. Choose this option, and move onto the next question.
- If you do not know the answer, work through the options by eliminating the least likely options first.

Question 2

2.1 A number of the agreed roles of the family physician apply to this scenario: consultant, leader of clinical governance, champion of community-orientated primary care and capacity-builder. The family physician should use his or her position as a consultant to build capability in the clinical team by guiding colleagues towards an improvement in quality of care (central to ensuring clinical governance). The ethos of person-centred teaching is also central to this approach.

The aim of the morbidity and mortality meeting is to provide an open forum for dialogue between members of the multidisciplinary team. The clinical cases and facility statistics provide opportunities to issues to be identified in the health system, which could form the basis of quality improvement initiatives. Members of the morbidity and mortality meeting include clinical staff, clinical managers, and often an impartial guest from outside the facility, such as the visiting specialist from the referral hospital, or the family physician who has been appointed to the district. The chairperson should be a clinician of suitable seniority, and could be the family medicine registrar pursuing a workplace-based learning opportunity. An open discussion should be facilitated, in which learning experiences can be shared in a safe and blame-free environment.

2.2 It helps to plan the format and participants for the morbidity and mortality meeting. Morbidity and mortality meeting cases should be identified beforehand by the chairperson or his or her delegate. This allows for completion of a standardised presentation template, comprising the reason for the presentation, the clinical diagnosis and management plan, analysis of the issues (clinical care, systems and processes, patient-related factors and community-related factors), a review of the available evidence or guidelines, and possible medico-legal pitfalls. Planning ahead may also clarify which members of the healthcare team should be invited. In the present case of a community paediatric problem that relates to tuberculosis, the following members could be invited: subdistrict and district managers with infectious disease and child health programme portfolios, the regional hospital's paediatrician responsible for community paediatrics in the drainage area, the primary healthcare manager in the subdistrict, primary healthcare facility staff, community health workers, ward-based outreach teams and community members, such as ward councillors. Aim for a balance between representation and practical problem solving, by ensuring that the number of attendees is justified and manageable. It should be an inclusive process, during which gaps and solutions can be identified.

2.3 The following steps may apply to the plan of action, aimed at addressing the increase in paediatric tuberculosis incidence in your subdistrict:

- A discussion of individual cases of children admitted with tuberculosis. These cases should be identified before the meeting, and include available data, such as the results of investigations, the notification procedure that was followed, the primary health care and community care received, and family and contextual information. The data of each child death should be captured on the Child Death Data Capture Sheet, and codes for cause of death and modifiable factors should be assigned using the Child PIP programme (see Table 1).
- During analysis of the issues stage of the discussion, various tools or methods may be used to "unpack" the issue, also called significant event analysis. Three methods or tools are described here for the sake of completeness. Choose one method when answering the question.

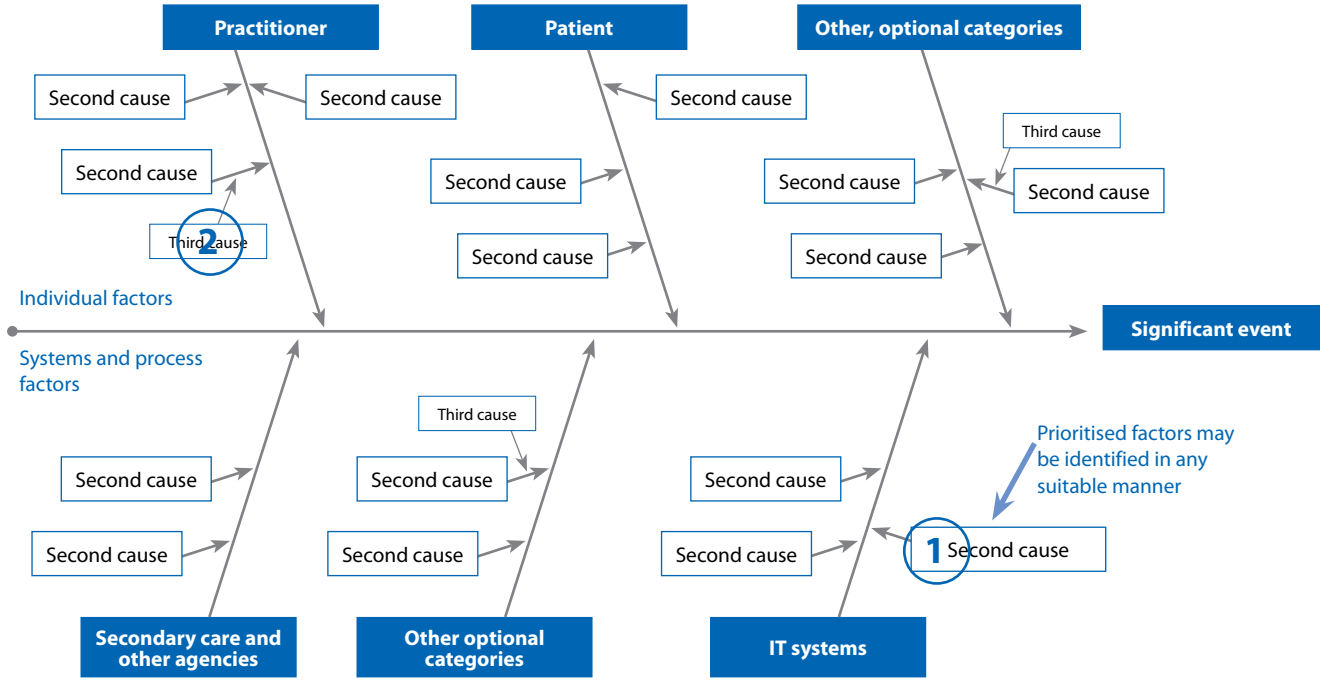
  All three methods allude to the World Health Organization (WHO) health system building blocks of leadership and governance (including policies), the health financing system, health workforce, health information system, health services used to deliver health interventions, and equitable access to essential medical products, vaccines and technologies:

  The Child PIP: The Child PIP is a mortality audit tool, similar in concept to the Perinatal Problem Identification Program, but designed specifically for infants and children (from birth up to 18 years). The Child PIP programme aims to use the information gathered from a careful mortality review to improve the quality of care which sick children receive in the health system. Each in-hospital child death (admissions, emergency centre and wards) is audited using the software, and modifiable factors are identified (facility or system factors compared to community or caregiver factors). This programme is used increasingly across all of the provinces of South Africa. The Child PIP system of categorising modifiable factors, when auditing a death, is displayed in Table 1. The Child Death Data Capture Sheet should be completed within 24 hours. All possible caregivers and health workers involved in the care of this child must be interviewed.

  The fishbone method: The fishbone method is a graphic illustration of the relationship between an incident and its potential causes, and aims to identify, explore, sort, display

Table 1: Categorising modifiable factors when auditing a death using the Child Healthcare Problem Identification Programme

Where they occur	**Who is responsible**		
	Clinical personnel	**Administrators**	**Family or caregiver**
Ward	• Clinical methods • Assessment • Management • Monitoring	• Infrastructure • Staff • Consumables	• Growth and development • Disease prevention • Home treatment • Care seeking and compliance
Emergency and admission	• Clinical methods • Assessment • Mangement • Monitoring	• Infrastructure • Staff • Consumables	• Growth and development • Disease prevention • Home treatment • Care seeking and compliance
Referring facility and transit	• Pre-transit care in a referring facility • In-transit care	• Pre-transit care in a referring facility • In-transit care	• Growth and development • Disease prevention • Home treatment • Care seeking and compliance
Clinic and outpatient care	• Clinical methods • Assessment • Management • Monitoring	• Infrastructure • Staff • Consumables	• Growth and development • Disease prevention • Home treatment • Care seeking and compliance
Home	• Promotion • Prevention • Social support	• Transport • Community development	• Growth and development • Disease prevention • Home treatment • Care seeking and compliance



IT: information technology

Figure 1: Approach to analysing the fishbone diagram

and analyse factors or underlying problems. It resembles the skeleton of a fish: see Figure 1.

Step 1: Place the identified incident in a box on one side of a page in the "head" of the fish. Draw the backbone of the fish as a horizontal line from this box across the page.

Step 2: Identify and label the primary causal factors (categories), each represented as a "rib". Any number and type or pre-existing categories may be used.

Step 3: Identify secondary and further level causes, indicated by smaller "bones" linked to each other and the ribs. Individual and group brainstorming may increase detected causes.

Step 4: Analyse the diagram and attempt to prioritise the causes (Figure 1).

The five "why" method: The five "whys" method starts with a clearly defined incident, and attempts to uncover a main cause by sequentially asking the question: "Why?" By convention, the question is asked five times, but there is no maximum or minimum. As "Why?" is continually asked, the peeling away of causal layers should be visualised until the underlying processes are identified.

- The results of the significant event analysis should be discussed during the morbidity and mortality meeting. The analysis and audit of the two deaths, and increase in paediatric tuberculosis cases, should be seen in the context of the subdistrict health system and the defined community served by this health system.

  Examples of potential problems identified during this morbidity and mortality meeting review process, include:

  Health workforce issues: Primary care staff not trained in the WHO Integrated Management of Childhood Illness strategy or the national tuberculosis management guidelines (2014).

  Health information system: The subdistrict notification process of new adult tuberculosis patients is not able to ensure that primary care staff and community care workers conduct contact tracing and screening. This may result in exposed children under the age of five years not receiving isoniazid preventive therapy.

  Access to medical technologies and vaccines: The availability of the bacille Calmette-Guérin vaccination, with special attention being given to appropriate storage and distribution to ensure that the vaccines remain viable.

- An effective multidisciplinary team approach is recommended for the management of the identified issues. Think about the other members of the team, as well as community members and organisations which should be involved.
- Reports (minutes) and attendance registers must be kept at facility level for each morbidity and mortality meeting meeting that is held. These reports should highlight the identified issues and planned action, i.e. training of staff, implementation of the guidelines and a review of the notification of communicable diseases. These reports should be reviewed monthly by the facility and/or subdistrict and/or district management teams to ensure that the decisions are implemented. These reports may also be required for audits, such as the National Core Standards audit of the Office of Health Standards Compliance.

Further reading:

- Viljoen W. How to organise and run morbidity and mortality meetings. In: Mash B, Blitz J, editors. South African Family

Practice manual. 3rd ed. Cape Town: Van Schaik, 2015; p. 570-571.

- The Child Healthcare Problem Identification Programme [homepage on the Internet]. c2015. Available from: http://www.childpip.org.za/
- Enhanced significant event analysis [homepage on the Internet]. NHS Education for Scotland. [homepage on the Internet]. c2015. Available from: http://www.nes.scot.nhs.uk/education-and-training/by-theme-initiative/patient-safety-and-clinical-skills/enhanced-significant-event-analysis.aspx
- Chabikuli N, Fehrsen S, Hugo J. Organisational and management principles. In: Mash B, editor. Handbook of family medicine. 3rd ed. Cape Town: Oxford University Press, Southern Africa, 2011; p. 333-363.

Question 3

3.1 Family physicians should be aware of the role that programme evaluation is playing within the district health system. The term "programme evaluation" includes evaluations of all health-related interventions, processes and services, such as community mobilisation and communication campaigns, laboratory diagnostic services, training and education, direct service interventions, policy processes, surveillance systems and infrastructure programmes.

The rationale of the statement is justifiable: "To be most beneficial and instrumental, evaluations should be conducted at all phases of the life of a programme." Traditionally, evaluations were conducted at the end of the programme. Often, this meant that planning and implementation problems were not detected and corrected in time. Evaluations are meant to be action oriented, and should inform judgement on whether a proposed programme should be started, how well an existing programme is functioning, or whether or not an established programme is achieving the desired effect. Four types of evaluations are described according to the stage of the programme, namely developmental evaluation, process or performance evaluation, outcome or impact evaluation, and a comprehensive evaluation which examines all of the stages. The choice of evaluation type also influences the study design of the evaluation.

The researchers conducted a comprehensive evaluation of a service improvement intervention aimed at improving the uptake of the prevention of mother-to-child transmission (PMTCT) of HIV services at selected sites in Nigeria in this paper.

3.2 The evaluation question determines the selection of the study design to be used for the evaluation. The researchers engaged the stakeholders in identifying the root causes of barriers and enablers to the improved uptake of PMTCT of HIV services. The service improvement process began with a cause-and-effect analysis, based on a fishbone diagram. Eleven service providers and nine programme managers were involved in the analysis. Service improvement teams were established in the healthcare facilities to act on the three identified problems. They met with community and religious leaders to advocate antenatal service utilisation to address low attendance, they introduced rapid HIV tests at all the antenatal clinics to improve HIV counselling and testing, and they increased the frequency of support supervision to increase the number of HIV-positive women receiving antiretroviral drug prophylaxis.

This paper reports on a pre- and post-intervention study design to evaluate the intervention. When considering an appropriate study design to address evaluation, two considerations apply, i.e. firstly, the stage of the programme, and secondly, the inferences to be made by the evaluation.

In this study, the programme was evaluated as a whole. Suitable questions should include whether or not services are available and accessible, of a suitable standard or quality, and are being used (utilisation), as well as whether or not the target population is being reached (coverage). Questions on whether or not improvements in health-related behaviour, disease patterns and health status have occurred are answered following an outcome or impact evaluation. Therefore, the intention is to assess the effects of a programme, as well as its impact on stakeholders or participants.

The second important consideration relates to the type of inference to be made. Do decision-makers simply want to know whether or not the programme goals and expected changes have been achieved, or do they want to establish whether or not the programme was the cause of the achieved outcomes? Is it important to establish a causal relationship, and to determine whether or not the observed effects were as a result of the programme interventions?

The authors do not state the "level of certainty" desired from the evaluation. At the lowest level of inference and certainty, an adequacy assessment simply answers the question: "Did the expected changes occur?", without establishing any causal relationship between the programme activities and the changes, i.e. inference is not made on whether the observed changes were because of the programme. Whether or not there was some form of a causal relationship between the programme and the outcomes can be established using a plausibility assessment, which also answers the question of: "Did the programme seem to have an effect above and beyond other external influences?" Whether or not there was a direct causal relationship between the programme and the outcomes, as well as the strength of this relationship, can be evaluated using a probability assessment. The aim of such an assessment is to ensure that there is only a small known probability that the difference between the programme and control groups is as a result of confounding problems, bias or chance.

It is likely that the authors aimed for the probability assessment, as their data analysis methods examined strength of association, using Poisson regression for the analysis of rates. This method is used to estimate rate ratios when comparing different exposure groups. Here, the two

groups of data are those of the pre- and post-intervention periods. The authors discuss the limitations of their method, and mention the lack of randomisation and unavailability of a control group. They also report that the assumptions used to estimate averted mother-to-child transmission (MTCT) of HIV events were drawn from control trials in which there was near-perfect compliance, which is not always the case in routine service settings; suggesting the likelihood of overestimated averted MTCT of HIV events.

3.3 When choosing indicators, the criteria used to judge the programme should be considered. These indicators should address the evaluation questions, and must align with the stated goals and objectives of the programme. The authors in this paper report on the evaluation of a service improvement process to enhance the performance of PMTCT of HIV in the Nigerian healthcare system.

Indicators can include measures of programme input, e.g. staff time, financial resources, materials and tools; activities, e.g. the participation rate, coverage rates and the efficiency of resource use; and measurement of the effects of the programme, e.g. changes in participant behaviour or practices, health status, quality of life or policies. Programme activities used in this study were measured, including changes in aggregated antenatal routine service data between the six-month period prior to the service improvement process and those in the six-month period after.

Four output measures from routine data were captured from the sites' monthly reports of service utilisation, i.e. the number of:

- Women attending the antenatal clinic for the first time.
- Pregnant women who had tested for HIV.
- HIV-positive pregnant women receiving ARV drug prophylaxis.
- HIV-positive women newly initiated on antiretroviral therapy.

In addition, a service ratio, a measure of programme effect, was used as a proxy indicator of the relative uptake of ARV drug prophylaxis. The service ratio calculates the number of women who received ARV drug prophylaxis in a month, over the number of women who tested positive for HIV in the same month. In addition, they report on estimates of averted MTCT of HIV events; another measure of the programme effect.

The authors discuss the value of using routine data in the paper's discussion section. They advocate the potential of using routine data as part of implementation research and programme evaluation. When considering the use of routine data indicators, the characteristics of good indicators should be remembered: "(They) should actually measure what they are intended to (validity). They should provide the same answer if measured by different people in similar circumstances (reliability). They should be able to measure change (sensitivity), and they should reflect changes only in the situation concerned (specificity). In reality, these criteria are difficult to achieve, and indicators, at best, are indirect or partial measures of a complex situation".

Further reading:

Dudley L. African primary care research: performing a programme evaluation. Afr J Prm Health Care Fam Med. 2014;6(1), Art. #634, 6 pages.

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