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A SYSTEMATIC APPROACH TO THE EVALUATION OF POST GRADUATE PRACTICAL EXAMINATIONS IN MEDICAL MICROBIOLOGY - AN OVERVIEW

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ABSTRACT: BACKGROUND: Assessment forms an essential part of any curriculum. There are several reasons why we need to assess student performance, most important of which is that it forms a basis for certifying student-doctors as Health-care professionals who practice in society, It also needs to be realized that assessment drives learning and therefore all the desired outcomes need to be taken into account while assessing .A well formatted blueprint will go a long way in fulfilling these objectives (1, 2).

The entire process of evaluation of post graduate practical examinations in Medical microbiology is done over a period of three days. The students have to perform a number of exercises with the end result of the tasks performed on a particular day yielding results on the next or the last day. Therefore it is not easy to maintain objectivity in assessment unless we have a concrete system of evaluation in place.

Hence, there was a felt need to prepare and try out a blueprint for examining post graduates in practical examinations which would bring about the desired outcomes in terms of maximum objectivity and testing of each individual component of the desired skill tested for. The scheme when adopted for use in exams was found to yield satisfactory results in comparison to conventional methods of practice in evaluation.

This may also be used as a guide to plan and prepare similar documents according to the Syllabi and Guidelines followed by different universities in the subject specialty mentioned here or even for other subjects or courses.

KEYWORDS: Evaluation, Post Graduate, Practical Examinations, Medical Microbiology.

METHOD: The present system of practical examinations in microbiology involves the candidates performing various assigned tasks over a period of three days .Some of these exercises are carried out over a period of 2-3 days.^(3,5)

The curricula of different universities in some instances do not specify in particular the distribution of marks for the different exercises in the practical examinations nor is there a uniform structured format which can be used for evaluation across universities.

The usual practice therefore is to award marks to the candidates after completion of exercises on the 3rd day based on the final reporting and presentation and comparing the

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performance among the students. Some examiners follow a system of grading the performance of each individual exercise and finally tend to translate the grading to marks.

These methods are subjective and fail to assess the candidates based on the various aspects of the practical skills that need to be taken into cognizance during assessment.

The proposed scheme was prepared with an intention of overcoming the deficiencies mentioned and making the entire process more objective.

The different exercises to be tested during the process of examinations were listed down and the tasks to be performed in each of them were broken down into individual components. The relevance and importance of each step was analysed and discussed by the panel of examiners and marks were accordingly allotted. Scope for adequate scrutiny of Knowledge, Skill and Attitude was taken into consideration while preparing the checklists.⁴

A set of three examiners were asked to assess the candidates as per the usual practice and one of the examiners used the checklist for assessment of the various exercises.

STRUCTURED SCHEME OF MARKING OF PRACTICAL EXERCISES FOR MD – Microbiology^(3,5) **TOTAL MARKS ALLOTTED – 300 MARKS**

1. Bacteriology – Short case (Pure Culture) – 30 Marks
2. Bacteriology - Long Case (Mixed Culture)- 50 Marks
3. Mycobacteriology : Ziehl-Neelsen Stain - 10 marks
4. Virology - ELISA – HIV/HBsAg/HCV – 30 marks
5. Immunology – 30 marks
6. Mycology - 30 marks
7. Parasitology - 30 marks
8. Serology - 30 marks
9. Slides and discussion - 30 marks
10. Microteaching Session / Pedagogy – 30 marks

DAY 1	DAY 2	DAY 3
Bacteriology-Pure culture	Report - Pure	Report - Mixture
Bacteriology - Mixture	Serology	Mycology- Slide culture
Mycology	Immunology	Slide discussion
Virology	Mycobacteriology	Pedagogy
Animal experiments	Parasitology	
	Slides	

1. Bacteriology : Short Case : 30 Marks⁽⁶⁾

1. Day 1- Preliminaries - 06 marks - 20%
2. Day 2- Isolation on plates - 03 marks -10%
3. Biochemical reactions -03 marks -10%
4. Antibiotic sensitivity testing - 03 marks -10%
5. Interpretation & Reporting - 03 marks -10%
6. Presentation - 03 marks -10%
7. Discussion – 06 marks - 20%
8. Time Management - 03 marks – 10

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2. Bacteriology - Long Case: 50 Marks ⁽⁶⁾

1. Day 1- Preliminaries - 06 marks - 12%
2. Day 2- Isolation on plates - 10marks -20%
3. Day 2 - Discussion – 06 marks - 12%
4. Day 3 – Biochemical reactions – 06 marks – 12%
5. Antibiotic sensitivity testing - 04 marks -08%
6. Interpretation & Reporting - 06 marks -12%
7. Presentation - 03 marks -06%
8. Discussion – 06 marks - 12%
9. Time Management - 03 marks - 06%

3. Mycobacteriology : Ziehl-Neelsen Stain : 10 marks⁽⁶⁾

1. Staining - 03 marks – 30%
2. Diagram – 02 marks – 20%
3. Reporting & Presentation – 20%
4. Discussion – 30%

4. Virology - 30 marks - ELISA - HIV/HBsAg/HCV⁽⁸⁾

1. Test Results -09marks – 30%
2. Interpretation – 06 marks – 20%
3. Presentation – 06 marks – 20%
4. Discussion – 09 marks -30%

5. Immunology-30 marks-ASO/CRP/RA ⁽⁸⁾ and Animal Experiments- 15 marks each⁽⁶⁾

1. Reporting & Interpretation – 09 marks -30%
2. Discussion - 06 marks – 20%
3. Handling of Test Animal – 06 marks – 20%
(Rabbit/ Mice/Guinea pig)
4. Discussion – 09 marks – 30%

6. Mycology : 30 marks⁽⁷⁾

- Day 1 – Interpretation & Reporting – 4.5 marks
Diagrams – 1.5 marks
Presentation – 3 marks
Discussion - 6 marks
- Day 3 – Slide Culture – 06 marks
Diagram - 03 marks
Discussion – 06 marks

7. Parasitology : 30 marks⁽⁷⁾

1. Focusing of Ova/ Cysts – 6 marks – 20%
2. Concentration technique – 3 marks – 10%
3. Egg Counting technique – 3 marks – 10%
4. Focusing of the Malarial / Blood Parasite – 6 marks – 20%
5. Diagrams & Report – 3 marks - 10%
6. Discussion – 9 marks (4.5 + 4.5) marks – 30%

8. Serology : 30 marks⁽⁸⁾

Widal/VDRL/TPHA/RPR/Brucella Agglutination etc;

1. Technique – 6 marks – 20%
2. Test results – 7.5 marks – 25%
3. Interpretation & Reporting – 3 marks – 10%
4. Presentation – 3 marks – 10%
5. Discussion - 10.5 marks – 35%

9. Slides and discussion : 30 marks-10 slides-3 marks each

Pattern:

Bacteriology – 2 slides

Mycology - 2 slides

Parasitology – 3 slides

Virology – 2 slides

Immunology – 1 slide

1. Identification – 1.5 x 10 = 15 marks – 50%
2. Description - 0.5 x 10 = 5 marks – 16.6 %
3. Diagram - 0.5 x 10 = 5 marks – 16.6%
4. Discussion – 0.5 x 10 = 5 marks – 16.6%

10. Microteaching Session / Pedagogy – 30 marks⁽⁴⁾

1. Introduces the subject – 3 marks
2. Presents topic in a logical sequence – 3 marks
3. Emphasises on important points – 3 marks
4. Appropriate use of A-V aids - 6 marks
5. Shifting emphasis – 3 marks
6. Solicits questions / doubts – 3 marks
7. Interactive session – 3 marks
8. Use of Innovation – Models /specimens etc; - 3 marks
9. Summarises effectively – 3 marks

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DISCUSSION: As medical educators, we have an ethical obligation towards the society which expects us to produce and send into the society quality and competent Health- Care professionals on whom they can depend upon in times of need to provide efficient health-care delivery.

This is linked to having a well defined, organized and systematic scheme of evaluation during conduct of examinations especially when systems adopt a summative evaluation process to determine the basic minimum requirements as well as the order of merit which is the norm in most of our universities.

The process of evaluation should include whether the predetermined educational objectives towards a said course have been achieved. For this to be complete, there needs to be a set of objectives and the appropriate measuring instrument which will facilitate in deciding whether the expected outcomes were achieved to the desired extent.

As teachers certifying outcomes of post graduate examinations, we need to have a blueprint of the process of evaluation which is reliable, valid, objective and feasible which can be subjected to improvement with constant review and constructive feedback from senior academicians, fellow colleagues, Peer group members and even the student community.¹⁰ It also eliminates bias and inter-observer/ examiner bias during examinations and ensures that a quality system is maintained during the entire process of evaluation.

The entire process of evaluation of post graduates in Medical microbiology is done over a period of three days, having a large set of exercises with the end result of the tasks performed on a particular day yielding results on the next or the last day where it is not easy to maintain objectivity unless we have a system of evaluation in place.

Presently there is no uniform structured format which can be used for evaluation of practical examinations in Microbiology which comprehensively assesses all the different component skills expected of the student. The usual practice therefore is to award marks to the candidates after completion of exercises on the 3rd day based on the final reporting and presentation and comparing the performance among the students. Some examiners follow a system of grading the performance of each individual exercise and finally tend to translate the grading to marks.

These methods are subjective and fail to assess the candidates based on the various aspects of the practical skills that need to be taken into cognizance during assessment.

The present draft has been prepared with an intention of overcoming the deficiencies mentioned and making the entire process more objective. This format of evaluation if adopted for assessment during examinations will be worthwhile as it deals with an individual's achievement relative to himself than to others. It tries to test competence in that it not only checks the desired skills but goes onto assess the extent to which the skill is perfect. The assessment pattern attempts to look for the best rather than the typical performance. Time management has been given due consideration as a part of the evaluation process which is not accounted for routinely as it is equally important to not only possess the required skills but also carry out the desired assignment within a specified framework of time. The draft helps all the examiners to look for specific criteria during the process of assessment which makes the process more valid. The presence of a well structured assessment tool as a part of the curriculum will also be a motivating factor for the students undergoing the training programme to concentrate on essential skills for overall development.

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