SUBJECT REVIEW REPORT

DEPARTMENT OF MICROBIOLOGY

FACULTY OF MEDICINE
UNIVERSITY OF PERADENIYA

27th to 29th November 2006

Review Team :
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1. SUBJECT REVIEW PROCESS

The subject review evaluates the quality of education within a specific subject or discipline. It is focused on the quality of the student learning experience and achievements in terms of its management and quality assurance.

This report examines the quality of academic programmes offered by the Department of Microbiology in the Faculty of Medicine, University of Peradeniya, for the students who are enrolled in the MBBS Degree Programme. Microbiology course/module are offered in the 3rd year of the MBBS programme.

This review was carried out using the process recommended by the CVCD and the UGC, laid down in the Quality Assurance Hand Book for Sri Lankan Universities published in July 2002.

The main features of this subject review were:

- Production of an analytical self evaluation by the academic staff delivering the programme.
- Peer review
- A review visit of 3 days
- An overall judgment , contained in a short report
- A comprehensive subject review report compiled by the review team

This review was carried out by the following academic staff:

Prof. GS Vidanapathirana,	Senior Professor of Microbiology, Faculty of Science, University of Kelaniya
Prof. Nelun de Silva,	(Review Team Chair) Professor of Medical Microbiology Faculty of Medicine, University of Ruhuna
Dr. Deepthi de Silva	Senior lecturer in Physiology, Faculty of Medicine, University of Kelaniya**,**

The visit was conducted from the 27th to 29th November 2006 at the Department of Microbiology, Faculty of Medicine, Peradeniya.

The review team was given the opportunity to peruse the Self Evaluation Report (SER) submitted by the department prior to the visit. All three members of the team felt that the format of the SER did not conform to the standards stipulated in the Quality Assurance Handbook. Four main areas were not addressed at all and the SER was padded up with irrelevant documents such as topics taught, lecture handouts and correspondence which the review team had to sort through to obtain the main gist of the areas expected to be covered. The department provided a supplementary SER which gave additional information on the previously omitted areas.

2. THE UNIVERSITY, FACULTY AND DEPARTMENT

The University of Peradeniya traces its origin to the University of Ceylon established by the Ceylon University ordinance in Colombo, in July 1942. After much controversy and debate, Peradeniya was decided on as the most suitable site for the new university which could house faculties, halls of residence, staff quarters and other facilities. The University was officially opened in Peradeniya as University of Ceylon, Peradeniya on 20th April 1954. The University of Ceylon continued to function as two campuses in Peradeniya and Colombo till 1967, when the Universities Act (No. 16 of 1978) made provision for the establishment of these campuses as independent universities. Under section 139(1) of this act the Peradeniya campus was re

established as an independent university under the name "University of Peradeniya, Sri Lanka".

The Faculty of Medicine was established in 1961. Its mission statement reads as
"*The Medical Faculty is entrusted with the holistic education of health professionals of all kinds with ethical values and moral respect, in an environment of excellence, where their education and training, the provision of preventive and curative services to individuals and the community and research are seen to be part of a continuum. The foundation of and a desire for continuing education, and a spirit of inquiry and the recognition of responsibility to improve the health of the people must be consequences of such education*."

The faculty offers a medical course leading to the Degree of Bachelor of Medicine and Bachelor of Surgery (MBBS). The duration of the course is approximately five academic years.

The Medical Library which serves both the Dental and Medical Faculties is situated adjacent to the main entrance to the Faculty and contains about 40,000 volumes of books and a collection of leading medical and dental journals. Registered students and staff are eligible to use it. In addition a Medical e-library consisting of computers with internet access for staff and students is located within the library.

The undergraduate medical curriculum was revised in 2004, is called "beyond 2004" and incorporates changes suggested by World Federation of Medical Education 2003 conforming to the needs and demands of the modern world. The new curriculum was first introduced for 2004/05 new entrants to the medical school and focuses on early clinical relevance, self directed learning, professional development and community oriented learning. The vision of the new curriculum is "*to provide an undergraduate course of education that will enable the product to be a medical professional of quality as good as anywhere in the world*"

The goal of the new curriculum reads as "*at the end of the undergraduate course the student should possess adequate knowledge, skills and attitudes to preserve, promote and maintain healthy life and prevent death*".

The Department of Bacteriology was established in 1965 where its first Head was Prof. SN Arsecularatne. The department's name was changed to the Department of Microbiology in 1967. Its motto is "*students first – patients next*". There are 7 academic cadre positions which are occupied by four permanent and three temporary academic staff members. The current Head of the Department assumed duties in 1989. Two permanent staff members are abroad on study leave and the third who joined in 2004 is now a senior lecturer.

The Department has a well equipped student practical laboratory which is shared with the Department of Parasitology and has adequate microscopes for student use one to one. In addition a well equipped diagnostic laboratory and a research laboratory are part of the department facilities. The premises also have a tutorial room shared with the Department of Community Medicine. The lecture theatre in the adjacent building has good acoustics but is in need of a coat of paint.

There are six Technical Officers including one chief staff grade Technical Officer, six Laboratory Attendants, one Labourer and one Clerical Officer. There are weekly meetings of academic and technical staff to discuss the undergraduate and postgraduate academic programme, research, departmental matters and other issues which need to be sorted out. Other department meetings inclusive of all the staff are held once in three months. A noteworthy feature is a "department day" which has been incorporated from 2000 onwards. This day is marked by a celebration and the production of a departmental book which is a record of the previous year's achievements depicted in pictures and text.

3. AIMS AND LEARNING OUTCOMES

The aims of the Microbiology course is to provide principles and scientific basis of Microbiology (Bacteriology, Virology, Mycology and Immunology) in relation to pathogenesis, laboratory diagnosis, prevention and treatment of infective diseases as well as providing basic practical skills in staining and microscopy relevant to the diagnosis of bacterial infections.

The learning outcomes of the old curriculum were not stated in the SER, however a detailed list of course contents under the broad headings of general microbiology, systematic bacteriology, mycology and virology and clinical Microbiology were given.

The objectives for practicals were to

- to form a hypothesis to explain available information
- allow students to make accurate observations
- use observations to confirm or refute hypothesis
- learn processes of reasoning to arrive at a aetiological diagnosis in an infective disease.

In the new curriculum, objectives were provided for the immunity, infection and barrier tissues (years 1-4) the learning outcomes were given for each topic. (Annexe 1)

4. FINDINGS OF THE REVIEW TEAM

4.1 Curriculum Design, Content and Review

The old curriculum is being phased out and the last batch of students following the old curriculum is in their second term at present. There has been a gradual change in content over the years where the emphasis has shifted from Systematic to Clinical Microbiology. The old curriculum spans three terms of the third year of the medical curriculum and is mainly a taught course providing an input in General Microbiology and Immunology (1^{st} term), Systematic Microbiology (2^{nd} term) and Clinical Microbiology (3^{rd} term).

There are approximately 60 lectures, 15 tutorials and 15 practical hours per student. There are 4.5 hours of teaching per week allocated to the department. The lecture schedules, practical and tutorial schedules are displayed for the students making them aware of the content areas being covered. The content areas of the lectures are logically sequenced, comprehensive and appropriate for a third year medical undergraduate. The third term lectures have special relevance to their learning in the clinical setting since they are being exposed to patient care in the hospital simultaneously.

The tutorials are conducted at regular intervals for small groups of around 20 students. The topics were clinically relevant and encouraged critical thinking.

The old curriculum content areas are at a suitable academic level and opportunities are provided for students to gain sufficient knowledge, intellectual and specific skills.

In terms of subject coverage there is sufficient depth and coverage of content which makes suitable intellectual demands on students as they progress through the curriculum from term 1 to term 3.

Though no formal revision of the curriculum has taken place till 2004 when the major change occurred, the content areas have shifted from a lab based pure microbiology to a clinically relevant one where the emphasis is on infections of the systems, antibiotic use and infection

control. These changes may have occurred as a result of informal feedback from the students as indicated in the SER (p. 10) but documentation to this effect is not evident. There are no indications that external examiners have reviewed the curriculum either. Perhaps these changes have occurred due to the perceptions of the Head of the Department on the need for clinical relevance when teaching Microbiology in the undergraduate medical curriculum.

The new curriculum has not been in place long enough for the team to make an objective review but few points of observation are noteworthy. The major input in Microbiology takes place in the Infection, Immunity and Barrier tissues component of the Foundation Module. From year one to year four this component is conducted for 2 weeks duration of the new curriculum. Additional inputs are structured in the Foundation module of the 2nd year and in the system based modules in 3rd and 4th years.

Even though the emphasis is deemed to have shifted to a student centred learning curriculum, the major teaching learning activity continues to be lectures.

The reviewers rate this aspect of the Department of Microbiology as "SATISFACTORY".

4.2. Teaching, Learning and Assessment Methods

Teaching, Learning Activities (TLA)

Lectures still remain the main TLA in the Department of Microbiology both in the old as well as the new curriculum. As indicated by the Head of the Department, lectures are the most resourceful TLA's in poor resource settings as in the current environment in the department with a depleted staff student ratio. The format of this TLA has changed from the early years when lectures were limited to oral delivery with the use of slides wherever applicable to use of an overhead projector with transparencies and finally to the current mode of delivery via power point presentations. An evaluation conducted has revealed that more than 50% of students prefer the use of blank transparencies where the teacher writes on the transparency during the lecture presumably due to the slower pace of the lecture. The teachers have taken this into account and slowed down the pace of delivery, which was aptly demonstrated in a lecture done by Dr. Kodituwakku and attended by the review team. This lecture was well delivered, clearly heard at the back and the slides were clear and comprehensive. The students had been provided with a handout of the lecture. Even after 40 minutes into the lecture, breaks were not given, nor any activities introduced to encourage deep learning. The team was concerned that the teacher may not have been able to cover all of the contents highlighted at the beginning of the lecture.

Lectures are supplemented by tutorials conducted by all the academic staff including the temporary staff for small groups of students, about 20 in each. Tutorials give opportunity for the students to ask questions on areas of difficulty and allow them to develop their oral communication skills. They are expected to attend the tutorials with a written answer which provides avenues for improving their writing skills. The tutorial topics are unusual and unique and encourage original and critical thinking and also enable them to develop information retrieval skills. However we are concerned that all the students may not benefit equally in this TLA and whether the participation of all students can be assured to make the tutorial a more meaningful TLA. A feedback from students may indicate areas for improvement.

The aims of the practical sessions carried out by the students were to allow them to see through microscopy, organisms which cause human disease. This is being done by teaching them the use of the oil immersion light microscope and Gram and Ziehl Neelsen staining procedures. The organisms which commonly cause human infections are given to them for

staining and observation of the microscopic characteristics and students get hands on practical experience in these techniques together with the ability to interpret results. Other areas covered in the practical sessions include demonstrations on immunological techniques and mycology. The current situation in the department where the supply of gas to the laboratory has been cut off permanently is of concern since the students of the old curriculum have not been exposed to any practical work at all. The department must find an alternative way soon, to overcome this problem.

The content taught in the new curriculum has not changed much but since it is integrated, it seems a more logical approach. Even though the theme is to introduce self learning, lectures continue to dominate as the main TLA. There is evidence of some shift towards self learning and exploration in a student seminar conducted on Koch's postulates which has been a meaningful experience for the students and staff equally. The teachers involved in the new curriculum should explore other TLA's such as problem based learning, fixed learning modules, study guides etc. to bring about a change to student centered learning.

Assessment

The examination format is well documented regarding conduct and procedures. Assessment of students has been by in course and end of course in the traditional curriculum. There has been a change with the introduction of the Gram stain assessment with clinical specimens as an in course assessment and the lengthy practical in the end course being replaced by OSPE. Change in assessment methods in 2000 has brought about an immense improvement to the outcomes in terms of the number of distinctions and pass rates. These changes are documented with formal approval sought by the Faculty Board. The in course assessment in the old curriculum does not provide a feedback to the students on their performance.

Review of past question papers reveal that the assessments are balanced and test a spectrum of the content areas. Since there were no learning objectives in the old curriculum it was difficult to assess whether assessments are aligned and test the learning outcomes. Item analysis for some MCQ's has been done but the outcomes are not known. Essay questions encourage creative thinking.
Since the names of students appeared on the mark sheet prepared by the Head, the team was concerned but it was revealed that this is the standard practice across all departments.
In the new curriculum the formative component is emphasized and feedback given on MCQ's. The poor performance (41% failure rate) in the first formative assessment in the new curriculum needs address.

The reviewers rate this aspect of the Department of Microbiology as "GOOD".

4.3. Quality of Students, including Student Progress and Achievements

The SER did not give any information regarding this aspect of the review but the supplement (p. 2) summarized the numbers of students obtaining distinctions in this subject in five previous 3rd MBBS part 1 examinations.

Following a request by the review team, the department provided information regarding the numbers of students in the past six batches and the pass/ fail rate at the first attempt. This information is tabulated below.

Batch	Total number of students	Number of failures (% of total)	Number of distinctions
1997/1998	185	54 (29%)	Not available
1998/1999	199	54 (27%)	Not available
1999/2000	173	29 (17%)	12
2000/2001	191	24 (13%)	14
2001/2002	173	8 (5%)	14
2002/2003	174	13 (7%)	24
2002/2003 "A"	184	11 (6%)	42

As discussed in the assessment methods, the increase in the distinctions and reduction in the failure rates is related to a change in the assessment method (removal of the viva and practical and its replacement with a clinically relevant OSPE totalling 35% of the total mark). The more recent achievement of a pass rate of over 90% of the batch is commendable.

In the new curriculum, a formative assessment using MCQs in the infection and immunity module in the first year indicates a 41% failure rate (grade D or less) in this batch. It is not possible to draw a conclusion regarding longer term student performance at this early stage of the new curriculum but the department should review this carefully.

The assessment of this aspect is based on student performance in the old curriculum.

The reviewers rate this aspect of the Department of Microbiology as "GOOD".

4.4. Extent and Use of Student Feedback (Qualitative and Quantitative)

The documentation provided to the reviewers i.e. copies of all questionnaires used to obtain feed back and details of how they are used; the presentation of the Head of the Department, discussions held with students and staff, indicated that there is an excellent mechanism in place to obtain formal and informal feed back from the students of both undergraduate and postgraduate programmes. The reviewer team noted that a well structured questionnaire, which included all aspects of teaching, and learning have been given to students regularly to obtain formal feed back.

In addition informal feedback from students has been obtained from their tutorial discussions and group meetings of students and staff.
The review team was happy to note that large majority of students rated the Department of Microbiology as one of the student friendly departments in the faculty. A large majority of the students were satisfied with the teaching and learning processes adopted by the department.

However the review team noted that the department does not have a formal staff, student liaison committee as expected in the Quality Assurance Handbook and wishes to recommend that such a committee is set up with representation from all batches of students following microbiology modules/courses in order to establish a formal mechanism to facilitate bilateral communication.

The reviewers rate this aspect of the Department of Microbiology as "SATISFACTORY".

4.5 Postgraduate Studies

Post graduate studies in the Department of Microbiology are carried out through the appropriate Boards of Study of the Postgraduate Institute of Medicine (PGIM), University of Colombo, Postgraduate Institute of Science (PGIS), University of Peradeniya. Their major contribution to postgraduate studies is the training of postgraduate students in MD Microbiology, Diploma in Medical Microbiology in collaboration with the PGIM, University of Colombo.

In addition the department offers its major contribution in terms of a total of 10 credit courses for the M.Sc. course in Medical Microbiology, a new course conducted by the PGIS, University of Peradeniya. Several members of the department are also involved in the supervision of research (projects) students of the M.Sc. in Plant Science course conducted by the PGIS. The documentation provided to the reviewers indicated that there has been a continuous stream of postgraduate students working in the Department. They included students who followed MD Microbiology programme, Diploma courses in Medical Microbiology, MPhil and M.Sc. research programs. The review team was happy to note that the Department actively conducts collaborative research programmes, with both local research institutes (IFS, Faculty of Science) and international institutes (Institute of Tropical Medicine, Nagasaki University, Japan).

The review team is satisfied that the Department of Microbiology possesses a sufficient infrastructure, facilities and equipments to conduct postgraduate research and provides a dedicated supervisory service to all postgraduate students.

The reviewers rate this aspect of the Department of Microbiology as "GOOD".

4.6. Peer Observation

The SER did not give any information regarding this aspect of the review. There has been a long established tradition of peer observation of lectures in the department. This was stated by the Head of the Department and confirmed by the lecturers in the department. Junior lecturers regularly sit in at senior lecturers' and professorial lectures of the department. The review team who observed three junior lecturer's attending a senior staff member's lecture confirmed this. The Head of the Department reviews junior lecturers' lecture content prior to the lecture. When there is an opportunity, senior staff members of the department also sit in on junior staff lectures. Constructive criticism is encouraged from junior as well as senior colleagues.

Following the introduction of the new curriculum, a formal process of peer review has been set up within the Medical Faculty. The original SER did not contain any information regarding this aspect of the review. The supplement to the SER included information regarding peer review of 4 lectures by two staff members. The reviews were performed using a structured assessment form with an overall judgment regarding the teaching session. The reviewers were from the Department of Parasitology and their comments suggest that the quality of lectures was excellent and that peer review is a useful experience for improving teaching the content areas that are shared by these two departments. The department should attempt to continue this process, extend it to other teaching/ learning methods and obtain the views of colleagues from other departments regarding the quality of teaching offered by staff members.

There is also a more formal mechanism of peer observation conducted by the department on a checklist prepared by a monitoring committee known as "Z" committee. According to this the entire Department of Microbiology and Parasitology visits all lectures, make comments, evaluates and discusses all aspects of teaching. The comments made in this exercise are made available to the Dean of the Faculty for necessary action.

The review team was provided with the completed peer evaluation forms with comments. It was evident during our discussion with staff that the feedback from peer observation sessions is made known to the respective teachers and that the comments are used in a positive manner to improve the quality of delivery of teaching material.

The review team was impressed by the cooperation of the academic staff in the implementation of an effective peer observation process.

The reviewers rate this aspect of the Department of Microbiology as "GOOD".

4.7. Skills Development

The initial SER did not give any information regarding the development of skills within this course. The supplement offered 4 pages of information that did not adequately explain how skills are developed among the undergraduates. The review team, after discussion with the department, agrees that the following areas are likely to be developed in students during their contact with departmental teaching.

A. Laboratory techniques in Microbiology (p30-31 in supplement gives details of the in course assessment in the old curriculum)

1. Skills in microscopy (correct use of the microscope, choice of field, documenting findings)
2. Making a smear and Gram staining of this
3. Identification of organisms based on culture or staining characteristics

B. Critical thinking skills (seminar in infection and immunity module, p 32 of supplement).
The new curriculum encourages this skill and the teaching in the infection and immunity module has successfully implemented this. The students were asked to find how Koch's postulates were proven in a series of infectious diseases.

The teaching staff was highly satisfied by the student learning outcomes and the three new curriculum students who attended the discussion with members of the review team were also satisfied with this process, finding it interesting and relevant for their studies.
Development of this skill appears to be part of the departmental teaching strategy for many years in the old curriculum. There has been an emphasis on "creative" thinking which had been encouraged and expected at tutorials and assessments.

This is a valuable aspect of the departmental teaching strategy and the skills of the staff in encouraging undergraduates in this aspect should be more widely used during the whole course.

C. Handwriting skills (p 33-34 of SER supplement)
Students' handwriting is improved by repeated practice of writing an answer to the tutorial questions. Students' self generated tutorial answers are sometimes formally checked for content and writing but more often checked informally during the tutorial time. This is useful as it emphasizes the need of this skill to students. The review team inspected specimens of handwritten tutorial and essay answers. The standard of writing and spelling among students is generally satisfactory.

D. Research skills (p 36 of SER supplement)
Some students collaborate with the department during their undergraduate research project done during their Community Medicine appointment.

There was no information provided regarding the department's teaching role in developing other skills including computer, communication and time management. It is likely that the teaching programme involving the department develops some of these in the old and new curricula.

The reviewers rate this aspect of the Department of Microbiology as "SATISFACTORY".

4.8 Academic Guidance and Counseling

This aspect of the self evaluation report was not written well. However the presentation of the Head of the Department, discussions with the students and members of the staff indicated that several areas of student support is provided by the Faculty of Medicine to all students who join the faculty at the initial stages. The structure of the medical curriculum, its nature and teaching and assessments methods are made known to the students during their introductory briefings. The faculty student counselors attend to student needs and grievances when necessary. However there was no evidence to believe that the student counselors have received special training for this purpose.

In addition the review team noted that there are informal academic guidance and counseling available to students continuously through members of the academic staff. The Department has evolved a system of providing academic guidance and counseling to students who have failed in microbiology examinations.

The reviewers rate this aspect of the Department of Microbiology as "GOOD".

5. CONCLUSIONS

Curriculum Design, Content and Review

Strengths/Good Practices

Curriculum change to an integrated one with emphasis on student centered learning

Weaknesses

There were no learning objectives for the old curriculum

Teaching, Learning and Assessment Methods

Strengths/Good Practices

Change of assessments to include OSPE

Weaknesses

Major TLA continues to be lectures

Quality of Students, including Student Progress and Achievements

Strengths/Good Practices

A marked improvement in performance with the change in assessments

Weaknesses

High failure rate in a formative assessment using MCQs in the new curriculum

Extent and Use of Student Feedback

Strengths/Good Practices

Use of comprehensive, well structured questionnaires to obtain student feed back on teacher evaluation on a regular basis.

Weaknesses

Absence of a formal Student-Staff Liaison Committee and qualitative feedback

Postgraduate Studies

Strengths/Good Practices

Involvement of the teaching staff in collaborative PG research with the Faculty of Science; University of Peradeniya

Peer Observation

Strengths/Good Practices

Peer observation of lectures, tutorials by the entire Department of Microbiololgy and by an outsider from the Department of Parasitology

Weaknesses

There is no evidence that these practices are part of the routine structure of the department

Skills Development

Strengths/Good Practices

Opportunities exist for development of generic skills of students

Weaknesses

These opportunities are not recognised and harnessed to maximise the output

Academic Guidance and Counseling

Strengths/Good Practices

The availability of staff guidance for students who have failed in microbiology examinations

Weaknesses

A formal mechanism of providing academic guidance and counseling with trained personnel was not evident

Based on the observations made by the review team and discussed above, the eight aspects were judged as follows:

Aspect Reviewed	Judgement Given
Curriculum design, content and review	**Satisfactory**
Teaching, learning and assessment methods	**Good**
Quality of students including student progress and achievements	**Good**
Extent of student feedback, qualitative and quantitative	**Satisfactory**
Postgraduate studies	**Good**
Peer observation	**Good**
Skills development	**Satisfactory**
Academic guidance and counselling	**Good**

6. RECOMMENDATIONS

The review team is impressed by the overall high quality of teaching that is offered by this department in the old and new curricula. Our main recommendations are on the following aspects:

1. Curriculum & TLA's

- It is recommended that more self learning activities such as student seminars, self study packages, study guides and assignments are incorporated in the new curriculum
- Reviewers felt that the students need to be exposed to the practical work as soon as possible
- Department may consider introducing a module on Research Methodology in Microbiology

2. Student Feedback & Student Affairs

- Student staff liaison committees, department meetings with students could be held regularly to obtain qualitative feedback
- It is recommended to establish a formal mechanism to address student appeals, grievances and problems related to academic matters

3. Staff Shortages

- Department may explore avenues to keep recruited staff in the department by some form of motivation such as exposure to staff development programmes

4. Information Technology Access

- It is recommended that the access to internet and computers for the staff be increased to develop their IT skills

7. ANNEXURES

Annexure 1 – LEARNING OBJECTIVES OF NEW CURRICULUM

Year 1

Topic/ Concept/Objectives

Immunity, infection & Barrier Tissues - 1

Introduction to Microbiology - An Overview

a.understand the interactions of microorganisms with human beings

b. state why medical undergraduates need to know about microorganisms

c. understand what medical microbiologists do

Proving causations of infection - Causality - Koch's postulates and its limitations

a. state Koch's postulates and their limitations

b. explain how causal associations can be proved in infective diseases

Microbial Classification and visualization

a. describe the basis of classification of infective agents [viruses, bacteria, prions, atypical agents, fungi, parasites]

b. explain the ways by which infective agents can be seen or their presence recognized

Host parasite relationships

a. describe the different ways in which infective agents relate to the human host

b. define (i) the terms used to describe these relationships (eg: symbiosis, mutualism, commensalism, parasitism etc) ; (ii) the terms used to describe the organism in the relationship(eg: host, parasite, commensal, saprophyte, pathogen etc) and (iii) terms used for outcome of the relationship (eg: infection, infestation, disease)

a. Microbial growth, dissemination and survival within and outside the human host

a. describe the dynamics of growth in different types of micro-organisms (eg: Virus, Bacteria, fungi and macro-parasites)

b. list the different ways in which microorganisms survive for long periods within and outside the human host

b. Macro-parasitic growth, dissemination and survival within and outside the human host

a. describe how microorganisms disseminate within and outside the human host

Methods of preventing infections

1. describe the modes of transmission of the organisms /agents listed in 2005-1/SBM-7/03-1

a. Tissue injury - The inflammatory process

a. list the injuries that result in inflammation
b.outline the steps in the inflammatory process
c.list the cardinal signs of inflammation
d. describe the outcome of the inflammatory process

b. Host response to microbial infection (Pathogenesis)

a. describe the essential steps for microbial infection and disease - attachment, invasion, mechanisms of damage

The need for a body defence system

a. Introduction to the immune system
Should be able to appreciate the imporatnce of the defence system

Oragnization of the defence system

a. Structure of the immune system (Skin, mucosa and lympho-reticular system -BM, thymus, spleen, LN, MALT)
b.Functions of the organs / tissues in the immune system
(Skin, mucosa and lympho-reticular system -BM, thymus, spleen, LN, MALT in relation to elicit a defence response)
Should be able to discuss the structure and the basic functions of the organs in the defence system

Introduction to cells, immunoglobulins and cytokines

should be able to state the different cells and their functions within the immune system, should be able to state the types and the functions of immunoglobulins and cytokines

Introduction to barrier tissues

1. outline the different types of barrier tissues in the human body and their related functions

Skin as an organ

a. describe the general organization of the skin including the skin of the palm, sole and scalp

a. appearance of the skin on the flexor / extensor surfaces, frictional areas

b. creases and flexure lines, scars and stretch marks, sensitive areas

b. recall the arrangement of dermatomes

c. list the appendages of the skin and their distribution

d. identify in a given section of skin the following under LM:

Epidermis, Dermis, Keratin, Hair follicles, Sweat gland, distribution and its modifications (Mammary gland), Arrectores pilorum muscle, Pacinian Corpuscle, Meissner's Corpuscle.

e. describe the arrangement of subcutaneous tissue

Structures binding the skin to the underlying tissues

a. describe the layers of the skin

b. state the composition of subcutaneous tissue and its functions

Functions of the skin

a. correlate the structure in relation to function

b. briefly state the functions of the skin

a. serving as a barrier against infection/injury

b. helping to regulate body temperature

c. removing waste products from the body

d. providing protection against ultraviolet radiation from the sun

e. producing vitamin D

f. serving as a sensory organ

g. in social interactions

Round up session - Skin

a. correlate the structure of the skin with its functions

Year 2

Topic/ Concept/ Objectives

<u>Immunity, infection & Barrier Tissues - 2</u>

Systematics of infective agents

Explain how the structure and biological properties of the different groups of infective agents determine causation, diagnosis, management, prevention and control of major infective diseases of humans. (see foundation 2 module for detailed objectives.)

(Bacteria/Protoza - F2)

Viruses

Be able to describe habitat, including reservoirs, main mode(s) of transmission, morphology and growth characteristics in relation to identification, key virulence factors in relation to human disease and principles of prevention

Fungi

Be able to describe habitat, including reservoirs, main mode(s) of transmission, morphology and growth characteristics in relation to identification, key virulence factors in relation to human disease and principles of prevention

Helminths

Be able to describe habitat, including reservoirs, main mode(s) of transmission, morphology and life cycles in relation to identification, causation of disease and principles of prevention

Arthropods

Be able to describe morphology, habitat, life cycles and biological characteristics relating to disease causation and transmission of infective agents of humans

Transmission of infective agents to humans

a) Guidelines for seminar

b) Seminar based on factors influencing the spread of infective diseases in the 21st century

Immune mechanisms as a defense strategy

a. Innate immunity
Should be able to describe the mechanisms in innate immunity
b. Adaptive immunity (humoral and cell mediated immune responses)
Should be able to describe the mechanisms in innate immunity

c. Lymphoid organs and cell trafficking
Should be able to describe the involvement of lymphoid organs and cell trafficking in a coordinated immune response

Year 3

Topic/ Concept

Immunity, infection & Barrier Tissues-3

Foundation module 3

Bench skills Objectives: Effective use the compound light microscope with in built illumination to visualize the following agents

Microscopy, examination of stained smears/blood films.

Gram stain and Zeihl Neelsen - Bacteria

Wet prep, Gram stain and negative stain - Fungi -

Giemsa - Malaria

Faecal wet mounts - Protozoa and Helminths

Infection and Immunity module Year 3

Major infective diseases (parasitic) **in Sri Lanka**

Malaria, filariasis, intestinal helminthiasis, scabies, amoebiasis : to name the aetiological agents, and describe pathogenesis, diagnosis and management; explain transmission and epidemiology of the disease; discuss prevention and control

Relationship of infective agents to human disease (Micro)

Zoonotic diseases

a) Guidelines for seminar
b) Seminar

Immune tolerance

Outline the basic concepts of MHC restriction and immune tolerance

Immune mechanisms in disease

Describe the role of immune mechanisms in disease (allergy, hypersensitivity, autoimmunity and immune deficiency)

Immunology in a diagnostic lab

Discuss role of immunology in a diagnostic laboratory for: a) diagnosis of infective diseases and b) assessment of immune function (ELISA, IFA, CFT, Agglutination, RIA, Flow cytometry, Western blot, Skin prick test, Electrophoresis,
Immune function tests ie: cell counts / phenotyping / proliferation / phagocytosis / cytokine secretion, complement assays)

Protective mechanisms to infection

Describe protective mechanisms to infection abd be able to discuss Integrated immune mechanisms in Bacterial, Viral, Fungal and Parasitic infections

Immunology of tumours

Outline immune mechanisms relating to tumors
(Generation of tumors, immune responses against tumors, immune evading mechanisms, immunotherapy)

Year 4

Topic/ Concept

Immunity, infection & Barrier Tissues - 4

Continuous input is expected into the systems based modules. This needs to be quantified to allow for Dept planning

Special topics

Infection control

State the risk of transmission of infection within health care institutions; Define the term Hospital Acquired (nosocomial) Infection ; State important infective agents implicated in HAI; Discuss methods used in prevention and control of HAI including outbreaks

Use of antimicrobial agents and threat of resistance

Describe the principles underlying the rational use of antimicrobial agents; Discuss the reasons for emergence and spread of antimicrobial resistance; State methods to prevent/limit the emergence and spread of antimicrobial resistance

Infection in the compromised host

Explain what is meant by a compromised host giving commonly encountered examples in clinical practice; Discuss strategies to prevent/manage infections in the compormised host

Sepsis syndrome

Define sepsis; Describe the pathogenesis of sepsis; Discuss intervention / management strategies

Vector borne diseases

List the major vector borne diseases (globally and in Sri Lanka).Describe the epidemiological factors that influenze the transmission and spread of these diseases. Discuss the prevention and control of these diseases.

Seminar on Emerging infections

Define the terms Emerging and Re-emerging infections; Discuss with examples the reasons for this phenomenon; Briefly outline measures for prevention

Immunodeficiencies

Outline the congenital and acquired immunodeficiency disorders and the principles of management

Allergic/ Immunological diseases of organs

Describe the immunological basis of the following diseases and outline principles of management
Respiratory tract: Rhinitis, Asthma, Extrinsic allergic alveolitis, Pulmonary fibrosis
Skin: Eczema, Contact dermatitis, Urticaria / Angioedema, Pemphigus, Phemphigoid, Lichen planus, Polyarteritis nodosa, Erythema nodosum
Eye: Conjunctivitis, Scleritis, Uveitis

GIT: Pernicious anaemia, Inflammatory bowel diseases, Autoimmune hepatitis, Biliary cirrhosis
Blood: Transfusion reactions, HDN, Autoimmune Haemolytic anaemia, Drug induced anaemia, Autoimmune thrombocytopenia
Nervous: Guillain-Barre Syndrome, Myasthenia gravis,
Renal: Glomerulonephritis
Cardiovascular: Rheumatic Fever, Carditis, Vasculitis
Endocrine: IDDM, Thyroid diseases

These topics should be covered in relevant systems and modules

Systemic immunologiocal diseases

Describe the immunological basis of the following systemic diseases and the principles of management
SLE, Rheumatoid Arthritis, Juvenile Chronic Arthritis ****These topics should be covered in relevant systems and modules***

Transplant Immunology

Outline the principles underlying transplant immunology including HLA typing / Cross matching and Graft rejection

Annexure 2 – THE VISIT

On the 1st day of the visit, the team met the QAA representative to discuss details of the conduct of the review process and how to give judgements on all eight aspects to be reviewed. Prof. Peiris emphasized the need to look at curriculum design, content and review, teaching learning and assessment methods and skills development as part of the academic programme and other five criteria as good practices.

Subsequently the review team met the Dean, and the Head of the Department of Microbiology, Prof. Vasanthi Thevanesam, in the Deans office. The Dean spoke of the vision of the Faculty which is to contribute towards a healthy nation by providing early diagnosis and preventive care. Their goal is to produce a medical graduate possessing adequate knowledge, skills and attitudes to preserve, promote and maintain healthy life and prevent death. He also believes that it is the responsibility of the teacher to provide effective teaching learning methods and a conducive learning environment for the students. In response to a query as to why the faculty embarked on curriculum changes, he reiterated that changes must occur in any process especially to keep up with the new developments and practices in the field of Medicine.

Prof. Vasanthi Thevanesam gave the review team the itinerary that she had amended based on that provided by the QAA representative and the schedule was agreed upon by the team. She later gave a comprehensive presentation of the self evaluation report and there was opportunity for the review team to clarify areas of doubt.

The team was shown around the department facilities by the chief technical officer and the facilities in terms of equipment and resources were at a satisfactory level for the undergraduate and post graduate teaching and research. There was evidence of regular surveys of the equipment being carried out where the equipment surveyed were categorised into as functional, needing repair and to be discarded. There was also evidence of recent purchases of refrigerators, autoclave and a safety cabinet. The team met the five members of the academic staff to discuss the current teaching programmes, on going research, career development as well as the problems faced in recruiting academic staff as many qualified staff members do not return after foreign training.

At the end of day one, the team met with some undergraduate students to obtain their views on the present curriculum, in Microbiology, their anxieties, and learning problems if any and discuss other relevant issues. There were about ten students following the old curriculum and three who were following the new curriculum in their second year.

Their opinion was sought on the accessibility of the staff, teaching learning activities of the department, awareness of the examination procedures etc. to which all of the students expressed their satisfaction. The students following the old curriculum expressed concern over their inability to do the practical work in the 1st term due to non availability of gas in the laboratory. When questioned on ways and means of knowing how well they are progressing in their work in terms of feedback from the staff, they expressed that feedback was not forthcoming even after continuous assessments. However the students following the new curriculum were given an indication of their progress by regular formative assessments. Day one was brought to a close around 5.30 pm.

Day 2 commenced with time set aside to peruse the documentary evidence produced by the department on teaching learning activities, assessments, postgraduate studies and all other relevant documents.

This was followed by a meeting with the non academic staff where the review team set out to find the work atmosphere of the non academic staff, their training in related areas, health and safety aspects in the work place and opportunities provided for promotions and career development opportunities.

A meeting with the post graduate students of all categories such as the MD Medical Microbiology of the PGIM, University of Colombo, MSc in Medical Microbiology of the PGIS, University of Peradeniya and MPhil students followed next. Their specific areas of research, constraints in terms of available facilities, guidance provided by the supervisor etc. were discussed candidly.

The afternoon of day 2 was spent in observing a lecture conducted by Dr. Aruna Kodituwakku for students following the old curriculum and thereafter the team observed tutorials being conducted by all the academic staff members, individually for small groups of students about 20 in each.

Day 3 commenced with a meeting of all the staff of the department where the review team thanked each and every one for the part they played in the review process and for providing all the necessary facilities for the team. The team then went on to give a general feedback on their performance highlighting their strengths and weaknesses. The afternoon of day 3 was utilised for writing the report.

Annexure 3 - LIST OF PERSONS MET DURING THE VISIT

- Dean of the Faculty
- Emeritus Professor SN Arsecularatne
- Head of Department – Prof. Vasanthi Thevanesam
- Senior Lecturer - Dr. Aruna Kodituwakku
- Temporary academic staff – Ms. Abeykoon, Ms Charukeshi, Ms. Ashwini & Mr. Viduranga
- Chief Staff Grade Technical Officer - Mr. Eriyagama
- Technical Officers - Mr. Ekanayake, Mr. Abeykoon, Mr. Athula Kumara, Ms. Gamage and Mr. Wijedasa.
- Clerical officer - Ms. Wijekoon.
- Laboratory attendants - Mr. Abeyratne, Mr. Karunaratne, Mr. Karunarathne, Mr. Hemasinghe, Mr. Panigamuwa and Mr. Karunadasa
- Labourer - Mr. Wimalasena.

Annexure 4 – LIST OF TEACHING SESSIONS OBSERVED AND MEETINGS HELD

- Lecture conducted by Dr. Aruna Kodituwakku
- Tutorial conducted by Prof. SN Arseculratne
- Meeting with the academic staff
- Meeting with the non academic staff
- Meeting with students of both old and new curriculum

Annexure 5 – LIST OF FACILITIES OBSERVED

- Student practical laboratory
- Diagnostic laboratory and its equipment
- Research laboratory with its equipment
- Class rooms and lecture theatre

Annexure 6 – LIST OF DOCUMENTS OBSERVED

- Examination procedures – responsibilities, schedules, eligibility criteria etc.
- Guidelines for evaluation
- Item analysis of MCQ's, Examination results – mark sheets
- Notices to students
- Question papers and answer scripts
- Handouts, lecture notes, objectives (old curriculum), Tutorial topics
- List of recommended text books, Instruction sheets for practical work
- Handouts for practicals – microscopy, staining smear preparation, clinical histories for specimens
- Quality of students including student progress and achievements
- Analysis of examination performance
- Feedback forms by students and peers from the Department of Parasitology
- Information on Postgraduate Studies- MPhil, MSc students, research topic, links with other institutions