Infection and Immunity module workbook

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Infection Unit Timetable

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Introduction to the Unit Introduction to Infection	Lecture An Infection Model	Lecture Acute sepsis in the Emergency Department	Lecture Hospital acquired infections	Lecture Travel-related infections	Lecture Blood borne viruses	Lecture Infections on surfaces	Lecture Infection prevention	Lecture Chronic Infections	Lecture The Immunocompromised host	
Group work	Group work	Group work	Group work	Group work	Group work	Group work	Formative Assessment	Group work	Group work	Group work Presentations
Lecture Introduction to microbes	Lecture Anti microbials and resistance	4:30pm Innate Immunity Lecture	Lecture Interactive case studies	Lecture Adaptive Immunity Lecture	Lecture Review and preparation for Week 11	Lecture Allergy	Lecture Antimicrobial stewardship	tbc	Lecture Clinical examples of infections in immunocompromised hosts	Wrap-up session

Introduction

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Aim

The term "Infection" covers a large topic that is of central importance to the practice of medicine in all specialities. It crosses many boundaries, both in terms of understanding the relevant basic science and in the clinical application of this knowledge. It is not possible to cover all of this material in a single unit; and there is no intention of doing so.

As a consequence of the above paragraph the aim of this unit is to provide a structure for a student to consider a patient who presents with a possible infection. Material will be presented in a clinical context and will seek to identify patterns of disease and presentation. We have chosen a limited number of clinical problems and for each identified selected micro-organisms. Each is chosen to highlight principles of microbial physiology with links to a common 'infection model'.

The 'infection model' will be used in different contexts so that your knowledge of how to apply this model will grow as the semester progresses.

Understanding the patient-pathogen interaction is an important first step in the infection model. This will also allow for a progressive accumulation of knowledge of how the body responds to infection and the role of the immune system.

Learning During the Infection Unit

The teachers running the Unit are all involved in looking after patients with infections on a daily basis.

'Infection' is potentially complex, with a risk that the amount of information hinders an understanding of some simple core principles.
We will start the Unit by outlining a clinical approach to a patient who may have an infection. We will provide you with an 'infection model'. As the weeks proceed we will add to this model and cover relevant microbiology and immunology. BUT on every occasion this is done within the context of the infection model.

It will only be at the end of the Unit that you will be able to appreciate the microbiology and immunology that has been covered. Indeed, it is likely that in the early sessions you will be acutely aware of the gaps in your knowledge. This is deliberate. The challenge for you, the learner, is to understand this balance and to begin a process of seeking out information. The more you are willing to do this the greater will be the control you have over your own learning and the more likely it will be that the information will be something that you are able to retain and take with you into the clinical years.

The approach to the teaching is to ensure that at the end of the Unit you have a basic knowledge that is useful. Our preference is to cover less material but to make sure the information is both relevant and provides you with a pattern and way of thinking that you can use for any patient with an infection. As an example, we do not expect you to know every bacteria or recognise all their names. But we do expect you to have a clear understanding of some common or important bacteria and be able to relate them to patterns of infection that you can describe in reasonable detail. As with the knowledge of microbial physiology and host immunology this list of micro-organisms will grow throughout the Unit.

More importantly, you will come across infections and micro-organisms in other Units. We hope you will have a framework for bringing all of this information together.

The Unit has been modified for 2015 based on student feedback. We have a set of 'core' lectures early in the Unit to help guide your learning. We have clarified the learning outcomes. We have produced a summary of all 'infection' teaching in Phase 1 (including the systems-based Units) to help with learning and revision.

Summary of Intended Learning Outcomes

On completion of this unit students should be able to:

- Describe the principles of the infection model
- Describe the 'microbial world' and key features of bacteria, viruses and fungi. By the end of the Unit you should be able to identify important and/or common examples of microbes and the diseases they cause. You should link the principles of infection outlined within this Unit to the infections described in the systems-based Units.
- Describe a clinical approach to gathering information to evaluate a patient with a possible infection and to use the principles of pathogen/patient/person/place to consider a diagnosis of infection.
- Describe the patient - pathogen interaction for a range of clinically important infections
- Describe the use of laboratory investigations to aid in the diagnosis of infection, and to interpret common and important results for a patient with a possible infection
- Describe the principles of managing a patient with infection, both with reference to general measure of support and specific anti - microbial treatment. Describe the principles of antimicrobial stewardship. Note: Antimicrobial agents will be further considered in the Clinical Pharmacology Unit
- Describe important issues linked with hospital - acquired infections; including how these are investigated and managed.
- Describe the role of the doctor and allied health professionals in the prevention of infections. To further describe additional specific measures to prevent infections.
- Outline the principles of the epidemiology of infective diseases and contrast infections acquired in different settings, including travel - acquired infections.
- Describe the response of the body to infection utilising the innate and acquired (adaptive) immune system in a range of clinical infections. To further describe the infective consequences of an immune system that functions inappropriately, including patients who are immunocompromised.

Assessments and Assessment Methods

Formative:

There is one formative assessment which will be conducted in session 8.

Summative:

This unit will be assessed on the basis of satisfactory attendance and also in End of Semester Assessments (ESAs) from semester 3 onwards through the remainder of the course, including the Primary Professional Examination, the Intermediate Professional Examination and the Final Professional Examination.

Reading

The recommended textbook is:

Lippincott's Illustrated Reviews: Microbiology. (Third Edition 2013), Harvey, RA, Cornelissen, CN, Fisher, BD.

This is an excellent textbook and will be of value throughout your course. Each chapter is relatively short with a clear layout and useful pictures and diagrams. We especially like the first seven chapters which covers all you need to know about microbial physiology and the principles of diagnosis of an infection. There are sections at the back of the book that cover a systems-based approach to infection: e.g. Urinary Tract Infection, etc. There are separate chapters for individual micro-organisms and you can look at these selectively.

Other textbooks that can be used include:

- *Infectious Disease; Pathogenesis, Prevention and Case Studies* -N. Shetty, J.W. Tang, J. Andrews. Wiley-Blackwell. A combined clinical and microbiological approach to infections

- *Medical microbiology and infection at a glance* - Stephen Gillespie and Kathleen Bamford (for a quick overview of the subject)

- *The viral storm* - Nathan Wolfe (for entertainment as well as educa