



ROYAL AUSTRALASIAN COLLEGE OF DENTAL SURGEONS
Incorporated

GUIDE FOR STUDY
FOR
THE SUBJECTS OF
THE PRIMARY EXAMINATION

Royal Australasian College of Dental Surgeons
64 Castlereagh Street, Sydney, NSW, 2000, Australia

March 2007

PREFACE

THIS INFORMATION HAS BEEN COMPILED IN ORDER TO ASSIST CANDIDATES IN THEIR PREPARATION FOR THE EXAMINATION.

READING LISTS ARE PREPARED AND PUBLISHED AS A SEPARATE GUIDE. CANDIDATES SHOULD ENSURE THAT THEY HOLD THE LATEST COPIES SINCE MODIFICATIONS ARE MADE FROM TIME TO TIME.

IT IS NOT REQUIRED THAT ALL BOOKS LISTED SHOULD BE READ, RATHER THAT CANDIDATES MAY SELECT THOSE WHICH ARE READILY ACCESSIBLE TO THEM.

JOURNALS RECOMMENDED SHOULD BE USED.

ANATOMY

Updated by John McGeachie, 26 February 2007

Head and Neck

Candidates will be expected to demonstrate a detailed knowledge of the anatomy of the head and neck, including that of the skull and the vertebral column.

Particular emphasis will be placed on the anatomy of the oral cavity, the infra-temporal region, pharynx and larynx, anatomy related to functions of the mandibular mechanism, swallowing, neck movements and posture.

Neuroanatomy

Candidates should possess a general knowledge of the morphology of the brain and spinal cord, and detailed knowledge of the functional components of the cranial nerves, their branches and the central connections of those components. Particular emphasis will be placed on the Trigeminal, Facial and Hypoglossal nerves. An understanding of the embryology of the nervous system is also helpful.

Thorax

A general knowledge of the contents of the thoracic cavity is required, together with knowledge of the cardio-pulmonary circulation.

Dental Anatomy and Embryology

Candidates should be thoroughly familiar with the morphology of the dentition and be able to identify precisely individual teeth. Precise knowledge of normal occlusal relationships and of the chronology of dental development is required also.

General knowledge of facial development in the embryo and of the derivatives of pharyngeal arches and pouches is expected.

HISTOLOGY

In general, candidates will be expected to have a knowledge of the structure of the basic tissues both at the level of light microscopy and electron microscopy.

The major effort should, however, be concentrated on the more specialised oral and dental tissues. Of particular concern should be:

1. The structure, development and functional changes of the teeth and the component tissues - enamel, dentine, pulp and cementum.
2. The structure of the periodontium.
3. The specialisations of the oral and nasal mucosa.
4. The structure and the products of the salivary glands.
5. The structure and functional adaptation of the temporomandibular joint.

The essence of study should be the relation of structure to function and the implications for the oro-dental clinician.

PHYSIOLOGY

A knowledge of human physiology above the level normally expected of a undergraduate dentistry student is required. Particular emphasis should be placed on understanding the general physiological mechanisms that are especially relevant to dentistry. A detailed understanding of less-relevant topics such as the special senses or reproductive physiology is not expected.

Areas of special emphasis should include:

- Major physiological control systems, including the autonomic nervous system and the endocrine system
- Adaptation to “stress” in the broadest sense
- Sensory physiology with emphasis on pain
- Control of the masticatory system
- Autonomic physiology and pharmacology
- Respiratory and cardiovascular physiology
- Haemorrhage and shock
- Physiological principles of drug action, particularly local anaesthesia

Candidates will be expected to be able to apply their knowledge of fundamental mechanisms of physiology to clinical situations that are related to the care of their patients, including diagnosis and treatment, as well as to management of dental patients who have relevant general medical conditions.

CELL BIOLOGY & BIOCHEMISTRY

Candidates are expected to have a knowledge of the applications of Biochemistry, Molecular Biology and Cell Biology to the study of Dental Science that is at least as extensive as their knowledge of the topics covered in their undergraduate degree, but with particular focus on the areas listed below. Candidates should use the detailed learning objectives listed with each chapter of the lecture notes as an indication to the depth of learning.

Nutrition

Candidates should be aware of the general principles of nutrition, especially in relation to the effects of nutrition on human health and disease.

Cell Biology

Candidates should be able to:

- Describe the cell cycle and its regulation, and discuss how this regulation is deranged in cancer cells.
- Appreciate the processes of differentiation and morphogenesis.
- Discuss the potential applications as well as technical difficulties of using stem cell therapy, especially in relation to the dental setting.
- Describe the process of cell signalling, particularly the common pathways outlined in the learning objectives to Chapter 3.
- Appreciate how drugs that interact with cell signalling pathways can be used therapeutically.

Metabolism

Candidates should be able to:

- Give an overview of the catabolic, energy generating pathways of metabolism.
- Appreciate how metabolism is regulated in the fed, fasted and diabetic state and describe the changes that occur in metabolic regulation in response to trauma or injury.
- Appreciate the role of the pentose phosphate pathway in both generating and protecting against reactive oxygen species.

Gene regulation and protein structure

Candidates should be:

- Familiar with the processes of DNA replication, transcription and translation.
- Familiar with the use of techniques such as PCR and DNA microarrays to study the regulation of gene expression.

- Appreciative of how protein structure is determined and how an understanding of these principles is important in rational drug design.

PATHOLOGY

It is not difficult to suffer from "information overload" while attempting to study Pathology. To avoid this, candidates should remember that a satisfactory performance in the examination in Pathology does not require that they amass a huge quantity of information. More important is their ability to demonstrate they have reached the stage where they can make scientifically informed decisions rather than empirical judgements. In practical terms, candidates presenting for the examination should be able to demonstrate:

- an understanding of processes in Pathology (i.e. the sequence of events and the mechanisms involved) and
- the ability to apply this knowledge to problems encountered in clinical practice.

Specifically, the examination will focus on the fundamental mechanisms of disease i.e. the subject matter conventionally referred to as General Pathology. Candidates will thus be expected to demonstrate knowledge of:

- acute and chronic inflammation and their possible outcomes
- the role of the normal immune response and its contribution to inflammatory lesions
- healing in injured tissues (including specialised tissues such as bone and peripheral nerves) and factors that might interfere with normal healing
- normal haemostasis and factors that might affect this process
- mechanisms of vascular disease
- characteristics of neoplasms and the mechanisms of emergence of neoplastic cell populations.

Candidates will be required to explain how these processes account for the development of lesions and clinical manifestations, both in oral diseases and in relevant systemic disorders as listed in "Suggested Reading".

MICROBIOLOGY

On presentation to the Primary Examination, candidates should be able to

Appreciate

- The varying nature of infectious agents
- The range of techniques used for diagnostic microbiology
- The varying growth requirements of bacterial species in the oral cavity
- The principles of disease transmission in the oral cavity and the dental environment
- The ecological determinants of the oral flora
- The protective immune response to infective agents, including the role of both humoral and cellular aspects of the immune system
- The principles and application of vaccination
- Side effects of commonly prescribed antimicrobial agents

Understand

- The role of bacteria in the aetiology of diseases of the oral cavity
- The management of dental infections using microbiological principles
- The use of salivary diagnostics and caries activity tests in clinical patient care
- The differing mechanisms of disease causation with bacteria, fungi, viruses and prions
- Principles of instrument recirculation
- The mechanisms of operation and limitations of commonly used sterilisation methods
- The role and interpretation of quality assurance tests for sterilisation

Describe

- The formation of biofilms, including dental plaque
- The role of oral bacteria in systemic diseases such as infective endocarditis
- Protocols for antibiotic cover
- The role and selection of disinfectants in clinical dentistry
- The mechanism of action of common classes of antimicrobial agents
- The clinical manifestations of infections of the oral cavity
- Oral lesions associated with immune suppressed states such as AIDS
- Pathways of the spread of infection involving inanimate surfaces in the dental surgery
- Clinical follow up for a sharps injury from a patient with a blood-borne viral infection

Amended March 2007

[Ref: Regulation/Primary – Guide to Study 2007]