



ROYAL AUSTRALASIAN COLLEGE OF DENTAL SURGEONS
Incorporated

**GUIDE TO STUDY
FOR
THE SUBJECTS OF
THE PRIMARY EXAMINATION**

**Royal Australasian College of Dental Surgeons
Level 13, 37 York Street, Sydney, NSW, 2000, Australia**

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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 2008

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. Specific emphasis will be placed on the Trigeminal, Facial, Glossopharyngeal, Vagus 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 general knowledge of the cardio-pulmonary circulation.

Dental Anatomy and Embryology

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

Embryology: A general knowledge of the development of the embryo, facial development, 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

(updated by David Powis, March 2009)

A knowledge and understanding of human physiology above the levels expected of an undergraduate dentistry student is required. During study particular emphasis should be placed on understanding the physiological concepts and principles that are especially relevant to dentistry. A detailed understanding of less dentally-relevant topics, such as the special senses or reproductive physiology, is not expected.

Areas of special emphasis include:

- Physiological control systems, including the autonomic nervous system and the endocrine system
- Homeostasis and the body's response to "stress"
- Sensory physiology with an emphasis on nociception and pain perception
- Muscle physiology, particularly as it relates to mastication
- Saliva and salivation
- Autonomic physiology and pharmacology
- Respiratory physiology
- Cardiovascular physiology and body fluid balance
- Haemorrhage and shock
- Physiological principles of drug action, particularly as they relate to analgesia and local anaesthesia

Candidates will be expected to be able to relate their knowledge of fundamental mechanisms of physiology to clinical situations concerned with the care of their patients, not only to basic diagnosis and treatment, but also to management of dental patients who have pre-existing general medical conditions or who experience medical problems while undergoing dental treatment.

CELL BIOLOGY & BIOCHEMISTRY

Updated by P Dunkley, 27 February 2008

Candidates are expected to have knowledge of the general principles and application of Nutrition, Biochemistry, Molecular Biology and Cell Biology to the study of human health and especially 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 be aware of and be able to discuss:

A) The effects of diet, exercise and trauma on metabolism

1. Chemical nature of the macronutrients and micronutrients; including carbohydrates, proteins, fats, water soluble vitamins, fat soluble vitamins and the major minerals including calcium, iron and zinc
2. Sources of and dietary guidelines for the macronutrients and the micronutrients
3. Processes of digestion and absorption of nutrients, with special emphasis on the role of the oral cavity
4. Functions of the macronutrients and the micronutrients
5. Normal metabolism of the macronutrients during the fed and fasted states
6. Effects of exercise and trauma on macronutrient and micronutrient metabolism
7. Biochemical and clinical consequences of decreased or increased macronutrient and/or micronutrient intakes

B) The control of metabolism (Endocrine and Signal Transduction Biochemistry)

8. Chemical nature of the water and fat soluble hormones
9. Mechanisms of action of these hormones including their synthesis, secretion, transport, receptors types and degradation
10. Signal transduction mechanisms including receptors, ion channels, second messengers (calcium and cyclic nucleotides), protein kinases and phosphatases, structure-function relationships of proteins, reactive oxygen species, lipid signal and transcription factors
11. Normal functions of the hormones
12. Biochemical and clinical consequences of altered hormone action, with particular emphasis on NIDDM and IDDM, thyroid disease and other endocrine disorders relevant to clinical practice

C) Cell division, growth, differentiation and death (Molecular and Cellular Biology)

13. DNA replication, transcription and translation, and how these events play a role in recessive and dominant inheritance
14. Normal processes of cell division, growth, differentiation and death
15. Control mechanisms for cell division, growth, differentiation and death including pharmacological controls
16. Modern techniques of molecular and cellular biology and especially cloning, PCR, DNA microarrays, gene therapy, stem cell therapy and pharmacogenomics
17. Biochemical and clinical consequences of genetic, cellular and molecular abnormalities, with particular emphasis on cancer and other disorders relevant to clinical practice

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 2009