

MODULE I

Surgical Sciences and Principles

PLASTIC & RECONSTRUCTIVE SURGICAL SCIENCE & PRINCIPLES

1/4/06

PREAMBLE

- The examination for this module is to be sat in October during the first year of advanced training and must be passed before sitting the Final Fellowship Exam. Failure to pass by October of the 3 year of advanced training will result in the trainee being not being permitted to proceed to 4th year training.
- It will be held at the same time as the BST exam by RACS throughout Australasia (October only).
- Time and format: will consist of two 2 ½ hour exams with 100 True/False multiple choice questions. Each question will have 5 parts (See example).
- Successful applicants to advanced training in Plastic and Reconstructive Surgery will be given notice of the curriculum, reading list and date of the exam on acceptance to the programme.
- The reading list will be reviewed and possibly revised on an annual basis prior to notice being given to new trainees entering advanced training. Any changes will not affect the exam until November the following year.
- It is expected that trainees will have completed one third of the study before they commence their 1st year. Regular reading (about 15 hours per week) of the recommended texts as well as reading relevant to daily clinical workload prior to the October exam will ensure that the exam will be passed by the vast majority of trainees at their first attempt.

CORE TEXTS

The questions will largely be taken from the sections of these texts dealing with basic science, anatomy, general patient care and surgical principles. Detailed surgical management learnt during advanced training will be examined in the Final Fellowship exam.

1. Plastic Surgery - Indications, Complications and Outcomes - Vol 1, B. Achauer, Editor (Mosby 2000). \$380

OR

Plastic Surgery – Vol 1 (General Principles), S. Mathes and V. Hentz, Editors (Saunders Dec, 2005), ISBN 0721688128

\$370. It is anticipated that most Trainees will choose to obtain a set containing all eight volumes.

Please note that questions from either of these two texts will be quite general and those candidates using Achauer will not be disadvantaged.

2. Plastic Surgery Secrets - 1999 – J. Weinzwieg (Hanley and Belfus 1999) \$124
3. The Management of Cutaneous Melanoma - Clinical Practice Guidelines - 1999 NHMRC <http://www.health.gov.au/nhmrc/publications/synopses/cp68syn.htm> call toll free 132 447
4. Non-Melanoma Skin Cancers - Clinical Practice Guidelines - 2003 NHMRC <http://www.nhmrc.gov.au/publications/synopses/cp87syn.htm> call toll free 132 447
5. Fundamental Techniques of Plastic Surgery - 10th Ed, A.D. McGregor & I.A. McGregor (Churchill-Livingston 2000) \$180
6. Last's Anatomy, Regional and Applied – R.M.H. McMinn 9th Edition (= RACS preferred edition) (Churchill-Livingston 1998 reprinted 2003) \$149
7. Basic Science for Surgeons – L.C. Argenta, Editor (Saunders 2004) \$92
8. Examination of Hand and Wrist. – R. Tubiana et al (Martin Dunitz 1996) \$104
9. Fractures of the Facial Skeleton P. Banks and A. Brown (John Wright 2001) \$104

OTHER SUGGESTED TEXTS

1. Antibiotic Therapeutic Guidelines – 2003 Version 12 www.tg.com.au
2. Infection Control in Surgery - 1998 – RACS
http://www.surgeons.org/Content/NavigationMenu/WhoWeAre/ReportsandPublications/Publications/Infection_Control.pdf
3. Grant's Atlas of Anatomy - JE Anderson
4. Grant's Method of Anatomy
5. Gray's Anatomy
6. Anatomy - A Regional Atlas of the Human Body - CD Clemente
7. Integrated Basic Surgical Science J.Toouli et al (Arnold 2000) - chapters relevant to surgery in general and Plastic Surgery (This is also the text for the main surgical science in the Part 1 exam)

COURSE OUTLINE

C = congenital and paediatric
I = inflammatory and infection
T = trauma
N = neoplastic
D = degenerative
A = aesthetic
P = procedures and techniques

Surgical Science

- Biomechanics of skin, soft tissue, bone
- Wound healing – skin, tendon, nerve, cartilage, muscle, bone
- Distraction osteogenesis and tissue expansion
- Graft healing – skin, tendon, nerve, cartilage, muscle, fat
- Pathological wound healing – eg scarring, keloid, stretching, steroids, radiotherapy, smoking
- Growth and puberty
- Aging – normal and abnormal
- Physiology of microcirculation, flaps
- Delay phenomenon
- Pathology of flap failure and no-reflow
- Alloplastic materials
- Tissue engineering, skin substitutes
- Statistics, research methodology, literature searches, critical assessment of publications
- History of Plastic and Reconstructive Surgery

Clinical Care

- Resuscitation and early management of burns and trauma
- Preoperative assessment for surgery
- Body mass index, co-morbidities, smoking, pre-operative assessment
- Anaesthesia – local, regional, agents, problems, doses, resuscitation from overdose
- Relevant areas of GA
- Care and protection of the anaesthetized patient
- Perioperative care and analgesia
 - Fluids and electrolytes, acid/base
 - Monitoring of flaps
 - Respiratory care
 - Endocrine disorders affecting surgical management
 - Paediatric (drug doses, fluid and nutritional management)
- Postoperative pain management
- Principles of chronic pain management
- Blood transfusion
- DVT, PE, anticoagulation
- Bleeding and clotting problems in surgery
- Burn and trauma management (facial, hand and lower limb specifically)
- Wound management
- Skin malignancy
- Clinical photography
- Medical imaging
- Ethics and law
- Informed consent
- Medicolegal risk management
- The risky aesthetic surgical patient
- The dissatisfied aesthetic surgical patient
- Risk management
- Quality assurance and surgical auditing
- Continuing education
- Surgical record-keeping

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| <ul style="list-style-type: none"> ▪ The role and responsibilities of the Registrar ▪ Psychology, psychiatry and counselling ▪ Multidisciplinary management | |
| Pathology <ul style="list-style-type: none"> ▪ Skin, oral cavity, salivary glands, breast, limb Epidemiology Carcinogenesis Pathology of benign and malignant lesions Metastatic spread especially cervical, axillary and groin nodes ▪ Genetics in Plastic & Reconstructive Surgery ▪ Specimen handling and processing, histopathology processing. Markers ▪ Pathology of congenital anomalies – vascular anomalies, haematomas, cleft, craniofacial, hand ▪ Physiology and pathology of surgery, trauma, burns (thermal, electrical, chemical) ▪ Infection, antibiotics and sterilisation ▪ Infectious diseases of importance to surgeons ▪ Sepsis and septic shock ▪ Principles and effects of radiotherapy and chemotherapy ▪ Principles of transplantation and immunology ▪ Inflammatory and autoimmune disorders ▪ Principles of other pathological processes such as Dupuytren's and other fibromatoses, lymphoedema, ulceration (decubitus, lower limb, etc) | N C/N N C T I I I N I/D D/N |
| Anatomy <ul style="list-style-type: none"> ▪ Anatomy relevant to Plastic & Reconstructive Surgery (all, except the brain and viscera of chest and abdomen) ▪ Embryology and developmental biology of limbs, hands, head and neck – including face, ears, mouth, craniofacial area ▪ Histology of skin and other relevant tissues eg nerves, blood vessels, etc ▪ Developmental anomalies ▪ Aesthetic norms – 'normal' aesthetic measurements and appearances in various racial groups | C A |
| Basic Surgical Techniques in Plastic & Reconstructive Surgery <ul style="list-style-type: none"> ▪ Excision and debridement ▪ Suturing techniques ▪ Sutures ▪ Dressings, drains and splints ▪ Skin graft types and techniques ▪ Flap types and techniques including flap geometry design and practical application ▪ Repair of vessels, nerves, tendons ▪ Open reduction and internal fixation (hand and craniomaxillofacial), external fixation ▪ Operating room equipment (including diathermy, laser, microscopes, liposuction, etc) and instruments | P P P P P P P/T P/T P |

PLASTIC & RECONSTRUCTIVE SURGICAL SCIENCE & PRINCIPLES MULTIPLE CHOICE EXAM SAMPLE QUESTIONS

This is first of two 2 ½ hour exams, each with 100 True/False multiple choice questions. Each question will have 5 items consisting of statements which relate to the main question. You are to mark whether each of these statements, A to E are TRUE or FALSE using a pencil to fill in the T or F ovals the answer sheet. If you change your mind, erase your first mark and make a new mark. Make no stray marks.

Question No. 1 The superior orbital fissure

- A: separates the greater and lesser wings of the sphenoid
- B: lies between the optic foramen and foramen lacerum
- C: transmits the ophthalmic division of the trigeminal nerve
- D: transmits 2 of the 3 motor nerves to the extraocular muscles of the orbit, only the abducens nerve does not pass through the fissure
- E: transmits the inferior ophthalmic veins to the pterygoid plexus

Reference: P.149 Plastic Surgery Secrets

Question No. 2 Merkel cells

- A: can be detected by light microscopy
- B: are thought to be pressure receptors
- C: are thought to be of neural crest origin
- D: are found in the basal layer of the skin
- E: are connected to neighboring keratinocytes by desmosomes

Reference: Plastic Surgery Indications, Operations, and Outcomes, Volume One, Achauer, P.25

Question No. 3 The thyroglossal duct

- A: originates from the endoderm of the floor of the pharynx
- B: originates at the foramen caecum
- C: passes caudally in front of the hyoid bone
- D: gives rise to the thyroid gland which buds from the distal end
- E: remnants include branchial cysts and sinuses

Reference: Last's Anatomy Regional and Applied, 9th Edition, P. 39

Question No. 4 The thoracodorsal nerve

- A: is the nerve to serratus anterior muscle
- B: runs down the posterior axillary wall , across the lower border of teres major and enters the deep surface of the muscle it supplies
- C: is a branch of the posterior cord of the brachial plexus
- D: is easily damaged during axillary lymph node dissection causing winging of the scapula
- E: finishes with a cutaneous branch to the shoulder skin

Reference: Last's Anatomy Regional and Applied, 9th Edition, P. 68

Question No. 5 The theory of selective photothermolysis explains why

- A: the ideal laser pulse width should equal the thermal relaxation time of the target tissue
- B: laser energy absorption by tissue is independent of laser wavelength
- C: undesirable tissue damage is minimized by the choice of appropriate laser pulse width
- D: it is best to warm the skin to 38 degrees C prior to laser treatment of vascular lesions
- E: the best clinical result is obtained if laser energy is widely dissipated in the skin

Reference: Plastic Surgery Indications, Operations, and Outcomes, Volume One, Achauer. P.189

Question No. 6 With respect to Z plasty

- A: the central limb is placed along the scar to be lengthened which is usually tight
- B: angles may vary from 30 to 90 degrees
- C: this relies on tissue laxity being available parallel to the scar being lengthened
- D: greater Z plasty angles deliver less lengthening of the scar
- E: limbs of a Z plasty should follow skin creases where possible

Reference: Plastic Surgery Secrets P.10

Question No. 7 Burn injuries have the following effects

- A: elevated catecholamine production which is the major mediator of the hypermetabolic response
- B: a systemic response of various organs which occur in a biphasic pattern of early hyper-function followed by late hypo-function
- C: a raised metabolic rate which returns to normal once the burn wounds are excised and grafted
- D: circulatory levels of immunoglobulins are depressed
- E: a significantly higher metabolic expenditure in children

Reference: Plastic Surgery Secrets P. 398 - 400

Question No. 8 Cutaneous squamous cell carcinoma can arise related to

- A: long-term healed scars
- B: immunosuppression
- C: UV irradiation
- D: IV drug usage
- E: dementia

Reference: Clinical Practice Guidelines. Non-melanoma skin cancer: Guidelines for treatment and management in Australia 2002 P.11

Question No. 9 For melanoma, therapeutic lymph node dissection for proven lymph node metastasis

- A: can give a 10 year survival rate of 50% if one node is involved
- B: can give a 10 year survival rate of 30% when 2 or 3 nodes are involved
- C: always has a poor survival outcome
- D: is contraindicated in the presence of systemic metastases
- E: eradicates the risk of systemic metastases

Reference: Clinical Practice Guidelines. The management of cutaneous melanoma. 1999 P. 28

Question No. 10 Concerning the collagen content of skin and wounds

- A: type III collagen is the most abundant type in normal dermis (approx. 90%)
- B: type II collagen is actively secreted by fibroblasts in early wound healing
- C: type I collagen becomes the predominant fibroblast product by week 2 of wound healing
- D: during remodelling, type I collagen is replaced by type III collagen
- E: the initial pattern of collagen deposition in wounds is random

Reference: Plastic Surgery Secrets P