

# MODULE 4

## Hand, Upper Limb & Microsurgery

# HAND, UPPER LIMB AND MICROSURGERY

15.02.05

Preamble - Objectives and Outcomes

ALSO SEE [OVERALL PREAMBLE](#) (hypertext link on webpage)

At the time of presentation for the Final Fellowship Examination the candidate should have a thorough understanding of all aspects of general and specific management of the hand and upper limb. The principles and practice of microsurgical repair and reconstruction applied to all regions should be mastered. Candidates wishing to pursue a practice largely focussing on hand surgery should proceed to an appropriate fellowship.

The graduating trainee will be able to:

- Safely and effectively perform appropriate surgical procedures
- Consistently demonstrate sound surgical skills
- Demonstrate manual dexterity and binocular hand-eye co-ordination required to carry out microsurgery
- Design and carry out effective management plans
- Select and organise appropriate diagnostic testing as needed
- Accurately interpret imaging
- Effectively manage the care of patients with severe and acute trauma
- Communicate information to patients about procedures, alternatives, and risks associated with surgery in ways that encourage their participation in informed decision making
- Maintain accurate and comprehensive records
- Work in collaboration with members of an interdisciplinary team co-ordinating appropriate hand therapy and rehabilitation

In the following module the material required is presented under the headings of “Revisional Knowledge”, “Core Knowledge” and “Outline Knowledge”.

“**Revisional Knowledge**” should have been largely covered in preparation for the Plastic & Reconstructive Surgical Science and Principles examination, but continued revision and updating throughout clinical training is required.

“**Core Knowledge**” is the material, which will be required to be known in detail for the Final Fellowship Examinations and to practice Plastic & Reconstructive Surgery in general.

“**Outline Knowledge**” is material of which the principles need to be understood, but a detailed knowledge, such that the trainee would be expected to manage the conditions on their own is not required. To practice in these areas would generally require further training such as a 1 to 2 year post FRACS fellowship with a dedicated hand surgery unit either within Australasia or overseas.

Reading material will be presented, but cannot be all encompassing, nor can the material listed in the curriculum modules. Plastic & Reconstructive Surgery is an evolving and changing area and trainees are required to read widely in the literature and keep up with recent events.

Most topics within this module are allocated to one of the following largely “pathological” groupings

## **Coding Used:**

- A = Aesthetic
- C = Congenital and Paediatric
- I = Inflammatory and Infection
- N = Neoplastic & Tumours
- D = Degenerative Conditions
- P = Procedures and Techniques
- T = Trauma

A thorough grasp of the anatomy, physiology and pathophysiology is required for each topic.

## Recommended Reading

### Core Texts

Plastic Surgery - Indications, Complications and Outcomes - Vol 4, B Achauer, Editor, Mosby, 2000

Operative Hand Surgery 2 Vol set 5th Ed. Green, Hotchkiss, Pederson and Wolfe Churchill-Livingston 2005  
ISBN 0443066264 Price Approx \$ 685

### Other Resources

Examination of the Hand and Wrist, R. Tubiana, Martin: Dunitz, 1998 Approx Price \$104

Lister's The Hand: Diagnosis and Indications P. Smith. Churchill-Livingston 2001 ISBN 0443064164 Approx  
Price \$ 304

Journal of Hand Surgery (American and Europe)

Hand Surgery (Asia-Pacific journal)

Hand Clinics

There are many other good hand and upper limb texts available

## Delivery of this module

Study of texts and journal articles

Clinical experience including operative management, ward care and consulting clinics

Biannual Registrar's Hand Course (for Plastics, Orthopaedics and General trainees) run by the Australian Hand  
Surgery Society at the time of the Annual General Meeting.

### Other Resources

Local state hand surgical meetings

The Hand Interest Group of the RACS ASC

Visiting clinics and theatre sessions of specialist hand and upper limb surgeons

Tutorial programmes run by state educational committees of the Board in Plastic and Reconstructive Surgery

## Assessment methods used for this module

Multiple choice questions are used for revisional knowledge in the Plastic and Reconstructive Surgical Science  
and Principles Exam (Nov. 1st year)

Consultant assessment and mentor reports throughout training.

Report from the Supervisor of Surgical Training in their region.

Log Book assessment review

Final Fellowship Examination in Plastic & Reconstructive Surgery (Usually May during 4<sup>th</sup> Year), including written  
questions, long and short case clinical examinations, vivas in surgical anatomy and applied anatomy, and  
operative surgery and pathology (7 parts).

## Revisional Knowledge

– Much of the basics in this will have already been covered in the Plastic & Reconstructive Surgery Science  
and Principles Examination. Trainees are required to be able to analyse and appropriately apply the science  
and principles of the following in clinical environments:

- General principles – including history of hand surgery and microsurgery
- Anatomy - anatomical site (e.g. finger, hand ) and system (e.g. nerves, musculo-tendon)
- Bone, cartilage, ligament and tendon physiology and biomechanical properties
- Skin loss – principles of management of minor and major skin loss/degloving. (See skin and  
integument module) T
- Fractures and dislocations – diagnosis and biomechanics and fixation principles T
- Wrist – anatomy and biomechanics.
- Tendon injuries – diagnosis, healing and principles of repair T
- Nerve healing and regeneration. Basic techniques of nerve repair and reconstruction P
- Infection – diagnosis and principles of management of common hand infections. I
- Burns – thermal, electrical chemical and radiation injuries of the hand. (see skin and integument  
module) T

- Dupuytren's contracture – pathology and principles of surgery
- Arthritis – including rheumatoid arthritis, osteoarthritis and other related degenerative and inflammatory conditions. Pathology, clinical assessment
- Tumours – including benign and malignant conditions of soft tissues and bone.

D  
D  
N

#### Microsurgery

- Replantation and free tissue transfer; principles and techniques.
- Pathophysiology of micro and macro circulation.
- Ischaemia- reperfusion injury.
- Principles of perioperative management, including monitoring and anticoagulation.

T/P  
  
P

**Core Knowledge** - A detailed knowledge in these areas will be expected. All trainees are required to be able to diagnose, plan, perform effectively and manage:

- Clinical examination
- Investigation- EMG / nerve conduction studies, bone scan, Ultrasound, Xray, CT, MRI, arthrography, arthroscopy
- Post operative management, hand therapy and rehabilitation.
- Congenital anomalies – classification, assessment and principles of treatment.
- Skin loss – detailed management of minor and major skin loss, including fingertip, avulsions/degloving. (See skin and integument module).
- Fractures and dislocations – diagnosis and surgical indications, surgical approaches, fixation techniques (percutaneous, internal and external) and rehabilitation. Acute and chronic ligamentous injuries. Splinting and casting
- Growth plate and other specific paediatric injuries
- Wrist – biomechanics, diagnosis of congenital, traumatic and degenerative conditions.
- Tendon injuries – diagnosis and management of flexor and extensor tendon injuries. Secondary tendon surgery-grafting, tenolysis, pulley reconstruction.
- Tendon transfers – principles, indications and techniques.
- Nerve and brachial plexus injuries; compressive neuropathies. Neural healing and regeneration. Diagnosis, management, techniques of nerve decompression, repair and reconstruction.
- Compartment syndromes, pressure injection injury.
- Tenosynovitis and stenoses-trigger fingers and DeQuervain's
- Infection – surgical management of common and unusual hand infections.
- Burn injuries – surgical management. (See skin and integument module).
- Dupuytren's contracture – pathology, management and recurrent disease.
- Hand contractures – diagnosis and management.
- Arthritis – including rheumatoid arthritis, osteoarthritis and other related degenerative and inflammatory conditions. Pathology, clinical assessment and surgical treatment. Arthrodesis and arthroplasty.
- Tumours – including benign and malignant conditions of skin, soft tissues and bone. Management of ganglions.
- Miscellaneous conditions such as complex regional pain syndrome, gout, vascular disorders, fingernail abnormalities, lymphoedema (See skin and integument module).
- Replantation revascularization of digits, major limbs, scalp and other parts.
- Free tissue transfer; principles and techniques.
- Regional reconstruction – upper limb, lower limb, head and neck, breast and trunk.
- Nerve repair and grafting, neurotization neurolysis.

C  
T  
T  
T  
TD  
T  
P  
TD  
D  
D  
I  
T  
D  
TDA  
DI  
N  
D  
T/P  
P  
P  
P

**Outline Knowledge** - In this area the principles are required, but not a detailed knowledge such that the candidate would be in a position to manage the condition alone. Therefore, trainees are expected to be able to discuss the outline of management of:-

- Advanced investigation-Arthroscopy, mini C-arm operation. P
- Anaesthesia for upper limb surgery. P
- Congenital and other paediatric anomalies – detailed management of all conditions listed in Swanson’s classification. Growth plate anomalies. C
- Protheses, orthoses including myoelectrical arms, functional electrical stimulation.
- Arthroplasty -biological reconstruction and alloplastic devices. P
- Bioengineering relevant to hands e.g. nerve conduits, growth factors, bone and cartilage culture / substitutes. DT
- External fixation and bone distraction.
- Wrist including distal radio-ulnar joint– biomechanics, detailed ligamentous and articular anatomy. Management of congenital, traumatic (fractures, dislocations and instability patterns), degenerative and avascular (Kienbocks etc.) conditions. P  
TD
- Distal radius and ulnar fractures. T
- Upper limb fractures, dislocations and other conditions e.g. tendon avulsions, ruptures, epicondylitis. T
- Malunion, delayed union and non-union.
- Elbow and shoulder pathology.
- Tendon transfers tenodesis and joint stabilization and other management of nerve and muscle dysfunction. P
- Nerve and brachial plexus injuries; compression neuropathies. Advanced management. Neuroma and chronic regional pain management. Thoracic outlet syndrome and nerve root impingement. DT
- Fingernail pathology, dermatological treatment, surgery. (See skin and integument module). IA
- Upper limb contractures and deformities-Post trauma (including Volkmann’s), brachial plexus palsy, stroke, cerebral palsy quadriplegia, leprosy, polio, neuropathy (e.g. Charcot-Marie-Tooth)
- Thumb, finger and hand construction and reconstruction including non-microsurgical transfers e.g. neurovascular island flaps, groin flaps, pollicization, digital transfer. TA  
P
- Limb transplantation principles T
- Arthritis – including juvenile, psoriatic and other related degenerative and inflammatory conditions. Advanced clinical assessment and surgical treatment. Medical management (Outline knowledge of Rheumatology) D
- Local anaesthetic and steroid injection techniques. P
- Tumours – Detail of rarer benign and malignant conditions of soft tissues and bone. Multi-disciplinary management N
- Miscellaneous conditions such as, autoimmune disorders (scleroderma, SLE), gout, vascular disorders, vibration injuries and epidermolysis bullosa, general medical conditions affecting hands (clubbing, Osler’s nodes, secondary tumours, etc.) D
- Factitious and other psychological conditions. (See skin and integument module). T
- Occupational heath, musician’s hands, workplace assessment and rehabilitation. D
- Medicolegal and impairment assessment and report writing.
  
- Toe to hand transfers. P
- Brachial plexus reconstruction. P
- Microsurgery of infertility. P
- Microsympathectomy P
- Microlymphatic surgery. P