

Training Curriculum
of
Rehabilitation in Orthopaedic Surgery
The Hong Kong College of Orthopaedic Surgeons

Background

Orthopaedics is the medical specialty devoted to the diagnosis, treatment, rehabilitation and prevention of injuries and diseases of the musculoskeletal system. Rehabilitation is always an integral part of orthopaedic management. Significant advancement in recent years especially in spinal injuries, joint replacements, amputations and hand reconstructions has made rehabilitation stand out as a subspecialty of her own in the field of Orthopaedics. This is echoed internationally by the formation of Orthopaedic Rehabilitation Association under the council of musculoskeletal specialty societies of American Academy of Orthopaedic Surgeons.

In Hong Kong, the need of specialist in Orthopaedic Rehabilitation is well reflected by the establishment of Orthopaedic Rehabilitation Unit in the New Territory East Cluster of Hospital Authority in 2001 and the newly appointed Orthopaedic Rehabilitation Consultant in Kowloon Central Cluster.

In response to this world trend of development and increasing local demand, the Hong Kong College of Orthopaedic Surgeons finds herself the most appropriate academic professional body to take up the responsibility of developing this subspecialty by providing training and monitoring the professional standard of this group of specialists.

Objectives

- ◆ To provide training on clinical skill and knowledge in function restoration after orthopaedic surgery
- ◆ To provide training on clinical skill and knowledge in the assessment and management of patients with musculoskeletal disability/handicap and their complications.

- ◆ To set up and monitor subspecialty training program so that upon completion of training, the medical personnel is competent to practice as rehabilitation specialist in orthopaedic surgery and can become a trainer in this specialty
- ◆ To maintain and advise on the professional standard of Rehabilitation in Orthopaedic Surgery
- ◆ To promote leadership of the orthopaedic profession in multidisciplinary rehabilitation teams
- ◆ To promote scientific research and facilitate future development of Rehabilitation in Orthopaedic Surgery

Subspecialty Board

- ◆ The Rehabilitation Subspecialty Board will be formed under the Council of Hong Kong College of Orthopaedic Surgeons
- ◆ The subspecialty board will oversee matters relating to the training. This will include training program, trainers, training centers accreditation and exit assessment/examination.
- ◆ The subspecialty board will monitor related CME programs.

Entry Requirement

- ◆ To be eligible for training, the trainee must have completed the basic surgical training and passed the MRCS examination of the Hong Kong Intercollegiate Board of Surgical Colleges or equivalent as endorsed by the Hong Kong College of Orthopaedic Surgeons.

Program Structure

- ◆ This is a 5-year accreditation course designed for higher specialist training in conjunction with Orthopaedic Surgery

- ◆ The program includes
 1. A minimum of 3 year of Higher Surgical Training in the practice of Orthopaedic Surgery
 2. A minimum of 2 years of Orthopaedic Rehabilitation Subspecialty Training of which at least one year must be taken after obtaining the Fellowship of the Hong Kong College of Orthopaedic Surgeons

- ◆ The Orthopaedic Rehabilitation Subspecialty Training consists of the following parts:
 1. 12 months Basic Orthopaedic Rehabilitation in Departments of Orthopaedics and Traumatology with Rehabilitation facilities accredited by HKCOS under supervision of a Training Director.
 2. 12 months of Advanced Orthopaedic Rehabilitation in Orthopaedic Rehabilitation Units accredited by HKCOS with hands on experience in the rehabilitation of a wide spectrum of orthopaedic conditions, including Spinal Cord Injury and Amputees
 3. Seminars and workshops organized by the HKCOS
 4. Continuous 6-monthly assessment on performance and log book by Training Directors

Exit Assessment

- ◆ Trainee who has satisfied the following requirements will be recommended by the Subspecialty Board to the Council of the HKCOS for accreditation of Specialist in Rehabilitation (Orthopaedic Surgery)
 1. Satisfactory log-book, attitude and clinical performance in the continuous 6-monthly assessment by Training Director throughout the training period.
 2. Satisfactory attendance in seminars and workshops organized by the HKCOS
 3. Obtain Fellowship of Hong Kong College of Orthopaedic Surgeons
 4. Dissertation on a chosen project with direct supervision from Training Director or Director of the Orthopaedic Rehabilitation Unit, leading to publication in an approved journal by HKCOS
 5. Viva assessment in Orthopaedic Rehabilitation

Training Facilities

- ◆ Institution and facilities which have the following components for Orthopaedic Rehabilitation can apply for the status of training centre
 1. Accredited for basic and higher training program for Orthopaedic Surgery
 2. Over 250 Orthopaedic Rehabilitation admission per year on in-patient service
 3. Regular out-patient clinics covering orthopaedic rehabilitation services. Examples of these clinics include spinal injuries, amputations, hand reconstructions, sports injuries and adult joint reconstructions.
 4. Qualified trainers in the trainer trainee ratio of at least 1:2
 5. Presence of multidisciplinary team structure which may include physiotherapist, occupational therapist, prosthetics and orthotics clinical psychologist, medical social worker and orthopaedic specialty nurse.
 6. Regular team meetings and academic meetings

Trainer

- ◆ A specialist in rehabilitation(Orthopaedic Surgery) working in a training centre will be considered as a trainer.
- ◆ A trainer should supervise no more than 2 trainees at any time.

Content

Basic Orthopaedic Rehabilitation

- ◆ **General Orthopaedics Rehabilitation**
 - ◆ Use of orthopaedic walking aids
 - ◆ Wheelchair design and prescription
 - ◆ Use of plaster and traction devices
 - ◆ Principle and practice of bracing and orthotics
 - ◆ Principles and practice of Physical therapy
 1. Use of Physical agents in Orthopaedics
 2. Electrical therapy
 3. Exercise and Manipulation
 - ◆ Work related injuries
 1. Prevention
 2. Chronic pain syndromes and management strategies
 3. Assessment for impairment and activity limitation
 4. Functional Capacity Evaluation
 5. Occupational and ergonomic factors contributing to cumulative trauma disorders
 - ◆ Peripheral Nerve Disorders
 1. Entrapment Syndromes
 2. Traumatic Nerve Injuries
 3. Electro-physiological Evaluation of Nerve Injuries
 - ◆ Arthritis and Joint Disorders
 1. Primary and Secondary degenerative disorders
 2. Inflammatory joint diseases
 3. Osteonecrosis
 4. Osteochondritis
 5. Chondromatosis

6. Neuropathic Joint

◆ Limb Burn Rehabilitation

1. Pathophysiology of :
 - ◆ Acute burn
 - ◆ Scar, keloid formation and hypertrophic scars
 - ◆ Heterotrophic calcifications
 - ◆ Contracture
2. Use of medication
 - ◆ Antipruritic
 - ◆ Topical agents
 - ◆ Steroid
3. Surgical management of Scar contractures
4. Physical therapy
 - ◆ Therapeutic exercise
 - ◆ Pressure therapy

- ◆ **Trauma**

- ◆ **Biology of healing**

1. Anatomy and Biomechanics of bone
2. Primary and Secondary healing of bone
3. Effect of Operative treatment on fracture healing
4. Biology of soft tissue healing with respect to muscle, tendon, nerve and ligaments

- ◆ **Principle of fracture management**

1. Description of fractures
2. Classification of fractures
3. Biomechanics of fractures
4. Internal fixation and external fixation
5. Biomechanics of lateral devices and intramedullary devices

- ◆ **Special Rehabilitation problems in trauma**

1. Hip fracture
2. Polytrauma patient
3. Spinal trauma
4. Osteoporotic fractures
5. Pathological fractures
6. Periprosthetic fractures
7. Reflex Sympathetic Dystrophy
8. Heterotrophic Ossification
9. Burn Injury

Sports Injury

- ♦ **Principle and practice of rehabilitation in sports injury**
 1. Sports Physiology
 2. Muscle strength, flexibility and endurance training strategies
 3. Physiological adaptation to aerobic exercise
 4. Protective bracing and joint stability

- ♦ **Acute and Cumulative/Repetitive Injuries**

- ♦ **Rehabilitation strategies for athletes**
 1. Rotator cuff injuries
 2. Patellofemoral syndromes

- ♦ **Rehabilitation principles after arthroscopic re-constructive surgery**
 1. ACL / PCL re-construction
 2. Patella stabilization procedures
 3. Shoulder stabilization procedures
 4. Ankle and foot
 5. Elbow

- ♦ **Multi-directional Instability of joint**

Adult Joint reconstruction

- ◆ **Biomechanics of joints**
 1. Free body diagram on joint biomechanics
 2. Kinesiology and Kinematics
 3. Biotribology
 4. Design of joint prosthesis
 - ◆ Constrained and Non constrained types
 - ◆ Cemented and Cementless designs
 - ◆ Influence of design on final range of motion

- ◆ **Biomaterials**
 1. Basics of material science
 2. Metals
 - ◆ Iron based alloy
 - ◆ Cobalt based alloy
 - ◆ Titanium based alloy
 3. Polymers
 4. Ceramics
 5. Composites

- ◆ **Rehabilitation after joint replacement**
 1. Hip joint
 - ◆ Stable position
 - ◆ Principle of physical therapy
 - ◆ General program
 - ◆ Gait training
 - ◆ Management of common complications
 2. Knee joint
 - ◆ General program
 - ◆ Pros and Cons of CPM
 - ◆ Post-operation flexion contracture and management
 - ◆ Management of common complications

- ◆ **Rehabilitation of Non-arthroplasty reconstruction of joint**
 1. Arthrodesis
 2. Osteotomy
 3. Acetabuloplasty

Advance Orthopaedic Rehabilitation

Hand Surgery

- ◆ **Functional assessment of hand**
 1. Sensory assessment
 2. Power
 3. Dexterity
 4. Intrinsic and extrinsic hand

- ◆ **Principle of Tendon Rehabilitation**
 1. Tendon healing mechanism
 - ◆ Extrinsic and Intrinsic
 - ◆ Blood supply
 - ◆ Suturing technique and tendon strength
 2. Flexor tendon and extensor tendon
 3. Principle of tendon rehabilitation programs
 4. Rehabilitation program for tendon graft
 5. Rehabilitation program for tendon transfer

- ◆ **Principle of Neurological Rehabilitation**
 1. Post traumatic
 2. Compressive neuropathy
 3. Brachial Plexus injury
 4. Sensory re-education

- ◆ **Principle of Hand Splints**
 1. Dynamic splints
 2. Functional splints
 3. Static splints
 4. Protective splintage

- ◆ **Management of stiff hand and chronic pain**

Prosthetic and Orthotics/Amputees

- ♦ **Lower limb amputation**
 1. Amputations through the foot
 2. Amputations through the ankle
 3. Amputations through the leg
 4. Amputations through the knee
 5. Amputations through the thigh
 6. Amputation(dis-articulation) through the hip
 7. Hemipelvectomy

- ♦ **Upper limb amputation**
 1. Wrist disarticulation
 2. Amputations through forearm
 3. Elbow disarticulation
 4. Above elbow amputations
 5. Shoulder disarticulation and forequarter amputations

- ♦ **Prosthetic Components, Design and Prescription Principles**
 1. Endoskeleton and Exoskeleton
 2. Socket design
 3. Suspension of prosthesis
 4. Single axis knee hinge and polycentric knee design
 5. Prosthetic foot design e.g. energy storing foot design
 6. Myoelectric prosthesis
 7. Computer aided design and manufacture

- ♦ **Pain following amputation**
 1. Neuroma formation
 2. Sudeck's atrophy
 3. Phantom limb
 4. Pressure problem
 5. Gait problem

Spinal Cord Injury

- ◆ **Principle of spine injury and surgical treatment**
 1. Biomechanics of spine fracture
 2. Definition of stability
 3. Classification of spine fractures
 4. Principle and Biomechanics of spine instrumentation

- ◆ **Neurological and Functional classification of spinal cord injury**
 1. Classification according to IMSOP/ASIA
 2. Prognostication of Neurological and functional recovery

- ◆ **Rehabilitation program according to level of injury**
 1. Prevention of deformities
 2. Management of pressure sores
 3. Bladder and bowel management
 4. Balance and transfer
 5. Strategies to gain mobility
 6. Orthotics and walking aids

- ◆ **Management of common complication in SCI**
 1. Thromboembolism
 2. Chronic Pain
 3. Spasticity
 4. Autonomic dysreflexia
 5. Respiratory complications

- ◆ **Secondary surgery**
 1. Upper limb reconstruction
 2. Function electrical stimulation
 3. Tendon transfer

- ◆ **Multi-disciplinary approach**
 1. Psychosocial aspects
 2. Depression
 3. Sexuality Issues
 4. Work and Home modification

- ◆ **Pediatrics Reconstruction Surgery**

- ◆ **Principle of Gait Analysis**
 1. Observation gait analysis
 2. Laboratory gait analysis
 3. Normal and Pathological Gait Cycle
 4. Interpretation of Kinetics and Kinematics Data
 5. Dynamic EMGs
 6. Energy consumption estimations

- ◆ **Rehabilitation problems of Cerebral Palsy Child**
 1. Management of spasticity
 2. Principle of orthotics treatment
 3. Exercise therapy
 4. Gait training after operation
 5. Seating strategies
 6. Choice of Surgical treatment

- ◆ **Rehabilitation of children with amputation**

- ◆ **Other neuromuscular conditions**
 1. Arthrogyrosis
 2. Myelodysplasia
 3. Muscular dystrophies
 4. Poliomyelitis

- ◆ **Limb lengthening**
 1. Soft tissue response to limb lengthening
 2. Biology of bone lengthening and bone transport
 3. Care of external fixator
 4. Psychology of limb lengthening