

THE HONG KONG COLLEGE OF ORTHOPAEDIC SURGEONS

Training Curriculum of Orthopaedic Rehabilitation

Effective from 1 July 2016

(for Trainees admitted from 1 July 2016 onwards)

1. Background

Orthopaedics is the medical specialty devoted to the prevention, diagnosis, treatment and rehabilitation of injuries and diseases of the musculoskeletal system. Since the late Professor Sir Harry Fang was appointed as the first orthopaedic consultant in Hong Kong in the 1960s, rehabilitation has always been an integral part of the work of orthopaedic surgeons. The scope of orthopaedic rehabilitation has been well defined as rehabilitation of musculoskeletal problems due to orthopaedic and non-orthopaedic conditions in adults and children since then. With the advancement of research and technology, orthopaedic rehabilitation, like other orthopaedic subspecialties, has become highly specialized. Orthopaedic Rehabilitation Units, managed by Orthopaedics and Traumatology Departments, have been set up in all clusters of the Hospital Authority. Consultant posts designated for orthopaedic rehabilitation were created in some of these clusters to cope with the need for orthopaedic rehabilitation in Hong Kong.

The Hong Kong College of Orthopaedic Surgeons (the “College”) 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. The First Fellowship of the Subspecialty in Rehabilitation was conferred in 2004. Fellows or trainees of the College, except those eligible for the First Fellowship, will need to complete an Orthopaedic Rehabilitation Training Programme accredited by the College and pass the Exit Assessment to obtain the Fellowship of the Subspecialty in Rehabilitation. In response to subspecialty development and increasing local demand of orthopaedic rehabilitation, the training curriculum was reviewed by the Orthopaedic Rehabilitation Subspecialty Board in 2014.

2. Objectives

- 2.1 To provide training on clinical skill and knowledge in functional restoration after orthopaedic surgery.
- 2.2 To provide training on clinical skill and knowledge in the assessment and management of patients with musculoskeletal impairments, their resultant activity limitation and their resultant participation restriction.
- 2.3 To monitor subspecialty training program so that upon completion of training, the medical personnel is competent to practice as a specialist in Orthopaedic Rehabilitation and can become a trainer in this specialty.
- 2.4 To maintain the professional standard of Orthopaedic Rehabilitation.
- 2.5 To promote leadership of the orthopaedic profession in multidisciplinary rehabilitation teams.
- 2.6 To promote scientific research and facilitate future development of Orthopaedic Rehabilitation.

3. Entry Requirement

- 3.1 To be eligible for training, the trainee must be a Higher Orthopaedic Trainee or a Fellow of the Hong Kong College of Orthopaedic Surgeons.
- 3.2 The registration for Orthopaedic Rehabilitation Subspecialty Training is open in July each year. Trainees intending to join the Orthopaedic Rehabilitation Subspecialty Training should submit their registration on or before the 31st of July each year.
- 3.3 Trainees must pay the annual training fee. The amount of the training fee is decided by the Orthopaedic Rehabilitation Subspecialty Board and be endorsed by the Council of the College.

4. Programme Structure

- 4.1 This is a 5-year accreditation course designed for higher specialist training in conjunction with Orthopaedic Surgery.
- 4.2 The programme includes:
 - 4.2.1 A minimum of 3 year of Higher Surgical Training in the practice of Orthopaedic Surgery.
 - 4.2.2 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.
- 4.3 The Orthopaedic Rehabilitation Subspecialty Training consists of the following parts:
 - 4.3.1 12 months Basic Orthopaedic Rehabilitation in Departments of Orthopaedics and Traumatology with Rehabilitation facilities accredited by the College under supervision of a Training Director.
 - 4.3.2 12 months of Advanced Orthopaedic Rehabilitation in Orthopaedic Rehabilitation Units accredited by the College with hands-on experience in the rehabilitation of a wide spectrum of musculoskeletal condition.
 - 4.3.3 Seminars and workshops organized by the Orthopaedic Rehabilitation Subspecialty Board (as stated in the training outline Appendix).
 - 4.3.4 Continuous 6-monthly assessment on performance and logbook by a Orthopaedic Rehabilitation Subspecialty trainer. Trainees must submit their Training Assessment Form within one month after completing every 6-month session of training. Failure to comply with this rule may result in termination of training.

5. Exit Assessment

Trainee who has satisfied the following requirements will be recommended by the Subspecialty Board to the Council of the College for granting the subspecialty fellowship in Orthopaedic Rehabilitation.

- 5.1 Satisfactory logbook, attitude and clinical performance in the continuous 6-monthly assessment by Training Director throughout the training period.

- 5.2 Satisfactory (at least 70%) attendance in seminars and workshops series for Orthopaedic Rehabilitation Subspecialty Training organized by the Orthopaedic Rehabilitation Subspecialty Board (See Appendix).
- 5.3 Obtain Fellowship of the Hong Kong College of Orthopaedic Surgeons.
- 5.4 Accumulate 60 training points in the 2 years of Orthopaedic Rehabilitation Subspecialty Training.
- 5.5 Dissertation on a chosen project with direct supervision from an Orthopaedic Rehabilitation Subspecialty trainer.
- 5.6 Viva assessment in Orthopaedic Rehabilitation to assess the standard of knowledge, experience and dissertation of the trainee.
- 5.7 Trainees should have their first attempt of Exit Assessment within 5 years of their registration for Orthopaedic Rehabilitation Subspecialty Training.

6. Training Facilities

Institution and facilities which have the following components for Orthopaedic Rehabilitation can apply for the status of training centre.

- 6.1 Accredited for basic and higher training program for Orthopaedic Surgery.
- 6.2 Over 250 Orthopaedic Rehabilitation admission per year on in-patient service.
- 6.3 Regular out-patient clinics covering orthopaedic rehabilitation services. Examples of these clinics include spinal injuries, amputations, hand reconstructions, sports injuries and adult joint reconstructions.
- 6.4 Qualified trainers in the trainer trainee ratio of at least 1:2.
- 6.5 Presence of multidisciplinary team structure which may include physiotherapist, occupational therapist, prosthetics and orthotics clinical psychologist, medical social worker and orthopaedic specialty nurse.
- 6.6 Regular team meetings and academic meetings.

7. Trainer

- 7.1 One must be a fellow in the Subspecialty in Orthopaedic Rehabilitation under the College of Hong Kong Orthopaedic Surgeons to be a trainer.
- 7.2 A trainer has to be assessed and accredited by the Orthopaedic Rehabilitation Subspecialty Board.
- 7.3 A trainer should supervise no more than 2 trainees at any time.

Content: Basic Orthopaedic Rehabilitation

General Orthopaedic Rehabilitation

- ◆ **Use of walking aids**
- ◆ **Wheelchair design and prescription**
- ◆ **Use of plaster and traction devices**
- ◆ **Principle and practice of bracing and orthotics**
- ◆ **Use of technology and innovation in orthopaedic rehabilitation**
- ◆ **Principles and practice of Physical therapy**
 1. Use of Physical agents in Orthopaedics
 2. Therapeutic modalities
 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
 - ◆ Heterotopic 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 tissue 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. Complex Regional Pain Syndrome
 8. Heterotopic Ossification

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 reconstruction
 2. Patella stabilization procedures
 3. Shoulder stabilization procedures
 4. Ankle and foot
 5. Elbow

- ♦ **Joint instability**

Adult Joint reconstruction

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

- ◆ **Biomaterials**
 1. Basics of material science
 2. Metals
 3. Polymers
 4. Ceramics
 5. Composites

- ◆ **Rehabilitation after joint replacement**
 1. Hip joint
 - ◆ Stable position
 - ◆ Principle of physical therapy
 - ◆ Multi-disciplinary rehabilitation program
 - ◆ Gait training
 - ◆ Management of common complications
 2. Knee joint
 - ◆ Multi-disciplinary rehabilitation program
 - ◆ Pros and Cons of CPM (Continuous Passive Motion)
 - ◆ Post-operation flexion contracture and management
 - ◆ Management of common complications

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

Content: Advanced Orthopaedic Rehabilitation

Hand Surgery

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

- ♦ **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. knee joint design
 5. Prosthetic foot design
 6. Myoelectric prosthesis
 7. Computer-aided design and manufacture

- ◆ **Pain following amputation**
 1. Neuroma formation
 2. Complex Regional Pain Syndrome
 3. Phantom limb
 4. Stump problems
 5. Joint contracture
 6. 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. International Standards for Neurological Classification of Spinal Cord Injury (ISNCSI)
 2. Prognostication of Neurological and functional recovery

- ♦ **Rehabilitation program according to level of injury**
 1. Prevention of deformities
 2. Prevention and Management of pressure sores
 3. Cardiovascular management
 4. Respiratory management
 5. Neurogenic bladder management
 6. Neurogenic bowel management
 7. Functional Rehabilitation
 8. Special consideration in mobility aids
 9. Orthotics
 10. Assistive technology, ADL aids and environmental modification
 11. Use of robotics in SCI rehabilitation

- ♦ **Management of common complication in SCI**
 1. Thromboembolism
 2. Neuropathic Pain
 3. Spasticity
 4. Autonomic dysreflexia

- ♦ **Secondary surgery**
 1. Upper limb reconstruction
 2. Function electrical stimulation
 3. Implantable devices

- ◆ **Multi-disciplinary approach**
 1. Psychosocial aspects
 2. Depression
 3. Sexuality Issues
 4. Work and Home modification
 5. Long-term follow-up care of SCI

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. Arthrogryposis
 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