SICOT Training Manual

FOREWORD

Maps and guides are essential to all who seek destinations, who know where they want to go but who need help to get there. All trainees determined to become successful surgeons need similar maps in the form of educational objectives which will help them reach their destinations. Maps, as with educational objectives, must be kept up-to-date when necessary, as new knowledge becomes available. SICOT is dedicated to the improvement of orthopaedic surgery throughout the world. The most certain way of achieving its goal is to help in the education of surgeons. We have borrowed the Educational Objectives of the Canadian Orthopaedic Association to help us in our task. These objectives provide a guide to a basic orthopaedic training or education. They set a standard for trainees to achieve and assure the trainee of an acceptable level of knowledge. They can inform examiners of what a candidate should know at the end of training. Regional and local knowledge requirements can be added to reflect the incidence of endemic disease. It is our hope that these Educational Objectives will form a part of the training in most SICOT member countries and help to provide a common link between universities or teaching hospitals in all our nations.

ACKNOWLEDGEMENTS

SICOT is pleased to acknowledge the generosity of the Canadian Orthopaedic Association in providing the material for this publication. Special thanks go to Dr Garth Johnston and Dr Merv Letts of Ottawa, Canada.

***Anthony J. Hall**, Secretary General of SICOT, 1993-2002*

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CONTENTS

INTRODUCTION

Rationale and Use

It is easy for orthopaedic educators to state that the terminal objective of a training programme is to produce compassionate, knowledgeable, technically competent orthopaedic surgeons. However, once stated, the question arises as to how to accomplish this ultimate goal. Once begun, the process of defining the educational domains, the body of knowledge and technical exercises required to achieve the ultimate goal; it very rapidly becomes an enormous exercise. This is particularly true in orthopaedic practice due its tremendous scope and diversity. In addition to the breadth of orthopaedic practice there have recently been vast increases in the extent and complexity of surgical procedures leading to a tendency for subspecialisation within the specialty and an increasing dependency upon further training beyond the requirements of the certification authorities. This often takes the form of clinical and research fellowships. Postgraduate surgical training has moved well beyond the apprenticeship system where it was assumed that, if the trainee was around long enough and saw enough clinical material, he/she would acquire the necessary attitudes, knowledge and technical skills. At present, time constraints, cut-backs in trainee posts and funding make it necessary to define the duration of training, the material and the location where the trainee will acquire these fundamentals.

Working Document

These objectives, therefore, must not be a static document collecting dust on a shelf but must be made available to all concerned in orthopaedic training - trainees, service chiefs, programme directors, examiners and programme accreditation committees.

Trainees

The objectives define the scope of orthopaedic training including the stages and milestones which must be attained along the way.

Chiefs of Service

The chiefs of service may examine the facilities and personnel available to them and identify when and how the objectives are to be accomplished.

Programme Directors

The programme directors can monitor with more certainty a trainee’s progress during the education programme, identify problems earlier and correct them.

Examination Panel

The examination panel using the objectives can ensure that the entire scope of training is tested as well as avoiding questions which are more highly specialised

or technical than is required by a general orthopaedic surgeon.

Certification Authorities

For purposes of accreditation, each programme may be assessed on the basis of its ability to fulfil the objectives and provide the proper milieu to allow adequate training, in spite of wide regional variations.

Design

Each section of the objectives consists of describing the ultimate goal to be achieved in a general way and the more specific detail as to how this is to be done. The objectives are also subdivided on the basis of the cognitive and technical skills which are required to achieve the ultimate goal.

Future

In the future it will be necessary to have mechanisms in place for the regular review of the objectives of training in general. There will also have to be a format for discussion and consensus between the training programmes worldwide.

AFFECTIVE EDUCATIONAL DOMAINS

As orthopaedic educators, we may believe that the young men and women entering our training programme have already developed their moral and ethical fibre. We must not, however, discount our ability to act as strong role models in the development of the trainee's professional attitude and conduct. We cannot teach compassion. However, possibly by explaining the wider issues of our patients' problems and by calling upon our broad clinical experience, it is possible to expand the horizons of our trainees beyond mere knowledge or technical expertise. In general orthopaedic practice we are usually called upon to deal with issues which are debilitating rather than fatal. It is therefore necessary to develop in the orthopaedic trainee an appreciation for the special emotional, psychological and even economic needs of each individual patient. The orthopaedic surgeon is often called upon by various agencies to assess disability. In doing so, it is important to keep in mind that we must primarily represent the best interests of our patient. The orthopaedic trainee must appreciate that in order to provide the highest level of service he/she must continually strive for excellence throughout their professional career. To accomplish this requires continued devotion to increasing and up-dating medical knowledge. The orthopaedic surgeon does not exist in isolation but functions in many instances as a member of a team providing multi-faceted service to patients. As part of his education the trainee should be encouraged to develop the ability to take part in or even lead this team. The orthopaedic trainee should also be encouraged to bring the knowledge and special skills of the orthopaedic surgeon to the community at large.

COGNITIVE AND PSYCHOMOTOR EDUCATIONAL DOMAINS

The substance of these domains constitutes the educational objectives as outlined below.

DEFINITIONS

It is helpful to be more specific in some of the terms used in the educational objectives.

Knowledge

The orthopaedic trainee will demonstrate to the Director of the Orthopaedic Programme or his designate, before completion of the specific rotation, a satisfactory fund of information under each of the following headings.

1. Definition (or general description)

2. Incidence - age, sex, location, racial, etc.

3. Epidemiology

4. Classification

5. Aetiology

6. Differential Diagnosis

7. Pathogenesis

8. Clinical Picture - history, physical findings, lab investigations, X-ray

9. Pathology - gross, microscopic, histochemical & embryological & natural history

10. Treatment - non-operative & operative

11. Results of Treatment

12. Prognosis

The trainee will demonstrate his/her fund of knowledge by direct questioning at rounds, in clinic, during oral examination and by performance in medical certification examinations.

Clinical Competence

The trainee will demonstrate to the satisfaction of the Director of the Orthopaedic Programme or his designate, before the end of the rotation, the ability to perform

a complete history and physical examination demonstrating the salient features of the condition, interpretation of information and physical findings, the ability to form a complete differential diagnosis and to conduct an efficient meaningful investigation of the differential diagnosis by radiological and laboratory means. The trainee will demonstrate this during rounds, patient examination on the ward, review of history and physical examinations on both the ward and the out-patient clinics and during the observed history and physical examination during oral exams.

Technical Competence

The trainee will demonstrate to the satisfaction of the Director of the Orthopaedic Programme or his designate the ability to formulate a treatment plan based on a differential diagnosis. When operative treatment is indicated, the trainee will demonstrate the following points as outlined on the Trainee Technical Evaluation sheet. Technical competence will be determined by performance in the operative suite and also in the Manual Skills Laboratory.

TRAINEE TECHNICAL EVALUATION SHEET

NAME PATIENT HOSP. NO.

TRAINEE YEAR IN TRAINING

PROCEDURE

COMMENTS

1. Pre-op planning:
    a) Has examined patient
    b) Knows indications
    c) Reviewed literature
2. Preparation of case:
    a) X-rays displayed
    b) Patient properly positioned
    c) Instruments checked
3. Anatomy reviewed:
    a) Proper incision
    b) Pitfalls
4. Proper aseptic technique

5. Soft tissue dissection

6. Bone work

   a) Three-dimensional ability

   b) Handling of tools and instruments

   c) Safety precautions

7. Persevere for best result

8. Modifying operation according to situation

9. Closure

10. Dressing (cast, etc)

11. Knowledge of immediate post-op management

Specific classification systems are not identified unless only one exists or is universally accepted. The trainee must demonstrate that the classification being used is a recognised classification complete and useful in planning treatment, assessing prognosis and determining the rate of complications.

Most of the general conditions in the objectives are well suited to identify levels of competence by the completion of each rotation. Some specific rotations (eg hand, spine, rheumatology, joint reconstruction) are only offered once during the trainee's training, usually at a fairly senior level. In these circumstances it is required that a trainee complete the total objectives for the conditions seen on the rotation.

BASIC SCIENCE AND RESEARCH OBJECTIVES

The trainee, upon completion of postgraduate training or the appropriate portion thereof, must demonstrate to the program director or his designate, by discussion, examination and methods of practice, a satisfactory level of knowledge in:

General

A. Organ Systems

Integumentary

Describe wound healing and repair including skin grafting.

Cardiovascular

Describe the pathophysiology and principles of management of:

i) common cardiac arrhythmia's

ii) heart failure

iii) haemorrhage and shock.

Respiratory

Describe normal respiratory function, classify respiratory failure and discuss the principles of management.

Gastrointestinal

Describe normal gastrointestinal function and its abnormalities as related to the musculoskeletal system. Understand nutritional requirements and the methods of nutritional support.

Genito-Urinary

Describe normal renal function, classify renal failure, describe the haemodynamics and musculoskeletal effects of acute and chronic renal failure.

Haematological And Lymphatic

Describe normal and abnormal respiratory function of blood, blood coagulation, blood transfusions.

Endocrine

Describe normal and abnormal function of the parathyroid glands.

B. Pathological Mechanisms

Inflammation

Describe the pathophysiology of the inflammatory process and its natural history.

Infection

Describe the cellular characteristics of infecting organisms, natural habitat, methods of production of infection, toxins, characteristics of human infection.

Neoplasia

Describe the theories of the aetiology of neoplasia, normal controls of cellular growth, spread of tumours, tumour grading and staging systems.

Describe the principles of therapy including radiotherapy, immunotherapy and chemotherapy.

Immunology

Describe normal immunological function and the diseases of the neuro-musculoskeletal systems related to abnormal immune function.

Describe the general features of transplantation and rejection and the immunological factors relating to bone and joint transplantation.

Genetics

Describe common inheritance patterns in musculoskeletal diseases.

Trauma

Describe the metabolic response to trauma its variations and management.

Pharmacology

Describe pharmacological actions of drugs commonly used in orthopaedic surgery (i.e. antibiotics, chemotherapeutic agents, analgesics, sedatives, anaesthetic agents and commonly used drugs in cardiovascular and respiratory diseases).

Research

The trainee must demonstrate by discussion, examination and methods of practice:

a) An understanding of the development of a research protocol. The ability to design and execute a research project and communicate the rationale scientifically.

b) The ability to analyse critically a scientific article and appropriately alter and review current practice by following the recommendation in appropriate texts and journals.

c) The ability to communicate scientifically.

d) Develop an understanding of diagnostic techniques and therapeutic measures.

Musculoskeletal and Neural

The trainee must be able to demonstrate by discussion, examination and methods of practice, an in depth level of knowledge of the basic sciences of bone, joint, muscle, tendon, central and peripheral nervous system under the following general headings:

a) Anatomy - embryology, gross, microscopic

b) Physiology and Biochemistry - including development and growth, maintenance and repair.

c) Pathology - including gross, microscopic, electron microscopy - natural history

d) Pharmacology

e) Biomechanics including Material Properties

f) Materials used in Orthopaedics

CORE EXPERIENCE

The following is intended as a minimal requirement to be achieved for each of the rotations indicated. It should act as a guideline to the responsible service chief/section head who accepts the trainee for rotation, receive their approval and be the basis on which a trainee's performance is judged.

The trainee upon completion of each of the following rotations must demonstrate a satisfactory level of knowledge and clinical competence as determined by the Chief of the Service or designate. This will be done by direct questioning or observation of clinical practice in the following areas:

Intensive Care (ICU Rotation)

a) Cardiac disease, infarcts, cardiac failure, arrhythmiaís, ECG (EKG) interpretation.

b) Conduct of advanced cardiopulmonary resuscitation (CPR).

c) Acute and chronic respiratory insufficiency, interpretation of blood gas analysis and its use in patient management.

d) Common metabolic disorders, basic metabolic and nutritional requirements including parenteral nutrition (TPN).

e) Electrolyte disturbances and acid base imbalance.

f) Use of blood component therapy and coagulopathies.

g) Overwhelming sepsis including the use of antimicrobial agents.

h) Advanced techniques of monitoring.

Surgery Rotation - Trauma

a) Triage and establishment of treatment priorities in victims of multiple injuries.

b) Technical competence in the following:

- Cricothyroidotomy - needle and surgical

- Endo-tracheal intubation - oral

- Needle and chest tube insertion for the establishment of underwater drainage

- Peripheral venous cut down

- Subclavian and internal jugular puncture

- Central venous pressure and Swan Ganz catheter monitoring

- Needle pericardiocentesis

- Application and removal of pneumatic anti-shock garments

- Peritoneal lavage, mini laparotomy

c) Chest wall, pleural space and lung injuries including principles of respiratory support and the indications for performing emergency thoracotomy.

d) Non-operative management of major intra-abdominal injuries and later potential complications and indications for performing emergency laparotomy.

e) Major blood loss, acute renal failure, electrolyte and acid base imbalance, acute adrenal insufficiency.

f) Non-surgical management of ileus, bowel obstruction, diaphragmatic hernia and massive haemoperitoneum.

g) The acute surgical abdomen.

Plastic Surgery Rotation

a) General principles of design of incisions, soft tissue handling, methods of skin closure, skin grafting and assessment of wound healing.

b) Hand

i) Injuries

Establishment of treatment priorities in both major and minor hand injuries, lacerations, soft tissue defects.

Principles of management of tendon injuries, extensor and flexor, acute and chronic.

Principles of management of vascular and nerve injuries of the hand.

ii) Rheumatoid Arthritis

The pathomechanics and principles in reconstruction of articular and skeletal deformities.

iii) Neuro-Muscular

Biomechanics and pathogenesis.

c) Burns

Assessment and management of thermal burns including inhalation burns, evaluation of the depth and extent of the burns, fluid and electrolyte management, antibiotics and surgical principles.

d) Technical Competence - in the following:

- Split thickness skin grafting

- Local flaps

- Tendon repair

- Introduction to or advancement of abilities in micro-surgery

Vascular Surgery Rotation

a) Anatomy and physiology of the peripheral circulation. The physiology and factors controlling the microcirculation.

b) Physiology and management of shock and its sequelae.

c) Patterns of peripheral vascular disease, their clinical presentation and an awareness of the possibility of acute vascular injury.

d) Signs and symptoms of both acute and chronic peripheral vascular insufficiency (arterial and venous).

e) The performance of a physical examination of the peripheral and central circulation and the use of Doppler ultrasound equipment.

f) The indications for arterial reconstruction and repair.

g) The management of deep venous thrombosis, pulmonary embolism, recurrent pulmonary emboli, chronic venous insufficiency with ulceration.

h) Pre-operative assessment and post-operative management of patients undergoing vascular surgery including respiratory problems, major fluid and electrolyte imbalances and renal problems. The indications for and limitations of angiography in the traumatised patient.

Neurological Surgery Rotation

a) Basic knowledge of the anatomy and physiology of the central and peripheral nervous system.

b) Performance and interpretation of a neurological examination.

c) Indications and limitations of non-invasive and invasive investigative techniques.

d) Assessment and management of head injuries and appropriate differential diagnoses of altered level of consciousness.

e) Patho-anatomy, assessment and methods of investigation and management of injuries to the spinal cord, nerve roots, patterns of injury and their prognosis.

f) Assessment and management of spinal cord tumours, primary and secondary, and tumour-like conditions.

g) Assessment and management of degenerative disorders of the spinal cord and peripheral nervous system.

h) Assessment and management of peripheral nerve injuries.

Radiology Rotation

a) Principles of general radiological interpretation (i.e. Chest).

b) Principles of radiological investigation of trauma, indications and interpretation of specialised techniques (i.e. Angiography, Computerised Tomography, Arthrography).

c) Interpretation and pathophysiological correlation or radiography of arthritic disorders, infection, tumours, metabolic and reactive disorders.

d) Paediatric musculoskeletal radiology.

e) Techniques and interpretation of radiological investigation of spine injuries and disorders - including Myelography, Computerised Tomography and MRI if available.

f) Principles of isotope scanning (Nuclear Medicine) and ultrasonography.

ADULT ORTHOPAEDIC OBJECTIVES

These objectives are written in such a way as to assume...

a) that the trainee has completed core training (which usually contains a 3 month orthopaedic rotation)

b) that each of the designated rotations in adult orthopaedics are of approximately 6 months duration.

Trauma Objectives

The trainee, upon completion of the rotation indicated, will demonstrate a satisfactory level of knowledge, clinical competence and technical competence as determined by the Chief of Service, Programme Director or designate. This will be done by direct questioning or observation of clinical practice in the

following areas:

GENERAL

Cognitive - Initial management of major multiple system trauma

- Establishment of treatment priorities

- Systemic effects of trauma

- Patterns of injury

- Major bleeding

- Assessment and management of major multiple extremity injuries

- See also Core Objectives - Surgery Rotation

FRACTURES

General

Cognitive - Definition, classification

- Biomechanics and mechanism of production

- Principles of management, reduction, maintenance and mobilisation, methods of achieving these principles by closed means and indication for surgical management

Technical - Application of principles of surgical management of simple fractures

- Surgical management of moderately complex fractures - Application of external fixation

- Surgical management of complex fractures

Healing

Cognitive - Histochemical, physical and radiological events

- Factors affecting fracture healing

- Clinical and radiological assessment of union, delayed union and non-union

COMPLICATIONS

Immediate Skin

Cognitive - Classification of open fracture

- Assessment and management of Types 1 and 2 open fractures

- Assessment and investigation of infection

- Indication for amputation

Technical - Surgical management of Type III injuries

Vascular

Cognitive - Awareness, assessment and investigative techniques of the ischaemic limb

- Impending compartment syndrome, pathophysiology, assessment, initial management, indications for surgery

Technical - Fasciotomy

- See also Core Objectives - Vascular Rotation

Nerve Injury

Cognitive - Awareness, assessment and investigative techniques

- See also Neuro-Muscular Disorders Objectives

Muscle/Tendon Injury - Awareness, assessment

- See also Soft Tissue Injury Objectives

Associated Injuries

Cognitive - Awareness of common associated injuries and patterns

Early Fat Embolism Syndrome

Cognitive - Clinical and radiological assessment

- Differential diagnoses, management including respiratory support

- Recognition, assessment, investigation and management of traumatically induced coagulopathies

- See also Core Objectives - ICU and Trauma

Deep Venous Thrombosis/

Pulmonary Embolism - See Core Objectives - Vascular

Late Delayed Union & Non-Union

Cognitive - Definition, clinical and radiological assessment, classification and non-operative management

- Indications for surgery

- Principles for use of internal fixation

- Types and techniques of bone grafting

Technical - Surgical management using internal fixation, bone grafts

- Use of electrical stimulation both internal and external

Malunion

Cognitive - Definition, criteria of acceptable position

- Factors influencing remodelling and predictability

- Biomechnical and pathological effects of malposition

Technical - Surgical revision of single plane malunion

- Surgical revision of complex fractures,

malunions and osteotomies

Others (eg Joint Stiffness, Muscle/Tendon, Tissue, Osteoporosis, Algodystrophy)

Cognitive - Definition, clinical assessment non-operative management

Technical - Surgical soft tissue releases

PATHOLOGIC FRACTURES

Cognitive - Definition, aetiology, natural history

- Assessment clinically and radiologically, non-operative management

- Indications for surgery

- Adjunctive methods of management of open reduction, internal fixation

Technical - Management of complex fractures by internal fixation, amputation, excision and prosthetic replacement

SOFT TISSUE INJURIES

Cognitive - Histological and histochemical events in normal and abnormal healing

- Assessment of mild, moderately severe and major injuries

- Indications for surgery, timing of surgery

- Selection of incisions, handling of tissues

- Indications and methods of wound closure, simple, local flaps and Z-plasties

- Principles of methods of closure of soft tissue defects, use of local flaps and

free flaps

- Assessment of infected and ischaemic wounds

- Recognition and assessment of myositis ossificans

Technical - Management of wound healing by secondary intention

- Surgical excision

JOINT INJURIES

Closed

Cognitive - Classification of ligament injuries, clinical and radiological assessment, non-operative management, indications for surgery

- Principles of operative management

Technical - Surgical repair of simple (single) injuries

- Surgical management of complex acute injuries and late reconstruction

Open

Technical - Assessment and management of simple lacerations into joints, use of suction irrigation techniques

- Major surgical joint debridement

Articular Cartilage

Cognitive - Classification, assessment, natural history

- Use of continuous passive movement devices

- Simple osteochondral fragments

Technical - Arthrotomy for excision of loose bodies or replacement

- Internal fixation

- Surgical management of complex injuries

UPPER EXTREMITY

Shoulder (Including Scapula, Sternoclavicular Joint, Clavicle and Acromioclavicular Joint)

Cognitive - Clinical and radiological assessment

- Classification

- Complications and associated injuries

- Principles of operative management and indications for surgery

Technical - Operative management including techniques of open reduction

- Non-operative management of fractures of the scapula - body, acromion, coracoid, glenoid

Glenohumeral Joint

Cognitive - Clinical and radiological assessment

- Classification

- Complications and associated injuries

- Prognostic factors

- Indications for surgery

- Ability to choose appropriately between the various forms of operative management

- Indications and contraindications

Technical - Operative management of traumatic instability

- Operative management of complex, multi-axial instability

- Non-operative management - closed reduction

Proximal Humerus

Cognitive - Clinical and radiological assessment

- Classification (Neer28)

- Complications and associated injuries

- Indications for surgery

- Indications for prosthetic replacement

Technical - Open reduction/internal fixation

- Prosthetic replacement

- Non-operative management

Humeral Shaft

Cognitive - Clinical and radiological assessment

- Classification

- Complications and associated injuries

- Indications for surgery

Technical - Reduction, internal fixation

- Non-operative management

Distal Humerus

Cognitive - Clinical and radiological assessment

- Classification and mechanisms

- Types of complications and their management

- Indications for open reduction

Technical - Techniques of open reduction/internal fixation of simple fractures (unicondylar)

- Open reduction/internal fixation of complex supracondylar and T-fractures

- Closed treatment

Elbow Dislocation

Cognitive - Clinical and radiological assessment

- Classification

- Complications and their management

- Indications for surgery

Technical - Open reduction

- Closed reduction

Olecranon

Cognitive - Clinical and radiological assessment

- Classification

- Indications for surgery

Technical - Open reduction/internal fixation

- Non-operative management

Radial Head And Neck

Cognitive - Clinical and radiological assessment

- Classification

- Complications and management of non-operative treatment

- Indications for surgery

Technical - Open reduction/internal fixation

- Radial head excision

Combined Forearm And Elbow

Cognitive - Clinical and radiological assessment

- Classification - (Monteggia25)

Technical - Surgical management

Radius And Ulna - Shaft

Cognitive - Clinical and radiological assessment

- Classification

- Complications and management

- Indication and techniques of non-operative treatment

Technical - Open reduction/internal fixation

- Operative management of complex cases

- Complications of non-union, malunion, synostosis

Distal Radius And Ulna

Cognitive - Clinical and radiological assessment

- Classification (Colles’9, Smith’s37, Barton’s4)

- Complications

- Indications for surgery

Technical - Operative management

- Surgical management malunion

- Non-operative management

Distal Radioulnar Joint

Isolated Cognitive - Clinical and radiological assessment

- Complications

- Indications for surgery

Technical - Operative treatment

- Surgical management of late instability

- Non-operative management

Combined

Cognitive - Clinical and radiological assessment

- Classification (Galeazzi15)

- Complications

- Indications for surgery

Technical - Operative management of simple injuries

- Operative management of complex injuries and late instability

- Non-operative management

Carpal

Cognitive - Clinical and radiological assessment

- Classification and patterns of injury and late instability

- Complications and their management

- Indications for surgery

- Clinical assessment, methods of investigation, non-operative and operative management of late carpal instability

Technical - Operative management of simple injuries

- Operative management of complex injuries

- Closed treatment

Hand - See Adult Hand Objectives - Trauma

SPINE AND PELVIS

Spine (General)

Cognitive - Knowledge of spinal anatomy, including blood supply to the spinal

cord

- Pathology of spinal injury

- Complete neurological examination and its interpretation

- Patterns of neurological deficit

- Complications and associated injuries

- Radiological evaluation including myelography, CT scanning

- Functional assessment following spinal injury

- Anticipated functional capacity

- Bracing

- Team approach to spinal injuries

Cervical Spine

Cognitive - Clinical and radiological assessment

- Classification

- Neurological evaluation

- Patterns of neurological injury

- Methods of investigation

- Non-operative management - orthotics

- Indications for surgery

- Knowledge of anterior approaches and instrumentation not to include technical ability

Technical - Closed reduction of fractures and fracture dislocations

- Operative management of acute fractures and fracture dislocation to include decompression (posterior)

- Applications of halo and halo traction vest

- Stabilisation of late instability

Thoracic And Lumbar

Cognitive - Clinical and radiological assessment

- Classification 2 and 3 column concepts and relationship to treatment and

prognosis

- Neurological evaluation

- Patterns and neurological injury

- Indications for non-operative management, both skeletal and neurological

- Knowledge of types of surgical approaches and their indications

- Knowledge of types of instrumentation and fusion

- Post-operative care. Rehabilitation

- Functional assessment

- Knowledge of complex and anterior approaches and instrumentation not to include technical ability

Technical - Non-operative management

- Operative treatment to include laminectomy posterior fusion, posterior instrumentation

- See also Adult Objectives - Spine

Pelvis (General)

Cognitive - Complete knowledge of pelvic anatomy - skeletal, vascular, visceral and neurological

- Classification and its relationship to stability, treatment and prognosis

- Clinical assessment including associated injuries

- Complications

- Radiological assessment, plane films, special views, special techniques (urological and vascular)

- Indications for surgery

Technical - Non-operative management (general, pelvic and complications)

- Surgical management of simple fractures

- Operative management of moderately complex fractures including internal and external fixation

- Management of complications

Acetabulum

Cognitive - Clinical and radiological assessment

- Classification (Judet-Letournel21)
- Complications and associated injuries
- Indications for surgery

Technical - Open reduction - simple dislocations for failed closed reduction

- Arthrotomy for osteochondral loose fragments
- Open reduction for complex dislocation
- Late reconstruction
- Non-operative management (including traction)

LOWER EXTREMITY

Hip Dislocation

Cognitive - Clinical and radiological assessment

- Classification
- Complications and associated injuries
- Indications for operative management

Technical - Open reduction of simple dislocations for failed closed reduction

- Arthrotomy for osteochondral loose fragments
- Open reduction of complex dislocations
- Late reconstruction
- Non-operative management including closed reduction

Femur Intracapsular

Cognitive - Clinical and radiological assessment

- Classification (Pauwels30, Garden16)
- Complications and associated injuries
- Indications and principles for surgical treatment

Technical - Endoprosthetic replacement

- Late reconstruction

- Non-operative treatment

- Open reduction/internal fixation with or without arthrotomy

Extracapsular

Cognitive - Clinical and radiological assessment

- Classification (Evans12, Boyd & Griffin6, Tronzo43)

- Complications and associated injuries

- Indications for surgical management

Technical - Open reduction/internal fixation of four-part fractures

- Surgical management of non-union

- Late reconstruction and osteotomy

- Non-operative management

- Open reduction/internal fixation of two-part and three-part fractures

Subtrochanteric

Cognitive - Clinical and radiological assessment

- Classification (eg Fielding13)

- Complications and associated injuries

- Indications for surgery

Technical - Open reduction/internal fixation of non-comminuted fractures

- Surgical management of complex fractures

- Indications for grafting, special devices

- Non-operative management

Femur Shaft

Cognitive - Clinical and radiological assessment

- Classification

- Complications and associated injuries

- Indications for surgery

- Indications for grafting

- Post-operative management

Technical - Operative management (types of internal fixation)

- Operative management of complications, delayed union, malunion, non-union (osteotomy, bone grafting)

- Non-operative management (traction, spica, cast, cast bracing)

Distal Femur

Cognitive - Clinical and radiological assessment

- Classification (supracondylar, T-condylar and bi-condylar)

- Complications and associated injuries

- Indications for surgery

Technical - Operative management of simple fractures

- Operative management of complex fractures, complications, delayed union, non-union, malunion

- Non-operative management

Knee Ligaments & Dislocations

Cognitive - Clinical and radiological assessment

- Classification

- Associated injuries and complications

- Indications for surgery

- Recognition and classification of late instability

Technical - Operative management of acute injuries

- Non-operative management (therapy and bracing)

- Early and late ligament reconstruction

- Non-operative management (cast, cast bracing, function bracing)

Patella Fractures & Dislocations

Cognitive - Clinical and radiological assessment

- Operative management of acute injuries (ORIF, patellectomy retinacular repair)

- Patella stabilisation

- Non-operative management

Menisci

Cognitive - Clinical and radiological assessment

- Associated injuries and complications

- Indications for surgery

Technical - Operative management (including operative arthroscopy)

- Non-operative management

- Diagnostic arthroscopy

- See also Joint Injuries and Sports Medicine

Tibia Plateau

Cognitive - Clinical and radiological assessment

- Classification

- Associated injuries and complications

- Indications for surgery

Technical - Operative management of simple injuries (ORIF, bone grafting)

- Complex injuries, late reconstruction and reconstruction for complications

- Non-operative management

Tibial Shaft

Cognitive - Clinical and radiological assessment

- Classification

- Complications and associated injuries

- Indications for surgery

Technical - Operative management acute injuries (ORIF)

- Operative management for complications (delayed union, non-union, malunion, single plane)

- Surgical reconstruction complex osteotomies

- Non-operative management

Distal Tibia

Cognitive - Clinical and radiological assessment

- Classification

- Complications and associated injuries

- Indications for surgery

Technical - Operative management of acute injuries (simple)

- Operative management of acute simple and complex injuries (ORIF)

- Late reconstruction for complications

- Non-operative management

Ankle Fractures

Cognitive - Clinical and radiological assessment

- Classification

- Complications and associated injuries

- Indications for surgery

Technical - Operative management of complex including trimalleolar

- Operative management of late reconstruction for delayed union, non-union, malunion

- Non-operative management

- Operative management of simple fractures

Ligament Injuries & Dislocations

Cognitive - Clinical and radiological assessment

- Classification

- Complications and associated injuries

- Indications for surgery

Technical - Operative management of acute injuries

- Reconstruction for late ligament instability

- Non-operative management

Foot - Tarsals (Fractures & Dislocations)

Cognitive - Clinical and radiological assessment

- Classification (eg Talus-Hawkins18)

- Complications and associated injuries

- Non-operative management of avascular necrosis

- Indications for surgery

Technical - Operative management of acute injuries

- Operative management of acute complex injuries

- Late reconstruction for complications (non-union, malunion, delayed union and avascular necrosis)

- Non-operative management

Sub-Talar Dislocation

Cognitive - Clinical and radiological assessment

- Classification

- Complications and associated injuries

- Indications for surgery

Technical - Operative management of acute dislocations and chronic instability

- Operative management of late complications (including triple arthrodesis)

- Closed treatment

Calcaneus Fractures

Cognitive - Clinical and radiological assessment

- Classification

- Complications and associated injuries

- Indications for surgery

Technical - Operative management by manipulation

- Operative management by open reduction and internal fixation

- Non-operative management not requiring manipulation

Tarsal Fractures

Cognitive - Clinical and radiological assessment

- Classification

- Complications and associated injuries

Technical - Operative management

- Non-operative management

Tarsal Metatarsal Dislocation

Cognitive - Clinical and radiological assessment

- Classification

- Complications and associated injuries

- Indications for surgery

Technical - Operative management

- Non-operative management

Metatarsal & Phalangeal Fracture

Cognitive - Clinical and radiological assessment

- Classification

- Complications and associated injuries

- Indications for surgery

Technical - Operative management

- Non-operative management

Hand Objectives

It is now generally recognised that competence in hand surgery implies an additional year of specialised training. The objectives of hand surgery training in a general orthopaedic training programme are two-fold:

1. The preparation of candidates for such specialised training.

2. Clinical competence in common “minor” hand surgery procedures, traumatic and reconstructive.

It should be realised that the ability of any individual programme to teach this material may vary and may have to rely upon outside assistance, for example, a plastic surgery training unit.

The trainee upon completion of the rotation indicated will demonstrate a satisfactory level of knowledge, clinical competence and technical competence as determined by the Chief of the Service, Programme Director or designate.

This will be done by direct questioning, or observation of clinical practice in the following areas:

GENERAL

Cognitive - Detailed knowledge of the anatomy and function anatomy of the hand and wrist

- Technique of physical examination of the hand to include detailed neurological examination, long tendon function, deformities and contractures, assessment of function and disability

- Knowledge and clinical assessment of the hand and hand function in specific conditions (cerebral palsy, stroke, rheumatoid arthritis, congenital anomalies, Dupuytren's contracture)

TRAUMA

Fracture & Dislocation

Cognitive - Clinical and radiological assessment

- Classification

- Complications and associated injuries

- Indications for surgery

- Detailed knowledge of post-operative care and rehabilitation

- Functional assessment

- Knowledge of, but not technical competence for complications, delayed union, non-union, malunion

Technical - Operative management of common, "minor" hand injuries, simple fractures

- Non-operative management (including the causes of deformity and methods of splintage)

- Technical competence in closed reduction and the use of percutaneous fixation pins

Dislocations & Ligament Injuries

Cognitive - Clinical and radiological assessment

- Classification

- Complications and associated injuries

- Knowledge of the causes of irreducibility

- Indications for surgery

- Methods of splintage

- Rehabilitation and post-operative care

- Knowledge of but not technical competence, operative management of late deformity and instability

Technical - Operative management of acute injuries

- Non-operative management

Open Injuries

Cognitive - Clinical and radiological assessment

- Assessment of tissue viability

- Principles of methods of closure

- Rehabilitation

Technical - Operative management of appropriate soft tissue injuries

- Amputation levels and technique

- Technical competence in simple closure, delayed closure, local flaps, Z-plasties

- Assessment of priorities for repair of associated injuries (nerve, vascular, tendon, bone)

Tendon

Cognitive - Clinical and radiological assessment of tendon injury

- Function

- Deformity

- Knowledge of late reconstruction

Technical - Indications for operative management of acute injuries

- Methods of arthrodesis

- Repairs of extensor tendons and flexor tendons in zones 4,5

Massive Combined Injuries

Cognitive - Clinical and radiological assessment

- Indications for surgery

- Assessment of tissue viability and function

- Establishment of treatment priorities

- Knowledge of principles of advanced reconstruction and rehabilitation

Technical - Debridement and amputation levels

- Initial wound management

Rheumatoid Arthritis & Osteoarthritis

Cognitive - Clinical and radiological assessment in mechanisms and pathogenesis of hand deformities

- Indications for surgery

- Assessment of function and disability

- Principles of hand rehabilitation

Technical - Operative management of common soft tissue and bony procedures for the arthritic patient (eg synovectomy, wrist fusion, etc)

- Non-operative management (including splintage)

Congenital Anomalies

Cognitive - Clinical and radiological assessment

- Classification

- Indications for surgery

- See also Paediatric Section

Technical - Operative management of minor anomalies

Paralytic

Cognitive - Clinical and function assessment

- Principles and techniques of splintage

- Principles of tendon transfer

- Indications for surgery

Technical - Surgical reconstruction of selected common problems (eg radial nerve palsy)

Infections

Cognitive - Clinical and radiological assessment

- Non-operative management

Technical - Technical competence in the management of paronychia, pulp space injection, septic tenosynovitis

- Operative management of infection of fascial spaces (mid-palmar, thenar, hypothenar, subaponeurotic)

- Indications and technique of amputation

Tumours

Cognitive - Clinical and radiological assessment

- Methods of investigation

- The assessment and staging of neoplasms

- Functional assessment

Technical - Technique of open biopsy

- Levels and technique of amputation

Neuromuscular Objectives

The trainee, upon completion of the rotation indicated, will demonstrate a satisfactory level of knowledge, clinical competence and technical competence as determined by the Chief of Service, Programme Director or designate. This will be done by direct questioning, or observation of clinical practice in the following areas:

BRAIN

Cognitive - Knowledge of the anatomy, physiology and pathology of those traumatic, vascular and degenerative conditions causing, presenting as, or altering musculoskeletal function including control of sensory motor function (head injuries, cerebral palsy, stroke, co-ordination (Friedreich's ataxia22) psychomotor disturbances and psychic regional pain)

- Detailed neurological examination of higher centres as they pertain to musculoskeletal function

- Non-operative management of deformity, spasticity by or injection techniques

- Principles of surgical management (tendon transfer, osteotomy, arthrodesis)

- Surgical management of deformity, spasticity by tendon transfer, osteotomy,

arthrodesis, neurectomy

SPINAL CORD

Anatomy

Cognitive - Gross, microscopic - (including tracts) electron microscopic, embryology of CNS

Physiology

Cognitive - Neural transmission

- Control and feedback from higher centres

Pathology

Cognitive - Gross, microscopic, of congenital, traumatic, vascular, neoplastic and degenerative conditions including natural history

Clinical Picture

Cognitive - Methods of presentation, clinical findings, methods of investigation - radiological (myelographic, tomographic, computerised tomography, magnetic resonance imaging) and electrophysiological (evoked potentials)

- Detailed clinical assessment and investigative techniques

- Principles of surgical management

Technical - Non-operative management of weakness, deformity or spasticity by orthotics or injection techniques

- Surgical management of tendon transfer, arthrodesis

PERIPHERAL NERVOUS SYSTEM

Anatomy

Cognitive - Gross (including surface anatomy, areas of possible entrapment, brachial and lumbosacral plexuses) and microscopic

Physiology

Cognitive - Neural transmission and factors altering the rate of transmission, the effects of ischaemia, anaesthetic, compression, response to injury and the gamma system

Pathology

Cognitive - Gross, microscopic and ultramicroscopic response to injury, degenerative disorders, neoplasms

Clinical Picture

Cognitive - Methods of presentation and physical findings

- Performance of detailed neurological examination on a segmental or peripheral nerve basis

- Clinical classification of nerve injuries (according to Seddon34 and Sunderland38)

- The use and interpretation of electrophysiological testing

- Establishment of treatment plan

- Indications for surgery

- Knowledge of peripheral nerve repair (using magnification techniques (loupes, operating microscope))

Technical - Operative management neurolysis, epineurolysis, nerve transfer

- Non-operative management (orthotics, therapy)

- Release of simple entrapment syndromes (carpal tunnel)

MUSCLE

Anatomy

Cognitive - Gross (including all muscles, classification of types of muscles, microscopic and ultramicroscopic

Physiology

Cognitive - Neuromuscular transmission, muscle contraction, electrical stimulation, strength duration testing and muscle types

- See also Sports Medicine Objectives

Pathology

Cognitive - Gross, microscopic and ultramicroscopic of all inflammatory, dystrophic, degenerative, neoplastic conditions

- See also Paediatric Objectives

Clinical Picture

Cognitive - Methods of presentation and physical findings, strength grading

- Clinical assessment, strength grading, long tendon imbalance, secondary deformities, tendonesis and contractures

Technical - Principles of surgical management - pre-requisites for successful tendon transfer

- Operative management of simple tendon transfers

- Operative management of complex neuromuscular disorders

COMBINED NEUROMUSCULAR

Cognitive - Phasic activity and synergism, prime movers

- Retraining and rehabilitation

Joints Objectives

The trainee, upon completion of the rotation indicated, will demonstrate a satisfactory level of knowledge, clinical competence and technical competence as determined by the Chief of Service, Programme Director or designate. This will be done by direct questioning, or observation of the clinical practice in the following areas:

GENERAL

Anatomy - Gross, microscopic, ultramicroscopic including articular cartilage and synovium

- Surgical approaches

Physiology - Joint lubrication, cartilage metabolism, formation and components of joint fluid

Pathology - Response of synovium to injury, effect of joint effusions on cartilage metabolism, supporting capsule and ligaments (joint stability), long tendon function and balance, (biomechanics of production of deformity)

- Synovial fluid analysis

- Pathophysiology of synovial changes and articular cartilage damage in inflammatory, degenerative, metaplastic, bleeding disorders and villonodular synovitis

Clinical Evaluation - History, applied general physical examination, detailed examination of all joints including functional disability rating

- Formation of a differential diagnosis of a swollen painful joint

- Principles for non-surgical management

Investigative Techniques - Arthrography, joint aspiration, arthroscopy, radionucleide scans

- Synovial fluid analysis

Pharmacology - Non-steroidal anti-inflammatory medications, steroids, anti-metabolites, radioisotopes

- Including mechanisms of action, indications, complications, side effects, metabolism and dosage

Orthotic Principles - Principle of construction and use of resting and dynamic splints

Role Of Surgery - Principles of synovectomy, joint realignment, stabilisation, balance of long tendon function, osteotomy, arthrodesis, arthroplasty

INFECTION

Cognitive - Differential diagnosis (including most likely infective organism), methods of staining and culture

- Antibiotic management (both initial blind and specific)

- Indications for surgery

- Investigation, diagnosis and surgery

- Principles of arthrodesis

- Investigation, differential diagnosis and indications for infected arthroplasty or revision surgery for arthroplasty following sepsis

Technical - Major joint debridements

- Arthrodesis of major joints

- Arthrotomy, arthrocentesis, arthroscopic lavage, establishment of suction irrigation

INFLAMMATION

(Rheumatoid and Sero-negative)

General - Pathology of inflammatory joint disease

- Radiological classification of inflammatory joint disease

- Principles of non-surgical and surgical treatment

A. UPPER EXTREMITIES

Hand - See Adult Hand Objectives

Wrist

Cognitive - Pathomechanics of joint deformity

- Non-operative management (Orthotics, therapy)

- Indications for surgery

- Detailed radiological evaluation (including carpal indices)

Technical - Arthrodesis

- Implant arthroplasty

- Excision distal ulna

Elbow

Cognitive - Pathomechanics, clinical and radiological evaluation of deformity

- Indications for surgery (including debridement, synovectomy and arthroplasty)

Technical - Surgical management including joint debridement, synovectomy, radial head excision

- Surgical management of joint arthroplasty

- Non-operative management

- Excision rheumatoid nodules

- Ulnar nerve transposition

Shoulder

Cognitive - Indications for surgery

- Indications for arthrodesis and arthroplasty

Technical - Synovectomy and stabilisation

- Arthroplasty, non-constrained both hemiarthroplasty and total replacement

- Arthrodesis

- Diagnostic arthroscopy

- Non-operative management

- Excision distal clavicle

B. SPINE

Cognitive - Awareness of cervical instability, classification

- Indications for surgery

- Knowledge of but not technical competence in surgical stabilisation, including

adjunctive methods, methyl methacrylate, internal fixation devices

Technical - Halo application and management of halo-vest

- Non-operative management (types of cervical orthoses and their efficiency, including halo)

- See also Adult Spine Objectives

C. LOWER EXTREMITY

Foot - See Adult Foot Objectives

Ankle

Cognitive - Indications for surgery - debridement, synovectomy, arthrodesis

- Indications for total ankle arthroplasty

Technical - Diagnostic arthroscopy

- Synovectomy and arthrodesis

- Non-operative management (orthotics)

Knee

Cognitive - Indication for surgery

- Indications for total joint replacement and arthrodesis

Technical - Synovectomy

- Total joint replacement

- Non-operative treatment (radioisotopic synovectomy)

Hip

Cognitive - Indications for surgery (including cemented vs non-cemented arthroplasty)

Technical - Total hip arthroplasty

- Indications for revision surgery for total joint replacement

- Technique of revision THR without severe bone loss

- Non-operative management

DEGENERATIVE

(Osteoarthritis)

A. UPPER EXTREMITY

Hand - See Hand Objectives

Wrist

Cognitive - Classification of carpal instabilities

- Indications for surgery - including arthroscopy

- Indications for arthroplasty (excisional, interpositional)

Technical - Detailed clinical and radiological assessment of wrist mechanics

- Arthrodesis (intercarpal and radiocarpal)

- Non-operative management

Elbow

Cognitive - Indications for surgery - including arthroscopy, excision of loose bodies, release contractures

- Indications for elbow arthroplasty

- Indications for release of contractures

Technical - Joint debridement, excision loose body

- Arthrodesis

- Technique of arthroscopy

- Non-operative management

- Excision radial head

Shoulder

Cognitive - Indications for surgery

Technical - Rotator cuff decompression (acromioplasty), repair

- Unipolar arthroplasty (Neer27)

- Arthrodesis

- Bipolar arthroplasty, non-constrained

- Excision distal clavicle

- Non-operative management (therapy-injection)

B. SPINE - See Adult Spine Objectives

C. LOWER EXTREMITY

Foot And Ankle - See Adult Foot Objectives

Knee

Cognitive - Assessment of ligament instability

- Indications for surgery

- Assessment of biomechanical predisposing factors (clinical, arthroscopic, radiological)

- Indications of principles of distal femoral osteotomy

Technical - Diagnostic arthroscopy

- Arthroscopic excision of loose bodies, debridement

- High tibial osteotomy

- Arthrodesis

- Total joint arthroplasty

- Non-operative management

- Patellectomy

Hip

Cognitive - Indications for surgery

- Knowledge of biomechanics of proximal femoral and pelvic osteotomy

- Knowledge and assessment of the painful implant and indications for surgery

Technical - Total hip arthroplasty - cemented and non-cemented

- Revision arthroplasty in the absence of severe bone loss

- Non-operative management

REACTIVE AND METAPLASTIC

(Villonodular Synovitis)

(Synovial Chondromatosis)

Cognitive - Investigative techniques (arthrography, diagnostic arthroscopy, synovial biopsy)

Technical - Excision of pedunculated lesions

- Joint debridement, synovectomy, removal of loose bodies

TUMOURS

(Synovioma and Synovial Sarcoma)

- See Adult Tumour Objectives

TRAUMA

- See Also Trauma - Joint Objectives

Tumour Objectives

The trainee, upon completion of the rotation indicated, will demonstrate a satisfactory level of knowledge, clinical competence and technical competence as determined by the Chief of Service, Programme Director or designate. This will be done by direct questioning, or observation of clinical practice in the following areas:

TUMOURS AND REACTIVE LESIONS

Primary Cognitive - Definitions and terms (neoplasia, carcinoma, sarcoma, cyst, reactive lesion, hyperplasia, dysplasia)

- Theories of aetiology, pathogenesis, control of growth, methods of spread of neoplasms in general (local-systemic-privilege of joint) and of sarcomas in particular

- Clinical presentation of bone pain, systemic manifestations, limb locations, spine locations

- Epidemiology (geographical, social, risk factors)

- Methods of investigation (lab-discriminating tests)

- Radiological, scan, ultrasound, CT, MRI, skeletal survey, xerogram, tomograms, arteriograms

- Classification by cell of origin of primary tumours and reactive lesions of bone and primary soft tissue tumours

- Principles of technique of biopsy

- Principles of action of adjunctive methods of treatment

- Local

- Cryotherapy

- Caustic agents

- Radiotherapy

- Systemic

- Chemotherapy

- Immunotherapy

- Regional Techniques and their indications, timing and complications

- Clinical pathological and radiological picture of tumours and reactive lesions of bone and soft tissue tumours including incidence, epidemiology, natural history and prognosis

- Technique of closed and open biopsy (including needle, trephine biopsy, i.e. spine)

- Knowledge of the techniques and significance of staging (Enneking11)

- Methods of investigation - indications for each study, what each shows and usefulness

- Principles of surgical management (margins, types of resection and compartments in different anatomical locations)

Cognitive - Knowledge but not technical competence in the surgical management of major surgical ablative therapy and reconstruction

- Limb sparing surgery, allograft considerations, implant considerations, regional adjuvant techniques

- Knowledge of the methods of reconstruction - allograft, autograft, custom prostheses, rotation plasty, amputations, arthrodesis

Technical - Surgical management of intracompartmental soft tissue tumours

- Surgical management of bone tumours in the distal extremities

Metastatic Tumours To Bone

Cognitive - Knowledge of the most common primary tumours metastasising to bone

- Work-up for a tumour of unknown origin

- Radiological picture of metastatic bone disease and its differential diagnosis

- The investigation of a lytic lesion in bone

- Management of complications of metastatic bone disease (hypercalcaemia)

- Indications for surgery

- Knowledge of methods of spine decompression and stabilisation

Technical - Open reduction/internal fixation of pathological fractures

- Non-operative management of pathological fracture

Infection Objectives

The trainee, upon completion of the rotation indicated, will demonstrate a satisfactory level of knowledge, clinical competence and technical competence as determined by the Chief of Service, Programme Director or designate. This will be done by direct questioning, or observation of clinical practice in the following areas:

GENERAL

Definitions And Terms - Pus

- Sequestrum

- Involucrum

Aetiology And

Classification - Bacterial (acute, chronic) viral, fungal

Pathogenesis - Haematogenous, inoculation (compound wound), direct spread, septic arthritis, osteomyelitis (vertebral girdle and extremities) and periprosthetic (acute and chronic)

Clinical Picture - Acute - subacute - chronic

- Differential diagnosis

- Discriminate between bone and joint clinical signs

INVESTIGATIONS

Laboratory And

Bacteriology - Haematology (FBC, ESR)

- Bacteriology, technique of staining and staining characteristics

- Methods of culture, pathology, gross and microscopic treatment of specimens

- Detailed knowledge of the organisms found to produce musculoskeletal infections, their incidence, frequency, methods of spread, methods of culture microscopic characteristics, predilection for specific sites, tissues and conditions, pathogenesis of infection, mechanisms of spread

Imaging - Radiology - early and late changes

- Radioisotope - Tc/galium/indium

- CT and MRI

Biopsy - Principles of biopsy (fine needle, core needle, arthrocentesis, arthroscopy, open biopsy)

Treatment - General principles

- Antibiotic selection

- Mechanism of action

- Pharmacology (including complications)

- Indications for surgery

Pharmacology Of Antimicrobial Agents - Mechanisms of action, spectrum, dose and administration, metabolism, specific variations and their use to specific conditions (renal failure), complications

Prognosis And Complications - Noscomial infections

- Hospital bacteriological environment

- Altered host resistance

- Development of organism resistance, precautions

OSTEOMYELITIS

Cognitive - Clinical and radiological assessment

- Classification

- Methods of clinical and radiological investigation

- Complications

Technical - Non-operative management

- Simple surgical drainage

- Complex surgical drainage, debridement

- Adjunctive methods - management - (Intracavitary antibiotics)

- Major bone resections and reconstruction

SEPTIC ARTHRITIS

Cognitive - Clinical and radiological assessment

- Classification

- Methods of clinical and radiological investigation

- Complications

Technical - Non-operative management

- Indications for surgery

- Complex surgical drainage

- Late reconstruction for complications, instability - major joint destruction

- Simple surgical drainage

- Arthrocentesis, arthroscopy

SPECIFIC

Compound Fractures

Cognitive - Clinical and radiological evaluation

- Assessment and classification of soft tissue wound, associated injuries, bony injuries

- Initial non-operative management (culture wound care, tetanus prophylaxis, antibiotics)

Technical - Operative management - Types I and II

- Operative management of Type III (soft tissue wound, neurovascular injury, fracture)

- Methods of fixation (including internal, external, external fixators)

- Technique of open cancellous grafting (Papineau29)

- Surgical management of established infections and other complications (delayed union, non-union)

- Soft tissue coverage, local flaps & myocutaneous resection and reconstruction

- Amputation

Total Joint Replacement

Cognitive - Clinical and radiological evaluation (including radioisotope scans)

- Differential diagnosis

- Methods of culture

- Antibiotic therapy (including antibiotic cement)

- Indications for surgery

Technical - Operative management (debridement, suction, irrigation)

- Operative management (implant removal, direct exchange of wound care, late reconstruction)

- Aspiration techniques

Trophic Ulcerations (Neurovascular)

Cognitive - Prevention (of the diabetic foot)

- Clinical and radiological assessment

- Differential diagnosis

- Methods of investigation (bone scan, gallium scan tomography, wound culture, sinogram)

- Causative agent

- Antibiotic management

Technical - Operative management - debridements

- Amputations

Immune Compromised Conditions

Cognitive - Clinical and radiological assessment

- Differential diagnosis - likely causative organisms

- Investigative techniques

- Methods of wound culture

- Antibiotic therapy

- Indications for surgery

Technical - Operative management

Tuberculosis

Cognitive - Clinical and radiological assessment

- Differential diagnosis

- Methods of culture

- Technique of aspiration biopsy of peripheral lesions

- Antibiotic therapy

- Atypical infections

Technical - Aspiration spinal biopsy, open biopsy and debridement

- Resection

- Amputations

- Arthrodesis

REGIONAL

Spine

Cognitive - Radiological assessment

- Differential diagnosis

- Methods of spread

- Pathogenesis

- Antibiotic therapy

- Indications for surgery

- Principles of operative management, anterior and anterolateral, decompression, debridement and fusion

Technical - Aspiration biopsy

- Methods of bracing

PREVENTION

Patient -Immune compromise (disease or drugs)

Hospital - Ward environment

- O.R. environment

- Skin preparation

- Draping technique

Surgeon - Communicable disease

- Gown and glove technique

- Tissue management

- Wound care

Spine Objectives

The trainee, upon completion of the rotation indicated, will demonstrate a satisfactory level of knowledge, clinical competence and technical competence as determined by the Chief of Service, Programme Director or designate. This will be done by direct questioning, or observation of clinical practice in the following areas:

SPINE DISEASE

General

Cognitive - Detailed knowledge of the embryology of the spine especially as it pertains to pathological processes (deformities, infections, tumours)

- Gross anatomy of the spinal column, spinal cord, their blood supply, both extrinsic and intrinsic

- Functional and microscopic anatomy of the spinal cord

- Detailed knowledge of the biomechanics of the spine and its abnormalities

- Non-operative management, various types of braces and their efficacy

- Role of physiotherapy

Fractures - See Adult Trauma - Spine

Cervical Spine

Cognitive - Detailed knowledge of the biomechanics of the motion segment (normal and pathological)

- Clinical and radiological assessment

- Classification

- Detailed neurological examination

- Non-operative management (medication, cervical orthoses, physiotherapy, functional assessment)

- Indications for surgery

- Detailed knowledge of pathogenesis, results, complications of management

- Methods of investigation

- Indications for surgery

Technical - Laminotomy and disc excision

- Anterior approaches, cervical discotomy and fusion (not necessarily in antero-lateral approaches - or odontoid)

Degeneration And Instability Of The Cervical Spine

Cognitive - Clinical and radiological assessment

- Classification (cervical spondylosis, cervical segmental instability, cervical myelopathy, radiculopathy, vertebral foraminosis)

- Complications

- Non-operative management

- Detailed knowledge of pathogenesis and limitations of methods of investigation

- Indications for surgery

Technical - Posterior and anterior fusion techniques (not in Laminectomy, Laminoplasty or Extensive anterior decompression)

- Results and complications

Thoracic Discs

Cognitive - Knowledge of clinical patterns of disease

- Knowledge of treatment (not of technical competence)

Lumbar Disc

Cognitive - Clinical and radiological assessment

- Differential diagnosis

- Classification

- Neurological examination

- Non-operative management (medication, bracing, physiotherapy, other adjunctive pain treatments)

- Indications for surgery

- Investigative methods (myelography, electrophysiology, tomography and discography)

- Knowledge but not technical competence of more complex problems

- Results and complications

- Management of complications

Technical - Chymopapain

- Minimally invasive techniques

- Foraminotomy

- Laminectomy

- Disc excision

Mechanical Instability (Spondylolytic Or Degenerative)

Cognitive - Clinical and radiological assessment

- Classification

- Complications and associated conditions

- Pathophysiology

- Non-operative management (spinal orthoses, physiotherapy)

- Indications for surgery

- Methods of investigation

- Advanced non-operative management

- Knowledge of more complex approaches including anterior (but not technical competence)

- Results and complications

Technical - Basic techniques

Degenerative Etc. (Spinal Stenosis, Central And Lateral)

Cognitive - Clinical and radiological assessment

- Classification

- Associated conditions

- Non-operative management

- Indications for surgery

- Detailed knowledge of the pathogenesis

- Methods of investigation (myelography, electrophysiology, discography)

- Indications for surgery

- Results and complications

Technical - Operative management (foraminotomy, laminectomy, lateral recess release, fusion)

Infection

Cognitive - Diagnosis

- Classification

- Investigation

- Basic treatment

- Knowledge of operative approaches (but not technical competence in surgical treatment)

Biopsy

Cognitive - Awareness

Technical - Competence in closed biopsy techniques

Tumours

Cognitive - X-ray assessment of disease states

- Knowledge of operative approaches

- Knowledge of methods of surgical treatment (but not technical competence of surgical treatment)

Deformity

Cognitive - Clinical and radiological assessment

- Pathogenesis

- Natural history

- Neurological examination

- Non-operative management

- Indications for surgery

- Exposure to technique (but not necessarily technical competence of surgical treatment)

Foot and Ankle Objectives

The trainee, upon completion of the rotation indicated, will demonstrate a

satisfactory level of knowledge, clinical competence and technical competence as determined by the Chief of Service, Programme Director or designate. This will be done by direct questioning, or observation of clinical practice in the following areas:

GENERAL

Anatomy - Detailed knowledge of the anatomy of the normal foot (including embryology and radiological anatomy)

- Recognition of common foot patterns and their predisposition to symptoms (variations of normal anatomy)

Biomechanics - Detailed knowledge of the biomechanical analysis of the norma foot and its function.

- Predisposing biomechanical factors to symptomatology

Clinical Evaluation - The ability to conduct a thorough clinical evaluation (including biomechanical evaluation, stress mats, neurovascular examination)

Investigative

Technique - Detailed knowledge of the normal and radiological appearance, electrophysiological investigation and ankle arthroscopy

ANKLE

Trauma - See Trauma - Fractures and Dislocations

Osteochondritis Dissecans

Cognitive - Clinical and radiological assessment

- Differential diagnosis

- Classification

- Aetiology

- Non-operative management

- Indications for surgery

Technical - Arthroscopy

- Operative management (including the indications for arthroplasty, arthrodesis)

Rheumatoid Arthritis - See Rheumatoid Factors

SUBTALAR COMPLEX

General - Detailed knowledge of the anatomy (including talocalcaneal navicular

joint, both gross and radiological)

- Biomechanical (long muscle control, function, predisposition to pathological states)

- Orthotics - detailed knowledge of the orthotic management of subtalar conditions

Hypermobile Pes Planus

Cognitive - Clinical and radiological assessment

- Non-operative treatment

- Indications for surgery

Technical - Operative management (stabilisation, osteotomy, arthrodesis)

Spastic Flat Foot

Cognitive - Clinical and radiological assessment

- Classification

- Non-operative management

- Indications for surgery

Technical - Operative management

Trauma - See also Trauma

Lateral Process Fractures

Cognitive - Clinical and radiological assessment

- Non-operative management

- Indications for surgery

Technical - Operative management

TARSAL AND TARSOMETATARSAL

Pes Cavus

Cognitive - Clinical and radiological assessment

- Aetiology

- Associated conditions

- Non-operative management

- Indications for surgery

Technical - Operative management

Degenerative

Cognitive - Clinical and radiological assessment

- Non-operative management

- Indications for surgery

Technical - Operative management

METATARSOPHALANGEAL

Cognitive - Clinical and radiological assessment

- Classification

- Biomechanical causes

- Non-operative management

- Indications for surgery

Technical - Technical competence in realignment procedures, exostectomy and pseudarthrosis (excision arthroplasty)

- Osteotomy and implant arthroplasty

SESAMOIDS

Cognitive - Clinical and radiological assessment

- Non-operative management (orthotics)

- Indications for surgery

Technical - Realignment procedures and excision

NEUROMA

Cognitive - Assessment and non-operative management

- Indications for surgery

Technical - Competence in decompression and neurectomy

TOES

Cognitive - Clinical and radiological assessment

- Biomechanical forces contributing to deformity

- Non-operative management

Technical - Competence in interphalangeal fusion

- Tendon transfers

- Tenotomy

SPECIFIC CONDITIONS

A. Neuropathic (Diabetic Charcot)

Cognitive - Clinical and radiological assessment

- Neurological and vascular evaluation

- General methods of foot care and precautions

- Causes of ulceration and deformity

- Non-operative management (healing cast technique, orthotics, general foot care of skin lesions)

- Indications for antibiotics

- Special investigative methods (bone scan, tomography)

Technical - Competence in debridement of calluses and minor ulcerations

- Debridement and amputations

- Arthrodesis

- Exostectomies

- Management of complex combined neuropathic changes

B. Paralytic

Cognitive - Clinical and radiological evaluation

- Biomechanical analysis of the causes of deformity

- Specific orthotic management

Technical - Competence in the operative management

C. Rheumatoid

Cognitive - Clinical and radiological assessment

- Differential diagnosis

- Pathogenesis of deformity

- Complications

- Non-operative management (orthotics, therapy)

Technical - Competence in management of minor deformities, nodules

- Operative management (arthrodeses, arthroplasty - excisional and interpositional) osteotomies and realignment procedures

Amputations, Prosthetics and Orthotics Objecitves

The trainee, upon completion of the rotation indicated, will demonstrate a satisfactory level of knowledge, clinical competence and technical competence as determined by the Chief of Service, Programme Director or designate. This will be done by direct questioning, or observation of clinical practice in the following areas:

AMPUTATIONS

GENERAL

Conditions

Detailed knowledge of the conditions requiring amputation, ischaemia, tumour, infection, trauma) and the specific indications required for each.

Limb Assessment

Knowledge and clinical competence in the assessment of the limb with reference to viability of the stump and successful eradication of disease.

Patient Assessment (Psychological Status) - Social, Psychological And Economic Impact

Ability to co-operate with occupational therapist, physiotherapist and rehabilitation team. Ability to use a prosthetic appliance functionally (intelligence, cardiopulmonary status, motivation).

Team Approach - Contributions And Roles Played By The Prosthetist, Physiotherapist, Occupational Therapist, Psychologist And Social Worker Surgical Principles

Levels of amputation, optimal stump length, technical considerations for standard amputations, recognition and management of complications, post-operative care (types of dressings, i.e. immediate vs early fitting), management of stump oedema, haematoma, infection, necrosis, contractures, neuromas and phantom pain.

PROSTHETICS

GENERAL

Material

Knowledge of the materials used in the formation of the various components of the prosthesis, their benefits, shortcomings and alternative materials available.

Functional Assessment

Knowledge and functional assessment of the demands placed on the prosthesis related to patient age, size, sex, vocation and the ability to alter various prosthetic components for best function.

Socket

Knowledge of the methods of socket fitting, difficulties with variation in stump size and length, special conditions and the assessment of stump symptoms with their reference to socket fitting.

Suspension

Knowledge of the standard methods of prosthetic suspension, various alternatives available and the ability to choose from these for the most functional prosthetic fitting.

Joint

Knowledge of the standard types of joints used in prosthetic fittings, their benefits, shortcomings, alternative joints available and the ability to choose from these alternatives.

Cosmetics

Knowledge of the methods of cosmetic covering of prostheses.

Fitting

Knowledge of the methods of prosthetic fitting, balancing, alignment and ability to relieve stump socket symptoms due to these causes.

Knowledge of the above general components to allow correct prosthetic prescription for each of the standard lower extremity amputation levels.

Knowledge of the major contact and pressure areas in the lower extremity stump for each phase of gait.

Upper Extremity

Knowledge of the above general components to allow correct prosthetic prescription for best function prosthesis.

Knowledge and clinical ability to assess the causes of limited function relative to prosthetic fitting or components.

ORTHOTICS

GENERAL

Orthotic Principles

Knowledge of the aims of orthotic fitting - stability, control of motion, prevention of deformity, maintenance of alignment and the basic methods by which these are achieved.

Materials

Knowledge of the materials commonly used in orthoses, their benefits, drawbacks and alternative materials available.

Assessment

Knowledge and clinical ability to assess the biomechanical problem at hand, the function deficiency and apply basic orthotic principles for their correction.

Fitting

Knowledge of the techniques of orthotic fitting.

Prescription

Knowledge of the above general components to allow correct orthotic fitting and the assessment of function of the orthosis.

REGIONAL

Lower Extremity

Cognitive - Post-operative management including immediate prosthetic fitting

- Detailed knowledge of prosthetic prescribing and supervision of rehabilitation

- Assessment of complications of amputation surgery for toes, transmetatarsal, below knee, above knee amputations, (chronic stump pain, stump ulceration, neuroma, stump overgrowth, hypertrophic new bone, ankle disarticulation (Syme40 & Boyd5), knee disarticulation and hip disarticulation)

Technical - Management of complications

- Hip disarticulation

- Hemipelvectomy

- Amputations of toes, transmetatarsal, below knee, above knee (including assessment of neurovascular status, potential viability of the stump, selection of types, location of flaps)

- Musculotendinous reinsertion, “myoplasty, myodesis”

Upper Extremity

Cognitive - Occupational and physiotherapy

- Prescription of prosthetic appliances

- Post-operative management of the stump

- Prescription fitting

Technical - Shoulder disarticulation and fore-quarter amputation

- Amputations of the finger or ray amputation

- Amputations through the wrist, forearm, elbow disarticulation, upper arm (including care of the stump)

Sports Medicine Objectives

The trainee, upon completion of the rotation indicated, will demonstrate a satisfactory level of knowledge, clinical competence and technical competence as determined by the Chief of Service, Programme Director or designate. This will be done by direct questioning, or observation of clinical practice in the following areas:

GENERAL

Anatomy

Detailed knowledge of applied functional anatomy to athletic performance.

Physiology

Detailed knowledge of the concept of fitness, especially with reference to cardiopulmonary conditioning and exercise physiology. Muscle metabolism, function (slow twitch, fast twitch, neuromuscular conduction, glycogen metabolism) and training (aerobic and anaerobic). Osteopenia (secondary to amenorrhoea).

Pathophysiology

Inflammatory process (with special reference to repetitive injuries and stresses).

Biomechanics

Involving specified function, i.e. walking, running, throwing, swimming. Development and use of protective equipment and safe surroundings.

Pharmacotherapeutics

Use and abuse of drugs in relation to sports (injury management, performance enhancing).

Team Approach

Awareness that the contemporary setting involves a sophisticated team of experts including physicians, physical educationalists, physiotherapists, nutritionists, physiologists, engineers, nutritionists.

UPPER EXTREMITY

Shoulder - Impingement Syndromes (Rotator Cuff)

Cognitive - Clinical and radiological assessment

- Classification

- Complications and associated conditions

- Non-operative management (physiotherapy, injection techniques)

- Indications for surgery

- Investigative techniques (injection, arthrography, arthroscopy)

Technical - Surgical decompression of impingement

- Operative repair of tears, acute and chronic

Biceps Tendon

Cognitive - Clinical and radiological examination

- Non-operative management (injection techniques, physiotherapy)

- Indications for surgery

Technical - Surgical management of instability, chronic inflammation and rupture

Instability (Glenhumeral) - See Adult Trauma

Elbow - Epicondylitis

Cognitive - Clinical and radiological assessment

- Non-operative management (physiotherapy, medication, injection therapy)

- Indications for surgery

- Differential diagnosis

- Investigative techniques (arthrography, electrophysiology)

Technical - Surgical management (muscle slide, tendon lengthening and repair)

Instability Medial (Throwing)

Cognitive - Clinical and radiological assessment

- Differential diagnosis

- Non-operative management

- Indications for surgery

- Biomechanical analysis

- Pathophysiology

- Investigative techniques (arthrography)

Technical - Operative management (excision loose bodies and arthroscopy)

LOWER EXTREMITY

Foot

Cognitive - Clinical and radiological assessment of foot pain (including stress fractures, tendinitis, tibialis posterior)

- Differential diagnosis

- Primary non-operative treatment

- Detailed knowledge of the biomechanics of running, normal and pathological (planovalgus, pes cavus concerning pre-disposition)

- Non-operative management (footwear, special orthotics, training schedules)

Technical - Operative management

- See also Foot and Ankle Objectives

Ankle - See Adult Trauma

Achilles Tendon

Cognitive - Assessment (Thompson test41)

- Differential diagnosis (“plantaris pop”)

- Non-operative management (rest, medication, therapy)

- Indications for surgery

Technical - Surgical repair of acute ruptures

- Surgical reconstruction for late rupture

Lower Leg

Cognitive - Clinical and radiological assessment

- Differential diagnosis – “shin splints” (compartment syndrome, vascular insufficiency, stress fracture, tendinitis, periostitis)

- Techniques of investigation (compartment pressure studies, bone scan, vascular assessment)

- Non-operative management

- Indications for surgery

Technical - Operative management

KNEE

Meniscus And Ligament - See Joint and Trauma Objectives

Patella

Cognitive - Clinical and radiological assessment (malalignment, instability, abnormal tracking)

- Non-operative management (activity schedules, bracing, physiotherapy, medication)

- Indications for surgery

- Other overuse syndrome (patellar tendinitis, iliotibial band friction syndrome)

- Biomechanical principles, predisposition

- Methods of management (including training techniques)

Technical - Methods of investigation (including diagnostic arthroscopy)

- Operative management (arthroscopic shaving, realignment, stabilisation, Maquet procedure23, Elmslie-Trillat10, patellectomy)

HIP

Stress Fractures

Cognitive - Clinical and radiological assessment

- Differential diagnosis of groin pain (with special reference to overuse syndromes)

- Associated conditions

- Investigative techniques (bone scan, arthrography, arthroscopy)

- Non-operative management (medication, physiotherapy, orthotics)

- Indications for surgery

Technical - Diagnostic arthroscopy

Muscle Tendon (Adductor Tendinitis, Pubic Symphysitis, Hip Pointer)

Cognitive - Clinical and radiological assessment

- Differential diagnosis

- Associated conditions

- Non-operative management

SPINE

Cognitive - See Under Spine

- Detailed knowledge of the biomechanics of the spine and brachial plexus (with special reference to sports injuries)

- Predisposing condition (congenital anomalies)

- Special precautions

- Non-operative management (training techniques, orthotics, physiotherapy)

- Advice re: risk of injury, participation

Pain Objectives

General

Definition of chronic pain syndromes.

Theories of the mechanisms - central (Melzak44) - peripheral.

Role of endogenous opiates (endorphins).

Psychological factors.

Clinical picture.

Investigation.

Principles of management.

PAEDIATRIC ORTHOPAEDICS OBJECTIVES

While the cognitive and technical objectives are listed under specific conditions, the affective objectives for paediatric orthopaedics may be stated generally as follows:

Upon completion of the core curriculum in paediatric orthopaedics, the trainee will have demonstrated to the satisfaction of the orthopaedic faculty by his behaviour that he appreciates the:

1. Unique psychological and emotional aspects of illness or injury in children

2. Differences in diagnosis, treatment, and prognosis in children's disorders imposed by the physis

3. Unique role played by the family of the child with illness or injury

Criteria for Acceptable Performance

Cognitive Objectives

The criteria of acceptable performance for the cognitive objectives in paediatric orthopaedics is an average score (over four years) in paediatric orthopaedics on the Orthopaedic In-Training Examination at the fiftieth percentile or higher.

In addition, there should be a consensus of the faculty, based on observations made in day-to-day contact throughout the residency years, that the trainee is able to apply his knowledge of paediatric orthopaedics effectively in the practice of orthopaedics.

General Affections of Bones

A. Developmental Disorders

Core Objectives

Cognitive: After studying specified material, the trainee, without aid of references, will be able to:

1. Define

    a) Dysplasia

    b) Dystrophy

    c) Dysostosis

2. Classify the epiphyseal, physeal, metaphyseal, and diaphyseal dysplasias, eg. Rubin31 or McKusich24.

The trainee should have an understanding of the interpretation of radiographs

and knowledge of the reference source to assist in the classification of the diagnosis.

3. Identify each of the following conditions, pointing out the distinguishing clinical, radiological and laboratory features giving the prognosis.

a) acrocephalosyndactyly

b) multiple epiphyseal dysplasia

c) achondroplasia

d) melorrheostosis

e) metaphyseal dysostosis

f) metaphyseal dysplasia

g) osteopetrosis

h) osteogenesis imperfecta

i) Englemann's Disease

j) osteopoikilosis

k) diastrophic dwarfism

l) the mucopolysaccaridoses

m) spondyloepiphyseal dysplasia

n) enchondromatosis

o) hypophosphatasia

p) dysplasia eiphysealis hemimelica

B. Metabolic and Endocrine Disorders

1. Slipped Capital Femoral Epiphysis

Core Objectives

Cognitive: After studying specified material, the trainee, without aid of references will be able to:

1. List the predilected age group, sex, body types, and the incidence of bilaterality in slipped capital femoral epiphysis.

2. Describe the theories of aetiology.

3. List the expected clinical and roetgenographical features encountered

with the following types of slipped epiphysis:

a) pre-slip

b) acute slip of 25%

c) acute slip of 50%

d) acute slip of 75%

e) chronic slip of 50%

4. Describe the optimal operative treatment for each of the above slipped capital femoral epiphyses.

5. Discuss the complications of slipped capital femoral epiphysis and its treatment.

Technical: Upon completion of his core curriculum in paediatric orthopaedics, the trainee will have demonstrated, to the satisfaction of an attending orthopaedic surgeon, his ability to:

1. Plan a corrective osteotomy of the proximal femur.

2. Demonstrate the ability to manage an acute slipped capital femoral epiphysis by traction and pinning in situ.

2. Rickets

Core Objectives

Cognitive: After studying specified material, the trainee, without aid of references, will be able to:

1. List the types of rickets and the specific aetiology of each.

2. Describe the characteristic clinical, radiological, laboratory, and pathological findings in each type of rickets.

3. Discuss the management of a given patient with rickets.

3. Renal Osteodystrophy

Core Objectives

Cognitive: After studying specified material, the trainee, without aid of references, will be able to:

1. Describe the initial pathologic lesion in renal osteodystrophy.

2. List the characteristic clinical, radiological and laboratory features of renal osteodystrophy.

3. Discuss the management of a given patient with renal osteodystrophy.

4. Hypophosphatasia

Core Objectives

Cognitive: After studying specified material, the trainee, without aid of references will be able to:

1. Discuss the metabolic defect, genetics, clinical, radiological and laboratory characteristics of hypophosphatasia.

5. Hypoparathyroidism

Core Objectives

Cognitive: After studying specified material, the trainee, without aid of references, will be able to:

1. Describe the clinical and laboratory findings in idiopathic hypoparathyroidism.

2. Give the primary feature that distinguishes hypoparathyroidism and pseudo-hypoparathyroidism.

6. Hypothyroidism

Core Objectives

Cognitive: After studying specified material, the trainee, without aid of references, will be able to:

1. Discuss the aetiology and the clinical, radiological and laboratory findings in Cretinism.

2. Discuss the management and prognosis of a given patient with Cretinism.

C. Circulatory Disorders

1. Osteonecroses

Core Objectives

Cognitive: After studying specified material, the trainee, without aid of references will be able to:

1. Define osteonecrosis as to pathogenesis.

2. Given a specific history, physical examination, and X-rays, identify, outline a rational plan of management, and give the prognosis for:

a) Osgood-Schlatter's Disease

b) Kohler's Disease

c) Sever's Disease

d) Freiberg's Infarction

e) Scheuermann's Disease

f) Calve's disease (not an osteonecrosis)

g) Panner's Disease

h) Blount's Disease

i) Legg-Calve-Perthes Disease

j) osteochondritis dissecans

3. List the causes of aseptic necrosis of the capital femoral epiphysis in children.

4. Describe the types of Legg-Perthes according to Catterall7 and Herring19 including at least two characteristics of each type of their prognostic significance.

5. Describe the pathological stages of coxa plana and correlate each stage with its radiological appearance.

6. Discuss the operative and non-operative management of Legg-Perthes.

Technical: Upon completion of his core curriculum in paediatric orthopaedics, the trainee will have demonstrated to the satisfaction of an attending orthopaedic surgeon, his ability to:

1. Describe the various orthoses available and prescribe and check out an orthosis for use in the ambulatory treatment of unilateral coxa plana.

2. Perform an arthroscopy or arthrotomy of the knee and remove a loose body.

2. Sickle Cell Disease

Core Objectives

Cognitive: After studying specified material, the trainee, without aid of references will be able to:

1. Classify sickle cell disease according to the types of haemoglobin defect.

2. List the types of osseous changes in sickle cell disease.

D. Tumours and Tumour-Like Conditions

Core Objectives

Cognitive: After studying specified material, the trainee, without aid of references will be able to:

1. Classify a given primary tumour (benign or malignant) according to the AFIP fasicle in the following series.

a) osteogenic

b) chondrogenic

c) collagenic

d) myelogenic

2. Recognise a given bone or soft somatic tissue tumour by clinical, radiological, and pathological examination.

3. Stage a tumour.

4. Outline the management and prognosis of the above tumour, and give the rationale for the plan chosen including indications for limb salvage or amputation.

5. Demonstrate knowledge of principles of radiotherapy and chemotherapy for malignant tumours.

6. Describe the clinical, radiological and pathological features, prognosis and management of:

a) eosinophilic granuloma

b) Hand-Schuller-Christian Disease

c) Letterer-Siwe Disease

d) Gaucher’s Disease

e) chondroblastoma

f) fibrous dysplasia

g) unicameral bone cyst

h) aneurysmal bone cyst

i) fibrous cortical defect

j) non-ossifying fibroma

k) chondromyxoid fibroma

l) enchondroma

7. Discuss the biopsy techniques and pre-requisites for a satisfactory biopsy.

8. Discuss the common metastatic bone tumours in children.

Technical: Upon completion of his core curriculum in paediatric orthopaedics, the trainee will have demonstrated, to the satisfaction of an attending orthopaedic surgeon, his ability to:

1. Excise a benign tumour

2. Inject a bone cyst

Infections of Bones and Joints

Core Objectives

Cognitive: After studying specified material, the trainee, without aid of references will be able to:

1. Discuss the pathogenesis of haematogenous osteomyelitis.

2. List the characteristic clinical, radiological, radio-isotope, laboratory and pathological features in acute, subacute, chronic and residual osteomyelitis.

3. Prescribe an appropriate course of antibiotic therapy for a given patient with acute osteomyelitis.

4. List the indications for operative treatment of acute and chronic osteomyelitis.

5. Discuss the management of a given patient with one of the following complications of ostoemyelitis:

a) fracture

b) pyarthrosis

c) growth disturbance

Technical: Upon completion of his core curriculum in paediatric orthopaedics, the trainee will have demonstrated, to the satisfaction of an attending orthopaedic surgeon, his ability to:

1. Treat a case of acute osteomyelitis.

2. Understand the principles and techniques of treatment of chronic osteomyelitis including the Papineau29 technique.

Affections of Joints

A. Arthritis

1. Pyogenic

Core Objectives

Cognitive: After studying specified material, the trainee, without aid of references, will be able to:

1. Describe the pathogenesis and pathological changes occurring in the joints of infants and children with acute pyogenic arthritis.

2. Describe the bacteriological, clinical, laboratory, and radiological characteristics of acute septic arthritis.

3. Describe the management and list possible complications of acute pyogenic arthritis.

4. List factors that may affect the prognosis of acute septic arthritis in children.

5. List the conditions to be considered in the differential diagnosis of a child with an acutely painful joint and the plan by which you would reach a specific diagnosis.

6. Discuss the clinical, radiological, laboratory, and bacteriological characteristics of inflammatory conditions of the intervertebral disc.

7. Discuss the management and prognosis of a given paediatric patient with an inflammatory condition of the intervertebral disc.

8. Discuss foreign bodies and nail puncture wounds in the aetiology of septic arthritis.

Technical: Upon completion of his core curriculum in paediatric orthopaedics, the trainee will have demonstrated, to the satisfaction of an attending orthopaedic surgeon, his ability to:

1. Aspirate the hip joint.

2. Incise and drain the affected hip joint of a patient with pyogenic arthritis.

2. Rheumatoid

Core Objectives

Cognitive: After studying specified material, the trainee, without aid of references,

will be able to:

1. List the clinical, laboratory, radiological and prognostic differences between rheumatoid arthritis in adults and children.

2. Outline an approach to the management of a given child with monarticular rheumatoid arthritis, including the indications for:

a) specific drug therapy

b) splints, casts, and traction

c) physical therapy

d) surgery

e) ophthalmology consultation

Technical: Upon completion of his core curriculum in paediatric orthopaedics, the trainee will have demonstrated, to the satisfaction of an attending orthopaedic surgeon, his ability to:

1. Make and apply appropriate splints to immobilise specified joints in a patient with arthritis.

2. Aspirate any joint illustrating anatomical landmarks.

3. Haemophilia

Core Objectives

Cognitive: After studying specified material, the trainee, without aid of references, will be able to:

1. List the congenital disorders of coagulation that may be associated with recurrent haemarthrosis and indicate the distinguishing genetic, laboratory and clinical characteristics of each.

2. Discuss the management of a given child with an acute haemophilic haemarthrosis, including:

a) type, amount and duration of replacement therapy

b) use of traction, splints and casts

c) indications for aspiration

3. Discuss the management of a given child with chronic haemophilic arthropathy, including the indications for:

a) home maintenance therapy

b) use of traction, splints, and casts

c) operative treatment

4. Discuss the specific indications and contraindications for, expected results from, and coagulation management of:

a) synovectomy of the knee joint

b) replacement of the knee joint

c) excision of pseudotumour in a given child with haemophilia.

5. Discuss the previous high incidence of H.I.V. infection in haemophiliac patients and the precautions to be taken during invasive procedures.

Technical: Upon completion of his core curriculum in paediatric orthopaedics, the trainee will have demonstrated, to the satisfaction of an attending orthopaedic surgeon, his ability to:

1. Demonstrate various traction and casting techniques to correct a knee flexion contracture in a patient with haemophilia.

2. Knowledge of orthotics and techniques to arrest a flexion contracture of the knee or elbow.

3. Set up continuous passive motion equipment for post-haemarthrosis of knee.

4. Tuberculosis

Core Objectives

Cognitive: After studying specified material, the trainee, without aid of references will be able to:

1. List the distinctive clinical, laboratory (including bacteriology and analysis of the synovial fluid), radiological, and pathological features of tuberculous arthritis in peripheral joints.

2. Discuss the pathogenesis, clinical, radiological, and pathological findings in spinal tuberculosis (Pott's disease) with and without paraplegia.

3. Discuss the management of a child with tuberculous arthritis of the hip or spine, including:

a) type and duration of drug therapy

b) indications for casting

c) types of operative treatment, with indications for each

Technical: Upon completion of his core curriculum in paediatric orthopaedics, the trainee will have demonstrated, to the satisfaction of an attending orthopaedic surgeon, his ability to:

1. Perform a needle biopsy of a vertebral lesion

B. Discoid Meniscus

Core Objectives

Cognitive: After studying specified material, the trainee, without aid of references will be able to:

1. a) Discuss the embryology of the knee joint.

   b) Describe the altered anatomy in the knee and mechanism by which it produces a “discoid” lateral meniscus according to Kaplan20.

2. List the clinical and pathological findings encountered in a “discoid” lateral meniscus.

3. Discuss the operative treatment of a “discoid” lateral meniscus with emphasis on technical differences between excision of “non-discoid” and “discoid” menisci, including arthroscopic differences.

Technical: Upon completion of his core curriculum in paediatric orthopaedics, the trainee will have demonstrated, to the satisfaction of an attending orthopaedic surgeon, his ability to:

1. Perform a diagnostic arthroscopy of the knee in a teenage patient.

C. Popliteal Cyst

Core Objectives

Cognitive: After studying specified material, the trainee, without aid of references will be able to:

1. Discuss the aetiology and natural history of popliteal cysts in children (as opposed to adults).

2. Describe the possible anatomical relationships between popliteal cysts and the adjacent bursae, muscle and joint.

3. Discuss the indications for non-operative and operative treatment of a popliteal cyst.

4. Give a differential diagnosis of swelling behind the knee and how to differentiate.

Technical: Upon completion of his core curriculum in paediatric orthopaedics, the

trainee will have demonstrated, to the satisfaction of an attending orthopaedic surgeon, his ability to:

1. Aspirate and inject a popliteal cyst.

D. Transient Synovitis of the Hip

Core Objectives

Cognitive: After studying specified material, the trainee, without aid of references will be able to:

1. Discuss possible aetiologies of transient synovitis of the hip.

2. Describe the clinical, laboratory and radiological findings and differential diagnosis of transient synovitis of the hip.

3. Discuss the treatment of transient synovitis of the hip.

Affections of the Nervous System

A. Cerebral Palsy

Core Objectives

Cognitive: After studying specified material, the trainee, without aid of references, will be able to:

1. Classify cerebral palsy according to the aetiology and site of neuropathological changes and discuss the clinical findings in each.

2. Given a patient with cerebral palsy, discuss the principles upon which the total care of the patient will be based.

3. Discuss appropriate non-operative and/or operative management of a given patient with cerebral palsy.

4. List the indications, advantages, disadvantages, post-operative management, and unique complications of each of the following types of surgery in cerebral palsy:

a) neurectomy

b) tendon or muscle lengthening

c) tendon transfer

d) arthrodesis

5. List the commonly encountered hand, wrist, elbow, spine, hip, knee, ankle and foot deformities in cerebral palsy and discuss the management of each - alone or in combination.

6. Discuss the pathogenesis and management of the subluxed hip in the cerebral palsy child.

7. Understand the progression and management principles of scoliosis in the cerebral palsy patient.

8. Discuss the principles of seating in the non-ambulatory cerebral palsy child.

9. Discuss the pathogenesis and treatment of pelvic obliquity.

Technical: Upon completion of his core curriculum in paediatric orthopaedics, the trainee will have demonstrated, to the satisfaction of an attending orthopaedic surgeon, his ability to:

1. Perform a tendon transfer or lengthening for correction of a spastic deformity.

2. Perform a subalter arthrodesis.

3. Perform a femoral osteotomy.

B. Spinal Dysraphism

Core Objectives

Cognitive: After studying specified material, the trainee, without aid of references will be able to:

1. Discuss the incidence and natural history of myelomeningocele, according to Sharrard35 and to Smith.

2. Discuss the genetics and list the theories of aetiology of spinal dysraphism indicating the strengths and weaknesses of each.

3. Describe the pathological features of spinal dysraphism.

4. Describe the most likely deformity of the hip, knee, ankle, foot and toes resulting from neurosegmental lesions at levels L1, L2, L3, L4, L5, S1, S2, S3 and indicate the reasons for each deformity.

5. List the spinal levels of involvement by myelomeningocele in order of frequency according to Sharrard.

6. Describe, for each of the following deformities, the pathogenesis, segmental level, indications, and contraindications to non-operative and operative management and methods to retain management gains:

a) equinovarus foot

b) equinovalgus foot

c) planovalgus foot

d) hyperextension deformity of the knee

e) paralytic dislocation of the hip

f) knee flexion deformity

g) pelvic obliquity

h) lumbar lordosis

i) paralytic scoliosis

j) calcaneus foot

7. Discuss the incidence, prevention and treatment of each of the following complications of myelomeningocele:

a) trophic ulceration

b) neuropathological arthropathy

c) non-union of attempted arthrodesis

d) fractures and epiphyseal separations

e) pelvic obliquity

8. Understand the ambulatory and mobility devices available for the myelomeningocele child.

Technical: Upon completion of his core curriculum in paediatric orthopaedics, the trainee will have demonstrated, to the satisfaction of an attending orthopaedic surgeon, his ability to:

1. Apply a cast to the limb of a given patient with sensory deprivation of the limb.

2. Prescribe and check an orthosis for deformity in the paraparetic child.

C. Diastematomyelia

Educational Objectives

Cognitive: After studying specified material, the trainee, without aid of references will be able to:

1. List the pathological, clinical and radiological findings in diastematomyelia.

2. Discuss the management of a given patient with a slowly progressive neurological deficit in one lower limb caused by diastematomyelia.

3. Discuss tight filum terminale with regards to investigation, differential diagnosis and management.

D. Friedreich's Ataxia

Core Objectives

Cognitive: After studying specified material, the trainee, without aid of references will be able to:

1. Give the pathogenesis and mode of inheritance and describe the pathological changes in the spinal cord and cerebellum in Friedreich's ataxia22.

2. Describe the clinical findings in classical Friedreich's ataxia.

3. Discuss the management of the orthopaedic problems in a given patient with Friedreich's ataxia.

E. Peripheral Nerve Disorders

Core Objectives

Cognitive: After studying specified material, the trainee, without aid of references will be able to:

1. List the types of inheritance of Charcot-Marie-Tooth disease.

2. Discuss the clinical, electromyographic, and pathological findings in Charcot-Marie-Tooth disease.

3. Discuss the prognosis and management of a given patient with Charcot-Marie-Tooth disease.

F. Poliomyelitis

Core Objectives

Cognitive: After studying specified material, the trainee, without aid of references will be able to:

1. List the clinical and laboratory features of poliomyelitis that are important in its differential diagnosis

2. Describe the clinical stages of poliomyelitis.

3. Describe the pathological findings in poliomyelitis.

4. Discuss the non-operative management of a given patient with:

a) acute, and

b) convalescent poliomyelitis, including indications for the use of bed rest, splints, braces, muscle strengthening and strengthening exercises, and timing of ambulation.

5. List the indications for operative treatment in a patient with residual poliomyelitis.

6. Describe a rational plan of reconstructive surgery in a given patient with residual poliomyelitis affecting either the limbs or the spine or both.

G. Neurofibromatosis

Core Objectives

Cognitive: After studying specified material, the trainee, without aid of references will be able to:

1. Describe the clinical manifestations and pathological findings encountered in neurofibromatosis involving the following tissues:

a) cutaneous

b) subcutaneous

c) nervous

d) skeletal

e) vascular

f) lymphatic

2. Discuss the possible relationships with neurofibromatosis in patients who have as the primary manifestation:

a) hypertrophy of an upper limb

b) leg length inequality

c) scoliosis

d) congenital pseudarthrosis of the tibia.

H. Spinal Atrophy

Core Objectives

Cognitive: After studying specified material, the trainee, without aid of references will be able to:

1. Describe the pathological, clinical and laboratory findings encountered in spinal atrophy.

2. Discuss the management of a given patient with spinal atrophy.

3. Discuss the management of spinal curvature in the child with spinal muscular atrophy.

Affections of Muscle

A. Muscular Dystrophy

1. Pseudohypertrophic muscular dystrophy

2. Facioscapulohumeral (Landouzy-Dejerine) muscular dystrophy

3. Scapulohumeral (Erb) muscular dystrophy

4. Myotonic dystrophy

5. Congenital myopathies

B. Myotonia Congenita

C. Myositis Ossificans Progressive

D. Bacterial Myositis

E. Progressive Systemic Sclerosis (scleroderma)

F. Dermatomyositis

Core Objectives

Cognitive: After studying specified material, the trainee, without aid of references, will be able to:

1. Discuss the mode of inheritance, clinical manifestations, laboratory and electromyographical findings, pathological changes and management of a given patient with one of the following conditions affecting skeletal muscle:

a) pseudohypertrophic muscular dystrophy

b) facioscapulohumeral (Landouzy-Dejerine) muscular dystrophy

c) limb girdle muscular dystrophy

d) myotonia congenita

e) myositis ossificans progressiva

f) bacterial myositis

The Spine

A. Scoliosis

Core Objectives

Cognitive: After studying specified material, the trainee, without aid of references, will be able to:

1. Discuss three possible aetiological factors in “idiopathic” scoliosis.

2. Classify, list the differences in curve patters, sex distribution, incidence, management and prognosis in:

a) idiopathic scoliosis

b) congenital scoliosis

c) paralytic scoliosis

3. Demonstrate his ability to measure accurately scoliotic curves according to the methods of Cobb8.

4. List the factors of prognostic significance in “idiopathic” scoliosis.

5. Discuss the cause(s), significance, and measurement of vertebral rotation in scoliosis.

6. List the characteristics of a structural scoliotic curve.

7. List the indications for spinal instrumentation in the treatment of scoliosis.

8. List the indications for spinal fusion in the treatment of scoliosis.

9. Given a pre-operative patient with scoliosis and appropriate X-rays, select the proper fusion area, give the optimal method of correction and outline the studies necessary for adequate evaluation of respiratory function.

10. List the indications and contraindications for use of the Milwaukee

Brace and the lower profile brace in the treatment of scoliosis.

11. List the complications of the non-operative management of scoliosis, and means to avoid them.

12. Discuss the pseudarthrosis following spinal fusion, including causes, recognition, and management.

13. Discuss the natural history of the untreated spinal curvature.

Technical: Upon completion of his core curriculum in paediatric orthopaedics, the trainee will have demonstrated to the satisfaction of an attending orthopaedic surgeon, his ability to:

1. Apply a body cast.

2. Prescribe and check out an appropriate orthosis for use in the management of a given patient with scoliosis.

B. Congenital Disorders

Core Objectives

Cognitive: After studying specified material, the trainee, without aid of references will be able to:

1. Discuss the aetiology, clinical and radiological manifestations, and management of

a) Klippel-Feil syndrome

b) kyphosis (congenital)

2. Discuss the possible aetiologies, clinical and pathological findings, and management of muscular torticollis

3. Discuss dangers of paraplegia associated with congenital kyphosis.

C. Scheuermann's Disease

Core Objectives

Cognitive: After studying specified material, the trainee, without aid of references will be able to:

1. Discuss the possible aetiological factors in Scheuermann's disease.

2. List the distinguishing clinical and radiological features encountered in Scheuermann's disease of:

a) thoracic spine

b) lumbar spine

3. Discuss the management and prognosis of a given patient with

Scheuermann's disease.

Congenital Disorders of the Upper Limb

Objectives

Cognitive: After studying specified material, the trainee, without aid of references will be able to:

1. Classify congenital skeletal limb defects according to Frantz and

O'Rahilly14 and according to the New International Classification (Swanson39).

2. Given one of the following disorders of the upper limb, the trainee will be able to identify and/or classify the defect, describe the clinical and pathological features, outline a rational plan for management, and write an appropriate prosthetic prescription (if indicated):

1. Sprengel's deformity

2. cleidocranial dysostosis

3. pseudarthrosis of the clavicle

4. ankylosis of the elbow

5. radioulnar synostosis

6. dislocation of the radial head

7. Madelung's deformity

8. polydactyly

9. syndactyly

10. camptodactyly

11. clasped thumb

12. macrodactyly

13. clinodactyly

14. brachydactyly

15. symphalangism

16. trigger finger or thumb

17. Poland's syndrome

18. reduction deformities (including club hand, cleft hand, phocomelia, amputations, etc)

19. brachial plexus palsy

Technical: Upon completion of his core curriculum in paediatric orthopaedics, the trainee will have demonstrated, the satisfaction of an attending orthopaedic surgeon, his ability to:

1. Perform the necessary operative procedures for correction of a given patient with a simple accessory digit, trigger finger or thumb.

The Lower Limb

A. Foot Deformities

1. Pes Planus

Core Objectives

Cognitive: After studying specified material, the trainee, without aid of references, will be able to:

1. List the important clinical and radiological features in the differential diagnosis between a relaxed flatfoot deformity secondary to ligamentous laxity and one associated with a short tendo achilles.

2. Describe the pathology in one type of flatfoot deformity caused by each of the following:

a) primary ligamentous laxity

b) primary osseous abnormality (tarsal coalition)

c) primary joint abnormality (eg rheumatoid arthritis)

d) primary muscle pathology (eg cerebral palsy)

3. Describe the differential clinical and radiological features in each of the above types of flatfoot.

4. Describe the management (non-operative, operative, or both) of a given patient with one of the above types of flatfoot deformity.

2. Pes Cavus

Core Objectives

Cognitive: After studying specified material, the trainee, without aid of references will be able to:

1. List the specific neuromuscular lesions that may lead to a cavus deformity of the foot and describe the operative approach to each.

B. Leg Deformities

1. Torsional

Core Objectives

Cognitive: After studying specified material, the trainee, without aid of references will be able to:

1. Discuss the normal torsional development of the femur and tibia from

the pre-natal period until growth is complete.

2. Describe the postural attitudes associated with the development of abnormal femoral and tibial torsion.

3. Describe how hip rotation is altered by femoral anteversion and retroversion.

4. Describe the clinical and radiological techniques for the measurement of femoral torsion.

5. Describe the clinical techniques for measuring and recording abnormal tibial torsion.

6. List the acquired conditions attributed to increased femoral anteversion.

7. Discuss the indications for exercises, splinting and osteotomy in the treatment of abnormal femoral and tibial torsion.

2. Angular

Core Objectives

Cognitive: After studying specified material, the trainee, without aid of references will be able to:

1. Describe the normal variation in the femoral neck shaft ankle between birth and old age.

2. Classify congenital coxa vara according to Amstutz1, describe the pathological, clinical and radiological features of each.

3. Describe the management of a given child with congenital coxa vara.

4. List the causes of acquired coxa vara in children.

5. Describe the physiological angulation at the knee (genu varum, valgum) from birth through to adolescence.

6. Describe the techniques for measurement and recording of angulation at the knee.

7. Discuss the management of a given patient with genu varum or valgum.

3. Leg Length Inequality

Core Objectives

Cognitive: After studying specified material, the trainee, without aid of references, will be able to:

1. Specify the growth contributions of proximal and distal femur and tibia.

2. List factors to consider in the evaluation of leg length inequality, with the significance of each.

3. Discuss the indications, results and complications of:

a) epiphyseal plate stimulation

b) surgical lengthening of a limb

c) surgical shortening of a limb

d) epiphyseal plate arrest

e) epiphyseal plate stapling

f) resection of a bony bridge across the epiphyseal plate

4. Given a patient with leg length inequality:

a) make a growth prediction, using the Green-Anderson2 or Moseley26 methods.

b) read scanograms and skeletal age films, using the Greulich-Pyle17 atlas.

c) outline a plan of management of the leg length discrepancy specifying the reasons for the plan chosen.

d) Understand the principle of lengthening through the callus.

Technical: Upon completion of his core curriculum in paediatric orthopaedics, the trainee will have demonstrated, to the satisfaction of an attending orthopaedic surgeon, his ability to:

1. Perform an eiphyseodesis in the lower limb of a given patient.

2. Appreciate the concept of limb lengthening using the Ilizarov or Orthofix techniques.

C. Congenital Disorders

1. Clubfoot

Core Objectives

Cognitive: After studying specified material, the trainee, without aid of references, will be able to:

1. Discuss the pathogenesis of talipes equinovarus.

2. List the pathological findings in ligaments, muscles and bones in talipes equinovarus.

3. Discuss the aetiology, management and prognosis of talipes calcaneovalgus.

4. List the major elements of the foot deformity in talipes equinovarus.

5. Describe in detail the management of talipes equinovarus in a neonate by each of the following techniques:

a) strapping

b) splinting

c) casting

6. List the characteristic radiological findings of an incompletely corrected talipes equinovarus in the older child.

7. List the indications for and describe the techniques of operative treatment of talipes equinovarus in a given patient under the age of six months.

8. Describe the operative approach to each of the following patients with talipes equinovarus:

a) Six year old with 15 symbol 167 \f "MS LineDraw" \s 12 fixed forefoot adduction

b) Seven year old with fixed heel varus of 10 symbol 167 \f "MS LineDraw" \s 12

c) Sixteen year old make with 10 symbol 167 \f "MS LineDraw" \s 12 fixed heel varus and 15 symbol 167 \f "MS LineDraw" \s 12 fixed equinus

9. List three permanent stigmata of congenital talipes equinovarus.

Technical: Upon completion of his core curriculum in paediatric orthopaedics, the trainee will have demonstrated, to the satisfaction of an attending orthopaedic surgeon, his ability to:

1. Correct the deformities in a given patient with talipes equinovarus by non-operative methods.

2. Prescribe appropriate orthosis to maintain correction in patients with talipes equinovarus.

2. Metatarsus Varus

Core Objectives

Cognitive: After studying specified material, the trainee, without aid of references

will be able to:

1. Describe the types of metatarsus varus and discuss the management and prognosis of a given patient with either variety.

Technical: Upon completion of his core curriculum in paediatric orthopaedics, the trainee will have demonstrated, to the satisfaction of an attending orthopaedic surgeon, his ability to:

1. Correct a given metatarsus varus deformity by serial cast application.

3. Tarsal Coalition

Core Objectives

Cognitive: After studying specified material, the trainee, without aid of references will be able to:

1. List the most common tarsal coalitions in order of frequency.

2. Describe the radiological techniques for demonstration of the above coalitions.

3. Describe the usual clinical findings in patients with symptomatic tarsal coalitions.

4. Discuss the management of a given child with a symptomatic tarsal coalition.

4. Developmental (Congenital) Dislocation of the Hip

Core Objectives

Cognitive: After studying specified material, the trainee, without aid of references, will be able to:

1. Discuss the genetic, hormonal, mechanical factors that have been incriminated in the aetiology of developmental (congenital) dislocation of the hip.

2. Demonstrate the clinical findings in developmental (congenital) dislocation of the hip in the neonate and discuss the relative importance of each in the diagnosis.

3. List the radiological findings (including arthrography) in developmental (congenital) dislocation of the hip in the neonate and in the older child.

4. List the normal value for the acetabular index and C-E angle at a given age.

5. Describe the expected gross pathological findings in developmental

(congenital) displacement of the hip in a patient:

a) 18 months of age or under

b) over 18 months of age

6. Discuss the management of unilateral developmental (congenital) displacement of the hip in a given child under the age of 18 months.

7. Discuss the management of unilateral developmental (congenital) displacement of the hip in a given patient between 18 months and 6 years of age.

8. List the complications of developmental (congenital) displacement of the hip and its treatment and discuss the management of a given patient who has developed one of the complications.

Technical: Upon completion of his core curriculum in paediatric orthopaedics, the trainee will have demonstrated, to the satisfaction of an attending orthopaedic surgeon, his ability to:

1. Obtain and maintain reduction of a given developmental (congenital) displacement of the hip by non-operative methods.

5. Congenital Dislocation of the Knee

Core Objectives

Cognitive: After studying specified material, the trainee, without aid of references will be able to:

1. List the possible aetiological factors in congenital dislocation of the knee including genu recurvatum.

2. Describe the optimum management of a given patient with congenital dislocation of the knee.

6. Vertical Talus

Core Objectives

Cognitive: After studying specified material, the trainee, without aid of references will be able to:

1. Discuss the pathogenesis of congenital vertical talus, and describe the gross pathological findings.

2. List the clinical and radiological findings that distinguish congenital vertical talus from the other types of flatfoot.

3. Describe the management of a given child with congenital vertical talus

including:

a) indications, techniques, and prognosis of non-operative treatment

b) indications for operative treatment

c) type of staging and procedures

7. Proximal Femoral Focal Deficiency

(See Leg Deformities - Angular)

8. Reduction Deformities

Core Objectives

Cognitive: After studying specified material, the trainee, without aid of references, will be able to:

1. Discuss the principles involved in the selection of the operative procedures for the reconstruction of a lower limb deformity caused by absence (partial or complete) of the femur, tibia or fibula.

9. Coxa Vara

(See Leg Deformities - Angular)

10. Pseudarthrosis of the Tibia

Core Objectives

Cognitive: After studying specified material, the trainee, without aid of references will be able to:

1. Describe the radiological and pathological findings in congenital pseudarthrosis of the tibia.

2. Describe operative techniques that have been used successfully to obtain union in the treatment of congenital pseudarthrosis of the tibia with the efficacy of each.

3. Understand the principles of the electrical stimulation of bone healing in pseudarthroses of the tibia.

4. Discuss microvascular bone transplants in the treatment of congenital pseudarthrosis of the tibia.

5. Discuss the orthotic management of congenital pseudarthrosis of the tibia.

Traumatic Disorders

Paediatric Fractures and Dislocations

Epiphyseal Plate Injury

The trainee will be expected to have a basic knowledge of the anatomy, histology and physiology of the growth plate and its reactions to injury and disease including the ability to:

1. Give a classification of the growth plate injuries and their treatment32.

2. Discuss the prognosis of growth plate injury and types of growth disturbance.

3. Discuss the apophysis and apophyseal injuries especially as related to sports injuries.

4. Explain the development of epiphyseal bars and methods of treatment.

5. Discuss the relative growth contributions of the major epiphyseal plates and their influence on fracture management.

Differences in Fractures Between Children and Adults

The trainee will be expected to be able to discuss in detail the anatomical and physiological differences in fractures and dislocations between children and adults with the implications on treatment including the ability to:

1. Discuss the complications of fractures and dislocations in general as related to children.

2. Discuss the effects of remodelling on fracture management.

3. Discuss the effects of fractures on growth on long bones and appropriate treatment to ensure limb length equality.

4. Discuss pathological fractures in children and how they differ from similar fractures in adults.

Birth Fractures

The trainee will have a good understanding of birth presentation predisposed to the fractures of long bones as well as those disease entities with a high incidence of fractures at parturition including the ability to:

1. Discuss the treatment and management of birth fractures.

2. Classify birth fractures and discuss the incidence and management of specific fractures of clavicle, humerus and femur.

3. Discuss associated soft tissue birth trauma, eg brachial plexus, spinal

cord injury.

Fractures in Child Abuse

The trainee will be expected to be familiar with the signs and symptoms of trauma secondary to child abuse.

1. Discuss the management of the abuse child (including legal responsibility)

2. Discuss the radiological features of the abused child.

3. Discuss the epidemiology and prevalence of child abuse.

Fractures and Dislocations of Specific Bones and Joints in Children

The trainee will be expected to have knowledge of the types and treatment of fractures and dislocations of each bone and joint with particular emphasis on complications and differences in management from the comparable adult injury.

A. Hand

The trainee should be able to discuss fractures of the phalanges, metacarpals and carpal bones including the management of intra-articular and epiphyseal injuries including the ability to:

1. Discuss the avulsion injuries of the paediatric hand and their treatment.

2. Discuss dislocation of the finger joints in children and their management.

B. Wrist

The trainee will be expected to discuss the various types of epiphyseal injury seen about the wrist including complications and management including being able to:

1. Discuss the concept of the periosteal hinge in the treatment of fractures of children.

2. Discuss the treatment of torus and greenstick fractures in children.

Technical: Upon completion of his core curriculum in paediatric orthopaedics, the trainee will have demonstrated, to the satisfaction of an attending orthopaedic surgeon, his ability to:

1. Reduction and plaster immobilisation of a Type I or II epiphyseal injury distal radius.

2. Reduction and plaster immobilisation of displaced (bayonet apposition) distal radius and ulna metaphyseal fractures.

C. Forearm Fractures in Children

The trainee will be expected to understand the biomechanics and treatment of fractures of the distal, middle and proximal third of the radius and ulna including the ability to:

1. Discuss the cause and management of the Monteggia25 fracture dislocation and its equivalents in children.

2. Discuss proper casting techniques and limb positioning for optimum treatment of various forearm fractures.

3. Discuss treatment of malunion of fractures of the forearm.

Technical: Upon completion of his core curriculum in paediatric orthopaedics, the trainee will have demonstrated, to the satisfaction of an attending orthopaedic surgeon, his ability to:

1. Reduce greenstick fracture midshaft radius and ulna.

2. Reduce displaced fracture midshaft radius and ulna by closed or open means.

D. Fractures and Dislocations About the Elbow

The trainee will be expected to understand the anatomy and epiphyseal development in the region of the elbow as well as the ability to:

1. Discuss the complications of elbow trauma in children.

2. Discuss fractures of the distal humerus at various ages.

3. Comment upon the investigation of elbow injuries.

4. Discuss vascular complications following elbow trauma.

5. Comment upon the treatment of complications of the supracondylar fracture in children.

6. Contrast clinically and radiologically between the various fractures encountered about the elbow.

Technical: Upon completion of his core curriculum in paediatric orthopaedics, the trainee will have demonstrated, to the satisfaction of an attending orthopaedic surgeon, his ability to perform:

1. Reduction and plaster immobilisation of:

a) supracondylar fracture humerus (including percutaneous pinning)

b) dislocation of the elbow

c) insertion of traction pin in ulna for traction treatment of supracondylar fracture

d) Monteggia fracture-dislocation

2. Open reduction and fixation of medial epicondylar and lateral condylar fracture.

3. The application of Dunlop's traction with and without skeletal traction.

4. Compartment pressure monitoring.

E. Fractures of Humeral Shaft and Shoulder

The trainee will be expected to understand the biomechanics and management of fractures of the shaft and proximal humerus in the child including the ability to:

1. Discuss the epiphyseal plate injuries about the proximal humerus including methods of reduction.

2. Discuss the relative growth contributions of the proximal humerus and its influence on treatment.

3. Discuss fractures of the clavicle and acromioclavicular joint in children re: aetiology and management.

Technical: Upon completion of his core curriculum in paediatric orthopaedics, the trainee will have demonstrated, to the satisfaction of an attending orthopaedic surgeon, his ability to carry out:

1. Proper application of Figure of Eight bandage for fractured clavicle.

2. Application of Navy Sling or Velpeau bandage.

3. Reduction and plaster immobilisation of displaced fracture of proximal humerus.

F. Spinal Injury in Children

The trainee will be expected to be able to discuss the approach of spinal injury in children re: diagnosis and management, but in particular, the differences between adult and paediatric injury. The trainee will also be expected to:

1. Discuss cervical spine injury in children and its relation to congenital abnormalities.

2. Explain the differences in anatomy of the cervical spine between infants and adults and its influence on spinal injury.

3. Explain rotary subluxation and facet dislocation and underlying mechanisms predisposing the child to these injuries.

4. Discuss pathological fractures of the spine in children.

5. Describe and discuss the features of spondylolysis in the child including treatment.

G. Pelvic Fractures in Children

The trainee will be expected to have an understanding of the biomechanics and types of pelvis fractures characteristic in childhood including associated soft tissue trauma. The trainee will also be expected to be able to:

1. Discuss apophyseal avulsion injures about the pelvis.

2. Explain methods of investigation and pelvic fractures and associated trauma.

3. Classify fractures of the pelvis in children.

4. Discuss the investigation and diagnosis of associated adjacent soft tissue injury.

H. Fractures and Dislocations About the Hip in Children

The trainee is expected to know the anatomy and development of the hip with particular emphasis on the blood supply to the femoral head at various ages as well as be able to:

1. Classify fractures of the head and neck of the femur in childhood including a discussion of management.

2. Discuss acute dislocations of the hip in childhood.

3. Discuss the management of complications of fracture dislocation of the hip with particular reference to cox vara and avascular necrosis.

4. Discuss the Type I fracture of the proximal femoral physis with respect to aetiology, diagnosis, management and prognosis.

I. Fractures of the Femoral Shaft

The trainee will be expected to understand the anatomy, vasculature and biomechanics of the femur that predispose it to injury in childhood and as well to be able to:

1. Discuss the emergency management of fractured femurs in children.

2. Discuss the traction treatment of femoral fractures in children of different ages and complications to be avoided.

3. Explain the problems encountered in managing subtrochanteric fractures in children.

4. Discuss the indications and complications of intramedullary rodding in children.

Technical: Upon completion of his core curriculum in paediatric orthopaedics, the trainee will have demonstrated, to the satisfaction of an attending orthopaedic surgeon, his ability to:

1. Demonstrate proper application of:

a) Thomas splint

b) skin traction techniques for management of fractured femur - distal and proximal

c) insertion of traction pin to distal femur

J. Fractures About the Knee in Children

The trainee will have a good understanding of the anatomy of the knee area, predisposing the child to specific injury. In addition, the resident will be expected to:

1. Discuss the types and management of epiphyseal injuries of the distal femur and proximal tibia in children and their prognosis.

2. Explain the differences in cruciate injuries between children and adults.

3. Discuss avulsion injuries about the knee.

4. Discuss referred pain about the knee.

5. Discuss osteochondral fractures of the knee.

K. Fractures and Dislocations of the Patella in Children

The trainee will be expected to understand the influence of developmental anatomy on patella stability and be able to:

1. Discuss chondromalacia patellae.

2. Discuss operative and non-operative management of patella instability.

3. Discuss osteochondral fractures secondary to patella dislocations.

L. Fractures of the Tibia and Fibula

The trainee is expected to know the influence of growth of one paired bone on the other as well as the types of fractures encountered in the tibia and fibula. The trainee will also be expected to:

1. Describe and discuss toddler’s fractures.

2. Discuss fractures involving the epiphyseal plate in the distal fibula and tibia.

3. Discuss fractures of the tibia and fibula with regard to varus and valgus angulation.

4. Discuss stress fractures.

5. Discuss fractures of the distal tibia in children including the triplane and Tillaux fracture.

Technical: Upon completion of his core curriculum in paediatric orthopaedics, the trainee will have demonstrated, to the satisfaction of an attending orthopaedic surgeon, his ability to:

1. Demonstrate closed reduction and plaster fixation of:

a) fractured tibia and fibula

b) fractured proximal tibia

c) Type II growth plate injury of the distal tibia

2. Perform open reduction and internal fixation of growth plate injury where indicated.

M. Fracture and Dislocation of the Foot

The trainee is expected to know the ossification pattern of the bones of the feet together with the types of fractures characteristic of each bone.

As well, the trainee should be able to:

1. Discuss injuries of the talus in children together with the blood supply of the talus.

2. Classify fractures of the calcaneus.

3. Discuss avulsion fractures about the foot.

4. Discuss osteochondral fractures of the talus.

5. Discuss accessory bones of the foot.

N. Pathological Fractures

The trainee will understand the types of paediatric conditions predisposing to pathological fractures including:

a) tumours and cysts

b) myelomeningocele

c) osteogenesis imperfecta

d) stress fractures

e) disuse osteoporosis

f) osteomyelitis

g) fibrous dysplasia

Miscellaneous Congenital Disorders

A. Constricting Bands

Core Objectives

Cognitive: After studying specified material, the trainee, without aid of references will be able to:

1. Discuss the pathogenesis and gross pathological findings of congenital constricting bands.

2. List the indications for surgical excision of congenital constricting bands.

Technical: Upon completion of his core curriculum in paediatric orthopaedics, the trainee will have demonstrated, to the satisfaction of an attending orthopaedic surgeon, his ability to:

1. Perform a Z-plasty to release a skin contracture.

Congenital Amputation

Core Objectives

Cognitive: After studying specified material, the trainee, without aid of references will be able to:

1. Discuss the aetiology of congenital amputations.

2. Discuss the principles of prosthetic management of infant and child with upper extremity and lower extremity congenital amputations.

B. Arthrogryposis

Core Objectives

Cognitive: After studying specified material, the trainee, without aid of references will be able to:

1. Give the evidence supporting primary muscle and primary central nervous system aetiologies of arthrogryposis.

2. List the clinical features of arthrogryposis.

3. Discuss the optimal management of a given child with arthrogryposis.

C. Marfan’s Syndrome

D. Ellis-van Creveld Syndrome

E. Nail-Patella Syndrome

F. Ehlers-Danlos Syndrome

G. Trisomy-21 (Down’s Syndrome)

H. Turner’s Syndrome

I. Kleinfelter’s Syndrome

J. Mucopolysaccharidoses

K. Achondroplasia

L. Larsen’s Syndrome

M. Klippel Trenaunay Weber

Core Objectives

Cognitive: After studying specified material, the trainee, without aid of references, will be able to:

1. Define, discuss the genetics, clinical and radiological features, laboratory abnormalities, management and prognosis in Marfan’s Syndrome, Ellis-van Creveld Syndrome, Nail-Patella Syndrome, Ehlers-Danlos Syndrome, Trisomy-21 (Down’s Syndrome), Turner’s Syndrome,

Kleinfelter’s Syndrome, mucopolysaccharidoses and achondroplasia.

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