Government Physiotherapy College, Raipur, C.G.

SYLLABUS

Bachelor of Physiotherapy

Fourth Year

CLINICAL NEUROLOGY

COURSE DESCRIPTION

Following the basic science and clinical science course, this course introduces the student to the neurological conditions, which commonly cause disability. Particular effort is made in this course to avoid burdening the student with any detail pertaining to diagnosis which will not contribute to their understanding of the limitations imposed by neurological pathology on the functioning of the individual.

COURSE OBJECTIVES

The objective of this course is that after 100 hours of lectures & demonstrations, in addition to clinics, the student will be able to demonstrate an understanding of neurological conditions causing disability and their management.

COURSE OUTLINE

A. NEUROANATOMY

Review the basic anatomy of the brain and spinal cord including: Blood supply of the brain and spinal cord, circle of Willis, anatomy of the visual pathway, cranial nerves connections of the cerebellum and , long tracts of the spinal cord, pyramidal and extra pyramidal system, spinal nerve, the brachial and lumbar plexuses and cranial nerves.

B. NEUROPHYSIOLOGY

Review in brief the Neurophysiologic basis of: tone and disorders of tone and posture, bladder control, muscle contraction and movement and pain pathway.

C. BRIEFLY OUTLINE THE CLINICAL FEATURES AND MANAGEMENT OF THE FOLLOWING NEUROLOGICAL DISORDERS

1. Congenital and Childhood Disorders

a. Cerebral palsy
b. Hydrocephalus
c. Spine Bifida

2. Cerebra - Vascular Accidents

a. General classification; thrombotic, embolic, haemorrhagic
b. Gross localization and Sequelae
c. Risk factors, clinical features, investigations and management.
d. Brief rehabilitative programmed.

3. Trauma

Broad localization, first aid and management of Sequelae of head injury and spinal cord injury.

4. Diseases of the spinal cord

a. Cranio-vertebral junction anomalies.
b. Syringomyelia
c. Cervical and lumbar disc lesions (prolapsed).
d. Tumours (brief).
e. Spinal arachnoiditis.

5. Demyelinating Diseases (Central and Peripheral) – Acute disseminated encephalomyelitis, Transverse myelitis & multiple sclerosis.

6. Degenerative disorders -Parkinson's disease & Dementia.

7. Infections - Pyogenic Meningitis, tuberculous infection of central nervous system & Poliomyelitis.

8. Diseases of The Muscle: Classification, signs symptoms, progression and management.

Myasthenia gravis, course, clinical features and management.

9. Peripheral Nerve Disorders

a. Peripheral nerve injuries: Clinical features and management.
b. Entrapment neuropathy
c. Peripheral neuropathy (classification)
d. Gullian-Barre Syndrome
e. Diabetic neuropathy

10. Disease Of Cerebellum

Etiology, pathophysiology, clinical feature & management

a. Cerebral ataxia
b. Friedreich's ataxia

11. Miscellaneous

a. Epilepsy- Definition, classification, and management,
b. Intracranial tumours- Broad classification, signs and symptoms and in brief management.
c. Motor neuron disease- Definition, classification, clinical feature and management.

12. General assessment procedure and basic principles of management.

D. CLINICAL

Evaluation, interpretation, presentation & recording of two cases each in-

1. U.M.N. lesion, 2. L.M.N. lesion,
3. Extra-pyramidal lesion / Cerebellar
4. Hereditary & Degenerative disorders.

Emphasis must be laid on -

1. Basic history taking to determine whether the brain, spinal cord or peripheral nerve is involved.
2. Assessment of higher mental function such as orientation, memory, attention, speech and language.
3. Assessment of cranial nerves
4. Assessment of motor power.
5. Assessment of sensory function touch, pain and position.
6. Assessment of tone plasticity, rigidity and hypotonia.
7. Assessment of cerebellar function.
8. Assessment of higher cortical function- apraxia etc.
9. Assessment of gait abnormalities

RECOMMENDED BOOKS

1. Brain's Diseases of the Nervous System – Nalton – ELBS.
2. Guide to clinical Neurology – Mohn & Gaectier – Churchill Livingstone.
3. Principles of Neurology – victor – McGraw Hill International edition.
4. Davidson's Principles and practices of medicine – Edward - Churchill Livingstone.

CLINICAL ORTHOPAEDICS

85 Hrs

COURSE DESCRIPTION

Following the basic science and Clinical science course this course introduces the student to the Orthopaedic conditions, which commonly cause disability.

COURSE OBJECTIVES

At the end of the course, the candidate will –

1] Be able to discuss the Pathophysiology, clinical manifestations & conservative / Surgical management of various traumatic & cold cases of the Musculoskeletal Conditions.

2] Gain the skill of clinical examination & interpretation of the preoperative cold cases & all the post-operative cases.

3] Will be able to read & interpret a] salient features of the X-ray of the spine & Extremities pathological / biochemical studies pertaining to Orthopedic conditions.

4] Will be able to correlate the radiological findings with the clinical findings.

Theory – 65 Hrs

1**. INTRODUCTION TO ORTHOPAEDICS** **(5 Hrs)**

a. Orthopaedic terminology & instruments
b. History taking & clinical examination in orthopaedics.
c. Common investigation procedures in orthopaedics (Radiographs & other imaging techniques)
d. Principles of orthopaedic management
e. Common orthopaedic procedures (Arthrodesis, arthroscopy, arthroplasty, osteotomy, bone grafting, tendon transfers, soft tissue releases, tenotomy & lengthening procedure, tendon & nerve suturing, common spinal surgeries & stabilization procedures.

2. FRACTURES & DISLOCATIONS **(20 Hrs)**

a. Introduction to fractures
b. Types of fracture
c. Healing of fracture, factors affecting healing of fracture.
d. Fracture complications, its prevention & treatment
e. Principles of fracture management (conservative & operative)
f. Closed & open reduction, internal & external fixation
g. Enumerate major long bone fractures of **upper limb, lower limb & spine**. Briefly describe their mechanism of injury, clinical features, complications & management of following fractures
h. Upper limb – clavicle, scapula, humerus, radius, ulna, carpals, metacarpals, phalanges.

i. Lower limb – pelvis, femur, patella, tibia, fibula, tarsal, metatarsal, phalanges
j. Spine – cervical, thoracic & lumbar spine. (Vertebral column factures), rib fractures.
k. Dislocation, subluxation (shoulder, hip, patella, elbow) & their management.

3. SOFT TISSUE & SPORTS INJURIES (8 Hrs)

a. Sprain, Strain, Bursitis, Tendonitis, Tenosynovitis, fascitis & capsulitis.
b. Soft tissue healing.
c. Mechanism of injury, clinical manifestation, evaluation & basic treatment of following conditions
d. Shoulder - Rotator cuff injury & tendonitis, PA shoulder, adhesive capsulitis, sub-acromial bursitis, biceps tendonitis.
e. Elbow - Tennis elbow, Golfers elbow, triceps tendonitis, olecranon bursitis.
f. Wrist & Hand – DeQuervain's disease, Trigger finger & thumb, ganglion, Dupuytren's contracture, Carpal tunnel syndrome, mallet finger.
g. Hip - Groin strain (Hip adductor strain), ITB friction syndrome, piriformis syndrome, greater trochanter bursitis.
h. Knee ligament injuries- Cruciates, collateral, meniscus injuries, bursitis, tendonitis, Osgood Schlatter's disease, anterior knee pain, chondromalacia patellae
i. Ankle & foot - Ankle sprain, tendonitis, Heel pain, foot pain, metatarsalgia, tarsal tunnel syndrome, mortans neuroma

4. BONE & JOINT INFECTIONS (3 Hrs)

a. Osteomyelitis (Acute & chronic)
b. TB (Spine & hip) Pott's spine & paraplegia
c. Septic arthritis

5. COMMON TUMOURS OF MUSCULO-SKELETAL SYSTEM & THEIR MANAGEMENT (osteoma, osteosarcoma, osteochondroma, Ewing's sarcoma, GCT, multiple myloma). **(2 Hrs)**

6. ARTHRITIS (3HRS) – Outline the etiopathology, clinical presentation & management including joint replacement for the followings

- Osteoarthritis
- Rheumatoid arthritis
- Ankylosing spondylitis.

7. METABOLIC BONE DISEASES (2 Hrs) – Rickets, osteomalacia, osteopenia & osteoporosis.

8. CERVICAL & LUMBAR PATHOLOGY **(6 Hrs)**

a. Cervical – Cervical spondylitis, spondylosis, PIVD, Brachial plexus injury, thoracic outlet syndrome, brachial neuralgia, VBI.

b. Lumbar – Lumbar spondylitis, spondylosis, PIVD, spondylosisthesis, lumbar canal stenosis, LS strain, sciatica, lumbarisation, sacralisation.

9. SPINAL DEFORMITIES (2 Hrs) - Aetio-pathology, clinical features, & management of scoliosis, kyphosis, lordosis.

10. DEFORMITIES – **(5 Hrs)**

Congenital deformities -

a. Congenital deformities & limb deficiencies

b. Upper limb – sprengel's shoulder, radial club hand.

c. Lower limb – DDH, Coxa vara, CTEV, congenital vertical talus.

d. Spine – torticolis, spina-bifida, klipple feil syndrom.

Acquired deformities –

- Coxa vara, genu valgum, genu varum, genu recurvatum, pes cavus, planus, hallux valgus, hallux rigid, hammer toe.

11. NEURO-MUSCULAR DISORDERS - **(3 Hrs)**

Poliomyelitis – Aetio-pathology, stages, clinical presentation & management of poliomyelitis. Orthopaedic & orthotic management of PPRP deformities.

Cerebral Palsy – Aetio-pathology, types, clinical presentation, & orthopedic management.

12. AMPUTATION (2 Hrs) - Definition, levels of amputation of both lower & upper limbs, indications& complications.

13. HAND INJURIES (2 Hrs) – Mechanism of injury, clinical features, management of the following- crush injuries, Flexor & Extensor injuries and Burn injuries of hand.

14. X-RAYS OF EXTREMITIES & SPINE **(2Hrs)**

CLINICAL **(20 Hrs)**

1] Independent clinical orthopedic evaluation presentation & recording of

a] one acute soft tissue lesion [including nerve injury]

b] 2 cases of degenerative arthritis of extremity joint

c] 2 degenerative arthritis of spine

d] One case of acute P.I.D.

e] 2 chronic backaches

f] 1 post operative case of fractures of extremities

g] One traumatic paraplegia / quadriplegia

BOOKS RECOMMENDED

1. Outline of Fractures—John Crawford Adams.
2. Outline of Orthopedics.— John Crawford Adams.
3. Text book of Orthopedics.—Maheswari.
4. Apley's Orthopedics.
5. Textbook of Orthopedics and Traumatology— M.N.Natarajan

PHYSIOTHERAPY IN ORTHOPEDIC CONDITIONS

COURSE DESCRIPTION

This course serves to integrate the knowledge gained by the students in clinical orthopedics with the physiotherapy skills & techniques gained in exercise therapy, electrotherapy, thus enabling them to apply these in clinical situation of dysfunction due to musculo-skeletal pathology.

COURSE OBJECTIVES

The objective of this course is that after 95hrs of lectures, demonstrations & practical the candidate will

1) Be able to identify, discuss & analyze the musculo-skeletal dysfunctions in terms of biomechanical correlation, provisional diagnosis, investigation for an appropriate functional diagnosis with clinical reasoning.

2) Be able to plan, prescribe & execute appropriate Physiotherapy management for relief of pain, restoration/ maintenance of function, Rehabilitation of the disabled person to the maximum functional independence.

Syllabus –

1. Review manual, mechanical, skin, skeleton & spinal traction. **(2Hrs)**
2. Review common orthopedic surgeries & role of Physiotherapy in the same along with detailed preoperative & post operative physiotherapy evaluation & management including Arthroscopy, Arthroplasty, Arthrodesis, and Osteotomy, Soft tissue procedures & tendon transfers, common spinal surgeries. **(10Hrs)**
3. Detail description about the **Physiotherapy evaluation** skills in Orthopedic conditions including subjective & objective assessment & special test, with special emphasis on spine, shoulder, elbow, wrist & hand, hip, knee & ankle & foot. (Review of clinical Anatomy & Bio-mechanics**.** **(8Hrs)**
4. **Fractures** – Classifications of fractures, causes, types, sign & symptoms. Healing of fractures & the factors affecting it. Complications of fractures & its Physiotherapy management. Principals of fracture management. Role of Physiotherapy in fracture management. Role of Physiotherapy in management of specific fractures of **Upper limb** (Clavicle, Humerus, Radius, Ulna, Carpal & Metacarpal fractures) **Lower limb** (Pelvis, Neck femur, Intertrochantric fracture femur, shaft femur, patellar fractures, fractures around knee, tibial fractures, fractures around ankle & foot. **Spinal fractures** (vertebral fractures with & without neurological complications) Common dislocations & subluxation (Hip, Shoulder & patella) & its management**.** **(20Hrs)**

5. Physiotherapy in Soft tissue & Sports Injuries – Review causes, grades, clinical feature & management of Sprain, Strain. Bursitis, Tendonitis, Tenosynovitis, fascitis &

capsulitis. Soft tissue healing. Mechanism of injury, clinical manifestation, Physiotherapy evaluation, management & Rehabilitation of following conditions **(15Hrs)**

- Shoulder - Rotator cuff injury & tendonitis, PA shoulder/ Adhesive capsulitis.
- Elbow - Tennis elbow, Golfers elbow.
- Wrist & Hand – DeQuervain's disease, Trigger finger, Carpal tunnel syndrome.
- Hip - Groin strain (Hip adductor strain), hamstring strain, ITB friction syndrome, and Piriformis syndrome.
- Knee ligament injuries- Cruciate, collateral, meniscus injuries, including ACL ligament reconstruction surgery & Rehabilitation protocol.
- Ankle & foot – Shin split, Ankle sprain, Heel pain, foot pain.

6. Role of physiotherapy in **congenital & acquired deformities** - Torticollis, CDH, CTEV, flat foot, Mal-alignment at the knee joint, toe deformities**.** **(3Hrs)**

7. **Anesthetic foot & planter ulcers** in Diabetic foot & leprosy. Its detail physiotherapy evaluation & management including care of anesthetic foot, Role of Electrical modalities & Orthotics. **(3Hrs)**
8. **Cervical & Lumbar spine pathologies (10Hrs)** – Physiotherapy assessment & management of following conditions
   - Cervical Spine – Cervical spondylitis, PIVD, Vertebro-Basillar Insufficiency, Thoracic outlet syndrome.
   - Lumbar Spine - Lumbar spondylitis, PIVD, Spondylo-listhesis, Lumbar canal stenosis.
   - Differential diagnosis of Low Back Pain.
   - Principal s of Physiotherapy Management in Low back pain
9. Review **Spinal deformities (Scoliosis, Kyphosis) (5Hrs)** its classification, etiopathology, clinical presentation, & management (Conservative, Orthotic & Surgical) Detailed Physiotherapy evaluation including postural evaluation & management guideline.
10. **ARTHRITIS (8Hrs)** – Review basic classification of Arthritis. Etio-pathology, clinical presentation, investigation & Medical, Surgical & Physiotherapy management of **Osteo-arthritis, Rheumatoid Arthritis, Ankylosing Spondylitis.**
11. **Amputation (3Hrs) –** Review types, indication, surgical principals of major upper & lower limb Amputations. Complications of Amputation Surgeries, its prevention & treatment. Role of Physiotherapy in Post operative management , dressings & immediate post-operative fittings, prosthetic prescription , check-out & training of the Amputee with prosthesis.

12. **Neuro-Musculo-Skeletal Disorders (5Hrs) –**

    Poliomyelitis –Review Aetio-pathology, Clinical features, Stages, common deformities & its orthopaedic corrections including soft tissue release procedures, osteotomy, arthrodiesis, Tendon transfers. Detailed Physiotherapy evaluation, & management (Conservative & Post operative), Orthotic prescription & gait training.

    Cerebral Palsy – Review definition, causes, classification, clinical presentation, associated problems of Cerebral palsy, with special emphasis on orthopaedic management Principals in Spastic Cerebral Palsy. Detailed Physiotherapy evaluation & management principals. Recent trends in management (BOTOX)

13. **Physiotherapy in Burns (3Hrs)** - Review basic clinical anatomy of skin, various causes of burns, degree of burns, clinical features & complications of Burn injuries. Medical treatment & first aid, surgical treatment including skin grafting. Physiotherapy evaluation & management of Burn including the role of exercise therapy & electrotherapy modalities. Orthotics in Burn rehabilitation.

CLINICAL - (40Hrs)

Evaluation & treatment planning: its presentation & documentation of Minimum two cases each in – 1) # upper Limb (Including hand injury), 2) # lower limb, 3) Soft tissue lesion (any), 4) # spine with/without Neurological condition 5) degenerative arthritis of skeletal joint 6) musculo – skeletal condition of Hand & foot.

RECOMMENDED BOOKS

1. Tidy's physiotherapy.
2. Textbook of Orthopaedics- Cash.
3. Clinical Orthopaedic rehabilitation- Brotzman.
4. Orthopaedic physiotherapy - Jayant Joshi.
5. Physical Rehabilitation Assessment and Treatment – O'Sullivan Schmitz
6. Sports physiotherapy- Maria Zuluaga
7. Orthopaedic Physical Assessment- By G. Maggie

PHYSIOTHERAPY IN NEUROLOGICAL CONDITIONS

COURSE DESCRIPTION

This course serves to integrate the knowledge gained by the students in Clinical Neurology, with the skills gained in exercise therapy, electrotherapy and massage, thus enabling them to apply these in clinical situations of dysfunction due to pathology in the nervous system.

COURSE OBJECTIVES

The objective of this course in that after 120 hours of lectures, and 60 hours of practical and clinics the student will be able to identify disability due to neurological dysfunction, set treatment goals and apply their skills in exercise therapy, electrotherapy and massage in clinical situation to restore neurological function.

A. REVIEW OF NEUROANATOMY AND PHYSIOLOGY [20 hours]

Review the structure and function of *a)* neuron b) synapse c) supporting tissue. Review the organization and function of a) cerebral hemispheres b) cerebellum c) spinal cord d) peripheral nerves e) pyramidal system f) extra pyramidal system g) internal capsule h) Basal ganglia i) Lumbar and brachial plexus. Review the factors influencing alpha motor neuron activity. Review the neurological basis of muscle tone and movement and demonstrate the following: a) hvpotonia b) hypertonia - spasticity and rigidity c) ataxia d) Involuntary movement

B. PRINCIPLES OF ASSESSMENT [10 hours]

Review a) skills in history taking b) assessment of higher functions, cortical sensations, cranial nerves, dorsal column sensation and pain & temperature sensations c) assessment of motor function : grading of muscle power, assessment of range of movement, balance and coordination d) assessment of superficial and deep reflexes e) assessment of reflex maturation in terms of stimulus, and their significance f) assessment of gait-both normal and abnormal (spastic, ataxic and paralytic patterns) Emphasis should be placed on teaching accurate assessment techniques and various recording methods eg. colour coding on body charts, graphs etc. g) Bladder control and its types.

C. BASIC INVESTIGATIVE PROCEDURES USED IN NEUROLOGY [7 hours]

a. EMG

b. NCV

c. H reflex & F wave

d. EEG

e. Cerebral evoked potentials

f. CT scan

g. MRI

D. PRINCIPLES OF TREATMENT [8 hours]

Review the treatment principles as follows: -

a. Sensory re-education: hypersensitivity, hypo sensitivity and anesthesia.

b. Treatment of altered tone: hyper tonicity and hypotonicity.

c. Motor re-education: Strengthening exercise, coordination exercises, joint mobilization exercises, use of equilibrium and labyrinthine systems, use of PNF patterns, controlled sensory use of stretch to elicit movement (facilitation), light joint compression (inhibition), use of reflex activity to improve motor function, phylogenic sequence of motor behavior.

d. Treatment to improve functions: Free exercises, gait training with and without aids, activities of daily living, mat exercises and exercises and recreation.

e. Review the use of ambulatory aids in neurological conditions: in spastic upper motor neuron lesions, in lower motor neuron lesions, in dorsal column dysfunction and cerebellar dysfunction.

f. Review the use of splints and braces in spastic upper motor neuron and in flaccid lower motor neuron lesions in both upper and lower limbs.

g. Review the management of chronic pain in neurological conditions with respect to the types of pain, treatment modalities available, selection criteria for each modality and possible complications.

D. CEREBRAL PALSY **[10 hours]**

Define cerebral palsy and describe the topographical classification - monoloplegia, diaplegia, paraplegia, hemiplegia & tetraplegia. Describe types of cerebral palsy: spastic, athetoid, ataxic & mixed. Identify common associated problems: Visual, hearing, speech and intelligence. Assess reflex activity at different levels: Cortical, midbrain, brain stem, spinal. Assess developmental milestones from birth to five years. Assess functional Ability: Prone to supine (rolling), coming to sitting, quadripod, crawling, kneeling, kneel to stand, stand with support and walking. Examine for contractures as follows: hip flexion, adduction, internal rotation, knee flexion, ankle plantar flexion, inversion, eversion, flexion contractures of elbow, wrist, fingers and spinal deformities.

Treatment - Describe and demonstrate the treatment motor disabilities; Passive movement stretching of soft tissue tightness, use of ice to reduce spasticity, positioning the child to prevent soft tissue contractures, to inhibit abnormal reflexes and to facilitate volitional movement. Describe and demonstrate techniques of carrying of different types of CP children, encouraging bimanual activities in different starting positions like prone sitting and

standing and activities across the midline. Describe appropriate home programmes for positioning the child, handling them and assisting improvement of function. Introduction of use of various treatment approaches in CP.

E. PERIPHERAL NERVE LESIONS [6 hours]

Identify types of peripheral nerve lesions. Assess the motor system: Specific muscles, range of motion, active and passive ranges, muscle girth. Assess sensory system: touch, pain, temperature, paraesthesia, nerve degeneration & regeneration. Assess autonomic function: sweating, skin condition, soft tissue atrophy. Treatment: describe early reeducation techniques, electrical stimulation (selection of current), late reeducation techniques, active, assisted, resisted movements, Passive and auto assisted stretching, and massage. Describe sensory reeducation and pain relief by various modalities. Describe the common splints used in peripheral nerve lesions: static, & dynamic. Functional reeducation.

Muscle transfers; Preparation for transfer-assessment of muscle power, stretching of soft tissue tightness, isolation of muscle contraction, specific muscle strengthening. Post-operative management: Pressure bandaging & muscle reeducation after transfer. Describe a home programme.

F. MUSCULAR DYSTROPHY [7 hours]

Definition, Classification & Pathology. Describe motor dysfunction w.r.t stages of the disease: Ambulatory, wheelchair and bed stage. Other dysfunctions, investigation used, Identify and assess common contractures and deformities. Assess range of motion and muscle power. Assess functional ability.

Demonstrate treatment programme for strengthening weak muscles: active movements and hydrotherapy. Increase range of motion by suspension therapy, powder board, passive stretching, positioning etc. Demonstrate gait training with appropriate orthosis. Describe management of chest complications: breathing exercises, chest percussion, drainage of secretions and assisted coughing.

G. PARKINSONISM [6 hours]

Review the natural history, course and prognosis of the disease. Identify and assess problems in posture, sitting, kneeling and standing balance, voluntary and automatic movements, rigidity, tremor and gait. Assess also hearing, speech and finger dexterity. Describe disability grading according to Hoen's &Yarr's Scale.

Demonstrate treatment: postural awareness and relaxation training, flexibility excercises, gait training techniques, heel-toe gait, overcoming obstacles, start and stop on command, turning and walking backwards, forwards and sideward. Describe an appropriate home exercise programme.

H. SPINAL CORD LESIONS [10 hours]

Describe types of spinal cord lesions. Describe signs of tract and root interruptions. Describe positioning of the patient in acute spinal cord injury. Describe assessment of the motor system: tone, power of specific muscles, range of motion and limb girth. Myotome & dermatomal assessment. Describe assessment of sensory system and reflexes. Describe assessment of functional activities and balance reactions in appropriate cases. Describe assessment of respiratory function: Muscles of respiration, coughing ability and vital capacity. Describe how the level of lesion is ascertained. ASIA Scale & Frenekel's Scale.

Treatment: Describe the stages of immobilization & stage when loading of the spine is allowed. Describe spinal orthosis. Demonstrate motor reeducation programmes and a programme for

respiratory care in high level paraplegics and quadriplegics. Demonstrate progressive ambulation, mat exercises, various strengthening programmes, methods of decreasing spasticity and improving sitting balance. Demonstrate various types of paraplegic gaits and reeducation in functional activities: transfers, wheel chair transfers and protective falling. Describe common ambulatory aids used in paraplegics and common splints used in tetraplegics. Describe the use of hydrotherapy in paraplegics.

I. HEMIPLEGIA [10 hours]

Define hemiplegia and identify the following: Sensory disturbance, alteration in tone, loss of selective movement, loss of balance reactions and communications problems.

Treatment: Describe the unilateral and bilateral approaches to treatment. Describe positioning in the supine position, on the affected and on the unaffected sides. Demonstrate activities in the recumbent position: arm mobilization, trunk elongation, scapular movement, arm elevation activities for a recovering arm; Activities for the lower limb i.e. hip and knee flexion over the side of the bed, knee extension with dorsiflexion, hip control, isolated knee extension.

Mat activities: demonstrate rolling on to affected and unaffected sides, sitting and kneeling. Describe the technique of making a patient sit passively & active assisted sitting. Demonstrate transfer techniques. Describe activities in sitting, equal weight transfer on both buttocks, shuffling on buttocks, equal weight transfer through arms, balance reactions of trunk & head. Demonstrate activities in the standing position: standing from plinth, from chair (assisted and

independent). Weight bearing on affected leg, knee control in standing, weight transfers forward, backward and sideward, gait training and stair climbing. Describe tilt board activities in the lying and sitting positions. Describe additional methods of stimulation using verbal cues, ice, pressure & tapping. Describe management of shoulder pain and shoulder hand syndrome. Identify and describe hemiplegic's gait, identify synergy components and abnormal reflex activities.

Demonstrate re-education of gait: motor relearning techniques, functional approach and use of orthosis.

J. **CEREBELLAR LESIONS** **[3 hours]**

Identify and assess abnormal tone, decomposition of movement, dysdiadochokinesia, rebound phenomenon, proprioception, dysmetria, posture and gait.

Treatment: Demonstrate exercises for in-coordination; Frenekel's and weighted exercises. Demonstrate techniques for re-education of balance and equilibrium reactions by visual compensation. Describe use of appropriate aids for ambulation depending on the severity of affection - walker, elbow crutches, quadruped, walking sticks etc.

K. POLIOMYELITIS **[4 hours]**

Define poliomyelitis and review the Stages in the disease - acute, recovery and residual paralysis. Describe treatment in the acute stage: head, chest care, positioning. Describe the assessment of a patient in the recovery Stage: active and passive range of motion, soft tissue tightness, muscle power & Spinal deformities. Demonstrate treatment in the recovery stage: muscle strengthening, progressive resisted exercises, active assisted, active exercises. Describe the role of suspension and hydrotherapy. Describe the treatment of soft tissue tightness by passive

stretching. Auto stretching and positioning. Demonstrate treatment in the stage of residual paralysis Pre-operative assessment of contractures; hip flexion, TFL contractures, knee flexion and foot deformities. Describe also assessment of limb length discrepancy and spinal deformities. Review orthotic aids commonly used the management of polio. Describe tendon transfer operation commonly performed. Describe functional retraining for self-care, gait training and posture correction.

L. TRAUMATIC BRAIN INJURY **[3 hours]**

a) Types & mechanism of Head Injury, Clinical feature and potential complications.

b) Physiotherapy principles of immediate & post operative therapeutic management.

M. MULTIPLE SCLEROSIS Clinical feature, assessment and principles of therapeutic management. **[4 hours]**

N. CONCEPTS OF FOLLOWING NEUROPHYSIOLOGICAL TECHNIQUES [10 hours]

1. NDT (Bobath)
2. PNF
3. Rood's
4. Brunnstroom Movement Therapy
5. MRP
6. Vojta
7. Motor Control, Motor learning & motor development.

CLINICAL **[60 HRS]**

Practical shall be conducted for all the relevant topics discussed in theory in the following forms:

1. Bedside case presentations and case discussions
2. Lab sessions consisting of evaluation and assessment methods on student models, treatment
3. Techniques and practice sessions.

RECOMMENDED BOOKS

1. Tidy's physiotherapy.
2. Cash's Textbook of Neurology for Physiotherapists
3. Neurological Rehabilitation by D Umphred
4. Physical Rehabilitation Assessment and Treatment – O'Sullivan Schmitz
5. Elements of Pediatric Physiotherapy-Eckersley

REHABILITATION MEDICINE

COURSE OBJECTIVES

The objective of this course is that after 150hrs of lectures, demonstrations & practical the candidate will be able to identify, discuss & analyze the scope & role of Physiotherapist including the understanding of rehabilitation team approach in various fields of rehabilitation.

Theory – 110 Hrs

1. **INTRODUCTION –** Definition & concept of rehabilitation team approach. Brief explanation about the Role of each team member in the process of Rehabilitation**. (5hrs)**
2. **History of Physiotherapy**, Rules of professional conduct, Ethics and legislation of Physiotherapy in India. Administration, organization & management of Physiotherapy department. **(5hrs)**
3. Brief explanation about the **scope of Physiotherapy** in following fields. **(20hrs)**
    1. Sports Physiotherapy –Fitness Testing & Training
    2. Hand rehabilitation – Tendon injury
    3. Pediatric physical therapy – early identification & intervention in pediatrics age group patients including neo-natal screening, common congenital, acquired & developmental conditions producing disability in pediatrics.
    4. Geriatrics (Gerontology) – Age related changes in musculo-skeletal, nervous and cardio-respiratory systems. Assessment of Quality of life in old age population. Industrial Physiotherapy – Role of physiotherapy industrial health. Cumulative trauma disorders. Ergonomics.
    5. Community Based Rehabilitation – Concept & need of CBR. Difference between CBR & IBR. Role of Physiotherapy in CBR.
4. **THERAPEUTIC TECHNIQUES** **(20hrs)**

    Explain the theory and mechanisms of therapeutic techniques and relevant precautions, for the following:

    a) Joint mobilization
    b) Reducing spasm
    c) Assisting weak muscles
    d) Increasing endurance
    e) Muscle re-education following muscle transfer surgery
    f) Strengthening muscles
    g) Increasing co-ordination
    h) Improving balance

i) Gait training

5. Brief explanation about the fields of **Occupational therapy**. **(2hrs)**

   Architectural Barriers and modifications. **(5hrs)**

6. **Orthotics** – Material, Principals & Indications of Upper limb, Lower limb & Spinal orthosis. **(10hrs)**

7. **Prosthetics** – Material, Principals, Indication of upper limb & lower limb prosthetics. Checkout & training of prosthesis. **(10hrs)**

8. **Mobility aids**, appliances & assistive devices used in Rehabilitation. **(7hrs)**

   Pain – Physiology of pain, Pain assessment & modulation of Pain with physiotherapy. Myofascial pain syndrome. **(5hrs)**

9. **Disability evaluation** – Basic guideline for the evaluation of Disability & the process of certification in India (As per the notification in gazette of India). Enumerate the benefits and compensations awarded to a Person with disability (PWD) including PWD act. Legal aspect of Disability. **(5hrs)**

10. Brief explanation about **Communication problems** & its management. **(5hrs)**

11. Role of Physiotherapist in **Pre-vocational evaluation** & training. **(5hrs)**

12. Describe **Community Based Rehabilitation** & Compare It with Institutional Based Rehabilitation. **(6hrs)**

RECOMMENDED BOOKS

1. Rehabilitation Medicine by Howard A Rusk.
2. Rehabilitation Medicine by Joel A Delisa
3. New York University medical centre (NYU) Orthotics & Prosthetics
4. Atlas of Orthotics & Prosthetics
5. Geriatric Physical Therapy- By Gussian
6. Industrial Physical Therapy- By Linda Key
7. Sports Physical Therapy- By Norris
8. Women's health- By Polden
9. Disability evaluation- Gazette of India.
10. Physical Rehabilitation Assessment and Treament – O'Sullivan Schmitz

BIOSTATISTICS & RESEARCH METHODOLOGY

COURSE OBJECTIVE

The objective of this course is to instill a deep sense of data appreciation and to develop basic statistical skills in collection, compilation, analysis and interpretation of data. After undergoing this course, a student is expected to plan and execute a statistical project quite independently.

COURSE DURATION

The course is spread over a minimum of 50 lectures and expects a student to involve in sufficient amount of self reading. The teacher is expected to deliver maximum within limited time period.

1. **Definition-** Introduction, Scope, function, uses, limitations, distrust & pitfalls of statistics. Special emphasis to be given to health & medicine
2. **Planning statistical enquiry** – Steps, primary & secondary data, sources of primary & secondary data, planning a questionnaire, sampling methods, sampling and non – sampling errors.
3. **Classification and tabulation of data** – definition & methods of classification sturge's rule, definition & methods of tabulation , requisites of a good table , frequency distribution , marginal and conditional frequencies .
4. **Graphical representation of data**
   Histogram, frequency polygon, frequency curve, ogive, scatter plot.
5. **Measures of central tendency** – Definition, requisites of a good statistical average Mean including step deviation method, Median, Mode, Geometric & Harmonic mean, moving & Weighted average.
6. **Measures of variation** – Definition, Range, mean deviation, standard deviation, including step deviation method, coefficient of variation.
7. **Partition values –** median, quartile, quintile, deciles, and percentile.
8. **Correlation & Regression** – definition of correlation, Karl Pearson's coefficient of correlation, rank correlation & repeated ranks, definition of regression , distinction between correlation and regression, regression lines and regression analysis.
9. **Partial and multiple correlations –** definition
10. **Probability –** definition, addition and multiplication rules**.**
11. **Various tests of significance –** Hypothesis, Type I and II errors, $\chi 2$ (Chi square), t and Z-tests and their application.
12. **Errors in statistics**- Absolute error, relative errors, probable & standard error
    Theories of estimation – Point and interval estimation concept.

RESEARCH METHODOLOGY

1. Introduction

    a) Introduction Importance of research in clinical practice, scientific approach, characteristics, purposes, and limitations.

    b) Ethical issues in research, elements of informed consent.

    c) Structure of a research proposal.

2. Research Methodology

    a) Research question including literature review.

    b) Measurement: Principles of measurement, reliability and validity.

    c) Experimental sampling and design.

    d) Descriptive research

BOOKS RECOMMENDED

1. Methods in Bio-statistics – Mahajan – J. P.
2. Statistics in Medicine – Cotton, Little Brown, Boston.
3. Research for Physiotherapist – Project Design and Analysis – Hicko- Churchill Livingstone.
4. Bio-statistics – The manual for statistical methods for use in health & nutrition – K. V. Rao. – J. P.
5. Research methods in behavioral science – Mohsin – Orient Publication