

Paper II: Technical Subject

1. Musculoskeletal and Sports

- 1.1 Pain
 - 1.1.1 Pain concepts and history
 - 1.1.2 Pain assessment measurements
 - 1.1.3 Psychological, social and economic aspects of acute and chronic pain
 - 1.1.4 Neuro pathophysiology of pain
 - 1.1.5 Pain modulation, pain gate theory
 - 1.1.6 Pain management: pharmacology aspect, manual therapy, electrotherapy modalities, cognitive behavioral therapy
- 1.2 Assessment, evidence based approach management and recent advances
 - 1.2.1 Soft tissue injury: muscle contusion /strain/ ligament sprain / tear / weakness; tendinopathy, tendon tear / rupture/ tendinosis
 - 1.2.2 Chronic pain conditions - fibromyalgia, CRPS
 - 1.2.3 Fracture, dislocation, subluxation
 - 1.2.4 Degenerative joint diseases - osteoarthritis, adhesive capsulitis, spondylosis
 - 1.2.5 Arthropathies - rheumatoid arthritis, ankylosing spondylitis
 - 1.2.6 Infectious conditions
 - 1.2.7 Disorders and deformities: upper limb, lower limb and spine
 - 1.2.8 Nerve compression/radiculopath/peripheral nerve injuries - PIVD, sciatica, carpal tunnel syndrome
 - 1.2.9 Pre and post operative surgical conditions, rehabilitation protocol - ACL, PCL, MCL, hip/knee replacement, amputation, spinal fixation, tendon transfer, skin graft
- 1.3 Sports
 - 1.3.1 Principle of sports injuries, management and prevention
 - 1.3.2 Sports psychology
 - 1.3.3 Sports training including nutrition
 - 1.3.4 Drugs and Ergogenic aids in sports
- 1.4 Assistive aids and devices used in orthopedic conditions
- 1.5 Principles of pathological investigations and imaging techniques in Musculoskeletal conditions
- 1.6 Common outcome measure used in musculoskeletal conditions: Oswestry disability index, DASH
- 1.7 International and national guidelines for physiotherapy management of musculoskeletal conditions
- 1.8 Manual therapy: different school of thoughts - Mc Kenzie, Mulligan, Kaltenborn, Maitland, Cyriax, Butler's neural mobilization
- 1.9 Basic treatment techniques in musculoskeletal physiotherapy - taping, MET, MFR, trigger point release, positional release technique, mirror therapy, lymphatic drainage, manipulation, mobilization
- 1.10 Recent advances in musculoskeletal physiotherapy

2. Neurology

- 2.1 Theories of motor learning, motor control.
- 2.2 Neuroplasticity and clinical implications
- 2.3 Assessment, evidence based approach management and recent advances
 - 2.3.1 Cerebral vascular accident/ stroke
 - 2.3.2 Acquired brain injury/Traumatic brain injury

लोक सेवा आयोग

नेपाल स्वास्थ्य सेवा, फिजियोथेरापी समूह, नवौं (९) तह, उपप्रमुख फिजियोथेरापिष्ट पदको खुला र आन्तरिक प्रतियोगितात्मक लिखित परीक्षाको पाठ्यक्रम

- 2.3.3 Spinal cord injury
 - 2.3.4 Degenerative neurological
 - 2.3.5 Motor neuron diseases
 - 2.3.6 Demyelinating disorders
 - 2.3.7 CNS conditions
 - 2.3.8 Cerebellar disorders
 - 2.3.9 Neuropathies/polyneuropathies/myopathies
 - 2.3.10 Dementia and other cognitive disorder
 - 2.3.11 Vestibular disorders
 - 2.3.12 Neurogenic bladders and its rehabilitation
 - 2.3.13 Movement disorders - chorea, athetosis
 - 2.3.14 Tumors: Intracranial, spinal cord
 - 2.3.15 Neuromuscular junction disorder
 - 2.3.16 Peripheral nerve injury brachial plexus injury
 - 2.3.17 Disease of cranial nerves
 - 2.4 Neuro-surgical procedures – assessment and its interventions
 - 2.5 Basic knowledge of pharmacological drugs used for neurological conditions (antiseizure, antihypertensive, ICP- intra cranial pressure monitoring drugs, anti-parkinson's drugs, anti spasticity drugs (baclofen, botox))
 - 2.6 Oromotor rehabilitation
 - 2.7 Biofeedback mechanism
 - 2.8 Prescription and use of assistive/adaptive devices and equipment for persons with neurological disorders: foot drop splint, KAFO
 - 2.9 Wheel Chair prescription in various neurological conditions
 - 2.10 Application of technology for retraining of movement (robotics, virtual reality, targeted motor control, FES, biofeedback)
 - 2.11 Radiological investigations in neurology - CT, MRI
 - 2.12 Electro-Diagnosis- EMG, NCV, Evoked Potentials, Strength Duration Curve, Brain Stem-Evoked Potential studies
 - 2.13 Basic treatment techniques in neurology physiotherapy - Facilitatory and Inhibitory, PNF, Management of tone (spasticity and flaccidity), Core stability exercises, basic techniques to improve balance and coordination
 - 2.14 International and national guidelines for physiotherapy management in neurological conditions
 - 2.15 Different neurological approaches in management - Bobath, Brunnstorm, PNF
 - 2.16 Common outcome measure used in neurological condition - MMSE, ASIA scale
 - 2.17 Recent advances in neurology physiotherapy
3. **Cardio-Respiratory and Medical Disorders- critical care medicine**
- 3.1 Assessment, evidence based approach management and recent advances in
 - 3.1.1 Respiratory condition - COPD, pneumonia
 - 3.1.2 Cardiac diseases - myocardial infarction, hypertension
 - 3.1.3 Medical conditions: diabetes, obesity, burns, skin conditions
 - 3.1.4 Arterial and venous diseases, wounds/ ulcers
 - 3.1.5 Pre and post cardiac, respiratory and general surgical management
 - 3.1.6 ICU management
 - 3.1.7 Oncology and palliative care
 - 3.1.8 Poisoning
 - 3.2 Exercise prescription
 - 3.3 Cardio pulmonary resuscitation

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- 3.4 Principles of pathological investigations and imaging techniques in cardiorespiratory - chest X ray, ECG
 - 3.5 Common outcome measure used in cardiorespiratory conditions - ABG, spirometry, stress test, 6 minutes walk test
 - 3.6 International and national guidelines for physiotherapy management in cardiorespiratory conditions
 - 3.7 Basic and advanced respiratory management skills : breathe stacking, manual assisted coughing, ACBT
 - 3.8 Recent advances in cardio respiratory physiotherapy
- 4. Pediatrics**
- 4.1 Current situation of pediatric disability in Nepal
 - 4.2 Assessment, evidence based approach management and recent advances
 - 4.2.1 Congenital and acquired musculoskeletal disorders
 - 4.2.2 Congenital and acquired neurological disorders
 - 4.2.3 Congenital and acquired cardiovascular disease
 - 4.2.4 Congenital and acquired pulmonary disorders
 - 4.2.5 Pediatric orthopedic condition - CTEV, torticollis, perthes disease, legg-calve perthes disease
 - 4.2.6 Pediatric burns
 - 4.2.7 Developmental disorder, learning disorders, sensory integration
 - 4.2.8 Neonatal care, high risk babies
 - 4.2.9 Pediatric oncology and palliative care
 - 4.2.10 Pre and post pediatric surgical management
 - 4.3 Early intervention
 - 4.4 Role of physiotherapy in NICU and PICU
 - 4.5 Vitamins deficiency diseases
 - 4.6 Fitness and exercise prescription for special pediatric population
 - 4.7 Basic knowledge of pharmacological drugs used for pediatric neurological conditions eg: epilepsy, anti spasticity drugs (baclofen, botox)
 - 4.8 Neuropediatric approaches eg: Bobath, M-CIMT etc
 - 4.9 Basic treatment technique, handling used in pediatric physiotherapy: positioning, NDT, sensory integration etc.
 - 4.10 Recent advances in pediatric physiotherapy
 - 4.11 Principles of pathological investigations and imaging techniques in pediatric
 - 4.12 Prescription and use of assistive/adaptive devices and equipment in pediatric conditions : hip spica, AFO, KAFO, knight tailor brace, semi brace etc.
 - 4.13 Common outcome /goal setting measure used in pediatric physiotherapy -Pediatrics Berg Balance Scale, Manual Ability Classification System, Communication Function Classification system, Gross Motor Functional Classification System, INFANIB, GAS, COMP
 - 4.14 International and national guidelines for physiotherapy management in paediatric conditions
- 5. Women's Health**
- 5.1 Current situation of women's health in Nepal
 - 5.2 Assessment, evidence based approach management and recent advances
 - 5.2.1 Adolescent: Urinary Incontinence, Pre Menstrual Syndrome, Amenorrhea and Dysmenorrhea
 - 5.2.2 Common Gynecological conditions
 - 5.2.3 Incontinence, prolapse

- 5.2.4 Gestational Diabetes
- 5.2.5 Cardiovascular conditions
- 5.2.6 Musculoskeletal conditions
- 5.2.7 Neurological conditions
- 5.2.8 Communicable diseases
- 5.2.9 Pre and post gynecological surgical physiotherapy management
- 5.3 Different stages of pregnancy, complications and physiotherapy management
- 5.4 Antenatal and post natal physiotherapy
- 5.5 Stages of labor and role of physiotherapy
- 5.6 Psychology and sociology related to women's health
- 5.7 Women's health oncology and palliative care: breast cancer, cervical cancer
- 5.8 International and national guidelines for physiotherapy management in women's health conditions
- 5.9 Common outcome measures used in women's health physiotherapy: ICIQ-UI, POP-SS
- 5.10 Recent advances in physiotherapy related to women's health conditions
- 6. **Gerontology**
 - 6.1 Current situation of ageing population in Nepal
 - 6.2 Normal aging and well elderly
 - 6.3 Assessment, evidence based approach management (Promotion, Prevention and Cure) rehabilitation and recent advances
 - 6.3.1 Cardiovascular diseases
 - 6.3.2 Respiratory diseases
 - 6.3.3 Neurological diseases
 - 6.3.4 Musculo-skeletal diseases
 - 6.3.5 Metabolic syndrome
 - 6.3.6 Communicable and non communicable diseases
 - 6.4 Pain and fatigue management in elderly
 - 6.5 Balance and falls in elderly
 - 6.6 Social and physical changes with ageing
 - 6.7 Mental health and ageing (Dementia, depression)
 - 6.8 Basic treatment technique used in geriatric population - gait and balance training, muscle strengthening, circuit training, relaxation
 - 6.9 International and national guidelines for physiotherapy management in geriatric population/conditions
 - 6.10 Common outcome measure used in geriatric physiotherapy - Berg balance scale
 - 6.11 Recent advances in common geriatric conditions
- 7. **Community Specialization**
 - 7.1 Disability in Nepal, current situation, level of disability
 - 7.2 Legislation, health policy, health care system in Nepal
 - 7.3 CBR: planning, management and rehabilitation
 - 7.4 Preventive and community health physiotherapy for healthy population:
 - 7.5 Assessment, evidence based approach management (promotion, prevention and cure) and recent advances
 - 7.5.1 Cardio vascular diseases
 - 7.5.2 Respiratory diseases
 - 7.5.3 Neurological diseases
 - 7.5.4 Musculoskeletal diseases
 - 7.5.5 Metabolic syndrome
 - 7.5.6 Communicable and non-communicable diseases.

- 7.6 Industrial health and ergonomics including approach to lifting and handling, workspace, patient positioning, body mechanics and transfer techniques
 - 7.7 Methods of health promotion
 - 7.8 Global Health: concepts and emerging issues
 - 7.9 Exercise prescription in community based rehabilitation
 - 7.10 International and national guidelines for physiotherapy management in CBR
 - 7.11 Recent advances in community based approach
8. **Principles of Physiotherapy Practice**
- 8.1 Development of Physiotherapy Profession: legislation, rules and regulations, governing bodies - National & International (WCPT, NEPTA and NHPC)
 - 8.2 Scope of Physiotherapy in Hospital, NGO/INGO, Community, Fitness club, Sports and Industry
 - 8.3 Documentation (SOAP): History taking, physical assessment, analysis and management using International Classification of Functioning Disability and Health (ICF), short and long term goal (e.g. SMART goal), intervention and progress/discharge
 - 8.4 Standardized tests and scales used in various types of cases for assessment and interpretation in physiotherapy practice
9. **Ethics, Management, Research and Evidence Based Practice**
- 9.1 Ethical issues in practice of physiotherapy- clinical, research, academics and administration
 - 9.2 Ethics and professionalism
 - 9.3 Standard of physiotherapy practice and competency
 - 9.4 Continuing physical therapy education, maintaining portfolio, lifelong learning and management
 - 9.5 People management, communications and team work
 - 9.6 Development and implementation of policies and procedures
 - 9.7 Job descriptions, roles and responsibilities
 - 9.8 Evidence based practice: Introduction, components, steps of evidence-based practice, implication of EBP in physiotherapy clinical practice and research
 - 9.9 Clinical decision making (CDM): process, influencing factors, characteristics, conceptual frameworks for the interaction of CDM and patient management based on ICF
10. **Research Methodology and Biostatistics**
- 10.1 Introduction to biostatistics, its application on physiotherapy
 - 10.2 Research – Definition, concept, purpose, approaches
 - 10.3 Research Ethics
 - 10.4 Critical appraisal tools and reporting guidelines - CONSORT, PEDro, PRISMA, STROBE, CARE, TIDieR
 - 10.5 Writing a Research Proposal: Steps on the research process
 - 10.6 Hypothesis Testing
 - 10.7 Probability and Sampling: probability, population and sample, sampling distribution, sampling methods, survey in research, sample size determination and calculation
 - 10.8 Research Design - Qualitative and Quantitative research designs
 - 10.9 Epidemiological studies: calculation of incidence and prevalence, odd ratio, relative risk, Iceberg phenomenon

- 10.10 Data collection methods - Research reliability, validity and criteria for assessing, measuring the tools
 - 10.11 Analysis and interpretation of research data : chi-square test, mann-whitney u test, wilcoxon signed test, kruskal-wallis test, t-test, z-test, analysis of variance and co-variance, correlation analysis and regression analysis
 - 10.12 Interpretation of statistical results
 - 10.13 Discussion and conclusion of obtained results
- 11. Concepts in Biomechanics, Kinesiology and Pathomechanics**
- 11.1 Basic concepts in biomechanics
 - 11.2 Biomechanics of tissues and structures of the musculoskeletal system: bone, articular, cartilage, tendons, ligaments, peripheral nerves, skeletal muscle
 - 11.3 Biomechanics, kinesiology and pathomechanics in
 - 11.4 Upper extremity, lower extremity, vertebral column, thorax and chest wall, temporal mandibular joint
 - 11.5 Integrated function: Gait, Posture, hand function and their deviation
 - 11.6 Respiration - Bucket handle /pump handle movement
 - 11.7 Kinetics and kinematics investigation
- 12. Exercise Physiology**
- 12.1 Introduction to exercise physiology
 - 12.2 Metabolic consideration - VO₂ max, Lactate threshold, RQ, energy expenditure in terms of calorimetry, body composition, energy balance and health related aspects of exercise
 - 12.3 Fatigue assessment and scientific organization of work-rest regimes to control fatigue
 - 12.4 Fitness Testing: principles and practice - aerobic power, anaerobic power and capacity, muscular strength and power, flexibility
 - 12.5 Components of physical fitness, performance related components
 - 12.6 Exercise prescription for health and fitness with special emphasis to cardiovascular disease, Obesity, Diabetes etc.
 - 12.7 Applied Exercise Physiology:
 - 12.7.1 Aerobic power training
 - 12.7.2 Anaerobic power training
 - 12.7.3 Special aids in performance and conditioning
 - 12.7.4 Exercise at different altitudes
 - 12.7.5 Exercise at various climatic conditions
 - 12.7.6 Exercise and aging
 - 12.7.7 International and national guidelines of exercise prescription
- 13. Electrophysiology**
- 13.1 Electro physiological assessment devices
 - 13.2 Instrumentation for neuromuscular electrical stimulation.
 - 13.3 Muscles plasticity in response to electrical stimulation.
 - 13.4 Electrical stimulation and its effects on various systems.
 - 13.5 Cold therapy, hot therapy
 - 13.6 Modalities: Ultrasound, Biofeedback, LASER, TENS, IFT, Muscle stimulator,
 - 13.7 IRR, UVR, ESWT: its application, evidenced based practice and recent advances in electrotherapy