ACADEMIC REGULATION
AND
SYLLABUS FOR

MPT PROGRAMME

MASTER IN PHYSIOTHERAPY

Effective from
2008 - 2009
Academic Session

SIKSHA 'O' ANUSANDHAN UNIVERSITY
BHUBANESWAR
ORISSA, INDIA

GOALS OF THE COURSE:

a. To prepare a post graduate student professional autonomy with self regulating Discipline.
b. To impact knowledge of research principle in order to validate technique in practices of physiotherapy.
c. Prepare student to address problem related to health education and community of physiotherapy.
d. To practices of concepts to moral and esthetic of the profession.
e. To prepare a post graduate to be competent and provide quality service to the community.

NOMENCLATURE OF MPT DEGREE COURSES

The nomenclature of various MPT degree courses provide as follows.

a) MPT in Neurology
b) MPT in Orthopedics
c) MPT in Sports.

ELIGIBILITY OF ADDMISSION

Candidates who have passed BPT degree from any University in India or abroad with not less than 50% of marks in aggregation are eligible.

DURATION OF THE COURSE

The duration of MPT course on full time basis- 2 years

8) METHOD OF TRAINING

The training of the student for MPT degree shall be on a full time pattern with graded responsibilities in the management. Treatment of the patients entrusted in his/ her care. Training should include involvement in laboratory, experimental work and research studies. The participation of students in all facets of educational process is essential. Every candidate should take part in seminars, group discussions, clinics, journal review meetings and other continuing educational activities.

TABLE – I 1ST YEAR

TABLE – II IInd year

SERIAL NO.	*PAPER*	*SUBJECTS*	*THEORY*	*PRACTICAL*	*TOTAL*
1	I	Basic sciences	180 Hrs	95hrs	275 hrs
2	II	Biostatistics and Research Methodology	100		100
3	III	Physiotherapeutic-I & Evidence based practice	75	75	150
4	IV	Physiotherapeutic-I I& Evidence based practice	75	75	150
5		Journal clubs seminars, case presentation ,special clinical teaching, field work etc.		50	50
6		Dissertation		50	50
7		Clinical training		825	825
				TOTAL	1600

S NO	PAPER	SUBJECT	THEORY	PRACTICAL/ CLINICALS	TOTAL
1	V	Elective Basics	100	50	150
2	VI	Elective clinical conditions	100	50	150
3	VII	Elective assessment and evaluation	100	100	200
4	VIII	Elective physiotherapeutic intervention	100	100	200
5.		Dissertation		100	100
6		Journal clubs, seminars, case presentation, special clinics Teaching, field work		150	150
7.		Clinical training		750	750
				TOTAL	1600

- Elective basis Theory- Anatomy- 35 hrs/ physiology- 35 hrs/ pathomechanics-30 hrs/ Practical / clinical- anatomy- 20 hrs/ Physiology – 20 hrs/ pathomechanics- 10 hrs
- Journal club – 20 hrs/ seminars- 15 hrs/ clinical presentations – 25 hrs(25 cases) / special clinics – 10 hrs/ field visits- 30 hrs(5-6 visits/ year)/ Teaching UG students- 50 hrs

9) MONITORING PROGRESS OF STUDENTS (Internal monitoring)

It is essential to monitor the learning process of each candidate through continuous appraisal and regular assessment. It not only helps teachers to evaluate students, but also students to evaluate themselves. The monitoring is done by the teacher of the department based on the participation of the students in various teaching/ learning activities. It may be structured and assessment is done using checklists that assess various aspects.

Log Book: Every candidate shall maintain a log book and record his participation in the training programmes conducted by the department such as journal reviews, seminars, etc.
Special mention may be made of the presentations by the candidate as well as details of clinical or laboratory procedures, if any conducted by the candidate.

Periodic tests: The College will conduct two internal tests in each semester which carries 20 marks in each test. Which includes theory, practical, clinical and viva voice in the pattern of university examination. Records and marks obtained in each test will be submitted to the university soon after the examination is over.

10) ATTENDANCE
A candidate is required to attend a minimum of 75 % of training and the total classes conducted during each academic session of the MPT course. Relaxation up to 10 % will be considered as valid ground. In case of health ground or any appropriate situations considered by the authority.

11) DISSERTATION
Every candidate pursuing MPT degree course is required to carry out work on a selected research project under the guidance of teacher minimum range of assistant professor or above. The dissertation is aimed to train the student in research methods and techniques. It includes identification of a problem, formulation of a hypothesis, search and review of literature, getting acquainted with recent advances, designing a research study, collection of data, critical analysis, and comparison of results and drawing conclusions.
Every candidate shall submit the synopsis as prescribed Performa containing particulars of proposed dissertation work within six months from the date of commencement of the course on or before the dates notified by the university.

The dissertation should be written under the following headings;-
- Introduction
- Aims or objectives of the study
- Review of literature
- Materials and methodology

- Observation
- Discussion
- Conclusion
- Summary
- References
- Tables
- Annexure

Minimum requirements for dissertation

I. The topic for dissertation should be related to the specific specialty selected for MPT programmes.
II. Dissertation should have approximately 12,000 words.
III. The guide should certify the dissertation.
IV. Four copies of dissertation thus prepared will be submitted three months before final examination on or before the dates notified by the university.
Approval of dissertation work is an essential precondition for a candidate to appear in the final university examination. The evaluator apart from the guide out of which either is external outside the university or other postgraduate college of this university shall value the dissertation.
12. GUIDE

The academic qualification and teaching experience required for recognition by this university for postgraduate teacher for guiding MPT candidates shall be:
a) MPT/M.SC (PT) with teaching experience working on a full time position in an institution recognized by S 'O' A University.
b) The age of teacher /guide shall not exceed 65 years.
c) Not withstanding above, in view of acute shortage of teachers the teachers having three years teaching experience after MPT and working on a full time basis should be considered as guide for MPT course.
d) Co-Guide: May be taken from sister department or from another physiotherapy institution as the case may be. The co-guide should possess the requisite qualifications as per the provision.

13) CHANGE OF GUIDE:

In the event of a recognized guide leaving the college for any reason or in any circumstances beyond the control guide may be changed with prior permission from the University.

14) Readmission after break of Study:

Candidates remains absent for continuous period of one year or more without permission shall be deemed to forfeit the admission. In such case studentship shall stand cancelled. If a candidate wants to continue the course his application may be forwarded to the Vice-Chancellor, and subsequently after approval of vice chancellor and there after academic council. His /her case may be considered for readmission.

15) EXAMINATION PATTERN

1ST Semester

PAPER I: BASIC SCIENCES
PAPER II: BIO STATISTICS & RESEARCH METHODOLOGY.

2nd Semester

PAPER III: PHYSIOTHERAPEUTIC-I & evidence based practice
PAPER IV: PHYSIOTHERAPEUTIC-II & evidence based practice

3rd Semester

PAPER V: ANATOMY, PHYSIOLOGY AND PATHOMECHANICS RELATED TO ELECTIVE.
PAPER VI: CLINICAL CONDITIONS- ELECTIVE

4th Semester

PAPER VII; ASSESSMENT AND EVALUATIION-ELECTIVE
PAPER VIII: PHYSIOTHERAPEUTIC INTERVENTION-ELECTIVE & CLINICAL REASONING

All the papers carry 80 marks and the duration for the exam is 3 hours.

Dissertation has to be submitted 3 months prior to the commencement of the 2nd Year University examination. **Dissertation carries 100 marks.**

Practical & Viva

The practical & viva examination shall be conducted in the following subjects only.

2nd Semester

PHYSIOTHERAPEUTIC-I –Practical -100 marks and Orals-50 marks
PHYSIOTHERAPEUTIC-II –Practical -100 marks and orals-50 marks

4th Semester

PAPER VII ASSESSMENT AND EVALUATION-ELECTIVE-
Assessment & Evaluation-Elective Pracitcals-100 marks
(Long case-70 marks; time-45 minutes)
(Short case-30 marks; time-20 minutes)
Orals-50 marks

PAPER VIII: PHYSIOTHERAPEUTIC INTERVENTION -ELECTIVE-

Assessment & Evaluation –Elective
Practicals-100 Marks
(Long case-70 marks; time -45 minutes)
Short case-30 marks time-20 minutes
Orals- 50 marks

Dissertation –presentation and Orals- 100 marks (50 marks for written work, 25 marks for presentation, and 25 marks for orals.

Model Question Paper Pattern for Paper I

As the syllabus contains 4 different subjects in paper I (Basic sciences), in order to give weight age to all the 4 subjects, the following pattern is designed

Essay: 4 essays carrying 20 marks each 3*20 =60
(One essay from each subject)
4 short notes carrying 5 marks each 4*5=20
(One short note from each subject)

80 marks

Model Question Paper Pattern for Paper-II

As the syllabus contains 2 different subjects in paper II (Biostatistics & Research Methodology,) in order to give equal weight age to both the subjects, the following pattern is designed

Essay:4 essays carrying 20 marks each 3*20 =60
(Two essay from each subject)
4 short notes carrying 5 marks each 4*5=20
(Two short note from each subject)

80 marks

Model Question Paper Pattern for Paper III, IV, VI, VII & VIII

Each Theory paper carries 100 marks. The division of marks is mentioned here under:

Essay : 3 essays carrying 20 marks each 3*20 =60
Short notes : 5 short notes carrying 8 marks each 5*4 =20

80 marks

Model Question Paper Pattern for Paper V

As the syllabus contains 3 different subjects in paper V (Elective-Anatomy, Physiology, Pathomechanics) ,in order to give equal weightage to all the 3 subjects, the following pattern is designed

Essay: 3 essays carrying 20 marks each (One essay from each subject)	3*20 =60
5 short notes carrying 8 marks each (Two short note from Anatomy, two) from physiology and one from Pathomechanics	4*5=20
	80 marks

16) EXAMINERS (Practical):
There shall be two examiners in each subject. One of them shall be external from the other postgraduate institute affiliated to SOA or other out of the state postgraduate Institute recognized by SOA and the other shall be internal from the same college.

17) COMMENCEMENT OF COURSE:

The course shall normally commence from 1st july of academic year

18) CRITERIA FOR DECLARING AS PASS IN UNIVERSITY EXAMINATION;

A candidate shall secure not less than 50% marks in each of theory, practical examination (including clinical and oral) and dissertation. A candidate securing less than 50% of marks shall be declared to have failed in the examination.

19) CLASSIFICATION OF RESULTS

Second class – 50% and above but less than 65% of total marks.
First class -65% and above but less than 75 % of total marks and having passed the examination in first attempt.
Distinction-75% and above of total marks and having passed the examination in first attempt.

20) PROMOTION RULES

A student can carry all the first year papers to final year if he/she has failed and can appear for all the exam papers together.

SYLLABUS

PAPER – I
BASIC SCIENCES

BASIC ANATOMY

1. Anatomy of musculoskeletal system (Osteology, myology, Arthrology)
2. Anatomy of Cardio Pulmonary system (Structure of heart, Structure of lung, broncho pulmonary segments)
3. Anatomy of nervous system (Dermatomes and myotomes, cerebrum and cerebral hemispheres, cerebral cortex, cerebellum and its connections, brain stem- mid brain, pons, medulla)
4. Structure of kidney and bladder

References;-

- Grays anatomy
- Derek; Anatomy, palpation and surface marking
- Sieg; Illustarted essentials of musculoskeletal anatomy
- Nigel;- Anatomy and human movement
- Chaitow;-palpation skills assessment and diagnosis through touch
- Moffat;- Anatomy and physiology for physiotherapist
- Text book of anatomy and physiology by Tora tora
- Text book of anatomy by B D chaurasia
- Williams Peter late;- Grays's Anatomy the anatomical basis of medicine and surgery,38 Edi 1995
- Lumely john sp surface anatomy. The anatomical basis of clinical examination 2nd Edi 1996
- Anatomy and human movement – Palastanga

BASIC PHYSIOLOGY

1. Physiology of musculoskeletal system
2. Physiology of cardiopulmonary system
3. physiology of nervous system
4. physiology of bladder and bowel

Reference

- Kapandji; The physiology of the joints Vol I, II and III
- Moffat; Anatomy and physiology for physiotherapist
- Robert ; fundamentals of Sensory physiology
- Guyton; text book of physiology
- Chatterjee; text book of physiology

BIOMECHANICS

1. Basic mechanics : distance,displacement,velocity,acceleration,movement,force,energy,torque,moment of inertia, friction etc.
2. Basic physical properties of bone, joint, cartilage, muscle, tendons, ligaments.
3. Kinetics and kinematics of individual joints of upper extremity, lower extremity, vertebral column, ribs, temporo mandibular joint, pelvis.

REFERENCE

- Paul; Three dimensional analysis of human movement
- Charles; The neuroscience of human movement
- White and Punjabi; clinical biomechanics of spine
- Vladimir; kinematics of human motion
- Hinkle; fundamentals of human movement
- Palastanga; Anatomy and human movement
- Hamil; biomechanics basis of human movement
- Kapandji; The physiology of the joints Vol I, II and III
- Smidt; gait in rehabilitation
- Edward; biomechanics of spine stabilization
- Adrian; biomechanics of human movement
- Rose ; human walking
- Peter; Biomechanics of sport and exercise
- Whiting; Biomechanics of musculoskeletal injury

PHYSIOTHERAPY EDUCATION AND PRACTICE

Physiotherapy ethics

1. Morals and ethics
2. Ethical issues in physiotherapy
3. Moral problems and the ethical analysisof these problems
4. Indian association of physiotherapists- rules, regulations, framework, aims, and objectives.

Physiotherapy and law

Medico legal aspects of physiotherapy, liability, negligence, malpractice, licensure, workman's compensation.

Physiotherapy education

1. Aims of physiotherapy education
2. concepts of teaching and learning;

a) theories of teaching

b) relationship between teaching and learning

c) psychology of education

d) motivational process of learning, perception, individual differences, intelligence, personality.

3. Principles and methods of teaching; a) strategies of teaching, b) planning of teaching c) organization d) writing lesson plans e) audio visual aids f)teaching methods

4. Guidance and counseling; principles and concepts, guidance and counseling services of students and faculty

Practical

1. design a curriculum for a basic physiotherapy programme
2. prepare a lesson plan and conduct classes
3. construct a written objective type test for the lessons you have taken
4. prepare a plan for evaluating students
5. internal assessment tests in all topics
6. lectures and seminars.

Reference

- Catherine; Hand book for teaching for physical therapist
- Barbara; Ethics in rehabilitation
- Joy; Clinical reasoning in health professions
- John; The use of counseling skills

PAPER –II
BIOATATISTICS AND RESEARCH METHODOLOGY

BIOSTATICTICS

Objectives

- Distinguish between quantitative andqualitative variables
- Know how to summarize information using mean, median, standard deviation, quartiles and interquartile range
- Understand the key concept of probability
- Know when and how to use the bionomial distribution
- Understand the central limit theorem
- Know when and how to use the t- distribution
- Calculate and interpret the confidence intervals
- Understanding the meaning of P- values in significance testing
- Learn the use of Chi Square test
- Calculating and interpreting a correlation coefficient
- Understand the concept of regression

1. Introduction to statistics
2. exploratory tools for anivariate data;-
    - Types of variables- Quantitaive and qualitative variables
    - Simple plots of continuous variables- dot plots, stem and leaf plots, histograms and interpreting plots.
    - Numerical summarizes for continuous variables- mean, mode, and standard deviation, quartiles, percentilesinterquartile range.
    - Frequency tables

- Various types of graphs, obtaioning graphs using statistical software's like excel, miritah,5 plus

3. Probabilities and proportion
    - Introduction to probability and proportion
4. discrete random variables
    - Binomial distribution
    - Expected value for the mean and standard deviation
5. Continuous random variables
    - Normal distribution, 2 score
    - Obtaining normal distribution probabilities from tabular and statistical software,s

6. Sampling distribution of estimates
    - Parameters and estimates
    - Sample distribution of sample proportions
    - Standard errors of differences
    - Student's t- distribution
7. confidence intervals
    - confidence intervals for mean
    - confidence intervals for proportions
    - confidence intervals for difference between mean
    - confidence intervals for difference between proportions
    - Obtaining confidence intervals using statistical software like excel, minitals,5 plus

8. Significance testing
    - Differenve between tests and intervals
    - Types of hypothesis- Research hypothesis, Null hypothesis, t- tests and P values
    - Distiction between statistical and clinical significance
9. Tables of counts
    - One dimensional tables- Chi sqauare test for goodness of fit, tables for the chi- square distribution
    - Two way tables for counts- Chi square test for homogeneity chi square test of independence, 2 x 2 tabler , validity of chi square test
    - Performing chi square test using statistical software like excel , minitah, splus.
10. Data on a continuous variable
    - One way analysis of the variance and the f- rest
    - The f- rest and analysis of variance table
11. Relationship between quantitative variable regression and correlation
    - Correlation verses regression
    - Relationship modeling- the straight line, exponential curve
    - Inference for the simple linear model- inference about slope and intorcpet, regression model and prediction, model checking
    - Correlation and association- two regression lines, correlation coefficient

RESEARCH METHODOLOGY

Objectives

- To become familiar with the research in physiotherapy
- To understand the conceptual, empirical and interpretive phases of research
- To develop the skill needed to read publish research critically
- To develop the skills to conduct research
- To develop the skills to write research reports

INTRODUCTION TO RESEARCH

- The importance of research in physiotherapy,
  physiotherapy research; past, present and future. Paradigms; the positivist paradigm and naturalistic paradigm
- Ethical consideration in physiotherapy research.
  Introduction to conceptual, empirical and interpretive quantitative and qualitative research; phases of research

CONCEPTUAL PHASE

- Formulation of the problem- basic terms related to research problem, development and refinement of research problems. communicating the research problem, purpose and questions
- Concepts and variables, phenomena, concepts and constructs. Theory- variables- dependent variables and independent variables, operational definitions of variables.
- Literature review and the theoretical basis
  Purpose and use of literature review, locating a relevant literature for a review, use of electronic database like pubmed, CINAHL, ALT HEALTH WATCH etc. preparing written literature reviews
  Reading and using existing literature reviews, theories models and frame works.
- Hypothesis- function of hypothesis in quantitative research
  Types of hypothesis, characteristics of testable hypothesis, wording of the hypothesis and brief introduction to hypothesis testing.

EMPERICAL/ CONDUCTING PHASE

1. Research Design
   - Quantitative research designs; experimental research
     Characteristics of experiments , basic designs, factorial designs, repeated measures design, advantages , disadvantages of experiments
   - Quasi experimental research ; Non equivalent control group design, time seriesdesign, advantages and disadvantages of quari experiments
   - Non experimental
2. Research; Co relation research , advantages and disadvantages of non experimental research
   - Research design and the time dimension; Cross–sectional designs, longitudinal designs.
   - Specific types of quantitative research ; Surveys , evaluations andf out caomes research
   - Techniques of research control

- What is research control? Controlling exrtrinsic and intrinsic factors
- Qualitative research designs; distinction between qualitative and quantitative designs
- Qualitative research traditions;Brief overview of ethenography, phenomenology, and grounded theory.
- Brief overview of qualitative and quantitative research.

3. Population and sample

   Populations; target population accessible population.

   - Sample rationale
   - Nonprobability sampling ; convenience sampling , quota sampling, purposive sampling, advantages and disadvantages of non probability sampling
   - Probability sampling; Simple random sampling, stratified random sampling, cluster sampling, systematic sampling, advantages and disadvantages of probability sampling
   - Sample size in quantitative studies
   - Sampling in qualitative research- logic types and size

4. Internal and external validity in quantitative research

   - What is internal validity
     Threats to internal validity
     History,
     Selection maturation, mortality testing, instrumentation
   - What is external validity
     Threats to external validity- hawthrone effect, experimenter and measurements effects, novelty effect

5. Collection data

   - Data collection methods- self reports; interviews, questionnaires, scales, advantages and disadvantages of self report methods.
   - Observational methods- structured and unstructured observational methods, advantages and disadvantages of observational methods.
   - Biophysiologic measures ; in vivo measures , in vitro measures, advantages and disadvantages of physiologic measures.
   - Mearurement and assessment of qualitative data.
   - Measurement; errors inmeasurement
   - Reliability of measuring instruments; stability, ionternal consistency, and equivalence.
   - Validity of measuring instruments; content validity, criterion validity, construct validity
   - Assessment of qualitative data; credibility; prolonged engagement and persistent observation , triangulation, peer debriefing and member cheeks, searching for disconfirming evidence.
   - Dependability
   - Conformability
   - Transferability
   - Analysis of quantitative data , descriptive statistics; Frequency distribution, central tendency, variability, bivarate descriptive statistics- contingency tabler and correlation.

- Inferential statistics- sampling distribution hypothesis testing , type I and II errors , level of significance, statistical significance, parametric and non parametric tests, t- test , A anova, chi square, correlation coefficient, regression, ANCOVA.

NOTE

In this part of the course the emphasis will be on application and interpretation of the test rather than computation.

Analysis of qualitative data; general consideration is qualitative analysis

- Qualitative data management and organization; categorization, coding
- Overview of grounded theory analysis, phenomenologicakl analysis.

INTERPRETIVE PHASE

Discussions and conclusions;- Interpreting quantitatiove results, interpreting hypothesized significant results, interpreting non significant results, interpreting unhypothanised significant results, interpreting mixed results.

- Interpreting qualitative results.

CRITIQUING PUBLISHED RESEARCH

- Need for critiquing research
- Guidelines for critiquing research

WRITING RESEARCH FOR PUBLICATION

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- Guidelines for writing research;- title, abstract, introduction, literature review, methodology, result, discussion, referring documenting and structuring papers in social sciences using the American Psychological Association (APA) style guide (can be downloaded from http;//www.apastyleguide.org plagiarism and copy right laws)

REFERENCES

- Caroline hicks research for physiotherapist
- Methods in biostatistics B.K. mahajan
- John. Statistics a guide for therapist
- Jan ; basic statistics for health care research
- Barbara; statistical methods for health care research
- Darlene; documenting functional outcomes in physical therapy
- Diana; research for health professionals
- Mitchell; clinical research for health professionals

PAPER – III

PHYSIOTHERAPEUTIC-I

(Electrotherapy and its recent advances including electro physiology)

ELECTROTHERAPY AND ITS RECENT ADVANCES

At masters level , student should have in depth knowledge of the electrotherapy modalities, their configurations, instrumentation, and the principles on which the machine works(physics) , the clinical implications(selection of dosage, techniques, indications, contraindications, method of application, precaution, advantages , disadvantages, dangers, therapeutic effects, physiological effects, uses) and sound rationale for selecting a particular modality in a specific condition, able to justify how the modality selected is suitable for the particular condition.

Additionally student should update with the lates development with regard to electro modality by critically reviewing the journals.

In practical and orals, a candidate will be asked questions with regard to recent advances and evidence that he or she has reviewed in journals/ in oral examinations , examiner should have discussions with regard to recent advances.

- Short wave diathermy pulsed and continuous
- Micro diathermy pulsed and continuous
- Ultrasonic therapy
- Ultra violet therapy
- infrared radiation
- Laser therapy
- Paraffin wax
- Cryotherapy
- Moist heat therapy
- Contrast bath
- Electronic traction
- Lontophoresis
- Interferential therapy
- Transcutaneous electrical nerve stimulation
- Electrical stimulation- faradic , galvanic
- Dynamic currents
- Continuous passive motion
- Fluidotherapy
- Electromyogym
- Biofeedback

ELECTROPHYSIOLOGY

Excitable tissue- nerve
Excitation and conduction
Measurement of electrical events
Ionic basis of excitation and conduction
Physiologic basis of nerve conduction tests

- Excitable tissue- muscle

1. Skeletal muscles; electrical phenomena and ionic fluxes, contractile responses, physiological basis of electromyogram (EMG)
2. Cardiac Muscle; Electrical properties, electro cardio gram (ECG) , and physiological basis of ECG
3. Smooth muscles; electrical properties
    - Electrical events at synapse, chemical transmission of synaptic activity,
    - Electrical and ionic events and receptors
    - Electrical activity of the brain
    - Electro Encephalo gram (EEG) physiological basis
    - Physiology of pain
    1. history of clinical neurophysiology
    2. an introduction to electro diagnostic signals and their measurements
    3. nerve conduction study
        - principles of nerve conduction study
        - median nerve
        - ulnar nerve
        - radial nerve
        - brachial plexus
        - cervical radiculopathy
        - lumbar plexus and its branches
        - sacral plexus and its terminal branches
        - lumbrosacral radiculopathy
        - Anamolous innervention of the extermjities
        - Nerve conduction and nonlimb nerves
        - Response
        - Autonomic nervous system testing

    4. electromyography
        - introduction to electromyography
        - Technique of electromyography

    5. clinical application of electromyography and nerve conduction
        - Electromyographic findings in neurological disoders
        - Nerve conduction and EMG studies in polyneuopathies

    6. Repetetive nerve stimulation
    7. Single fibre and macro electromyography
    8. visual evoked potential
    9. brainstem auditory evoked potential
    10. somatosensory evoked potentials
    11. motor evoked potential

REFERENCES

- Low and reed; electromyography explained
- Nelson; clinical electrotherapy
- Claytons; electrotherapy

- Kimura; electro diagnosis in disease of nerve and muscle
- Kerb; biofeedback
- Joseph khan ; electro therapy explained
- Meljacker and wall ; text book of pain
- Prentice; Therapeutic modalities and sports medicine
- Bernadette; physical agents a comprehensive test for physical therapist.

PAPER –IV
PHSIOTHERAPEUTIC- II
(exercise therapy and its recent advances including exercise physiology)
EAERCISE THERAPY AND ITS RECENT ADVANCES

At masterslevel, student should have in depth knowledge if the Exercise therapy. The use of exercise in various population group and sound rationales for selecting a particular exercise in a specific condition, able to justify how the selected exercise is suitable for the particular condition. The effect and use of exercise.

Additionally , student should update with the latest development with regard to exercise therapy by critically reviewing the journal.

In practical and orals, a candidate will be asked questions with regard to recent advances and evidence that he/ she has reviewed the journals. In orals, examiner should have discussions with regard to recent advances.

1. starting position, derived position
2. movements- passive (relaxed passive movement, mobilization techniques, manipulation techniques of upper extremity, lower extremity and spine) active movements.
3. resisted exercises- progressive resisted exercises
4. Aerobic and an aerobic exercises
5. manual muscle testing
6. joint mobility
7. goniometry
8. suspension
9. mobility aids
10. relaxation techniques
11. functional re education, transfer techniques
12. Proprioceptive neuromuscular facilitation
13. swiss ball, physio balls
14. gait training
15. posture
16. Strengthening techniques
17. endurance techniques
18. Power
19. isometric, isotonic exercises for the whole body
20. stretching techniques

21. hydrotherapy
22. breathing exercises including postural drainage
23. Exercise therapy – equipment ;
    - Shoulder wheel, ladder, shoulder mobiliser, shoulder pullerys (overhead, over door, wall mounted), elbow mobiliser, pronation- supination board, supination pronation coordinator, wrist mobiliser, hand dynamometer, pinch dynamometer, wristcircumductor, hand gym board for fingers and thumb.
    - Multiple exerciser
    - Cycle ergometer
    - Tread mill- computerized, motorized, manual
    - Stepper
    - Twister
    - Ramp for gait training, stair case training
    - Rowing machine
    - Thera band
    - Pedo cycle
    - Tilting table
    - Peg board
    - Re- education board
    - Quadriceps board
    - Multi purpose cervical chair

    The student should be acquainted with the above mentioned exercise therapy equipment and any other latest equipment developed.

EXERCISE PHYSIOLOGY

Nutrition

- The bases for human performance
- Carbohydrates
- Lipids and proteins
- Vitamins
- Minerals and water
- Optimal nutrition for exercise

2. energy for physical activities
    - energy value of food
    - introduction to energy transfer, energy transfer in the body- phosphate bond energy, energy released from food
    - energy transfer in exercise
    - measurement of human energy expenditure
    - human energy expenditure during rest and physical activity
    - energy expenditure during walking, jogging, running, swimming
    - individual differences and measurement of energy capacities
3. system of energy delivered and utilization- the cardiovascular system, the cardiovascular regulation and integratyion, functional capacity of cardiovascular system
4. dynamics of pulmonary ventilation- regulation of pulmonary ventilation , pulmonary ventilation during exercise, acid- base regulation.

5. the endocrine system- organization, acute and chronic response to exercise.
6. Enhancement of energy capacity
    - Training for an aerobic and aerobic power
    - Muscular strength- training muscles to become stronger – strength measurement and resistance training, structural and functional adaptations to resistance training.
    - Special aids to exercise training and performance
7. exercise performance and environmental stress
    - exercise at medium and high altitude
    - Exercise and thermal stress- mechanism of thermo regulation, thermoregulation and environmental stress during exercise
    - Sport diving
    - Micro gravity; the cost frontier
8. Body composition, energy balance and wt control
9. Body composition assessment , physique, performance, and physical activity, over weight and weight control.
10. exercise successful ageing and disease prevention
11. physical activity , health, ageing
    - physical activity in the population
    - Ageing and physiologic function
    - Physical activity, health and longevity
    - Coronary heart disease
12. clinical exercise physiology for cancer, cardiovascular and pulmonary rehabilitation.

REFERENCES

- Axen- illustrated principles of exercise physiology
- Katch- exercise physiology , energy nutrition, and human performance
- Frank- exercise physiology for health care professionals
- Kisner- therapeutic exercise foundation and practice
- Dena gardiner- exercise therapy
- Basmajian- therapeutic exercises
- Kaltenborn - mobilization of joints
- Brunnstrom- movement therapy
- Lamb- physiology of exercises.

ELECTIVES
MPT IN ORTHOPEDICS
PAPER – V
ANATOMY AND PHYSIOLOGY AND PATHOMECHANICS

1. Embryological development of musculoskeletal system.

2. Osteology; structure of bone, ossification of bones, skull bones, facial bones, bones of upper extremity,, lower extremity, pelvis, vertebral column, ribs.
3. Myology; Structure of muscles , type of muscle, muscle fibers, origin , insertion,, nerve supply of muscles of upper extremity, lower extremity, Trunk.
4. Structure of joints , types of joints , detailed structure and formation of all the joints, detailed structure and formation of al the joints, neurobiology of joint
5. Neurology- pheripheral nerves, dermatomes and myotomes,
6. Physiology- Joint physiology (movements) , muscle physiology
7. Pathomechanics of fractures, deformed joints

MPT IN ORTHOPEDICS
PAPER-VI
CLINICAL CONDITIONS

Causes , clinical features, pathophysiology, general investigation (blood test, serum, creatinine, etc) medical and surgical management of the below mentioned conditions;

1. Fractures and dislocations
   A) Upper limb; Fracture of clavicle , scapula, humerus, forearm bones, carpal bones, metacarpal bones and phalanx. Shoulder dislocation, elbow dislocation, dislocation of radius, dislocation of radio ulnar joint, dislocation of carpo metacarpal joint of thumb.

   B) Lower limb; fracture of pelvis, femur, patella, tibia, fibula, tarsal bones, metatarsal and phalanx,. Dislocation of hip, patella, knee, ankle, sub- talar joint.
   C) Spine- fractures and dislocations/ sublaxation of vertebrae
   D) Skull bones and ribs

   (with emphasis made to post traumatic complications and preventive measures)

2. Amputation
3. Sprains and strains; injuries of soft tissue of body
4. Disease of joints
   Infective, rheumatoid, degenerative, neuropathic, metabolic, arthritisin systematic disoders, miscellaneous, periarthritis, JRA.
5. Deformities- of upper limb, lower limb and spine
6. Plexus and peripheral nerve injuries
7. Arthropathies- spondylitis, spondylolysthesis, spondylosis, anky losing spondylitis
8. metabolic diseases of bone- osteopenia, rickets, osteomalacia, osteoporosis.
9. tumors of bones and joints
10. Infectious disoders of bones and joints

11. congenital disoders
12. Developmental disoders bones
13. Bony abnormalities secondary to endocrine disoders
14. avascular necrosis of bones, and joint secondary to neurological conditions like;- cerebral palsy, leprosy, anterior poliomyelitis,spinal cord injuries.
15. Disoders of bone and joint secondary to muscular dystrophies- Arthrogryposis multiplex congenital, fibro dysplasia progressive
16. regional conditions of neck and upperlimb – Brachial neuralgia, cervical rib, thoracic outlet syndrome, torticollis, supraspinatus syndromes, rupture of rotator cuff, deltoid fibrosis, tennis elbow, ganglion, Dequervain's disease, trigger finger , trigger thumb, carpal tunnel syndrome, deputrens contracture.
17. regional conditions of spine and lower limb- ;- back ache, lumbo sacral strain, fibrositis back, sacralisationof 5^{th} lumbar vertebra, IVDP lumbar canal stenosis,Ephiphyseolysis , indiopathic chondrolysis of hip, quadriceps fibrosis, bursites around the knee, loose bodies in the knee, chondromalacia patella, plantar fascitis, calcaneal spur, Osgood schlatter disease,tarsal tunnel syndrome.
18. miscellaneous- Perthes disease, pagets disease, connective tissue disoders (SLE, polymyositis, dermatomyositis, polyarteritis nodosa.
19. bone skin grafting / tendon transfer procedures- The student should know the latest advances in orthopedic and surgical procedures.

MPT IN ORTHOPEDICS
PAPER – VII
ASSESSMENT AND EVALUATION

Principles and concepts
Patient history, observation,
examination,
Principles, scanning examination, examination of specific joints, functional assessment, specific tests, reflexes and cutaneous distribution,joint play movements, palpation, diagnostic imaging.

1. head and face
patient history, observation
examination- examination of the head, examination of the face, examination of the eye, examination of the nose, examination of the teeth, examination of the ear, special tests, reflexes and cutaneous distribution,joint playmovements, palpation, diagnostic imaging.

2. Cervical spine
Patient history, observation
Examination- active movements, passive movements, resisted isometric movements, pheripheral joint scanning examination, myotomes, functional assessment,special tests, reflexes and cutaneous distribution,joint play movements , palpation,diagnostic imaging.

3. Temporomandibular joint
Patient history, observation

Examination- active movements, passive movements, resisted isometric movements, functional assessment, specific tests, reflexes and cutaneous distribution,joint play movements , palpation,diagnostic imaging.

4. Shoulder

Patient history, observation

Examination- active movements, passive movements, resisted isometric movements, functional assessment, specific tests, reflexes and cutaneous distribution,joint play movements , palpation,diagnostic imaging.

.

5. Elbow

Patient history, observation

Examination- active movements, passive movements, resisted isometric movements, functional assessment, specific tests, reflexes and cutaneous distribution,joint play movements , palpation,diagnostic imaging.

6. Forearm, wrist and hand

Patient history,

Observation – common hand and finger deformities, otherphysical findings

Examination- active movements, passive movements, resisted isometric movements, functional assessment, specific tests, reflexes and cutaneous distribution,joint play movements , palpation,diagnostic imaging.

7. Thoracic(dorsal) spine

Patient history, observation

Kyphosis, scoliosis, breathing chest deformities.

Examination- active movements, passive movements, resisted isometric movements, functional assessment, specific tests, reflexes and cutaneous distribution,joint play movements , palpation,diagnostic imaging.

8. Lumbar spine

Patient history, observation

Examination- active movements, passive movements, resisted isometric movements, functional assessment, specific tests, reflexes and cutaneous distribution,joint play movements , palpation,diagnostic imaging.

9. pelvis

Patient history, observation

Examination- active movements, passive movements, resisted isometric movements, functional assessment, specific tests, reflexes and cutaneous distribution,joint play movements , palpation,diagnostic imaging.

10. hip

Patient history, observation

Examination- active movements, passive movements, resisted isometric movements, functional assessment, specific tests, reflexes and cutaneous distribution,joint play movements , palpation,diagnostic imaging.

11. Knee

Patient history, observation

Examination- active movements, passive movements, resisted isometric movements, functional assessment, specific tests, reflexes and cutaneous distribution,joint play movements , palpation,diagnostic imaging.

12. Lower leg ankle and foot

Patient history, observation

Examination- active movements, passive movements, resisted isometric movements, functional assessment, specific tests, reflexes and cutaneous distribution,joint play movements , palpation,diagnostic imaging.

13. Assessment of gait

Normal patterns of gait- stance phase, swing phase , joint motion during normal gait .

Normal parameters of gait- base width, step length, stride length,lateral pelvic shift, vertical pelvic shift, pelvic rotation centre of gravity, normal cadence.

Overview and patient history

Observation – foot wear

Examination- locomotion score, compensatory mechanisms.

Abnormal gait- antalgic (painful) gait, arthrogenic gait (stiff hip or knee),ataxic gait , contracture gait, equines gait, gluteus maximus gait, gluteus medius (trendelenburg's) , hemiplegic or hemiparetic gait, parkinsonian gait, plantar flexor gait, psoatic limp,quadriceps gait, scissors gait, short leg gait, steppage or drop foot gait.

14. assessment of posture

Postural development- factors affecting posture, causes of posture

Common spinal deformities- Lordosis, kyphosis, scoliosis

Patient history,

Observation – standing, forward flexion, sitting, supine lying prone lying

Examination

15. assessment of the amputee

Levels of amputation

Patient history, observation

Examination- measurements related to ampurtation active movements, passive movements, resisted isometric movements, functional assessment, sensation testing, psychological testing , palpation,diagnostic imaging.

16. Assessment and evaluation of pain

Apart from the above, the student is expected to learn assessment and evaluation in the following clinical conditions(pre operative and post operative)

CLINICAL CONDITIONS

1. fractures and dislocations

A) Upper limb- fracture of clavicle, scapula , humerus, forearm bones , carpal bones, metacarpal bones and phalanx. Shoulderdislocation , elbow dislocation, dislocation of radius, dislocation of radio ulnar joint, dislocation of carpo metacarpal joint of thumb.

a) Lower limb- fracture of pelvis, femur, patella, tibia, fibula, tarsal bones, metatarsal, phalanx.Dislocation of hip , patella, knee, ankle, sun tallar joint.

b) Spine- fractures and dislocations/ sublaxation of vertebrae
c) Skull bones and ribs
    a. (with emphasis made to post traumatic complications and preventive measures)

2. Amputation
3. Sprains and strains; injuries of soft tissue of body
4. Disease of joints
    i. Infective, rheumatoid, degenerative, neuropathic, metabolic, arthritis in systematic disoders, miscellaneous, periarthritis
5. Deformities- of upper limb, lower limb and spine
6. Plexus and peripheral nerve injuries
7. Arthropathies- spondylitis, spondylolysthesis, spondylosis, anky losing spondylitis
8. metabolic diseases of bone- osteopenia, rickets, osteomalacia, osteoporosis.
9. tumors of bones and joints
10. Infectious disoders of bones and joints
11. congenital disoders
12. Developmental disoders bones
13. Bony abnormalities secondary to endocrine disoders
14. avascular necrosis of bones, and joint secondary to neurological conditions like;- cerebral palsy, leprosy, anterior poliomyelitis,spinal cord injuries.
15. Disoders of bone and joint secondary to muscular dystrophies- Arthrogryposis multiplex congenital, fibro dysplasia progressive
16. regional conditions of neck and upperlimb – Brachial neuralgia, cervical rib, thoracic outlet syndrome, torticollis, supraspinatus syndromes, rupture of rotator cuff, deltoid fibrosis, tennis elbow, ganglion, Dequervain's disease, trigger finger , trigger thumb, carpal tunnel syndrome, deputrens contracture.
17. regional conditions of spine and lower limb- ;- back ache, lumbo sacral strain, fibrositis back, sacralisationof 5^{th} lumbar vertebra, IVDP lumbar canal stenosis,Ephiphyseolysis , indiopathic chondrolysis of hip, quadriceps fibrosis, bursites around the knee, loose bodies in the knee, chondromalacia patella, plantar fascitis, calcaneal spur, Osgood schlatter disease,tarsal tunnel syndrome.
18. miscellaneous- Perthes disease, pagets disease, connective tissue disoders (SLE, polymyositis, dermatomyositis, polyarteritis nodosa.
19. bone skin grafting / tendon transfer procedures- The student should know the latest advances in the assessment and evaluation protocols used in orthopedic physiotherapy.

MPT IN ORTHOPEDICS
PAPER – VII
ASSESSMENT AND EVALUATION

20. fractures and dislocations

A) Upper limb- fracture of clavicle, scapula , humerus, forearm bones , carpal bones, metacarpal bones and phalanx. Shoulderdislocation , elbow dislocation, dislocation of radius, dislocation of radio ulnar joint, dislocation of carpo metacarpal joint of thumb.

d) Lower limb- fracture of pelvis, femur, patella, tibia, fibula, tarsal bones, metatarsal, phalanx.Dislocation of hip , patella, knee, ankle, sun tallar joint.

e) Spine- fractures and dislocations/ sublaxation of vertebrae
f) Skull bones and ribs

a. (with emphasis made to post traumatic complications and preventive measures)

21. Amputation
22. Sprains and strains; injuries of soft tissue of body
23. Disease of joints
    i. Infective, rheumatoid, degenerative, neuropathic, metabolic, arthritis in systematic disoders, miscellaneous, periarthritis
24. Deformities- of upper limb, lower limb and spine
25. Plexus and peripheral nerve injuries
26. Arthropathies- spondylitis, spondylolysthesis, spondylosis, anky losing spondylitis
27. metabolic diseases of bone- osteopenia, rickets, osteomalacia, osteoporosis.
28. tumors of bones and joints
29. Infectious disoders of bones and joints
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31. Developmental disoders bones
32. Bony abnormalities secondary to endocrine disoders
33. avascular necrosis of bones, and joint secondary to neurological conditions like;- cerebral palsy, leprosy, anterior poliomyelitis,spinal cord injuries.
34. Disoders of bone and joint secondary to muscular dystrophies- Arthrogryposis multiplex congenital, fibro dysplasia progressive
35. regional conditions of neck and upperlimb – Brachial neuralgia, cervical rib, thoracic outlet syndrome, torticollis, supraspinatus syndromes, rupture of rotator cuff, deltoid fibrosis, tennis elbow, ganglion, Dequervain's disease, trigger finger , trigger thumb, carpal tunnel syndrome, deputrens contracture.
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37. miscellaneous- Perthes disease, pagets disease, connective tissue disoders (SLE, polymyositis, dermatomyositis, polyarteritis nodosa.
38. bone skin grafting / tendon transfer procedures-
    burns complications and physiotherapeutic interventions
    physiotherapeutic interventions for relief of pain
    The student should know the basic concept of orthopedic manual therapy, orthotics and prosthetics, spinal braces and corsets.

REFERENCE

- Goodman- Pathology implications for the physical therapist.
- Barbara-muscles, nerves and movement kinesiology in daily living
- Karen- Physiotherapy in orthopedics
- Loth- Orthopedic review for physical therapist
- Malone-Orthopedic and sports physical therapy
- Brotzman- Clinical orthopedic rehabilitation
- Magee- Orthopedic physical assessment
- Konin- Special tests for orthopedic examination
- Loudon- Clinical orthopedic assessment guide
- Reider- the orthopedic physical examination
- Carol- hematological physiotherapy
- Joan- physical therapy in arthritis
- Frederic- rheumatoid arthritis
- John- An atlas of radiological interpretation
- Jessica- human walking
- Todd- Knee ligament rehabilitation
- Connolly- fractures and dislocationsclosed management Vol- I and II
- William- Total joint replacement
- Anthony- a color atlas of clinicval assessment
- Text book of orthopedics by – Dr. N Natrajan
- System of Orthopedics by- Apley
- Clinical orthopedics by Richardson
- Jayanth Joshi- Textbook of orthopedics for physiotherapist
- Orthopedic textbook by G S Kulkarni
- Cash textbook of orthopedics
- Orthopedic assessment- Magee
- Saunder's manual of physical therapy
- Lowback pain- handbook herring
- Text book of orthopedics- Abnezar
- Amputation and prosthetics may
- Musculoskeletal physiotherapy
- Orthopedic physical examination- Robert Donatelle
- Orthopedic examination-Macre
- Old Tidy's for physiotherapist
- Jenny pain- a text book for therapist

MPT IN NEUROLOGY

PAPER- V

NEUROANATOMY AND NEUROPHYSIOLOGY, PATHOMECHANICS

NEURO ANATOMY

1. Introduction and organization of nervous system, normal development of brain and spinal cord.
2. neuro- biology of neurons and neuroglia
3. Coverings of the nervous system
4. Nerve fibres
5. Dermatomes and myotomes
6. cerebrum and cerebral hemispheres, Cerebral cortex
7. Cerebellum and its connections
8. Brain stem- Midbrain, pons, medulla
9. Thalamus, hypothalamus,- connections
10. Limbic system, reticular formation
11. internal capsule, corpus straitum
12. Basal ganglia and its connections
13. ventricular system and CSF
14. blood brain barrier
15. spinal cord , tracts- ascending, descending
16. Blood supply of CNS and peripheral nervous system, venous drainage of CNS
17. Peripheral nervous system
18. Autonomic nervous system
19. cranial nerves and their nuclei

It is mandatory to see/ comprehend the dissected parts of the nervous system.

NEUROPHYSIOLOGY

Functions of all the organs are mentioned below.

- Coverings of the nervous system

- Nerve fibres
- Dermatomes and myotomes
- cerebrum and cerebral hemispheres, Cerebral cortex
- Cerebellum and its connections
- Brain stem- Midbrain, pons, medulla
- Thalamus, hypothalamus,- connections
- Limbic system, reticular formation
- internal capsule, corpus straitum
- Basal ganglia and its connections
- ventricular system and CSF

- blood brain barrier
- spinal cord , tracts- ascending, descending
- Peripheral nervous system
- Autonomic nervous system
    - cranial nerves and their nuclei
    - Motor control
    - Neural development of posture and gait
    - Physiology of pain
    - Physiology of reflexes – normal and abnormal
    - Physiological basis of motor learning and recovery of functional motor control

PATHOMECHANICS

The student should get well acquainted with the pathomechanics of individual joints and posture related to neurological diseases.

MPT IN NEUROLOGY

PAPER- VI

CLINICAL CONDITIONS

Causes , clinical features ,pathophysiology, general investigation (blood test, serum creatinine, CSF analysis, etc.) Medical and surgical management of the below mentioned conditions.

- Intracranial neoplasams

  Gliomas,meningiomas, neuromas, angiomas, cranio- pharyngiomas, pituitary adenomas, medical and surgical management.

- Pyogenic infections of CNS

  Menenghitis, brain abcess, tuberoculosis, neurosyphillis.
- Viral infections of CNS

  Poliomyelitis, viral encephalitis, substance sclerosing encephalitis, AIDS
- Cerebro vascular disease

  Stroke syndrome, ischaemic stroke infarction, thrombo- embolicstroke, Hemorrhagic stroke, Transient ischaemic attack, arterio- venous malformation of the brain, intracranial hemorrhage.

- Metabolic disoders of brain

  Hypoencephalopathy, hypoglycemic encephalopathy,hepatic encephalopathy
- Degenerative disease of the brain

  Parkinsons disease, motor neurone disease, amyotrophic lateral sclerosis, progressive b ulbar palsy, alzheimer's disease.
- Cerebral palsy
- Spina bifida

- Polyneuropathy- Post infective poly radiculo neuropathy (gullian bare syndrome) diabetic neuropathy, heriditary sensory neuropathy.
- Disoders of spinal cord

Compression of spinal cord, neoplasm of the vertebral column, inter vertebral disc prolapsed, extra dural or epi dural abscess.

- Syringomyellia, multiple sclerosis, myasthenia gravis
- Peripheral nerve and plexus lesions
- Carniovertebral junction abnormalities
- Hydrocephalus
- Cerebral lesions.

MPT IN NEUROLOGY
PAPER- VII
ASSESSMENT AND EVALUATION

The main objective of this paper is to make the student familiarize with the assessment tools in neurological physiotherapy. The student should understand the use of various assessment tools to a specific condition. The tool should have established reliability and validity and should be tested on a specific population group. The following assessment tools should be critically analyzed and reviewed. Any latest tools published in journals as research articles should also be critically discussed in the journal review meetings.

1. Measurement and assessment; what and why?
2. classification of impairment , disability and handicap
3. how to choose a measure?
4. measurement in practice
5. General neurological examination
6. measures for use in neurological disability

Measures of cognitive impairment and disability

1. Glasgow coma scales
2. Children's coma scales
3. Edinburgh – 2 coma scale
4. blessed dementia rating scales; information- concentration – memory test; dementia scale

Measure of motor impairment ;

1. motor club assessment
2. rivermead motor assessment
3. Motricity index
4. trunk control test
5. Motor assessment scale
6. modified ashworth scale for spaticity
7. isometric muscle strength
8. motor neurone disease/ amyotrophic lateral sclerosis

9. dynamometer

Measures of focal disability

1. standing balance
2. functional ambulation categories
3. hauser ambulation index
4. Timed walking test
5. Rivermead mobility index
6. Nine hole peg test
7. Action research arm test
8. Franchay arm test

Activities of daily living and extended ADL tests

1. Barthel ADL index
2. Katz ADL index
3. Nottingham ten point ADL index
4. Rivermaid ADL scale
5. Northwick park index of independence in ADL
6. Kenny self care evaluation
7. Nottingham extended ADL index
8. Frenchay activity index

Global measures of disability

1. OPCS disability scale- severity categories
2. functional independence measure
3. PULSES profile

Measures of handicap and quality of life

1. WHO handicap scale
2. Rankin scale
3. Glasgow outcome scale
4. Quality of life - a measure
5. environmental assessment – non standard

Multiple sclerosis

1. Kurtzke multiple sclerosis rating scale
2. An illness severity for multiple sclerosis

Stroke scales

1. Mathew stroke scale
2. National institute of health stroke scale
3. Canadian neurological scale
4. Orgogozo score
5. hemispheric stroke scale
6. clinical classification of scale
7. Clinical classification of stroke (Bamford)
8. allen score for prognosis of stroke
9. Guy's hospital score for haemorrhage

Head injury

1. Galveston orientation and amnesia test
2. Rappaport disability rating scale

Parkinson's disease

Columbian rating scale

1. Parkinson's disease impairment index, disability index
2. Hoehn and Yahr grades
3. Unified parkinson's diseases rating scale version 3

Spinal cord injury

1. Frankel's scale
2. motor index and sensory indices
3. American spinal cord injury association assessment chart
4. Pain assessment and evaluation

Investigation techniques

Ct scan, MRI, X- ray, Nuclear imaging, EEG, NCV, EMG, Evoked potentials, Basic procedure, principles and interpretation of results in neurological conditions. Assessment of posture, gait, co- ordination, voluntary control.

MPT IN NEUROLOGY
PAPER VIII
PHYSIOTHERAPEUTIC INTERVENTIONS

Student should be able to plan appropriate treatment regime based on the knowledge of various subjects learned during the two year programme for the below mentioned conditions. Additionally emphasis should be on special techniques/ approaches like Bobath , Neurodevelopment therapy, Motor relearning programme, Sensory integration, PNF, Roods approach etc. Student should update himself/ herself with latest advancement in the therapeutic approaches.

- Physiotherapeutic interventions for relief of pain
- Physiotherapy management of patients with postural control , mobility controldisoders.
- Neurological rehabilitation – neurofacilitation approach
- Intracranial neoplasms; Gliomas, meningiomas, neuromas,angiomas,cranio-pharyngiomas, pituitary adenomas, medical and surgical management.
- Pyogenic infections of CNS; Msis, Neurosyphilis
- Viral infection on CNS; Poliomyelitis, viral encephalitis, Substance sclerosing encephalitis, AIDS
- Cerebro – vascular Diseases; Stroke syndrome, ischaemic stroke infarction, thrombo- embolic stroke,, hemorrhagic stroke, Transient ischaemic attack, Arterio-venous malformations of the brain,Intra cranial hemorrhage.

- Metabolic disoders of the brain; Hypoxic encephalopathy, hypoglycemic encephalopathy, hepatic encephalopathy.
  - Degenerative disease of the brain
    Parkinsons disease, motor neurone disease, amyotrophic lateral sclerosis, progressive b ulbar palsy, alzheimer's disease.
  - Cerebral palsy
  - Spina bifida
  - Polyneuropathy- Post infective poly radiculo neuropathy (gullian bare syndrome) diabetic neuropathy, heriditary sensory neuropathy.
  - Disoders of spinal cord

    Compression of spinal cord, neoplasm of the vertebral column, inter vertebral disc prolapsed, extra dural or epi dural abscess.
    - Syringomyellia, multiple sclerosis, myasthenia gravis
    - Peripheral nerve and plexus lesions
    - Carniovertebral junction abnormalities
    - Hydrocephalus
    - Cerebral lesions.

REFERENCES

- Goodman; pathology implications for the physical therapist
- Barbara; muscles, nerves and movement kinesiology in daily living.
- Greame; clinical neurology
- Brandt; neurogical disoders course and treatment
- Brains; Disease of the nervous system
- Shirley; diagnosis , treatment of movement impairment syndromes
- Richard; neurological rehabilitation
- Susan; neurological physiotherapy
- Helen; Neuroscience of rehabilitation
- Wade DT 1992 , assessment in neurological rehabilitation, oxford press
- Omer; management of peripheral nerve problems
- Darcy; neurological rehabilitation
- Gerald; evaluation and treatment of chronic pain
- Alfred; Early diagnosis and therapy in cerebral palsy
- Charles; The neuroscience of human movement
- Mark ;traumatic brain injury rehabilitation

MPT IN SPORTS MEDICINE
PAPER –V
ANATOMY, PHYSIOLOGY AND PATHOMECHANICS

- Psychological factors in sports injuries

- Psychological factors in sports injuries

Types of injuries, reaction to the injury, response of joint structures to injury, effects of immobilization, effects of remobilization.

- Inflamatory and healing process, micro trauma, stress reactions
- Rules andregulations of sports , sport specific injuries
- Pathomechanics of sport injuries
- Physical demand in different sports
- Flexibility exercises- Neurophysiology
- Physiological effects of stretching and mobilizations prior to the participation in sports.
- Types of exercises and their physiological effectsrelated to sports
- Biomechanics of sports and its relationship to joint injuries
- Uses and application of biomechanics in different sport events (like throwing mechanics, running mechanics, swimming mechanics……)
- Aquatic- physical properties of water, physiologic effects of water immersion and its therapeutic value.

a. Embryological development of musculoskeletal system
b. Osteology; structure of bone, ossification of bones, skull bones, facial bones, bones of upper extremity,, lower extremity, pelvis, vertebral column, ribs.
c. .Myology; Structure of muscles , type of muscle, muscle fibers, origin , insertion,, nerve supply of muscles of upper extremity, lower extremity, Trunk.
d. Arthrology; Structure of joints , types of joints , detailed structure and formation of all the joints, detailed structure and formation of al the joints, neurobiology of joint
e. Neurology- pheripheral nerves, dermatomes and myotomes,
    i. Physiology- Joint physiology (movements) , muscle physiology
    ii. Pathomechanics of fractures, deformed joints.

MPT IN SPORTS MEDICINE
PAPER –VI
CLINICAL CONDITIONS

Student is expected to learn common causes, mechanism, pathophysiology,signs, symptoms, and surgical treatments of following sports related injuries and also should know the recent advances in the surgical, medical management of sports related injuries.

- Epiphyseal injuries

Classification , complications and prognosis of epiphyseal injuries, Osgood schlatter disease,tendonitis at the insertion of patellar tendon, complete avulsion of the epiphysis of the tibial tubercle shoulder contributing risk factors- intrinsic factors, extrinsic factors.

- Shoulder girdle injuries

Injuries to the sterno clavicular joint- sprains, dislocations,scapulothoracic joint lesions, acromioclavicular joint sprains, anterior dislocation of glenohumeraljoint, recurrent anterior dislocation of shoulder, thoracic outlet syndrome, painful arc, rotator cuff injuries, impingement syndromes, glenoid labrum lesions.

- Elbow joint injuries

Olecranon bursitis, valgus extension overload, elbow, ulnar nerve lesion, ulnar and radial collateral ligament sprains, contusions and strains, dislocations, osteochondritis dissicans, little leaguers elbow, problems resulting from throwing- medial lesions, lateral lesions , posterior lesions.

- Elbow injuries from tennis

Epicondylitis- incidence, pathology, mechanism of injury

- Wrist and hand injuries

Colles fracture, scaphoid fracture, gamekeepers thumb, DIP joint fracture, and dislocation, jersey finger, boutonniers deformity, pseudo boutonniers deformity, fractures of the metacarpals, bonnets fracture, mallet fracture, Dequervain's tenosynovitis of the thumb, bowlers thumb, handler palsy, hamate fracture, ganglion cysts, trigger finger, carpel tunnel syndrome.

- Thigh injuries

Contusion to the quadriceps, strain of the quadriceps musculature, acute strain of the hamstring group, complete rupture of the patellar tendon.

- Knee injuries

Knee ligament injuries – first degree sprain, second degree sprain, third degree sprain, anterior and posterior cruciate tears, anteriolateral instability meniscal lesion, articular cartilage lesions, patell femoral dysfunction.

- Injuries of the patella

Patella fracture- acute dislocation, recurrent dislocation,sublaxation and spontaneous reduction of a dislocated patella, osteochronditis dissocans, jumper's knee.

- Injuries to the lower leg, ankle and foot

Tibiofibular sinostosis, rupture of gastrocnemius, tennis leg, total rupture of the Achilles tendon, partial rupture of the achillies tendon,

tendinopathies- achillies tendonitis, anterior tibialis tendonitis, peroneal tendinitis, posterior tibial tendonitis, flexor hallucis longus tendinitis , flexor digitorum longus tendonitis,compartmental compression syndromes,heel burses, Os trigonum injury, calcaneal apophysitis, tarsometatarsal injuries, tarsal tunnel syndrome, cuboids syndrome, metatarsal stress fracture, interdigital neuroma, stairclimbers transient parasthesia,turf toe, sesmoitidis.

- Injuries to the ankle

Syndesmotic ankle sprain, inversion sprains, eversion sprains, dorsiflexion sprains, tarsal tunnel syndrome, stress fracture of the metatarsal, vorton's neuromas , corns and calluses, blisters, ingrown toenails, peroneal tendon sublaxation.

- Injuries to the low back

, dearrangement syndrome, spondylolysthesis.

- Injuries to the running athelete

Causes of overuse injuries, common running induced injuries to the lower back, common running induced injuries to the hip – illiotibial tract pain, trochanteric bursitis,stress fracture of femoral neck, slipped capital femoral epiphysis, vague hip pain.

- common running related injuries to the knee

medial patellar pains, pes anserine bursitis, patellar tendonitis, retropatellar pain, lateral knee pain, biceps femoral tendonitis.

- common running related injuries to the lower leg

tibial stress relation, stress fracture, medial tibial stress syndrome, compartment syndrome- anterior posterior lateral,fibular stress reaction and stress fracture,retro calcaneal bursitis medial arch pain, plantar fascitis.

- Swimming injuries

" swimmers shoulder" anterior sublaxation of the glenohumeral joint, breast stroker's injury.

MPT IN SPORTS MEDICINE
PAPER – VII
ASSESSMENT AND EVALUATION

- Emergency sports assessment

Pre event preparation

Primary assessment; levels of consciousness, establishing the airway, assessment for bleeding, fluid loss and shock, pupil check, assessment for head injury , assessment for spinl cord injury, assessment for movement, positioning the patient,injury severity, secondary assessment.

- Participation evaluation

  Objectives of the evaluation

  Setting up the examination

  Preparticipation of the history

  Examination; eye examination, musculoskeletal examination, neurological examination and convulsive disoders. Cardiovascular examination , pulmonary examination, urogenital examination, grastointestinal examination, dermatological examination, examination for heart disoders, general medical problems, dental examination.

- Application of isokinetics in testing

  Student should be able to use and understand results of electrodiagnostic tools and imaging techniques used in the sport evaluation.

- Assessment and evaluation of the following
- Epiphyseal injuries

  Classification , complications and prognosis of epiphyseal injuries, Osgood schlatter disease,tendonitis at the insertion of patellar tendon, complete avulsion of the epiphysis of the tibial tubercle shoulder contributing risk factors- intrinsic factors, extrinsic factors.

- Shoulder girdle injuries

  Injuries to the sterno clavicular joint- sprains, dislocations,scapulothoracic joint lesions, acromioclavicular joint sprains, anterior dislocation of glenohumeraljoint, recurrent anterior dislocation of shoulder, thoracic outlet syndrome, painful arc, rotator cuff injuries, impingement syndromes, glenoid labrum lesions.

- Elbow joint injuries

  Olecranon bursitis, valgus extension overload, elbow, ulnar nerve lesion, ulnar and radial collateral ligament sprains, contusions and strains, dislocations, osteochondritis dissicans, little leaguers elbow, problems resulting from throwing- medial lesions, lateral lesions , posterior lesions.

- Elbow injuries from tennis

  Epicondylitis- incidence, pathology, mechanism of injury
- Wrist and hand injuries

  Colles fracture, scaphoid fracture, gamekeepers thumb, DIP joint fracture, and dislocation, jersey finger, boutonniers deformity, pseudo boutonniers deformity, fractures of the metacarpals, bonnets fracture, mallet fracture, Dequervain's tenosynovitis of the thumb, bowlers thumb, handler palsy, hamate fracture, ganglion cysts, trigger finger, carpel tunnel syndrome.

- Thigh injuries

  Contusion to the quadriceps, strain of the quadriceps musculature, acute strain of the hamstring group, complete rupture of the patellar tendon.

- Knee injuries

Knee ligament injuries – first degree sprain, second degree sprain, third degree sprain, anterior and posterior cruciate tears, anteriolateral instability meniscal lesion, articular cartilage lesions, patell femoral dysfunction.

- Injuries of the patella

Patella fracture- acute dislocation, recurrent dislocation,sublaxation and spontaneous reduction of a dislocated patella, osteochronditis dissocans, jumper's knee.

- Injuries to the lower leg, ankle and foot

Tibiofibular sinostosis, rupture of gastrocnemius, tennis leg, total rupture of the Achilles tendon, partial rupture of the achillies tendon, tendinopathies- achillies tendonitis, anterior tibialis tendonitis, peroneal tendinitis, posterior tibial tendonitis, flexor hallucis longus tendinitis , flexor digitorum longus tendonitis,compartmental compression syndromes,heel burses, Os trigonum injury, calcaneal apophysitis, tarsometatarsal injuries, tarsal tunnel syndrome, cuboids syndrome, metatarsal stress fracture, interdigital neuroma, stairclimbers transient parasthesia,turf toe, sesmoitidis.

- Injuries to the ankle

Syndesmotic ankle sprain, inversion sprains, eversion sprains, dorsiflexion sprains, tarsal tunnel syndrome, stress fracture of the metatarsal, vorton's neuromas , corns and calluses, blisters, ingrown toenails, peroneal tendon sublaxation.

- Injuries to the low back

Postural syndrome, dysfunction syndrome, derangement syndrome, spondylolysthesis

- Injuries to the running athelete

Causes of overuse injuries, common running induced injuries to the lower back, common running induced injuries to the hip – illiotibial tract pain, trochanteric bursitis,stress fracture of femoral neck, slipped capital femoral epiphysis, vague hip pain.

- common running related injuries to the knee

medial patellar pains, pes anserine bursitis, patellar tendonitis, retropatellar pain, lateral knee pain, biceps femoral tendonitis.

- common running related injuries to the lower leg

tibial stress relation, stress fracture, medial tibial stress syndrome, compartment syndrome- anterior posterior lateral,fibular stress reaction and stress fracture,retro calcaneal bursitis medial arch pain, plantar fascitis.

- Swimming injuries

" swimmers shoulder" anterior sublaxation of the glenohumeral joint, breast stroker's injury.

MPT IN SPORTS MEDICINE

PAPER – VIII

PHYSIOTHERAPY INTERVENTIONS

- Ptrevention of athletic injuries
  Athletic co- ordination program- skeletalmuscle- type 1 and type 2 fibers, general conditioning principles- strength, power, muscular endurance, flexibility, anaerobic metabolism.

- Warm – up period
  Warm up schedule, stretching partner stretching using proprioceptive neuromuscular facilitation technique.

- Protective and supportive equipment
  Protective equipment, supportive devices,motion limiting devices.

- Treatment of athletic injuries
  Tapping and wrapping techniques

- Emergency care and athletic first aid
  Cardiopulmonary emergencies, ABC of resuscitation, haimlick maneuver shock injuries – internal injuries, head and neck injuries, fractures, dislocations.

- Injury first aid
  ICE or cold application , compression , elevation, gait instruction, stretcher and wheelchair uses.

- Physiotherapeutic intervention for relief of pain
- Therapeutic modalities and procedures
- General principles of therapeutic modalities, hydrotherapy, short Short wave diathermy pulsed and continuous, Micro diathermy pulsed and continuous, Ultrasonic therapy, Ultra violet therapy ,infrared radiation,Laser therapy,Paraffin wax, Cryotherapy, Contrast bath, Lontophoresis, Transcutaneous electrical nerve stimulation, massage indications and contraindications, therapeutic and physiologic effects, treatment techniques.
- Fitness training related to specific sports
- Manipulative therapy principles , concept, indication, contraindication , application.
- Injuries rehabilitation

Goals of rehabilitation, types of exercises- isometric, isotonic exercises, specific form of exercises – manual resistance, proprioceptive neuromuscular facilitation, surgical tubibg, circuity training, sport - specific skills.

- Application of isokinetics in athletic rehabilitation
- Nutrition and athelete

Well balanced diety, pre event nutrition, increasing weight, decreasing weight in wresllers, carbohydrate loading diet, sugar before and after competition.

Prevention and physiotherapy treatment of the following;-

- Epiphyseal injuries

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- Swimming injuries

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- Sports for youth with disabilities

Role of physiotherapist in preparing the impaired for sport events (like para Olympics) Apart from the above the student should know the pre and post operative rehabilitation protocols.

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