

S.Y. B.P.T.

SUBJECT	TEACHING HOURS		
	THEORY	PRACTICAL	TOTAL
PATHOLOGY	50	-	50
MICROBIOLOGY	50	-	50
PHARMACOLOGY	50	-	50
BIostatISTICS & RESEARCH METHODOLOGY	50	-	50
EXERCISE THERAPY - II	100	150	250
KINESIOLOGY	75	-	75
ELECTROTHERAPY- I & II	150	200	350
CLINICS	-	-	550
TOTAL HRS.			1425

Exams:

PAPER NO.	SUBJECT	MARKS				TOTAL
		THEORY		PRACTICAL/VIVA		
		EXTERNAL	INTERNAL	EXTERNAL	INTERNAL	
1.	PATHOLOGY – MICROBIOLOGY	40 (20 + 20)	10 (05+05)	-	-	50
2.	PHARMACOLOGY	40	10	-	-	50
3.	BIostatISTICS & RESEARCH METHODOLOGY	40	10	-	-	50
4.	EXERCISE THERAPY – II & KINESIOLOGY	80 (56+24)	20 (14+06)	80 (40+40)	20	200
5.	ELECTROTHERAPY- I & II	80	20	80 (40+40)	20	200

STRUCTURE OF QUESTION PAPERS

Subject:

Electrotherapy I & II

Duration: 3 Hours

SECTION – I (40 Marks) Electrotherapy I

Q – 1	Full Question		15 Marks
		OR	
Q – 1	Full Question		15 Marks
Q – 2	Write Short Notes (3 out of 4) (5 Marks each)		15 Marks
Q – 3	Write Short Notes (5 out of 6) (2 Marks each)		10 Marks

SECTION – I (40 Marks) Electrotherapy II

Q – 4	Full Question		15 Marks
		OR	
Q – 4	Full Question		15 Marks
Q – 5	Write Short Notes (3 out of 4) (5 Marks each)		15 Marks
Q – 6	Write Short Notes (5 out of 6) (2 Marks each)		10 Marks

Subject:

Exercise Therapy II - Kinesiology

Duration: 3 Hours

SECTION – I (56 Marks) Exercise Therapy II

Q-1	Full Question		16 Marks
		OR	
Q-1	Full Question		16 Marks
Q-2	Full Question		16 Marks
		OR	
Q-2	Full Question		16 Marks
Q-3	Write short notes on: (4 out of 5) (4 Marks each)		16 Marks
Q-4	Write short notes on: (4 out of 5) (2 Marks each)		08 Marks

SECTION – II (24 Marks) Kinesiology

Q-5	Full Question		10 Marks
		OR	
Q-5	Full Question		10 Marks
Q-6	Write short notes on: (2 out of 3) (3 Marks each)		06 Marks
Q-7	Write short notes on: (2 out of 3) (4 Marks each)		08 Marks

Subject:

Pathology-Microbiology

Duration: 2 Hours

SECTION – I (20 Marks) Pathology

Q – 1 Write Short Notes (2 out of 3) (5 Marks each) 10 Marks

Q – 2 Write Short Notes (5 out of 6) (2 Marks each) 10 Marks

SECTION – II (20 Marks) Microbiology

Q – 3 Write Short Notes (2 out of 3) (5 Marks each) 10 Marks

Q – 4 Write Short Notes (5 out of 6) (2 Marks each) 10 Marks

Subjects:

Pharmacology and Biostatistics & Research Methodology

Duration: 2 Hours

Total 40 Marks

Q – 1 Full Question		10 Marks
	OR	
Q – 1 Full Question		10 Marks
Q – 2 Write Short Notes (4 out of 5) (5 Marks each)		20 Marks
Q – 3 Write Short Notes (5 out of 6) (2 Marks each)		10 Marks

PATHOLOGY:

OBJECTIVES:

At the end of the course the candidate will be able to:

1. Acquire the knowledge of concepts of cell injury and changes produced thereby in different tissues and organs; capacity of the body in healing process.
2. Recall the etio-pathogenesis, the pathological effects and the clinico-pathological correlation of common infection and non infectious disease.
3. Acquire the knowledge of concepts of neoplasia with reference to the etiology, gross and microscopic features, diagnosis and prognosis in different tissues and organs of the body.
4. Correlate normal and altered morphology of different organ systems in different diseases needed to understand the disease process and their clinical significance (with special emphasis to neuro-musculoskeletal and cardiovascular – respiratory system).
5. Acquire knowledge of common immunological disorders and their resultant effects on the human body.
6. Understand in brief, about the hematological diseases and investigations necessary to diagnose them and determine their prognosis.

DETAILED SYLLABUS

1. General Pathology:

1. Introduction: Aims and objects of study of pathology, definitions of health, disease, causes of disease, methods of study of disease.
2. Cell Injury :
Cell injury-Causes, Mechanism & Toxic injuries with special reference to Physical including ionizing radiation, Chemical & Biological. Cellular ageing.
Reversible injury (degeneration) - types morphology- cloudy swelling, hyaline, fatty changes.
Intra-cellular Accumulation- Mucin, Protein.
Irreversible cell injury-types of necrosis- Apoptosis – Calcification- Dystrophic & Metastasis.
Extra-cellular accumulation-Amylodosis.
3. Inflammation & Tissue repair:
Acute inflammation – features, causes, vascular & cellular events.
Inflammatory cells & Mediators.
Chronic inflammation: Causes, Types, Nonspecific & Granulomatous – with examples.
Wound healing by primary, secondary union, factors promoting & delaying healing process.
Healing at various sites- bone, nerve & muscle.
Regeneration & Repair.
4. Immuno-pathology:
Immune system: organization-cells antibodies regulation of immune responses.
Hyper-sensitivity (types and examples including graft rejection)
Basic concepts of autoimmune disease (emphasis on S.L.E. & R.A.)
Secondary Immuno-deficiency including H.I.V. Infection – Acute, chronic, including AIDS.
5. Disturbance of circulation:

Hyperemia/Ischemia and Haemorrhage
Oedema - pathogenesis - types – transudates / exudates.
Chronic venous congestion- lung, liver
Thrombosis – formation – fate – effects
Embolism – types- clinical effects
Infarction – types – common sites
Gangrene & Necrosis – types – etiopathogenesis
Shock – Pathogenesis, types

6. Growth and its disorders:

Atrophy, Hypertrophy, Hypoplasia, Metaplasia, Agenesis, Dysplasia.
Neoplasia classification, Histogenesis, Biologic behaviors, difference between Benign & Malignant tumour.
Malignant neoplasms- grades-stages-local & distal spread.
Carcinogenesis: Physical, Chemical, Occupational, Heredity, Viral, Nutritional
Precancerous lesions & Carcinoma in situ.
Tumour & host interactions – local and systemic effects-metastatic (special reference to bones and C.N.S.)

7. Hematology:

Anemia, definition, classification, etiology, lab investigations, blood picture;
Hemorrhagic disorders – causes and classification (hemophilia)

2. Systemic Pathology: (Each condition in this section is to be taught under the specific headings of Causes, Development, Gross and Microscopic only)

1. Respiratory System:

Pneumonia, Bronchitis, Bronchieactes, Asthma, Emphysema, Tuberculosis, Carcinoma of Lungs, Occupational Lung Diseases, ARDS, Pleuritis, Atelectasis.

2. Cardiovascular System:

Rheumatic Heart diseases, Myocardial infarction, Atherosclerosis and other disease of blood vessels – TAO, Buerger's diseases, Thrombophlebitis; Congenital Heart diseases, Hypertension, CCF.

3. Alimentary System:

Peptic Ulcer, Ulcerative lesions of intestine, Enteric Fever.

4. Liver:

Jaundice, Hepatitis, Cirrhosis, Portal Hypertension.

5. CNS:

Reaction of nervous tissue to injury, infection & Ischemia, Meningitis (types), Encephalitis, CVA (Atherosclerosis, Thrombosis, Embolism, Aneurysm, Hypoxia, Ischaemia, Hemorrhage), Brief outline of CNS Tumors, Hydrocephalus, Leprosy, Parkinsonism.

6. Neuro-muscular Junction: Myasthenia gravis, Myasthenic syndrome.

7. Peripheral Nerves: Neuritis, Neuralgia, GBS, Neuropathies.

8. Bones and Joints: Osteomyelitis, Osteoarthritis, Septic Arthritis, Gout, Ankylosing Spondylitis, Osteomalacia, Rickets, Bone tumors briefly - Giant Cell tumor, Osteosarcoma, Ewing's Only, Hemarthrosis, Infective TB.

9. Muscles: Disorder of muscles including Poliomyelitis and Myopathies, Volkman's Ischaemic contracture.
10. Skin: Scleroderma, Psoriasis, Autoimmune disorders.
11. Urinary System: Nephritis, Glomerular Nephritis, Nephrotic Syndrome.
12. Endocrine System: Thyroid – Thyroiditis and Thyroid tumors, Diabetes.

TEXT BOOKS

1. Textbook of Pathology: 5th edition. Harsh Mohan. Anshan Publishers
2. Robbins & Cotran Pathologic Basis of Disease. 8th edition. Kumar V; Abbas AK et al. Saunders

REFERENCE BOOKS:

1. Pathology: Implications for Physical Therapists - Goodmann and Boissonault - W.B. Saunders.
2. Y.M. Bhende's General Pathology and Pathology of Systems. Deoshare SG. Popular Prakashan Ltd 2008

MICROBIOLOGY:

OBJECTIVES:

At the end of the course the candidate will be able to have sound knowledge of the agents responsible for causing human infections pertaining to CNS, CVS, musculoskeletal and Respiratory system.

DETAILED SYLLABUS

1. General Bacteriology:

1. Introduction, historical background, classification of micro – organisms
2. Morphology of bacteria
3. Staining of bacteria
4. Sterilization
5. Disinfection
6. Cultivation and culture media

2. Systemic Bacteriology:

1. Gram-Positive cocci – Streptococci, Pneumococci, Staphylococci
2. Gram-Negative Cocci – Gono and Meningo cocci
3. Gram-Positive Bacilli
4. Gram-Negative Bacilli-Typhoid, Cholera, Dysentery
5. Aerobic-Diphtheria, T.B., Leprosy
6. Anaerobic-Tetanus, Gas Gangrene, Botulism
7. Syphilis and Leptospirosis
8. Enterobacteriaceae (E.Coli, Klebsiella) and Pseudomonas, Clostridium, Salmonella and Vibrio.

3. Immunology:

1. Immunity – Innate immunity & acquired immunity. Structure and function of immune system and Immune response – normal / abnormal.
2. Define Antigen, Antibody and Antigen – antibody reaction & application for diagnosis.
3. Hyper-sensitivity
4. Auto-immunity
5. Agglutination, precipitation

4. General Virology:

1. Introduction & general properties.
2. DNA virus
3. Measles, Mumps, Rubella, polio and congenital viral infections
4. Hepatitis and Rabies
5. H.I.V.
6. Demonstration of test in: diagnosis of AIDS, Hepatitis and Syphilis

5. Parasitology:

1. Introduction- Entamoeba histolytica
2. Malaria, Filaria
3. Amoebiasis
4. Round worm and loop worm
5. Toxoplasma – Cystisarcosis & Echinococcus

6. Mycology:

1. Candidiasis

2. Ring worm
3. Scabies

7. Applied Microbiology:

1. Hospital acquired infections, Universal safety precautions and Waste disposal.
2. Hygiene in restaurants and kitchens
3. Disease caused by infected food and water

TEXTBOOKS:

1. Text Book of Microbiology by Anantnarayan. 4th edition. Orient Longman.
2. Text Book of Microbiology by Chakrovorthy. 2nd edition. New central books.

REFERENCE BOOKS:

1. Medical Microbiology by Irving. 1st edition. Taylor and Francis.
2. Textbook of Microbiology by Arora. 2nd edition. CBS publications.
3. Concise Textbook of Microbiology - C.P.Baweja
4. Textbook of Microbiology – Nagoba

PHARMACOLOGY

OBJECTIVES:

At the end of the course the candidate will be able to

1. Describe pharmacological effects of commonly used drugs by patients referred for physiotherapy; list their adverse reactions, precautions to be taken, contraindications, formulation and route of administration.
2. Identify whether the pharmacological effect of the drug interferes with the therapeutic response of physiotherapy and vice versa
3. Indicate the use of analgesics and anti-inflammatory agents with movement disorders, with consideration of cost efficiency and safety for individual needs.
4. Get the awareness of other essential and commonly used drugs by patients. The basis of their use and common as well as serious adverse reaction.

DETAILED SYLLABUS

1. General pharmacology:

Introduction, definitions, classification of drugs, sources of drugs

Principles of drug administration and routes of administration, distribution, metabolism, excretion of drugs, factors influencing drug reaction, dosage and factors modifying it.

Drug toxicity including allergy and idiosyncrasy.

2. Drugs acting on Autonomy nervous system :

Cholinergic and anticholinergics drugs

Adrenergic and anti-adrenergic drugs

3. Drugs acting on peripheral nervous system:

Skeletal muscle relaxants,

Local anesthetics,

Sports medicine and doping,

Drugs and exercise

4. Drugs acting on central nervous system:

General anesthetics, Sedatives, hypnotics and pharmacotherapy of sleep disorders,

Antiepileptic, drugs for Parkinsonism,

Opioid analgesics, non-steroidal anti-inflammatory drugs,

CNS stimulants

5. Drugs acting on Cardio-vascular system:

Treatment of Heart Failure: Digitalis, Diuretics, Vasodilators, ACE inhibitors

Antihypertensive Drugs: Diuretics, Beta Blockers, Calcium Channel Blockers, ACE

Inhibitors, Central Acting Alpha Agonists, Peripheral Alpha Antagonists, Direct acting Vasodilators

Antiarrhythmic Drugs

Ischemic Heart Disease – Nitrates, Beta-Blockers, Calcium Channel Blockers

Treatment of Vascular Disease, Cerebral ischemia and Tissue Ischemia: Lipid-Lowering agents, Antithrombotics, Anticoagulants and Thrombolytics

6. Drugs acting on respiratory system:

Treatment of COPD, Bronchial Asthma, Drugs used in inhalation therapy

7. Endocrine pharmacology :

Thyroxin, glucocorticoids, anabolic steroids, calcitonin, insulin and hypoglycemic agents

8. Drugs acting on G.I Tract:

Drug for peptic ulcer antiemetic, drug for diarrhea and constipation.

9. Geriatrics:

Pharmacological challenges in geriatric age group and its effect on physical therapy.

10. Miscellaneous:

Antimicrobial Agents

Immunological agents and vaccines

Chemotherapeutic agents

Vitamins and Antioxidants
Irritants counterirritants

11. Pharmacology and physiotherapy:

Drugs acting on CNS and cardio respiratory system which influence the physical exercise.
Pulmonary effects of general and local anesthetic agents
Physiotherapeutic noninvasive mode of drug penetration use in Phonophoresis and iontophoresis

TEXTBOOKS:

1. Textbook of Pharmacology for Physiotherapy, 1st Edition, Padma Udaykumar, Jaypee Publication.

REFERENCE BOOKS:

1. Essentials of Medical Pharmacology, 6th Edition, KD Tripathi, Jaypee Publications
2. Pharmacology & Pharmacotherapeutics, 12th Edition, RS Satoshkar, SD Bhandarkar, Nirmala N Rege, Popular Publications
3. Handbook of Pharmacology, 1st Edition, Dr UN Panda, AITBS Publication
4. Pharmacology for Physical therapist by Panus.

BIOSTATISTICS AND RESEARCH METHODOLOGY

OBJECTIVES:

At the end of the course the student will be able to

1. Learn about statistical science and its application to problems of human health and disease, with the ultimate goal of advancing the public's health.
2. Know various phases of research that are needed to conduct research and publish research papers.

DETAILED SYLLABUS

Biostatistics:

1. Introduction: Meaning, definition, characteristics of statistics., Importance of the study of statistics, Branches of statistics, Statistics and health science including physiotherapy, Parameters and Estimates, Descriptive and inferential statistics, Variables and their types, Measurement scales
2. Measures of central tendency: Mean, Median, Mode, Arithmetic and Geometric mean.
3. Sampling: Why sampling? Methods of sampling and concepts of sample size
4. Measures of variability
5. Standard deviation, Co efficient of variation, Normal distribution Curve.
6. Standard error and its significance, limitations
7. Probability and Hypothesis Testing: Null Hypothesis, Alternative Hypothesis, Acceptance and rejection of Null Hypothesis. Level of significance.
8. Statistical tests, X² test, standard error of proportions, difference of proportions
9. Mean and difference of mean
10. Concept of and t test x² Z test.
11. Values, co efficient of correlation
12. Analysis of variance & covariance: Analysis of variance (ANOVA), what is ANOVA? Basic principle of ANOVA, ANOVA technique, Analysis of Co variance(ANACOVA)
13. Computer application in biostatistical Analysis.

Research Methodology:

1. Introduction to Research methodology: Meaning of research, objectives of research, Motivation in research, Types of research & research approaches, Research methods vs. methodology, Criteria for good research
2. Research Design - Qualitative and Quantitative research designs, Experimental design, Non experimental design, Observational Study design, Meta analyses
3. Data collection methods.
4. Types of epidemiological studies and measurements of various indications
5. Possible errors that may generate due to study design and how to overcome them
6. How and what to read from journals?

TEXTBOOKS:

1. Methods in Bio-Statistics, by B.K. Mahajan, 6 Ed. 1997:
2. An introduction of Biostatistics: Sunder Rao. P.S.S.
3. Rehabilitation research – Elizabeth Domholt.
4. Carolin hicks – Research for physiotherapist.

REFERENCE BOOKS:

1. Elements of Health Statistics: Rao.N.S.N.
2. Darlene – Documenting functional outcomes in physical therapy.
3. Diana-Research for health professionals.

EXERCISE THERAPY II AND KINESIOLOGY

OBJECTIVES:

At the end of the course the candidate will be able to

1. Describe the biophysical properties of connective tissue and the effect of biomedical loading and factors which influence the muscle strength and mobility of articular and periarticular soft tissue.
2. Acquire the skill of assessment of isolated and group muscle strength subjectively and objectively.
3. Analyze normal human posture and its associated problems, its management.
4. Analyze the various normal musculoskeletal movements during breathing, gait and daily living activities and in terms of biomechanical and physiological principles.
5. Describe and demonstrate various therapeutic exercises with its technique: including chest P.T. on self and also acquire the skill of application on model.
6. To demonstrate general fitness, exercise and shall gain fitness for oneself

DETAILED SYLLABUS

EXERCISE THERAPY II:

1. Passive movements: Definition, types, technique, effects and uses, CPM unit, comparison of active with passive movements for all joints of extremities, neck and trunk.
2. Stretching: Definitions related to stretching, types of contractures. Differentiation properties of soft tissues affecting elongation and aims of stretching. Manual and mechanical stretching, cycle mechanical stretching. Indications and aims of stretching, principles and contraindications, MFR, Assessment of muscle length and fascia. Techniques for all joints, Individual muscle stretching.
3. Traction: types, effects and uses, indications, contraindications, principles of application for cervical and lumbar spine, traction to soft tissues of joints – gliding movements.
4. Mobilization: causes of restriction of R.O.M., prevention of restrictions, techniques of mobilization of various joints of limbs to mobilize joint R.O.M. through functional diagonal patterns, joint mobilization; manipulation-definition, types; joint shapes, types of motion; stretching, glides, compression, traction, indications, contraindications, precautions and conditions for special precautions.
5. M.M.T.: need of M.M.T., uses, fundamental principles, anatomical and physiological basis, Oxford scale of muscle gradation, principles of isolation, substitution, stabilization, grading procedure for muscles of extremities, neck and trunk. Individual and group muscle testing.
6. Posture, types, factors influencing posture, regulation of posture and posture mechanism, pelvic tilt and postural deviations of spine and its treatment.
7. Crawling exercises: principles, types, effects and uses of Clapp's crawl
8. Strengthening of muscles: Principles involved to prevent muscle wasting, Rood's technique of initiating muscle contraction, progressive strengthening of muscles (loads assisted and resisted exercises), use of equipments, reeducation of muscles and restoration of functions, practice of strengthening of muscles of limbs, neck, trunk and face, emphasis on hand and foot muscles, quadriceps, glutei, triceps, deltoid and face muscles, use of manual and mechanical resistance, contraindications, isometric and isokinetic exercises regime, plyometrics, MET (Muscle Energy Techniques)
9. Proprioceptive Neuromuscular Facilitation: Introduction, responses of NM mechanism, basic

techniques of PNF patterns of arm, leg, neck, head and trunk (emphasis on straight patterns), specific techniques of emphasis-repeated contractions – slow reversal, contract and relax, hold and relax, rhythmic stabilization, inhibitory techniques, Bobath Rood's and Kabat.

10. Relaxation: muscle tone, postural tone, general and local relaxation techniques of relaxation.
11. Neuro Muscular coordination: Factors governing coordination, principles of re-education, Frenkel's exercises and its techniques, balancing exercise.
12. Functional Re-education: Mat activities for reeducation of hemiplegics, paraplegics and cerebral palsy, walking reeducation in neurological and orthopedic conditions.
13. Aerobic exercises: Physiological effects and therapeutic uses, fitness testing, stress testing for healthy and convalescent individuals.
14. Breathing exercises: Mechanisms of normal breathing, muscles of respiration, changes in thoracic cage during the process of respiration.
Segmental and diaphragmatic breathing exercises, pursed lip breathing.
Forced expiratory techniques, ACBT, Autogenic Drainage.
Humidification and Nebulization.
Postural drainage, assistive measures, techniques, indications and contraindications.
15. Hydrotherapy: physiological properties of water and hydrodynamics, physiological and applications of Bad Ragaz Technique, indications and contraindications.

TEXT BOOKS:

1. Practical Exercise Therapy - Margaret Hollis
2. Therapeutic Exercise - Carolyn Kisner
3. PNF - Knott and Voss
4. Principles of Exercise Therapy – Dena Gardiner
5. Muscle Testing- Daniel Kendall

REFERENCE BOOKS:

1. Therapeutic Exercise- Basmajian and Wolf
2. Orthopaedic Evaluation-Magee
3. Cash's Textbook for Physiotherapists in Chest, Heart & Vascular diseases
4. Physical Rehabilitation- O Sullivan

KINESIOLOGY:

Introduction to Biomechanics:

1. Mechanics of joint motion:

- a) Structure and types of joints and types of movements
- b) Osteokinematics & Arthrokinematics
- c) Concave Convex Rule
- d) Joint function, kinetics & kinematics

2. Mechanics of muscular action:

- a) Elements of muscle structure – fiber, size, motor unit, length tension, and arrangement & number relationship.
- b) Classification of muscles, line of pull, types of contractions, role of muscles and tendons, action of two joint motions, non customary action

3. Skilled Movements:

- a) Rope climbing, cycling, running, ballistic and volitional movements

4. Impetus:

- a) Impetus to external objects and receiving impetus

Regional Kinesiology:

1. Biomechanics of joints:

- a) Kinetics, kinematics and patho-mechanics of joint – hip , knee, ankle and foot, shoulder, elbow, wrist and hand, temporomandibular joint

2. Biomechanics of spinal column:

- a) Spinal curves, articulations, non-contractile soft tissue of column, IV disc, ligaments, intrinsic equilibrium, movements of spinal column and muscle mechanics

3. Mechanics of pelvic complex:

- a) Pelvis at rest, in standing body and in motion, patho-mechanics of pelvis

4. Mechanics of thorax:

- a) Movements between ribs and vertebrae, sternum and ribs, patho-mechanics of respiration

Kinetics and Kinematics of Gait & ADL:

5. Locomotion:

- a) Normal gait analysis: definition of gait, phases of normal gait, normal gait with kinetic and kinematics, abnormal pathological gaits, gait training.

6. Postural strain and occupational hazards:

- a) Correct use of body mechanics at home, at school and work, recreation, particular application for patients, physiotherapists and other staff.

7. Kinetics and kinematics of ADL

- a) Supine to sitting, Sitting to standing, Squatting, Climbing up and down, pushing, pulling, overhead activities, walking, running, jogging.

TEXT BOOKS

1. Joint Structure and Function – Cynthia .C. Norkins
2. Clinical Kinesiology – Brunnstrom

REFERENCE BOOKS

1. Kinesiology of the Human Body – Steindler
2. Kinesiology of the Musculoskeletal system – Neumann & Donald
3. Kinesiology – The mechanics and Pathomechanics of Human motion – Oatis & Carol
4. Biomechanical Basis of Human Motion – Joseph and Hamill
5. Physiology of the Joints – Kapandji Vol.- I,II,&III

ELECTROTHERAPY I

OBJECTIVES:

At the end of the course the candidate will be able to

1. Describe the production and physiological effects, therapeutic uses, merits, demerits, indications and contraindications of high frequency modes
2. Describe the physiological effects and therapeutic uses of various topical pharmacotherapeutic agents to be used for the application of sono/phonophoresis
3. Acquire the skill of application of the electrotherapy modes on models for the purpose of treatment
4. Acquire the ability to select the appropriate mode as per the tissue specific and area specific application

DETAILED SYLLABUS

1. Infra Red Rays-

Definition, Production of IR rays, luminous and non-luminous generators, penetration, technique of application, physiological effects and therapeutic uses, duration and frequency of treatment, indications and contraindications, dangers and precautions

2. Ultra Violet Rays –

Definition, classification, Production of UVR, UVR generators: mercury vapour lamps (Kromayer lamp), fluorescent tubes (Alpine sun lamp), Theraktin tunnel and PUVA apparatus;

Technique of application of UVR, local and general irradiation, specific conditions like psoriasis, acne, alopecia and indolent wounds

Technique of application using accessories Filters, sensitizers

Parameters: penetration, absorption, duration and frequency of treatment

Indication and contraindications

Dangers and precautions

Physiological and therapeutics effects of UVR

Chemical reactions with skin structure of skin, penetration and absorption of UVR

Technique to find out the test dose, calculation of E1, E2, E3, E4 doses and its importance

3. LASERS –

Introduction and characteristics, therapeutic effects, principles of application, indication, contraindication and dangers

4. Short Wave Diathermy:

Introduction, Methods of Heat Production by SWD treatment,

Types of electrodes, Placement and Spacing of electrodes, Tuning

Testing of Apparatus

Various methods of application (capacitors field method and cable method etc.) in various conditions

Parameters: Intensity, Duration and Frequency of treatment

Method of application with Dosage

Effects: Physiological effects and therapeutic effects

Dangers and precautions

5. Pulsed SWD –

Definition, characteristics, mechanism of production,

Physiological effects and therapeutic uses,

Indications and contraindications,

Techniques of application, Dangers and precautions

6. Capacitive energy transfer (Long Wave Diathermy)

Introduction and characteristics, physiological effects and therapeutic uses, technique of application and principles of treatment and dangers

7. Micro Wave Diathermy –

Introduction and characteristics, physiological effects and therapeutic uses, technique of application and principles of treatment and dangers

8. Ultrasonic therapy –

Introduction and characteristics, US therapy parameters, coupling media,

Therapeutic and physiological effects,

Indications and contraindication; Dangers and precautions,

Technique of application and dosage.

Phonophoresis and its implication

9. Cryotherapy –

Physiological effects and therapeutic uses, techniques of application and contraindications

Dangers and precautions

10. Hydrotherapy –

Properties of water, buoyancy, effects of buoyancy on movements,

Principle and methods of application,

Hubbard tank, contrast bath and whirlpool bath

11. Superficial Heat Modalities –

Paraffin Wax Bath:

Principle of wax therapy application, Structure of the bath, composition of wax and mineral oils, physiological effects and therapeutic uses, methods of application with dosage, dangers and precaution

Heating pad

Physiological and Therapeutics effects, Method of application with Dosage, Indications and Contraindications, Dangers and precaution

Moist heat

Physiological and Therapeutics effects, Method of application with Dosage, Indications and Contraindications, Dangers and precaution

12. Prescription of electrotherapy modality and dosage

ELECTROTHERAPY – II

OBJECTIVES:

At the end of the course the candidate will be able to

1. Describe and identify various types of electrodes, use in therapeutics, resistance offered by the skin and significance of various media used to reduce the same.
2. Describe the production, physiological effects, therapeutic uses, merits, demerits, indications and contraindications of various low and medium frequency. Describe the panel diagrams of the machines.
3. Acquire the skill of application of low and medium frequency modes on the models for the purpose of treatment
4. Describe the physiological effect and therapeutic uses of various therapeutic ions to be used for the application of iontophoresis

DETAILED SYLLABUS

1. Nerve Muscle Physiology –

Resting potential, action potential, propagation of action potential, motor unit, synapse and synaptic transmission of impulses, effects of positive and negative electrodes on nerves and accommodation

2. Faradic Current –

Definition, characteristic and modification faradic current, parameters of simulation, physiological and therapeutic effects, indications and contraindications and precautions, techniques of stimulation for individual and group muscle, faradic foot bath, Faradism under pressure and Pelvic floor muscle reeducation.

3. Interrupted Direct current –

Introduction and characteristics, parameters of stimulation, physiological and therapeutic uses of stimulation, precautions

4. Galvanic Current –

Introduction and characteristics, parameters of stimulation, physiological and therapeutic uses of stimulation, precautions.

FG test, SD curve, Chronaxie and rheobase measurement

5. Types of electrical stimulators –

NMES- construction component, principle of application, types of electrode, physiological effect

FES- construction and component

6. Iontophoresis –

Definition, principles, physiological and therapeutic uses, ions commonly used and their clinical indication, techniques of iontophoresis, and principles of treatment, contraindications and dangers

7. TENS –

Definition, theories of pain modulation, pain gate theory, principle and techniques of treatment, indication and contraindication, dangers and precautions, dosage

8. Medium frequency Current –

Interferential Current: Definition, characteristics, physiological and therapeutic effects, indications and contraindications, techniques of application, parameters, dosages, precautions

Russian Currents

Rebox currents

9. Advanced Electrotherapy –

Computerization in electrotherapy, programming of parameters of treatment, appropriate selection of parameters and combination in therapy, combined therapy-principles, therapeutic uses and indications like US with stimulation or TENS or IFT etc.

Introduction to sinusoidal, Diadynamic currents, HVPGS and micro currents

TEXTBOOKS

1. Clayton's Electrotherapy (theory and practice): 8th edition. Forster A; Palastanga N, AIBS publication.
2. Electrotherapy Explained: 4th edition. Low J; Reed A. B and H Publications 2006.
3. Basis of Electrotherapy- Subhash Khatri. Jaypee brothers 2003.
4. Principle and practice in Electrotherapy: 4th edition. Joseph Kahn, Churchill Livingstone 1999.

REFERCE BOOKS

1. Clinical Electrotherapy- Nelson and Currier
2. Electrotherapy: Evidence Based Practice: 11th edition. Sheila Kitchen. Churchill Livingstone
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