

ELECTRO THERAPY

Current for treatment

- Stimuli and Paralytic current
- High frequency current position
- Low frequency current, carrier effect in radiotherapy and similar
- Induced heat current
- Electrolysis
- Galvanic therapy

Electrotherapy

- Electrolysis
- Galvanic therapy
- Induced heat current
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PHYSIOTHERAPY TECHNIQUES

PART-I

Physical agents and their effects

- Physical agents and their effects
- Therapeutic effects of physical agents
- Indications and contraindications
- Precautions and safety

Electrotherapy

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ELECTRO MECHANIC AND ELECTROTHERAPY

1. Current for treatment.

- Sinusoidal and Faradic currents.
- High frequency current production.
- Low Frequency Currents
- Interrupted direct current
- Electrodiagnosis
- Inferential Therapy

2. Electro Checks/Electrical shocks.

3. Physical effects of heat and temperature. Transmission of heat. Wave length and frequency.

4. Infra red rays and its sources.

5. Ultraviolet ray and its sources. Choice of lamp for treatment.

6. Sound Waves:

Sound waves and their velocity, reflection and refraction of sound waves, characteristics of tone, resonance, Inter ference of waves.

7. Currents from cell and Main's supply, Ohm's Law: Electrical Units. Resistance in series and parallel. Chemical effects of currents.

ELECTROTHERAPY

(Application of Electromechanics to Electromedical work)

1. Technique and application of Galvanic current.

Its effects and Uses.
Indications and Precautions.

2. Technique and application of Faradic current.

Its effect, uses, dangers, indications and contra-indications.

3. Short Wave Diathermy.

- Introduction and general consideration.
- Heating of Tissues
- The machine circuit
- The patient circuit
- Physiological effects of SWD
- Therapeutic effects of SWD
- Dangers in SWD

a) Condenser field Method.

- i) Cross fire ii) Through & Through
- ii) Co Planar. iii) Mono Planar.

i) Cable method V) Disk Method

ii) Pads Method

b) Cable Method:

Special Techniques: Dangers and precautions. Contra - indications

4. Infra Red Rays.

- Physiological effects of Infra - Red Rays.
- Therapeutic effects of Infrared rays.
- Technique of irradiation.
- Dangers and precautions.

5. Ultrasonic:

- Introduction.
- Characteristics.
- Physiological effects.
- Physical effects.
- Therapeutic effects.
- Technique of application.

PRACTICALS OF ELECTROTHERAPY

LOW FREQUENCY CURRENTS

Electrical stimulation

1. Types of current used - low or high
2. Apparatus – Developing diagram, identification of main parts, electrodes, connections etc.

1. Low frequency currents – types like TENS etc
1. Indications for use like Bell's Palsy
2. Methods of use
3. Safety precautions for self and for patients.

2. Study of electrodes and their application.
3. Study of methods to avoid electric shock.
4. Study of the situations in which burns may occur.
5. Study of different faults in the system and their effects.

HIGH FREQUENCY CURRENTS

1. Study of Short Wave Diathermy and types of currents used.
2. Study of production of heat by low and high frequency currents.
3. Study of movement produced by low frequency currents.
4. Developing a general diagram of Short Wave Diathermy and studying different parts at the machine available in the lab.
5. Studying Pads, Disc, & cable
6. Study of physiological effect of Short Wave Diathermy
7. Study of therapeutic effects of SWD
8. Study of indications for use of SWD
9. Study of methods for avoiding burns and contraindications.
10. Study of applications of SWD on soft tissues such as eyes.

BIO-MECHANICS

1. Preliminary exercise on measurement, involving different geometrical dimensions.
2. Force, measurements of force and its effects. Tensile & compressive forces.
3. Moments, its kinds, Effects of opposite moment & principle of moments.
4. Reaction or supporting forces of a horizontal beam & reaction at sacrum.
5. Work done in Machines used for lifting, principle of work applied to a machine.
6. Some simple machines.
7. Power, power of engines & pumps its mechanical efficiency.
8. Transmission of motion & Power.
9. The inclined plane and screw.
10. Energy.
11. application of physical principles to body system.
12. Mode of transmission of heat.
13. Light.
14. Wave motion, different kind of wave motion reflection & refraction of waves.
15. Sound, factors necessary for production of sound. Sound as a energy. The nature of sound, propagation of sound in air, water & solid. Characteristics of sound.
16. _____ principle.

Practical

1. To find the centre of gravity of a irregular shape bodies.
2. To verify the principle of lever load x load = Effort x effort area
3. To resolve the forces, of a weight rolling down on an inclined plane.
4. To resolve the different forces at different angle on a single joint and to find their net effect on that joint.
5. To find the centre of gravity of a lever area place on a fulcrum under specific loading.
6. To find the unknown reaction of a lever under a specific concentrated loading.
7. To resolve an inclined force making an angle θ with X-axis and to find the component forces of that inclined force by making use of trigonometric function.

ELECTRO-MAGNETISM

Weeks

1. Introduction to the course.
2. The structure of the atom.
3. Isotopes.
4. Ionization and excitation.
5. Electric charges.
6. Electric introduction-electroscopes.
7. Electric charge an electrical potential.
8. Capacitance and capacitors.
9. Electric current-ampere, volt, resistance.
10. Resistance and ohms law.
11. Circuit laws.
12. Energy and power.
13. The heating effect of electric current.
14. Sources of electrical energy.
15. Magnetism-introduction.
16. The magnetic effect of electric current.
17. Applications of magnetic effect.
18. Electro-magnetic induction.
19. Mutual induction and self-induction.
20. Introduction of A.C.
21. Transformer-theory.
22. Transformer-practical aspects.
23. Introduction A.C. circuits.
24. Reactance, resonance, impedance.
25. Power factor-power in single-phase circuit.
26. Single phase three phase, comparison and contrast.
27. Electrical distribution system in Pakistan.
28. Different supply systems.
29. A.C. in three-phase system.
30. Introduction to electrical machines.
31. Generator-A.C. & D.C. Principle, working-main parts.
32. Motor-Principle, Main parts working.
33. Electrical measuring instruments and measurements.
34. Indicating instrument-types, Principle and working.
35. Thermionic emission and P.N. Junction.
36. Diode structures and working.
37. Characteristic of diodes.
38. Triode-its working and characteristics.
39. Rectification.
40. Introduction to amplification.

PHYSIOTHERAPY INSTRUMENTS

Physiotherapy equipment. Application of electrical technology in physiotherapy equipment. Control and Operative component of the equipment like switches circuit breakers, relays and other details as follows.

1. Ultra Sonic Therapy Unit (Circuit Description, Dosage control, Constant and pulsed Operation).
2. Microwave Diathermy.
3. Surgical Diathermy Machines.
4. Precautions to be used while using Physiotherapy Instruments.
5. Baths all types
6. Exercise Machines – Types, Usage and brief introduction to circuits.

Special Anatomy

41-44 Skeleton

- (i) Classification and general features of bones & joints
- (ii) Bones of upper limb
- (iii) Bones of lower limb
- (iv) Joints of upper & lower limbs, classification of joints and bones
- (v) Essential features of each type

45-46 Kind of movement in joint, classification of movements, structure of each joint, their relations.

47-50 Skull – general features, base and roof of base

- Ventral view
- Superior & Infr
- Post

5. Description of Cranium, cranial nerves and pharyngeal bones and their movements

51-59 Muscles – General anatomy of muscles, their classification and action, Nerve supply & sources of various fibres & body muscles including diagrams, their nerve supply with special emphasis on their group fibres as spinal, cranial, sympathetic, Mechanism and action of muscles acting on joints and movements they produce

59-62 C.N.S. – General Organization of C.N.S.

- Brain & Spinal cord
- Sympathetic & para sympathetic system
- Cranial and peripheral nerves