SNS COLLEGE OF PHYSIOTHERAPY

Affiliated To The Tamil Nadu Dr. MGR Medical University, Chennai
Coimbatore– 641035

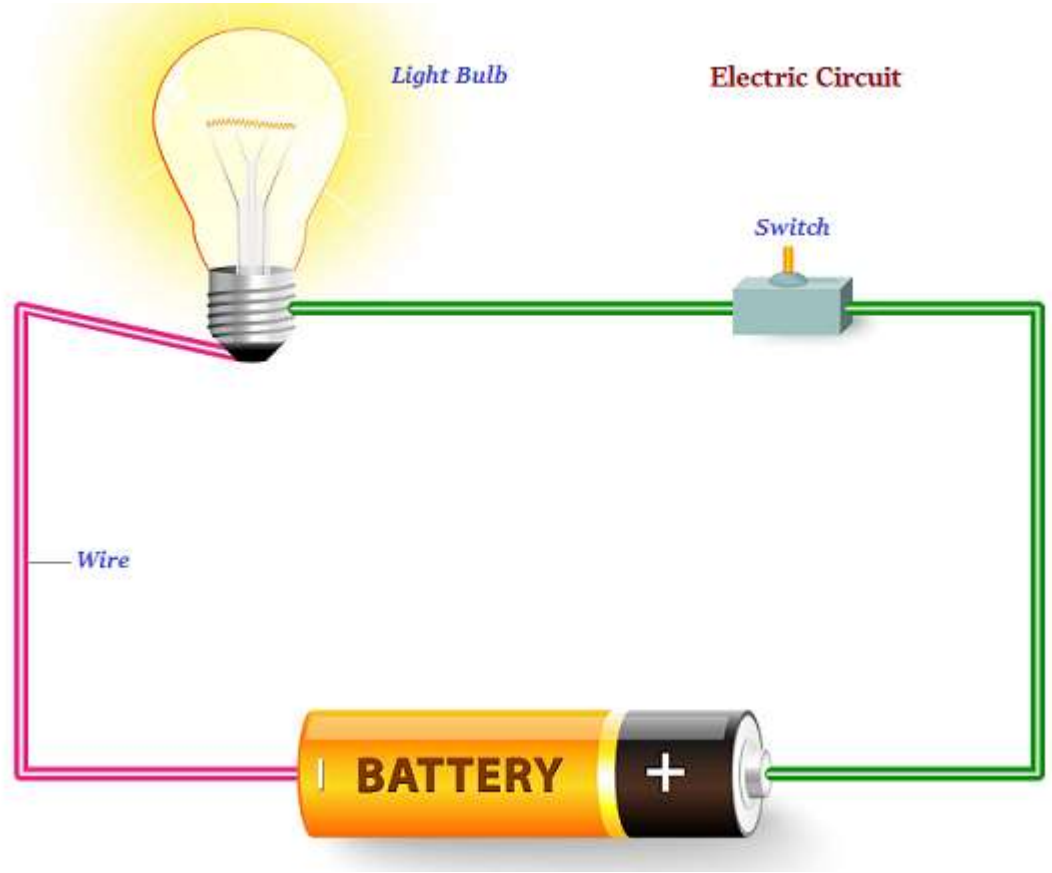
COURSE NAME: ELECTROTHERAPHY I

SUBJECT CODE: 6281

TOPIC: ELECTRICITY

Introduction to the Electricity

- Electricity is a form of energy
- It is associated with the movement of electrons
- Plays a vital role in daily life and medical applications
- Used extensively in therapeutic and diagnostic fields



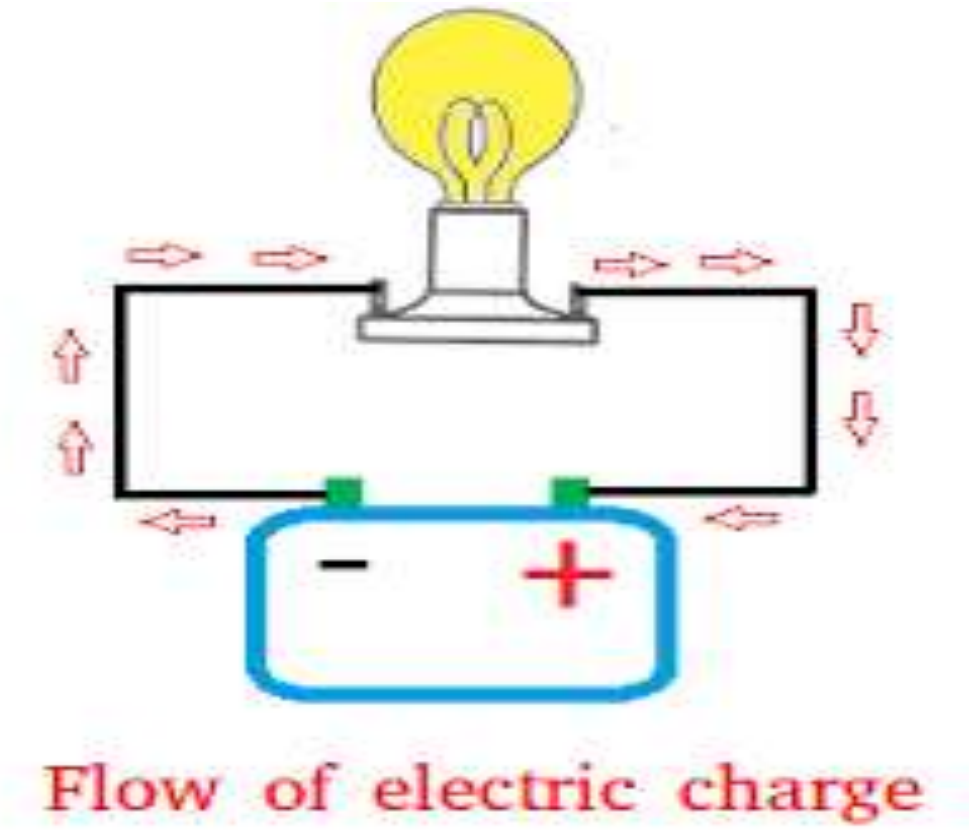
Definition of Electricity

Electricity is the flow of electric charge

Charges are carried mainly by electrons

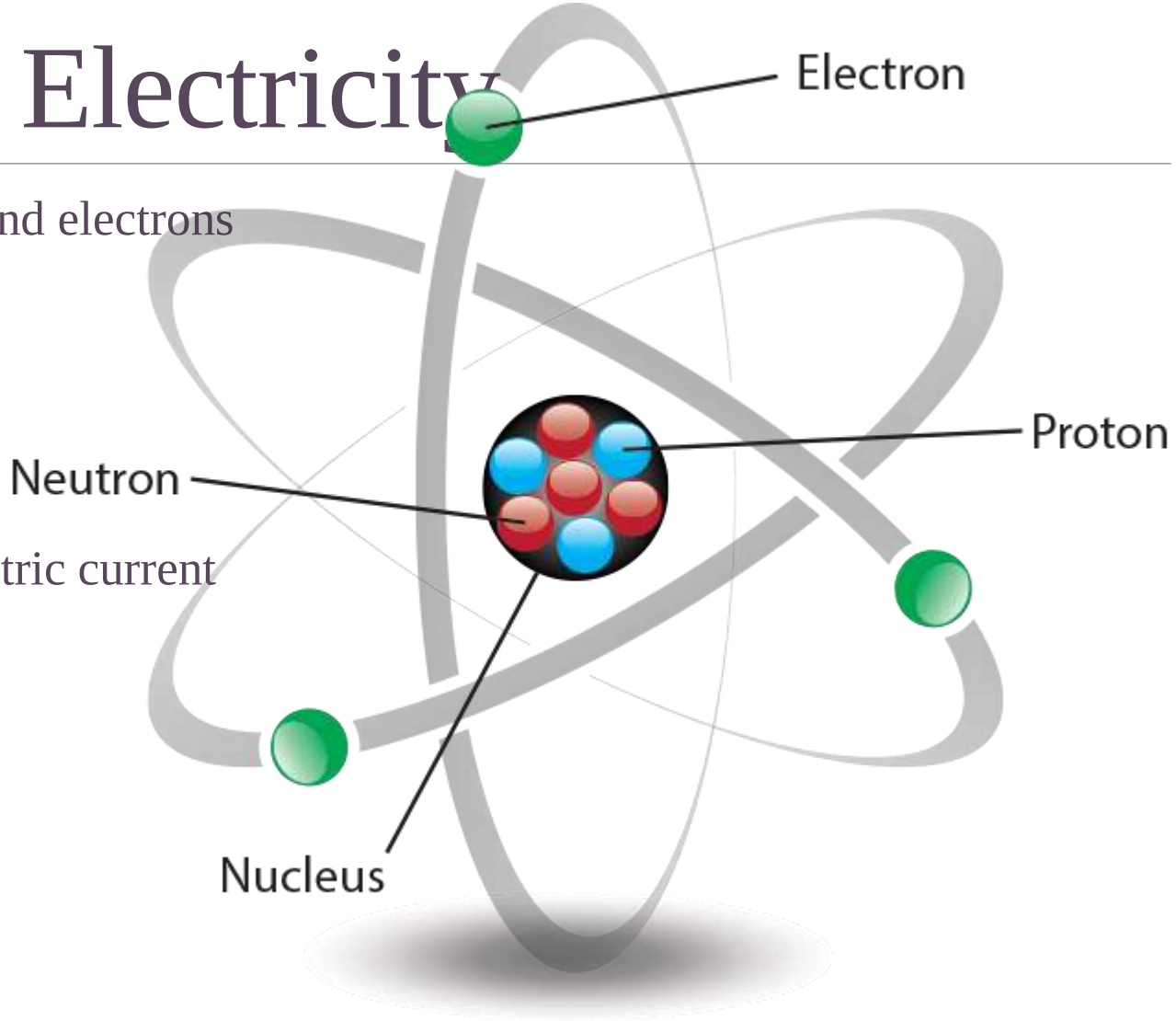
Exists in static and dynamic forms

Measured in terms of current, voltage, and resistance



Atomic Basis of Electricity

- Atom consists of protons, neutrons, and electrons
- Electrons carry negative charge
- Movement of electrons produces electric current
- Conductors allow easy electron flow



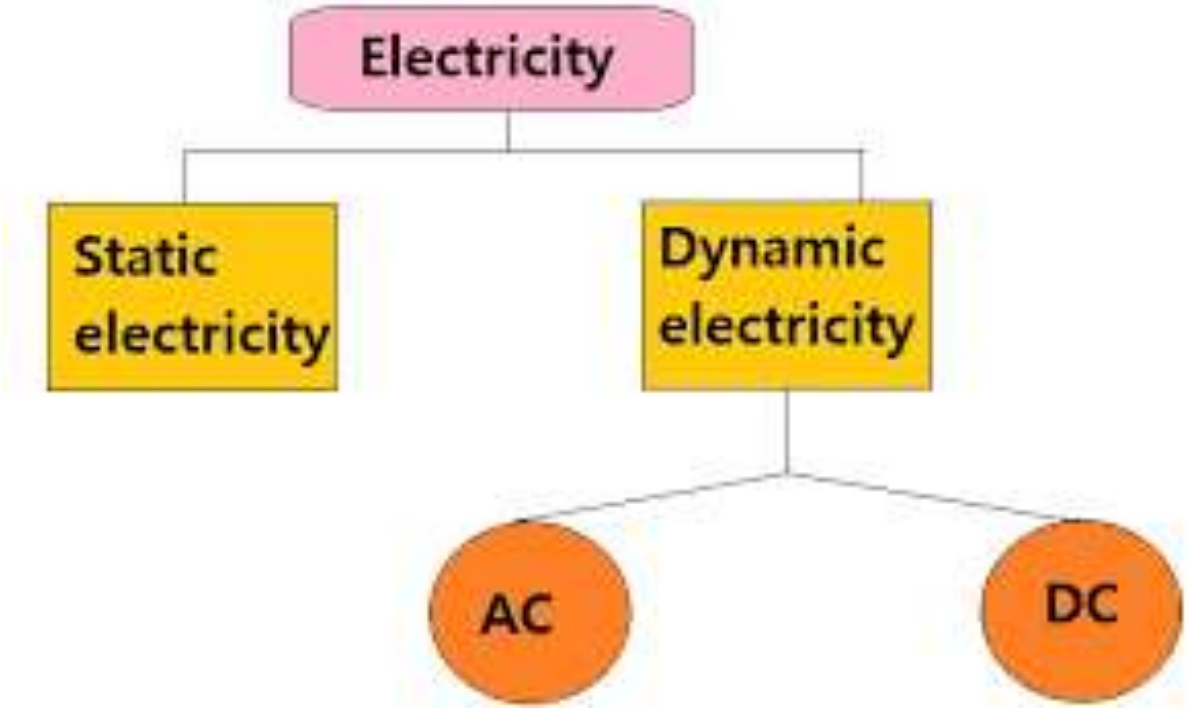
Types of Electricity

Static electricity

Current electricity

Each type behaves differently

Both have practical and therapeutic importance



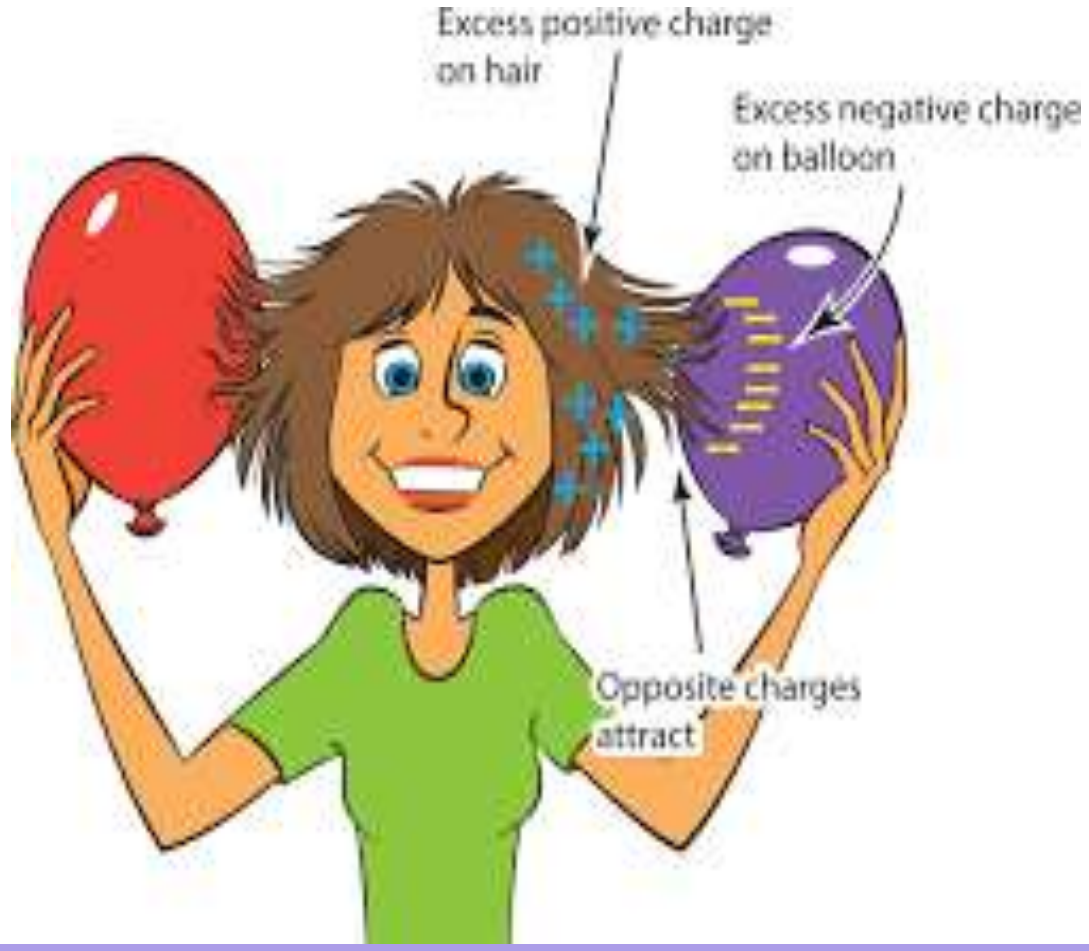
Static Electricity

Accumulation of electric charges at rest

Produced by friction or induction

Example: lightning, balloon rubbing

Used in some electrostatic therapies



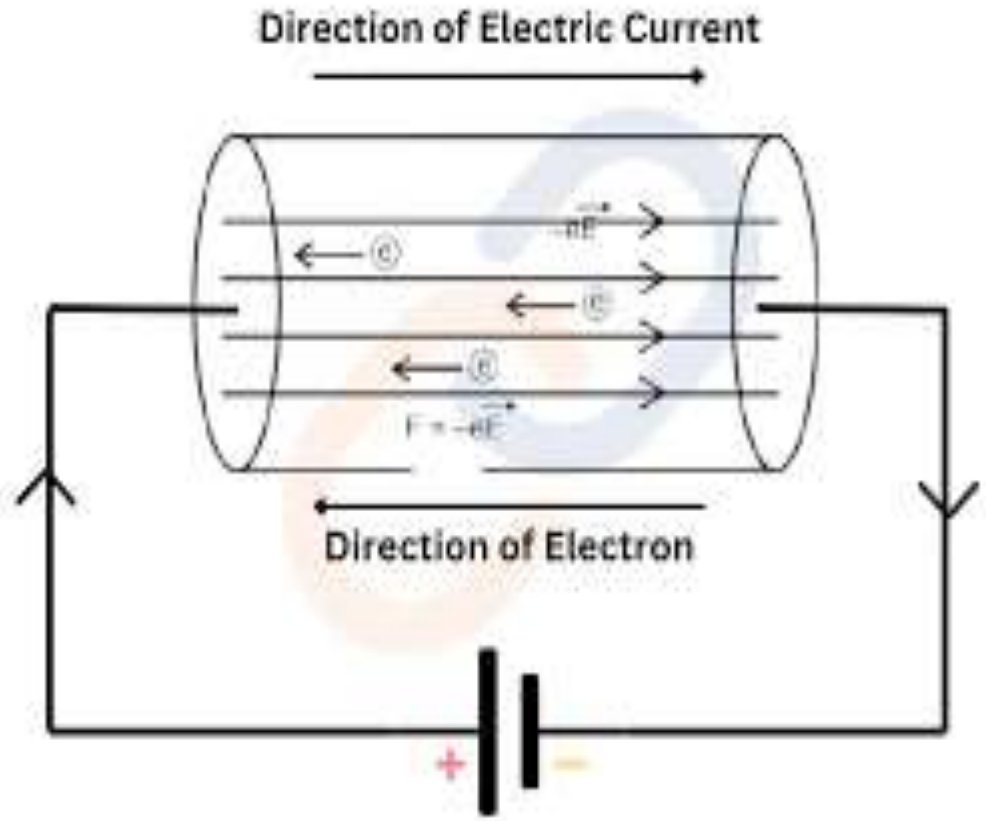
Current Electricity

Continuous flow of electrons through a conductor

Requires a source like a battery or generator

Used in electrical devices and medical equipment

Safer and more controllable than static electricity



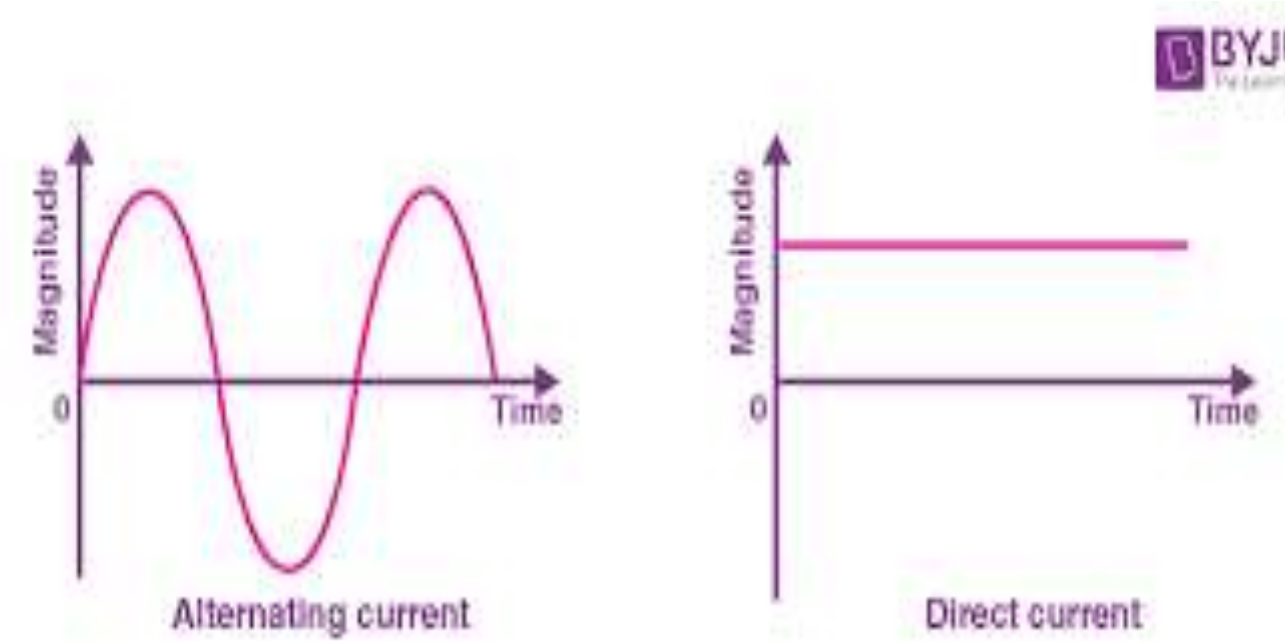
Types of Electric Current

Direct Current (DC)

- Flows in one direction
- Example: batteries

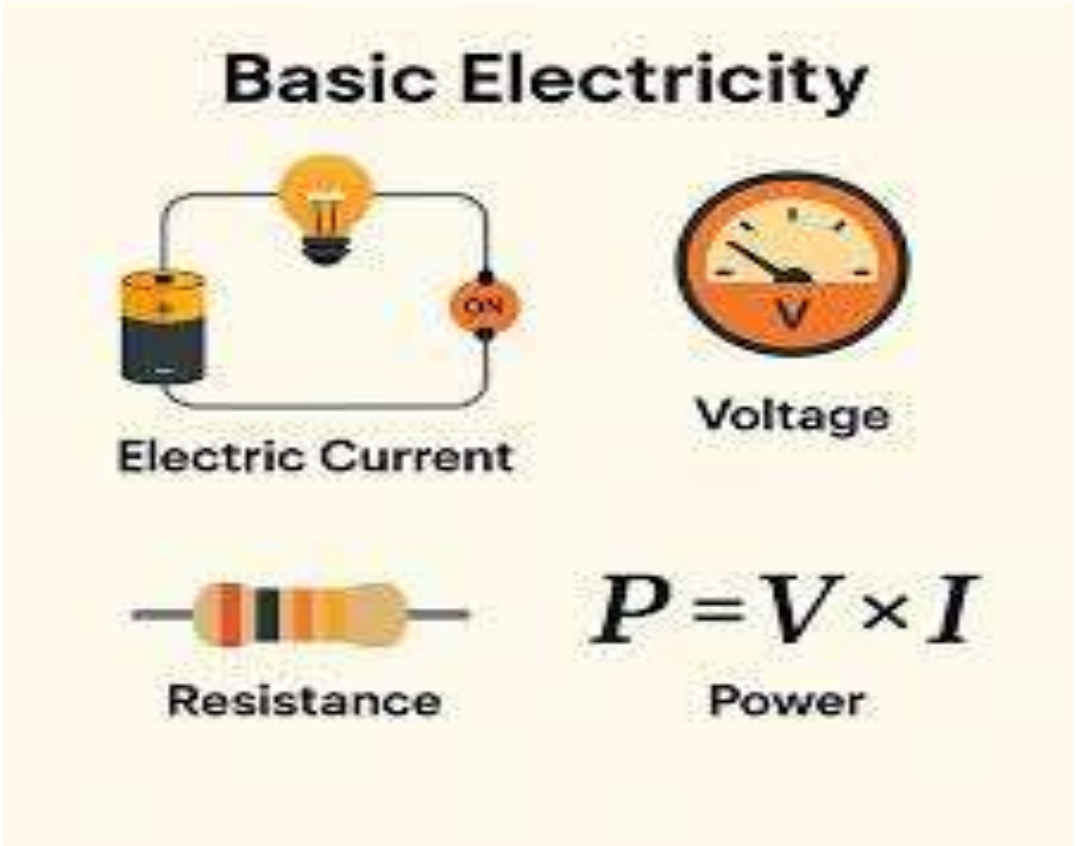
Alternating Current (AC)

- Changes direction periodically
- Example: household electricity



Basic Electrical Quantities

- Electric Current (I): Flow of charge (Ampere)
- Voltage (V): Electrical pressure (Volt)
- Resistance (R): Opposition to current flow (Ohm)
- These determine electrical behavior



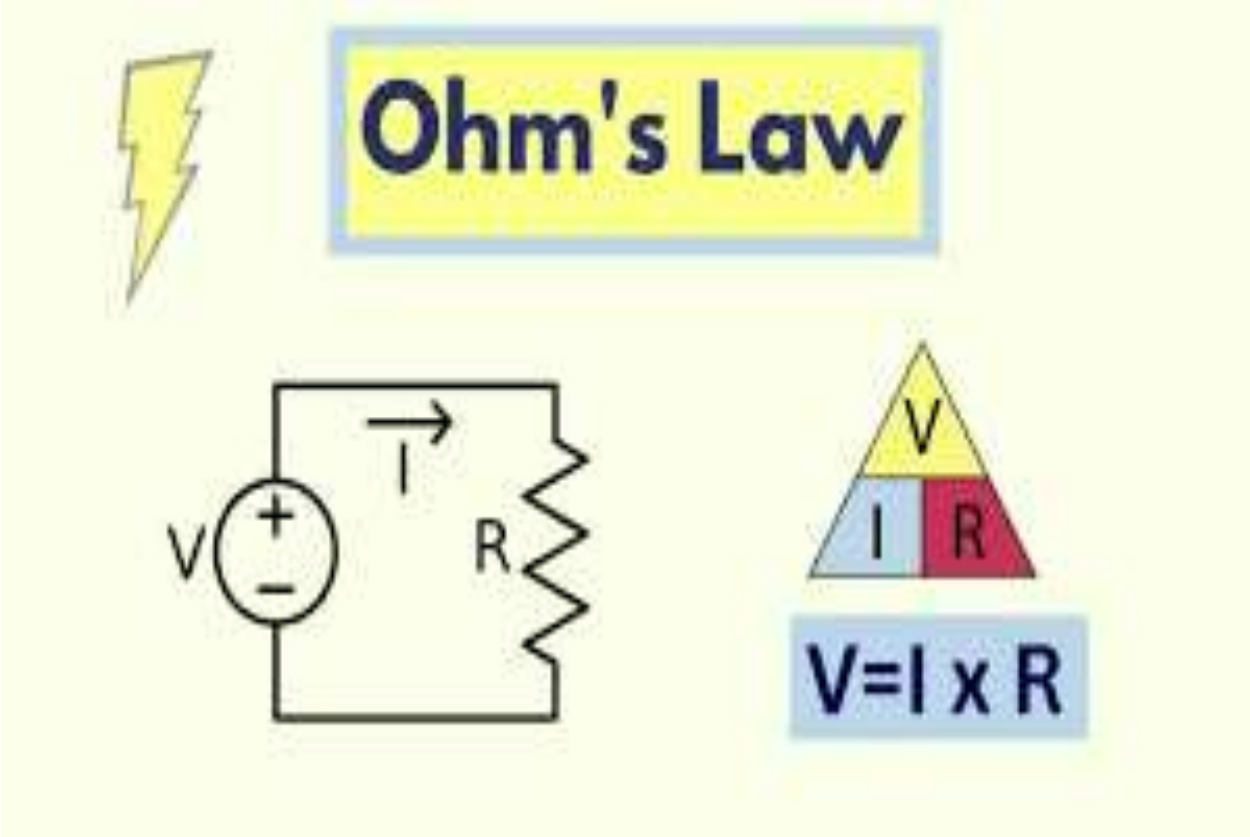
Ohm’s Law

Relationship between voltage, current, and resistance

Formula: $V = I \times R$

Increasing voltage increases current

Increasing resistance decreases current

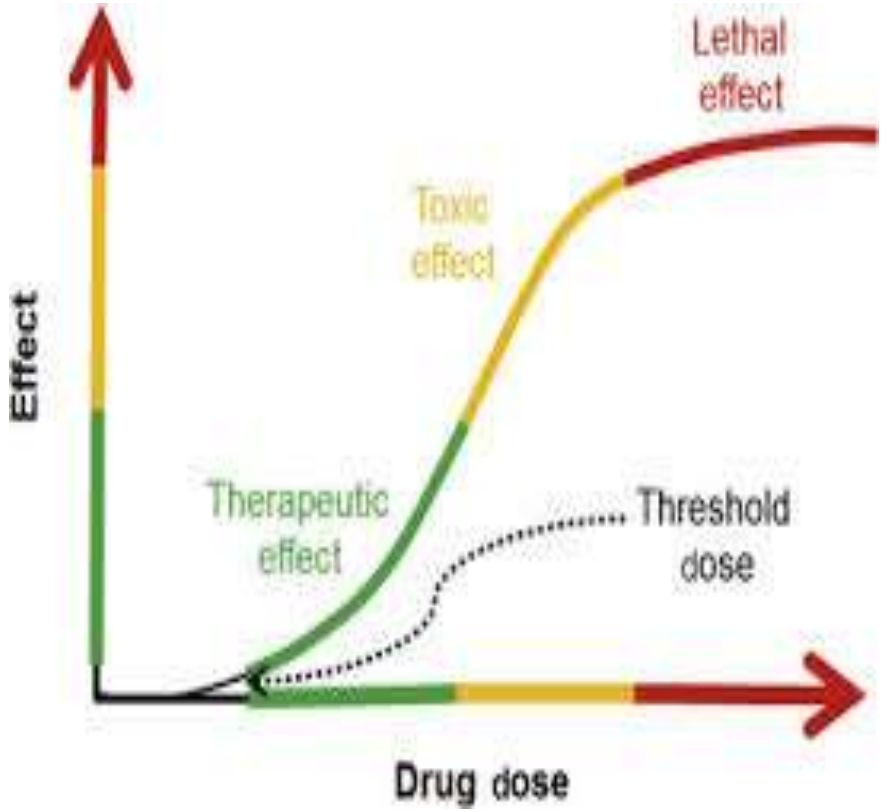


Effects of Electricity

- Heating effect
- Magnetic effect
- Chemical effect
- Physiological effect on nerves and muscles

Therapeutic Electricity

- Use of electricity for medical treatment
- Common in physiotherapy and rehabilitation
- Helps in pain relief and muscle stimulation
- Applied in controlled and safe doses



Therapeutic Uses of Electricity

- Pain management
- Muscle strengthening
- Nerve stimulation
- Improving blood circulation
- Reducing inflammation

Common Electrotherapy Modalities

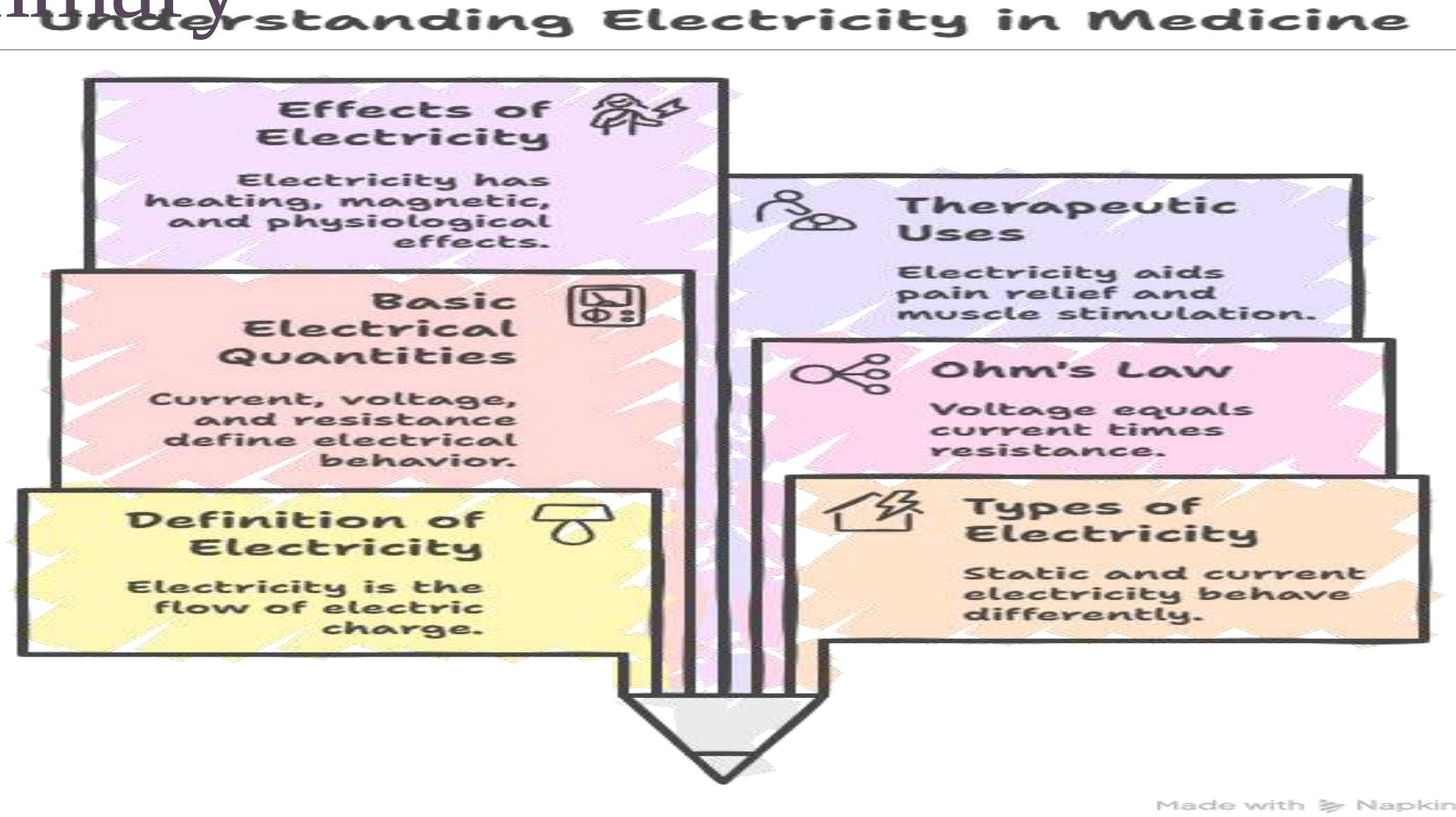
TENS (Transcutaneous Electrical Nerve Stimulation)

IFT (Interferential Therapy)

Ultrasound therapy

Galvanic and Faradic currents

Summary


Understanding Electricity in Medicine
Effects of Electricity
Electricity has heating, magnetic, and physiological effects.
Therapeutic Uses
Electricity aids pain relief and muscle stimulation.
Basic Electrical Quantities
Current, voltage, and resistance define electrical behavior.
Ohm's Law
Voltage equals current times resistance.
Definition of Electricity
Electricity is the flow of electric charge.
Types of Electricity
Static and current electricity behave differently.
Made with Napkin

Thank you