SNS COLLEGE OF PHYSIOTHERAPY

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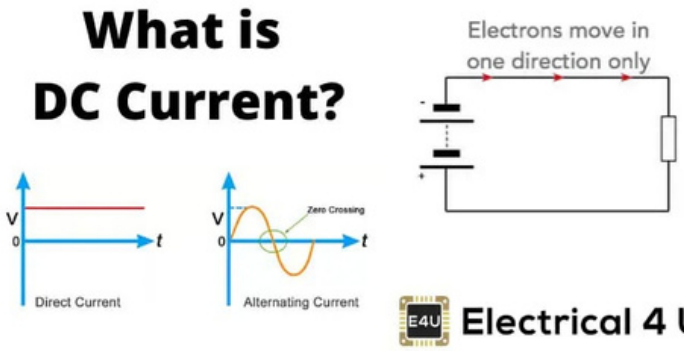
COURSE NAME :Basicphysics and biomechanics

SUBJECT CODE : 6273

TOPIC : Empathize: DC CIRCUITS

Empathize – Therapist Perspective

- Difficulty adjusting current
- Time constraints in OPD
- Risk of skin burns Need for
- predictable output



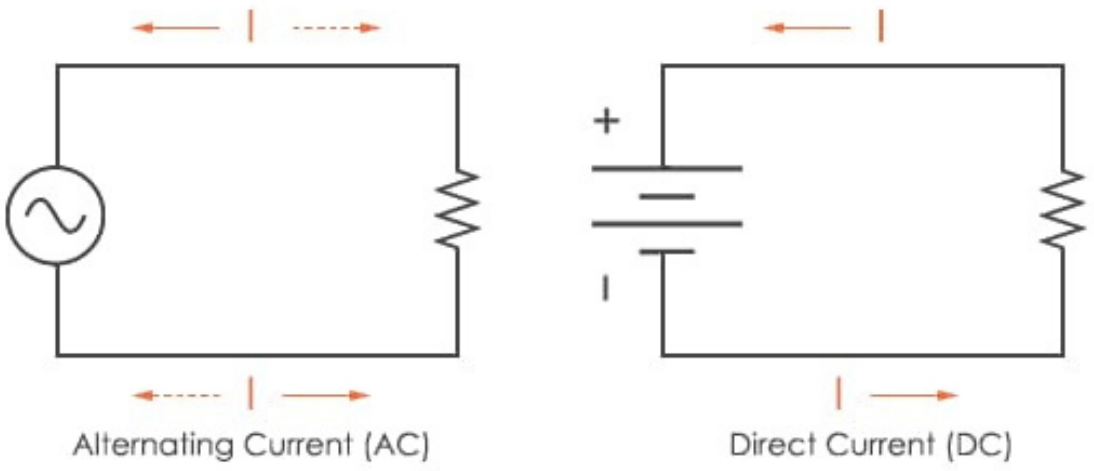
Case: Therapist managing multiple electrotherapy patients.

Define – Core Clinical Problem

DC Source →
Electrodes →
Patient

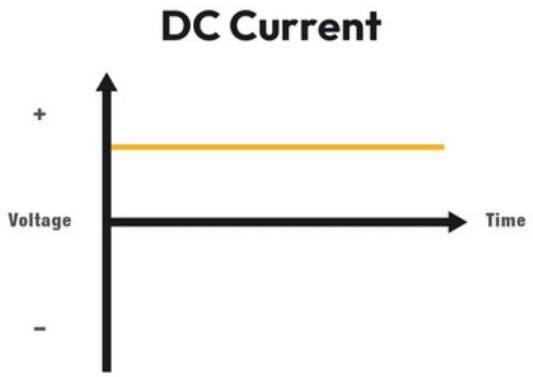
- Sudden DC causes discomfort
- Uneven current density Poor
- compliance Safety concerns

Defined problem linking patient discomfort with circuit behavior.



Define – DC Circuit Issues

- High current density
- Poor electrode contact
- Unstable voltage Lack
- of feedback

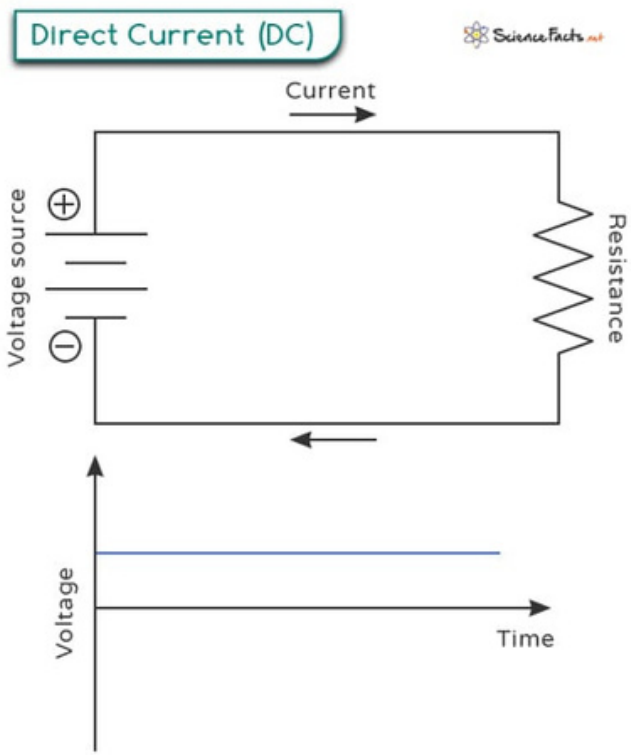


Circuit limitations directly affect clinical outcome.

Ideate – Clinical Solutions

- Ramped DC output
- Large carbon electrodes
- Moist sponge interface
- Preset programs

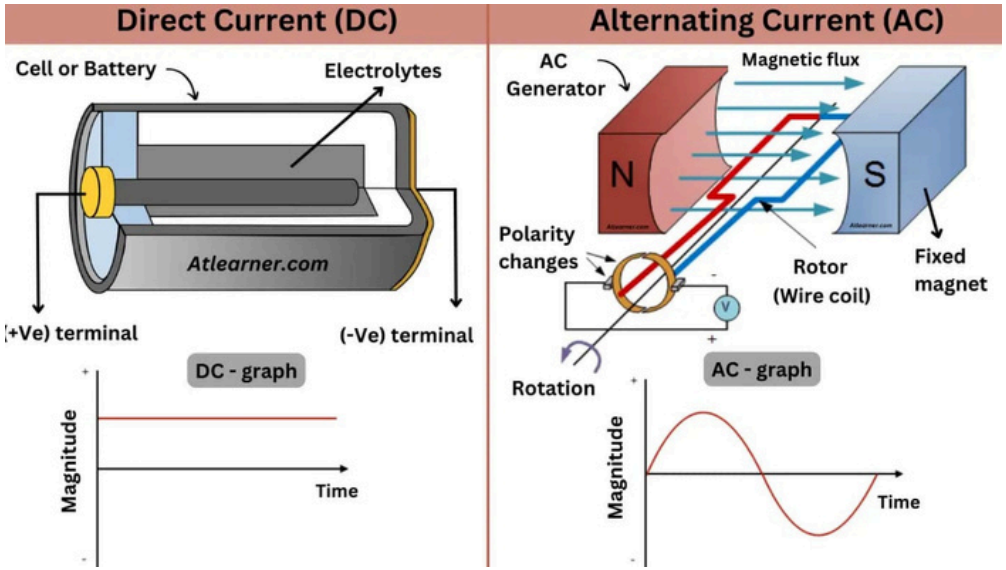
DC Source →
Electrodes →
Patient



Ideas generated to improve comfort and safety.

Ideate – Circuit Modifications

- Series resistors
- Current regulators
- Polarity indicators
- Safety cut-off



Applying electronics to therapy device design.

Prototype – Therapy Device Design

- Low-intensity DC
- Smooth intensity knob
- Compact casing Visual
- indicators

DC Source →
Electrodes →
Patient

Prototype built for physiotherapy teaching labs.

Prototype – Clinical Applications

- Denervated muscle stimulation
- Iontophoresis Pain relief
- Wound healing
-

DC Source →
Electrodes →
Patient

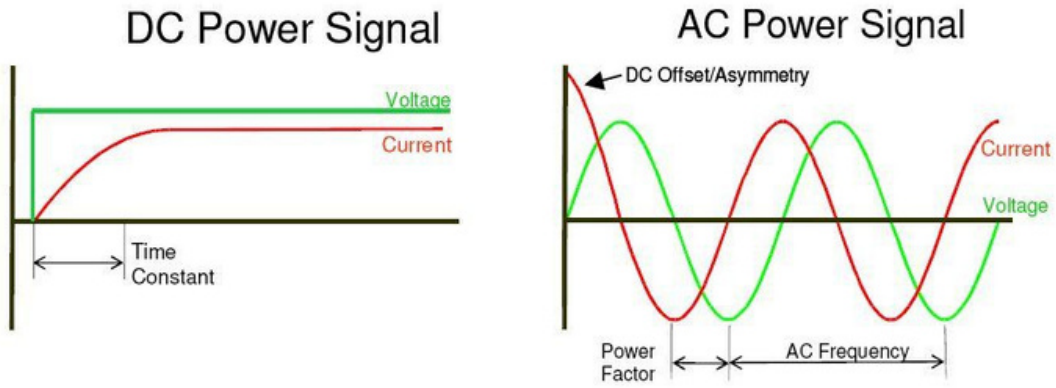
Prototype tested in simulated clinical scenarios.

Test – Patient Outcomes

DC Source →
Electrodes →
Patient

- Reduced pain
- Improved tolerance
- No skin irritation
- Better adherence

Observed patient response after using improved DC device.



Test – Exam & Viva Relevance

- Design thinking steps DC
- circuit principles Clinical
- reasoning University exam
- alignment

DC Source →
Electrodes →
Patient

Integrates engineering concepts with physiotherapy exams.