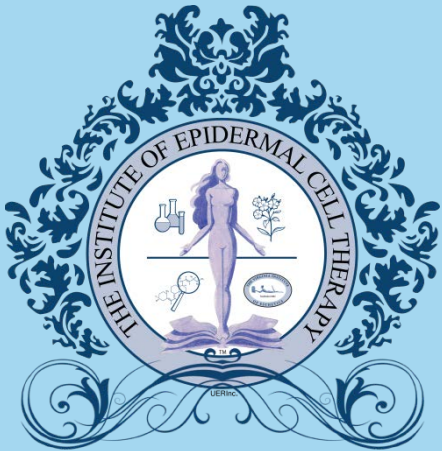
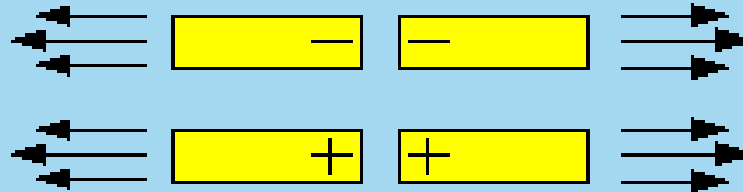


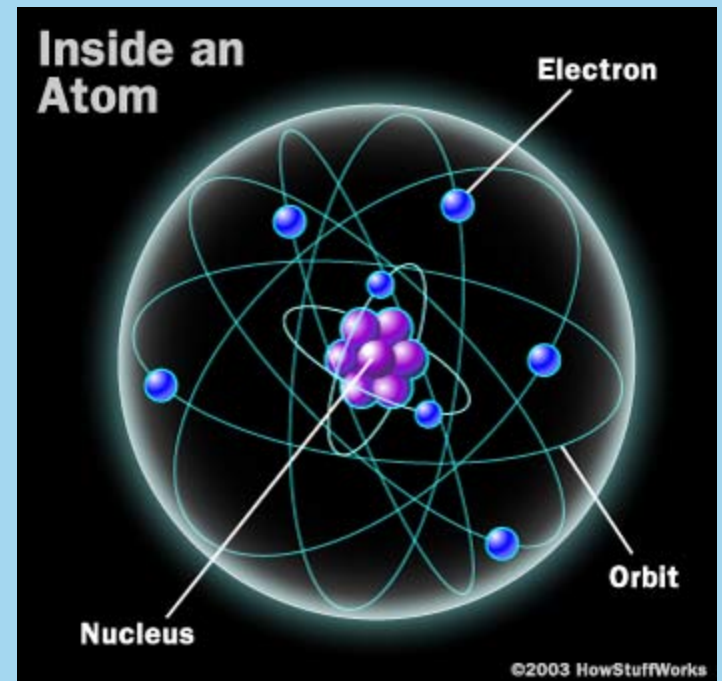


Electrical Current

opposite charges attract



like charges repel





Course Objectives

Explain Basic Principles of Electricity

Explain Electrotherapy

Identify the Machines Used in Skin Care Treatments

Explain the Function and Benefits of Each Machine

Machines use and Safety -Precautions



Electricity

Electricity – a form of energy that can't be seen which occurs as a result of the flow of electric current. An electric current is the ***flow of electrons***.

Free electrons can flow from atom to atom provided there is some form of an electron pump.

A battery acts as an electron pump. Since like charges repel each other and opposite charges attract, the negatively charged electrons move away from a battery's negative (-) side and moves towards the battery's positive (+) side



Electricity

Batteries and generators create differences in electrical pressure that are needed to make electrons flow.

Electricity will only flow in a closed circuit. A **switch** can be used to open and close a circuit.

The **switch** must be made of a material that transmits the current. This material is called a *conductor*.



Electricity

Batteries and Cells

Light Bulb

Resistance

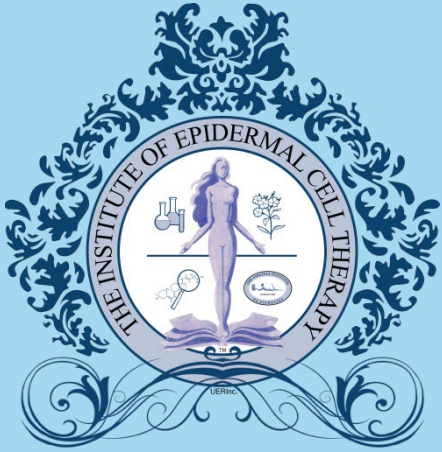
Units of Measure

Ohm's Law

Power

Instruments and Components

Safety Devices

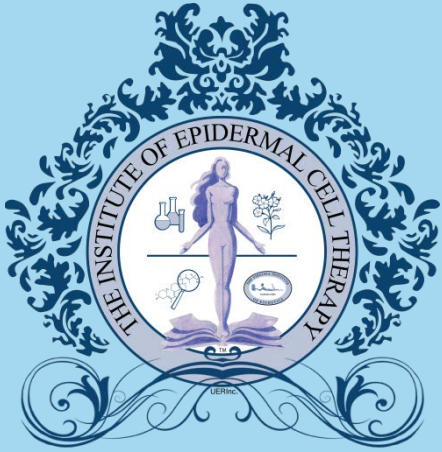


Electricity

Batteries and Cells

Direct Current – The current produced by a battery. Current flows in the same direction all the time. The electrons flow from the negative build up to the positive build up

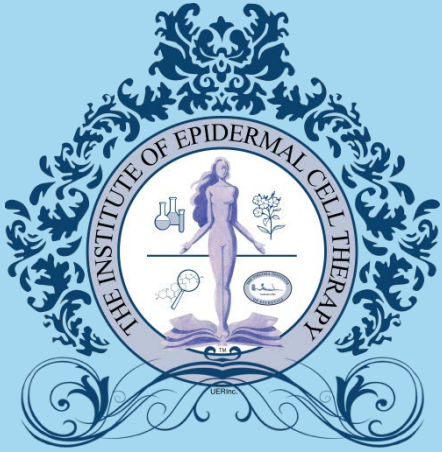
Alternating Current – Most generators produce this current. The direction and flow is reversed at regular intervals



Electricity

Light Bulb – a glass container in which a filament, a long coil of tungsten wire, is placed in a vacuum.

The electrons of tungsten are tightly bound and requires a lot of energy to force the electrons through the tungsten. This intense energy makes the tungsten wire glow red hot. The tungsten wire has a high melting point so it doesn't break



Electricity

Resistance – is the tendency to resist the movement of electrons through a conductor

As resistance increases, more energy is required to push the current through. Additional energy can be obtained by a more powerful electron pump.

A greater potential difference between the two ends of the battery creates a more powerful electron pump

Resistance (R) = Potential Difference (V) volts
Current (A) amps



Electricity

Ohm's Law – describes the constant relationship between current flow, potential difference, and resistance

$$\text{Resistance} = \frac{\text{Potential Difference}}{\text{Current flow}} \quad R = \frac{V}{A}$$

$$\text{Current} = \frac{\text{Potential Difference}}{\text{Resistance}} \quad A = \frac{V}{R}$$

$$\text{Potential Difference} = \text{Resistance} \times \text{Current} \quad V = R \times A$$



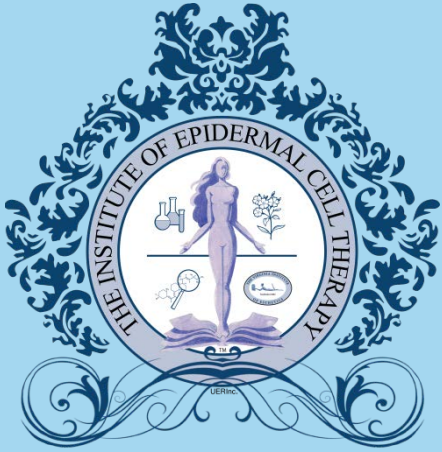
Electricity

Power – the amount of work a machine is able to do.

The measure of power is watts.

Power is a result of pressure (or potential difference) and electric flow

Power (W) = Pressure (V) x Electric Flow (A)



Electricity

Instruments and Components

Capacitor – used to store an electric charge

Rectifier – converts alternating current (AC) to a form of direct current (DC)

Converter or Inverter – device to change AC to DC

Rheostat – a variable resistor that allows the amount of current flow to be increased or decreased

Transformer – device used to change an AC voltage

Ammeter – measure the amount of current flow

Voltmeter – measure the potential difference between 2 points

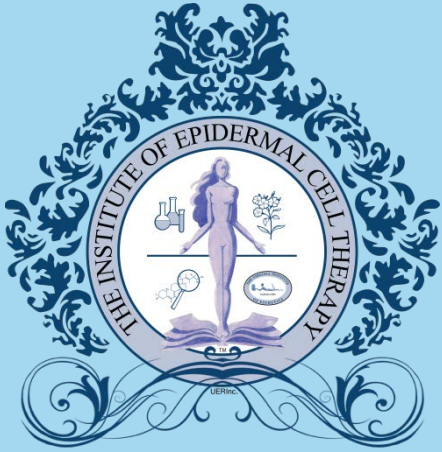


Electricity

Safety Devices – preventive measures to reduce the risk of electrical shock and fire hazards due to inadequate insulation or short circuits

Fuse – a thin piece of wire made from metal of low melting point. It is incorporated as part of the circuit

Earth Leakage (ground plug) – lead connected to the body of the appliance and the earth metal plate



Electrotherapy

Application of electricity in various forms to the skin or face or body for specific effects.

Electricity is applied to the skin by means of an electrode which serves as a conductor and applicator of electrical current.

Most applications are in the magnitude of milliamps



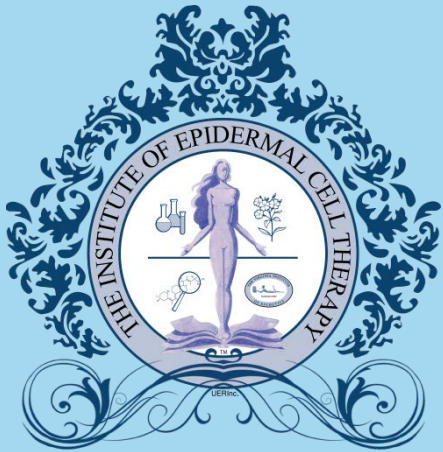
Electrotherapy

Faradic – is AC used for its mechanical effect on tissues. Faradic treatments are used to tone the body muscles

Interferential – uses 2 different AC currents. These currents are for deep muscle contractions with little surface reaction

Galvanic – is DC used for its chemical effect on tissues. The cathode (-) opens pores and increases blood flow and the anode (+) closes the pores, decrease blood supply, soothes the nerves and hardens the tissues

High Frequency – rapidly oscillating current of low amperage and relatively high voltage that produces warmth or heat without chemical changes or mechanical contractions



Skin Care Machines

Rotary Brush Machine

Steamer

Vacuum Machine

Galvanic Current

- Iontophoresis
- desincrustation

High Frequency Machine