

# **BASIC COMPONENTS OF ELECTRIC CURRENT**

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❑ Medical therapy using electric currents.

❑ Also called electrotherapeutics.

❑ Electrotherapy, also electro physical agents (EPA) are any forms of treatment or assessment conducted using an electro physical agent which can be applied externally to the human body.

## USES OF ELECTROTHERAPY

- ✓ Relief of pain
- ✓ Improving muscle strength
- ✓ Re-education/retraining of muscle control.
- ✓ Maintain and improvement of ROM
- ✓ Acceleration of wound healing
- ✓ Improving local blood circulation
- ✓ Reducing oedema
- ✓ Temporary reduction of spasticity
- ✓ Stress incontinence.

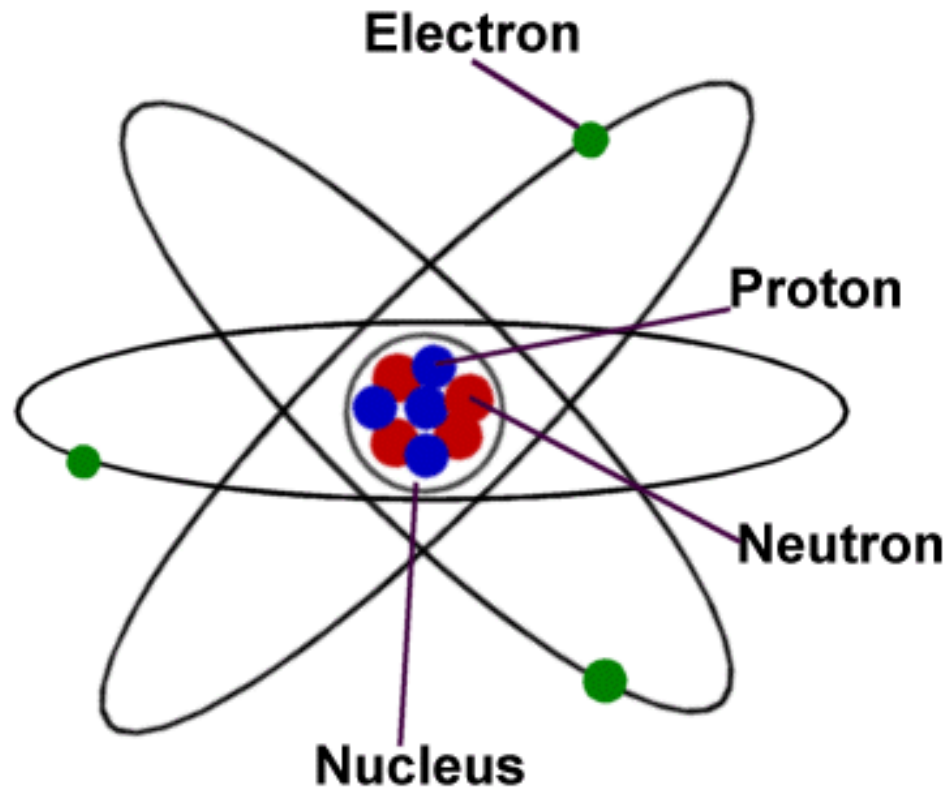
# TYPES OF ELECTRIC CURRENTS USED IN ELECTROTHERAPY

1. Direct Current (DC)
2. Alternating Current (AC)
3. Pulsed Current (e.g., TENS)

## SOME OTHER CURRENTS-

- ✓ High voltage pulse current
- ✓ Micro current
- ✓ Interferential current
- ✓ Russian current

# ATOM



Atoms can have an electrical charge, positive or negative.

This happens when an atom gains or loses electrons.

More electrons means a negative charge and fewer means a positive charge.

Once an atom has an electrical charge it is called an ion.

- ❑ The nucleus is the component of the atom that is made up of particles that are bound together by the extremely strong nuclear force. The proton and the neutron are the two most significant nuclear particles.
- ❑ Gold Stein was the first to find protons. The proton is a large nuclear particle with a positive charge on it. It is responsible for the nucleus' overall positive charge.
- ❑ The neutron is a nuclear particle with a mass almost equal to that of a proton, but it is electrically neutral, meaning it has neither positive nor negative charges.
- ❑ Electrons are negatively charged particles that revolve in orbits around the nucleus, and their quantity in a neutral atom is equal to the amount of protons.



# TYPES OF ELECTRICITY

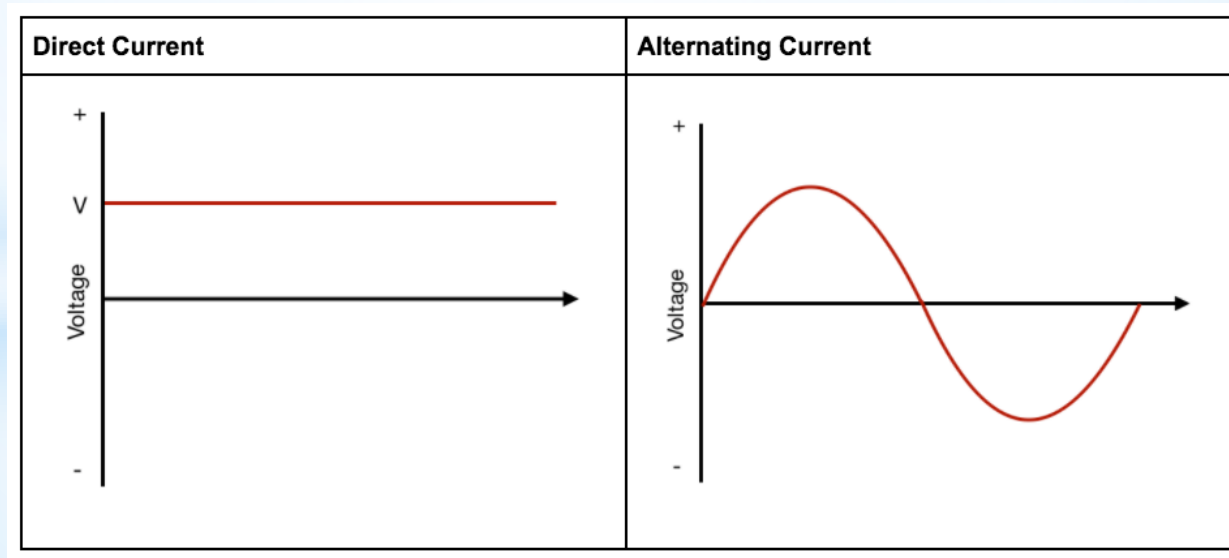
❑ **Static Electricity**-Static electricity occurs when the charges on a body do not flow. Positive charges on one substance attract negative charges on another. The most basic approach to generate a static electric charge is to rub two materials together.

❑ **Current Electricity**-When charged particles move through a conductor, an electric current is created. Direct current (DC) and alternating current (AC) are the two forms of electric currents (AC).



❑ Direct current (DC) is an uninterrupted and uni-directional flow of charged particles.

❑ Alternating current (AC) is an uninterrupted and bi-directional flow of charged particles.



# High Voltage Pulse Current (HVPC)

It is essentially a monophasic, twin-peak current with a short pulse duration. It uses electrical stimulation to achieve a number of therapeutic goals.

**Uses-** Wound healing



# Micro Current

Direct current in the microampere range, often known as micro current. Electrical stimulation is applied "below the threshold," which means it is too weak to excite nerve fibres, resulting in no muscle activity. It aids wound healing by facilitating the galvanotaxis process, which draws neutrophils, macrophages, and fibroblast cells to the wound site.

**Uses-** Pressure sores, venous ulcers, diabetic mellitus ulcers, ischemic ulcers, pain relief.

# Interferential Current (IFC)

Interferential current employs "medium frequency" current to produce the effect of a low-frequency current in the tissues. IFC stimulates deep tissues by using kilohertz-carrier-frequency pulsed or sinusoidal currents to overcome the skin's impedance.

**Uses-** Pain relief, improves circulation, muscle strengthening.

# Russian Current

Russian currents are alternating currents with a frequency of 2500 Hz and a 50 percent duty cycle that are burst modulated at a frequency of 50 Hz. With a suggested treatment time of 10 minutes each stimulation session, the stimulus is administered during a 10 second "on" phase followed by a 50 second "off" or rest interval.

**Uses-** Strengthening of muscle.

## **References-**

- \* Essentials of Electrotherapy by Chippala P 2017**
- \* Textbook of Electrotherapy by Singh J**

**THANK YOU**