INTERRUPTED DIRECT CURRENT (IDC)

1. Definition, Type, Duration, Shape, Frequency

1.1 Definition

Interrupted Direct Current (IDC), also known as **Galvanic Interrupted Current** (**IGC**), is a **monophasic direct current** that is **periodically switched on and off**.

Unlike continuous DC which flows steadily, IDC flows in **pulses of direct current**, separated by intervals of no current.

This interruption reduces skin irritation and chemical effects compared to continuous galvanic current.

1.2 Type

IDC is a monophasic pulsed current.

It is also referred to as:

Interrupted Galvanic Current (IGC)

Interrupted Direct Current

1.3 Duration

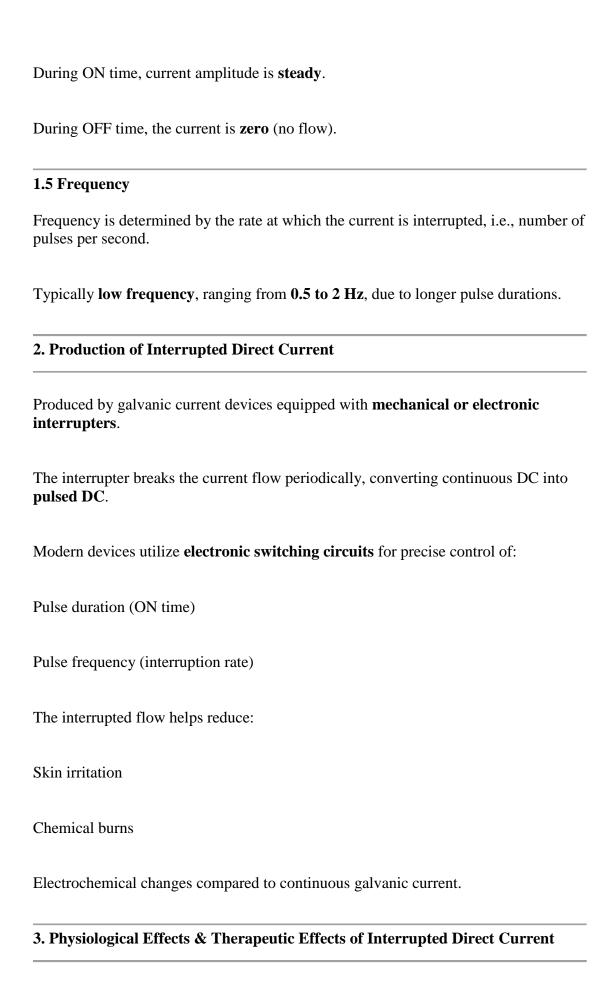
Pulse Duration (ON time): Usually ranges from **0.5 to 10 seconds**, adjustable based on treatment needs.

Interruption Time (OFF time): Equal or longer than ON time to enhance patient comfort.

Total Treatment Time: Typically between **10 to 30 minutes**, depending on the clinical condition.

1.4 Shape

Pulses are rectangular or square waveforms of direct current.



3.1 Physiological Effects

Electrochemical Effect:

Ion migration caused by current flow (movement of cations and anions).

Results in **chemical changes in tissues** beneficial in treatments like iontophoresis.

Electrothermal Effect:

Minimal heating due to interrupted current, avoiding tissue damage.

Excitation of Nerve and Muscle Fibers:

Stimulates both motor and sensory nerves.

Produces muscle contractions and sensory sensations.

Muscle Contraction:

Produces **stronger and longer-lasting contractions** compared to Faradic current due to longer pulse durations.

Improved Circulation:

Muscle contractions act as a pump improving **local blood flow** and oxygenation.

Pain Relief:

Stimulation of sensory nerves modulates pain signals via the **gate control theory**.

Reduction of Edema:

Enhances lymphatic and venous drainage, reducing swelling.

3.2 Therapeutic Effects **Muscle Strengthening and Re-education:** Effective in stimulating weak but innervated muscles. **Reduction of Muscle Spasms:** Sustained contractions can relax muscle spasm. **Stimulation of Denervated Muscles:** Longer pulse durations can stimulate muscles lacking nerve supply. **Pain Management:** Sensory nerve stimulation for acute and chronic pain relief. **Improvement of Blood Flow and Tissue Healing:** Enhanced circulation supports repair processes. **Management of Atrophic Muscles:** Prevents muscle wasting due to disuse or nerve injury. **Correction of Motor Deficits:**

Used in treating conditions such as:

Other peripheral motor deficits

Foot drop