FARADIC CURRENT

1. Definition, Type, and Duration

1.1 Definition of Faradic Current

Faradic current is a **short-duration, interrupted direct current** (also known as pulsed current).

It is **asymmetrical biphasic** in nature.

Historically generated by an **induction coil**.

Used primarily for **neuromuscular electrical stimulation (NMES)** to activate motor nerves and produce muscle contractions.

1.2 Types of Faradic Current

Classical Faradic Current:

Produced by **induction coils**.

Less common today due to **limited control** over parameters like intensity and frequency.

Modified Faradic Current:

Produced by **modern electrical stimulators**.

Parameters such as **frequency, pulse duration, and intensity** are adjustable for precise therapy.

1.3 Characteristics

Characteristic	Details
Type	Asymmetrical biphasic pulsed current
Pulse Duration	0.1 to 1 millisecond (usually 0.1–0.3 ms)
Frequency	50 to 100 Hz
Intensity	Low to moderate; up to muscle contraction level
Waveform	Spiky, short pulses with exponential rise and fall

1.4 Duration

Application Time: Typically 10 to 30 minutes, depending on therapeutic goals.

Pulse Duration: Very short pulses, less than 1 ms.

Inter-Pulse Interval: Determines frequency of stimulation.

2. Production & Surging of Faradic Current

2.1 Production of Faradic Current

Generated by a **Faradic stimulator** using electromagnetic **induction principles**.

The stimulator contains:

A **primary coil** connected to a power source.

A **secondary coil** where current is induced due to magnetic flux changes in the primary coil.

The induced current in the secondary coil is **interrupted**, producing **pulsatile electrical stimuli**.

This interrupted nature mimics **natural nerve impulses** for muscle stimulation.

2.2 Surging of Faradic Current

Surging refers to the **gradual increase (ramp-up)** and **decrease (ramp-down)** in current intensity.

Purpose of surging:

Prevents muscle fatigue by avoiding abrupt contractions.

Improves patient comfort during therapy.

Facilitates rhythmic and smooth muscle contractions similar to natural movements.

2.3 Surge Parameters

Parameter	Typical Range	Purpose
Surge Duration (On-Time)	5 to 10 seconds	Duration of muscle contraction phase
Surge Interval (Off-Time)	5 to 20 seconds	Rest period allowing muscle relaxation
Surge Ramp-Up/Ramp-Down	1 to 2 seconds	Smooth transition in intensity to prevent discomfort