

Diadynamic Current

Dr. Mohammed Taher Ahmed

E-mail-momrarar@ksu.edu.sa

dr.taher_M@yahoo.com

mobile 0542115404



Outline

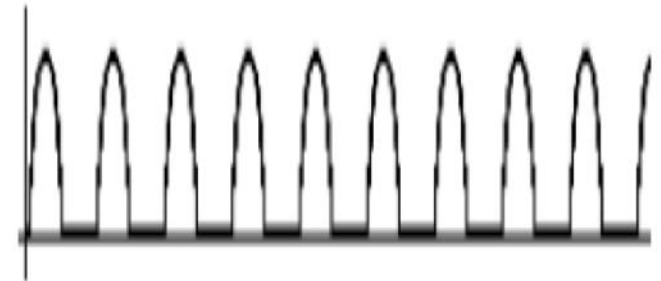
- Introduction and history
- Modulation of waves
- Types of diadynamic current
- Physiological effects
- Indications and therapeutic uses
- Contraindications and side effects
- Methods of applications

History of Diadynamic

- Diadynamic current is discovered by *Pierre Bernar*, a French Dentist, in France, later spread to Russia, Germany, and Poland, in the late of 1960s and early 1970 spread to Canada and Australia.
- Basic principle of diadynamic current is modulation of symmetrical biphasic sinusoidal waveform.
- **Diadynamic** is a low frequency of (50-60Hz), with pulse duration is extremely long, (6-10msec).
- **Diadynamic** currents are mixed currents, which use effects of the concurrent application of galvanic and faraday, or other impulse-like currents

Half-Wave Rectification (Single Phase or Monophasé Fixe (MF))

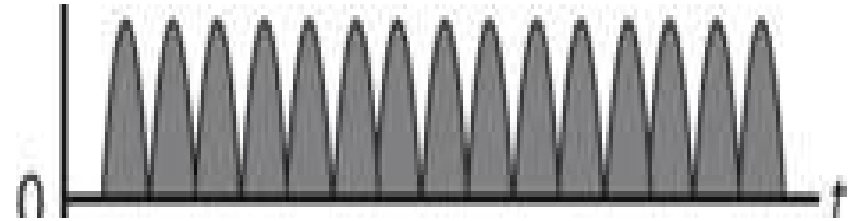
- Eliminates the second half of each AC cycle
- Produce a monophasic pulsed current
- Pulse duration equal to the inter-pulse interval
- Frequency equal to that of the original (50Hz).



This 50Hz causing excitation, facilitation and supporting muscle tone, it eliminates edema around the nerve envelope, reducing pain and supporting muscle tone.

Full-Wave Rectification (Double Phase or Diphassé Fixe (DF))

- Duplicate the second half of each AC cycle
- Direct monophasic current
- No inter-pulse interval
- Frequency is twice to original (=100Hz.)



Types of diadynamic current

1- DF
(diphase Fixe)


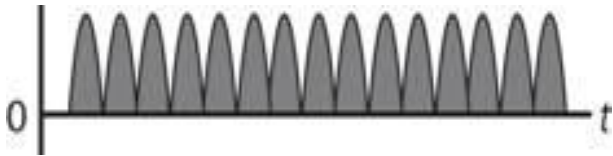
2- MF
(monophase Fixe)

3-CP
(Courtes Periodes),

4- LP
(Longues
Periodes)

5-RS
(Syncopal Rhythm)

Modes of DD

	<i>Fixed Monophasic (MF) Diadynamic</i>	<i>Fixed Diphasic (DF) Diadynamic</i>
Wave rectification	Half wave rectified alternating sinusoidal current	Full wave rectified alternating sinusoidal current
Waveform		
Frequency	50Hz	100Hz
Pulse period	10ms	Continuous series of 10ms impulse
Interpulse interval	10ms	NA
Sensation	Strong vibration	Stabbing & prickling
Uses	Treatment of pain without muscle spasm Connective tissue trauma [Ligament sprains) and Phantom pain	Improved circulation, Analgesia (100 Hz), Pretreatment for CP & LP

Short Period (CP) Diadynamic

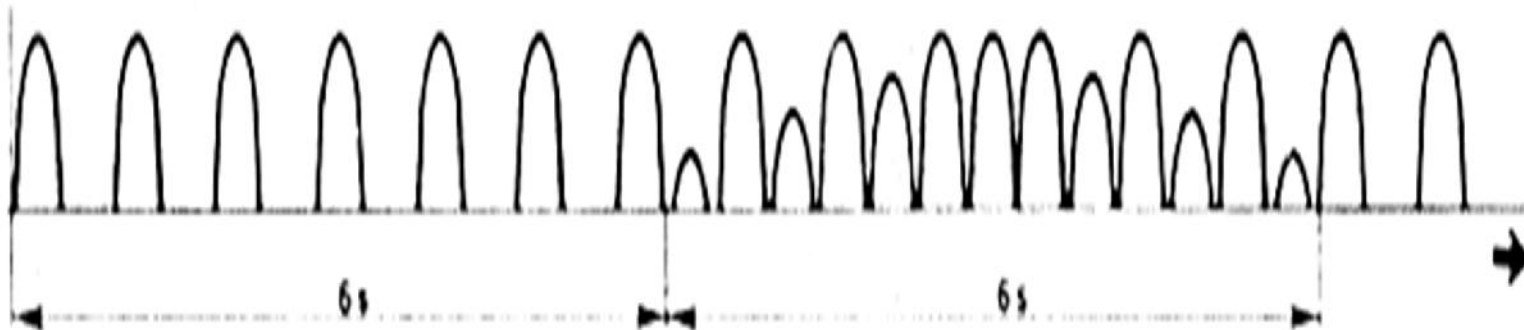
- ❖ Alternating delivery of equal DF (1second) and MF(1second),
- ❖ No intervening pauses.
- ❖ Abrupt changes between the tensing MF current and relaxing DF current.
- ❖ In DF, there are fine tremors
- ❖ In MF, there are strong and constant vibration
- ❖ Intensity of the MF current is 11 % lower than that of the DF
 - ❖ **Muscle & ligament traumas, acute injuries.**
 - ❖ **Heat may be a problem in acute cases. So cold packs can be used**



CP rapid alternation between DF and MF.

Long Period (LP) Diadynamic

- ❖ Slow alternation between six 6 seconds of MF current and 6 seconds DF
- ❖ Peak intensity is varied (surged)
- ❖ The gradual raising and lowering in amplitude is associated with more pleasant sensation than produced by CP.
 - ❖ Neuralgia, myalgia, arthralgia & chronic pain conditions.
 - ❖ LP has a long lasting analgesic effect



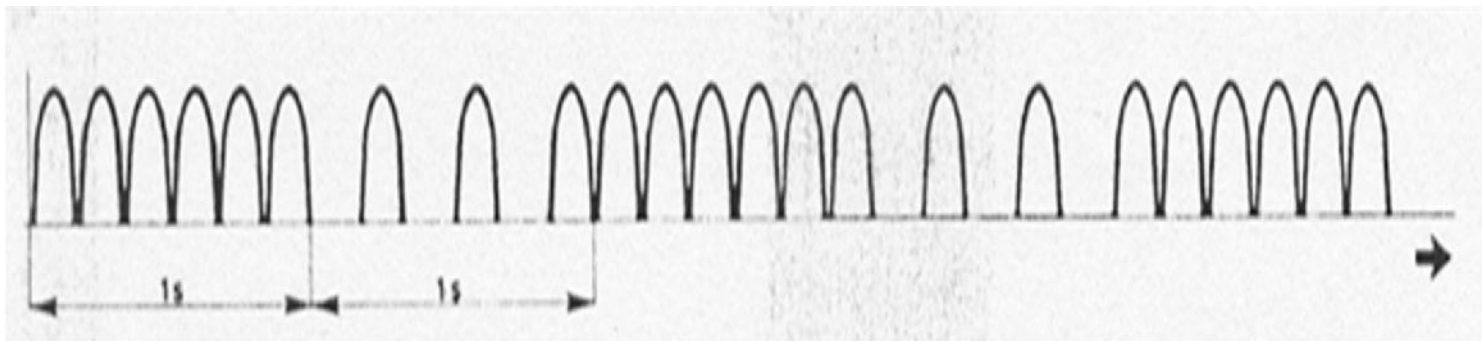
Syncopal Rhythm (RS) Diadynamic

It is a delivery of fixed duration of MF, followed by equal rest duration (i.e. 1 second phase of MF followed by 1 second rest phase).

It can be used as

Faradic stimulation of muscles

Motor test of nerve excitability



Physiological Effects

Masking of pain

Direct mechanism

Stimulation of sensory nerves leading to pain relief through stimulation of pain gate mechanism

Indirect mechanism

Improving circulation through pumping action of muscle contraction with subsequent removal of irritant wastes

Vasomotor effects

2- Increase local circulation due to
Release of H-like substance due to polar effect
Altering autonomic activity

Muscle stimulation

Both CP&LP causes muscle contraction vi depolarization of motor nerve fibers but it is not the current of choice for muscle strengthening

Inflammatory effects

Decrease inflammation and swelling
Due to increased local circulation and change of cell membrane permeability

Therapeutic Effects and Indications

Therapeutic effects

- Relief of pain
- Decrease inflammation & edema.
- Muscle re-education
- Increase local circulation.
- Facilitation of tissue healing.

Indications

- Soft **tissue** injury as sprains, contusions and epicondylitis
- Treating pain especially in small joints.
- Sudeck's atrophy.
- Peripheral nerve disorders as neuralgia, radiculopathy and herpes zoster.

Contraindications and Side effects

Contraindications

- ❖ Over neoplastic lesion.
- ❖ Over extreme edema.
- ❖ Over hemorrhagic area.
- ❖ Over osteomyelitis
- ❖ Over anterior cervical.
- ❖ Over transcranial area.
- ❖ Over electronic implants.
- ❖ Over superficial metal.

Side effects

- ❖ **Skin breakdown and burn** : monophasic nature of diadynamic current may lead over time to skin damage and burn.
- ❖ This can be overcome by **short period** of application or **reversible of polarity**.



***Methods of Application of Diadynamic
Current***

Electrodes placements

Pain Spot Application

Bipolar; in which two electrodes are positioned at each end of muscle belly .

Monopolar, in which one electrode may be placed on the motor point and the other proximal to it.

Electrodes is placed on both sides of the spine at the level of the nerve root supplying the painful area.

Myo-energetic Application

Paravertebral Application

Vasotropic Application

Along the vascular paths affected the circulatory disorders being treated

Trans-regional Application

To treat joint electrodes may be placed opposite to each other

Nerve Trunk Application

two electrodes are placed along the course of the peripheral nerve trunk where it is superficial

Dosage of Treatment

Intensity: The intensity of the currents should be increased, gradually as following;

1. The patient should feel the current intensity as **vibration, prickling, tingling, stabbing**
2. Increases intensity, the motor nerves are activated and the **muscles begin to contract.**
3. If the patient experience **slight pain & or burning sensation decrease intensity.**

Duration of treatment

- ❖ Total application time is 12 minutes
- ❖ Single application time 3 minutes.

Frequency of treatment

- ❖ 6-9 treatments either daily or day per day
- ❖ Maximum 12 treatment