

# RUSSIAN CURRENT

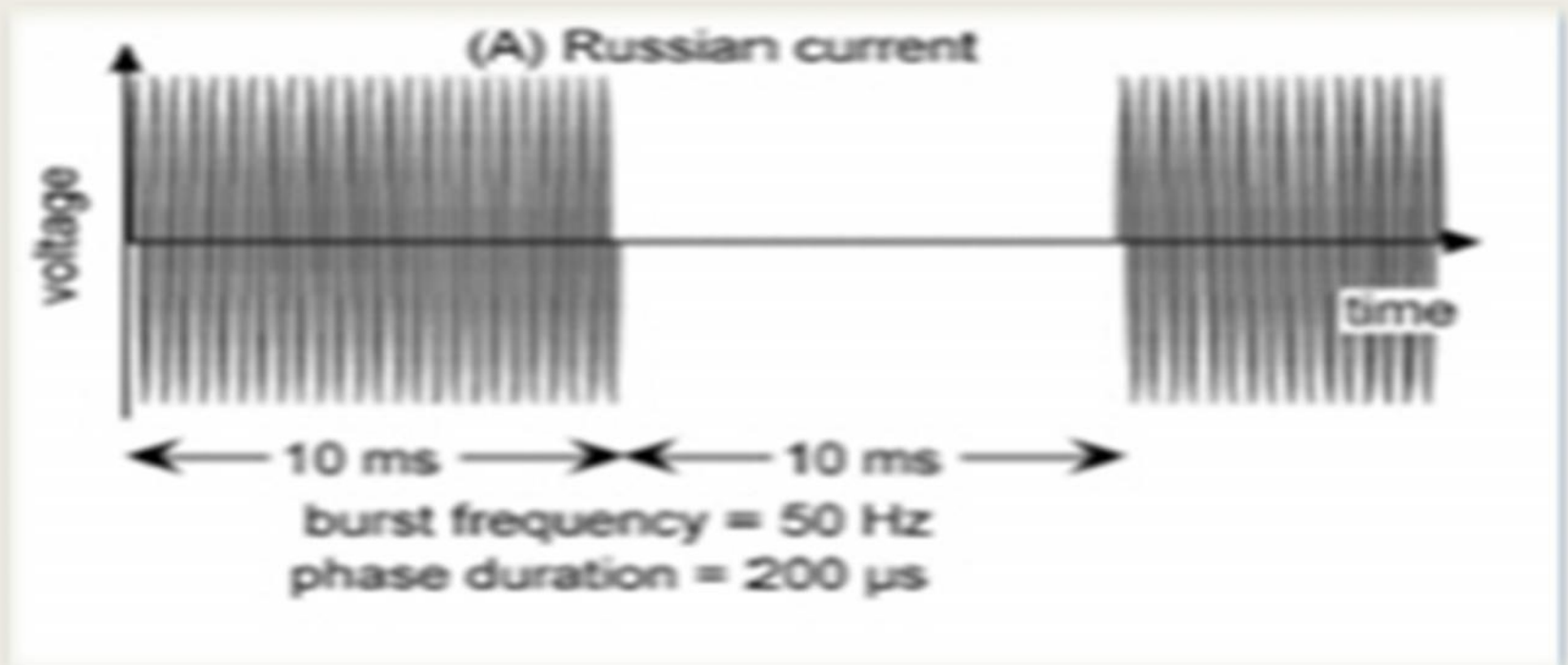
DR. MOHAMMED TA OMAR Ph.D. PT.  
ASSOCIATE PROFESSOR-RHSD-CAMS

E-MAIL: [MOMARAR@KSU.EDU.SA](mailto:MOMARAR@KSU.EDU.SA)  
[DR.TAHER\\_M@YAHOO.COM](mailto:DR.TAHER_M@YAHOO.COM)

MOBILE:+966542115404

# *Russian Current*

- Russian current was developed by Russian physiologist named **Yakov Kots 1977**.
- Russian current is burst modulated alternating current (**BMAC**), consists of 2500 Hz (2.5KHz) frequency evenly alternating sinusoidal waveform producing 50 bursts per second (50 Hz)



# *Characteristics of Russian Current*

**Carrier Frequency:** 2.500Hz ( 2.5KHz).

**Waveform:** Biphasic alternating sinusoidal waveform.

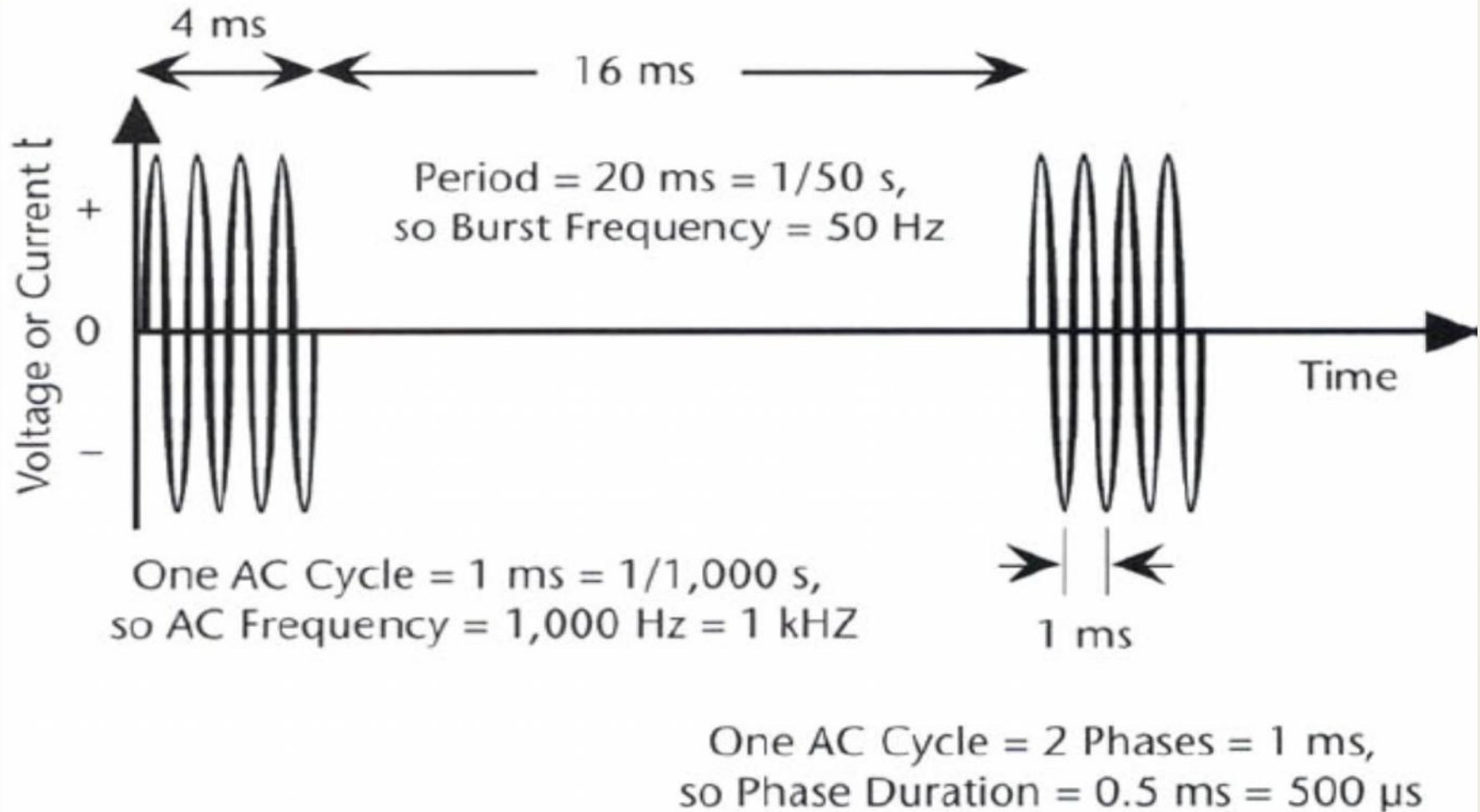
**Current Amplitude:** Maximum current amplitude is 100mA  
Clinical used at 70mA.

**Bursts Frequency:** 50 Hz.

**Burst Duration:** 10ms

**Burst DC :** 50%

# *Burst Modulated Alternating Current*



# Training protocol with Russian current:

Russian current is (10/50/10), which is

- 10 = Muscle contractions, lasting for 10 seconds
- 50 = off time (no contraction) for 50 seconds
- 10 = cycle repeated for 10 times
- Amplitude/ Intensity: Tetanic contraction
- Pulse rate (frequency): 50 – 70 Hz
- Burst duration: 10ms
- Inter burst interval: 10ms
- Duration of treatment: 10 minutes,
- Frequency of treatment: once daily, for 3-6 months

Apply current during volitional activities (voluntary activities)

- Isometric exercises at several points through range of motion.
- Slow isokinetic exercises 5 - 10° per second.
- Short arc joint movement when ROM is restricted

# Training protocol with Russian current:

Russian current is (10/50/10), which is

- 10 = Muscle contractions, lasting for 10 seconds
- 50 = off time (no contraction) for 50 seconds
- 10 = cycle repeated for 10 times
- Amplitude/ Intensity: Tetanic contraction
- Pulse rate (frequency): 50 – 70 Hz
- Burst duration: 0.2ms
- Inter burst interval: 10ms
- Duration of treatment is 10 minutes,
- Frequency of treatment is once daily, for 3-6 months

Apply current during volitional activities (voluntary activities)

- Isometric exercises at several points through range of motion.
- Slow isokinetic (movements in same direction) exercises 5 - 10° per second.
- Short arc joint movement when ROM is restricted

# Physiologic Effects

The total number of bursts delivered per second.

- Russian current has a capacity to depolarized :
  - *Sensory nerve fibers*                      *Moderate prickling sensation,*
  - *Motor nerve fibers*                      *Muscle contraction*
- This contraction is
  - **Painless** due to sensory nerve blocked of pain gate
- Allow use of high amplitude
  - Contraction **Stronger** than those generated by **voluntary** control (30%-40%)

# Russian Current

Medium frequency modulated sinusoidal current



Depolarization of **sensory /motor nerve** fibers  
**Synchronously,**  
Motor nerve depolarization induce activation of  
**fast type II motor units**



High level electrically evoked muscular contraction



**Contraction against external load**

Isometric contraction, slow speed isokinetic, short arch isotonic



Increase Muscle Strengthening  
(30%-40%)



# Indication and Contraindications

## Indications

The only indication for use of Russian current is to strengthening the muscular system of healthy and athletic persons

- Post-knee ligaments surgery
- Post-arthroscopic knee surgery
- Following ligament sprain

## Contraindications

- Over the anterior cervical area
- Over the trnasthorcic area
- Over the lumbar or abdominal area during pregnant
- Over hemorrhagic area
- Over neoplastic area
- Over metallic and electronic implant
- Over area of impaired skin sensation