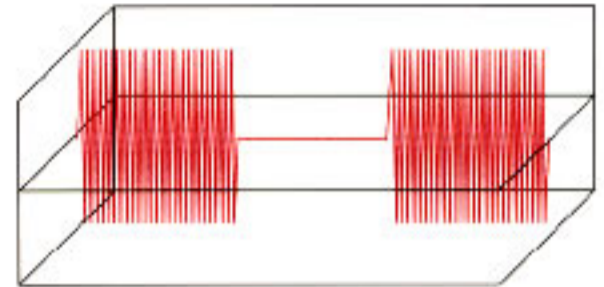




RUSSIAN CURRENT TREATMENT GUIDELINES

The characteristic waveform of the "Russian Current" was developed in the late 1970's as a direct result of reports of miraculous muscle strength and physical performance gains by Soviet athletes who had trained using the current. Much of what was claimed has actually been substantiated in the research literature.¹ The basis of this stimulation is a 2500 hertz, burst-modulated (pulsed), alternating current. This frequency provides a half-cycle duration of 200 microseconds - perfect for activation of muscle via the motor nerve. There has been a tremendous amount of research into the use of this current to augment muscle strength. This set of clinical protocols will describe the use of the "Russian Current" waveform in the treatment of lumbar instability, vastus medialis oblique (VMO) dysplasia with patellofemoral problems, and quadriceps weakness after anterior cruciate ligament (ACL) injury.



Some general guidelines for the safe and effective use of these devices include the following: 1) Make sure that the patient is well stabilized with the joint in a loose packed position. 2) The contractions should be isometric and should not be superimposed on a voluntary contraction. 3) If possible, contraction force should be measured. Milliampere readings fluctuate from day to day because of variations in the electrode-skin interface and are not good measures of dose.

LUMBAR INSTABILITY²

The patients are placed in prone on a treatment table and stabilized across the pelvis with a belt. This is the exception to isometric contraction and measuring contraction force principles because of the difficulty in stabilizing the patient in a dynamometer. Electrodes are placed bilaterally over the area of the multifidus muscle.

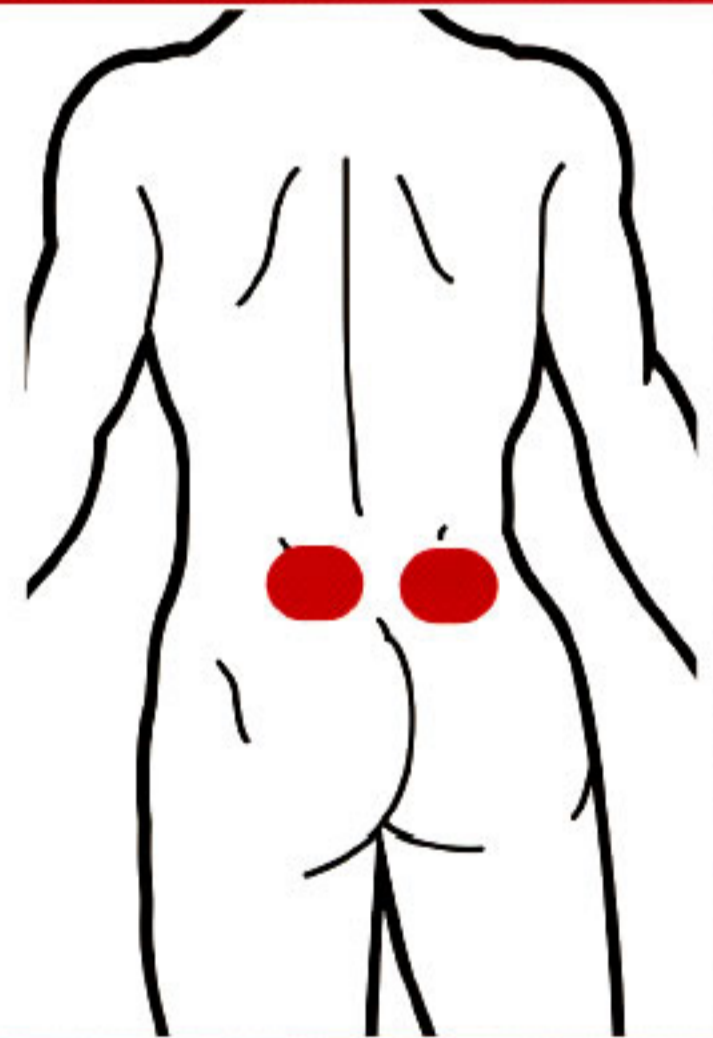
BURST FREQUENCY: 50-75 burst/sec

ON TIME: 15 Seconds

OFF TIME: 50 Seconds

MUSCLE CONTRACTION INTENSITY: To tolerance, but at least sufficient to cause an anterior pelvic tilt

10-15 contractions per session; 2-3 times per week





Russian Current Treatment Guidelines

VMO DYSPLASIA

The patients are positioned and isometrically stabilized in 10-15 degrees of knee flexion in a dynamometer (Lido, KinCom, Biodex, Cybex, Orthotron or other). The maximum voluntary quadriceps contraction force is recorded. Two alternative electrode placements are shown. One targets the vastus medialis group and one is for total quadriceps strengthening while targeting the VMO.

BURST FREQUENCY: 75 bursts/sec³

ON TIME: 9 Seconds

OFF TIME: 50-120 Seconds (depends on how much the patient fatigues)

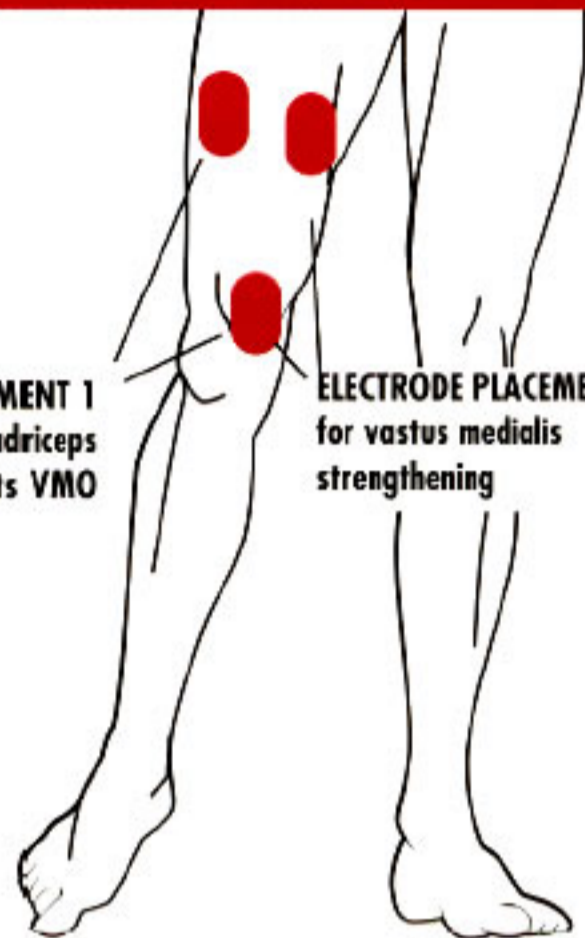
1 Sec Ramp Up; No Ramp Down

MUSCLE CONTRACTION INTENSITY: Electrically elicited contraction force should be at least 50% of MVC and ideally 100% or more

10-15 contractions per session; 2-3 times per week

ELECTRODE PLACEMENT 1
for total quadriceps
strengthening-targets VMO

ELECTRODE PLACEMENT 2
for vastus medialis
strengthening



ACL INJURY

Quadriceps femoris muscle weakness is ubiquitous after ACL injury. It has been demonstrated that NMES with this type of current is superior to volitional exercise in restoration of quadriceps function after ACL reconstruction^{4,5}. The patients are positioned and isometrically stabilized in >45 degrees of knee flexion in a dynamometer (Lido, KinCom, Biodex, Cybex, Orthotron or other). The maximum voluntary quadriceps contraction force is recorded.

BURST FREQUENCY: 75 bursts/sec

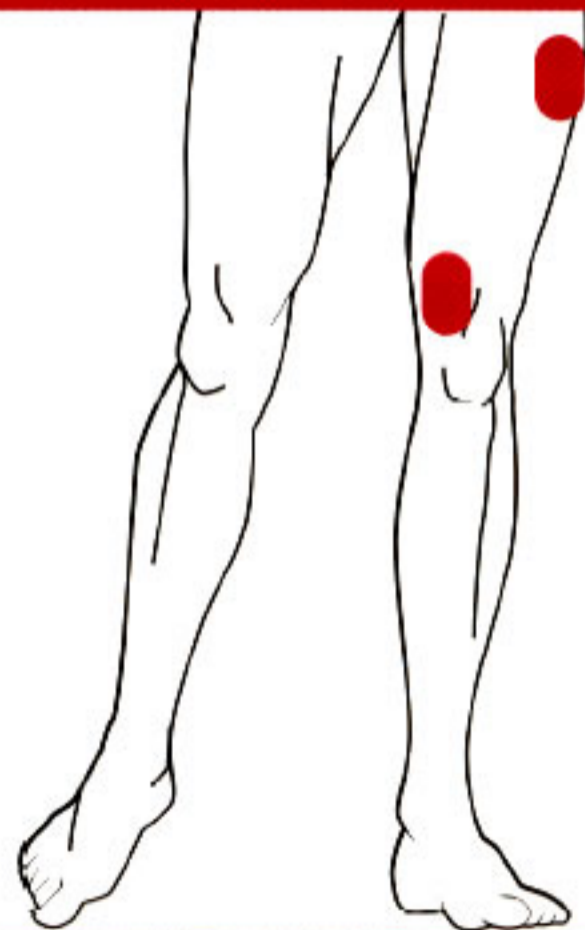
ON TIME: 9 Seconds

OFF TIME: 50-120 Seconds (depends on how much the patient fatigues)

1-2 Sec Ramp Up; No Ramp Down

MUSCLE CONTRACTION INTENSITY: Electrically elicited contraction force should be at least 50% of MVC and ideally 100% or more

10 contractions per session; 3 times per week



Guidelines by Lynn Snyder-Mackler, PT, ScD

1. Delitto A, Brown MB, Strube WJ, Rose SJ, Lehman RC. Electrical stimulation of quadriceps femoris in an elite weight lifter: a single subject experiment. *Int J Sports Med* 1989; 10:187-191.

2. Starring, DT. The use of electrical stimulation and exercise for strengthening lumbar musculature; a case study. *J Orthop Sports Phys Ther* 1991 14:61-64.

3. Binder-MacLeod SA, McDermond LR. Changes in the force-frequency relationship of the human quadriceps femoris muscle following electrically and voluntarily induced fatigue. 1991; 72:95-104.

4. Snyder-Mackler L, Delitto A, Bailey S, Strulke SW. Quadriceps Femoris Muscle Strength and Functional Recovery After Anterior Cruciate Ligament Reconstruction: A Prospective Randomized Clinical Trial of Electrical Stimulation. *J Bone Joint Surg* (in press).

5. Snyder-Mackler L, Ladin Z, Schepis AA, Young JC. Electrical stimulation of thigh muscles after reconstruction of the anterior cruciate ligament. *J Bone Joint Surg* 73-A: 1025-1036, 1991.

NOTE: The practitioner is advised to check the product information and new research indications and contraindications before applying this modality. These protocols are only guidelines and are not meant to indicate that there are not other waveforms, parameters, or modalities applicable to the stated indications. Any individual patient/pathology must be individually evaluated to determine optimal treatment parameters.

CPT Codes for Electrical Stim include: 97014-electrical stimulation (unattended), 97112-neuromuscular re-education, and 97118-electrical stimulation (manual)