



## ***SPEED Protocol***

### **Successive *P*rogression of *E*xercise using *E*mpiric *D*ecision-making**

The SPEED Protocol was developed in cooperation with Old Dominion University, Norfolk, Virginia. It was developed as a protocol for training and rehabilitation for female football (soccer) players. The protocol was developed to provide an objective and progressive process for advancing a client through the treatment intervention process. The SPEED Protocol utilized the CPM (Continuous Passive Motion) and the isotonic modes of the BTE PrimusRS.

The protocol begins with a CPM application, and progressed to an isotonic (concentric and eccentric) muscle exercise. However you may utilize the CPM and isotonic modes independently based on the needs of the client. Both modes have specific guidelines to follow, giving the protocol an objective and consistent method for progressing clients.

The CPM mode utilized the Target Force setting to make sure the client is challenged during the exercise and to provide feedback as an education tool to teach the client the correct movement with force control.

The isotonic mode utilizes an objective force measure to set the treatment level. Progression is guided by using work output (joules) as a goal, and power (watts) as a performance measure.

### **CPM with Target Force:**

Enter the PrimusRS treatment section for your client set up the CPM exercise using the following guidelines. Set the speed and ROM at levels that you as the clinician think are appropriate for each client. (Suggested starting settings are 10 degrees per second for 10 minutes.)

- 1.** Select desired body segment and muscle action and position the client so that the axis of rotation is properly aligned through the joint and perpendicular to the plane of movement. Adjust parameters as needed.
- 2.** Begin CPM and cycle through 2 repetitions to determine the weight of the limb. The client should be relaxed and not resisting or assisting as the tool moves through the ROM. Stop the exercise and determine the limb weight by viewing the scale on the left side of the graph.
- 3.** Re-Set Target force the value corresponding to the highest peak on the graph. (i.e. If the highest peak is drawn at 9 lbs, then set a target force for 9 lbs.)
- 4.** Restart the exercise. The client will then attempt to control the limb through the set ROM to achieve a “% time on target” that is 50% or greater for the 10 minute duration of exercise at 10 deg/sec.

- a.** It should take approximately 3-6 visits to achieve this.

**b.** Depending on muscle weakness and recruitment patterns, a combination of eccentric and concentric cueing may be required to gain volitional control through full ROM.

**5.** Once “% Time on Target” exceeds 50%, then progress to Isotonic Con/Ecc as outlined below.

## **Isotonic Exercise:**

Enter the Primus RS Treatment section for your client and select or setup the desired exercise function (from template or custom).

### **Initial Exercise Session:**

- 1.** Set up desired exercise in Isotonic Con/Ecc mode.
- 2.** Select tool and position the client so that the axis of rotation is properly aligned through the joint and perpendicular to the plane of movement (Same as in CPM).
- 3.** Position limb in mid-range for optimum muscle length.
- 4.** Select STATIC TRIAL. Tool will immediately lock in place.
- 5.** Perform isometric contraction with agonist muscle (group).
- 6.** Select appropriate direction (CW or CCW as CON) for concentric force.
- 7.** Select OK (Be sure to support limb as all resistance will be released and tool may drop).
- 8.** Explain to the client what is expected of them and what to expect with the resistance:
  - a.** Pacing should be comfortable. 1 sec. up (con), 2 sec. down (ecc).
  - b.** Give maximal effort until clinician stops the exercise.
  - c.** It is okay to slow down, but subject should try to achieve full ROM with each rep.
  - d.** Notify clinician if there is a sharp increase in musculoskeletal or articular pain.
- 9.** Select START.
- 10.** Select UNLOCK TOOL to position appropriately.
  - a.** Avoid starting in closed packed joint position when possible (e.g. elbow full extension/hyperextension when performing elbow flexion exercise).
  - b.** When possible, pre-load or pre-tension the muscle (e.g. slight overpressure into knee flexion when performing knee extension exercise).
- 11.** Select READY and have the client begin exercise.
- 12.** Monitor the client for accessory movement, deteriorating body mechanics, visible signs of distress, and rate of perceived exertion.

**13. Terminate the exercise when:**

- a.** Power levels drop below 75% for 10 consecutive seconds (2 bars on the feedback graph).
- b.** Deteriorating mechanics place the client at risk for injury.
- c.** Patient terminates exercise due to subjective reports of self-limiting pain or fatigue.

**14. Take note of the TOTAL WORK performed by the client.**

**15. Select SAVE.**

**16. Return to TREATMENT SET-UP screen.**

**17. Select MODIFY.**

**18. Under GOALS, select WORK.**

**19. Add 10% to the TOTAL WORK performed value and enter it in the white box.**

**20. Select SAVE.**

### **Second and Subsequent Exercise Sessions:**

**1. Select the client and enter the TREATMENT tab. Select the correct saved template that contains the exercise you are repeating.**

**2. Set-up and position patient as per previous treatment.**

**3. Explain what is expected of them and what to expect from treatment as per previous treatment**

**a.** Two race cars will be displayed to provide feedback and help motivate the client:

- i.** The top car is Work Goal for this treatment.
- ii.** The bottom car is the pace car based on the power of the previous exercise session.

**b.** The treatment goal is to beat the pace from the previous treatment (2 car lengths or less). This assures that each performance is improved over previous.

**c.** Attention must still be paid to safe mechanics

**4. At the completion of treatment a Work-Power performance table will appear. Decision making for progression:**

**a.** In the Work-Power performance table displayed at the conclusion of the exercise, observe the % change for both Work and Power.

**b.** Determine the work goal for the next treatment based upon % change in power. Use the following table as a guide:

<b>If the POWER value changes by this amount:</b>	<b>Adjust the WORK goal (Joules) by this amount:</b>
<b>increased 10%</b>	<b>increase 10%</b>
<b>increased 0-9%</b>	<b>increase 5%</b>
<b>decreased 1 to 10%</b>	<b>No Change</b>
<b>decreased &lt;10%</b>	<b>decrease 5%</b>

**To Adjust the Goal for an exercise:**

1. Go to TREATMENT SET-UP, Select MODIFY, and then change the Work goal for the next treatment. SAVE changes. Repeat this for each exercise completed.
2. Follow this progression for each treatment session.
3. After 4 weeks (or sooner), reset exercise resistance by performing a new STATIC TRIAL as described under “Initial Exercise Session”, and resume progression.

**NOTE:** This protocol is a guide only. Please use your clinical judgment any time you are assessing a client’s capabilities and designing an exercise program. Observe all relevant contraindications for each client.