



# Restorative THERAPIES

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## RT300 Upper Extremity Evaluation

### INSTRUCTIONS

The objective of this upper extremity assessment is to determine if the patient is appropriate for safe use of RT300 upper extremity FES (Functional Electrical Stimulation) ergometer.

Below are:

A. A brief overview of what RT300's electrical stimulation is doing and how RT300 operates in general with upper extremities. The default parameters utilized by RT300 are provided (although there is much flexibility in parameters) as these may be a good starting point for trial of FES with another device to determine responsiveness.

B. A guide to recommended electrode placement options. Details related to responsiveness to stimulation are very important to determining patient's appropriateness for RT300 upper extremity FES cycle.

C. A series of questions related to range of motion, tolerance and response to electrical stimulation, physical positioning, and patient presentation. These details are important to determining patient's appropriateness. Please provide as much detail as possible in answering the questions. Photos can be helpful as well.

If you have any questions about the evaluation, please feel free to contact Restorative Therapies' clinical support at 1-800-609-9166, x343.

### A. OVERVIEW

Each RT300 therapy arm session starts with a backward cycling passive 'warm-up' (motor powered). This is designed to reduce any tone or spasticity and get the body in motion before the application of the stimulation. The next phase is the active transition; this is where an increasing level of stimulation is applied to target muscle groups to drive the crank arm of the cycle. Note RT300 FES Cycle ergometer system has the capability to designate 'always on' channels. This enables the stimulation to initiate and ramp up to a therapeutic level if a need exists. For example, in the case of gleno-humeral joint subluxation correction or if winging of the scapula needs to be corrected, stabilization of the scapular or the GH joint are recommended, or postural corrections at the pelvis are required prior to the movement of the arm crank.

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Once the optimum 'always on' stimulation level is reached, the cycle will begin to move, initiating the start of the warmup phase. Once the warmup is completed, the synchronous muscle specific stimulation will initiate and the 'active' phase of the therapy session begins. After completion of the active phase of the therapy, the stimulation turns off and the 'cool-down' (back to motor powered) begins.

For bilateral arm cycling, the default stimulated muscle groups are:

- a. Crank angle coordinated stimulation to the biceps, triceps.
- b. 'Always on' stimulation to the shoulders (for subluxation correction, scapula, or postural musculature).

Default parameters for upper extremity cycling include a 40Hz frequency, 250usec pulse width and intensity as tolerated to obtain a muscle contraction. There is much flexibility in parameter adjustment on RT300 but this may be a good starting point if testing with a handheld FES unit.

You can see an example of FES arm cycling at: [www.restorative-therapies.com](http://www.restorative-therapies.com)  
Please select products and then either RT300-SLSA or RT300-SA.

## B. ELECTRODE PLACEMENT

**Figure 1.** Deltoids/Infraspinatus (subluxation correction):

\*Note you may also reduce subluxation by stimulation of deltoids alone by placing electrodes on anterior and posterior deltoid without involving rotator cuff musculature if needed.



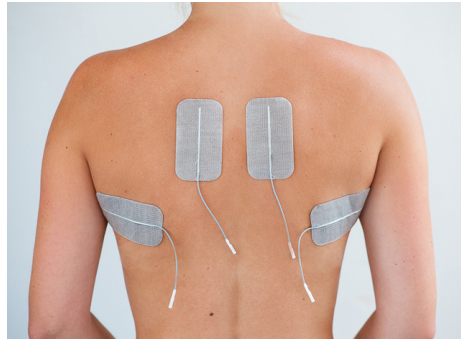
**Figure 2.** Shows placement for rhomboids with Lower trapezius/latisimus dorsi electrode placement, which is a good option for correction of scapular winging, stabilization of/scapular postural corrections.

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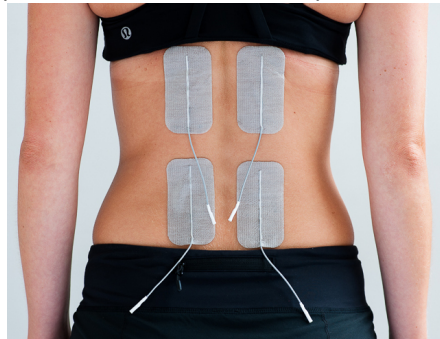


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**Figures 2 & 3.** Erector Spinae for trunk extension/postural correction



**Figure 4.** Bicep and finger flexor placements:



**Figure 5.** Tricep and wrist/finger extensors placements:

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## C. UPPER EXTREMITY ASSESSMENT

1. What is the patient's diagnosis? Are there any issues related to the patient, diagnosis or upper extremity exercise that are of concern? (Cognition, ability to reliably communicate, deformity etc.)

2. What muscle groups of the bilateral upper extremities exhibit MMT grades of 3/5 or below? (i.e. What are the greatest areas of weakness, note the system has the option for up to 16 channels of stimulation)

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3. What is the available pain free passive range of motion (PROM) at the following joints: (Please note if the patient has AROM, or if contractures are present)

LEFT			RIGHT	
		Shoulder flexion		
		Shoulder extension		
		Shoulder abduction		
		Elbow flexion		
		Elbow extension		
		Forearm pronation		
		Forearm supination		
		Wrist flexion		
		Wrist extension		
		Digit MCP flexion		
		Digit MCP extension		
		Digit PIP flexion		
		Digit PIP extension		
Please note any limitations:				



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4. Does the patient exhibit any GH joint shoulder subluxation? Bilaterally or unilaterally and to what degree?

5. With FES applied as shown in photos above for subluxation correction does the patient's subluxation correct with stimulation? Does it fatigue rapidly or is it sustained with FES application for a period of time? **\*PLEASE NOTE: If the patient has a subluxation, this portion of the evaluation must be completed with the use of FES.**

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6. Related to question 2, please test any weak muscle groups with FES and note responsiveness in each group. If no response is noted in a specific muscle group, please document the stimulation parameters utilized as this could be an area of severe muscle disuse atrophy or lower motor neuron damage. Please also note electrode size used for each muscle.

Please note that this evaluation cannot be completed without an FES trial.

7. How long is the patient able to tolerate sitting up in a 90-degree position? If the patient is unable to sit at 90 degrees, we may not be able to position the arm cycle close enough to the patient. (Also note if there are any components of the patient's wheelchair which would limit arm movement in a cycling motion.)

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8. Are there any other issues or concerns we should be aware of related to patient's ability to tolerate this type of physical activity?

\_\_\_\_\_  
Evaluator's name & discipline

\_\_\_\_\_  
Date

\_\_\_\_\_  
Evaluator's facility

\_\_\_\_\_  
Contact number

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