Upper-Limb Protocol

Qualitative Evaluation	Computer Generated Calculations

Relaxation	Silence	Episodic		Long-lasting (120 sec +)	
		# events	# of muscles	duration	# of muscles

Reinforcement	Response Present	Repeatability over 3 trials				# of muscles	Magnitude			
		once only	increasing	not changing	decreasing		Trial 1	Trial 2	Trial 3	Average
Deep breath										
Neck Flexion										

Voluntary movements		Response Present	Magnitude	Similarity Index
Shoulder	Shrug			
Bilat elbow	Flex			
	Ext			
Right ebow	Flex			
	Ext			
Left elbow	Flex			
	Ext			
Bilat wrist	Ext			
	Flex			
Right wrist	Ext			
	Flex			
Left wrist	Ext			
	Flex			
Right	Grip			
Left	Grip			
Right	Opposition			
Left	Opposition			

Fast as Possible		Magnitude	Similarity index	Onset time	Termination time	antagonist burst presence
Right wrist	Ext					
	Flex					
Left wrist	Ext					
	Flex					

Passive stretch		Type		Repeatability over 3 trials				# of muscles	Magnitude			
		Stretch	Shortening	once only	increasing	not changing	decreasing		Trial 1	Trial 2	Trial 3	Average

Right elbow	Flex											
	Ext											
Right wrist	Ext											
	Flex											
Left elbow	Flex											
	Ext											
Left wrist	Ext											
	Flex											
Comments												

Trunk Protocol

Relaxation	Silence	Episodic		Long-lasting (120 sec +)	
		# events	# of muscles	duration	# of muscles

Qualitative Evaluation | **Computer Generated Calculations**

Reinforcement	Response Present	Repeatability over 3 trials				# of muscles	Magnitude			
		once only	increasing	not changing	decreasing		Trial 1	Trial 2	Trial 3	Average
Neck Flexion										

Voluntary movements		Response Present	Avg Max Pressure	Magnitude	Similarity Index
Shoulder	Shrug				
Cough					
Maximum	Inspiration				
	Expiration				
Bilat elbow	Flex				
	Ext				
Right ebow	Flex				
	Ext				
Left elbow	Flex				
	Ext				
Bilat Hip Knee	Ext				
	Flex				
Right Hip Knee	Ext				
	Flex				
Left Hip Knee	Ext				
	Flex				

Passive stretch		Type		Repeatability over 3 trials				# of muscles	Magnitude			
		Stretch	Shortening	once only	increasing	not changing	decreasing		Trial 1	Trial 2	Trial 3	Average
Right shoulder	Abduction											
	Adduction											
Left shoulder	Abduction											
	Adduction											
Right elbow	Flex											
	Ext											
Left elbow	Flex											
	Ext											

Comments

Lower-Limb Protocol

Qualitative Evaluation	Computer Generated Calculations

Relaxation	Silence	Episodic		Long-lasting (120 sec +)	
		# events	# of muscles	duration	# of muscles

Reinforcement	Response Present	Repeatability over 3 trials				# of muscles	Magnitude			
		once only	increasing	not changing	decreasing		Trial 1	Trial 2	Trial 3	Average
Deep breath										
Neck Flexion										
Jendrassik										
Shoulder Shrug										

Voluntary movements		Response Present	Magnitude	Similarity Index
Bilat Hip and Knee	Flex			
	Ext			
Right Hip and Knee	Flex			
	Ext			
Left Hip and Knee	Flex			
	Ext			
Bilat Ankle	Dorsiflex			
	Plantar flex			
Right Ankle	Dorsiflex			
	Plantar flex			
Left Ankle	Dorsiflex			
	Plantar flex			

Fast as Possible		Magnitude	Similarity index	Onset time	Termination time	antagonist burst presence
Right Ankle	Dorsiflex					
	Plantar flex					
Left Ankle	Dorsiflex					
	Plantar flex					

Passive stretch		Type		Repeatability over 3 trials				# of muscles	Magnitude			
		Stretch	Shortening	once only	increasing	not changing	decreasing		Trial 1	Trial 2	Trial 3	Average
Right Hip and Knee	Flex											
	Ext											
Left Hip and Knee	Flex											
	Ext											
Right Ankle	Dorsiflex											
	Plantar flex											
Left Ankle	Dorsiflex											
	Plantar flex											

Phasic Stretch (taps)	Response Present	After-discharge
Right Patellar		
Right Achilles		
Left Patellar		
Left Achilles		

Achilles Clonus	Present	Duration
Right		
Left		

Withdrawal from Plantar Stimulation	Present (TA muscle)	Repeatability over 3 trials (TA muscle)				# of muscles	Magnitude			
		once only	increasing	not changing	decreasing		Trial 1	Trial 2	Trial 3	Average
Right										
Left										
Volitional Suppression of Withdrawal	Present (TA muscle)	Repeatability over 3 trials (TA muscle)				# of muscles	Magnitude			
		once only	increasing	not changing	decreasing		Trial 1	Trial 2	Trial 3	Average
Right										
Left										

Comments

SCI-Pediatric Specific Recommendation

The elements on this form are recommended as Exploratory for SCI-Pediatric studies. Duration of test is long and may be difficult for children to endure since subject needs to be lying supine and cooperative during testing. Additionally, subject needs to follow directions of test. Lower age limit could be around 8 years of age but would depend on subject and maturity.

Reference:

Zoghi M, Galea M, Morgan D. A Brain Motor Control Assessment (BMCA) protocol for upper limb function. PLoS One. 2013; 8(11):e79483.