



SPiSCI
Shoulder Pain in Spinal Cord Injury

Towards a comprehensive Model of Care
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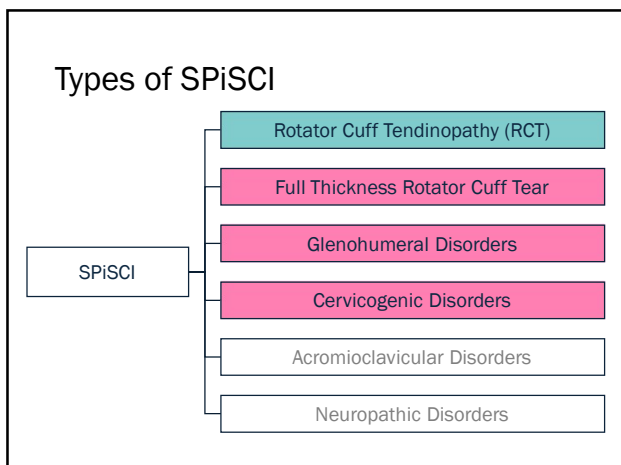

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SPiSCI

- Prevalent in the SCI population
- Contributes to disability
- Challenging to manage in the context of SCI
- Current management suboptimal



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Subjective Assessment SPiSCI

Clinical Features:

- Symptoms
- Functional Impact
- History
- Psychosocial Considerations



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Symptoms

- Shoulder Pain
 - Anterolateral
 - Mechanical
- Cervicothoracic Pain (referred pain)
- Other referred pain (arm)
- Weakness



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Functional Impact

- Activities that load the Rotator Cuff
 - Shoulder movement
 - Weightbearing through the Shoulder



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History

- Insidious onset...but follows a **spike in workload**



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Psychosocial Considerations

- Kinesiophobia
- Pain catastrophising
- Delayed health care
- Limited social support
- Ongoing litigation issues
- Finances



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Subjective Assessment SPiSCI

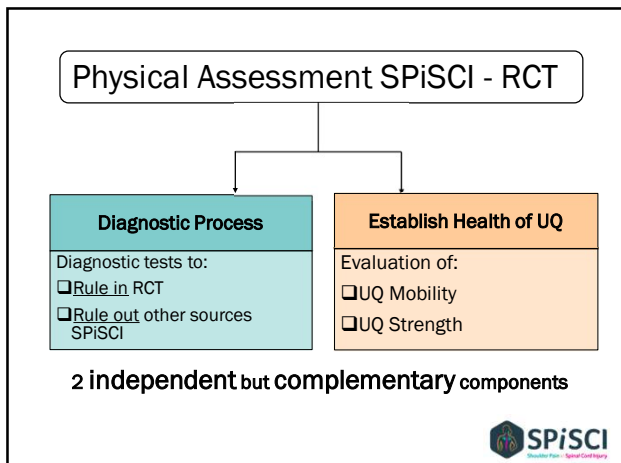
Does it sound like SPiSCI (RCT)?

- ✓ Symptoms
- ✓ Functional Impact
- ✓ History
- ✓ Psychosocial Considerations

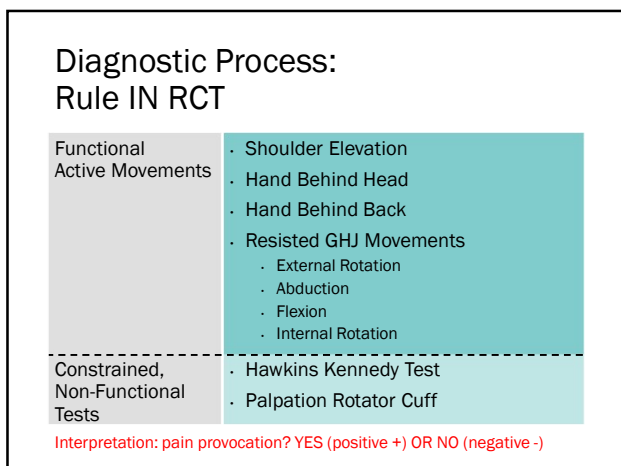
Yes

Physical Assessment SPiSCI - RCT

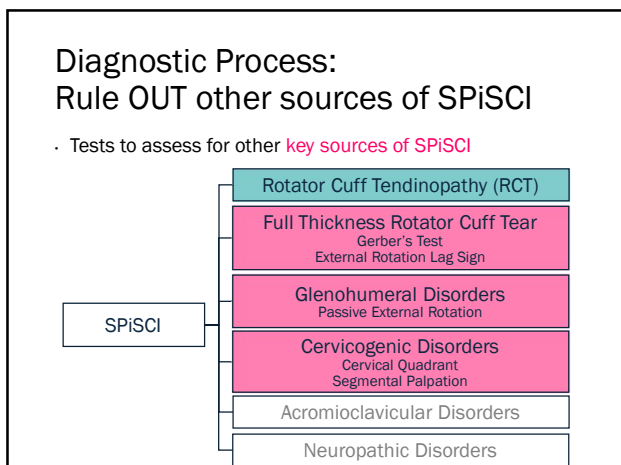
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Establish Health of UQ: Mobility

Passive Range of Motion (ROM)	<ul style="list-style-type: none"> · GHJ External Rotation (45°) · Shoulder Elevation (180°)
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Interpretation: ROM in degrees (normal values above)




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Establish Health of UQ: Strength

Isolated GHJ movements (isometric contraction)	<ul style="list-style-type: none"> · Abduction · External Rotation · Flexion 	} Always perform these tests
	<ul style="list-style-type: none"> · Internal Rotation · Extension 	

Interpretation: Normal OR Weakness (Mild, Moderate, Severe)




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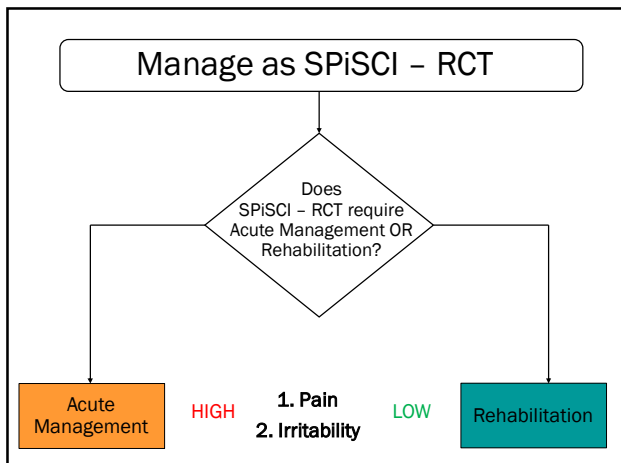
Interpretation of Assessment

Key outcomes (from Subjective AND Physical):

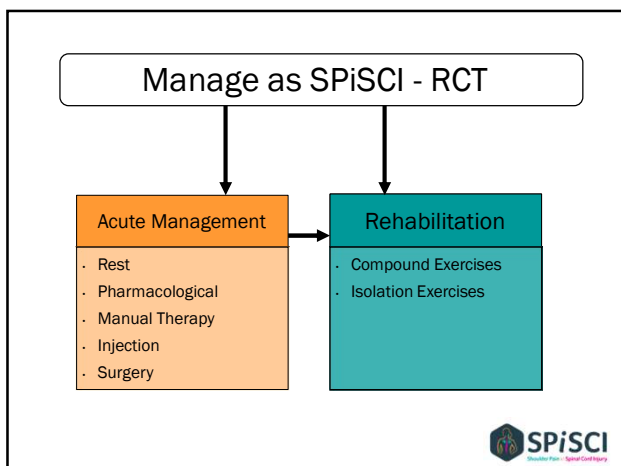
1. Does this person have RCT?	Yes OR No
2. Is this this person weak?	Yes OR No
3. Initial Management?	Acute OR Rehabilitation



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Core Assumptions

- Biological tissue of the shoulder complex remains unchanged after SCI
- Chronic musculoskeletal conditions, including RCT respond well to progressive overload exercise programs delivered using a biopsychosocial approach
- Building an exercise program to manage SPiSCI requires the clinician to understand how to:
 - **Develop & implement a program for RCT AND**
 - **Modify the program due to limitations caused by SCI**

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Core Concepts

- Compound & Isolation Exercises
- Volitional Fatigue
- Range of Motion (ROM) Titration
- 4 out of 10 (4/10) Rule
- Periodisation
- Progressive Overload



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Compound & Isolation Exercises

Compound Exercises:

- Movement multiple muscles & joints
- i.e. Horizontal Pull (Seated Row)

Isolation Exercises:

- Movement single muscles & joints
- i.e. Shoulder External Rotation



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Compound Exercises

Direction		Example Exercise
Horizontal	Push	Bench Press
	Pull	Seated Row
Vertical	Push	Shoulder Press
	Pull	Lat Pull Down



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Compound Exercises

Benefits:

- Target multiple muscle groups with one exercise
- Optimises efficiency of exercise program
- Exercises look functional

Limitations:


- Challenging to isolate specific muscles



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Isolation Exercises

Shoulder
Abduction
External Rotation
Flexion
Internal Rotation
Elevation (or Scaption)
Extension
Adduction
Shrug



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Isolation Exercises

Benefits:

- Target specific muscles that need it most
- Enable performance of constituents of a compound exercise

Limitations:

- Time consuming
- Limited ability to functionally strengthen UQ



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Volitional Fatigue (VF)

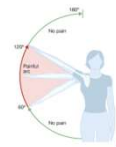
- During performance of consecutive repetitions, VF is the point at which the individual can no longer perform the movement pattern at the same speed they could perform at the start
- *Quality* of movement good
- *Speed* of movement slow



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ROM Titration

- Pain likely to be experienced during resistance exercise
 - Shoulder movement is being loaded (provocative)
 - Anticipate, educate and reassure person
- What you do to modify the exercise to improve pain is important
- Pain during resistance exercise
 - **MODIFY ROM FIRST, NOT LOAD**



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4/10 Rule

- Upon completion of a Set (note Repetitions & Load), ask your patient to rate how severe their pain was
- Pain \leq 4/10 = proceed
- Pain $>$ 4/10 = modify ROM first, not load
- Other options for modification to consider before load reduction include type of contraction
 - Isotonic, Eccentric, Isometric



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Periodisation

- Stress + Rest: important components of strength training
- Periodisation: process of structuring strength training over different periods of time
- Periodisation within a:
 - Session: 2 minutes rest between working sets of an exercise
 - Week: 2 sessions, non-consecutive days (ideal 2-3 days between)
 - Month/Year: recovery weeks, 1 session, warm up + 1 working set each exercise



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Progressive Overload



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Progressive Overload

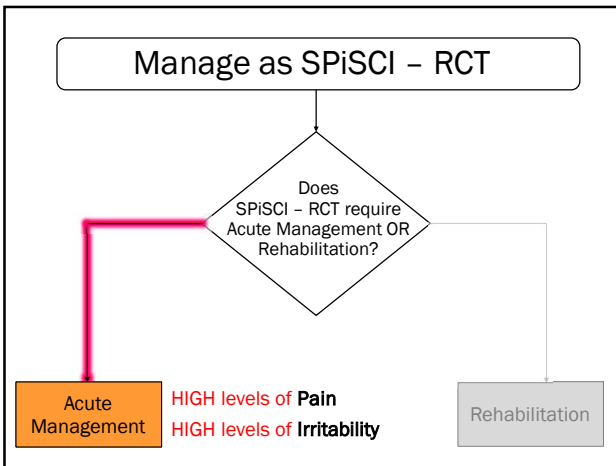
- Key variables that can be manipulated to provide additional stress:
 - **Load**
 - **Repetitions**
- Indication to progress:
 - **Volitional Fatigue** (VF) during a Working Set achieved? (Y/N)
- Double Progression Model (DPM)
 - Used to progress a resistance exercise by manipulating **Load or Repetitions** in order to provide **Progressive Overload** in a simple, structured, safe and effective manner



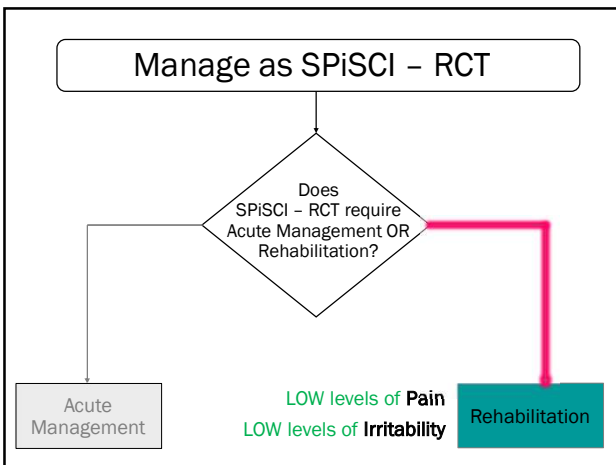
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Session	Set	Load	Reps	VF
1	1	8kg	4	N
	2		5	N
	3		6	N
2	1	9kg	4	Y
	2		4	Y
	3		4	Y
3	1		4	N
	2		5	Y
	3		5	Y
4	1		5	N
	2		6	Y
	3		6	Y
5	1	10kg	6	N
	2		4	Y
	3		4	Y

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Manage as SPiSCI - RCT

Acute Management

→

Rehabilitation

Acute Exit Criteria:
When do you progress to Rehabilitation?

1. Clues from patient narrative
2. Rehabilitation program is non-provocative

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Rehabilitation

Strength program:

* subject to modification due to various factors

6 Exercises	4 Compound	1 Horizontal Push	DPM Sets Rep Range VF Progressive Overload
		2 Horizontal Pull	
		3 Vertical Push	
		4 Vertical Pull	
	2 Isolated	5 Abduction	
		6 External Rotation	

Frequency: 2 sessions/week

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THE ROAD TO RECOVERY

what you think
it will be like

what it really
will be like

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