

Occupational Therapy's Role in Addressing Aging with a Spinal Cord Injury (SCI)

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Background- Spinal Cord Injury

Damage to nerve(s) within bony spinal canal, defined by its mechanism of injury

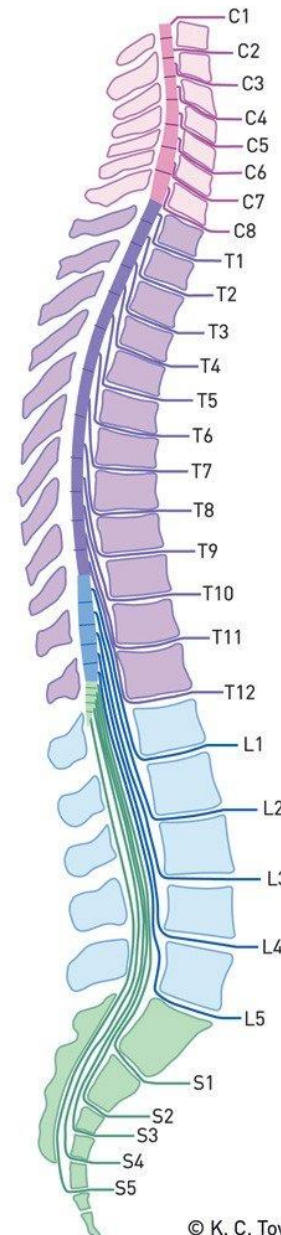
- Traumatic (sudden, direct blow)
- Non-traumatic (disease or loss of oxygen)

Spinal cord injuries are further classified based on residual function below level of injury

- Complete SCI: loss of all motor and sensory function below level of injury
- Incomplete SCI: some function, motor and/or sensory, intact below level of injury

Level of injury provides an outline for intact function and loss of function

Autonomic control	
Cranial nerves	Parasympathetic control
• Heart	
• Gastrointestinal	
T1 – L5	Sympathetic control
• Cardiovascular	
• Lungs	
• Gastrointestinal	
• Kidneys	
• Sweat glands	
L5 – S3	Parasympathetic control
• Bowel	
• Bladder	



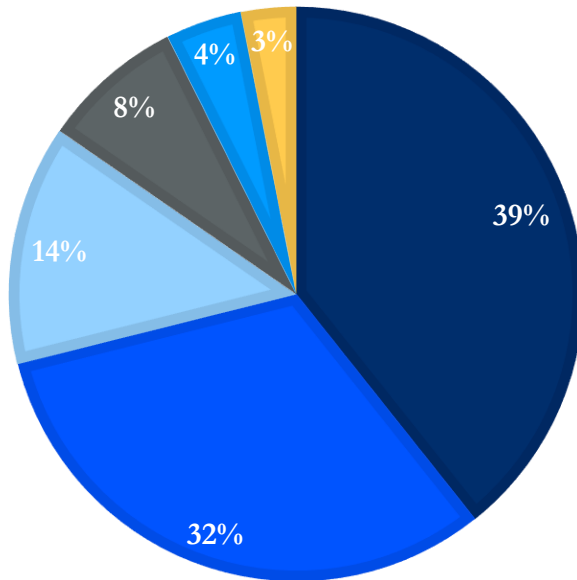
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Functional ability	
C3 – C6	<ul style="list-style-type: none"> • Voluntary movement limited to Diaphragm and partial triceps only • No grip function but may be able to perform limited arm cranking with hand/wrist straps • Torso support necessary for stability in wheelchair
C5 – C8	<ul style="list-style-type: none"> • All or most triceps functions present • Wrist flexion and extension present • Most/all finger flexion and extension present permitting grasp and release functions • Are able to perform arm crank exercise with/without wrist/hand straps • Torso support necessary for stability in wheelchair
T1 – L5	<ul style="list-style-type: none"> • Some upper extremity and back muscle function present • Able to perform arm cranking with no wrist/hand straps • Little or no abdominal muscle function • Torso support may be necessary for stability in wheelchair
T6 – T10	<ul style="list-style-type: none"> • Most or all upper extremity and back muscle functions present • Good muscle upper abdominal muscles • Greater power output possible due to increased contribution of trunk musculature • Good or normal stability in wheelchair
T11-T12	<ul style="list-style-type: none"> • Good abdominal and spinal extensor function • Some hip flexor and adductor function • Trunk musculature and increased “bracing” from hip flexors and adductors contributes to increased arm crank power output • Good or normal stability in wheelchair
L1– S2	<ul style="list-style-type: none"> • Good/fair lower limb function • Some walking possible • Little or no physiological limitation on arm crank power output • Normal stability in wheelchair

SCI Stats

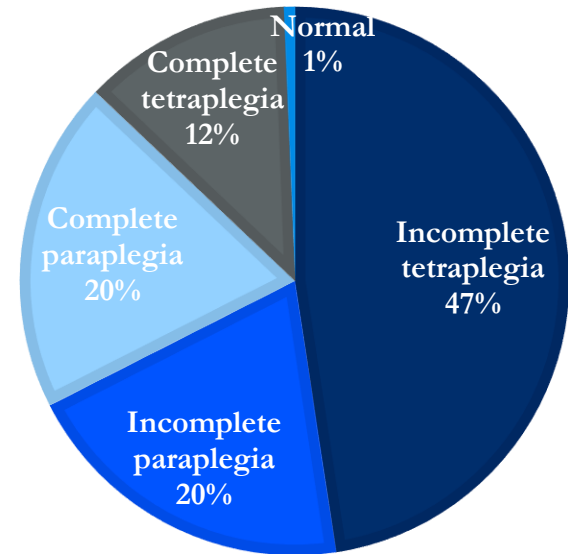
MECHANISM OF INJURY

- Motor Vehicle accidents
- falls
- violence
- sports
- medical/surgical
- other



LEVEL OF INJURY

- Incomplete tetraplegia
- Incomplete paraplegia
- Complete paraplegia
- Complete tetraplegia
- Normal



(National Spinal Cord injury Statistical Center [NSCISC], 2019)

Typical Aging

Changes across multiple systems

- Musculoskeletal, nervous, integumentary, etc.

Signs of natural aging

- Decreased muscle strength
- Decreased immune system
- Thinning of skin
- Higher blood pressure
- Slower reaction time

Aging with a SCI

Speed of aging increased after sustaining an SCI with earlier changes in

- Musculoskeletal, endocrine, and cardiovascular

Increased risk for

- Chronic pain
- Decreased bony density
- Compromised skin integrity

Focused Question

What is occupational therapy's role in addressing aging with a spinal cord injury for individuals receiving therapy services?

Methods

- Systematic review
 - 25 studies identified
- Inclusion criteria
 - Published in English
 - Peer-reviewed
 - Published between 2000-2020
 - Sample of participants with varying diagnostics (complete vs. non-complete)
 - Principles of neurorehabilitation or implications of aging post-SCI
- 8 studies included

Results

- Three main themes identified
 - 1. Quality of Life
 - 2. Physiological Changes
 - 3. Neurorehabilitation principles

Quality of Life (QoL)

- With physical changes, perceptual changes in QoL
 - Patient dependent
- McColl et al. (2003) highlighted potential for improved or maintained QoL
- Continuum of perception
 - Positive shift in satisfaction, stability, eventual decline

Bodily Changes



Physiologic:

Bladder infections
Postural changes



Pathological:

Heart disease



Degenerative:

Arthritis



Environmental:

Adaptive equipment
Mobility aids (wheelchair)

Neurorehabilitation Principles

- Movement repetitions
 - Mass practice for neuroplasticity
- Task-specific practice
 - Use client identified occupations

Bottom Line

- Gap in literature
- OT must address aging with a SCI
 - Within the scope of practice
 - Ethical responsibility
 - Client-centered

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