Aging and its Effects on Proprioception

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Introduction

- Who am I?
- What do I do?
- Why do I do what I do?
- What am I talking about?
Objectives

- Analyzing specific elements of proprioception
  - Mechanoreceptors
  - Vestibular System
- Factors that influence proprioception/determine if age is the cause
  - Normal vs. Pathologic change
  - Neurologic disorders
- What can the MD, PT, PTA, or AT do to improve a patient’s proprioception
  - Prepare for the future
  - Tests and Measures
- Implications
Proprioception

- perception governed by proprioceptors, as awareness of the position of one's body.
- Wait, what are proprioceptors again?
  - a receptor located in subcutaneous tissues, as muscles, tendons, and joints, that responds to stimuli produced within the body.
Specific elements of proprioception

- Proprioceptors
- Golgi Tendon Organ (GTO)
- Ruffini Ending
- Mechanoreceptors i.e. muscle spindles
- Pacinian Corpuscles
- Cutaneous receptors
- Meissener’s Corpuscle
Mechanoreceptors

- Located in joint structures, muscle to transduce stretch of a muscle, and cutaneous tissue
- Nerve ending apart of CNS
- Provide continuous afferent flow of nerve impulses to the CNS (cerebellum, thalamus, and cortex via the spinal cord)
Vestibular System/
Balance and Falls

- The brain coordinates signals from the visual system and proprioceptive system to create posture, balance and stability.
- A gradual, mild vestibular loss describes normal aging.
- Maintaining balance depends on information received by the brain from the eyes, muscles, joints, and vestibular (inner ear) organs.
Factors that Influence Proprioception

<table>
<thead>
<tr>
<th>Normal Change:</th>
<th>Pathologic Change:</th>
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<tbody>
<tr>
<td>➤ Forgetting names</td>
<td>➤ Alzheimer's Disease</td>
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<tr>
<td>➤ Misplacement of items</td>
<td>➤ Stroke</td>
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<tr>
<td>➤ Diminished creativity</td>
<td>➤ Parkinson's Disease</td>
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<tr>
<td>➤ Slowed learning</td>
<td>➤ Vision</td>
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<tr>
<td>➤ Slowed gait</td>
<td>➤ Diabetes</td>
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<tr>
<td>➤ Stooped posture</td>
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What can the MD, PT, PTA or AT do to help improve proprioception?

- Prepare for the future
- Communicate
- Provide patient education
- Stay up to date on evidence based research
Tests and Measures

- Functional Reach
- CTSIB
- TUG
- Tinetti/Berg
There is evidence of deterioration in proprioception with aging.

There are also other major factors that contribute to the increased loss of balance with the aging process.

Regular physical activity can help preserve proprioception and prevent falls in the older population.
References


