Head Injury Routine

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Clinical Educator
Objectives

- Discuss falls and how they affect residents in LTC
- Understand the different types and symptoms of a head injury
- Review the post fall head injury assessment and treatment options
A Fall

“An event which results in a person coming to rest unintentionally on a surface or object.” (Tinetti, 1998)
In Ontario, falls were responsible for 80% of head injury hospitalizations in people age 65 or older. (CIHI, 2000).

Every year falls account for 65% of injuries among seniors and cost Canadians 2.4 billions dollars annually.

25% of falls cause seniors to limit their normal activities due to an injury or fear of falling.

Falls are one of the leading causes of death among seniors (Veterans Affairs Canada, 2012)
Proactive Approach

- Morse Fall Scale
- History of falls
- Diagnoses
- Gait
- Ambulatory aids
- IV or saline lock
- Mental status

Morse Fall Risk Assessment

<table>
<thead>
<tr>
<th>Risk Factor</th>
<th>Scale</th>
<th>Points</th>
<th>Patient’s Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>History of Falls</td>
<td>Yes</td>
<td>25</td>
<td></td>
</tr>
<tr>
<td>No</td>
<td></td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Secondary Diagnosis (Two or more medical diagnoses)</td>
<td>Yes</td>
<td>15</td>
<td></td>
</tr>
<tr>
<td>No</td>
<td></td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Ambulatory Aid</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fixed</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cane/Walker/Crutch</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td></td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>IV/IV Line Lock</td>
<td>Yes</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>No</td>
<td></td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Gait/Transferring</td>
<td>Immobile</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>Weak</td>
<td></td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>Normal/Bed Rest/Immobilized</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td></td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Mental Status</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Forget Plans</td>
<td></td>
<td>15</td>
<td></td>
</tr>
<tr>
<td>Directed to own ability</td>
<td></td>
<td>0</td>
<td></td>
</tr>
</tbody>
</table>

Total Score __________

High Risk = 45 and higher
Moderate Risk = 25-44
Low Risk = 0-24

Risk Factors in LTC

- Environmental Factors
- Medications
- Dehydration
- Incontinence
- Heart disorder and diabetes
- Weakness and poor balance
- Cognitive impairments
- Foot problems
- Improper footwear
- Sensory impairments
- History of falls
Elderly in LTC

- Anticoagulant Therapies
  - Aspirin and Coumadin

- Age related changes
  - Some cerebral atrophy is normal
  - Makes the diagnosis difficult
Injury

- Bruising, Pain, Sprains
- Fragility Fractures
  - Osteoporosis and low weight
- Head Injury
  - Brain is shaken or bounced against the wall of the skull
  - Bleeding in the spaces surrounding the brain
  - Bruising of the brain tissue
  - Damage the nerve connections within the brain.
Anatomy

- Periosteum
  - Membrane that lines all bones
- Dura mater
  - Latin *tough mother*
  - Keeps in cerebral spinal fluid
  - Holds dural sinuses
  - Carry blood from brain to heart
- Pia mater
  - Latin *tender mother*
  - Cushions the brain with CSF
- Grey matter
  - Muscle control
  - Sensory perception
Traumatic Brain Injury

- Skull Fracture
  - Basilar
  - Linear
  - Penetrating
  - Depressing
- Intracranial Bleed
  - Epidural
  - Subdural
  - Subarachnoid
- Cerebral Contusion
- Diffuse Axonal Injury
- Sheer Injury
Skull Fractures

- Open or closed depending on the condition of the skin
  - **Basilar**
    - Caused by blunt trauma and fracture
    - Bleeding is seen around the eyes and ears
    - Fracture may extend to sinuses
      - Bacteria from nose and mouth into brain
  - **Linear**
  - **Penetrating**
    - Objects impaled into the brain such as a knife or gunshot
  - **Depressing**
    - Piece of skull is pushed inward like a ping pong ball
Intracranial Bleeds

- Intracranial in the skull vs. Intracerebral in the brain
- Subdural hematoma
  - Acute
    - With impact bridging veins tear and bleed
    - Blood clots causing increased pressure on the brain
      - Brain has no place to expand
  - Chronic
    - Atrophy of the brain where veins stretch
- Epidural hematoma
  - Fracture of the arteries of the brain in the temporal region
- Subarachnoid hematoma
  - Significant irritation in the meningeal layer
Axonal/ Shear Injury

- No bleeding or visible injury on CT scan
- Injury within the synapses of the brain
- Treatment is supportive
- Diagnosed by assessment: history and symptoms
  - Comatose vs.
  - Nausea
  - Vomiting
  - Stiff neck
  - Confusion
Assessment

- Check the environment
  - Witnessed or un-witnessed
- Airway, breathing, circulation
- Vitals including CBG
- Baseline vs. Normal
  - Pulse 60-100
  - Respirations 10-20
  - Oxygen >90%
  - BP – Hypo < 89/59; Hyper > 160/100
- Injuries, bleeding
- Check medication and history
  - Bleeding, clotting disorder and anticoagulants
Assessment

Posturing

- Decorticate
  - Cortex
  - Sensation
  - Thinking
- Decerebrate
  - Brainstem
  - Breathing
  - Heart beat

**Comparing decerebrate and decorticate postures**

Decerebrate posture results from damage to the upper brain stem. In this posture, the arms are adducted and extended, with the wrists pronated and the fingers flexed. The legs are stiffly extended, with plantar flexion of the feet.

Decorticate posture results from damage to one or both corticospinal tracts. In this posture, the arms are adducted and flexed, with the wrists and fingers flexed on the chest. The legs are stiffly extended and internally rotated, with plantar flexion of the feet.
Assessment

- Call family and MD
- Start GCS and Neuro assessment
  - Rate severity of TBI
  - **Mild TBI**
    - GCS greater than 12
    - Loss of memory or mental decline immediately after event
    - No abnormalities on a CT scan
  - **Moderate TBI**
    - CGS score of 9-12
    - Abnormalities on CT scan
    - Operative lesion
  - **Severe TBI**
    - GCS below 9 within 48 hours of injury
    - Score of 7 or less on GCS indicates a coma
# GCS

## Glasgow Coma Scale

<table>
<thead>
<tr>
<th>Eye opening</th>
<th>Score</th>
</tr>
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<tbody>
<tr>
<td>spontaneously</td>
<td>4</td>
</tr>
<tr>
<td>to speech</td>
<td>3</td>
</tr>
<tr>
<td>to pain</td>
<td>2</td>
</tr>
<tr>
<td>none</td>
<td>1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Verbal response</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>orientated</td>
<td>5</td>
</tr>
<tr>
<td>confused</td>
<td>4</td>
</tr>
<tr>
<td>inappropriate</td>
<td>3</td>
</tr>
<tr>
<td>incomprehensible</td>
<td>2</td>
</tr>
<tr>
<td>none</td>
<td>1</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Motor response</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>obeys commands</td>
<td>6</td>
</tr>
<tr>
<td>localises to pain</td>
<td>5</td>
</tr>
<tr>
<td>withdraws from pain</td>
<td>4</td>
</tr>
<tr>
<td>flexion to pain</td>
<td>3</td>
</tr>
<tr>
<td>extension to pain</td>
<td>2</td>
</tr>
<tr>
<td>none</td>
<td>1</td>
</tr>
</tbody>
</table>

**Maximum score** 15
Neuro Assessment

- **Pupils**
  - Should be equal
  - Reactive to light
  - 2.5-4mm is normal

- **Limb movement**
  - Weakness
  - Trouble walking
  - Abnormal reflexes
  - Loss of ROM

- **LOC**
  - Change in alertness or mental status
Red Flags

- Eyes
  - Blurred vision, sensitivity to light
  - Loss of vision and different pupil size
- General
  - Headache, Fever, Nausea, stiff neck
  - New discharge from ears or nose
  - Laceration, swelling, bruising of head and face
  - Change in speaking, reading, writing
Mrs. P. is 88.

- Meds include: Metformin, Coumadin, Tylenol Atenolol, Vitamin D, and Timolol for glaucoma.

She was found by PSW’s this morning on the floor.
She did not participate in afternoon activities because she complained of a headache and her headache continued throughout dinner.
She was given Tylenol and slept through the night.

What will you do for Mrs. P. at this point?
Next day, Mrs. P was awoke anxious and agitated with a headache.
Later in the day she had garbled speech, unsteady gait, and was picking at the bed sheets.

What will you do for Mrs. P.?
Questions
Resources
