Incidence & Rationale

• Up to 72% of stroke survivors will experience shoulder pain
  (Canadian Best Practice in Stroke, 2016)

• "Shoulder pain may inhibit patient participation in rehabilitation activities, contribute to poor functional recovery and can also mask improvement of movement and function."
  (Canadian Best Practice in Stroke, 2016)

• "Hemiplegic shoulder pain may contribute to depression and sleeplessness and reduce quality of life."
  (Canadian Best Practice in Stroke, 2016)

Shoulder Pain Assessment & Treatment

• To achieve timely and appropriate assessment and management of shoulder pain the organization requires:
  (Canadian Best Practice in Stroke, 2016)

  • Organized stroke care, with a critical mass of trained interprofessional staff.
  • Equipment for proper limb positioning
Shoulder Pain Assessment & Treatment

• To achieve timely and appropriate assessment and management of shoulder pain the organization should provide:
  • Initial assessment of ROM
  • Timely access to specialized, interprofessional stroke rehabilitation services

Objectives

• Why is the shoulder at risk?
• Presentations of the Hemiplegic Arm
• Review of positioning
• Review of handling techniques

Anatomy: Glenohumeral Joint
**Glenohumeral Joint**

- Ball and socket joint
- Stability vs. Mobility
- Only 1/3 of the humeral head is in contact with glenoid fossa during arm movement

**Shoulder Movement**

- From 0-30 degrees:
  - Setting of scapula
  - Primarily glenohumeral movement
- From 30-150 degrees:
  - Scapulo-humeral rhythm (2:1 GH:scapula)
  - External rotation and depression of humeral head to clear acromial arch
- Beyond 150 degrees:
  - Thoracic extension to complete elevation

**Low Tone Shoulder vs. High Tone Shoulder**
**Low Tone Shoulder**

- Most commonly seen early in stroke recovery
- Flaccid or low tone muscles at shoulder and trunk lead to altered alignment of scapula and humerus
- Motor pathways have been damaged that innervate the upper limb muscles
- Sensory impairment very common
- Very susceptible to structural damage (muscles, tendons, ligaments)

**Shoulder Subluxation**

**Consequences:**

- Structural changes can mask motor recovery
- Shoulder pain can influence a survivor's participation
**High Tone Upper Limb**

- Usually occurs later post stroke
- Change in the central nervous system resulting in increased tone
- Tone can be influenced by:
  - Positioning
  - Physical exertion (i.e. transfers)
  - Pain

**“Flexor Pattern”**
- Scapular retraction
- Shoulder internal rotation and adduction
- Elbow flexion
- Forearm pronation
- Wrist and finger flexion

**At risk for:**
- Contracture formation
- Skin integrity
- Shoulder pain
ii) Joint protection strategies should be instituted to minimize joint trauma
d) staff should position patients, whether lying or sitting, to minimize the risk of complications such as shoulder pain (Canadian Best Practice in Stroke, 2010)

Positioning of the Upper Limb
• Make sure the pelvis and trunk are aligned.
• Position shoulder in slight flexion, abduction, and external rotation; forearm in pronation and hand in open weightbearing position (palm down).

Positioning of Low Tone Upper Limb
Benefits:
• Support the shoulder joint to minimize subluxation
• Minimize edema to the wrist and hand with elevation
• Promote sensory awareness
Positioning of High Tone Upper Limb

Benefits:
• Maintaining muscle and joint length

Positioning & Supportive Devices

Positioning devices (static postures):
• Use pillows, lap trays, troughs, towels, airsplints, splints

Supportive devices (during dynamic activities only – removed when sitting or lying down):
• Use slings, pockets, waistband of pants, splinting cuff

Positioning of the Upper Limb

• Make sure the pelvis and trunk are aligned.
• Position shoulder in slight flexion, abduction, and external rotation; forearm in pronation and hand in open weightbearing position (palm down).
**Positioning – Side - Lying on the Hemiplegic Side**

- Move hemiplegic shoulder blade away from spine and gently move hemiplegic arm away from body – before rolling onto side
- Avoid the person being directly on the tip of the shoulder - readjust as needed
- Use pillows between knees, at back, and under hand if required

**Supportive Devices During Transfers & Gait**

- Low tone arms (CMSA Stage 1 or 2) should be supported during transfers and ambulation to minimize damage

*What tool/devices could you use?*

**Handling**

6.4 ii) Joint protection strategies should be instituted to minimize joint trauma

a) the shoulder should not be passively moved beyond 90° of flexion and abduction unless the scapula is upwardly rotated and the humerus is laterally rotated
b) overhead pulleys should not be used
c) the upper limb must be handled carefully during functional activities

*Canadian Best Practice in Stroke, 2010*
**Activities of Daily Living**

- Avoid moving or lifting the person using the armpit or pulling on arm; instead grasp the upper trunk near the scapula.
- Support both humerus and hand when moving the arm to position for ADL.
- When dressing, don gown on affected arm first and doff gown affected side last.

**Taking Blood Pressure**

- Avoid taking BP in hemiplegic arm.
- BP reading will be lower in hemiplegic arm.

**Injections**

- Injectable medications should not be administered in the hemiplegic arm.
- Increase risk of infection – poor venous and lymphatic systems with hemiplegic side.
- Injections i.e. BOTOX would be delivered into hemiplegic side – to treat this side.