

Module 4: Cognition, Perception, Vision and the Upper Extremity

Life After Stroke Education Series



Stroke Network
Southwestern Ontario

Disclaimer

- SWOSN has created the following PowerPoint to support the delivery of stroke education for providers working in the Life After Stroke Programs. SWOSN would like to acknowledge the Community Stroke Rehab Teams for providing the initial iteration of this resource.
- Every effort has been made to ensure that the following information provided is accurate, up-to-date, and complete, but no guarantee is made to that effect. This is a reference resource designed as a supplement to, and not a substitute for, the expertise, skill, knowledge, and judgment of healthcare practitioners. For the most current recommendations always refer to the Canadian Best Practice Recommendations for Stroke Care at: www.strokebestpractices.ca
- Images used in this presentation are for educational purposes only and are not to be duplicated

Outline

- Overview of Cognition Challenges
- Supporting Challenges in Cognition
- Vision and Perceptual Deficits
- Upper Extremity Function
- Strategies to Manage the Upper Extremity

Who Does What: Cognition?

CSRT OT & SLP Role

- Complete formal and informal assessments
- Collaborate to determine best intervention strategy
- Teach strategies
- Work with participant and family to individualize strategy

Participant & Support Person

- Implement strategies into daily activities
- Practice strategies
- Keep mind active
- Stay physically active
- Ask questions

Cognition and Thinking Skills

- Attention
- Orientation
- Memory
- Insight
- Impulsivity
- Executive function (planning, organizing, decision making, judgment, problem solving)

Thinking Challenges

- Mood
- Pain
- Fatigue



Supporting Fatigue

- **Educate** on and **support** the 4 P's
 - Prioritizing, pacing, planning and positioning
- **Identify** which activities are most important to the individual and **prioritize** completion of those tasks
- Build '**breaks**' into the programing based on participant's needs
- **Plan** a variety of activities throughout the day (alternating activity "type")
 - ex: social activities, physical activities, cognitive stimulation
- If able, **position** the participant's activities based on their 'high energy' and 'low 'energy' time(s) of day

Insight

- Cannot compensate for something you don't know may be a challenge...
- NEED to support them!



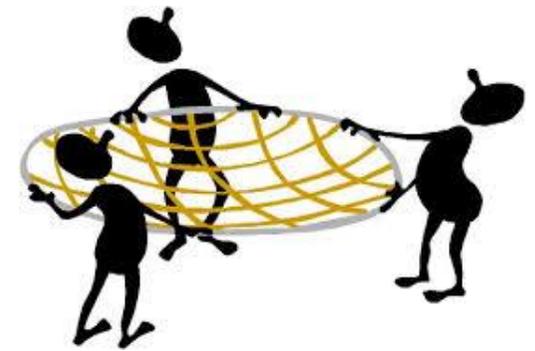
Supporting Safety

- Provide sufficient supervision to ensure the person's safety
- Post reminders such as:
 - Use your cane
 - Put the brakes on your walker before getting up
 - Put the brakes on your wheelchair before getting up
 - Do not cook or use the stove



Supporting Insight

- Make the environment as safe as possible
- Have mobility aids and other assistive devices close by
- Gently remind the person about limitations they may have
- Be honest but not critical about the limitations



Helping with Orientation

- Gently give correct information
 - Without making them feel foolish
- Mention the date when you arrive
- Show it to the person on the calendar or board
- Ask participants to participate in writing date
 - Serves as a repetition and empowers participants

Supporting Attention

- Make **eye contact** as you speak
 - This can help them focus on what you are saying and follow your instructions
- **Give** short, simple, step-by-step instructions
- **Give time** for the person to answer
- **Ask** if the person understands the instructions before you continue
- Help the person focus on **one thing at a time** by gently bringing their attention back to the task
- **Reduce distractions**, including television, radio, and separate conversations
- **Remember** that the person who had had a stroke is not acting this way on purpose

Supporting Memory

- Ensure the person is paying **attention**
 - Attention is the first step in remembering
- Encourage the person to use **memory aids**
 - Schedule, daily planner, calendar, and sticky notes
- **Repeat** information to help them remember it
- Store items in the **same place**
- **Label** drawers and cupboards to show what is in them
- Create a **routine**

Tips to Help with your thinking

- **Repetition** – This includes repeating something over and over in your head for short term memory. For long term memory this could be done by reviewing something day after day after day, by doing the same routine each day.
- **Visualization** – See it in your mind. Think about taking a picture in your head. Think about size, colors and placement of items.
- **Write it down** – This is the best method to remember items because you can always go back and see what you wrote down.
- **Stay physically active** – research shows the benefits of physical exercise on your thinking skills.
- **Learn something new** – keep your mind active, pick something meaningful to you (new language, how to change your oil, how to bake...).
- **Stay positive** – research show that people who better manage their stress and emotions have clearer ability to think.
- **Sleep** – getting proper sleep is important in ensuring good thinking health.

Supporting Impulsivity

- Remind the person to slow down
 - Add breaks, breaths, distance between
- Give clear and specific instructions
- Divide tasks into small steps
 - This lets them focus on one part of the task at a time



Vision and Perception Skills

- Visual inattention/ neglect
- Visual field cuts
- Double vision
- Blurriness
- Central vision loss

Supporting Visual Inattention

Decreased awareness of the body and environment on the side affected

How you can help:

- Arrange the environment to provide stimulation on the stroke-affected side
- Approach the participant from the unaffected side then, move to the affected side
- Use visual cues to assist the participant
- Encourage the participant to scan the environment using the Lighthouse Strategy

The Lighthouse Strategy

The lighthouse strategy combines:

1. Anchors
2. Guides
3. Turns

To help the person scan, plan, and implement functional tasks. For more information visit:

<https://www.medbridge.com/blog/2016/05/four-basic-strategies-to-improve-hemispatial-neglect/>



Unilateral Body Inattention

How you can help:

- Talk with the team about using the affected arm or leg in daily activities
- Position the affected arm so the participant can see it
- Gently rub the affected arm
- Encourage participant to help position the affected limb
- Use cues to draw attention to the affected side

Vision Concerns



Visual Field Cut



Double Vision



Blurry Vision



Central
Vision Loss

Vision Concerns

How you can help:

- Encourage the participant to strategies such as:
 - The lighthouse strategy
 - Low vision strategies (increasing contrast, increasing font size, etc.)
 - Visual cues
 - Red rulers, blockers, etc.
 - Practice scanning exercises in sitting or while moving
 - Slow down, allow time to process information

Functional Issues

- Bumping into doorframes/ furniture
- Reading—missing words on the left/right, not finding the next line, etc
- Eating—missing dessert!
- Decreased spatial orientation (and wayfinding)
- Not completing grooming tasks (hair, shaving, etc)



Cognitive and Visual Stimulation

- Puzzles, building models, Lego
- Card games, board games
- Word searches, Sudoku, “where is Waldo”
- Computer games (time pressures)/ apps
 - Eyecanlearn, lumosity, tactus apps, dexterity, etc.
- Reading
- Learning (TEDTalks, seminars, news)



Functional Activities

- Engage participants to assist with setup/ cleanup for activities/ snacks
- Establish a routine that incorporates date orientation
 - ex: participants writing their name and current date on name tag, whiteboard calendar
- If possible encourage participants to lead groups/ activities of their interest
 - ex: have a participant bring in a recipe and bake together as a group, planting seeds/ gardening
- Provide magazines, flyers, reading materials to 'scan'
 - ex: make a collage, grocery list
- Sorting tasks
 - ex: organizing therapy materials, utensils

Shoulder, Arm and Hand Difficulties

- Decreased sensation (touch, temperature, joint position and/or pain)
- Flaccid/low tone shoulder, arm, hand
- Spastic/high tone shoulder, arm, hand
- Apraxia

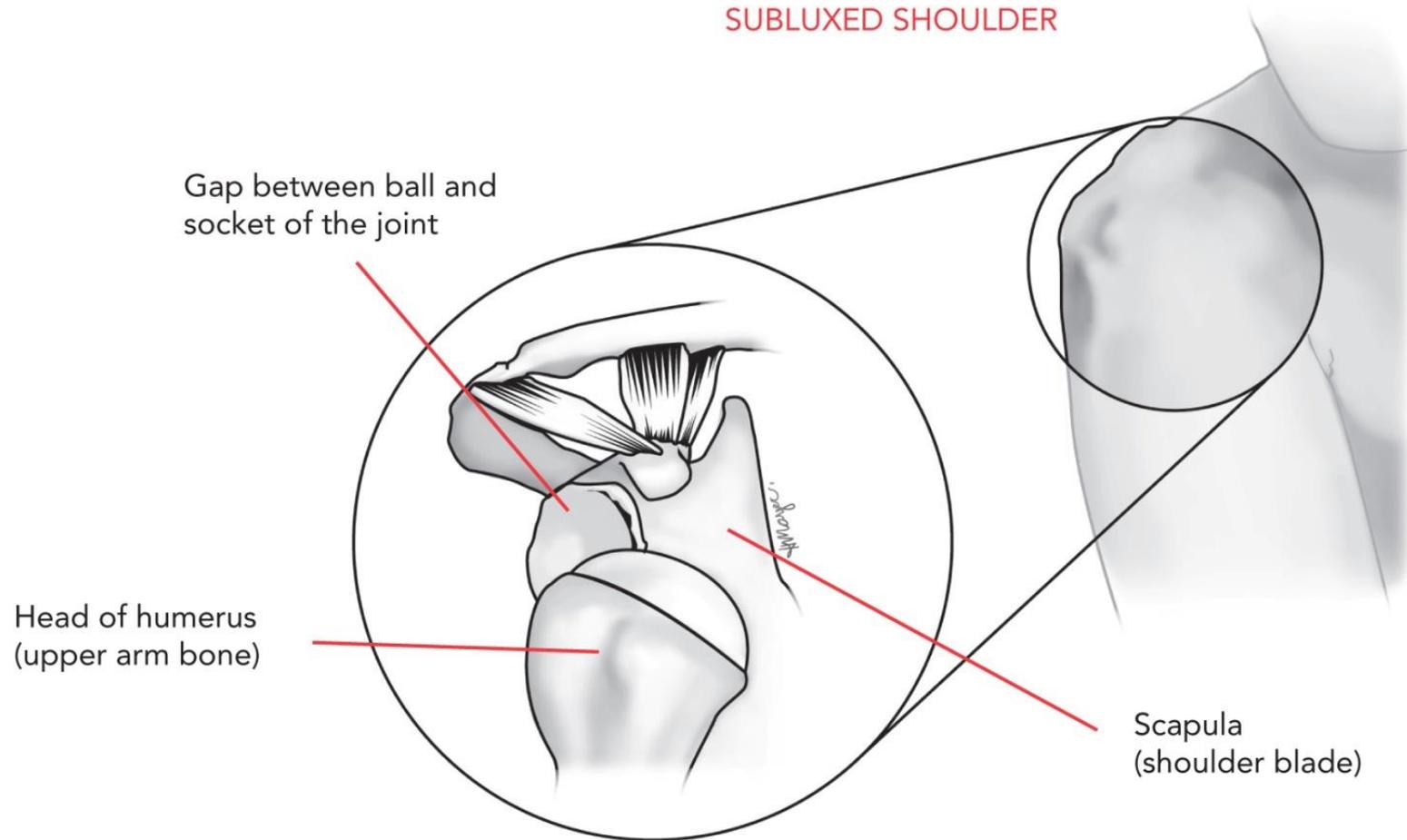
How can you help?

- Be aware of sensory problems the person may have
- Take steps to ensure they remain safe during activities
- Provide verbal cues or touch the limb when providing instruction for transfers or movement

Flaccid/Low Tone Shoulder

- Appears heavy and limp
- Strength and tone of the muscles supporting the shoulder joint are compromised
- As a result, gravity can drag the head of the humerus down, overstretching the weakened muscles
- This may cause the shoulder to move out of alignment
 - It may even cause a partial dislocation (subluxation)
- A subluxed shoulder has a gap between the ball and socket of the joint

Anatomy of a Subluxed Shoulder

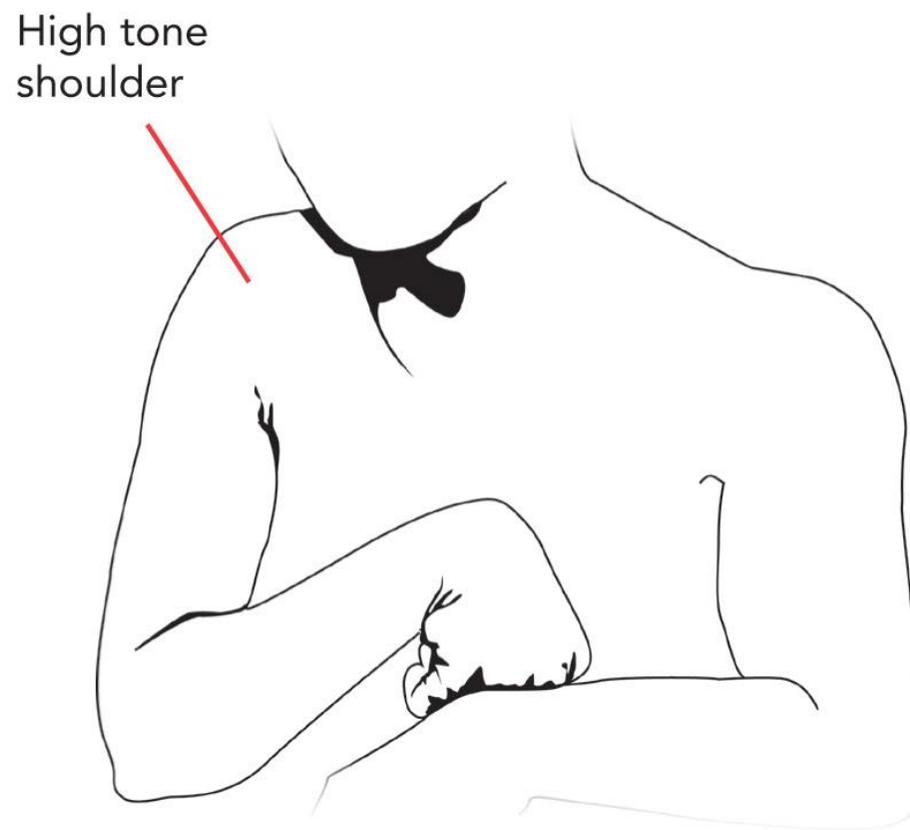


What can you do to help?

- Learn the techniques and strategies in the care plan of each stroke participant
- Members of the team can show you the correct way to move or position a participant's arm
- Support the affected arm and treat it gently
- Use a lap tray or arm trough
- Support the affected limb before moving
- Do not pull on the arm
- **Never** put the arm above shoulder height

High Tone Shoulder

- High muscle tone can pull the upper arm toward the chest wall; appears stiff or tense



What can you do to help?

- Support and position the limb in good alignment
- Use pillows or towels to improve arm positioning in bed/lying down position
- Support the arm on a lap tray when the participant is sitting
- Report joint or tissue pain to the right person



- Lap tray on wheelchair
- Pillow under hemiplegic arm with shoulder abducted, forearm pointing forward and hand supported

Other Shoulder & Arm Conditions

- **Rotator cuff injury:** The muscles surrounding the shoulder are injured.
- **Tendonitis:** Inflammation of a tendon.
- **Bursitis:** A bursa is a small, fluid-filled sac that reduces friction and allows tendons around a joint to glide more easily. Bursitis is inflammation of a bursa sometimes caused by pinching of the shoulder bursa.
- **Upper arm fracture:** Fractures of the upper arm can result from a fall or osteoporosis

***** The above need to be diagnosed and treated properly by the correct professionals*****

Managing the Affected Hand

- **Flaccid Hand**

- Lack of sensation and mobility after stroke can make a low-tone hand prone to positioning problems and swelling
- Swelling and disuse may cause pain and skin problems

- **Spastic Hand**

- Gentleness is important
- It should never be forced open!
- Use hand/wrist splint if recommended
- participants should not squeeze a ball to exercise the hand!

How can you help?

- Know the techniques and strategies for movement and positioning of shoulder – ***ask Stroke Team to show you correct way***
- Always support and handle the affected shoulder carefully
- To reduce swelling, support the arm on a lap tray or trough when the participant is sitting
- Encourage the participant to use their unaffected hand to gently open the fingers of the affected hand and place the hand on the supporting surface
- Report any changes in pain, swelling, or function to the right person

Apraxia of Arm & Hand

Definition: Difficulty carrying out purposeful movements even though the person has the physical ability to perform the task

- Break down task into simple steps
- Encourage repetition and practice
- Encourage person to close their eyes to visualize movement or task
- Hand-over-hand guidance (wheelchair brakes, cut food)
- Provide verbal cues and/or demonstrations

Strategies to Manage Affected Arm and Hand

- Mirror box
- Motor imagery
- Passive stabilizer
- Limb activation (sensation re-training)
- Passive range of motion (PROM)
- Active range of motion (AROM)
- Fine motor skills

Mirror Box

Purpose:

- Help facilitate active movement in affected arm

Instructions:

- Put affected arm in the box
- Put non-affected arm in front of the mirror
- Adjust the position of the box so that you can see the image of your arm in the mirror
- 30 minutes, 2x/day, daily



Mirror Box Script

- “Watch the mirror...do these activities with your affected hand at the same time...”
- Task examples:
 - Touch thumb to each fingertip
 - Grasp a water bottle/let it go
 - Pretend to play the piano
 - Pick up coins one at a time

Resources & Exercise Ideas:

- <https://youtu.be/5zwsN44wQbQ?si=xcS0C2DfNocXmOm0>
- <https://vch.eduhealth.ca/en/viewer?file=%2fmedia%2fVCH%2fEG%2fEG.210.M575.pdf#phrase=false&pagemode=bookmarks>

Building a Mirror Box

Option #1:

<https://mirrorthrapy.com/make-your-own-mirror-box-for-therapy/#:~:text=The%20mirror%20box%20should%20consists,this%20is%20the%20affected%20limb.>

Option #2:

<http://www.strokewise.info/2020/04/making-mirror-box-mirror-therapy-uses.html>

Option #3:

<https://www.youtube.com/watch?v=Wudba9URO48>



Motor Imagery

- This stimulates the brain areas responsible for making the affected arm or leg move Pain free & successful
- Meaningful activities
- Incorporate all other senses (smell, noise, touch)

COMMUNITY **Stroke**
Rehabilitation TEAM

Motor Imagery

Imagine the movement you want to do in your mind. Must be pain free and successful movements.

1. Reach for a cup
Drink from cup
Place cup down



2. Write with pencil



3. Dry dishes



4. Use TV remote



Motor Imagery

- “Today we are going to imagine you are reaching for a cup on the table....the cup is half full with water.”
- “Bring your arm forward slowly toward the table.../straighten your elbow.../open your fingers and thumb.../grasp the cup gently...”-include other senses (smell, touch/feel, sound, sight, taste)

Motor Imagery Videos

Mental Imagery Primer and Relaxation

<https://youtu.be/-d1aBZFkCmI?si=G04vUwrDO5xfL4OM>

Mental Imagery- Reaching for a Cup and Drinking From it

https://youtu.be/_ysy8N1kUiU?si=FcEDKI8RYuWMqw8P



Occupational Therapy TOOLKIT

Using Your Right Arm as a Passive Stabilizer

It is important that you use your affected your arm as much as possible during daily activities. Here are a few examples of how you can do that.



Use you right hand to stabilize your plate while eating.



Stabilize a sheet of paper with your right hand while writing with your left hand.



Stabilize a washcloth with your right hand while applying soap with your left hand.



Stabilize your toothbrush with the right hand while your left hand applies the toothpaste.

Limb Activation

1. Touching

- a. Rub different textures on affected hand and fingers (silk, towel, sand paper, hairbrush)
- b. Feel the texture with each finger separately and with palm of hand
- c. Feel them on your unaffected side
- d. Return to affected side
- e. Place hand in bowl of sand or rice



- ### 2. Close your eyes and place small objects (cotton balls, Q-tips, rocks) into a jar with affected hand



- ### 3. Fill cups with warm and cold water

- a. Touch and feel the different temperatures
- b. Feel them with your good side and compare with your affected side



Do these exercises every 2 hours for 15 minute sessions. Once the sensation becomes comfortable, progress to the next texture or change the amount of pressure you apply

How can you help?

- Provide opportunity to use affected arm safely (write, TV remote, light switch...)
- Incorporate affected arm into activities (stabilizer)
- Feel different textures (sensory re-integration)



Active Use of Arm/Hand

- Functional use
- ++++Repetition
- Must be challenging “right fit” to promote neuroplastic changes
- Avoid painful movements!
- Graded Repetitive Arm Supplementary Program (GRASP)
 - A hand and arm exercise program for people with stroke
 - Highly recommended that individuals have support to complete GRASP
 - Tested as a randomized controlled trial and results are published and shown to be effective
 - The program, manual and GRASP books are available free of charge

GRASP

**Graded
Repetitive
Arm
Supplementary
Program**





» Faculty of Medicine » Home » GRASP

- GRASP >
- GRASP Research Evidence >
- GRASP Overview and Evidence >
- GRASP Manuals and Resources >
- Sites that use GRASP >
- GRASP Feedback >

GRASP



Welcome to the GRASP Home Page!

Some Updates include:

- GRASP Home Version 1 is now available online!
- GRASP Hospital Version now updated (Version 2) and available online
- GRASP Equipment Kits now available for order through a third party provider.

Program manuals, booklets and training guides are available here:

<https://neurorehab.med.ubc.ca/grasp/>

Neurorehabilitation Research Program

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Grip and Fine Motor Skills

- Utilize activities that are meaningful to the survivor ex: baking, cake decorating, favourite board game
- Theraputty videos
 - <https://drive.google.com/open?id=1R1wc4leJU4wHg4v4sFP3tNt7SuaZzQww>
 - <https://drive.google.com/open?id=1M1zoBXxfd4vX6L8jRKdH05KzLVcg-268>



1) Total Arm Stretch

1. Sit straight in your chair and lean forward over your knees.
2. Make sure that your arms hang loosely in a relaxed stretch.
3. You should feel a stretch through your shoulders.
4. Hold the stretch for a count of 10 and then slowly straighten up.
5. Repeat 2 times.



Important Considerations

- Work within a pain free range of movement. If it hurts, STOP.
- Avoid overhead reaching
- Support passive range of motion of the arm only to shoulder height
- Perform activities in a balanced way.
 - When squeezing a ball to improve grasp, also intentionally extend the fingers to practice opening the hand
- Too much of a good thing can create problems!
- Do not 'pull' on the arm



Compensation: Assistive Devices



Compensation: Assistive Devices

Cutting utensils for one-handed use, such as a rocker knife, cheese knife, and pizza cutter.



Encouraging Self-Management and Independence

- Encourage participants to direct their activities
- Support the use of assistive devices to enhance independence
- Teaching participants useful technology ‘tricks’
 - Ex: voice to text, alarms/ reminders in phone, smart watches



Thank You

You have now completed **Module 4: Cognition, Perception, Vision and the Upper Extremity**. For any questions, please contact SWOSN@lhsc.on.ca and/or contact your designated Community Stroke Rehabilitation Team Representative.



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