

Right Hemisphere Stroke:

Beyond left hemiparesis

June 8, 2017



your health, your hospital

Presented by:

- **Holly Arnold, MPT**
 - in-patient Physiotherapist
- **Donna Gill, RN(EC)**
 - in-patient Nurse Practitioner
- **Olivia Mann, SLP(C), Reg. CASLPO**
 - out-patient Speech Language Pathologist
- **Sherry Rock, OT Reg. (Ont.)**
 - out-patient Occupational Therapist

Objectives:



- To review **right brain neuroanatomy**
- To review the **typical deficits** encountered by people with right hemisphere strokes as related to **brain function** and **neuroanatomical areas**
- To describe an **integrated rehabilitative approach** to a patient with right hemisphere stroke



Review of Right Brain

Neuroanatomy

Structure and function

Objectives:



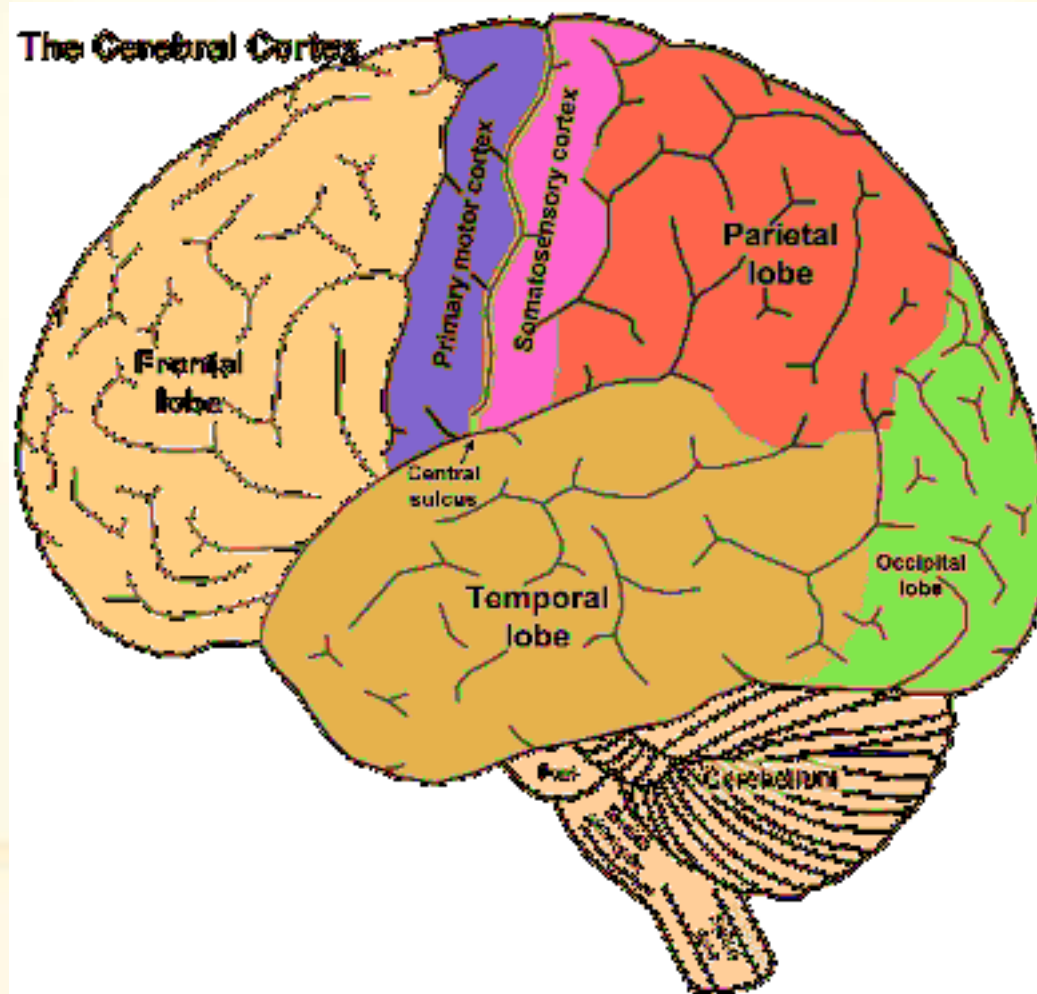
- ✓ To review **right brain neuroanatomy**
 - To review the **typical deficits** encountered by people with right hemisphere strokes as related to **brain function** and **neuroanatomical areas**
 - To describe an **integrated rehabilitative approach** to a patient with right hemisphere stroke



Neuroanatomy Review

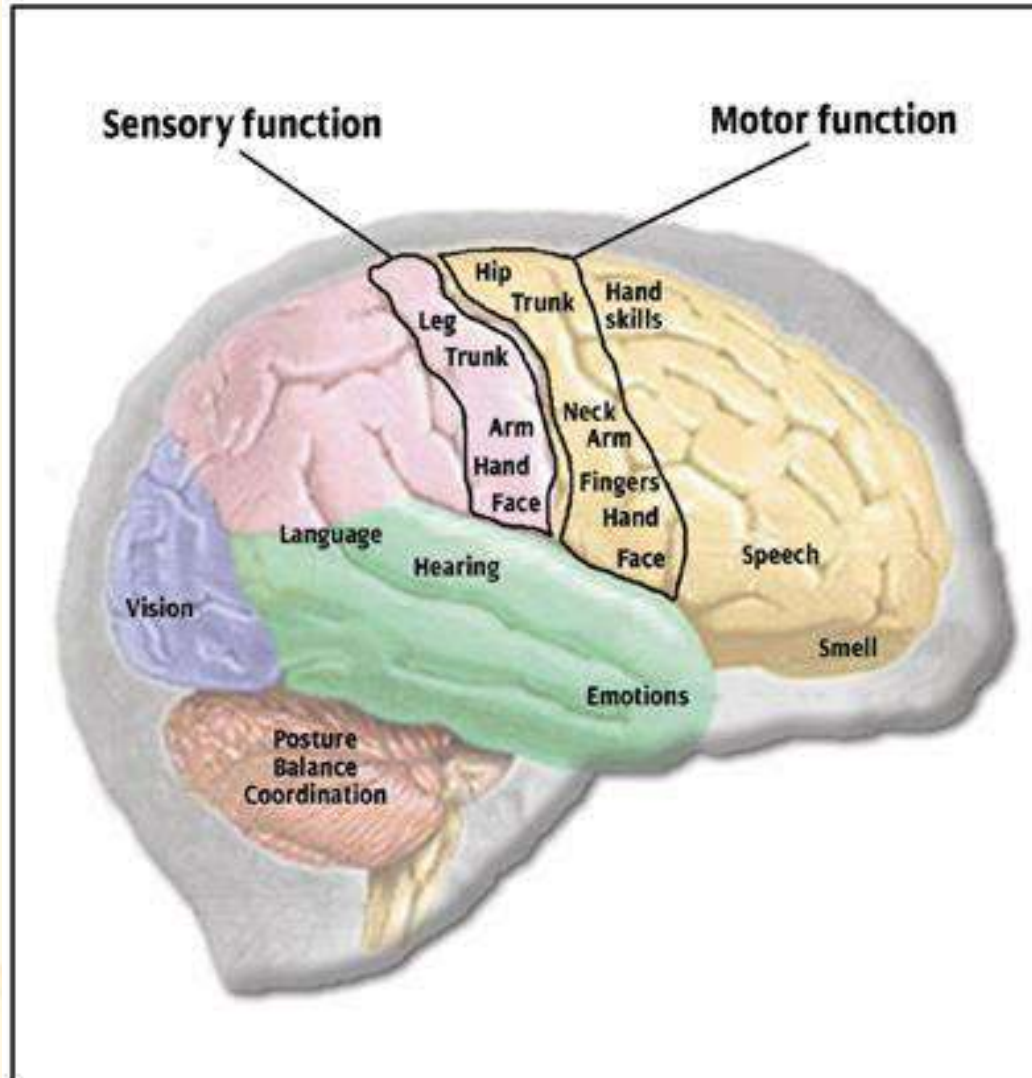
Cerebral Cortex

- Divided in to 4 lobes



Neuroanatomy Review

Motor and Sensory Function



Neuroanatomy Review

Motor & Sensory Function

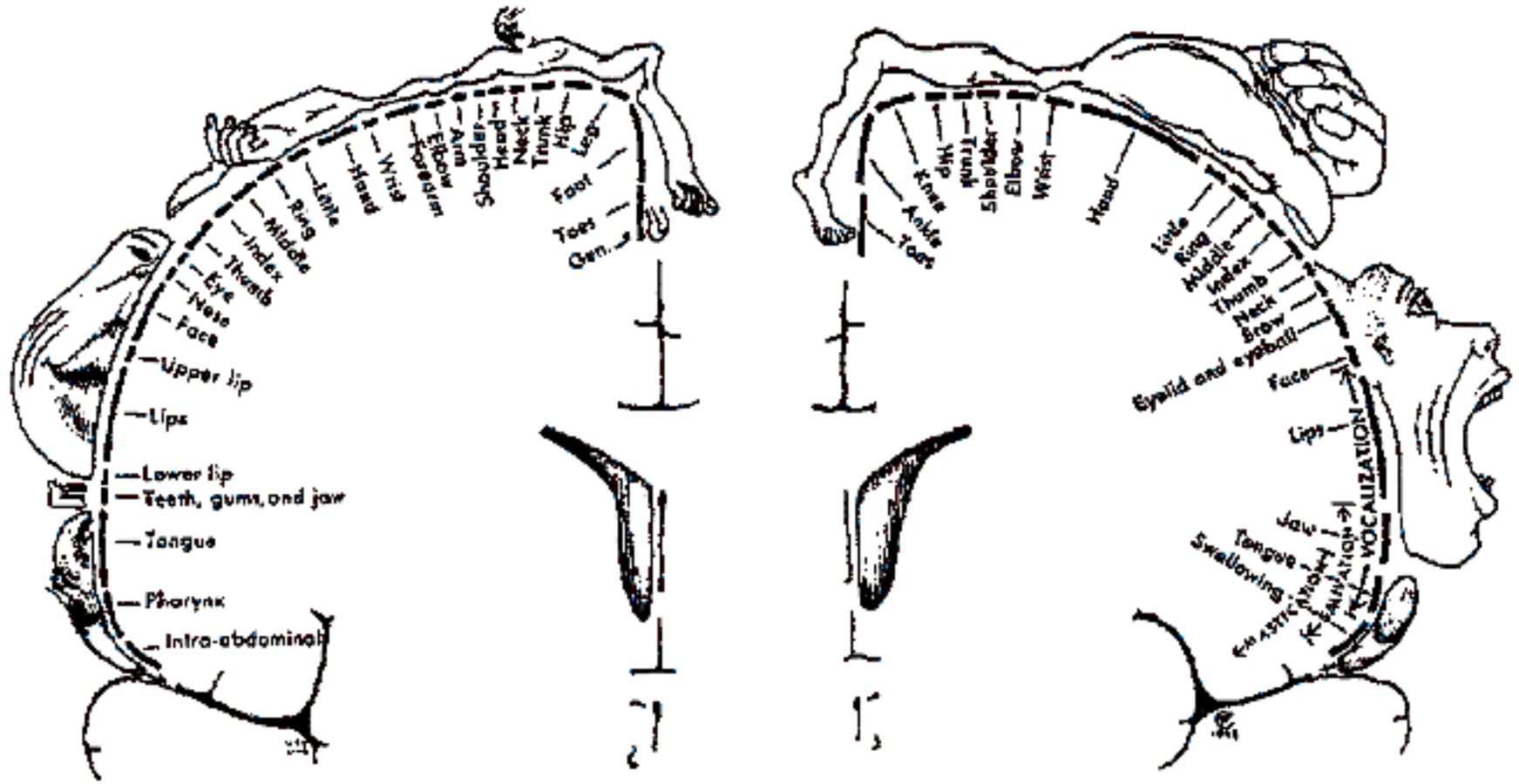


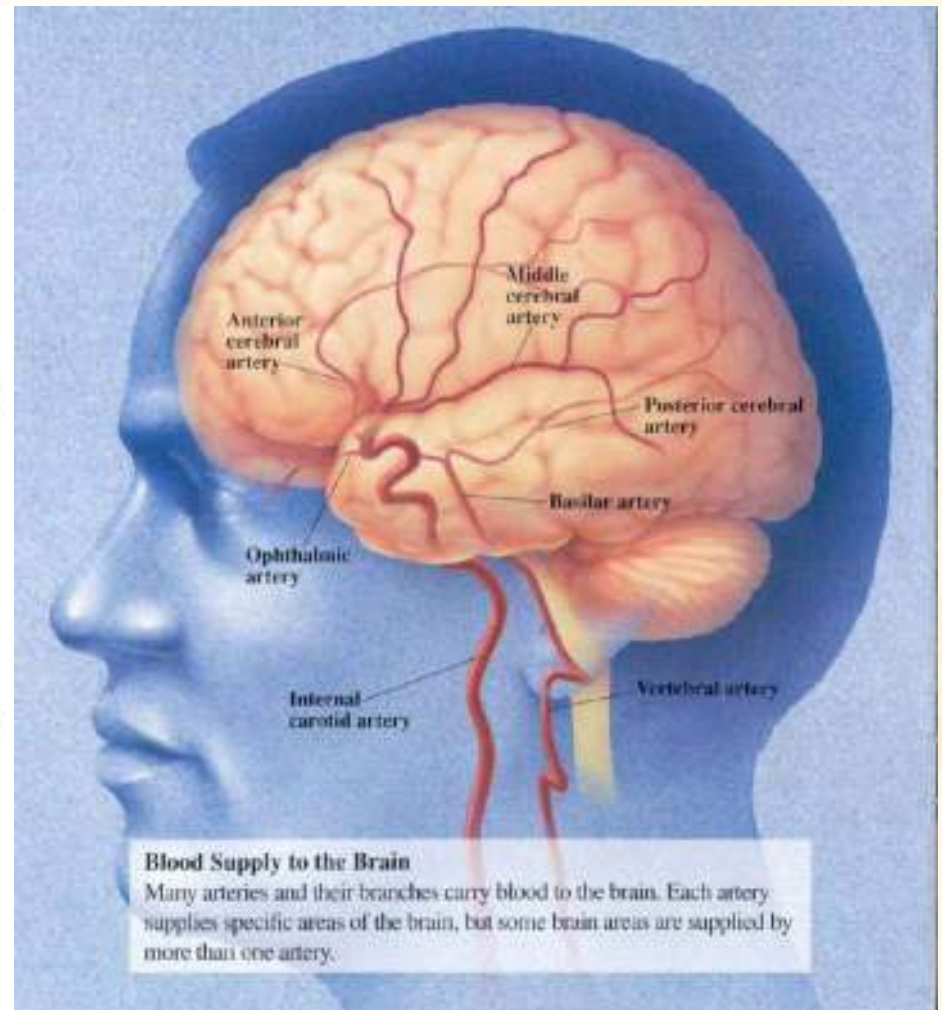
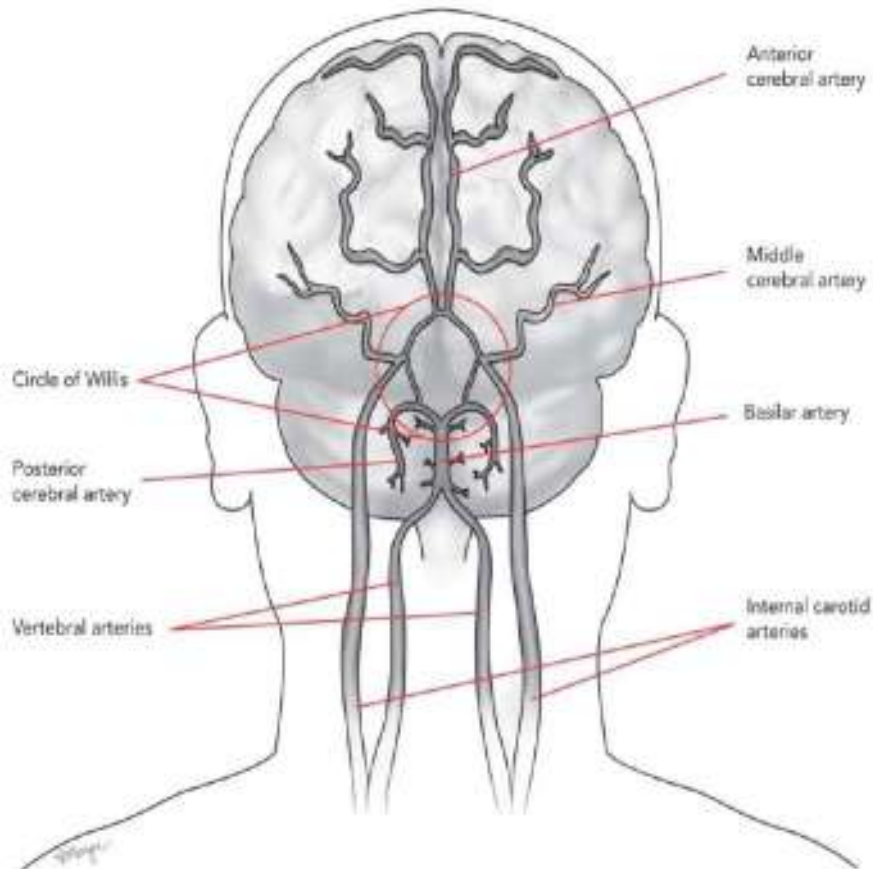
Figure 15-3. Homunculi of the primary somatosensory area (left) and primary motor area (right).

Neuroanatomy Review

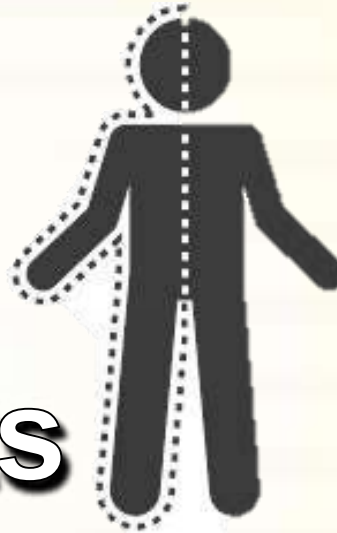
Blood Supply to the Brain



ARTERIAL NETWORK OF THE BRAIN



Typical Deficits



With right hemisphere stroke

Objectives:

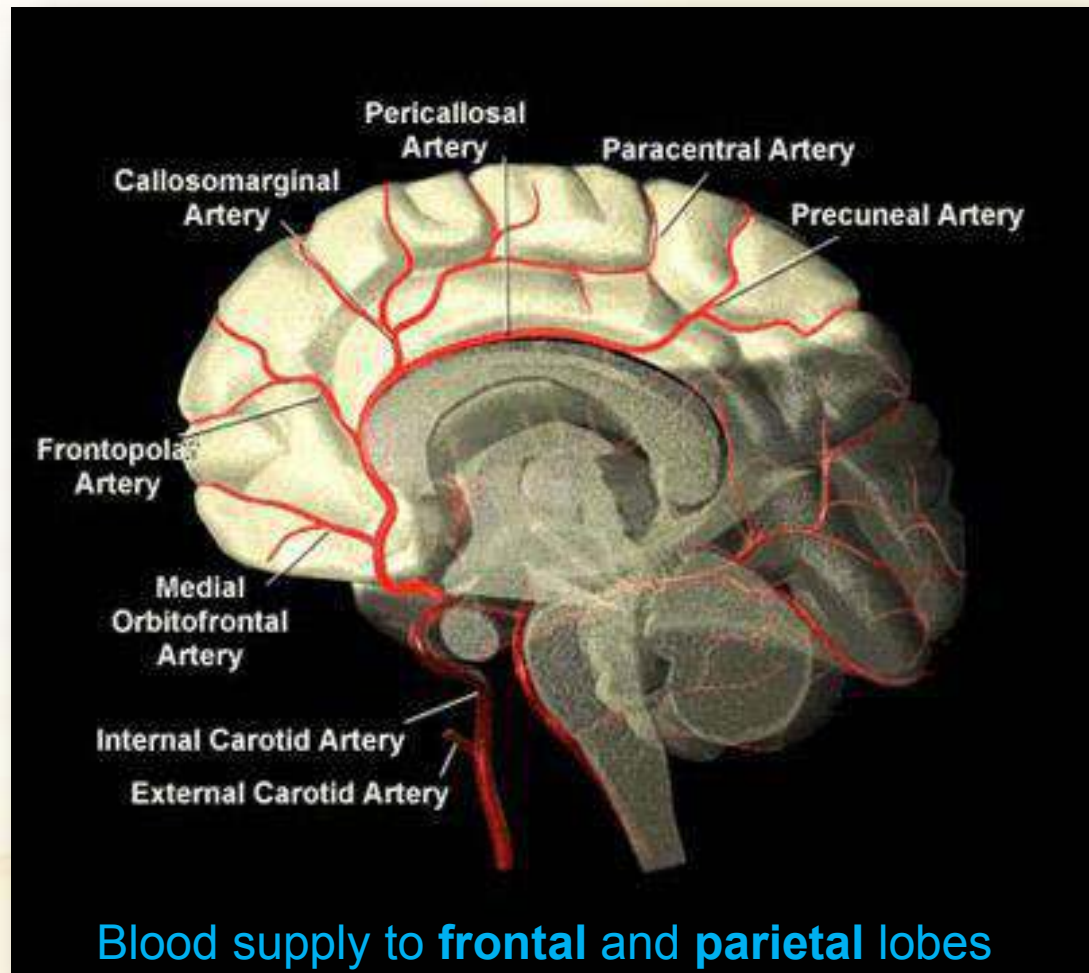


- ✓ To review **right brain neuroanatomy**
- ✓ To review the **typical deficits** encountered by people with right hemisphere strokes as related to **brain function** and **neuroanatomical areas**
- To describe an **integrated rehabilitative approach** to a patient with right hemisphere stroke



Right Anterior Cerebral Artery Stroke

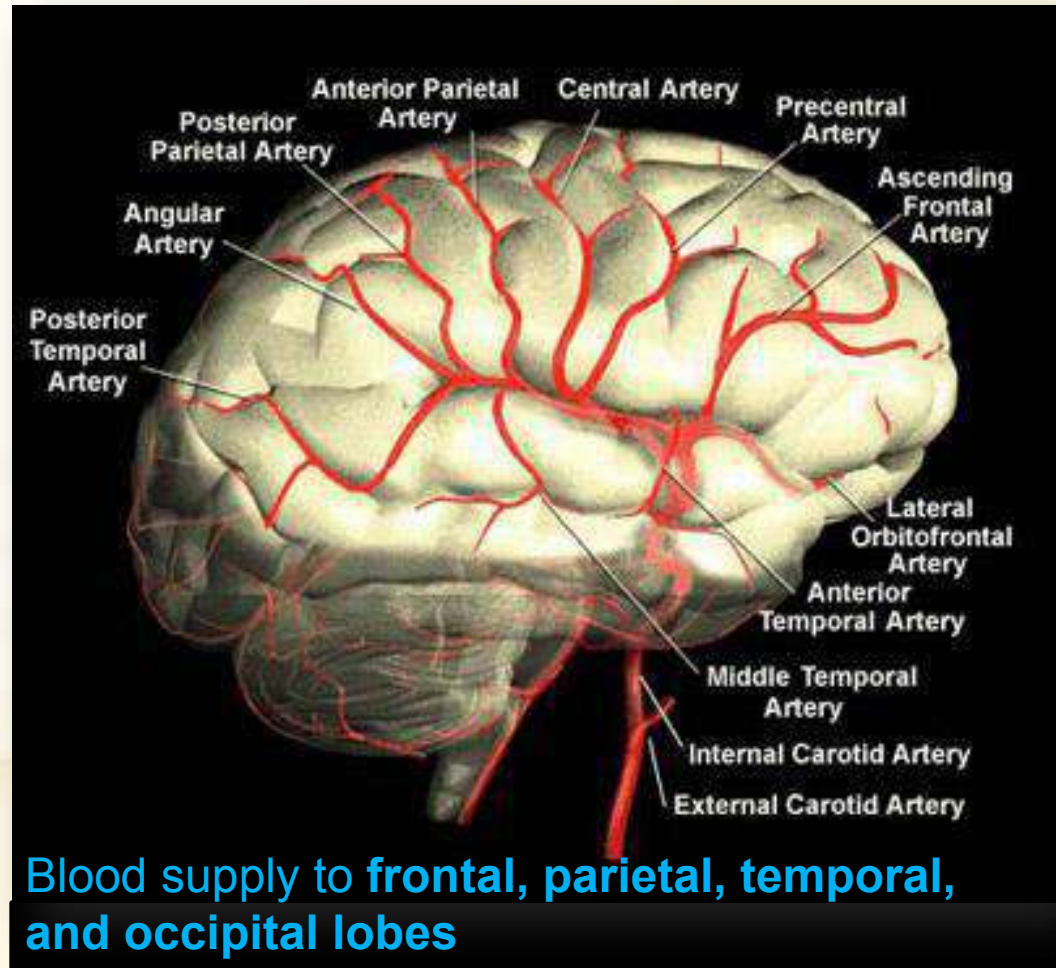
- Paralysis of left leg and foot
- Impaired gait
- Sensory loss to left leg and foot
- Flat affect
- Lack of spontaneity, apathy
- Memory impairment
- Incontinence





Right Middle Cerebral Artery Stroke

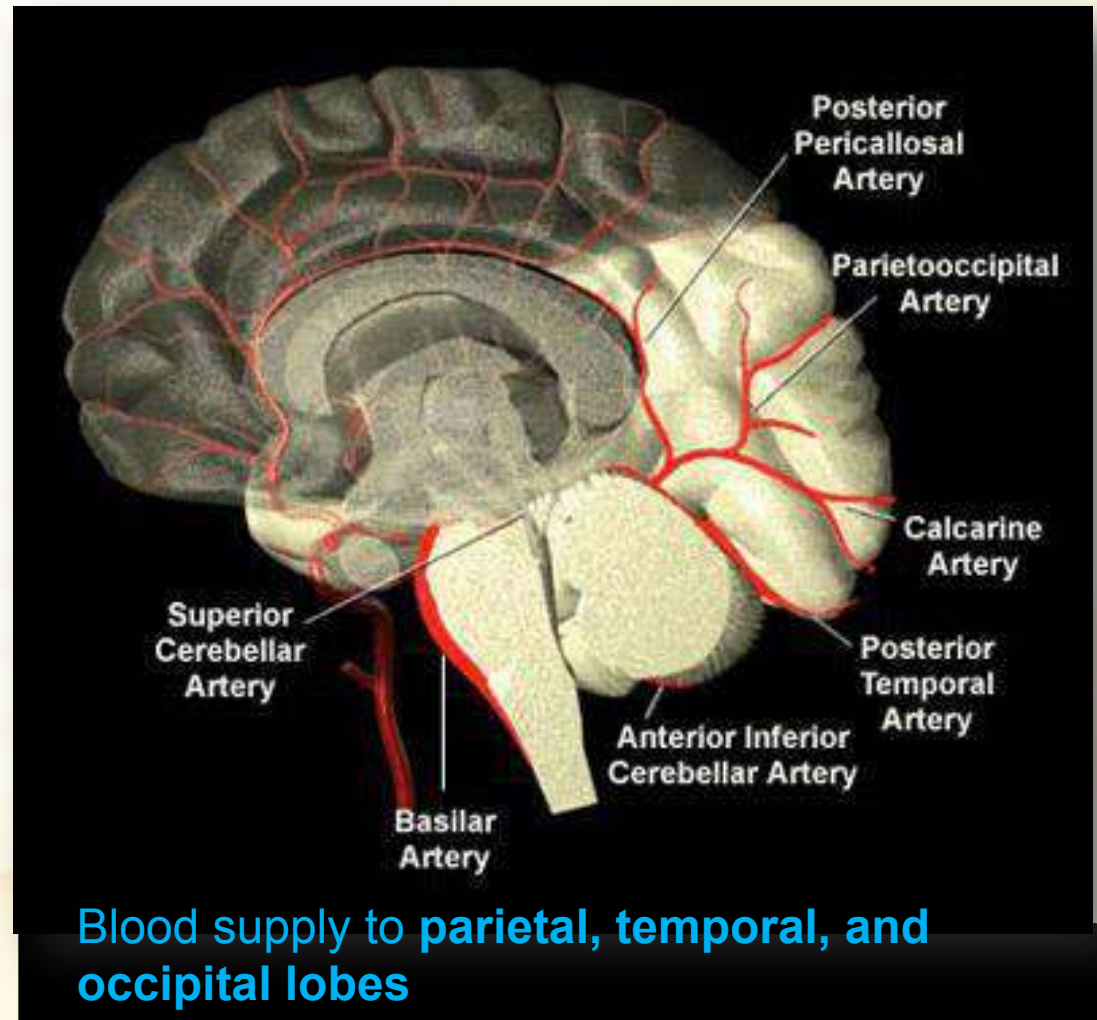
- Hemiplegia (left face, arm and leg)
- Left sensory deficits
- Homonymous hemianopsia
- Confusion
- Neglect
- Decrease auditory attention
- Short term memory loss
- Difficulty organizing Verbal information





Right Posterior Cerebral Artery Stroke

- Left sensory loss
- Pain & dysesthesia
- Dyskinesias
- Decreased visual attention
- Mild left hemiparesis
- Left visual field cut





Unique to Right CVA

- **Left sensory extinction**
 - Failure to respond to contralateral stimulation when simultaneous ipsilateral stimulation is present
- **Body scheme impairment / reduced body awareness**
 - Impaired knowledge of the position of body parts and the spatial relations between them
- **Impaired proprioception**
- **Agnosia**
 - inability to recognize common objects in the absence of sensory impairment
- **Acalculia**



Unique to Right CVA

- Visual perception changes – difficulty processing visual information into something meaningful



Patient Drawer

- Example: inability to find things in cluttered environment (figure-ground)
- Example: inability to learn from observing



Visual Neglect

- **Reduced awareness of contralateral stimulation**
 - Present in more than 40% of patients with right hemisphere stroke acutely.
 - Majority of patients experience spontaneous recovery.
- **Unilateral neglect and impaired constructional skills** are most common in patients with right hemisphere strokes.
 - *Paolucci, McKenna & Cooke (Australian Occupational Therapy Journal, 2009)*
- **Visual neglect**, difficulty with **visual reasoning** and visuoconstructive defects are independent predictors of poor functional outcomes after right hemisphere stroke.
 - *Losoi, Kuttunen, Laihosalo, Ruuskanen, Dastidar, Koivisto & Jehkonen (Neurocase, 2012)*



Language Impairments

“Active” type

- Insensitivity towards others, preoccupied with self
- Oblivious to social conventions
- Unaware of or inattentive to their physical and mental limitations
- Verbose, tangential, and rambling in speech
- Insensitive to the meaning of abstract or implied material
- Unable to grasp the overall significance or meaning of complex events

“Passive” type

- Unresponsive to social or environmental stimuli
- Use short utterances that lack emotional inflection
- Have difficulty maintaining attention for more than a few seconds

- Brookshire, Robert. (2007). *Introduction to Neurogenic Communication Disorders, 7th Ed.* St. Louis, Missouri: Mosby Elsevier.



Cognitive Impairments

- **Anosognosia**

- reduced self awareness
of stroke-related impairments

- **Apraxia**

- Inability to execute learned purposeful movements
unexplained by sensorimotor deficits

- **Impulsive, unorganized**

- **Impaired judgment**

- **Impaired insight**

- **Difficulty with follow-through**

- **Does not learn from mistakes**

- **Overall reduced attention**

With RIGHT brain strokes...

**TELL ME *YOUR*
CHALLENGES**



Objectives:



- ✓ To review **right brain neuroanatomy**
- ✓ To review the **typical deficits** encountered by people with right hemisphere strokes as related to **brain function** and **neuroanatomical areas**
- ✓ To describe an **integrated rehabilitative approach** to a patient with right hemisphere stroke

Case Study



**WHAT DO
YOU
NOTICE?**

**WHAT DO
YOU NOTICE?**



Patient arrives at rehab with
goal of driving and roller-skating
and driving this week

Case history

- 60 year old female
- Right **M**iddle **C**erebral **A**rtery CVA in 2016
- Team Goals:
 1. Achieve functional use of left upper extremity
 2. Increase independence in ADLs and IADLs;
 3. Increase independence in ambulation;
 4. Return to driving;
 5. Return to volunteer work
 6. Improve midline orientation and balance
 7. Improve neuromuscular control of L LE
 8. Increase independence on stairs





H.H. – Observations

- Minimal eye contact –right gaze
- When speaking, shifts topics without warning
- Talks without letting partner have a turn
- Weight on right > left
- Head tilted to the left
- Lack of insight
- Impaired awareness and judgment



Assessment Materials



SLP:

- Scales of Cognitive Ability for Traumatic Brain Injury (SCATBI)
- Cognitive Linguistic Quick Test (CLQT)

OT:

- Daily living questionnaire (Joan Toglia, 2006)
- Brief visual screen / Encourage client to get formalized eye assessment
- Bell's Test

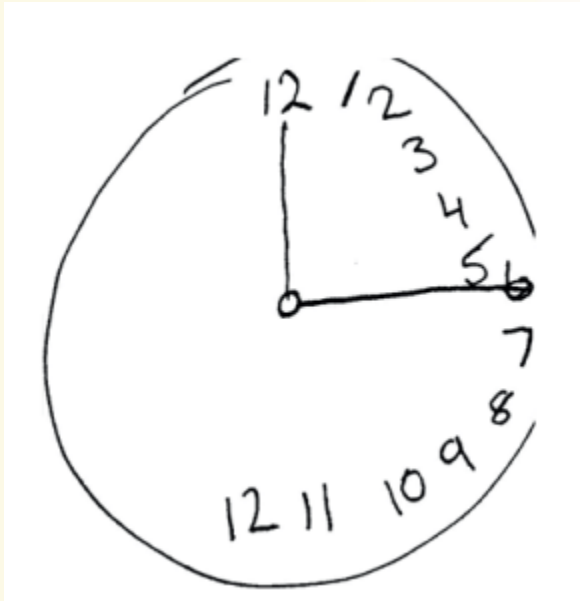
PT:

Non specific to right-brain stroke

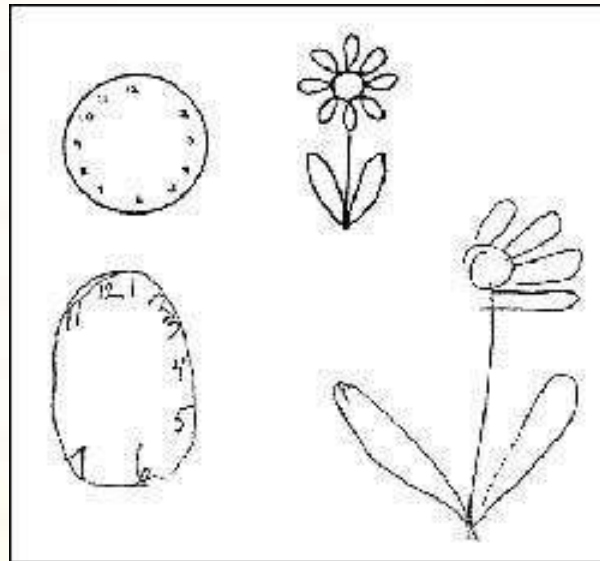


Early Example of Assessment Findings

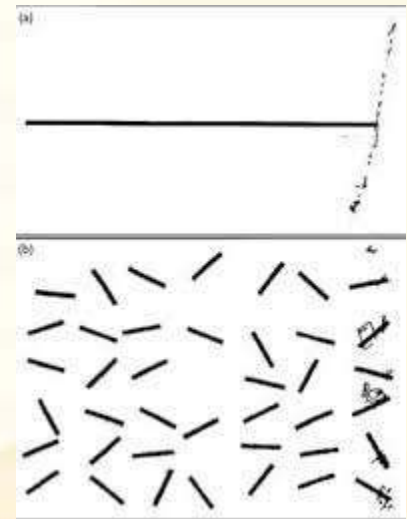
Clock Drawing (various tests)



Copying Tasks



Line Bisection





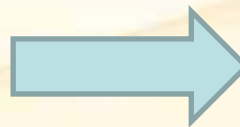
Integrative Treatment Approach

Treatment approach

- Provide the “just right challenge”
 - More compensation → Less compensation
 - Less cluttered → More cluttered tasks
 - Small field → Larger field to scan
 - Stationary → Dynamic tasks
 - Less distractions → More distractions

(Berryman et al. , 2010; Warren, 1998; Warren, 2008)

VISUAL
PERCEPTUAL
DEFICITS



Scanning hallway

Treatment approach

VISUAL PERCEPTUAL DEFICITS

- Incorporation of **kinesthetic/ motor** input
- (Berryman et al. ,2010; Luukkainen-Markkula et al., 2009; Profitis, et al., 2013; Spaccavento et al., 2016; Warren, 2008)



Treatment approach

- Lighthouse adaptation
(Niemeier, 1998; Pereira Ferreira, 2011)

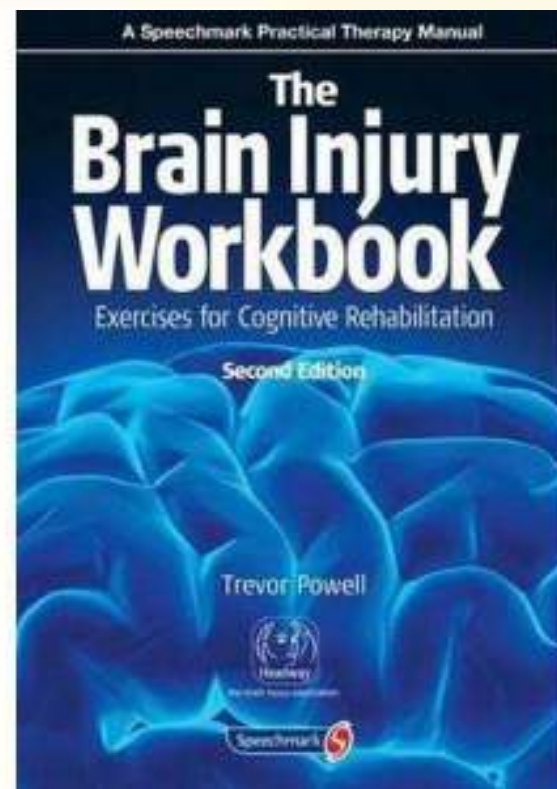
VISUAL
PERCEPTUAL
DEFICITS



Treatment approach

- **SLP / OT specific**
 - Self-rating systems for almost all activities
 - Role play
- **Team approach**
 - Informal rating of activities (*“how did you think that transfer went?” “Did you finish your entire tray – cue to look down at tray?”*)

INSIGHT AND
SELF-
AWARENESS



Example of self-aax questionnaire

INFORMATION SHEET 24

Executive skills questionnaire

Part 1
Living with a brain injury –
Attention, executive, language
& personal skills

Name _____ Date _____

This questionnaire assesses your executive skills. Read each of the statements and mark the box that best describes your behaviour at present. It might be helpful to ask someone who knows you well to complete the questionnaire and fill in the independent scorer column.

Scoring Agree = 2 Partially agree = 1 Disagree = 0

Question	Score					
	Self-score			Independent scores		
	Agree	Partially agree	Disagree	Agree	Partially agree	Disagree
1 I have difficulty planning and organising.						
2 I have difficulty doing more than one thing at a time.						
3 I have difficulty weighing up the pros and cons, deciding on what is important and making decisions.						
4 I sometimes misinterpret the actions of others and 'get the wrong end of the stick'.						
5 I am more impulsive, acting without thinking of the consequences.						
6 I often 'go off at tangents', or move too quickly from one idea to the other in conversation.						
7 I have difficulty summarising information, 'getting to the point', or 'seeing the wood from the trees'.						
8 I tend to hold firm, 'black and white' or rigid views.						
9 I have problems planning realistic goals, and working out the steps to achieve those goals.						
10 I sometimes have difficulty switching attention quickly in a fast-flowing conversation.						
TOTAL SCORE						

INTERPRETATION

Self-score

10-20: This suggests that your executive skills could be improved.

Discrepancy between self-score and independent score

5-20: This suggests that you may not be fully aware of your executive skills problems, or are denying them.

How relevant did you find this sheet? Very ☐ Slightly ☐ Not very ☐ What was the most important point for you?

Treatment approach

Cognitive impairments

- Encourage clients to “STOP, THINK then DO”
- Help to break the task down
 - Would you do this or that first...
 - What would you do first, second....
- Reflect on the performance with the client



(Vossel et al., 2013)

Treatment approach

Cognitive impairments

- Use visual cues to...
 - Slow patient down
 - To problem solve
- How...
 - Reading / Scanning
 - Walking
 - Within home environment



(on walker/wheelchair)

Treatment approach

Tangential / verbose speech

- **SLP specific**
 - Use **post-it notes** for interruption and/or every **minute of speaking** without break
 - Use **timer**
 - **Presentation** and **summarizing** tasks within time limit (“say XXX information in 3 minutes”)
- **Team approach**
 - Physical cue (pre-determined by SLP/staff) for partner’s turn
 - Other cue (such as **saying patient’s name**; hand up to indicate it’s partner’s turn)



Treatment approach

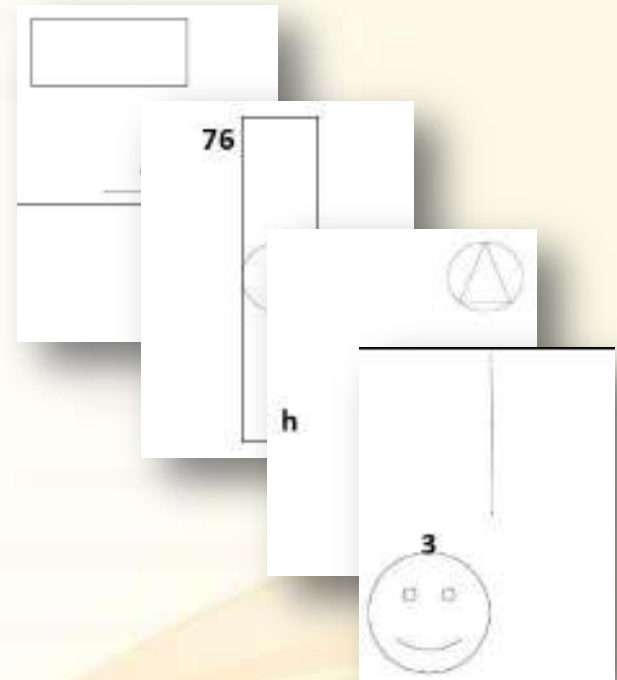
Attention / self monitoring

- **SLP Specific**

- “Liners” activity. Excellent for summarizing speech, attention to detail, turn taking, verifying information, and auditory comprehension.

- **Team approach**

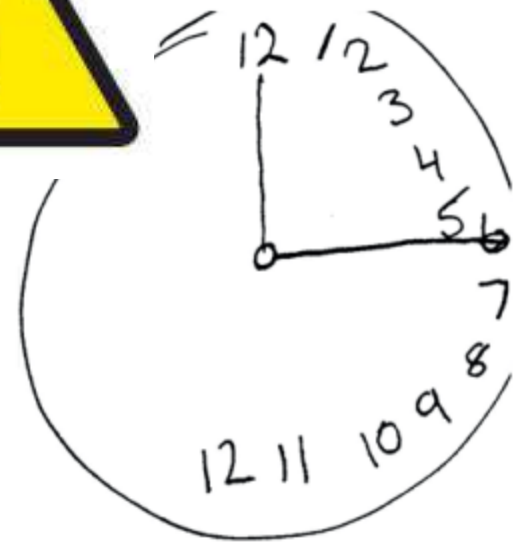
- Incorporate verifying with patient
- Watch out for “head nodders”!



Treatment approach

SAFETY

- **Unilateral neglect**— associated with falls, increased rehab stay and increased assistance required on D/C.
- **Impaired sensation and position sense** increases risk for injury to L LE/UE during transfers and ambulation/wheelchair mobility.



Treatment approach

SAFETY

- **Consider:**

- **Aircast** for support to L ankle
- **theraband wrapping** of L knee and ankle
- development of stroke teams (OT, PT, Nurse) to improve consistency with transfers and mobility.



Treatment approach

Incorporate use of
Left Arm and Leg

- Ensure attention is paid to **proprioceptive, sensory impairment, positioning and feedback** during treatment.
- Proprioceptive and sensory impairment linked to **Complex Regional Pain Syndrome** (or RSD) – negatively impacts recovery, and is associated with **increased rehab stay,** and **increased assistance required** upon D/C.



Treatment approach

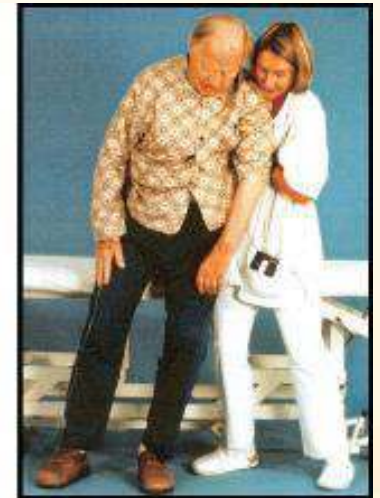
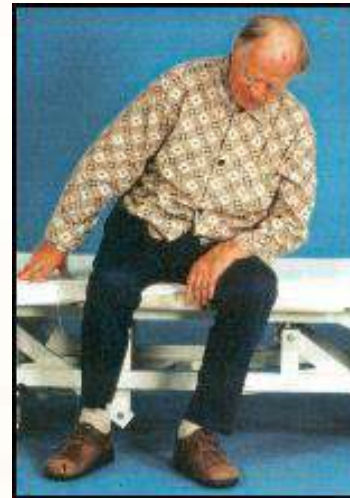
Incorporate use of Left Arm and Leg

- **PT specific interventions:** use L LE/UE with standing with R knee on ball/ R foot on slider, stepping activities.
- **Team approach:**
 - Incorporating affected UE in **weight bearing** or **active use** for ADLs
 - **use** of L LE and UE (if possible) for wheelchair propulsion
 - **use** of L arm for gait retraining (walker splint)
 - **consistent message** for incorporating UE/LE during bed mobility, transfers and sitting and standing tasks



Treatment approach **Pusher Syndrome**

- Frequently associated with **proprioceptive disorder** and **hemineglect**.
- Syndrome referred to as a **positive/productive manifestation** of neglect.
- **Abnormalities in body geometry** have a clear link to **R brain damage**.
- Close connection noted between **neglect** and **pusher syndrome** after R hemisphere CVA.



Treatment approach **Pusher Syndrome**



- **PT/OT specific strategies** such as side-saddle, ambulation with arm vs wall/holding handrail.
- **Team Approach:** to provide **consistent cues to encourage midline orientation** for bed mobility, sitting balance, transfers
 - assist on unaffected side to decrease push
 - transfer to L side where possible
 - leaning on theraball

Most importantly...

- Collaborate with the **team** and **FAMILY / FRIENDS** of patient
- What is functional?
- What is motivational? (client's interests!)





Team Tips



- Clear, specific, and **simple** verbal instructions
- Gain **eye contact** first before speaking
- Use **gestures** to help
- **Verify** the person has understood (eg. *“Ronny, can you tell me what I just explained?”*)
- If appropriate, **use physical or verbal signal** (eg. *light touch on shoulder, using person’s name when starting to talk*) to indicate it’s **your turn to talk**

Team Tips



- Bed selection which encourages patient to look to the left
- Encourage scanning left to right
- Red tape on left side of tray
- Wash/shave/touch left side of body
- Hand in active support or use of left upper extremity to assist with functional tasks
- Ask specific questions/encourage problem solving

Team Tips



- Falls prevention for those with motor deficits
- Environmental protection for those who are ambulatory
- Family education re: safety risks associated with cognitive/perceptual impairment as not always obvious given verbal abilities

Questions?

Thank you!

June 8, 2017



your health, your hospital