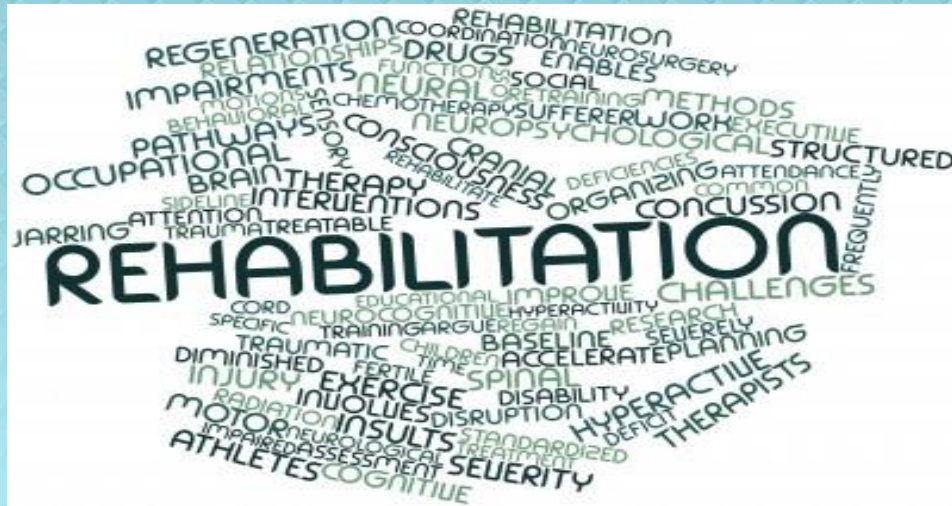


Brain Injury Rehabilitation



abi
Rehabilitation

Overview



- Brain Anatomy
- What is cognition? – What are thinking skills; and how do we help our clients with these
- Pathways of recovery at ABI Rehabilitation
- Case studies - putting this all together

The Brain in a Nutshell



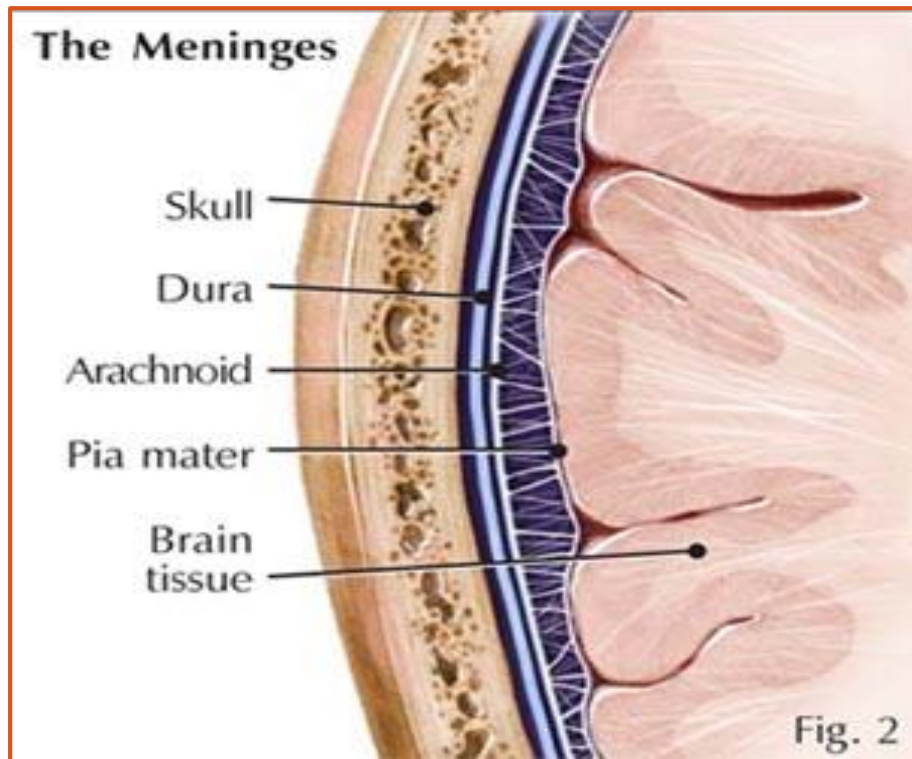
- Control centre for the whole body
- Controls our movement
- Controls our consciousness, how we think, learn and remember
- Controls our personality
- Controls our heart rate, breathing and blood pressure
- It is soft and squishy, like jelly, so is quite easy to damage

The Unfixed Brain

- [The Unfixed Brain](#) – a YouTube video



The Meninges

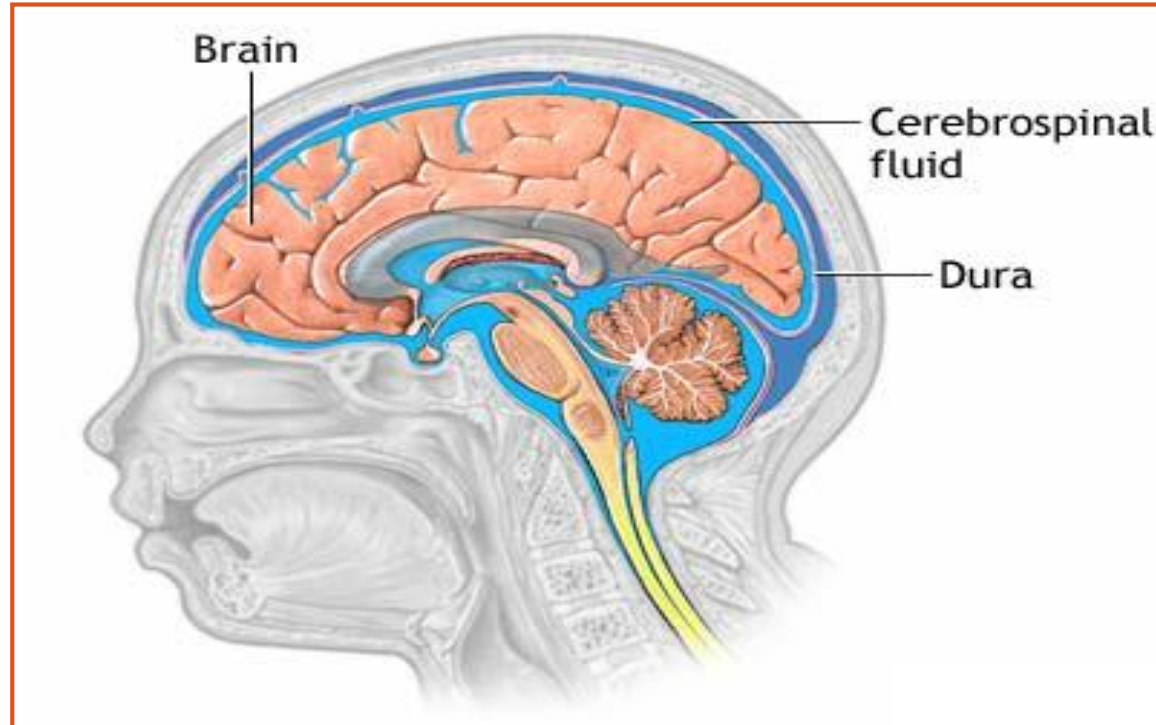


Cerebrospinal Fluid (CSF)

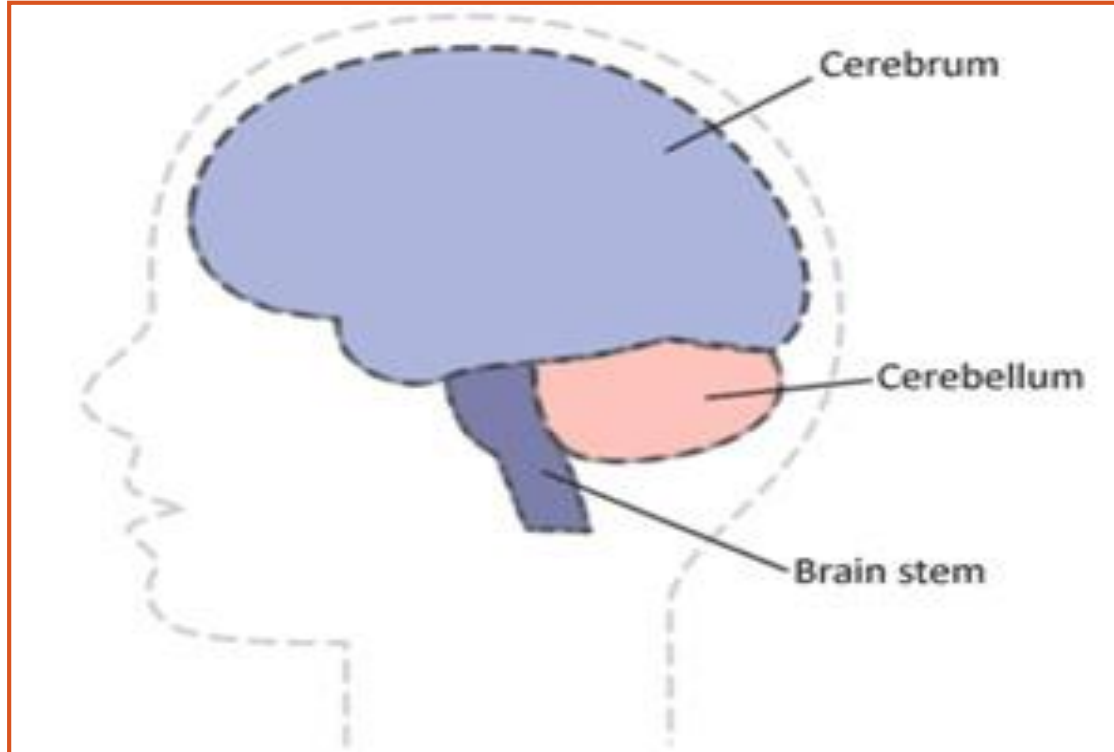


- The brain “floats” in cerebrospinal fluid (CSF), which protects it against damage
- The brain also has holes in it (called ventricles) that the CSF passes through

Cerebrospinal Fluid



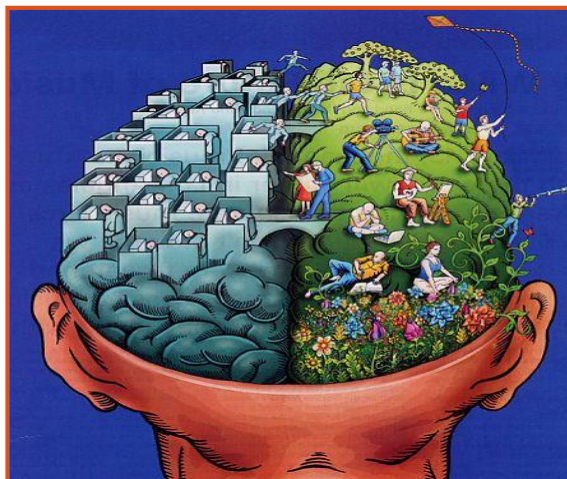
Structure of the Brain



The Cerebrum

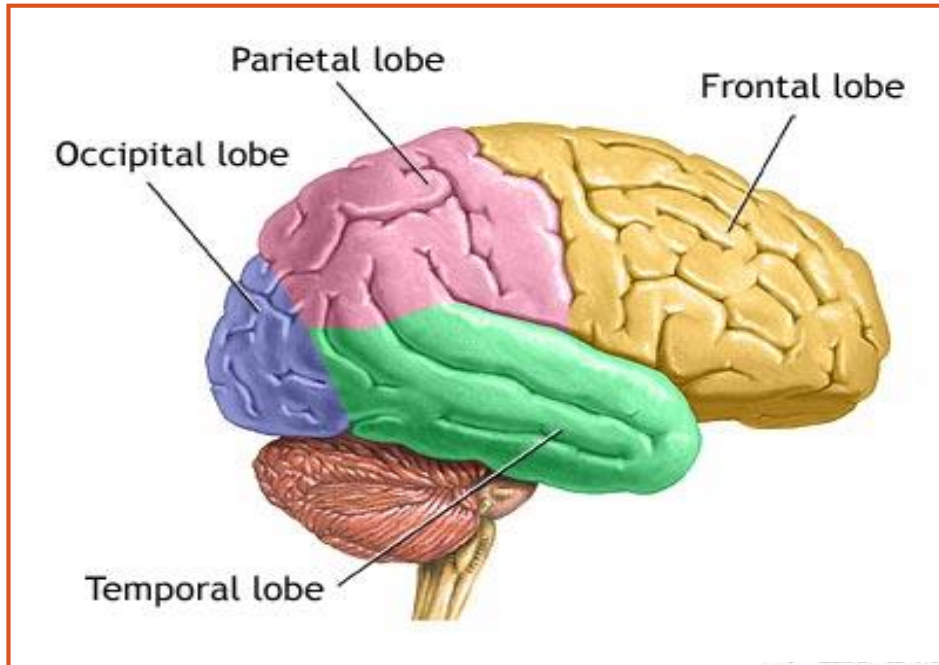
Left and Right Hemispheres

- The left side of the brain controls the right side of the body, and vice versa



The Cerebrum

- The cerebrum can be divided into four areas, called **lobes**



The Frontal Lobe



- The frontal lobe is like the manager of your brain – it is the part of your brain that helps make decisions and solve problems
- Some people with frontal lobe damage find it hard to think flexibly and solve problems

The Frontal Lobe



- We often talk about the frontal lobe having three “buttons,” which can be damaged
 - “Start” button
 - “Stop” button
 - “Oops” button

The Temporal Lobes



- People with damage to the temporal lobe often have problems with making new memories
- People with damage to the LEFT temporal lobe might have problems with language
 - Hard to understand other people
 - Hard to find the right word to use

The Occipital Lobes



- The occipital lobe is mainly involved with vision
- People with damage to the occipital lobe might find it hard to see parts of objects, might have problems recognising colours, or see things that aren't really there

The Parietal Lobes



- The parietal lobes are complicated
- They take information from all of your senses and “put it together”

The Parietal Lobes



- People with damage to the parietal lobes might have problems with:
 - Movement
 - Sensation (feeling things)
 - Reading and writing problems
 - Naming objects

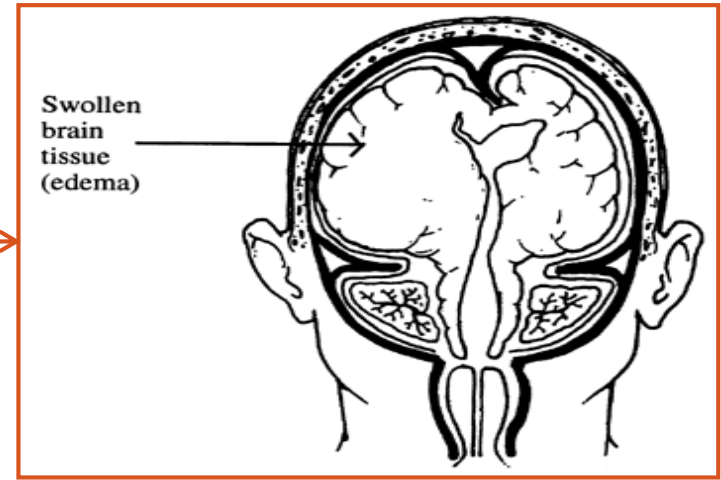
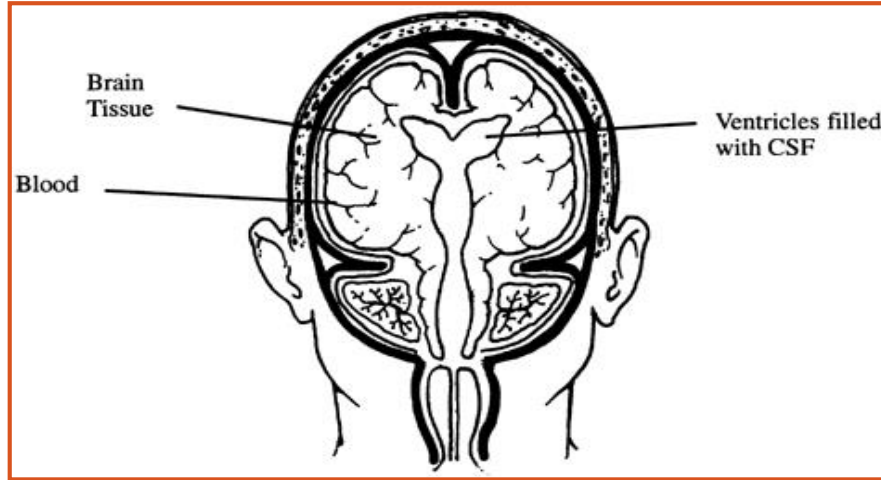
What Happens when a Brain is Injured?

Brain Injury



- When the brain is injured, the body starts a healing process, sending chemicals to the brain to help it repair
- This healing process causes the brain to swell
- The brain is in a very tight box (our skull), which means that this swelling can unfortunately cause more damage

Brain Swelling



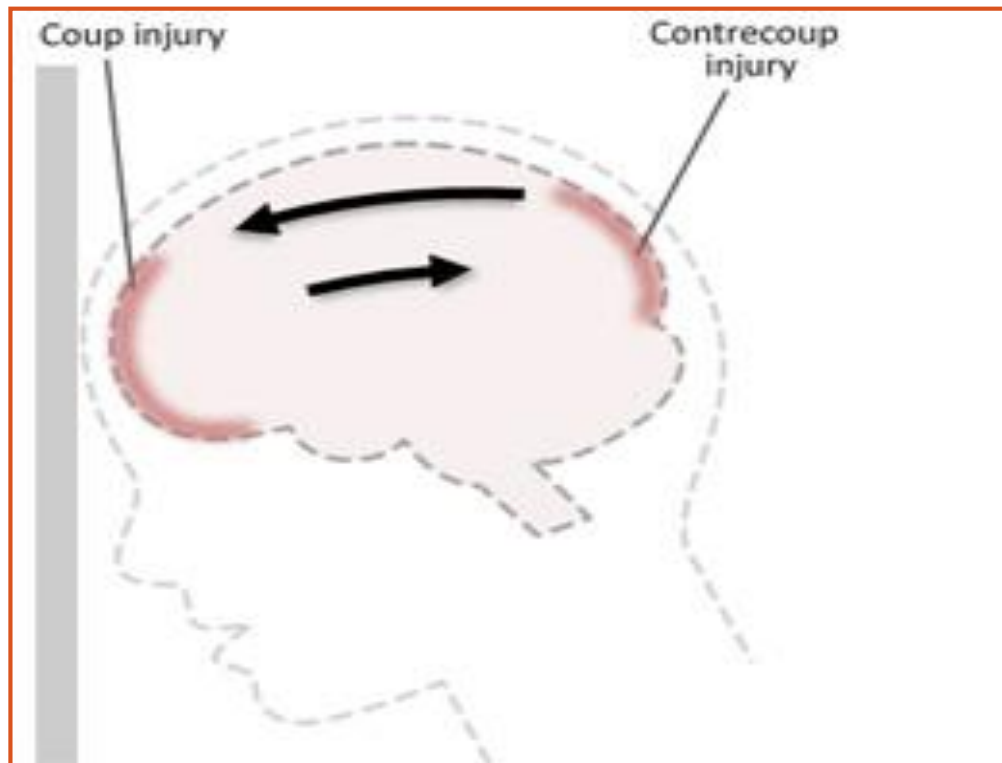
Sometimes, when the pressure inside the skull gets too high, a piece of skull is removed to give the brain more room to swell.

Contusions



- Contusions are like bruises on the brain
- Like a bruise on our arm, blood vessels in the brain break and leak blood out, which causes it to swell
- If our head is hit hard enough, our brain bounces around in our skull, which can cause bruises in other areas – this is called a **coup-contrecoup (or doof-bang)** injury

Contusions

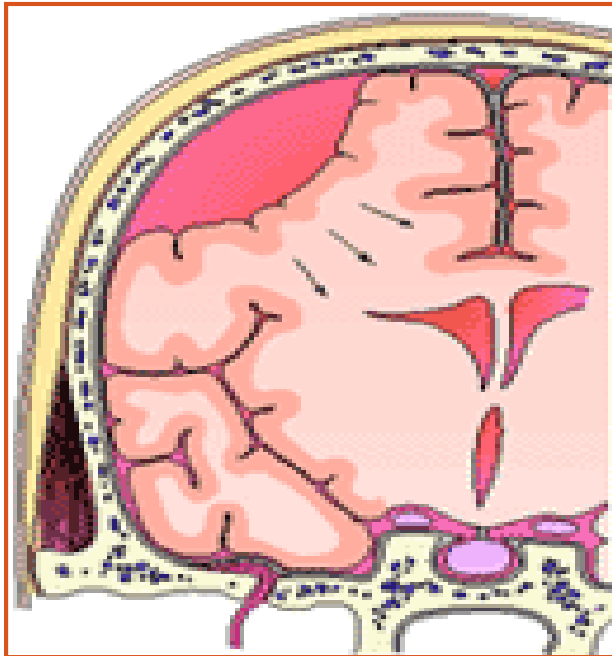


Haematomas / Haemorrhages

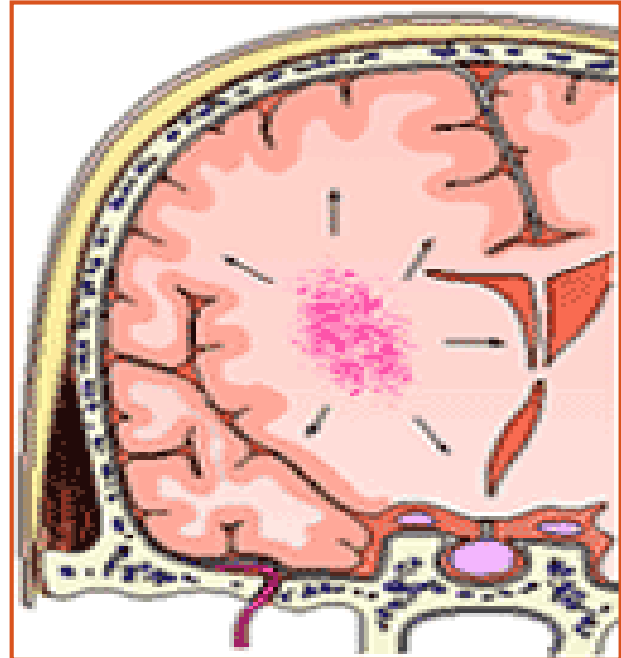
- A haematoma is a collection of blood
- This blood can collect:
 - In the meninges around the brain
 - Epidural, subdural, subarachnoid haematomas
 - Inside the brain itself
 - Intracerebral haematomas

Haematomas / Haemorrhages

Subarachnoid Haematoma



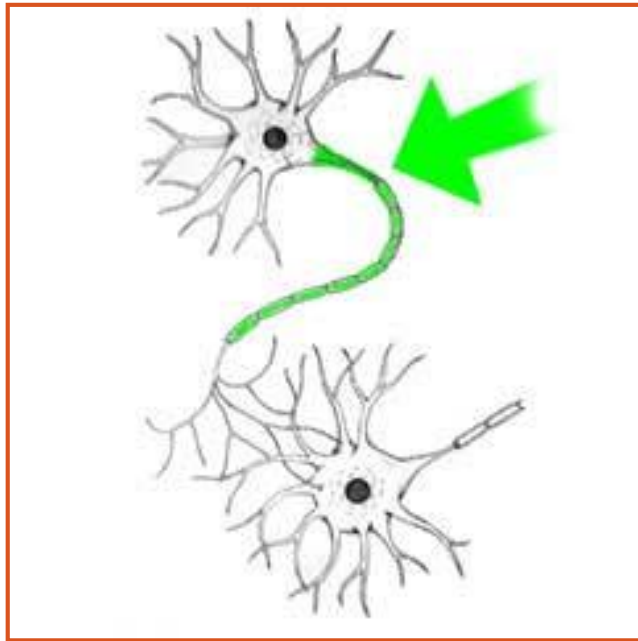
Intracerebral Haematoma



Diffuse Axonal Injury



- The brain is made up of billions of cells called neurons
- They talk to each other like circuits in a computer through connectors called axons
- If the brain bounces around in the skull a lot, the axons can be damaged or torn in places all over the brain



Recovery from Brain Injury



- Neurons that have died during the injury cannot grow again

BUT...

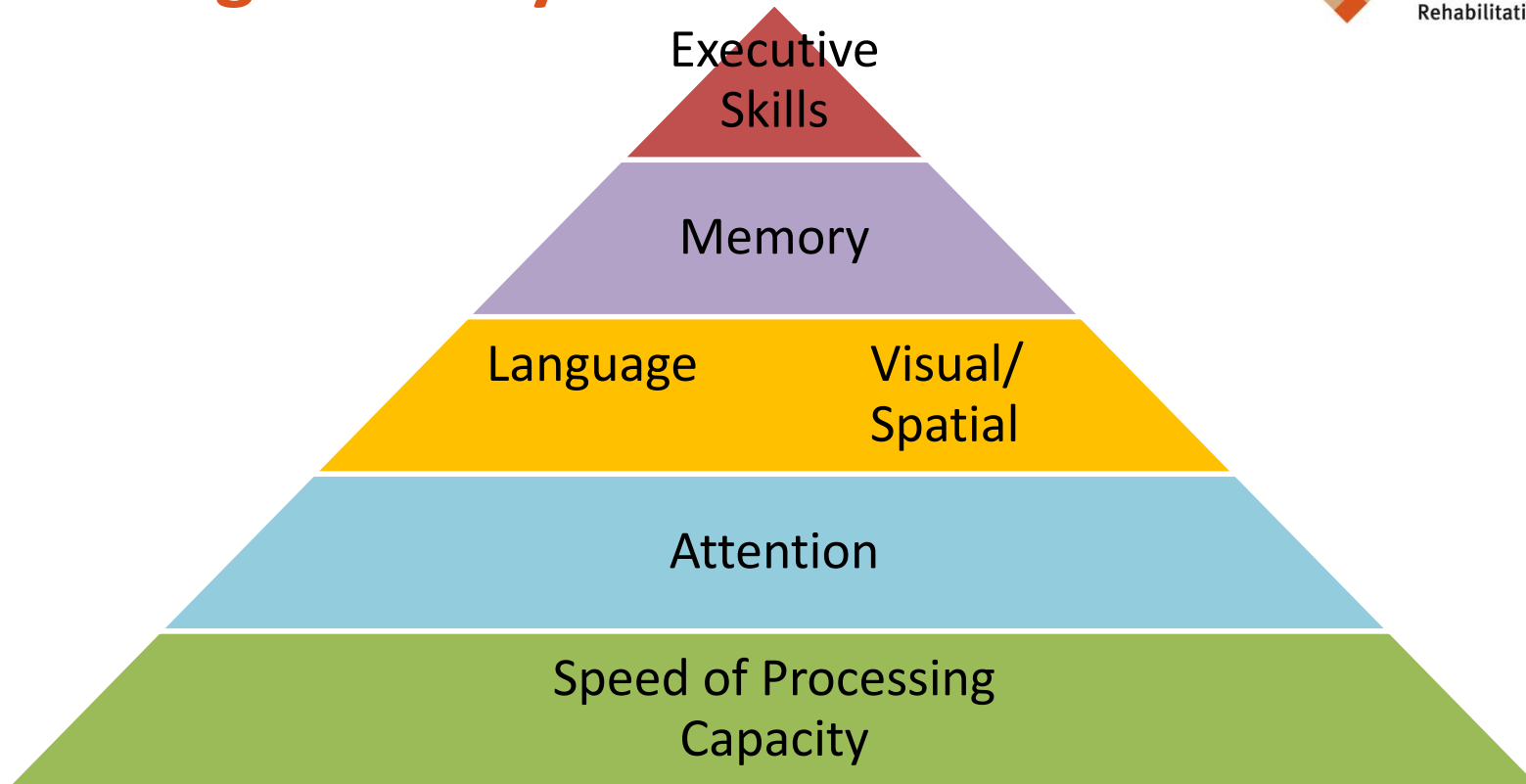
- The brain is able to start building new connections between other neurons – this is why people improve after a brain injury



What is Cognition and why does this matter?



The Cognition Pyramid

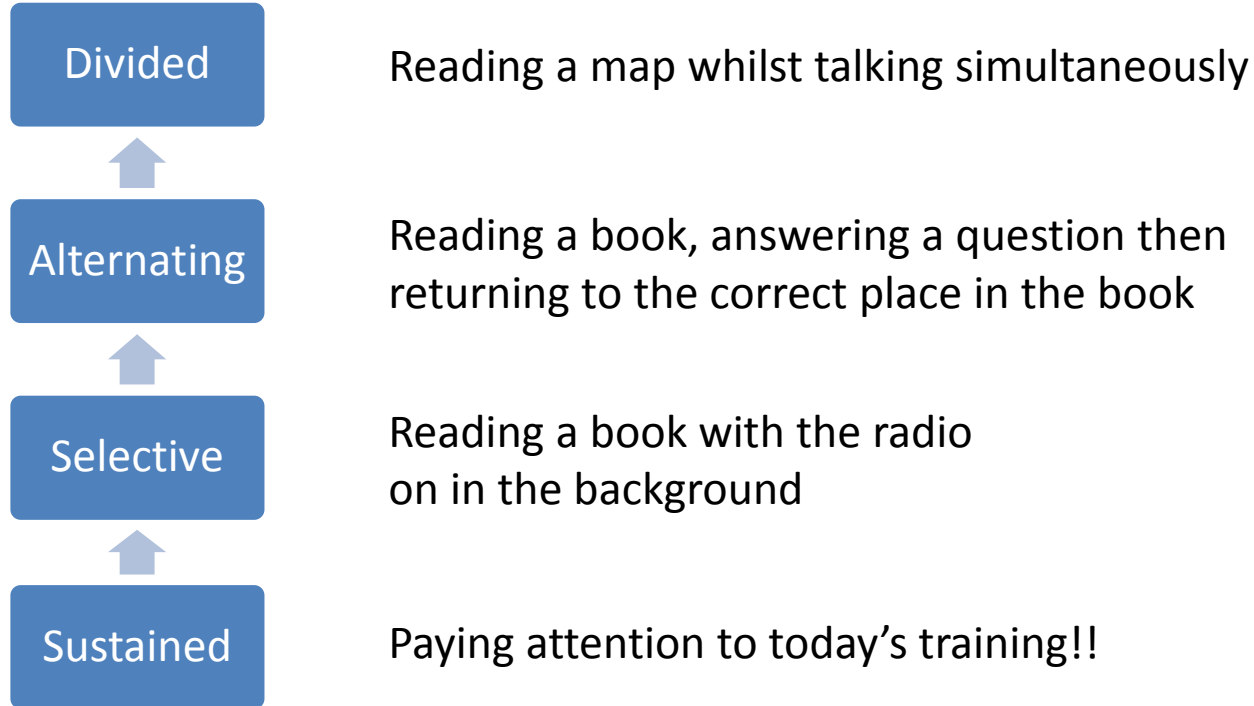


Speed of Processing and Capacity



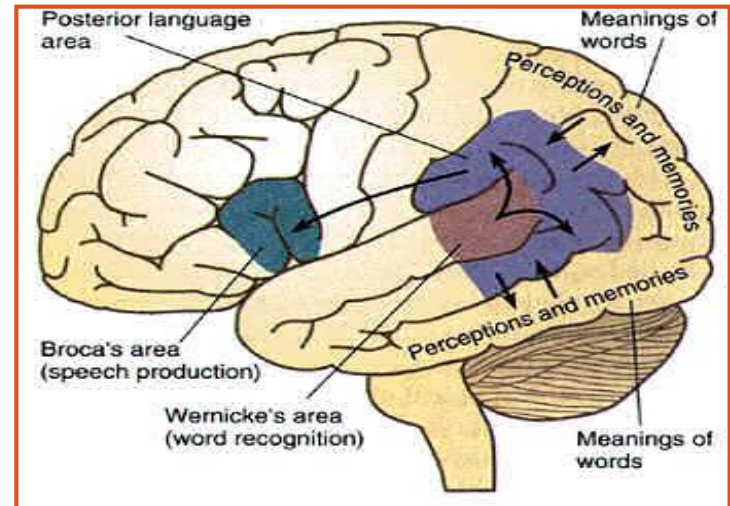
- Imagine a bucket of water and a constantly running tap
- This is the amount of water or information we can hold in our mind for any one time
- Following TBI the size of the bucket is smaller and the tap is running faster
- Therefore more details are spilling over and being missed entirely

Attention



Language

- Understanding and expression of a spoken or written language. Individuals with a specific disorder of language have aphasia.
- Four main modalities
 - Verbal - Speaking
 - Auditory - Listening
 - Reading
 - Writing

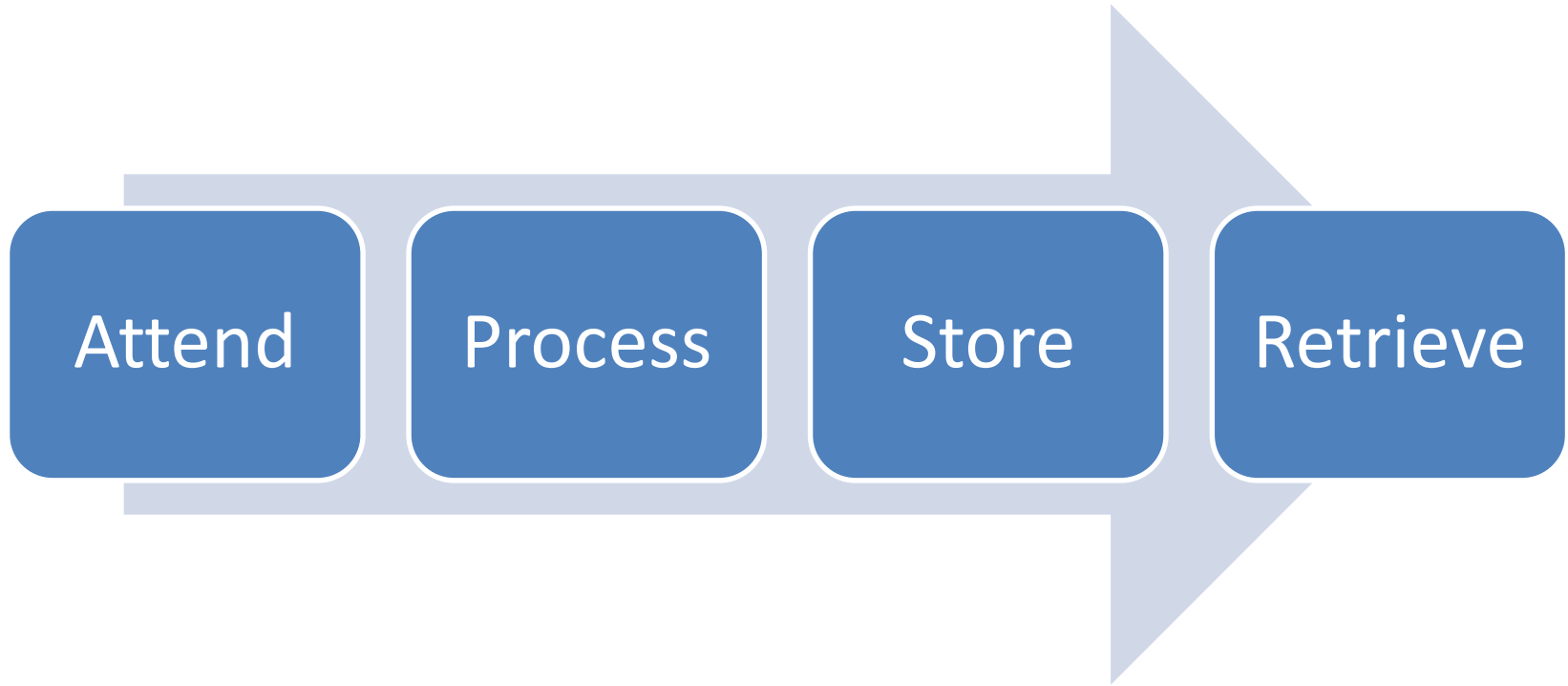


Visual / Spatial Processing



- This is the processing and “recording” of information that we see.
- Our brains have to turn the images from our eyes into pictures of our environment and make sense of these pictures, this includes the people, objects, distances, shadows, overlapping items.
- They are “recorded” or stored depending on our understanding and overall meaning we place on this.

Memory



Executive Functioning



- Executive skills are the highest skills in the cognitive pyramid
- The term executive skills describes a set of cognitive abilities that control and regulate other abilities and behaviours
- We often like to think of executive skills like the manager of a business. A manager needs to plan, organise, direct, control, set goals, initiate a plan, monitor the work, make multiple decisions and solve problems that arise in the business
- These skills are crucial for us to be able to function independently at home, work or in social situations

Common Difficulties with Executive Functioning after Brain Injury



- Step back
 - The ability to step back and view a situation before jumping in impulsively and not thinking about things first.
- Initiate and stop actions
 - Starting and stopping an activity without help from anyone.
- To monitor and change behavior as needed
 - Being able to determine the appropriateness and effectiveness of a task you have done and recognise and fix mistakes.
- To plan and organise
 - To plan and organise tasks before doing them.

Common Difficulties with Executive Functioning after Brain Injury (cont'd)



- Problem solve
 - To come up with a solution when faced with a problem or new task.
- Being flexible
 - To be able to adapt to changing situations and other points of view and think of alternative options.
- To form concepts and think abstractly
 - Being able to create concepts and ideas and to think outside the square.
- Self awareness
 - To have an awareness of your strengths and weaknesses and anticipate future difficulties. Think about your thinking.

Toolbox of Strategies to use with our Clients

Strategies to help with Cognitive Functions

- Grade tasks, monitor and write down progress to feed back to the person
- Eliminate distractions and background noise
- Create structure out of situations that are unstructured
- Try to avoid monotony by varying daily activities
- Encourage people to pace themselves and not to rush through tasks or activities
- Intellectual stimulation is important. Try to play games that require the person to think, such as scrabble or Sudoku
- Listening to music and playing with pets can help people relax while keeping their minds active at the same time

Strategies to Improve Processing and Capacity



- Improving the way in which information is delivered through:
 - Encouraging people to speak slower.
 - Encouraging others to present smaller messages or amount of information.
 - Have all important information written down to supplement the verbal information.

Strategies for Attention Difficulties



- Simplify information
- Remove distractions
- Structure activities to limit the demands on attention
- Prompt them to make an effort, e.g. “I am about to tell you something important...”

Strategies for Language Difficulties



- Speak face-to-face in a quiet environment
- Speak slow and clear
- Allow time for clients to respond
- Always use pen and paper to assist the client and communication partner to get the messages across
- Use body language, gestures, and pointing to objects/pictures to supplement verbal messages

Strategies for Visual Processing



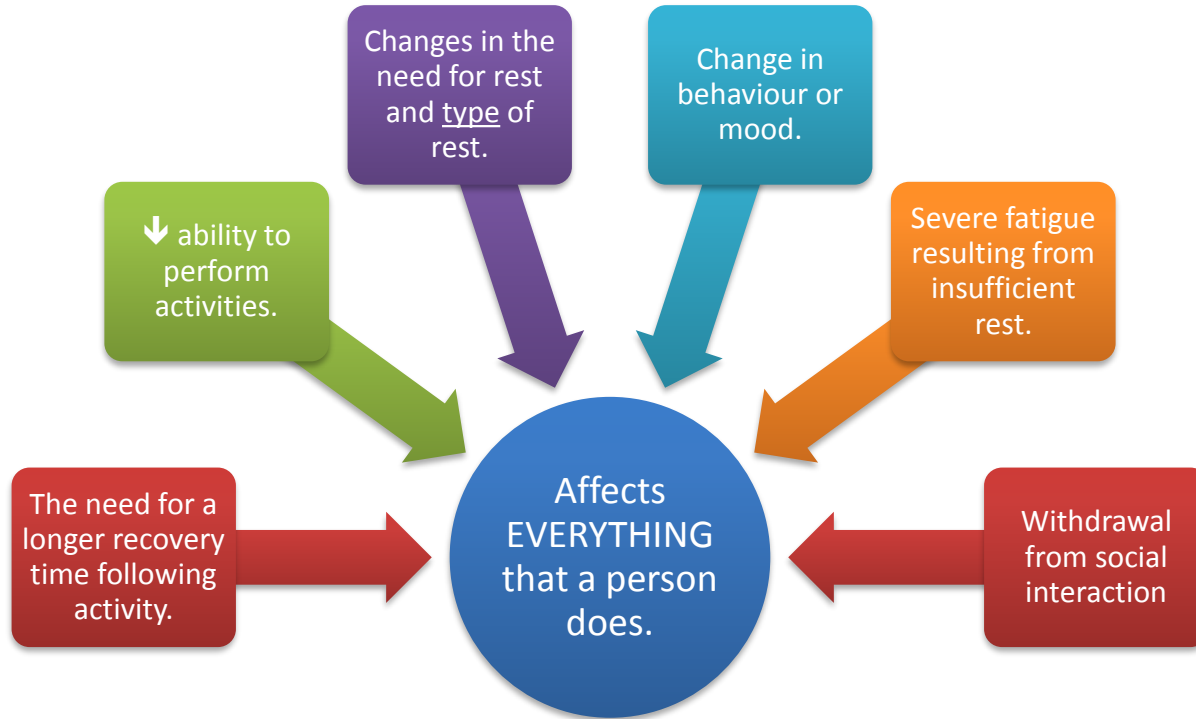
- Ensure clients have the correct glasses / lenses
- Refer to eye specialist if any concerns
- Some clients use eye patches to improve double vision
- All written information may need to be enlarged
- Use a line guide whilst reading

What is Fatigue?



- Fatigue is a medical term that describes tiredness, exhaustion and lack of energy.

Impact of Fatigue

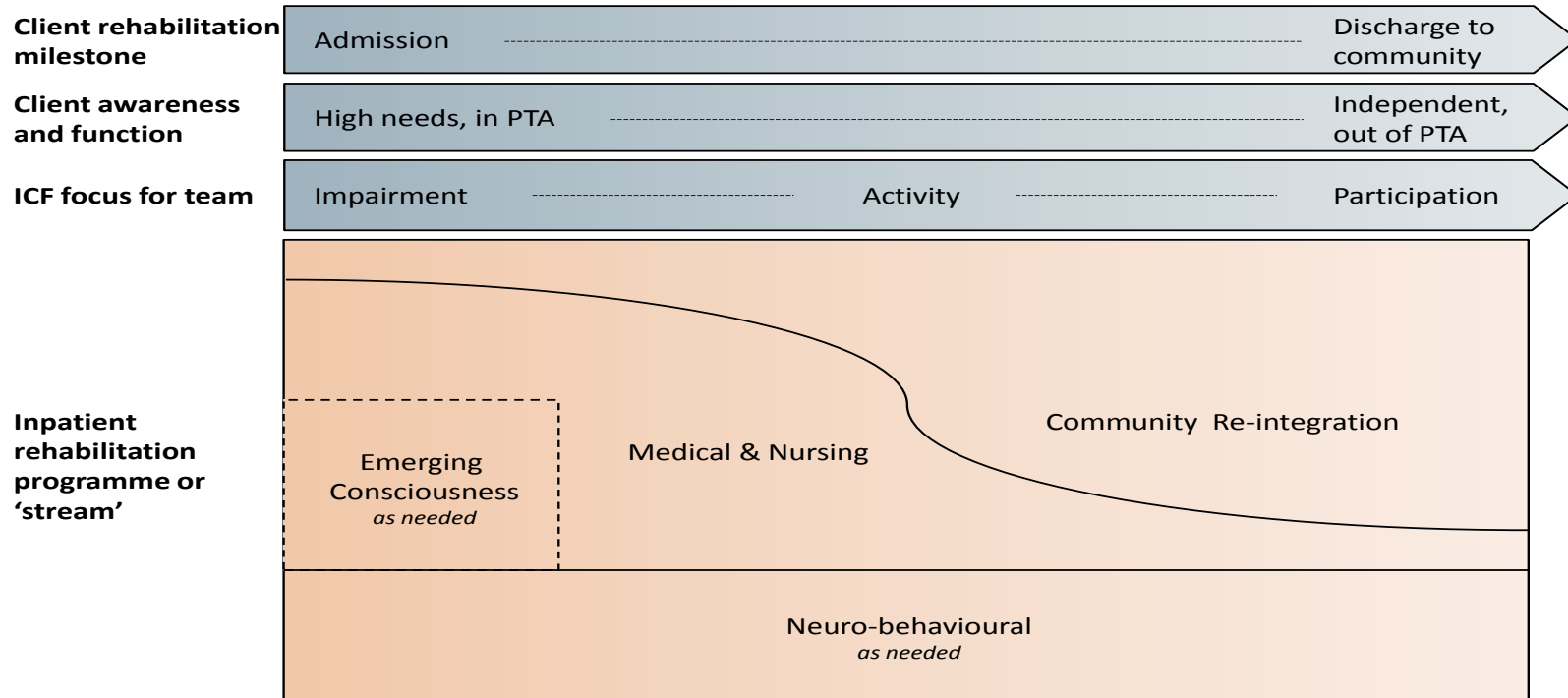




Pathways of recovery at ABI Rehabilitation



Integration of Rehabilitation Programmes at ABI Rehabilitation



Minimally Conscious State



- The MCS is a condition of severely altered consciousness.
- Clients usually have clear sleep and wake cycles.
- Clients are starting to have basic but minimal awareness of their environment.

Rehabilitation vs Care



- Rehab and care are one in the same when the client is minimally conscious.
- Every contact with staff should be therapeutic
- Each successful contact and experience builds on one another and prepares them for future therapy
- Daily cares should include constant orientation
 - Info of where they are, day, time, discuss any noises that are heard (mowing the lawns)
 - Who we are and what we are about to do
 - Talking about their interests or pictures on wall of family
- Stimulation should be no more than 30 minutes
 - Oral cares
 - Bed washes etc
 - If cares can't be completed within 30 mins time for rest should be allocated (30-60 mins)

AT – 22/Male



- Injured in Feb 2016
- Admitted to ABI Rehab ECP service in March 2016
- Multiple hospital admissions: May – December 2016
- Discharged from ABI Intensive to his own home in March 2017!!

AT – 22/Male - scan

Severe traumatic brain injury:

- L) base of skull fracture
- Bi-lateral subdural haematoma (SDH)
- Subarachnoid haemorrhage (SAH)
- L) scalp Fracture
- Bi-lateral frontal contusions
- Extensive cerebral oedema •4mm midline shift
- Parenchymal haemorrhage in pons anterior to base of 4th ventricle

AT – 22/Male – Secondary conditions



- Dense R) hemiplegia
- Pain and muscle spasms/cramps
- Muscle spasticity
- Limb contractures
- Decreased initiation
- Dystonia and tremors
- Dysphagia
- Plantar Flexion Contracture – Bilateral resting splints put in place
- Fatigue
- Craniectomy/No bone flap
- Readmitted to WPH twice for aspiration pneumonia and urosepsis

AT – 22/Male – Intensive Rehabilitation



- Rehabilitation consultant, Neurosurgery
- Physiotherapy
- Occupational Therapy (OT)
- Speech-language Therapy (SLT)
- Rehabilitation Nursing
- Dietitian Input
- Rehabilitation Assistants
- FAMILY

AT – 22/Male – Needs on discharge



- AT and Family – person-centred rehabilitation
- GP
- Community Nursing Rehabilitation
- Community Physiotherapy, OT & SLT
- Dietitian Review

Transition to Home and Community

Community Re-Integration

Community Re-Integration Phase



- The community re-integration programme at ABI Rehabilitation is the final phase of intensive rehabilitation
- During this time the rehabilitation team works to help prepare clients to return home and to address any barriers that might make this difficult
- What barriers do you think might make this difficult?

Community Re-Integration Phase



- The focus is on increasing clients' independence and confidence in daily activities, participating in their community, and resuming meaningful life roles
- The team also works to ensure that the necessary supports are in place before clients are discharged from the facility

Life Roles



- **Family / Whanau Relationships** – partner, parent, child, sibling, grandparent. Roles and responsibilities change as people grow and develop i.e. children grow up and leave home, grandparents may go from caregiver to cared for
- **Economic Roles** – paid employment to generate household income, managing of household budget to support family (pay rent/bills, buy food, savings)
- **Social Roles** – Membership of teams, clubs, churches, cultural groups as well as interacting with family, friends and colleagues

Life Roles (continued)



- **Community, Cultural and Spiritual Roles** – being a neighbour, volunteering, mentoring, attending groups
- **Vocational Roles** – paid or unpaid
- **Educational Roles** – studying or attending school
- **Civic Roles** – voting in local and national elections, school boards and councils

ROLES CAN BE INTERCONNECTED AND GIVE US A SENSE OF PURPOSE, SELF-WORTH, SELF-IDENTITY AND GENERAL WELL-BEING!



abi
Rehabilitation