

# STROKE REHABILITATION

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# STROKE REHABILITATION

2)

- What are the principles of stroke rehabilitation?
  - Concepts of stroke rehab
  - How the brain learns
  - Re-education of normal movement
  - Positioning
  - Shoulder care

# Part 1

## STROKE

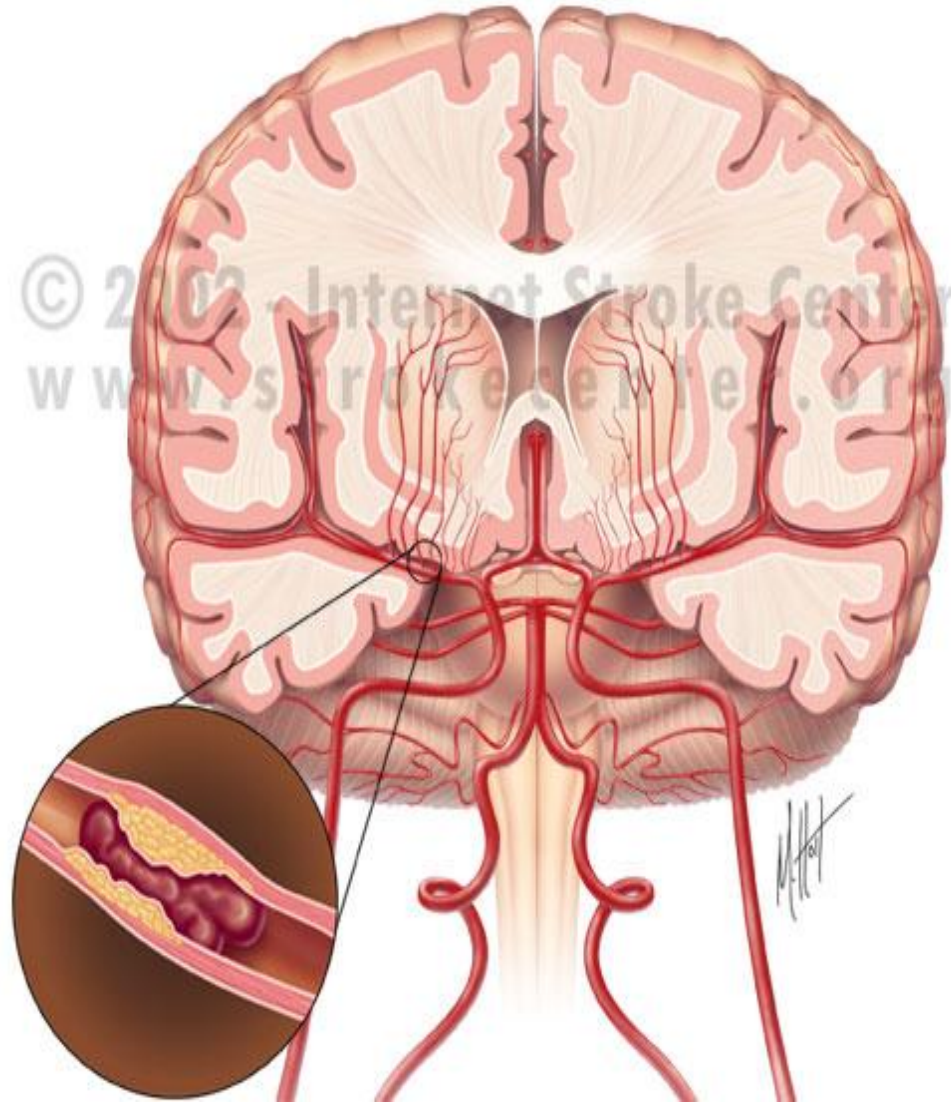
# What is a stroke?

A stroke is when an area of the brain is deprived of its blood supply for 24 hours or more - usually because of a blockage or burst blood vessel - depriving the cells of oxygen and other nutrients. The cells are then damaged or die.

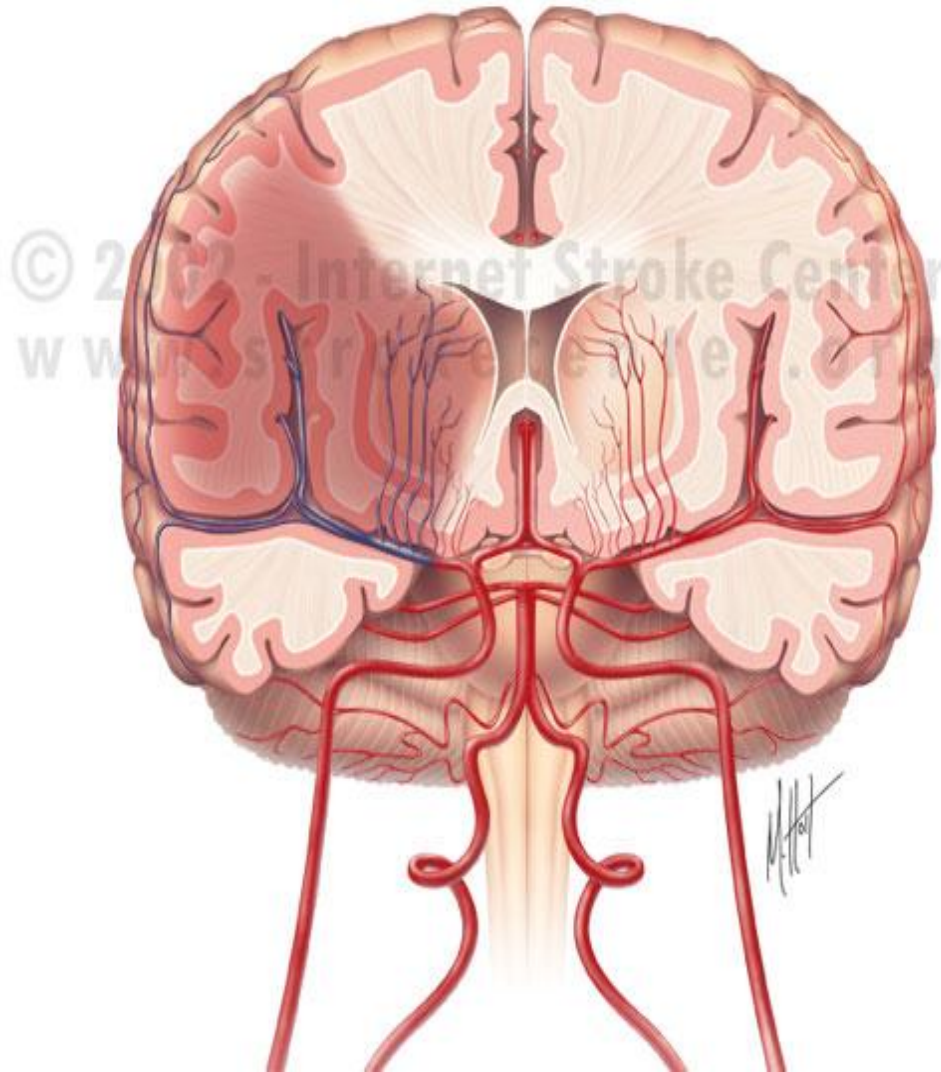
# Ischaemic stroke

- Most common type of stroke (80% of all cases).
- The artery is blocked by a blood clot, which interrupts the brain's blood supply.
- Cerebral thrombosis - a blood clot forms in the main artery leading to the brain
- Cerebral embolism - a blood clot forms elsewhere in the body and is swept into the arteries serving the brain
- The clot eventually travels to a blood vessel small enough to block its passage -> blocking the blood vessel and causing a stroke.
- In atrial fibrillation, where the two upper chambers of the heart - the atria - quiver instead of beating properly, blood is not properly pumped out of the heart.

# Pathology



# Changes



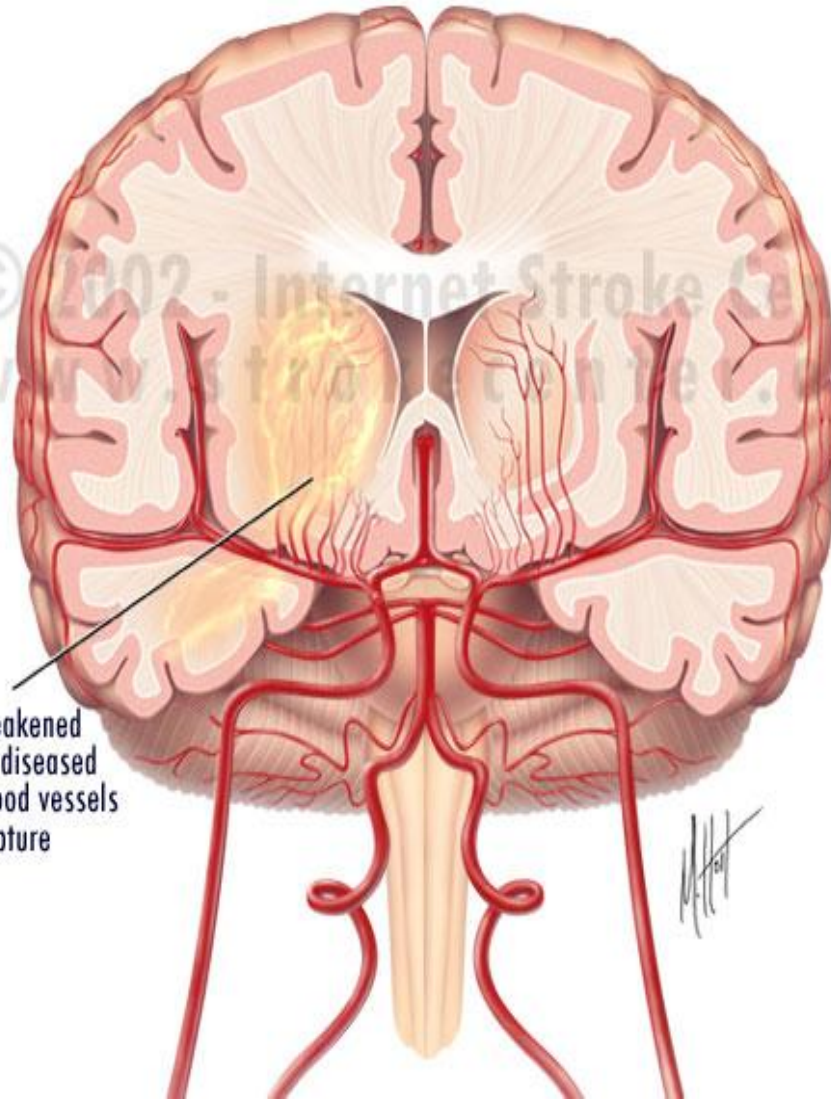


# Haemorrhagic stroke

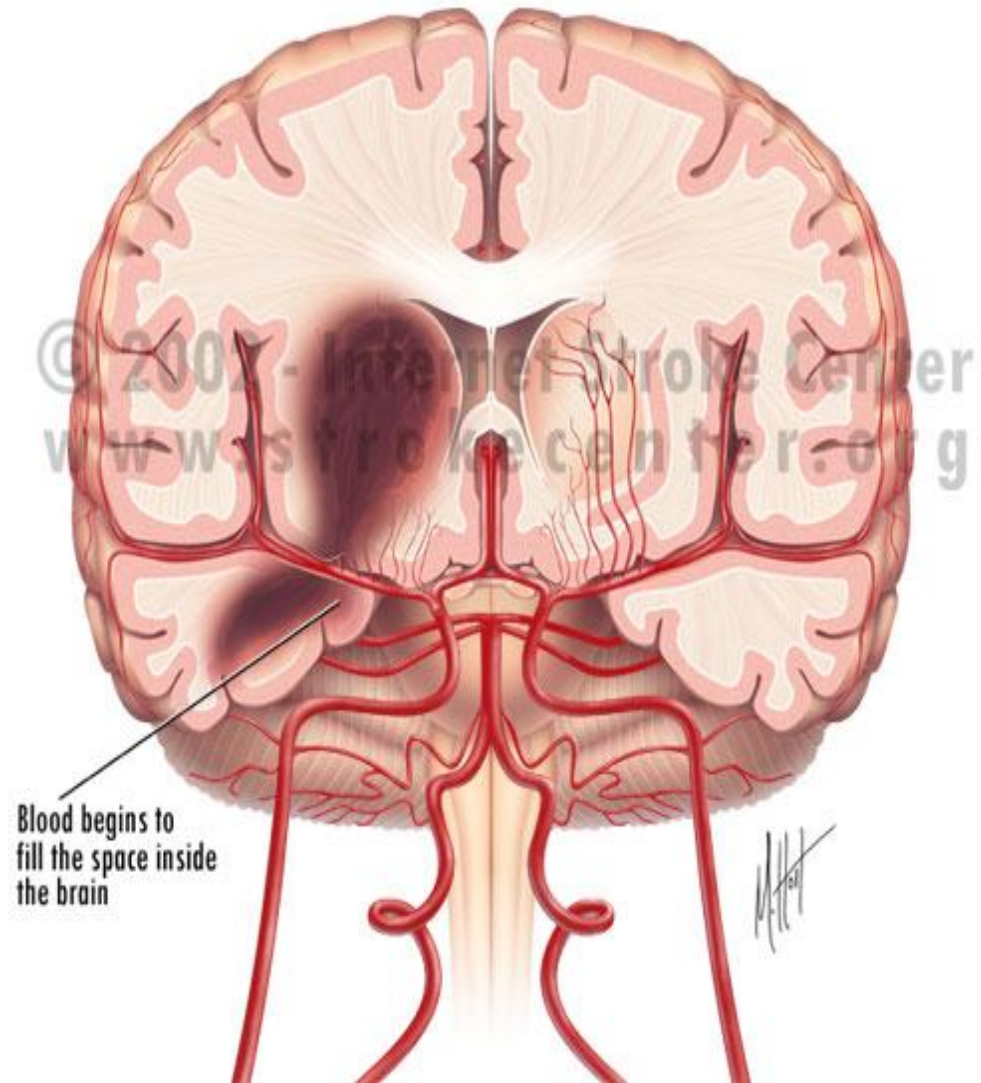
- A blood vessel in or around the brain ruptures causing bleeding, or a haemorrhage. When blood vessels within the brain become damaged, they are more likely to burst and cause a hemorrhage.
- A ruptured blood vessel will leak blood into the brain, eventually causing the brain to compress due to the added amount of fluid.
- The build up of blood presses on the brain damaging its delicate tissue, while other brain cells in the area are starved of blood and damaged.

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Weakened  
or diseased  
blood vessels  
rupture



# Pathology



# Risk factors

- **Age**
- **Smoking**
- **Alcohol**
- **Cholesterol**
- **Blood pressure**
- **Physical inactivity**
- **Obesity**
- **Diabetes**
- **Previous medical history**
- **Stress**

# Presentation of stroke patient

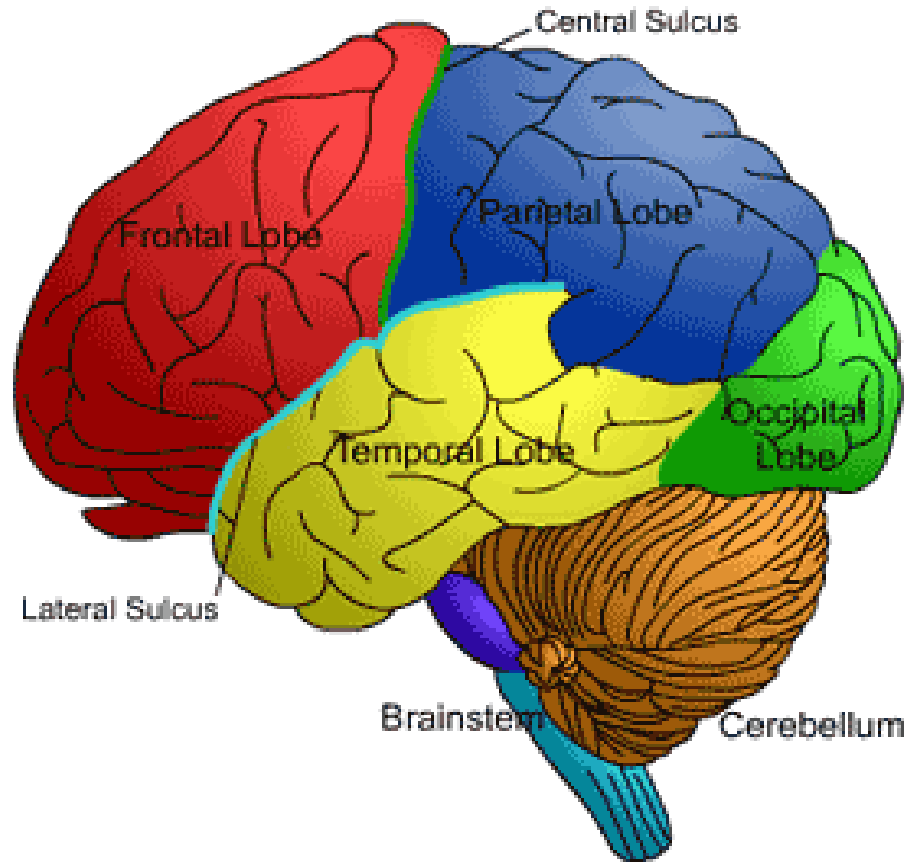
Patients can develop complex problems after a stroke that relates to where in the brain the stroke has occurred.

## Potential functions that can be affected after a stroke:

- Movement
- Feeling (sensation / proprioception)
- Speech
- Co-ordination
- Balance
- Memory / cognition
- Looking to stroke side – vision / perception

# Anatomy

Figure AB-11: Lobes of the Brain

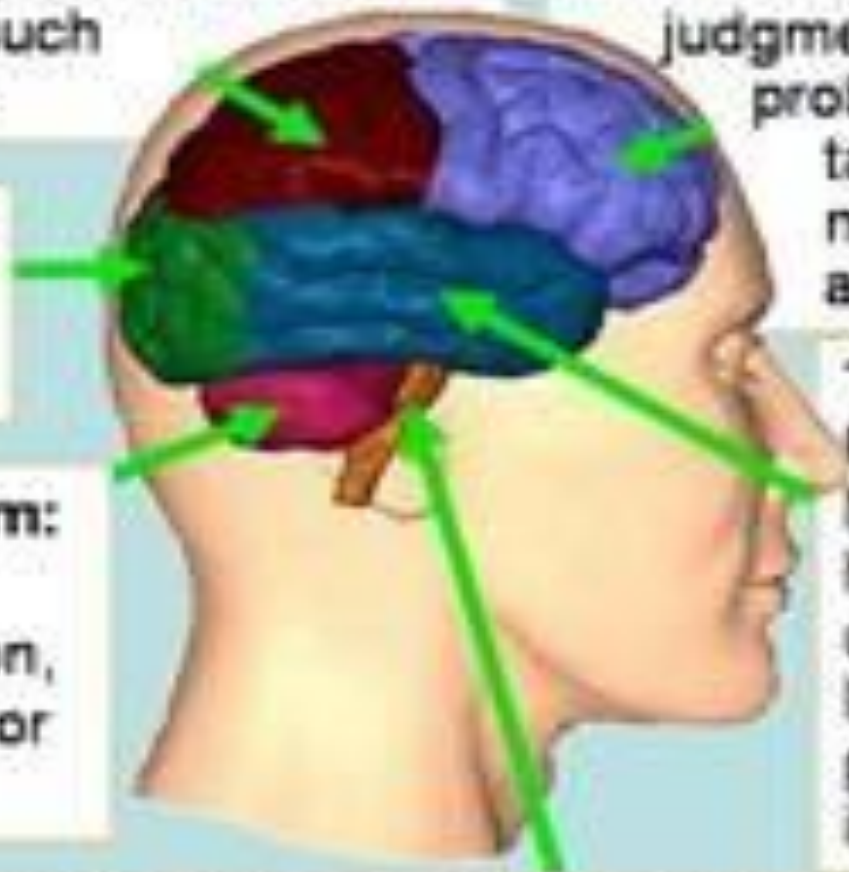


**Parietal Lobe:** Sense of touch, awareness of spatial relationships and academic functions such as reading

**Frontal Lobe:** Emotional control, self awareness, motivation, judgment, problem solving, talking, movement and initiation

**Occipital Lobe:** Vision

**Cerebellum:** Balance, coordination, skilled motor activity



**Temporal Lobe:** Memory, hearing, understanding language, and processing information

**Brainstem:** Breathing, heart rate, arousal and consciousness, sleep and wake cycles

# Part 2

## STROKE REHABILITATION



# The concept of stroke rehab

- Essential that we adopt a 24 hour approach to rehab
- The brain has the potential to adapt after stroke and learn from any stimulation 24 hours a day (*Neuroplasticity*)
- To maximise the patient's recovery all staff need to work towards the same goals
- Rehab approach is based on encouraging patient to move as normally as possible (*Normal Movement*)

# How the brain learns

- Research shows that the brain has the capacity to modify after a lesion / stroke (neuroplasticity)
  - Using unused pathways
  - Development of new pathways
- The brain is learning 24 hours a day
- The brain is like a sponge and absorbs information constantly

# Brain's ability to adapt (*Neuroplasticity*)

- Whatever we do to the patient influences the patient's recovery (positively and negatively)
- The way a patient is positioned or handled, and how they move themselves contributes to what the patient learns
- E.g. If patient is sat leaning to left in chair will learn that that is normal sitting posture or if allowed to pull with unaffected arm will discourage recovery of affected limb

# Normal Movement Approach

- Encourage the patient to move in normal manner
- Maximise ability to use affected side (facilitation)
- Reinforce symmetry and good alignment
- Discourage the over use of the patient's unaffected side, i.e. pulling / pushing
- Work on getting sitting balance and control and then progress into standing

# Positioning on back



# Considerations when lying on affected side

- Affected leg positioned as straight as possible
- Remove all body weight off affected arm by placing your hand near to shoulder blade and gently sliding affected shoulder through
- Support back with pillows to maintain good position on side
- Support unaffected leg bent up on pillow

# Lying on affected side



# Considerations when lying on unaffected side

- Support affected arm in comfortable position on pillows in front of face / body
- Support affected leg bent up on pillows



# Lying on unaffected side



# Positioning in the chair / out of bed

- It is very important for patients to get out of bed.
- Complications of staying in bed:
  - Respiratory complications (poor air entry to bases)
  - Knees / hips can become stiff and difficult to bend
  - Ankles / feet at risk of developing muscle shortening in achilles tendon if allowed to point down continually
  - Pressure sores
- Positioning in chair
  - Body straight
  - Arm supported

# Shoulder care

- Effects of a stroke on upper limb
  - Low tone / floppy arm
  - High tone arm (tight muscles)
  - Loss of movement
  - Reduced sensation / proprioception
  - Neglect

# Risk to upper limb

- Subluxation of shoulder
- Pain -> problems sleeping / difficulty concentrating / depression
- Injury due to reduced awareness of arm position
- Swelling of hand

# The subluxed shoulder

- Reduced muscle tone
- Muscles become lax
- Humerus is displaced – forwards and downwards
- Joint is unstable and very vulnerable





# Preventing shoulder subluxation

- Low tone arm must be supported at all times to keep shoulder joint in place
- Never pull or lift under arm
- When moving the arm:
  - Support under the wrist
  - Move it slowly keeping an eye on the patients face to detect pain
  - Avoid moving arm 90 degrees above the body if unsure of shoulder position



# Positioning of shoulder

- Sitting:
  - Arm should be well supported on pillow / tray slightly away from side and within patients sight
  - Ensure that arm does not slip off the side of chair / pillow

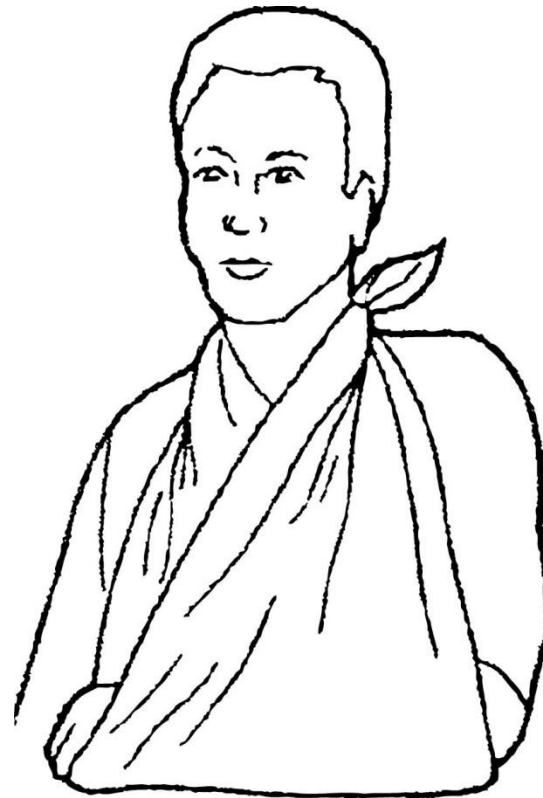
# Comfort



# Supports

- Standing:
  - Support low tone arm at elbow and wrist to prevent the effects of gravity
  - Supportive slings e.g. collar and cuff or triangular slings can be used when standing, walking and transferring to stop the arm pulling on shoulder joint
  - These slings should not be left on patient when sitting

# Triangular sling



# Conclusion

The brain learns 24 hours a day, 7 days a week and it is essential that all rehab is centred around the same goals

→ To encourage normal movement

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