

What are SLPs interested in?	
where is the damage?	- anatomy
What is the function of the damaged area?	- Areas important for speech and language processing, swallowing
what has caused the brain damage?	- Sudden incident (potential to improve) or progressive disease (symptoms getting worse over time)
What are the language/speech/swallowing symptoms?	- What are the signs and characteristics of abnormalities ; Severity
- Different methods for the assessment and investigation of neurologically-based communication disorders	

Nervous system	
Complex collection of nerve cells (billions)	that transmit signals between different parts of the body - allows you to do things like walking, speaking, swallowing
Structurally - NS has TWO components	Central nervous system (CNS) - Brain (incl. cerebellum & brain stem → image) ▪ Spinal Cord

Nervous system (cont)	
	Peripheral nervous system (PNS) - Nerves outside of the brain & spinal cord ▪ Connects CNS to limbs & organs
Contra lateral innervation	one side of the brain essentially controls the opposite side of the body

BROCA'S AREA & WERNICKE'S AREA	
BROCA'S AREA	
Paul Broca	
patients who lost the ability to speak	
Most had lesions in posterior part of left frontal lobe in the posterior part of the frontal lobe of left hemisphere	
region for expressive language	
WERNICKE'S AREA	
Karl Wernicke	
patients with fluent speech but impaired comprehension	
Most had lesions in the superior part of the left temporal lobe in the superior part of the temporal lobe of left hemisphere	
region for receptive language	

Anatomy and Function	
Brain	> Grey matter (nerve cell bodies) > Wrinkly appearance > Bumps – gyri > Grooves – sulci and fissures
Divided lengthways into two hemispheres	> left & right
FRONTAL LOBE – Function	> Attention > Language production > Voluntary movement > Behaviour and Personality > Planning of movement > Reasoning and problem solving
TEMPORAL LOBE – Function	> Hearing e.g., words, laughing, baby crying > Language comprehension > Interpret other people's emotions
PARIETAL LOBE – Function	> Processing of sensory information e.g., touch, pressure, pain, temperature, taste, position

Anatomy and Function (cont)	
	> Body orientation
OCCIPITAL LOBE – Function	> Processing of visual information e.g., in reading, recognising faces/objects
LANGUAGE AREAS IN THE BRAIN	> Left hemisphere
	> Frontal lobe (and Broca's area) vital for language and speech production
	> Temporal lobe (and Wernicke's area) vital for language comprehension
Grey is the surface – cerebral cortex	
Children with soft non wrinkly brains will have intellectual issues	

common causes of acquired communication disorders	
Sudden incidences are;	
> Stroke > Traumatic Brain Injury (TBI)	
Progressive diseases are;	
> Alzheimer's disease > Parkinson's disease > Multiple Sclerosis (MS)	

Nervous system requires a high blood flow		Brain lesions (cont)		Brain lesions (cont)		Brain lesions (cont)	
> Brain made up of cells (nerve cells) > They are the key players BUT to function properly; Nerve cells depend on adequate supply of oxygen and nutrients (e.g., glucose) through a dense network of blood vessels		Blood flow is suddenly interrupted to an area of brain (↓ oxygen & ↓ glucose) → Nerve cells begin to die Symptoms and effects depend on the lesion site		Damage is typically widespread or diffuse to an area or areas within the brain TBI - CLOSED HEAD INJURY Results when an outside force impacts the head BUT the skull is not broken, fractured, or penetrated		Swallowing disorders Speech and language problems	
Brain lesions						Progressive diseases	
Stroke	Rapid loss of brain function due to an injury to blood vessels in the brain	Change of behaviour		shaking of the brain inside the bony skull results in bruising and tearing of brain tissue and blood vessels		ALZHEIMER'S DISEASE	Most common type of dementia in older adults
Risk factors -	Overweight - Physical inactivity - Heavy drinking - Use of illegal drugs - High blood pressure - Cigarette smoking - High cholesterol - Diabetes	Sensory deficits memory loss speech/language problems		Damage is typically widespread or diffuse to an area or areas within the brain		Dementia	progressive deterioration in cognitive functions (e.g., thinking, communication)
Blood supply disturbed due to	A clot (Infarct/ Ischemic stroke) - 80%	Paralysis/hemiplegia	complete paralysis of half of the body	Effects largely dependent upon location and extent of the brain injury		Clients with Alzheimer's Disease	Inappropriate social behaviour
	Bleeding (Haemorrhage/ Haemorrhagic stroke) - 20%	hemiparesis	weakness of one entire side of the body	Change of behaviour			Poor memory
		If the stroke occurs in the left side of the brain, the right side of the body will be affected, and vice versa		Vision impairments			Problems performing routine tasks
		Traumatic Brain Injury (TBI) - OPEN HEAD INJURY	Sudden damage to the brain caused when the scalp/skull is broken, fractured, or penetrated	Sensory deficits			Problems with abstract thinking and judgement
		Damage to brain tissue and blood vessels		Paralysis, movement difficulties			Confusion
						PARKINSON'S DISEASE	Degeneration/ death of nerve cells leads to movement & cognitive impairments



Progressive diseases (cont)

Occurs in
around 1% of the
population aged
over 60

Symptoms Tremor (can
affect limbs +
jaw, tongue,
face in some
cases)

Absence of/
Reduced
movement

Muscle rigidity

Stooped posture

Dementia (40%
cases)

MULTIPLE
SCLEROSIS Demyelinating
disease

- in which the
protective cover
(Myelin) of nerve
cells in the brain
and spinal cord
are damaged

- Disrupts the
ability of the
nervous system
to communicate
properly (i.e.
information
transfer affected)

- > More common
in women 20-40
years old

- > Cause not
known (genetics
& environmental
factors such as
infections
proposed)

Symptoms vary depending
on the lesion
sites

Progressive diseases (cont)

Fatigue

Mobility problems

Problems with thinking, learning
and planning

Speech and swallowing diffic-
ulties