MEDICINE - CNS
NEET - SS

CONTENT

APPROACH TO NEUROLOGY CASE

Overview of the steps

00:02:17

1. Pathology
2. LMN v/s UMN
3. Specific Pathology
4. Associated features like fever or constitutional symptoms, weight loss, palpations, chest pain, skin rashes, joint pains and swelling, cough and breathlessness

Assessing the pathology

The approach :

1. Onset : Acute/sub-acute/chronic of symptoms.
2. Duration : Days/ hours/ months/ years
3. Progression : Progressive/ improving/ recurrent

Order of examination of nervous system :

- Higher mental functions : Cognitive symptoms.
- Cranial nerves
- motor system + coordination and cerebellum including gait
- Sensory

Acute onset :

Hyper acute : e.g. when patient tells yesterday morning by 9 am when I was writing with pen at, suddenly I felt weakness in upper limb.

Vascular causes and seizures present with hyper acute.

Acute : e.g. morning when I got up I had paraesthesia of

right hand and then it worsened and reached shoulder by 1hour. And by afternoon, right upper limb weakness. And by, evening weakness worsened. By next day morning complete weakness.

Classical acute presentations :

1. Vascular : LMN weakness with pain
2. Demyelination like in GBS
3. Trauma
4. Bleed into a tumour

Sub-acute : Progressed over days to months.

1. Demyelinating
2. Thrombotic stroke or multi infarct stroke
3. Nutritional or metabolic
4. Tumour : malignant

Chronic :

1. Degenerative.
2. Genetic or hereditary : Spino cerebellar ataxia.
3. Benign tumours : over years.

Duration :

Symptom of 2 or 3 days : acute.

Years : Degenerating or genetic disease.

Progression :

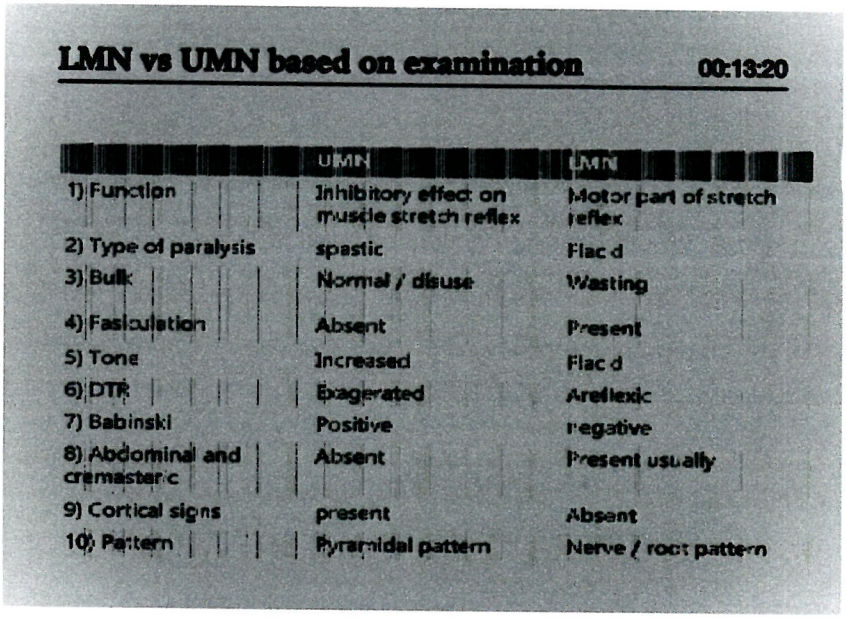
- Worsening

- Improving
- Recurrent illness : demyelination.

LMN v/s UMN

Higher mental function can be remembered as : AIME LOSS handedness

- Appearance, Intelligence, memory, emotional status.
- Level of consciousness, orientation, speech and handedness.
- +/- Lobar functions and mmsc.



LMN vs UMN based on examination 00:13:20

	UMN	LMN
1) Function	Inhibitory effect on muscle stretch reflex	Motor part of stretch reflex
2) Type of paralysis	spastic	Flaccid
3) Bulk	Normal / disuse	Wasting
4) Fasciculation	Absent	Present
5) Tone	Increased	Flaccid
6) DTR	Exagerated	Areflexic
7) Babinski	Positive	negative
8) Abdominal and cremasteric	Absent	Present usually
9) Cortical signs	present	Absent
10) Pattern	Pyramidal pattern	Nerve / root pattern

	LMN	UMN
Higher motor functions	-	+/-
Cranial nerves	+ and LMN type	+ and UMN type

Active space

Motor : 1. Bulk 2. Tone 3. Power 4. Reflexes 5. Gait 6. Co-ordination 7. Involuntary movements	Atrophy Decreased Plexus/Nerve/ Polyradiculopathy Hypo or Areflexia High stepping gait Cerebellum normal Polymini myoclonus, segmental myoclonus	Disuse atrophy Rigidity/spasticity Pyramidal Pattern Exaggerated reflexes Circumduction gait Cerebellum affected +/- Myoclonus, dystonia, tremors
Reflexes : Superficial – Plantar & abdominal. DTR	Normal. Unless the segment is affected Decreased	Babinski positive , plantar Abdominal absent Brisk/exaggerated
Sensory	Depends on small or large fibres	Seen in spinal cord injury : funicular, circumferential pain. Ankle jerk is checked.

Ankle jerk :

- In large fibre involvement (peripheral neuropathy) : lost.
- In posterior column involvement : normal.

Pyramidal Pattern : seen in UMN.

Upper limb :

- Wrist extension : weak.
- Supination > Pronation : weak.
- Elbow extension is weak.
- Shoulder abduction is weak.

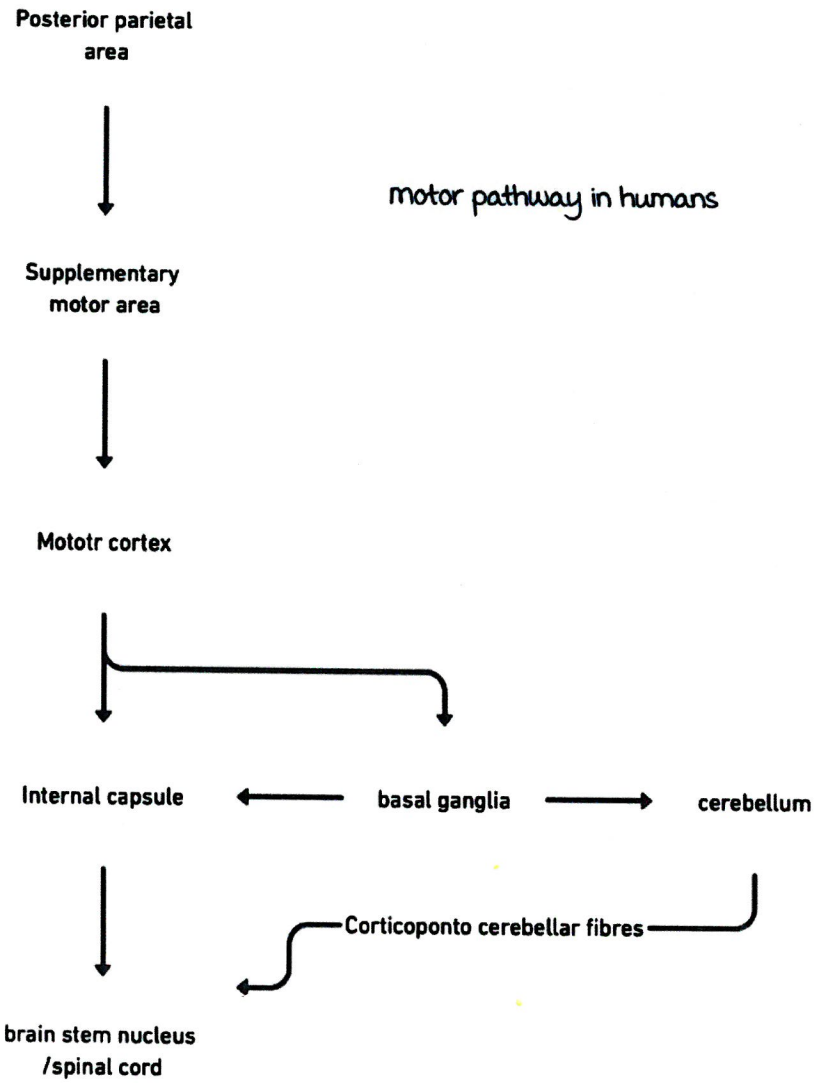
Lower Limb :

- Hip flexion, Knee flexion and ankle dorsiflexion is weak.
- Adductor spasticity is present
- Abduction of hip is weak.

Motor features : UMN and LMN 00:31:48

motor :

- Distal or proximal muscle weakness.
- Symmetrical or asymmetrical.
- Nerve pattern/ plexus pattern/pyramidal pattern.
- Any sign of spasticity : Foot clearance from ground is more affected in UMN. Tripping, heaviness and falls is seen in UMN. Wasting, fasciculation's are seen in LMN.
- Reflex.
- Involuntary movements.
- Cerebellum and ataxia.
- Stance and gait : UMN v/s LMN.



motor pathway in humans

Active space

UMN approach : Summary

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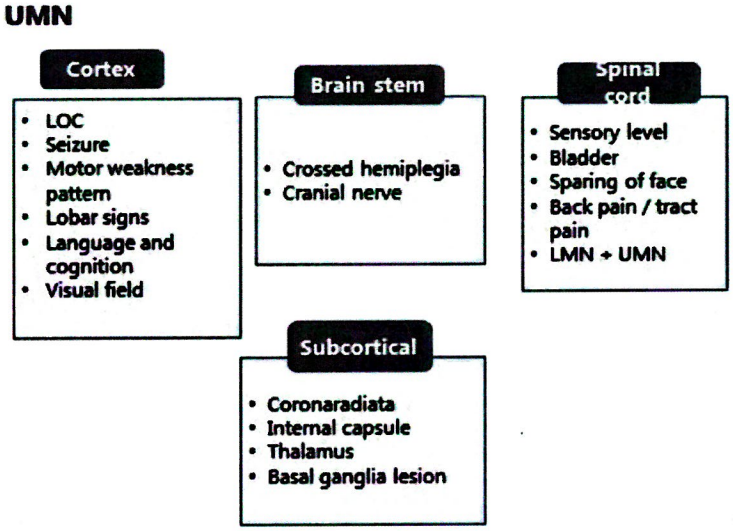


In motor cortex : maximum representation is for face, lips and hands. Hence, pattern of weakness will be facio-brachial predominantly, dexterity loss and distal weakness.

Corona radiata : If there is a lesion 1 cm in corona radiata, it will affect only few fibres. 1 cm lesion in internal capsule. it will have dense weaknes as many fibres will be affected.

Thalamus : Fluctuation sensorium will be present.

Basal ganglia : Parkinsonian phenomena, hyperkinetic movement disorders.

Active space

LMN approach : Summary

00:46:00

LMN

Anterior horn
- Pure motor
- Wasting
- Fasciculation
- Reflex loss

Radicle
- Asymmetry
- Radicular pain
- Radicular motor and sensory loss
- Reflex loss isolated

Plexus
- Asymmetry
- proximal plus distal
- Sensory + motor

Peripheral nerve
- Distal predominant
- Nerve pattern sensory motor loss
- Stocking and glow
- Loss of reflex
- +/- wasting

NMJ
- Symmetrical
- Proximal+ distal
- Face and pharyngeal + neck
- Fatigability
- Normal reflex

Muscle
- PROXIMAL > DISTAL
- Symmetrical
- Pure motor
- Normal reflex

APPROACH TO UMN DISORDERS

UMN Structures :

- Cortex.
- Sub cortex.
- Brainstem :

  Crossed hemiplegia : Ipsilateral cranial nerve palsy + contralateral hemiplegia.

  Cranial nerves symptoms.

  Vertigo : Also seen in insular cortex involvement.
- Spinal cord :

  Sensory level.

  Bladder involvement (depending on level of spinal cord involved).

  Tract pain.

Cortex 00:03:30

Loss of Consciousness : Classical pressenattion

Seizure : Orgin is cortex

Cortex predominantly is grey matter .

Different lobes of cortex :

Frontal :

- Medialfrontal cortex containing anterior singulum.

  Medial involvement.

  Lack of enrgy / apathy.

  Akinetic muteism
- Dorsolateral prefrontal cortex :

  Executive dysfunction.

  Not able to do Planned & sequential activitiy
- Orbitofrontal area :

  Personality problem.

  Disinhibition.
- Motor cortex :

Weakness predominantly involves face + upper limb.
Distal > proximal.
Dextrective loss.
Loss of fine activities : Pyramidal dysfunction.

Parietal :
Function : Calculation, language, temporal apraxias, proprioception.

Left parietal :
Involved in calculation & language apraxia.
Dominant.
Lesion of angular gyras produce Gerstman's syndrome (finger agnosia, agraphia, acalculia).

Right parietal :
Dressing apraxia.
Constructional apraxia.
Neglect.
Geographical.

Temporal : 2 parts :
Lateral :
Auditory area.
Wernickes area.
Visual processing.
Medial :
Memory.
Olfaction.
Limbic part.
Most epileptogenic area.

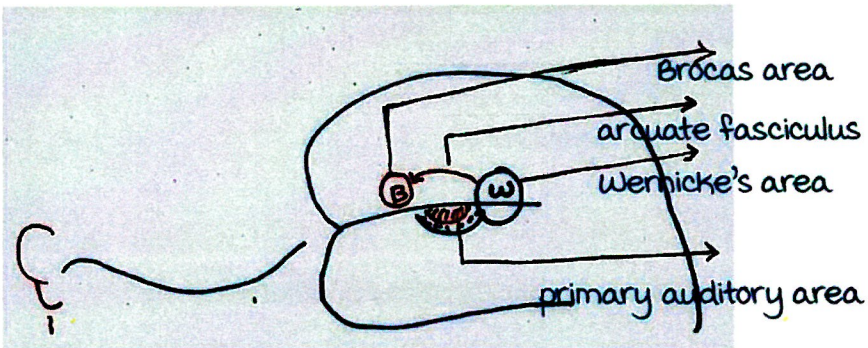
Occipital :
Occipital blindness : Pupillary reflex unaffected

Retina → fibres cross chiasma → lateral geniculate body(LGB)
Pupillary fibres before reaching LGB descends to mid brain to form pupillary reflex.

when retina/optic nerve /optic chiasma involved : Pupillary reflect affected.

Language 00:16:43

Language is the basic concept of communication through writing, speaking, gesture etc.
motor output of languages is speech using larynx, pharynx.
Sound falls on ears → Heschl's gyrus identifies → Tone of
(primary auditory area) sound
↓
Wernicke's area & temporal parietal area → Comprehension
(contains internal dictionary Lexicon)
↓
Arcuate fasciculus
↓
Brocas area → Produces reply by activating motor neurons
↓
Produce syntax grammar fluency
↓
Supplementary motor area (planning and programming)
↓
motor cortex
↓
Descends to brainstem cranial nerve nucleus
↓
Speech output



Active space

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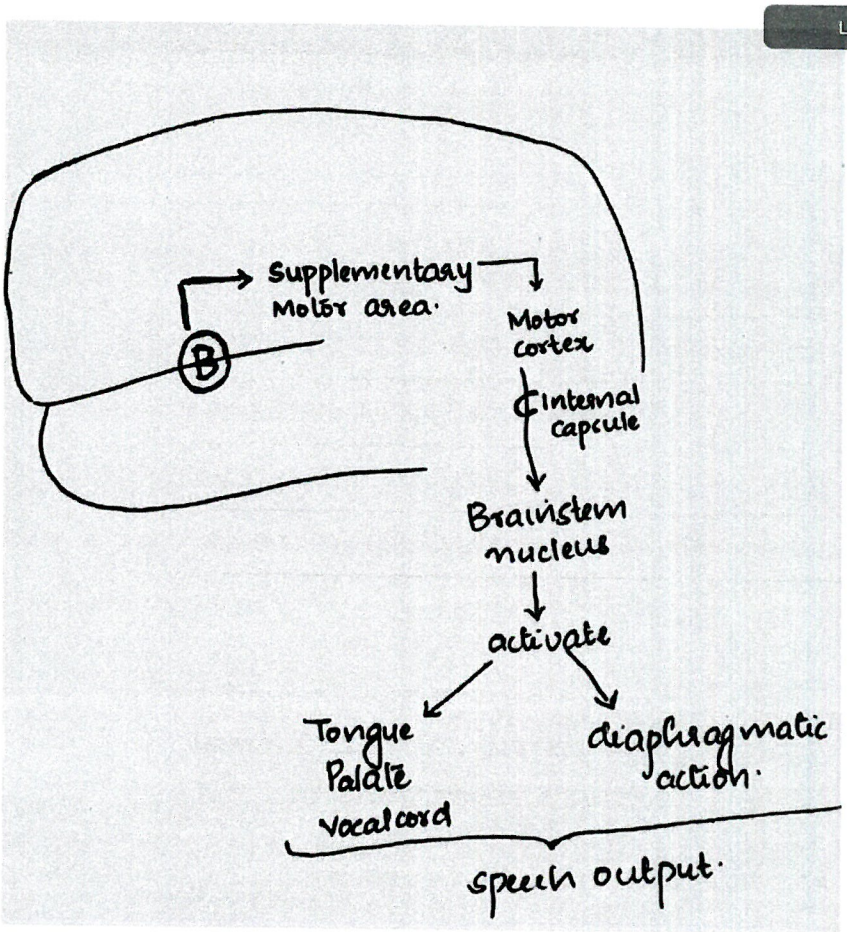
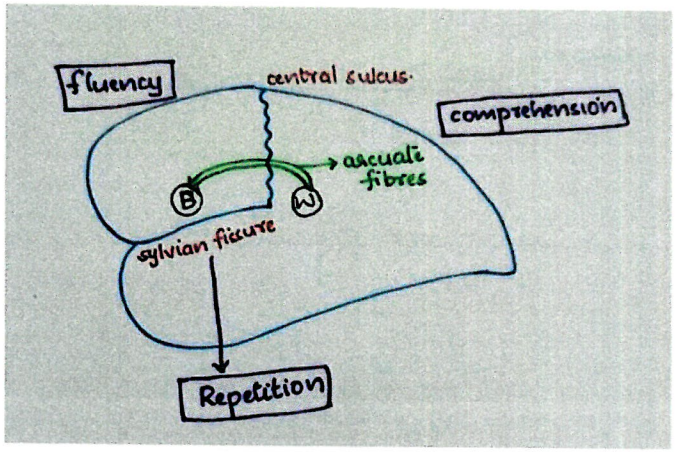


Intentional activation system cannot activate Broca's area causing akinetic mutism (no movement, no talk).

Right > left side :

- Limbic reward system gives emotional intonation.
- Prosody (rhythmic sound of speech).

Rest of language concept lies in left side.



Any lesion anterior to central sulcus → Fluency lost.

Any lesion posterior to central sulcus → Comprehension lostany

Any lesion involving Perisylvian circuit → Repetition lost.

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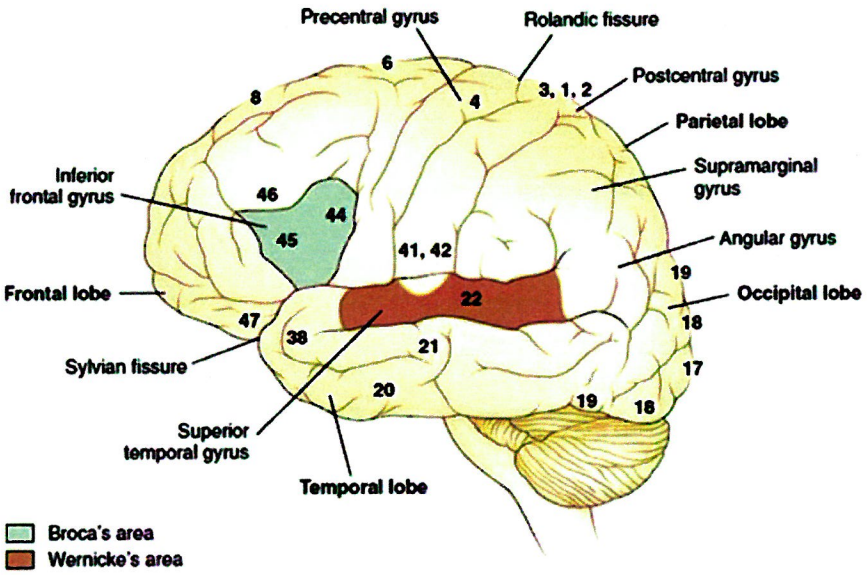
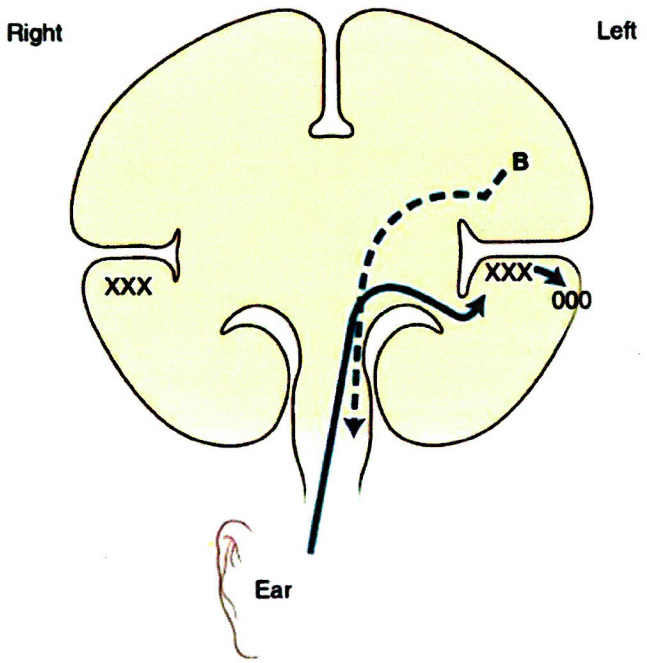
	Broca's area	Wernicke's area	TCM	TCS	TC mixed
Naming/Anomia	-	-	-	-	-
Fluency	-	+	-	+	-
Comprehension	+	-	+	-	-
Repetition	-	-	+	+	+, echolalia





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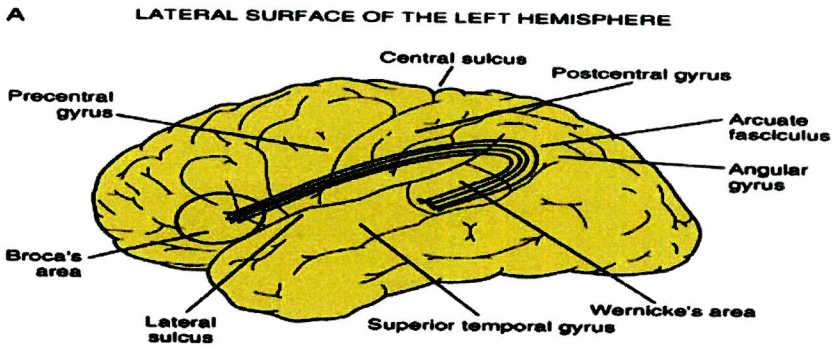
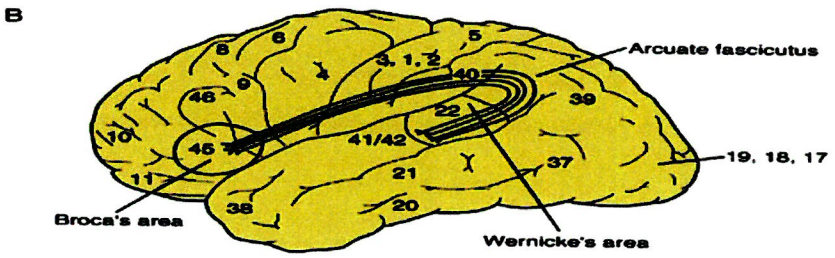
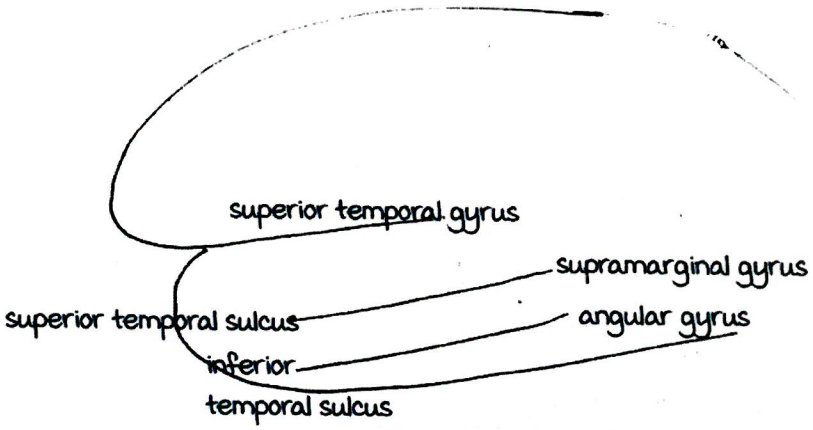






Supramarginal gyrus is involved in phoning, processing of language. Angular gyrus:

Is involved with naming.

Associated with anomia+ Gerstman syndrome.

Localisation of Gerstman syndrome:

Left /Dominant angular gyrus

Speech 00:35:35

Grammar/ syntax

Paraphrasing error:

Literal: Change in sound.

Example: Pencil said as pen'til'.

Active space

Semantic : Change in idea.

Example pencil identified as knife.

Name :

Unusual things given to identify (as otherwise from memory can identify).

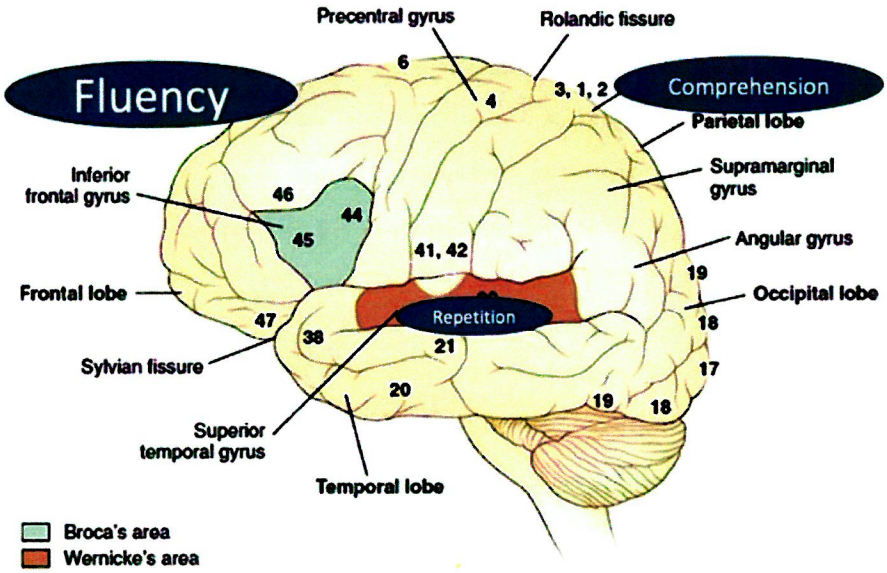
Like :

Small needle of clock.

Tip of pen.

Writing : Assess fluency, grammar, concept of language.

1. Spontaneous speech
   a. Informal interview
   b. Structured task
   c. Automatic sequences
2. Naming
3. Auditory comprehension
4. Repetition
5. Reading
   a. Reading aloud
   b. Reading comprehension
6. Writing
   a. Spontaneous sentences
   b. Writing to dictation
   c. Copying



Anomic aphasia :

Lesion in left angular gyrus.

Associated with Gerstman syndrome.

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