

MEDICINE - CNS
NEET - SS

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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, palpitations, 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 1 hour. 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 : **ALME 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	Flac d
3) Bulk	Normal / disuse	Wasting
4) Fasciculation	Absent	Present
5) Tone	Increased	Flac d
6) DTR	Exaggerated	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

<p>motor :</p> <ol style="list-style-type: none"> 1. Bulk 2. Tone 3. Power 4. Reflexes 5. Gait 6. Co-ordination 7. Involuntary movements 	<p>Atrophy Decreased Plexus/Nerve/ Polyradiculopathy Hypo or Areflexia High stepping gait Cerebellum normal Polymini myoclonus, segmental myoclonus</p>	<p>Disuse atrophy Rigidity/spasticity Pyramidal Pattern Exaggerated reflexes Circumduction gait Cerebellum affected +/- myoclonus, dystonia, tremors</p>
<p>Reflexes : Superficial - Plantar & abdominal. DTR</p>	<p>Normal. Unless the segment is affected Decreased</p>	<p>Babinski positive , plantar Abdominal absent Brisk/exaggerated</p>
<p>Sensory</p>	<p>Depends on small or large fibres</p>	<p>Seen in spinal cord injury : funicular, circumferential pain. Ankle jerk is checked.</p>

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 :

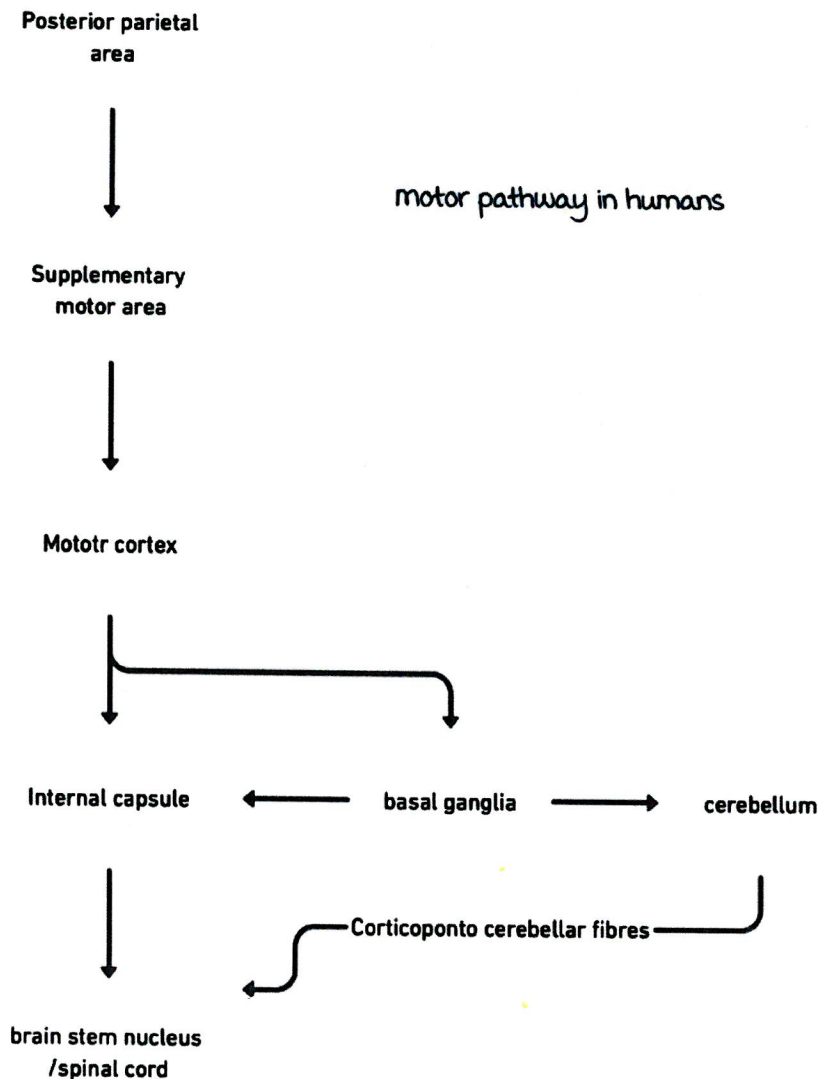
- Hip flexion, knee flexion and ankle dorsiflexion is weak.
- Adductor spasticity is present
- Abduction of hip is weak.

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.



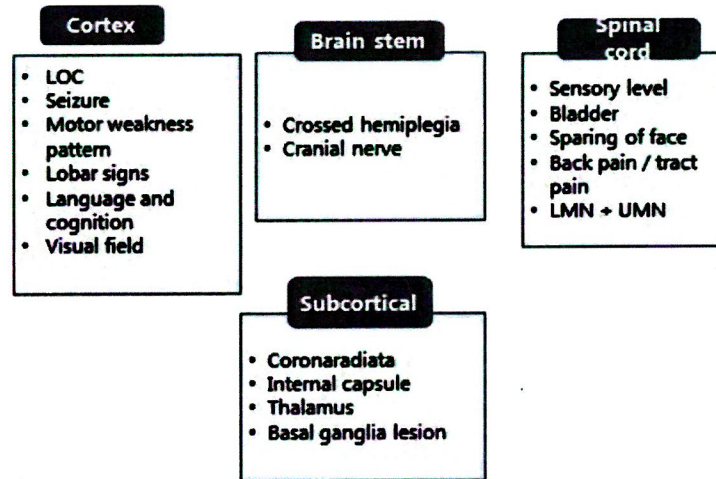
Active space

UMN approach : Summary

00:40:43

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UMN



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 weakness as many fibres will be affected.

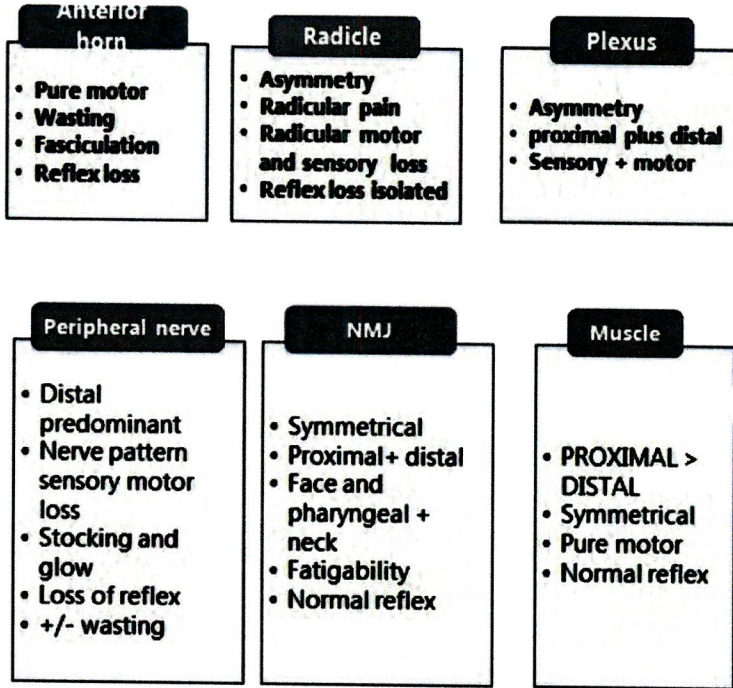
Thalamus : Fluctuation sensorium will be present.

Basal ganglia : Parkinsonian phenomena, hyperkinetic movement disorders.

LMN approach : Summary

00:46:00

LMN



Active space

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 presentation

Seizure : Origin is cortex

Cortex predominantly is grey matter .

Different lobes of cortex :

Frontal :

- medial frontal cortex containing anterior cingulum.
medial involvement.
Lack of energy / apathy.
Akinetic mutism
- Dorsolateral prefrontal cortex :
Executive dysfunction.
Not able to do Planned & sequential activity
- 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)



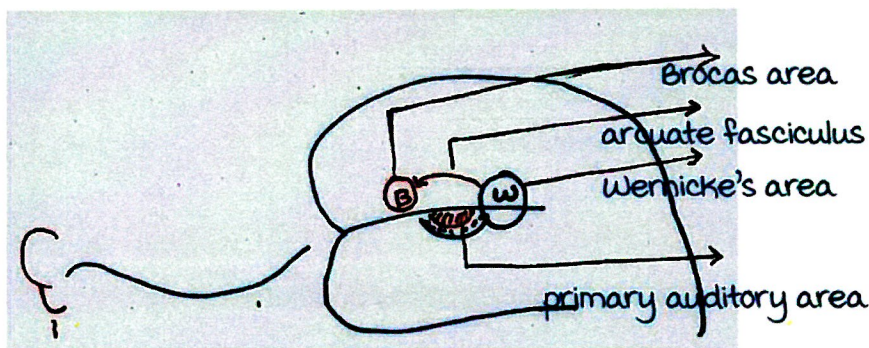
motor cortex

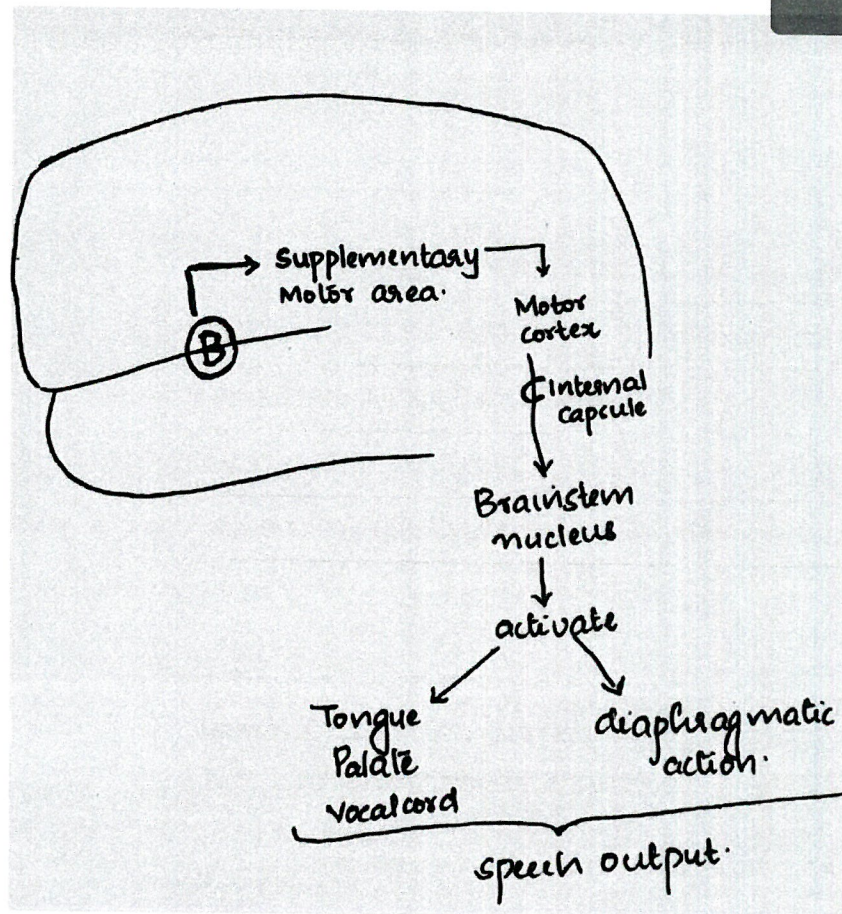


Descends to brainstem cranial nerve nucleus



Speech output



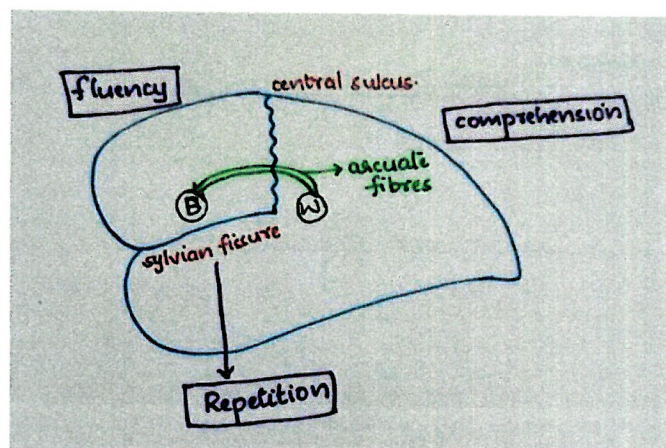


Intentional activation system cannot activate Broca's area causing **akinetic mutism** (no movement, no talk).

Right > left side :

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

Rest of language concept lies in left side.

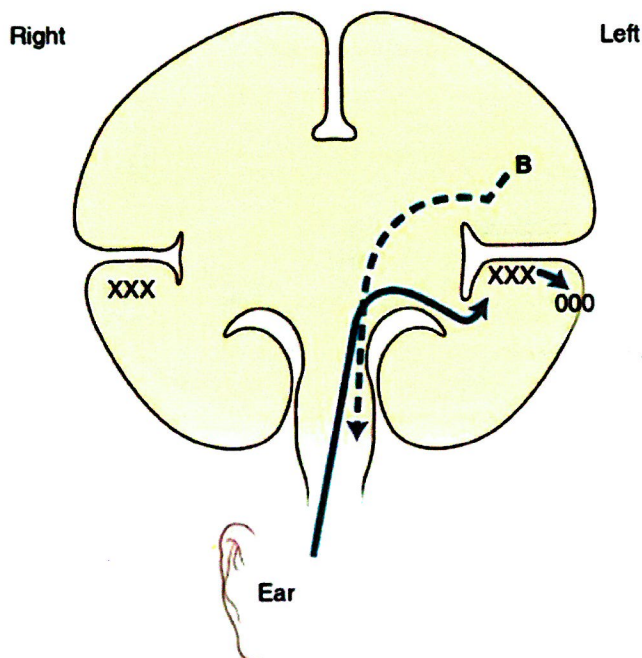
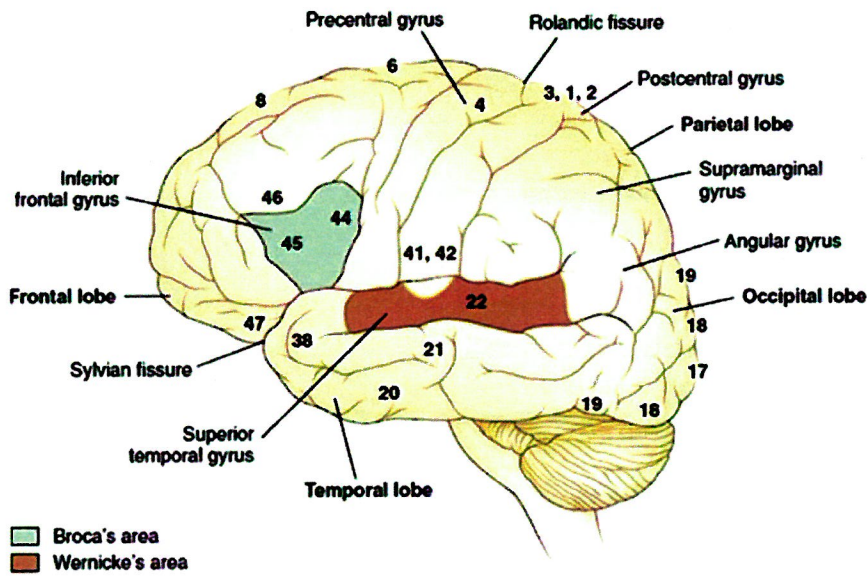


Any lesion anterior to central sulcus → Fluency lost.

Any lesion **posterior** to central sulcus → **Comprehension** lost any

Any lesion involving Perisylvian circuit → **Repetition** lost.

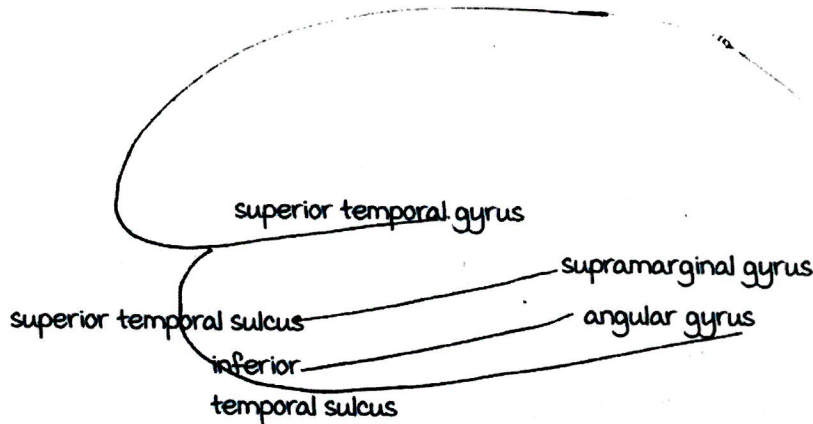
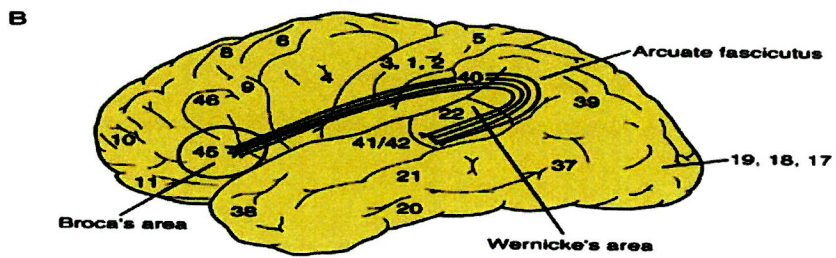
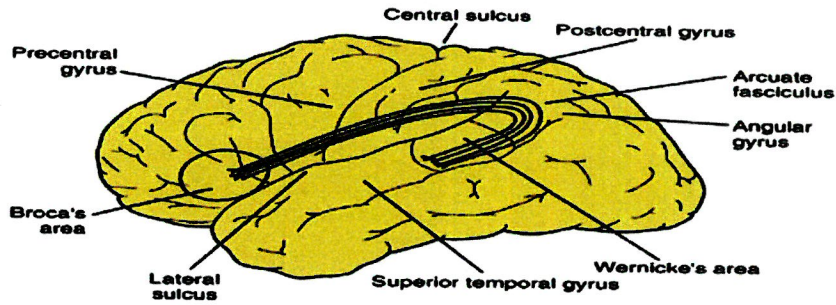
	Broca's area	Wernicke's area	TCM	TCS	TC mixed
Naming/Anomia	-	-	-	-	-
Fluency	-	+	-	+	-
Comprehension	+	-	+	-	-
Repetition	-	-	+	+	+, echolalia.



Active space

Leave Feedback

A LATERAL SURFACE OF THE LEFT HEMISPHERE



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).

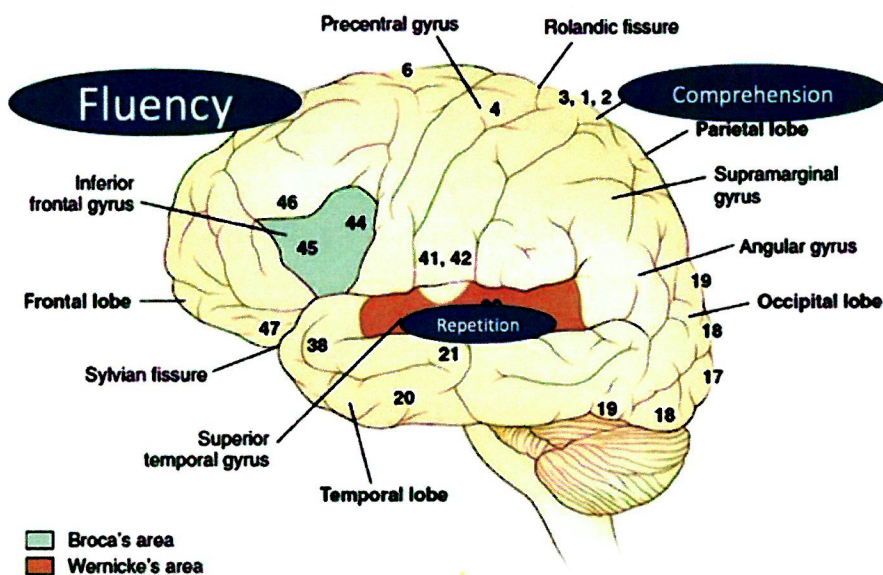
Like :

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.