



NOTES

CORTICAL DISORDERS

GENERALLY, WHAT ARE THEY?

PATHOLOGY & CAUSES

- Cortical structure damage in brain → functional regional-specific impairment

CAUSES

- Stroke (common), hemorrhage, infection, tumor, trauma, surgery, degenerative disease (e.g. Broca's aphasia, Wernicke's aphasia, Klüver–Bucy syndrome)

SIGNS & SYMPTOMS

- Affected brain region dependent
- Broca's aphasia
 - Expressive nonfluent aphasia
- Wernicke's aphasia
 - Receptive fluent aphasia
- Klüver–Bucy syndrome
 - Amnesia, compulsive eating, hypersexuality

DIAGNOSIS

DIAGNOSTIC IMAGING

- CT scan, MRI, single-photon emission computerized tomography (SPECT), positron emission tomography (PET)

LAB RESULTS

- Cerebrospinal fluid (CSF) analysis

OTHER DIAGNOSTICS

- Functional assessment
- Neurological exam

TREATMENT

OTHER INTERVENTIONS

- Address underlying cause



MNEMONIC: MD vs. DPM

Cortical brain

Memory **D**iscrimination

Subcortical brain

Devoid of seizure

Primarily sensation through thalamus

Movement disorders (most)

BROCA'S APHASIA

osms.it/brocas-aphasia

PATHOLOGY & CAUSES

- Aphasia
 - **Language loss/defect** (speaking, fluency, reading, writing, comprehension)
 - Injury to brain's language centers → different aphasia types
 - Most lesions involve dominant hemisphere (left in 95% of right-handed individuals, right in 50% of left-handed individuals)
- Broca's aphasia
 - **Broca's area**: responsible for language comprehension
 - Damage to Broca's area → **expressive nonfluent aphasia** (trouble expressing language → "individuals know what they want to say, but cannot get it out")

CAUSES

- Stroke (superior division of left-middle cerebral artery), traumatic brain injury, brain tumor, cerebral hemorrhage

SIGNS & SYMPTOMS

- Slowed, effortful speech
- Short sentences without grammatical construction (content appropriate, meaningful)
- Individual with Broca's aphasia may describe trip to barber for haircut as follows
 - "Yes... errr... Tuesday... er... Dad and Kevin T... (his own name), and Dad.... er... the mall... and ah... Tuesday... Tuesday, ten o'clock... and.. oh barber... one... um' barber... and er... hair..."
- Written, spoken language comprehension intact (or mildly impaired)
- Self-monitoring speech (generally still capable) → awareness of speech deficit

- **Broca's area**: anterior to primary motor cortex, damage to adjacent areas → individual may have associated contralateral hemiparesis, hemisensory loss

DIAGNOSIS

DIAGNOSTIC IMAGING

- Findings vary by underlying aphasia cause
 - May include evidence of bleeding/hypodensities (stroke); mass effect, overt tumors (cancer)
 - Functional imaging will reveal regional perfusion deficits

Brain CT scan

- With/without contrast

MRI

- Standard MRI
- Diffusion tensor imaging (images white matter tracts)
- Functional MRI (images neurological activity)

SPECT/PET

- Images neurological activity

OTHER DIAGNOSTICS

- Language assessment, screening tools

TREATMENT

- Treat underlying cause
- Most individuals improve/recover spontaneously within one month

OTHER INTERVENTIONS

- Speech therapy (early initiation)

KLÜVER–BUCY SYNDROME

osms.it/kluver-Bucy_syndrome

PATHOLOGY & CAUSES

- AKA bilateral temporal lobe disorder
- Caused by **bilateral lesions to medial temporal lobe**
 - Hippocampus, surrounding structures including **amygdala**; vital for declarative, long-term memory

CAUSES

- Trauma/lobectomy, herpes simplex encephalitis, stroke, Pick's disease, Alzheimer's disease

SIGNS & SYMPTOMS

- Amnesia (profound antero-, retrograde amnesia), **inappropriate things/compulsive eating, inappropriate object insertion into mouth, hypersexuality**, visual agnosia (inability to recognize familiar objects/people), docility (diminished fear/aggression response)

DIAGNOSIS

- Three/more symptoms present (most commonly placidity, hyperorality, dietary changes)

DIAGNOSTIC IMAGING

CT scan/MRI

- Temporal lobe lesions

LAB RESULTS

- If viral encephalitis underlying cause → CSF analysis, serology
- CSF fluid analysis
 - Normal/mild protein ↑, normal/low glucose content, normal/raised red cell count, lymphocytosis
- CSF serology
 - CSF antibodies compared to serum-specific antibodies
 - 4x rise in virus specific IgG/positive IgM
- CSF polymerase chain reaction (PCR) → specific virus identification

TREATMENT

MEDICATIONS

- Herpes simplex encephalopathy → antivirals

WERNICKE'S APHASIA

osms.it/wernickes-aphasia

PATHOLOGY & CAUSES

- Wernicke's aphasia
 - **Wernicke's area**: assigns speech sounds meaning
 - Damage to Wernicke's area → **receptive, fluent aphasia** (trouble interpreting language)

CAUSES

- Typically stroke (left middle cerebral artery), traumatic brain injury, brain tumor, cerebral hemorrhage

SIGNS & SYMPTOMS

- Impaired written, spoken language comprehension
- **Unaware of speech error, meaninglessness**
- Speech-specific symptoms
- **Jargon**: neologisms, real words used meaninglessly; structurally intact speech, typical intonation but lacks content
 - **Literal (phonemic) paraphasia**: substitution, addition, rearrangement of sounds → errors sound like intended word (e.g. "nog" instead of "dog")
 - **Verbal (semantic) paraphasia**: related word instead of intended word (e.g. "spoon" instead of "fork")
 - **Neologism**: made-up non-word instead of intended word (e.g. "fluparp" for "kettle")
 - **Circumlocution**: describe intended word (e.g. "it's pointed, thin, you write with it", in reference to a pen)
 - **Run-on speech**: verbalized idea stream related to topic (e.g. asked what do you do at the pet store: "The pet store is a place, it is a place with many pets, and pet food, my favourite animals are dogs, at the pet store I buy food for my dog, there are also fish at the pet store...")

DIAGNOSIS

DIAGNOSTIC IMAGING

- Findings vary by aphasia cause
 - May include evidence of bleeding/hypodensities (stroke); mass effect, tumor (cancer)
 - Functional imaging reveals regional perfusion deficits

Brain CT scan

- Vary by aphasia cause
- With/without contrast

MRI

- Vary by aphasia cause
- Standard MRI
- Diffusion tensor imaging
- Functional MRI

SPECT/PET

- Vary by aphasia cause

OTHER DIAGNOSTICS

- Language assessment, screening tools

TREATMENT

OTHER INTERVENTIONS

- Most individuals improve/recover spontaneously within one month
- Speech, comprehension therapy (early initiation)

BROCA'S & WERNICKE'S APHASIA COMPARISON

	SPEECH REPETITION	NAMING	AUDITORY COMPREHENSION	FLUENCY
BROCA'S APHASIA (EXPRESSIVE)	Moderate → severe	Moderate → severe	Normal → mild difficulty	Not fluent, effortful, slow
WERNICKE'S APHASIA (RECEPTIVE)	Mild → severe	Mild → severe	Severely impaired	Fluent