

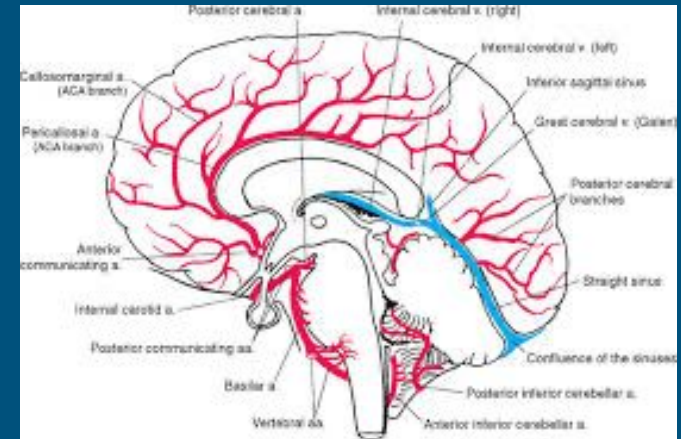
Neuroanatomical Breakdown of Acquired Expressive Speech Disorders

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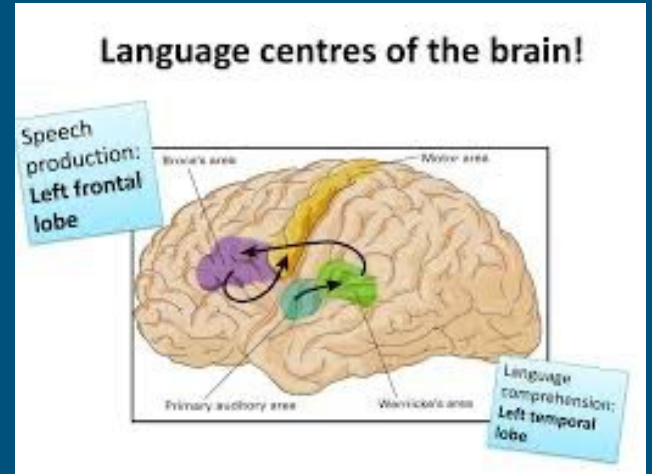
Introduction

- Acquired expressive speech disorders are variable when seen in practice
- Injury to similar area can cause expressive disorders that look very different
- Common site for strokes: Frontal lobe (due to blood supply)
- When focusing on lesions in the left frontal lobe, 3 speech disorders are possible: Broca's aphasia, Apraxia of Speech, and neurogenic stuttering



Introduction

- All expressive speech disorders, production is altered
- Injuries to different regions of the brain result in different speech disorders
- Neuroimaging is currently used to predict deficits based on lesion location (ex. Wernicke's aphasia)



Research Question: Where is the neuroanatomical breakdown in acquired apraxia, expressive aphasia, and neurogenic stuttering?



Speech disorders

Expressive Aphasia (Broca's Aphasia)

- Dysfluent, effortful speech, grammatical errors, difficulty naming

Apraxia of Speech (AOS)

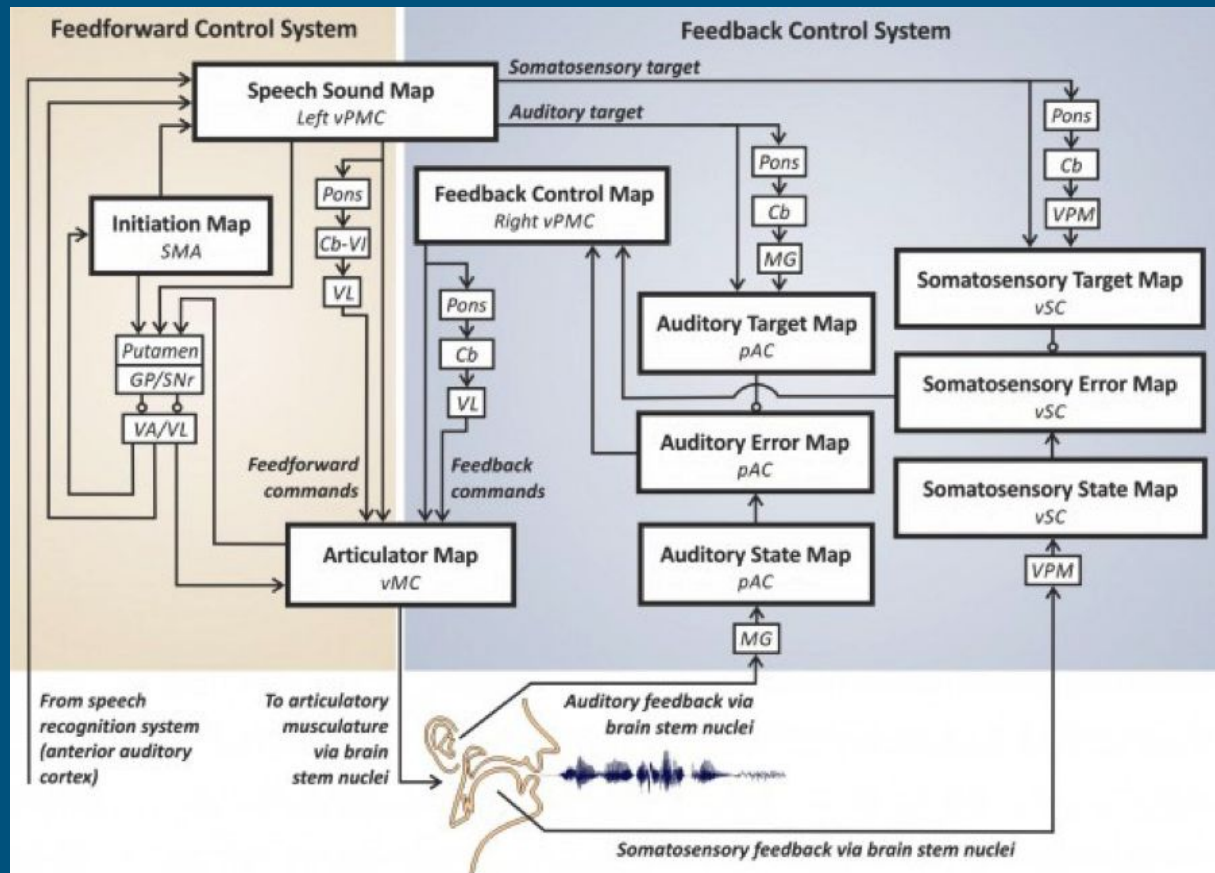
- Motor speech deficit, slow speech, segmented syllables, difficulty with repetition

Neurogenic Stuttering

- Repetitions, blocks, prolongations in productions of sounds/syllables

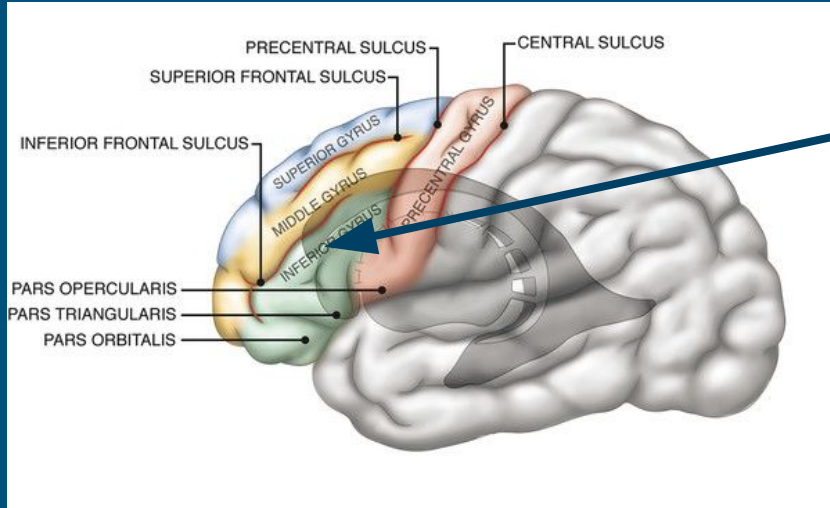


Directions Into Velocities Articulators (DIVA model)

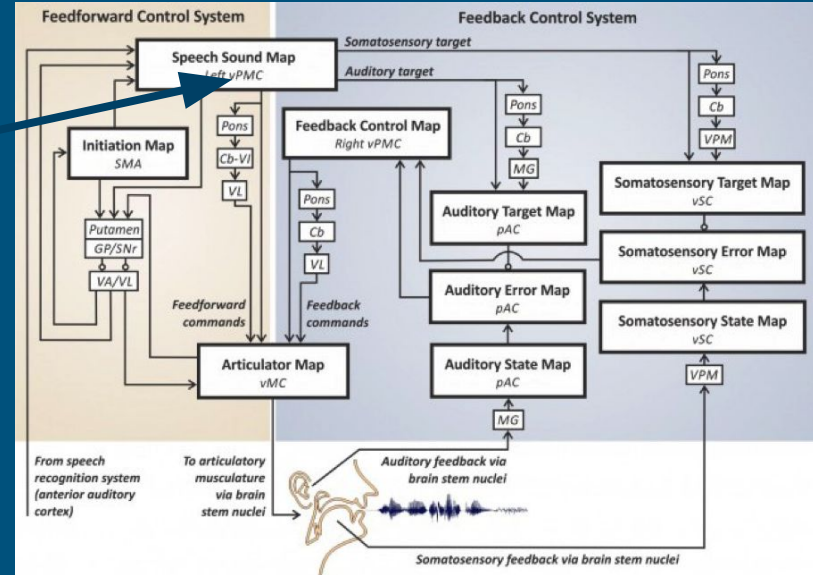


Neuroanatomy: Expressive Aphasia

Inferior left frontal gyrus

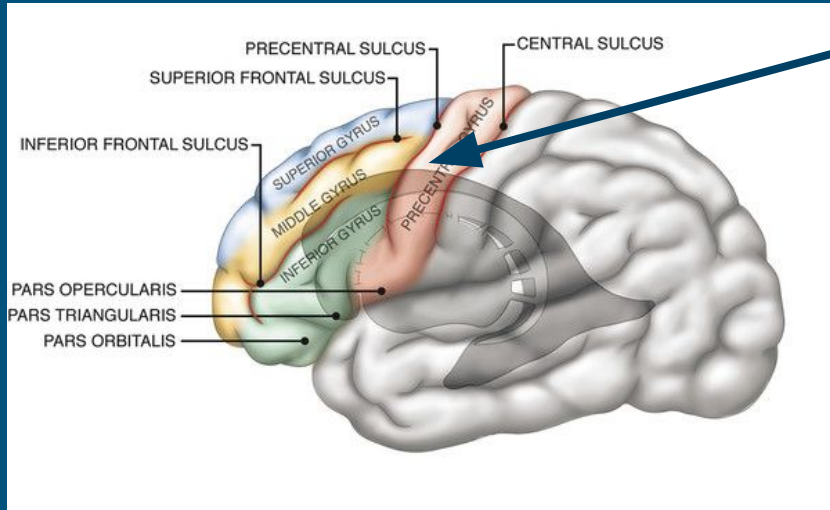


Speech sound map

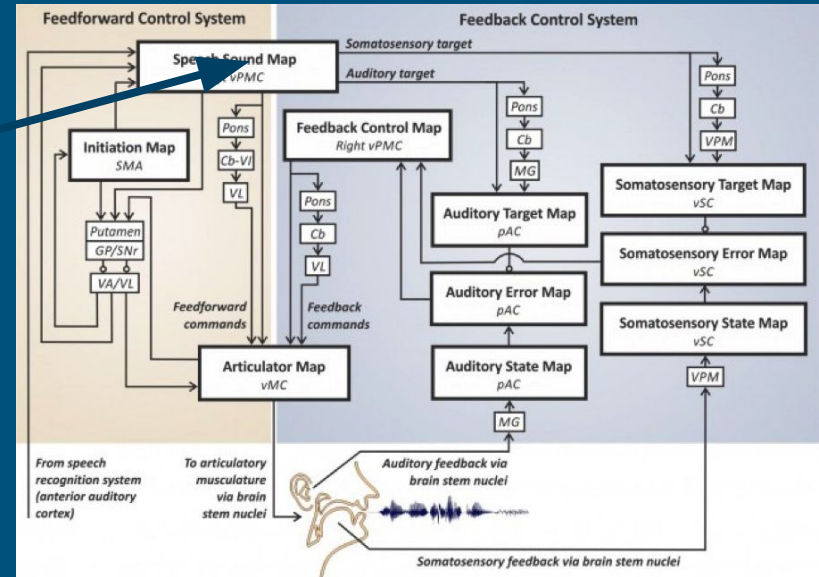


Neuroanatomy: Apraxia of Speech

Premotor cortex and adjacent precentral gyrus



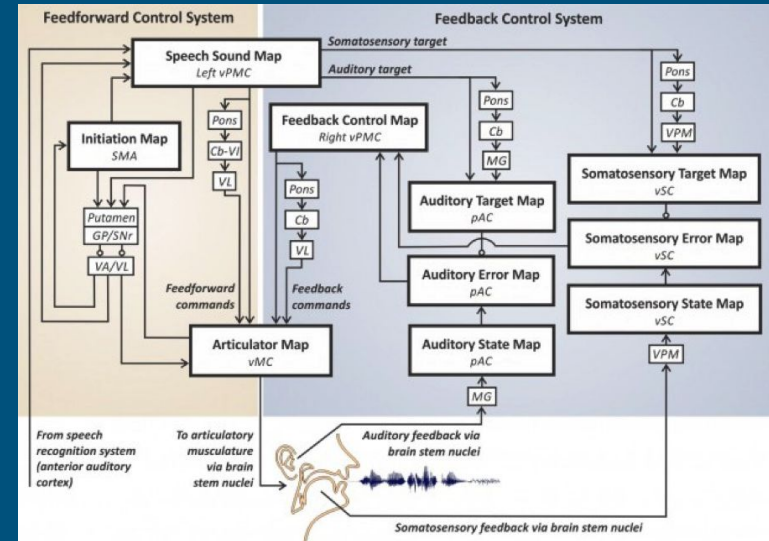
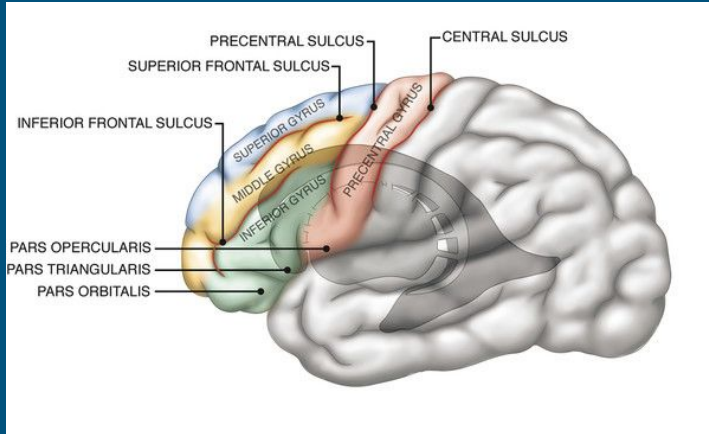
Feedforward control map



Neuroanatomy: Stuttering

Multiple possible locations based on case studies: basal ganglia, thalamus, pons

Stroke location associations: left middle cerebral artery, left temporal lobe, right parietal, left occipital infarcts



Discussion

- More cases of Broca's aphasia, more researched and easier to map.
- AOS comorbidity because of location, aligning with AOS location on DIVA model
- Stuttering: is it one specific location? Location could be in more than 1 part of DIVA model; arterial supply to subcortical structures (survival rate) vs. neurodegenerative disease that may affect the structure specifically.

Conclusion

- Research Question: Where is the neuroanatomical breakdown in acquired apraxia, expressive aphasia, and neurogenic stuttering?
- After examining models and comparing to lesion studies, able to come to this conclusion.
- AOS and Expressive aphasia overlap with locations in the IFG, precentral gyrus, and premotor cortex, also overlap in DIVA model
- Clinicians can benefit from knowing the true disorder presenting by lesion location (when a patient's symptoms may overlap) providing optimum therapy for spontaneous recovery period.

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