

# Introduction to Stuttering

*Communication Disorders, Swallowing Disorders, and Speech Therapy - An Introduction*

沟通障碍、吞咽障碍和言语治疗导论

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# Agenda

- What is Stuttering?
- Characteristics of stuttering
- Epidemiology of Stuttering
- Assessment of Stuttering
- Intervention of Stuttering

# The Monster Study

- Carried out by Dr. Wendell Johnson and his student, Mary Tudor in 1938 at University of Iowa and the Iowa soldiers and Sailors Orphans' Home
- 22 (10 stutterers and 12 normal) orphans were selected, and they were not told the intent of the study
- The nonstuttering 12 subjects were randomly divided into two groups, 6 each (IIA and IIB)
- IIA children (5-15 yo) all received feedback from STs of having stuttering speech... for five months

# The Monster Study

# What is Stuttering?

- Also called stammering or childhood onset fluency disorder
- “Dysfluency”
- Speech disorder involving frequent and significant problems in fluency and flow of speech
- People who stutter (PWS) know what they want to say, but they just have difficulty saying it

# Features of Stuttering

- Difficulty starting a word, phrase or sentence
- Prolonging a word or sounds within a word
- Repetition of a sound, syllable or word
- Brief silence for certain syllables or words, or pauses within a word (broken word)
- Addition of extra words such as "um" if difficulty moving to the next word is anticipated
- Excess tension, tightness, or movement of the face or upper body to produce a word
- Anxiety about talking
- Limited ability to effectively communicate

# Other Stuttering Features (Secondary Mannerisms)

- Rapid eye blinks
- Tremors of the lips or jaw
- Facial tics
- Head jerks
- Clenching fists



PWS



# A Stuttering Salesperson

# Disfluencies

- Word repetition
  - “Cookies **cookies** and milk”
  - “车....车....车子很多”
- Sound/Syllable repetition
  - “I **w-w-w**-want a drink.”
  - “**Go-go-go** away.”
  - “wuwuwuw..玩具”
- Phrase repetition
  - “He is-**he is** 4 years old.”
  - “他们他们很累，因为因为。。。 ”
- Interjection
  - “I **um** need to go home.”
  - “我 eh 不去了”

# Disfluencies

- Revision
  - “I **had-I lost** my tooth.”
  - “妹妹打 - 倒翻了水杯”
- Incomplete phrase
  - “*His name is* ... I can't remember”
- Broken word
  - “I want a c (**pause**) cookie.”
- Prolongation
  - “**Sssssssss**am is nice.”
  - “ss...四个人”, “ffffff....飞机”

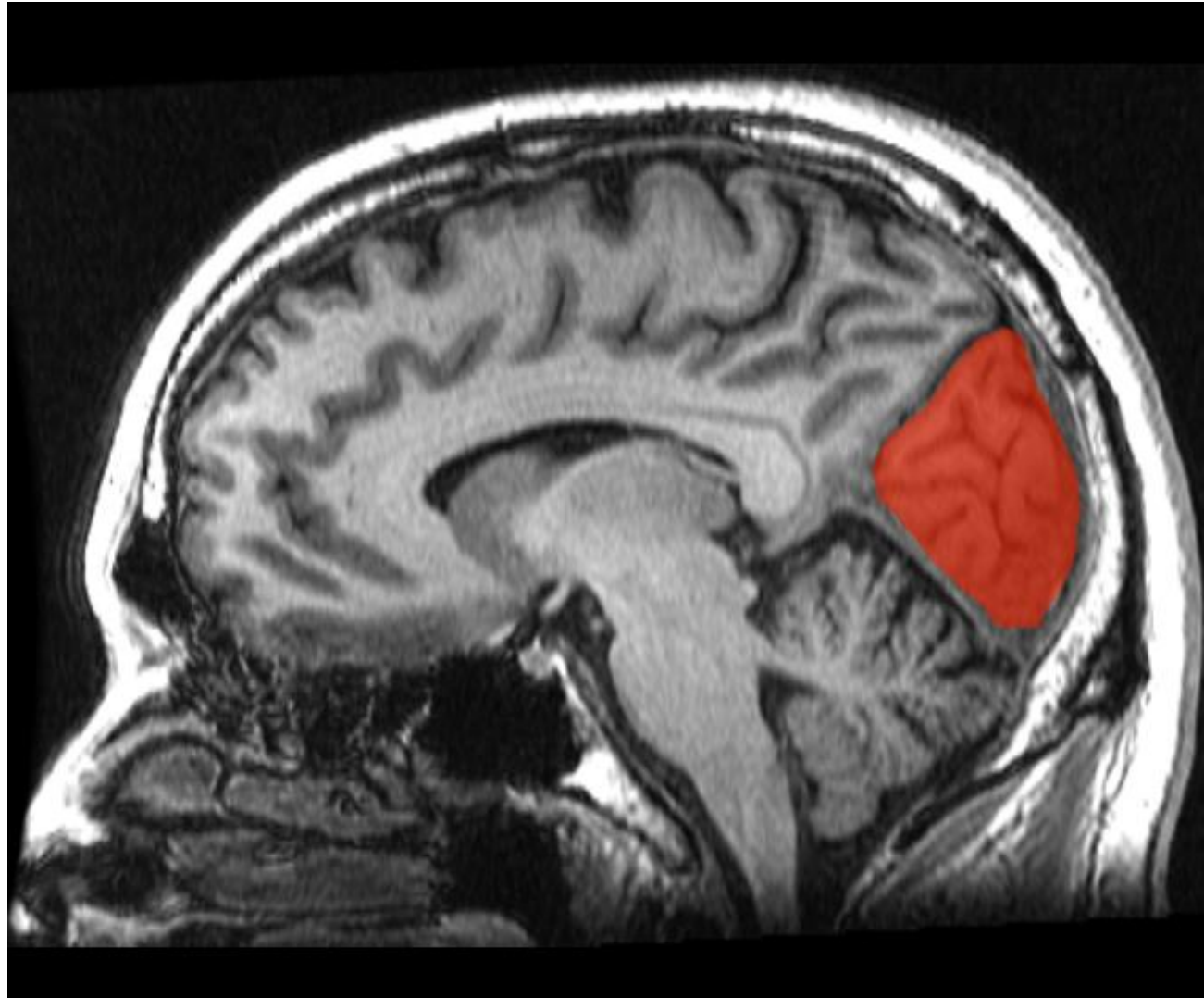
# Normal Developmental Disfluency

- Usually starts between 2 and 6 years of age
- Many go through normal periods of disfluency lasting less than 6 months
- If longer, need to seek help

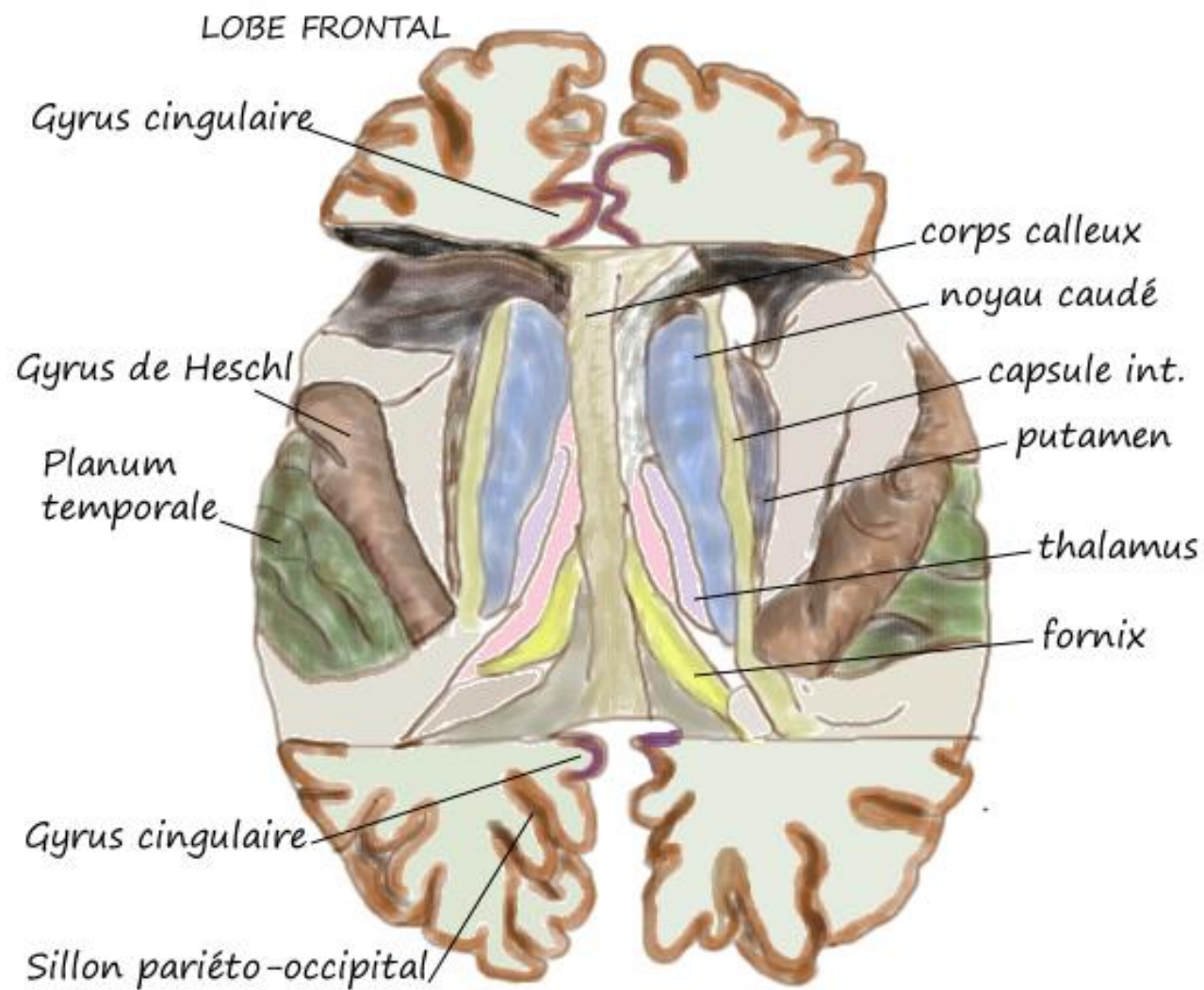
# Causes of Stuttering

- Family history
  - Many PWS have a family member how also stutters
  - May be related to genetic make up
  - Related to chromosome 2, 3, 5, 7, 9, 12, 13, 18, and 21
- Brain differences
  - PWS may have differences in the way the brain works for speech
  - During speech
    - Increased right hemisphere activation
    - Decrease temporal lobe activity
    - Unusual cerebellar activation
    - Stronger frontal lobe activation
    - Increased activation in cuneus and right lobule IV cerebellum
  - Anatomy
    - Increased size of right planum temporale
    - Increased number and variability of gyri
    - Abnormality in white matter
    - Size of corpus callosum

# Cuneus



# Planum Temporale



# Causes of Stuttering

- Linguistic factors
  - Linguistic stress
  - Word initial syllable
  - Low frequency and less familiar words
  - Word class: content words vs functional words
  - Syntactic complexity
  - Utterance length
  - Phonetic complexity
  - Tones?



# Epidemiology - Incidence Rate

- Danish (1990-1991)
  - All children from the island of Bornholm
  - 9 year follow up
  - By 3 years of age: 4.99%
  - By 9 years of age: 5.19%
- Australian
  - 1619 children from age of 2 in Melbourne
  - By 3 years of age: 8.5%
  - By 4 years of age: 11.2%
- Japanese (2009-2012)
  - 2274 children at 3 years of age from Hokkaido
  - By 3 years of age: 1.41%

# Epidemiology - Onset

- 30-36 mos
- Yairi & Ambrose (2005)
  - Longitudinal study of 163 CWS
  - 24-35 mos (60%), 42 mos (85%), 48 mos (95%)
- Reilly et al. (2009)
  - Longitudinal study of 1619 children (137 CWS)
  - Median = 29.9 mos
- Shimada et al. (2018)
  - Longitudinal study of 2274 children
  - 25-30 mos (21.9%), 31-36 mos (59.4%)
- More common in younger children and when they are closer to 3 yo

# Epidemiology - Gender Ratio

- Near 3 years of age:
  - Boys : girls = 1.58~2.1 ; 1
- Older
  - Boys : girls = 2.81~7.5 : 1
- Boys >> girls. Why?

# Demand and Capacity Model

- Demand for fluency > capacity of fluency
- Capacity
  - Speech motor control
  - Language development
  - Social and emotional functioning
  - Cognitive development
- Demand
  - Within the child
  - External environment

# Assessment and Intervention

# Assessment of Stuttering

- Case history
- Speech and language skills
- Fluency assessment
  - Frequency
  - Severity
  - Types
- Fluency related QoL, general health related QoL
- Impact of stuttering

# Intervention of Stuttering

- Amount of stuttering
- Child's reaction to his/her stuttering
- How does stuttering affect the child's daily life?
- How do others react to his/her stuttering?
- Age of child
- Mainly behavioral, can be instrumental

## Before & After Behavioral Treatment





# Delayed Auditory Feedback (DAF) on Normal Speakers



DAF on PWS

# Beginning of the Evaluation

# End of Handout