Stuttering Through the Ages

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Stuttering defined

Stuttering is a neurodevelopmental disorder involving many different brain systems active for speech – including language, motor and emotional networks. Each infant is born with a genetic makeup that contributes to his or her probability of stuttering however whether stuttering will develop depends upon experience. To learn to speak fluently, a child’s brain must develop many different neural circuits, and these circuits must interact in very precise and rapid ways. Stuttering emerges in childhood as a symptom that the brain’s neural circuits for speech are not being wired normally. For this reason, early intervention is critical, because by shaping the child’s experience, we can affect the ongoing wiring process in the child’s rapidly developing brain. The longer the stuttering symptoms persist in early childhood, the more difficult it is for us to change the brain’s wiring, and stuttering becomes a chronic, usually lifelong problem.

Anne Smith, 2008

Cognitive cycle of the SLP

Thought

Feelings

Physiological reaction

Behaviour

Where are we going?

• Recovery rates
• Multifactorial model and evidence
• Assessment of persistence and recovery
• Assessment beyond preschool
• Treatment approaches and other considerations
• Tie-up

Natural History of Stuttering to 4 Years of

Reilly et al. (2013) and Reilly et al. (2009)

• 8.5% of children affected by three-years of age
• 11.2% of children affected by four-years of age (onset slowed noticeably after 3;6)

What about recovery?

Yairi & Ambrose (1999) followed 84 children over four years. Findings indicated 74% recovery rate. Sample was gained through SLP referral, preschools, newspaper ads, other health professionals

Dworzynski et al. (2007) – 87% (stuttering not validated through objective speech data)

Mansson (2000) – 85%
Assessing risk

Journal of Fluency Disorders (2013 Editorial)

- Risk assessment for young children who stutter plays a role in improving care.
- Implications can be financial in the face of scarce resources
- Can also be burden and concern to a family

Evidence based defined

"An Evidence–based guideline is a document with recommendations meant to improve quality of care. It is founded on systematic reviews of scientific research and on the assessment of the advantages and disadvantages of different care options and includes expertise and experiences of healthcare professionals and service users.”

Richtlijn voor Richtlijnen, 2011

In other words . . .

Three Fold

A) Research
B) Clinician’s Experience
C) Client and Family Values

The Multifactorial Model

Physiological factors
Linguistic factors
Psychological factors
Environmental factors

Stuttering

Neurophysiological Findings (Structural and Functional)

Are there differences in brain structure/function of AWS?

- Reduction in white matter in speech and auditory areas (Sommer et al., 2002 & Watkins et al., 2008 & Chang et al., 2011)
- Greater activation of the right hemisphere (Jancke et al., 2004, Change et al., 2011, De Nil et al., 2000)
- Reduction of gray matter in cerebellum and medulla regions. Increased gray matter volume in temporal, parietal, frontal lobes (Song et al., 2008)

Neurophysiological Findings (Structural and Functional)

Are brain differences in adult brains a cause or effect of long time stuttering?

- 22 subjects, 9 to 12 years of age (Chang et al, 2008)
  - 15 CWS had less GMV in bilateral inferior frontal gyrus and middle temporal gyrus
  - 8 CWPS had more GMV in bilateral pre–central gyrus and superior temporal gyrus and other brain regions
  - 8 CWPS had reduced white matter fibers in the face and laryngeal area in LH left hemisphere compared to CWRS
  - No increased right sided activation in speech regions
  - No differences in corpus callosum between groups
Neurophysiological Findings (Structural and Functional)

Canadian study with 11 CWS and 11 CWNS, ages 6 to 12 years (Beal, Gracco, Brettschneider et al., 2012)

- CWS had less gray matter in speech areas
- CWS had less white matter volume in certain areas of the corpus callosum but not in areas of the right hemisphere compared to CWNS

Genetic Findings:

Is there a genetic predisposition to stuttering?

- Whatever the cause of stuttering there is evidence to support the idea of genetic transmission (Yairi & Seery 2011)
- 70% of the children who were beginning to stutter had relatives that stuttered (Ambrose et al (1993)
- 28 studies reported between 30% – 60% of PWS had a familial incidence of the disorder compared with <10% of PWNS (Yairi, Ambrose, Cox 1996)

Genetic Findings:

- Identical twins were more consistent for the presence of stuttering than fraternal twins (Howie, 1981)
- 45% of monozygotic twins were more consistent for stuttering compared to 15% of dizygotic twins (Felsenfeld et al 2000)

Genetic Findings:

- 39% of male relatives stuttered compared to 15% of female relatives (1964)
- Male to female ratio of 4.6:1 for a school population (Van Borsel et al, 2006)
- Functional brain regions different between males and females (Ingham, Fox & Ingham 2004)
- Chromosomal differences between both sexes (Suresh, Amborse, Roe et al , 2006)

Linguistic questions

1. Are children who stutter with co-occurring speech difficulty at a higher risk for persistence?
2. Is language status in CWS a risk for persistence?
3. Do CWS talk ‘faster’ than CWNS?
4. Are there language and speech/motor differences in PWS?
5. Is there a higher rate of stuttering in bilingual speakers?

Speech development

Poor phonological skills at onset may be associated with risk of persistent stuttering. No evidence for difference in error types between CWS–persisted and CWS–recovered (Paden et al., 1999). Also Spencer & Weber–Fox (2014) found measures of non-word repetition task and consonant production were predictive of persistence.

Paden (2002) found over time CWS who persisted gradually improved to a point that at a two–year follow up phonological development of the two groups were similar.

Gregg & Yairi (2012) asked are there relationships between phonological skills and initial characteristics of stuttering in ps CWS with co–occurring disorders? No differences found in stuttering characteristics between the mild and moderate phonological delay groups of ps CWS near onset.
Rate of speech

Meyers and Freeman (1985) found mothers of CWS may have faster rate of speech. Also in this study CWS talked at slower rate than CWNS.

Yaruss & Conture (1995) found that differences in rate between mother-child positively correlated with stuttering severity. They did not find between group differences in rate of CWS vs. CWNS or parents of CWS vs. CWNS.

Ryan (2000) found that there were no group differences in speaking rate of mothers of CWS and CWNS. Ryan found that mother’s rate correlated with child’s severity of stuttering.

Dissociations

When one area of linguistic performance is dissociated from another aspect of linguistic performance (Guitar & McCauley, 2010). Even if skill areas are within or above typical range.

- Dissociations among speech–language processes may bring about a disruption in speech fluency as more resources are devoted to resolving these differences. (Anderson et al., 2005)

- CWS were three times more likely than CWNS to exhibit dissociations between speech, vocabulary, and language skills. (Anderson et al., 2005)

Language and Speech Motor System Findings

Lower lip movement from 8 AWS and 8 AWNS (Kleinow & Smith, 2000)

- Target phrase in isolation and same phrase embedded in utterances of increased length and complexity
  - AWS had decreased speech motor stability
  - Speech motor stability of AWS decreased when stimuli was more complex
  - Increasing the length of the utterance did not affect the speech motor stability of either group

Speech Motor Findings

- PWS demonstrated reduced capacity to:
  - acquire new speech and non–speech motor behaviors rapidly and efficiently (Ludlow, Siren, Zikira, 1997 & Forester & Webster, 2001)
  - do not demonstrate reaction time improvements to the same extent as PWNS on repeated practice (Smiths–Bandstra & DeNil, 2007)
  - initiate and terminate motor movements (Caruso & Strand, 1999)
  - accurately and efficiently perform sequential motor tasks (Max, Caruso, Gracco, 2003)

- demonstrate reduced articulator coordination during speech drills (Smith, Sadagopan, Walsh et al., 2010)

- stutter less with repeated readings of the same materials (Smiths–Bandstra & DeNil, 2007)

- increase fluency with external timing cues, rhythm or voluntary control (Max, Guenther, Gracco et al., 2004)

People Who Stutter:
Language Findings

• Finding differences in AWS and AWNS for:
  ○ function and content words (Weber–Fox, 2001)
  ○ retrieving semantic information more slowly for words read in unexpected context (e.g. the boy hung his coat in the peanut) (Bloodstein and Bernstein Ratner, 2008)
  ○ violations in verb agreement (e.g. every the children pretends to be superheroes) (Weber–Fox & Hampton, 2008)
  ○ phonological processing in adults: only most difficult rhyme decision where the reaction times were slower (e.g. gown, own) (Weber–Fox, Spencer, Spruill, Smith, 2004)

Bilingualism Findings

• Over 50% of the world's population is bilingual (De Houer, 1998)
• Past data showed that bilinguals stuttered more than monolinguals
• 3 possible tendencies that stuttering occurs in:
  • one language but not the other
  • both languages on an equal level
  • both languages on a different level

Environmental questions

1. Do parents of CWS contribute to onset of stuttering?

1. Does interaction style contribute to risk of persistence?

Parent interaction

No consistent evidence that at onset parents of CWS have different communication and interaction styles than parents of CWNS. (Kloth & Jansen, 1998)

Parents of both CWS and CWNS did not differ in requests for information, performance or comments. They also found that CWS were more fluent when answering questions as parents asked high number of yes/no questions. (Weiss & Zebrowski, 1991,1992)

No differences were found between mothers of CWS and CWNS near onset in areas of linguistic complexity, lexical diversity, word rarity and MLU. (Miles & Ratner, 2001)

Parent anxiety

Limited understanding about how stuttering affects parents (Langevin et al., 2010).

Perceived impact on children: teasing, reacting negatively, frustrated

Impact on parents: 90% of parents reported that they were affected by their child’s stuttering and most frequently reported reactions that were worry, anxious, unsure, concerned, frustration, self blame, in shock.
Psychological questions

1. Are young CWS different than CWNS in temperament?
2. Do temperamental/emotional traits increase the risk of persistent stuttering?
3. When do communication attitude and anxiety begin to play a role in communication of PWS?

What is temperament? – Regarded as the biologically determined aspects of personality. We seldom have reliable method to determine what may be an effect of experience or neurological influences such as injury. The younger the children we study the more likely that we are looking at temperament (Alm, 2014).

Temperament

We begin with looking at what research finds for young children who stutter.

Reilly et al., (2009) as part of a larger study looked at shyness at age two and did not find any significant difference between children who would start to stutter and those who would not.

Van der Merwe et al., (2011) Measured salivary cortisol levels in 7 preschool CWS and 7 CWNS. Also measured parent report of anxiety and communication attitudes of the children.

Temperamental characteristics of CWS

Evaluated areas of temperament: activity level, adaptability, quality of mood, intensity of reaction, distractibility, attention, sensory, rhythmicity.

CWS more likely to exhibit temperaments consistent with:
- Hypervigilance, less distractibility
- Less adaptability to change
- Lower rhythmicity

Thought that these temperamental characteristics could contribute to exacerbation and persistence.

Stuttering interacts with temperament.

Emotional reactivity and regulation in childhood

Examines relations between children's emotional reactivity, emotion regulation, and attention regulation and stuttering.

Emotional reactivity refers to the tendency to experience frequent and intense emotional arousal.

Emotion regulation involves the process of initiating, maintaining, or modulating the occurrence, intensity, or duration of internal feelings and emotion-related physiological processes.

Attention regulation involves shifting one's attention away from something that is emotionally arousing in order to limit emotional effects.

Reactivity and regulation

CWS were significantly more reactive than CWNS
- When faced with everyday stressful, challenging, or exciting situations, CWS were more intensely aroused than CWNS.

CWS were significantly less able to regulate their emotions
- Once CWS children became upset or excited, they were less skillful and slower in returning to a baseline

CWS had significantly poorer attention regulation
- CWNS were better able to shift their focus of attention when necessary, whereas CWS tended to become fixated and were less able to disengage when required

Emotional reactivity and regulation in preschool children

Looked at stuttering, reactivity, and self regulation strategies in CWS and CWNS in two contexts:

1) emotionally inducing task
2) neutral task

To examine relationship between emotional behaviors during the tasks and speech dysfluency during a subsequent narrative task.
**School-age Temperament Findings**

- School aged CWS were more vulnerable and sensitive than children who do not stutter (Oyler, 1996)
- Increased sensitivity (reactivity) and higher self expectations among 50 school aged CWS (Riley & Riley, 2000)
- 58 CWS ages 3 to 8 years of age (Eggers et al., 2010)
  - Increase in reactivity: Negative Affectivity/Anger/frustration, Motor Activation/Approach
  - Lower in self-control: Effortful Control/Inhibitory Control/Attentional Shifting
  - No correlation between temperament and duration of therapy or stuttering severity

**Adult Temperament**

- 24 AWS and 24AWNS, Eggers, 2012b
  - Results: AWS have less efficient inhibitory control when compared to matched controls.
  - AWS had higher scores on reactivity and on a scale of nervousness.

**Psychological Factors**

**Awareness and communication attitudes**

From the age of three some children can recognize stuttered speech (Ambrose & Yairi, 1994). Boey et al. (2009) used parent report of child reactions to investigate awareness.

Peer responses to CWS in preschool. (Langevin, Packman, Onslow, 2009)

Preschool CWS are more likely than gender matched age controls to have more negative attitude toward speech. (Vanryckeghem & Hernandez, 2005). However, Van der Merwe et al. (2011) did not find differences between groups of CWS and CWNS on KiddyCAT scores.

**Trait/State Anxiety**

- Craig, Hancock, Tran et al., 2003
  - State and trait anxiety greater among those who stutter than general population
- Craig et al., 2003
  - 63 PWS >15 years using the STAI
  - PWS had higher scores than control
- Craig, 1990
  - 102 AWS gave STAI pre and post behavioral Tx
    - Higher on state anxiety in demanding situations and higher on trait than controls
    - Post TX: anxiety levels WNL, higher than AWNS

**Social anxiety**

- AWS
  - Fear speaking situations (Mahr & Torosian, 1999)
  - Scored higher on measures of social evaluation and anxiety in new situations (Messenger et al. 2004)
  - Increased fear of negative evaluation in a socially evaluative or new situation (Iverach & O’Brien, 2009)
  - Scored higher on fear of negative evaluation (Blumgart, Tran, Craig, 2010)

**So where does anxiety begin?**

- CWS ages 9 to 14 years (Craig, 1996)
  - No significant difference between 96 untreated CWS and 104 CWNS on STAI
- State anxiety associated with greater risks of stuttering in children (Weiss & Zebrowski, 1992)
- Higher trait & state anxiety and fear of negative evaluation in adolescents who stutter (Mulcahy, Hennessey, Beilby & Byrnes, 2008)
- Trait anxiety increasing as PWS grow older and have exposure to state anxiety (Craig, Hancock, Train and Craig, 2003)
Speech Attitudes

- Communication attitudes of AWS are more negative than AWNS (Brown & Hull, 1942; Erikson, 1969; Andrews & Cutler, 1974)

- CWS scored higher on the CAT-D in areas related to negative speech attitudes (Brutten & DeNil)

- CAT to 55 Flemish CWS and CWNS (ages 6 to 13 years) showed that as early as 6 years children have a negative attitude to speech (Vanryckeghem & Brutten, 1997)

Assessment of Stuttering Assessment

Analysis of stuttering and normal disfluency (Ambrose & Yairi, 1999)

90 Children ages 2–5 all within 6 months of stuttering onset, 54 age matched CWNS. Goals was to answer questions regarding stuttering characteristics at the early stages of the disorder.

Collected speech samples and analyzed according to:

stuttering like disfluencies (SLD) – part word repetitions, single syllable word repetitions, prolongations, blocks

other disfluencies (OD) – interjections, revisions, multisyllabic word and phrase repetitions.

Stuttering assessment

Describe the stuttering

Type & Frequency %SS
whole word repetitions
syllables
sound repetitions
blocks
prolongations
tension, extra movement, breathing disruption

Awareness
Avoidance
Rate
Severity Ratings

Natural recovery factors – Low Risk Group (Yairi & Ambrose, 2005)

- Female
- Early onset (before age 3)
- Short time since onset (less than 6 months since first reported)
- No family history of stuttering or history of natural recovery
- Trend of decreasing stuttering by 12 months post onset
- Strong phonological skills

Persistence factors – High Risk Group

- Male
- Later age of onset
- More than year since onset
- Family history of persistent stuttering
- Stable or increasing stuttering over time
- Weak phonological skills
Preschool assessment: Speech and Language

Speech production
Language measures
  - Receptive/Expressive Vocabulary
  - Receptive/Expressive Language
  - Language sampling

Preschool Parent Interview

Parent perception of the problem
  - Gather details about onset and trending of stuttering
  - Family history
  - Child’s personality
  - Behavior & management
  - Parent level of concern
  - Health, eating, sleeping
  - School
  - Developmental history

Interactive assessment

In order to understand the child’s communicative environment. We can learn more about:

- parent style of interaction
- parent rate of speech
- Parent language level

Preschool Child

What is the child’s level of awareness?

Communication attitude

Kiddy Cat & PCI child interview

School-age and Adult Assessment Overview

- Establish rapport
- Obtain background/case history
- Describe speech characteristics
- Consider home/social/work environments
- Note conditions/variables affecting speech
- Understand the impact on the client’s life
- Provide information about stuttering and therapy
- Recommend a plan of action for the client

Case History Areas

- Stuttering History
- Treatment History
- Current Speech Description
- Environmental Variables Affecting Speech
- Impact of Stuttering on Quality of Life
- Other Relevant Case History
- Client Perspective
- Identifying Information
School-age Assessment

Think about CALMS
- Cognitive
- Affective
- Linguistic
- Motor
- Speech

Cognitive
- Knowledge of stuttering
- Identify moments of stuttering
- Previous therapy techniques
- Model a fluency shaping strategy or stuttering modification skill

Affective
- Attitudes and feelings towards communication and stuttering
- Tools that examine speaker’s Communication Attitudes
  - Communication Attitude Test (CAT)
- Instruments that focus on role of environment or negative impact of stuttering on the speaker’s life
  - Behaviour Assessment Battery (BBA; Brutten & Vannucchamps 2007)
  - Overall Assessment of Speaker’s Experience of Stuttering (OASES) (Yaruss & Quesal, 2010)
    - Adults
    - Adolescents (13-17 yrs)
    - School-age children (7-12 yrs)
  - The School-Age Child Who Stutters: Working Effectively with Attitudes and Emotions ... A Workbook (Chmela & Reardon, 2001)

Linguistic
- Informal or Formal Articulation and/or Phonology Tests
- Informal or Formal Language Tests

Motor
- Assessing Speech Samples:
  - As representative of stuttering as possible
  - Fluency Types and Behaviors
  - Two to three contexts
    - Spontaneous speech (conversation /monologue)
    - Oral reading (Non–reader – picture description task)
    - Other – individual relevance (telephone, classroom, presentation)
  - Severity of stuttering

Social
- Speaking situations across different social speaking situations
- Pragmatics – eye contact, body language, turn taking, length of responses
Adult Assessment

- Background Information
  - Previous therapies
  - Lifestyle: work, family, social, hobbies
- Assess emotions and attitudes towards stuttering
  - what do they do for fun?
  - social situations?
  - avoidances?
  - family life?
- Client’s therapy goals

Adult Attitudes Towards Communication

- Tools that examine speaker’s Communication Attitudes
  - Communication Attitude Test (CAT)
  - S-Scale (Erikson, 1969)
  - Modified Erikson Scale (S-24) (Andrews & Cutler, 1974) online
  - Perceptions of Stuttering Inventory (PSI) (Wood, 1967) online
  - Self-Efficacy Scale for Adult Stutterers (SEAS) (Ornstein & Manning, 1985)
- Instruments that focus on role of environment or negative impact of stuttering on the speaker’s life
  - Wright and Ayer Stuttering Self-rating Profile (WASSP) (Wright & Ayer, 2000)
  - Behaviour Assessment Battery (BAA; Brutten & Vanryckeghem 2007)
  - Overall Assessment of Speaker’s Experience of Stuttering (OASES) (Yaruss & Quesal, 2010)

Treatment Approaches for Preschool Children

- Modify environment & interaction to be more facilitating of fluency
- Modify speech directly

**Palin Parent Child Interaction**

- Environment
- Interaction

**Shaping**

- Turtle talk
- Pausing

**Lidcombe Program**

- Speech – reinforcement
- Of child’s spontaneous fluency

Treatment

- Modify environment & interaction to be more facilitating of fluency
- Modify speech directly

**Palin Parent Child Interaction**

- Comprehensive assessment – detailed case history, child assessment, child interview, interaction assessment.
- Treatment – parent interaction, family strategies (environment and emotions) based on child’s linguistic, environmental, and emotional strengths and needs.
- Adapted to each child and family
- Parents – 3-5 times per week homework
- Goals – aim to decrease trend in stuttering by 30%, reduce parent anxiety, increase parent confidence
- Sessions – 2 assessment, 6 treatment, review

**Lidcombe**

- Smaller scale assessment – screening of speech, language, emotions. Fluency assessment.
- Treatment – parent verbal contingencies to control stuttering, parent administered.
- Essentially the same progression for each child
- Parents – daily homework
- Goals – aim for %SS < 1, SR = 1
- Sessions – 1 assessment, average number treatment sessions 15, maintenance sessions

More details

**Palin PCI**

- Up to 7 years of age
- Play-based with parent and child
- Video feedback
- Facilitated discussions to help parents support and increase child’s natural fluency

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The Palin PCI Approach

Clinician role:
- Facilitator
- Reinforcer
- Highlighting strengths
- Collaborator

Principles Underlying Palin PCI

- Parents of CWS have normal interaction styles
- Stuttering can affect parents’ interactions
- Interactions may be changed and can increase fluency
- Parents are already supporting child’s fluency

Overview of Treatment

- Six weeks PCI therapy – special times at home
- One session per week
- With both parents/carers and child
- One hour clinic sessions
- Six weeks consolidation period
- Review session and determine care plan

Strengths of Palin PCI

- Can be implemented with children for whom LP therapy may not be ideal
- Focus on parent–child interaction (not child’s stuttering)
- Lays therapy foundation with parents whose children who later require direct work on fluency
- Gives parents some understanding about how to manage their child’s fluency
- Parents who can’t commit to LP may commit to 6 weeks

Research Palin PCI

Millard, Nicholas, and Cook (2008)
- 6 children (CA: 3;3 to 4;10) stuttering more than 12 months (TSO ranged from 15–30months)
- Mean reduction from 8.4% SS to 2.7% SS one year post therapy
- Four children reduced with both parents, two required direct therapy where one had insignificant reduction over study and the other had reduction with one parent.

Millard, Edwards, and Cook (2009)
- 10 children (CA 3;7 – 4;11)
- Treatment n=6 and control n=4
- 4 of 6 children in treatment group significantly reduced stuttering during therapy phase. The other 2 showed significant reductions at the end of follow–up phase.
- One of four in control group reduced stuttering at follow-up phase.
- Parent knowledge and confidence measures
LP Foundations

- Designed for children < 6 years old
- Origins in behaviour therapy – Attention to child responses and parental contingencies
- Consistent speech measurement (%SS; Severity Ratings)
- Treatment by parents in structured sessions and everyday talking situations

Research LP

Jones, Onslow, Harrison & Packman (2000)
261 children in study, 250 completed the program
Analysis of age, gender, time from onset and severity in relation to treatment time.
- Average of 11 visits required
- Severity did impact treatment length
- Older children may progress more quickly through LP

Jones et al. (2005)
54 children were randomized to LP intervention (n=29) or control (n=25).

Parent delivery of LP

Carr Swift et al. (2011) investigated:
To what extent do parents deliver contingencies for US and SFS in structured and unstructured sessions?

Findings in structured conversations:
- Ratios of PVC for SFS:US were good
- Parent did not apply enough structure to practice
- Parent focus on rule vs. talking and corrected language vs. US
- Parent of one child continued with treatment despite child saying that he did not like the activity or the feedback

LP problem solving checklist

- Uses recordings from three at home therapy sessions
- Evaluates appropriate use of LP components
- Based on LP manual and references each item with page number in the manual

Almost never
Sometimes
Most of the time

What parents say about

The day to day realities of using the LP (Hayhow, 2009). Interviews revealed a variety of opinions and experiences that were categorized into three streams.

A straightforward journey
Starts well but hits problems

Problematic from the beginning
Mothers’ experiences

(Goodhue et al., 2010)

Implementation
Obstacles
Benefits

Perception of the program
expectations
overall perceptions
suggestions for improvement
child’s reactions

Emotions: empowerment, anxiety, guilt, distress,

Strengths of LP

• Research base

• Well described therapy process in the literature
  ○ Clear expectations for parents
  ○ Clear guidelines for SLP process

• Goal is to remove stuttering – high standards
  ○ Close monitoring standards – Stage 2 maintenance scheduling

• Families report enjoying the therapy

When & who

Palin PCI
• Children at early stages of stuttering onset less than one year & appear to be at risk
• Children with distressed parents but early in onset (low or high risk)
• Children with clear environmental or interaction triggers e.g. sleep routine, temperament, mismatch between parent expectations and child performance or rate.

Lidcombe
• Children who have been stuttering for over one year without significant signs of recovery.
• Children who are going to kindergarten
• Consider beginning earlier than one year monitor if risk factors are high e.g. positive unrecovered family history, male, phonological problems, stable or increasing in severity.

Indirect suggestions and advice

http://www.stutteringhelp.org/content/7-tips-talking-child-who-stutters

Video from the Stuttering Foundation reviews common environmental and interaction strategies for parents.

Reduction the Pace
Asking questions
Full listening
Turn Taking
Building confidence
Special time
Normal rules apply

School-age and Adult Therapy: Management

✓ More than just speech disfluencies

✓ No guaranteed cure for stuttering in school-age children

✓ It is okay to stutter

✓ Include people in child’s environment

✓ Tx must incorporate variety of individualized strategies aimed at each component of child’s stuttering

Therapy May Include . . .

✓ Changes to speech production to enhance fluency and minimize severity of moments of stuttering

✓ Changes to communication attitudes to reduce client’s negative reactions to stuttering

✓ Improvements in client’s communication abilities to ensure the client can convey message effectively in speaking situations

✓ Reduction in total impact of stuttering on client’s overall quality of life
**Treatment Approaches for School-age to Adults**

- Cognitive Behavior Therapy
  - Lidcombe
  - Fluency Shaping Skills
  - Stuttering Modification
  - Camperdown
  - Other

**School-age Lidcombe**

- May take longer to achieve stutter free speech.
- More variability of stuttering during stage 2.
- May need to incorporate fluency shaping or stuttering modification skills.
- Need for maintenance and follow-up.
- Lack of availability of parents in schools.
- Finding time.

**School-age Lidcombe Evidence**

  - 11 children, 6 years 10 months to 12 years 4 months
  - Measures: %SS & SPM at 2 months pre Tx to 12 months post Tx
  - Average of 12 one-hour treatment sessions to reduce stuttering <1.5%SS on measures obtained both within and out of the clinic.
  - 12 months post Tx, majority of the children maintained near zero stuttering.

- Kousnik, Shenker, Onslow (2009)
  - 12 children, mean age 9 years 0 months
  - Average to stage 2 was 7.5 weeks (range of 6 to 10 weeks)
  - Pre Tx was 2.7 to 18.9% SS to post Tx at 0 to 1.9%SS
  - 3 children unable to meet criteria established for preschool children

**Stuttering Modification**

- "Stutter more easily."
- Reduce speech related avoidance behaviors, fears and negative attitudes (Guitar & Peters, 1980; Peters & Guitar, 1991).
- Decrease tension so stuttering is less severe
- Four phases:
  - Identification
  - Desensitization: accepting your stutter, freeze your stutter, voluntary stuttering or stuttering on purpose
  - Modification: cancellation or pull out
  - Stabilization: make your own goals

**Fluency Shaping**

- "Speak more fluently"
- How?
  - Voicing onsets (gentle onsets, easy onset)
  - Linking (blending): Link sound in final word to sound in initial word
  - Soft contacts (light contacts, light touches)
Fluency Shaping Research

- ISTAR’s Comprehensive Stuttering Program (3 week intensive treatment) (Boberg & Kully, 1994)
  - 42 adult and teenage subjects
  - Reduced stuttering from 15% to 20% to 1% to 2% SS
  - Follow-up at 12 months, average stuttering increased to 5%
  - 24 months post, 7 subjects were called and their average stuttering was 2%.

- Onslow (1996)
  - 2 week intensive fluency shaping program in Australia, 18 subjects-10 to 48 years of age
  - Near zero stuttering at end of program
  - After 3 years, 10 subjects remained at near zero stuttering

Who? LP and Shaping

**LP**
- Children with no previous therapy.
- Children with less awareness of their stuttering.
- Children with no negative attitudes towards speech.
- Parent availability, time, funding.

**Shaping**
- Children with previous therapy experiences.
- Children who are aware of their stuttering.
- Children with negative speech attitudes.
- Less parent availability, time and funding.

Camperdown Program

- **What is it?**
  - For adults and adolescents (12 years and over)
  - Behavioral Treatment
  - Speech restructuring tool: Prolonged speech
  - Fluency enhancing not stuttering modification
  - No standardized anxiety component

- **How long does it take?**
  - Adults:
    - group format 13 to 20 hours
    - individual telehealth 8 to 10 hours
  - Adolescents
    - individual telehealth 11 to 16 hours

Camperdown Program Stages

1. Teach the components of treatment
   - use a model to learn prolonged speech
   - use of severity ratings
2. Natural sounding stutter free speech in the clinic
   - naturalness evaluation instead of speech rate evaluation
3. Generalization to everyday speaking situations
   - problem-solving
4. Maintenance and relapse prevention

Camperdown Program Advantages

- Require fewer clinician hours
- Less time to learn to use the speech pattern
- No formal transfer phase
Camperdown Program 
Fluency Technique

Resources:
Australia Stuttering Research Centre


Camperdown Evidence

• Evidence for AWS (O’Brian et al., 2003)
  - Results for 16/30 participants.
  - Minimal or no stuttering in everyday speaking situations for up to 12 months after entering maintenance.
  - Speech rates in normal range.
  - Achieved in a mean of 20 hours of clinic attendance.

• Evidence for webcam delivery phase II trial for 16 adolescents (Carey et al., 2014)
  - 14 completed the program.
  - Pre tx %SS was 6.1% (range 0.7 – 14.7)
  - Pre tx to maintenance was down to 2.8%SS with half of participants stuttering at 1.2% or lower
  - 25 sessions (15.5 hours)
  - Half of the participants showing little reduction in avoidance of speech situations.

Supporting Change

Implementing Cognitive Behavior Therapy with School-age Children (The Stuttering Foundation of America, DVD No. 6500)

Cognitive Behavior Therapy

• The cognitive model

Menzies et al., 2008

• Effects of CBT and stuttering treatment
• 30 participants (25 males, 5 females) randomly assigned to 1 of 2 groups
• 60% (18) diagnosed with social phobia
• Results:
  - speech restructuring alone did not have an impact on the social phobia
  - participants who received the CBT no longer met diagnosis for social phobia at follow-up
  - CBT did not reduce stuttering anymore than speech restructuring alone

Amster & Evelyn, 2008

• 5 males and 3 females (ages 27 to 56)
• Modified CBT alone or combined with stuttering modification program could help reduce perfectionistic tendencies
• First 3 weeks: CBT
• At 4 weeks: stuttering modification therapy and CBT
• Results:
  - decline in perfectionistic tendencies
  - participants reported avoiding less frequently, becoming upset about mistakes, reacting less negatively to failure
  - improvements in speech fluency throughout tx
  - 15 weeks: decrease in self reported perfectionism, no significant change in disfluency
Support for CBT and School-age Clients

- 9 to 14 years of age, 82% boys (Craig et al, 1996, Hancock et al, 1998)
- Smooth speech in the clinic and home based both with CBT
- Results from the majority of older children:
  - resulted in significant reduction in stuttering
  - significant reduction in anxiety levels
  - speech production was natural
  - speaking rates typical to peers
  - home based program was effective

CBT Conclusion

✓ CBT can be affective in reducing stuttering with and without speech restructuring techniques. (Blood, 1995 & Reddy Sharma, Shivanshankar, 2010)
✓ Evidence is supporting the combined use of CBT and direct stuttering therapy in order to effect change in stuttering severity and overall sense of client well-being
✓ PWS who have difficulty with relapse may be those who have a risk of developing a social anxiety. Best evidence in adolescent and adults in stuttering treatment should be delivered in CBT regiment (Craig et al, 1996)

Why don't we always use CBT?

- Not all AWS experience speech related anxiety and fears
- Most SLP's not trained in CBT

Minimize Negative Personal/Environmental

- Desensitization
- Self help and support Groups
- Cognitive Restructuring
- Bullying/Teasing
- Educating Teachers
- Helping Parents and Partners be supportive

Conclusion for the day