

## FLUENCY DISORDERS - A REVIEW

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**ABSTRACT**

The prevalence of stuttering is also highest almost pre-school children compared to school aged children and adults with estimated prevalence rates of approximately 2.4%, 1%, and less than 1% for the three age groups respectively. Fluency disorders can have a significant impact on children's social, economic, and emotional development. Emotional development includes fear, anxiety, anger, and shame about speaking, and they may also develop negative thoughts or feelings about themselves or communication. So early intervention can help children with fluency disorders improve their communication skills and navigate everyday situations with confidence. So, we need to understand the fluency disorders with characteristic and assessment parameters in detail, and here, we try to explain the fluency disorder in modern as well as ayurvedic perspective for the early intervention.

**KEYWORDS:** Fluency, Disfluencies, secondary mannerisms.**INTRODUCTION**

The prevalence of stuttering is also highest almost pre-school children compared to school aged children and adults with estimated prevalence rates of approximately 2.4%, 1%, and less than 1% for the three age groups respectively.<sup>[1]</sup> Disfluencies of speech are typical or typical and all the child related and speech related variables examined in the literature, the factor most reliable associated with recovery is the child gender with girls being for more likely to be out grow early stuttering and boys being more likely to persist. Male to female ratios appear to be appropriately equal and or near the onset of stuttering, but steadily increase at children get older with ratios ranging from 3:1 to 5:1 during school years and higher ratios in adulthood<sup>[2]</sup>, this pattern is consisting with gender differences reported for a variety of other neuro developmental disorders. Stuttering refers to speech events that contain monosyllabic whole -word repetitions, part word repetitions, audible sound prolongations, or silent fixations or blockages.<sup>[3]</sup>

**Risk factors for fluency disorders**

- Family history – there is now strong evidence that almost half of children who stutter have a family member who stutters. The risk that the child is actually stuttering instead of just having normal disfluencies increases that family member is still stuttering.

- Age at onset – children who begin stuttering before age 3 ½ year are more likely to outgrow stuttering; if the child begins stuttering before age 3, there is a much better chance to overcome it within 6 months.
- Time since onset – between 75% and 80% of all children who begin stuttering will stop within 12-24 months without speech therapy. If the child has been stuttering longer than 12 months, there is an even smaller likelihood he will overcome it is own.
- Boys are at high risk for persistence of stuttering than girls.<sup>[4]</sup>

**Stuttering**

Stuttering is a chronic interpretation in the Rhythm, flow, or fluency of speech. It refers to speech events that contain monosyllabic whole -word repetitions, part -word repetitions, audible sound prolongation, or silent fixations or blockages.<sup>[5]</sup>

- Characteristics of stuttering

It has three critical groups of symptoms core behaviour, accessory behaviour, emotional reactions.<sup>[6]</sup>

1. Core behaviour – the key features of stuttering are the presence of involuntary discontinuities in the flow of speech. These behaviours consist of three basic symptoms Repetitions, Prolongations, Blocks.

Repetitions	Prolongation	Blocks
Most common form of symptoms. Repetitions may occur at the phrase, single word, or single syllable, sound level.	Sound or airflow continues but movement of the articulator is stopped, and can occur on continuant consonants, (s, f, th, sh, v, z, w, r, l, y) or vowels. Generally judged by listeners. Most often observed later than repetitions.	Stopping of both airflow and sound during the production of speech. Usually, the last core symptoms to be observed in the development of stuttering. Always perceived by listeners.

These behaviours are sometimes categorised as forms of avoidance interjections, Running starts, Revisions.

**Interjections** – in which speakers insert extraneous meaningless words or phrases such as “um”, “you know” or “like” into the flow of connected speech. **Running starts** - in which speakers return once or several times to

the beginning of a thought or sentence in an attempt to regain fluency. **Revisions**- in which phrases or whole sentence are reformulated, often to avoid anticipated difficulties on specific words or sounds. These disfluencies are categorised in two forms, between -word disfluencies, and within – word disfluencies.<sup>[7]</sup>

Between- word disfluencies (non-stuttering like disfluencies)	Within -word disfluencies (stutter like disfluencies)
Which includes all difficulties that occur while a speaker is attempting to link words together E. g. Phrase Repetitions, Interjections, Running starts, Revisions.	Which includes all difficulties that interfere with the smooth transitioning between sounds and syllables within a word. Also called stutter like disfluencies. This is chronic form of disfluencies. E.g. Sound repetitions, syllable repetitions, prolongation, blocks.
E.g. I want -I want to go now	E.g. He -he- he wants some water.

2. Accessory behaviours or secondary mannerisms - It is at this point that the disorder starts to become more complex and often more severe, as layers of perception, expectations, feelings, and attitudes begin to take root beneath the surface symptoms. These represent the reaction of the person who stutters to his or her speech difficulties and usually begin as a random struggle through which the speaker tries to push out of

involuntary repetitions, prolongations, and blocks. These behaviours may take the form of speech related movements such as lip pressing, lip pursing, teeth clenching, extraneous body movements like eye blinking, head jerking, first clenching or stamping. These behaviours of two types escape behaviour and avoidance behaviour.<sup>[8]</sup>

Escape behaviour	Avoidance behaviour
Represent the speaker attempt to release him or herself from the block.	Are used to circumvent the moment of disfluencies together and may include behaviours previously used escape or new behaviours.
E g. By blinking, moving the head, stamping the feet	E g. word substitution, stalling, using starters.

3. Emotional reaction – ongoing struggle in the production of speech gradually results in deep -rooted feelings of shame, frustration, anger, anxiety, fear, negative self-perceptions, and eventually, habitually avoidance of speaking situations.<sup>[9]</sup>

**Assessment of fluency** – Ideally for assessment of fluency must examine core behaviours as well as attitudes, perception and reaction to stuttering.

Measurement of core behaviours -certain core behaviours are present in the speech of fluent speaker’s, these behaviours can be accomplished by looking at specific characteristics of the core behaviours, includes disfluency types, frequency of disfluencies, presence of clusters and duration of disfluencies.

1. Disfluency types - identified specific types of disfluencies like phrase repetitions, interjections, etc.

Core behaviours	Example
Phrase Repetitions	“I want-I want to go now “
Word repetitions (multi syllable)	“Cinnamon-cinnamon -cinnamon and sugar”
Word repetitions (single Syllables)	“He-he-he wants some water “
Syllable repetitions	“The par-par-party is at 6.00”
Sound repetitions	“My name is D-d-d-David”

Sound prolongation	"I ffffffeel good"
Block	"Do you (tense pause, often with fixed articulatory posted for subsequent sound) want some?"
Broken word	"Gi- (silent pause)-ive it to me"
Interjections	"I, um, like to travel"
Running starts	"She wants to go with us to the-she wants to go with us to the fair"
Revision	"I Really like to-a I really love ice cream"

2. Frequency of disfluencies – Examining the amount of disfluency present can provide information about the presence and severity of a stuttering disorders and is usually measured as the number of disfluencies per 100 word's or 100 syllables.

3. Presence of clusters - clusters are defined as the occurrence of two or more disfluencies on the same word or utterance. Children with three or more clusters of disfluencies in a 100- syllable sample should be considered to be stuttering or "at risk" for stuttering.

4. Duration of disfluencies - The duration of certain disfluencies, such as repetitions, can be measured as the number of reiteration (repetitions beyond the initial Prodi); however, the duration of most other forms of disfluency is described as a length of time (typically in seconds).<sup>[10]</sup>

Differential diagnosis of typical versus atypical disfluency in young children, and can be quite helpful in clinical practice.

Disfluency	Incipient stuttering	Normal disfluency
Within -word repetitions (sound, syllable, or single syllable Words)	More than 2 reiterations (e g "b-b-b-ball")	Fewer than 2 reiterations (e.g.-ball)
Prolongation	Longer than 1second	Less than 1second

Observation of Accessory behaviours – The presence of Accessory behaviours reflects the child's growing awareness of his or her stuttering and is evidence of increasing struggle. Most often, accessory behaviours emerge during the early elementary years and gradually become part of the child's chronic stuttering pattern. To measure these characteristics, the clinician must carefully note extraneous behaviours that occur specifically during moments of disfluency.

E.g. Closing eyes, blinking rapidly, squeezing eyes shut, looking around, moving eyes vertically or laterally, consistent loss of eye contact, throwing head back, torso or limb movements, foot /hand or finger tapping, audible inhalation or exhalation, gasping, visible tension around face or mouth, facial grimacing, lip pursing or pressing, tongue clicking, sudden changes in vocal pitch, loudness, or quality, word substitution or circumlocutions, stalling.

#### 4. Perception

It is important to keep in mind that stuttering can sometimes be almost entirely covert, with no observational symptoms at all. In such situations, the person who stutters has become so adept at substituting words and avoiding disfluencies that he or she doesn't actually appear to be stuttering. That situation is called "iceberg" that is completely hidden from view but that may be a powerful negative force within the person who stutters. In such situations, a diagnosis of stuttering may be individual perception of him or herself as a person who stutters and the shame, anxiety, fear, and avoidance behaviours that typically accompany that perception.

Assessment of psychological reaction and avoidance behaviour.

Measurement of speech rate- speech rate may reflect the severity of an individual's stuttering, with severe forms of stuttering often resulting in significant reduction in speaking and reading rate. Speaking rate is typically measured as the number of either syllables or words produced per minute, with syllable counts being the preferred method. The first part of any objective stuttering evaluation is a row count of the number of stuttering -like disfluencies in a given sample.<sup>[11,12]</sup>

Sample – 100-word sample

- Noted start time of the sample.
- Noted stop time of the sample.
- Noted total number of seconds included for sample.
- These numbers will help to calculate speech rate in the percentage, so make sure to time each sample.

Method of calculation - During a speech sample with a client who stutters, place a dash in each blank for a word spoken fluently and write the appropriate code in each blank for each stuttering -like disfluencies (SLD).

The stuttering -like disfluencies codes are

1. R<sub>sd</sub> = sound s-s-s."
2. R<sub>sy</sub> =syllable repetition "the par-par-par-party"
3. R<sub>w</sub> =whole word repetition "my-my-my"
4. P = audible sound prolongation "mmmmy"
5. B= inaudible sound prolongation or Block "s---o".

There are other kinds of disfluencies that aren't considered stuttering -like disfluencies but that definitely impend the forward flow of speech and are used often by who stutter to avoid overt stuttering moments, these are

non-stuttering -like disfluencies (NSLD). And codes are used as.

1. I = Interjections “the... like...dog”
2. R = revision “I wa—I like the dog”
3. PR = phrase repetitions “I want...I want up”.

Table -10×10

-	-	B	Rsd	-	-	-	P	-	-
-	-	-	-	Pr	-	-	I	-	R
I	Rsy	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	P
R	-	-	I	-	R	P	-	-	-
-	-	-	-	-	-	-	-	B	-
-	-	-	-	-	-	-	-	-	-
-	B	-	-	-	-	-	I	-	-

List the start and stop times for the sample, and for every word, write a dash if it is fluent or the proper code if there's a disfluency. This constitutes the Raw Disfluency count.

3% or greater words stuttered or 2% or greater syllables stuttered is representative of a person who stutters.

Totals – calculate the total number of SLD's and NSLD's from the sample.<sup>[13,14]</sup>

2. For the NSLD% - (non- stuttering -like disfluencies percentage), add up the non-stuttering -like disfluencies in the sample and divide it by the total number of words in the sample.

**Percentage**

1. For the SLD% (stuttering -like disfluencies percentage), take the number of SLDs (sound/syllable repetitions, whole word repetition, audible sound prolongation, and inaudible sound prolongations) in the sample and divide it by the total number of words I the sample.

3. Total disfluencies percentage (TD%) – add the SLDs and NSLDs together and divide them by the total words in the sample. 8% or greater total disfluencies per 100 word's is representative of a person who stutters.

If there were 10 SLDs in a 100-word sample, the SD% would be 10%.

For the SD/TD% - this is the number of overt stuttering -like disfluencies compared to all disfluencies. If this ratio is greater than 66%, client more likely to be a PWS.

Total number of words in the sample and divide it by the number of seconds then multiply by 60 to get it into minutes and got speech rate in WPM (words per minute).

**Classification of disfluencies as Normal, Borderline, or Beginning Stuttering**

Normal disfluencies	Borderline stuttering	Beginning stuttering
Fewer than 10 dysfluencies per 100 words. Disfluencies consist of 2 or fewer reiterations. Repetitions are slow and regular in tempo. SLDs comprise less than 50% of the total disfluencies.	More than 10 disfluencies per 100 words. Loose, relaxed disfluencies. SLDs and NSLDs may be present. Repetitions may have more than 2 reiterations. More than 50% of disfluencies are SLDs. Clusters may be present.	Disfluencies marked by tension. Repetitions are rapid and rushed. Rises in pitch during repetitions and prolongations. Struggle with airflow or phonation. Facial tension. Awareness, possible frustration. May use escape behaviours to terminate blocks Possible avoidance.

**According to Ayurveda**

In *Ayurveda* there is no special mentioning of speech Disorders as a separate category. There are references in Classics regarding the fluency disorders, developmental Speech problems, voice problems etc. The speech Problems mentioned in the classics are *Mooka*, *Minmina*, *Gadgada*, diseases of Swara like *Swarabheda*, *VakGraha*. These conditions are coming under fluency

Problems, articulatory problems and voice problems. Also, there are references regarding the *lakshanas of Swara* in other systemic disorders. The Nidana, Sampriti and Lakshana of the disease *Gadgada* is not Elaborately mentioned in *Ayurveda* classics. *Gadgada* is Mentioned in *Vatavyadhi Avarana Prakarana* by *Acharya Charaka*<sup>[15]</sup>, and *Acharya Sushruta*.<sup>[16]</sup> *Vruddha Vagbhata* mentioned *Gadgada* is due to intake of Vata

Aggravating Ahara vihara by garbhini<sup>[17]</sup>, Sushruta has Given the explanation regarding the manifestation of Speech Disorders as Vata gets Avarana by Kapha in Shabdhavaha Dhamani and produces Mooka, Minmina And Gadgada.<sup>[18]</sup> Charaka said in avarana pakarana that Gadgada is the symptom produced by the Avarana of Samana Vata by Prana Vata<sup>[19]</sup>, Also mentioned Swara And Vak Sanga occurs as a result of Avarana of Udana vata by kapha.

### Samprapti Ghatak

*Dosha -vata(pranvayu and udanvayu)*

*Dushya -shabdvahidhamani*

*Adhistaan -shir, jivha, nasa, kanth, aosth.*

*Strotas -mabovagstrotas and swaravahistrotas.*

*Lakshana: Lupta pada vyanjanadi<sup>[20]</sup>, Avyakta Vak<sup>[20]</sup>, Aspashtha vachana<sup>[21]</sup>, Gardhabavat Swara<sup>[21]</sup>, Sphuta Vak<sup>[22]</sup>, Svalpa Asambaddha Vak,<sup>[23]</sup> Gharghara Shabdha.*

*Mooktvam*- mutness or loss of speech is mentioned in all classical texts.

*Mimminatvam* -phonemes are getting correct pronunciation by movement of lips, tongue and palate. Any abnormalities of this organs system of speech produces a change in intonation causing hypo or hyper nasal speech.

*Gadgadavtam* – there is stoppage and disruption in the fluency of speech.the stoppage may take the form of disfluencies like repetitions of sound, syllable and words, prolongation, block of words.

In Ayurvedic classics the treatment procedures for *Gadgada* and other speech problems are not elaborately Explained. *Acharya charaka* and *Sushrut* explained the Treatment of disease *gadgada* under the common *Vatvadhi chikitsa, avarana of vata.*

### CONCLUSION

The literature review highlights the complexities and multifaceted nature of fluency disorders, particularly stuttering. The findings suggest that fluency disorders are not solely a matter of speech production, but also involve cognitive, emotional, and social factors. The literature review highlights the complexities and multifaceted nature of fluency disorders, particularly stuttering. The findings suggest that fluency disorders are not solely a matter of speech production, but also involve cognitive, emotional, and social factors.

The review underscores the importance of early identification and intervention, as well as the need for comprehensive treatment approaches that address the physical, emotional, and social aspects of fluency disorders. Furthermore, the literature emphasizes the significance of exploring the neural mechanisms underlying fluency disorders, as well as the impact of cultural and environmental factors on the experience of stuttering.

Overall, this literature review may provide a foundation for further research and clinical practice in the field of fluency disorders. It highlights the need for continued exploration and development of effective assessment and treatment approaches, as well as increased awareness and education about fluency disorders.

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