

Subject: Speech The	rapy for Stuttering			Original Effective Date:	7/5/07
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PREFACE

This Medical Guidance is intended to facilitate the Utilization Management process. It expresses Molina's determination as to whether certain services or supplies are medically necessary, experimental, investigational, or cosmetic for purposes of determining appropriateness of payment. The conclusion that a particular service or supply is medically necessary does not constitute a representation or warranty that this service or supply is covered (i.e., will be paid for by Molina) for a particular member. The member's benefit plan determines coverage. Each benefit plan defines which services are covered, which are excluded, and which are subject to dollar caps or other limits. Members and their providers will need to consult the member's benefit plan to determine if there are any exclusion's or other benefit limitations applicable to this service or supply. If there is a discrepancy between this policy and a member's plan of benefits, the benefits plan will govern. In addition, coverage may be mandated by applicable legal requirements of a State, the Federal government or CMS for Medicare and Medicaid members. CMS's Coverage Database can be found on the following website: http://www.cms.hhs.gov/center/coverage.asp.

FDA INDICATIONS

The FDA does not regulate speech therapy services.

CENTERS FOR MEDICARE AND MEDICAID SERVICES (CMS)

The coverage directive(s) and criteria from an existing National Coverage Determination (NCD) or Local Coverage Determination (LCD) will supersede the contents of this Molina medical coverage guidance (MCG) document and provide the directive for all Medicare members. The directives from this MCG document may be followed if there are no available NCD or LCD documents available and outlined below.

CMS has not issued any National Coverage Determination for Speech Therapy for stuttering.

INITIAL COVERAGE CRITERIA

Speech therapy for developmental, neurogenic or psychogenic stuttering is considered *experimental/investigational* with insufficient data to recommend coverage.

Various subtypes of Speech Therapy designed for stuttering also are not covered: these include, but are not limited, to all of the following:

- **EMG** biofeedback
- Gradual increase in length and complexity of utterance (GILCU)
- **D** The Lidcombe Program Demands and capacities model
- □ Language training
- □ Metronome conditioned speech retraining
- Prolonged Speech
- □ Regulated breathing and airflow
- □ Response contingency
- □ Self-modeling



- □ Shadowing
- □ Stuttering modification.

CONTINUATION OF THERAPY

N/A

COVERAGE EXCLUSIONS

Speech therapy for developmental, neurogenic or psychogenic stuttering is considered *experimental/investigational* with insufficient data to recommend coverage.

Explanation for Coverage Limits

There is lack of sufficient data to support the effectiveness of ST in neurogenic or psychogenic stuttering. ^{30,31} Results from studies are mainly from case series, have shown inconsistent results, and have not proven consistent effectiveness of ST treatments.

There is insufficient evidence from prospective or randomized-control trials to support the effectiveness of speech therapy for developmental stuttering. Studies have a low statistical power and internal validity issues.^{7,33} The treatment is primarily educational in nature where the therapist focuses on teaching the patient and family member's fluent speech techniques.^{3,8,34,35}

There is no known cure for stuttering.³ The literature identifies high post-treatment relapse rates and high dropout rates.^{3,20,21} Stutter free speech often occurs temporarily but it is difficult to maintain.^{17,19}

The lack of good study results showing reliable benefit of ST means that ST is not an evidence-based treatment for stuttering. ST remains investigational as a treatment for stuttering. Molina plans do not cover investigational treatments (cross-reference MCG-000).

DESCRIPTION OF PROCEDURE/SERVICE/PHARMACEUTICAL

Stuttering is a communication disorder that refers to speech events that contain monosyllabic whole-word repetitions, part-word repetitions, audible sound prolongations, or silent fixations or blockages. These may or may not be accompanied by accessory (secondary) behaviors (i.e., behaviors used to escape and/or avoid these speech events). ⁴⁴ Certain sounds, syllables, or words are repeated or prolonged, disrupting the normal flow of speech.¹ Frustration and avoidance may occur and often result from negative feedback received from others. Stuttering may be associated with secondary symptoms of struggling behavior such as rapid eye blinks, jaw jerking, involuntary head or other movements including tremors of the lips.³ Symptoms may be worse in stressful situations such as talking to a group or on the telephone.¹

DSM-IV criteria⁴⁶ defines stuttering as a disturbance in the normal fluency and time patterning of speech (inappropriate for the individual's age), characterized by frequent occurrences of one or more of the following:

- sound and syllable repetitions
- sound prolongations
- interjections
- broken words (e.g., pauses within a word)



- audible or silent blocking (filled or unfilled pauses in speech)
- circumlocutions (word substitutions to avoid problematic words)
- words produced with an excess of physical tension
- monosyllabic whole-word repetitions (e.g., "I-I-I-I see him")

Stuttering is classified as developmental or acquired (e.g., neurogenic or psychogenic).³ The most common type is developmental, which occurs in young children (between two and five years of age ⁴³) while they are still learning language skills. This accounts for greater than 80 percent of stuttering cases in the population. The mean age of onset is four years of age. Approximately 1% of children with developmental stuttering (idiopathic stuttering or stammering) have onset prior to age six.² approximately, 80 percent of children with developmental stuttering will resolve by adulthood. Neurogenic stuttering follows a neurological event such as traumatic brain injury, a tumor, degenerative disorder, or stroke^{2,3} Psychogenic stuttering is rare and involves rapid repetition of initial sounds. It is most commonly found in adults with a history of psychiatric issues following an emotional trauma or psychological event.^{1,3}

The precise mechanisms underlying stuttering are not known.^{1,3} The etiology has been reported as multifactorial.² There is strong evidence supporting a genetic component to stuttering. The degree of similarity between monozygotic twins is between 75% and 89%. The male-to-female ratio of stuttering is nearly 2:1 in children as high as 5:1 in adults.³ The resolution of stuttering in adulthood occurs more often in females compared with males. Recent studies have shown different cognitive processing abilities in people that stutter compared with those that do not stutter. One study demonstrated cognitive processes involved in persons who stuttered increased the use of the right hemisphere of the brain more than compared with fluent speakers.⁴ A comparison of functional magnetic resonance imaging scans in people who stutter identified varying neural system activation during the generation and production of speech.⁵

There is no definitive cure for stuttering.³ It has been estimated that 2% to 5% of children will stutter for some period of their life, and approximately 1% of adults or 3 million Americans stutter. The ultimate goal for speech therapy is to reduce and manage the disfluencies.³ Additional goals of therapy include "reducing the frequency of stuttering, decreasing the tension and struggle of stuttering moments, working to decrease word or situation avoidances, using effective communication skills such as eye contact or phrasing, and learning more about stuttering."²⁷ The following outlines various therapy techniques used for improving stuttering:

- *Electromyographic:* an EMG biofeedback computer system is used to monitor speech production and muscle activity. The goal is to develop control and awareness of these muscles. A sample of simple words and conversations are used to practice speech production and muscle relaxation.
- Gradual increase in length and complexity of utterance (GILCU): Programmed, criterion-based direct treatment that has 54 programmed steps in the treatment phase. This model is based on delivering positive feedback in the form of verbal, social, and tangible tokens for stutter free speech, with clinicians modeling in branching steps as needed to demonstrate fluency. Once stutter free speech is established, the transfer phase requires 10-15 hours. Maintenance goals are to reduce the frequency of treatment sessions gradually over a two year period.



- The Lidcombe Program: Originally designed for children under 6 years of age. It is now being offered to school-age children. The Lidcombe Program is conducted by parents, not by the speech pathologist. The role of the speech pathologist is merely to teach the parents how to conduct the treatment. The treatment occurs in situations where stuttering is known to occur and not in a speech clinic. The Lidcombe Program is individualized for every family.
- Demands and capacities model: Treatment is performed by parents. According to this model, most children get stuck and repeat words or sounds when they first begin to talk. Usually, they work through this phase, although some may need extra help. The aim of this indirect therapy is to achieve a better balance between the demands on the child to communicate and his or her developing capacities. The therapist will explore ways in which a parent can help reduce some of the pressures a child may experience, as well as ways in which to help increase their communication skills.
- *Language training:* This therapy provides language training in vocabulary, irregular verbs, and conversational speech activities.
- Metronome conditioned speech retraining: This is an advanced brain-based assessment & treatment
 program developed to directly improve the processing abilities that affect motor planning and
 sequencing. This therapy tool uses neurosensory and neuromotor exercises to improve the brain's
 inherent ability to repair or remodel itself through a process called neuroplasticity. This process
 challenges the patient to synchronize a range of hand and foot exercises to a precise computer-generated
 reference tone heard through headphones. The patient attempts to match the rhythmic beat with
 repetitive motor actions.
- *Prolonged Speech:* This technique is useful in controlling oral and laryngeal stuttering by means of modifying a stuttering block by stretching and extending it out just after the block has begun.
- *Regulated breathing and airflow:* A deep breath is slowly inhaled. Passive release of air (exhalation) is begun just prior to adducting the vocal folds to initiate phonation. This technique is used to assist in laryngeal blocking and overall reduction of tension by promoting relaxed breathing, tension reduction, and easy onset of vocalization.
- *Response contingency:* Stimulus contingencies are stimulus substitutions. A stimulus such as stuttering that evokes an involuntary response such as fear is repeatedly paired with a neutral stimulus such as phone ringing, and the neutral stimulus then begins to evoke the same response (fear) that only the first stimulus (stuttering) previously evoked.
- *Self-modeling*: Self-modeling refers to a therapeutic or training method, usually involving videotaping that uses exposure to oneself performing selected error-free behaviors as the conduit for promoting behavior change.
- Shadowing: The stutterer and clinician read or speak in unison. This technique is performed to enable a stutterer to demonstrate change in his/her speaking process.



Stuttering modification- This approach is based on the theory that most of the speech problems of
persons who stutter are a result of avoiding or struggling with dysfluencies, avoiding feared words,
and/or avoiding situations. The therapy focuses on reducing fears, avoidance behaviors, and negative
attitudes toward speech rather than avoiding communication.

GENERAL INFORMATION

Summary of Medical Evidence

There is lack of evidence–based consensus regarding therapy for stuttering.³ The available evidence is insufficient to support any stuttering intervention as being clearly effective.⁷ Studies have a low statistical power and internal validity issues.^{7,33} The most recent treatment approaches have focused on symptom reduction rather than elimination and self-monitoring of speech to manage stuttering events. Treatment in children is focused on preventing the progression of stuttering. Indirect approaches for improving developmental stuttering are based on changing the environment in which stuttering develops and decreasing demands on the child.⁶ Direct approaches are educational and target speech output by changing aspects of articulation, phonation, and breathing. There is no known cure for stuttering.³ The literature identifies high post-treatment relapse rates and high drop-out rates.^{3,20,21} Stutter free speech often occurs temporarily but it is difficult to maintain.^{17,19} One Health Technology review indicated that studies outside of the Lidcombe program review comparing different interventions did not present clear differences in favor of one treatment over another.⁷ Studies without a control group resulted in improvements in stuttering although the improvements were not maintained throughout the follow-up periods. The results from these studies had methodological weaknesses that eliminates them from serious consideration as high validity studies. No reported studies resulted in life impact changes.⁷ One author published information regarding stuttering for over 50 years stated "fluency enhancing procedures can easily result in stutter free speech temporarily but maintaining it is almost impossible."^{19,32}

Current treatment methods have been mainly educational in nature, where the therapist focuses on teaching the patient and family members fluent speech techniques to perform at home by slowing speech rate, encouraging smooth flow of speech, providing a relaxed environment, refraining from reacting negatively to stuttering, and decreasing speech demands.^{3,8,34,35}

Stuttering in Children and Adolescents

Among preschoolers, the prognosis for spontaneous recovery is good. Approximately 74-80% of children diagnosed with developmental stuttering will stop stuttering without treatment within two years or by their teen years.^{3,6} In particular, girls seem to recover well.^{22,24} Early intervention has been reported as effective in helping a child between the ages of 3 to 7 achieve normal fluency based upon results of the Lidcombe studies.⁸ However, the strength of the evidence has been questioned based upon small study size and low statistical power.^{7,26,33} Children with late onset of developmental stuttering have the poorest prognosis, especially if accompanied by speech and language delay.⁶ The likelihood of eliminating stuttering behaviors spontaneously decreases beyond six to eight years of age.^{3,25} Once stuttering has become established, and the child has



developed secondary behaviors, the prognosis is more guarded,²³ and only 18% of children who stutter after five years recover spontaneously.

There are three small random-controlled studies that have reported a favorable effect of the Lidcombe behavioral treatment for children.^{8,9} However, the trials were too small to reliably detect a significant treatment effect.²⁶ The first study included fifty-four children between the ages of three and six who had stuttered for at least 2% of syllables for six months without any previous stuttering treatment in the previous 12 months. The participants were randomized to begin the Lidcombe treatment immediately or to receive it following the trial.^{8,10} Over a nine month period the mean percentage of syllables stuttered dropped from 6.4 to 1.5, a decrease of 77% in the Lidcombe group. There was a 43% decrease in the control group with a significantly smaller change. Subgroup analysis detected a significantly larger treatment effect for children without a family history of stuttering recovery. There were several limitations to the trial results including power calculations requiring 55 participants in each arm to reliably detect a significant treatment effect but only half were recruited to the trial.²⁶ The sample size was further reduced by 13% due to loss to follow-up further reducing the sample size. One study determined that access to 650 families of stuttering preschoolers would be necessary to have a robust statistical demonstration of results.¹¹ A 5 year post follow-up study was conducted,¹⁰ only 20 of 29 patients in the treatment group were contacted and 8 of the 25 children in the no treatment group. Only 19 of the 20 children completed treatment and three of the 19 relapsed after 2 years of treatment. A meaningful comparison with the no treatment group could not be conducted due to the insufficient number of patients. The data is insufficient to support any valid conclusions.

The second randomized-control trial compared the Lidcombe program with the Demands and Capacities treatment model. Thirty-parent child pairs were randomized to receive one or the other treatment.⁹ The stuttering frequency and severity significantly decreased in both groups post-treatment with no difference in either group in terms of stuttering improvement. Similar results were noted in the third study of 46 German preschoolers for 16 week program review.¹² The sample size was small and statistically underpowered. The studies without control group showed improvements in stuttering that were not maintained until the end of the follow up time periods.⁷ The results from these studies had significant methodological weaknesses.

Koushik et al (2011) performed a retrospective file audit including logistical regression of variables from files of 134 children younger than 6 years who completed Stage 1 of the Lidcombe Program. Benchmarking data for clinic visits to Stage 2 is available for these files. Meta-analysis supplements worldwide Lidcombe Program benchmark data. The median number of clinic visits to Stage 2 was 11. High pre-treatment stuttering severity predicted more clinic visits than low severity. A trend toward statistical significance was found for the frequency of clinic visits. Frequent attendance of mean less than 11 days was associated with longer treatment times than infrequent attendance of mean 11 days or more. Results for North America were consistent with benchmark data from the UK and Australia. The mean attendance trend is clinically important and requires further investigation because of its potential clinical significance.⁴²

According to Guitar & Conture, developmental dysfluency is considered normal between the ages of 18 months and 7 years.¹⁵ Children under age 3 years will exhibit repetitions of syllables, sounds, words usually at the



beginning of sentences. This usually occurs in approximately one out of ten sentences. After age 3, the likelihood of repeating syllables or sounds will diminish. The child will then begin to repeat whole words and phrases. The words "um and "uh" with topic switching in the middle of a sentence, leaving sentences unfinished or revising sentences will occur. The American Academy of Pediatrics recommends a child with a persistent stutter and an associated history of seizure or other neurological symptoms should undergo a neurological evaluation.⁶ Three levels of stuttering have been recognized by the Stuttering Foundation of America. The following table highlights typical findings of normal dysfluencies, mild stuttering and severe stuttering:⁶

Characteristics	Normal Dysfluencies	Mild Stuttering	Severe Stuttering
Speech Behavior	Occasional brief sound repetitions, short words or syllables (1 in every 10 sentences or less lasting ¹ / ₂ second or less e.g., tr-tr-try this)	Frequent long sound repetitions, short words or syllables with occasional prolongations of sounds. (3% or greater of speech lasting ½ to 1 second e.g., tr-tr-tr-try this)	Very frequent very long and often repetitions of short words, syllables and sounds prolongation of sounds and blockages are frequent (10% or greater of speech lasting 1 second and longer)
Other Common Behaviors	Changing thoughts and words with occasional hesitations and speech pauses such as "um" or "uh"	Eyelid blinking and closing, looking to one side, physical tension noted around lips with prolongations and repetitions	Stuttering creates pitch of voice rise, more frequent and noticeable signs as indicated under mild stuttering category. Extra words or sounds used as speech "starters"
Frequency of Problem	Habits come and go, increases with child being: excited, tired, talking about new topics or complex speech, talking with listeners who are unresponsive, and when answering or asking questions	Habits come and go in situations as described under normal dysfluency, more present than absent in speech	More consistent and non- fluctuating and tends to be present more often during speaking
Common Reaction of Child	No reaction typically noted	Some embarrassment and frustration others will have little or no concern	Fear of speaking with embarrassment in most
Typical Parent Reaction	Varies -little to great	Minimal concern	All have concern of some degree
Recommended Referral decision	Referral not typically recommended	If speaking habits continue past 6-8 weeks	Refer as soon as possible

Information obtained from the Stuttering Foundation of America, 2006⁽³⁾



There is no known cure for stuttering.^{3,23} The likelihood of eliminating stuttering behaviors decreases if they persist beyond eight years of age.³ Stutterers have been reported to learn to stutter less severely and be less affected emotionally, though others may make no progress with therapy.

Andrade et al (2011) performed a systematic review of studies related to the effects of delayed auditory feedback on speech fluency in individuals who stutter. Texts that were related to treatment with delayed auditory feedback (DAF) and frequency-altered feedback (FAF) were analyzed. The results indicated that the use of altered auditory feedback devices for the reduction of stuttering events still do not have robust support for their applicability. Methodological variability does not allow a consistent answer, or a trend about the effectiveness of the device, to be drawn. The authors concluded that although the limitations in the studies prevent generalizations about the effectiveness of the device for the reduction of stuttering, these same limitations are important resources for future research planning. ⁴⁰

Cream et al (2010) investigated the efficacy of video self-modeling (VSM) following speech restructuring treatment to improve the maintenance of treatment effects in a randomized controlled trial, 89 adults and adolescents who undertook intensive speech restructuring treatment were randomly assigned to 2 trial arms: standard maintenance and standard maintenance plus VSM. Participants in the latter arm viewed stutter-free videos of themselves each day for 1 month. The results showed that the addition of VSM did not improve speech outcomes, as measured by percent syllables stuttered, at either 1 or 6 months post-randomization. Self-rating of worst stuttering severity by the VSM group was 10% better than that of the control group, and satisfaction with speech fluency was 20% better. Quality of life was also better for the VSM group, which was mildly to moderately impaired compared with moderate impairment in the control group. The authors concluded that VSM intervention after treatment was associated with improvements in self-reported outcomes.

Diagnostic Tools for Evaluation of Stuttering Severity³

The Stuttering Severity Instrument for Children and Adults and the Stuttering Prediction Instrument for young children are used to measure the frequency, type, and duration of stuttering; evaluate the overall rate of speech; assess whether secondary behaviors are present ; and determine the need for therapy. Formal testing also includes an assessment of the parents' and child's attitudes toward speech, emotional status and the impact of stuttering on their quality of daily living. Frequency is expressed in percent syllables stuttered and converted to scale scores of 2-18. Duration is timed to the nearest one tenth of a second and converted to scale scores of 2-18. The four types of Physical Concomitants are and converted to scale scores of 0-20.

Neurogenic or Psychogenic Stuttering



The number of neurogenic or psychogenic stuttering cases has been reported as rare.²⁸ There are no randomized-control studies or prospective studies supporting the effectiveness of speech therapy for stuttering in patients diagnosed with neurogenic or psychogenic disorders. The majority of information is reported in case studies or survey questionnaire results. There is insufficient data from low quality data to indicate that speech therapy procedures are effective or directly responsible for improving speech patterns in stuttering patients. Case studies have reported inconsistent results with fluency related speech therapy treatments.^{30,31} Other treatments are generally given at the same time stuttering therapy has been provided. It is difficult to ascertain if any stuttering improvement is directly related to other treatments or the natural improvement of the neurogenic condition. Case reports have identified stuttering in patients with Parkinson's disease and epilepsy. The stuttering stopped following medication administration or surgical intervention. Case reports have also identified drug-induced stuttering that abruptly ceased when medications were discontinued and returned when the same medications were administered.²⁹

Thomas and Howell (2007) reviewed several research study design techniques and outcomes to determine efficacy with the evaluation process for previous studies conducted on individuals who stutter.¹⁶ The reliability and validity of study results have been questioned. Perceptual measures of stuttering from independent observers showed large discrepancies of measurement of percentage of syllables stuttered, discrepancy ranges were noted from 3.80 to 13.70%. Differences in quantifying stuttering events among researchers have been noted. More fluent speech can typically be identified in stutters that are aware of their progress being monitored. Many studies had participants aware of being studied. There is absence of much needed replication data to evaluate and account for potential false findings. Long term outcome data is not incorporated into many studies evaluating speech therapy techniques for stutterers. Case history reporting and matched control groups were lacking. Treatment success was difficult to measure due to a high population of children that improve speech through spontaneous remission and large dropout rates. Few studies incorporated effect size statistics.

Bothe et al conducted a systematic review of research from 1970 to 2005 on the efficacy of stuttering treatments.¹⁷ It was noted "none of the currently available reviews are up to date, comprehensive, based on evaluation of the methodological quality of individual treatment trials, and based on consistent methods for reviewing methods and the outcomes of studies, as recommended in the current research literature." Outcomes reviewed included a below 5% syllables studies(SS) rate, demonstrated improvement in social, emotional or cognitive (SEC) variables, and a 6 month post treatment follow-up outcome assessment review. None of the treatment approaches reviewed showed definitive positive results due to poor study methodology, conflicting evidence, minimal study validation to support the findings, and failure to report follow-up outcomes supporting long term benefits. A few of the studies were considered to be possibly efficacious these included gradual increase in length and complexity of utterance (GILCU) prolonged therapy, and response contingencies. However, the sample size and methodological quality are poor. The following outlines specific study review results:¹⁷

Electromyographic biofeedback- Two studies met the criteria with conflicting results. Craig et al. reported 25 children in post treatment of 0.8% syllables stuttered (SS) in clinic conversation and 1.4SS% at home following treatment.¹⁸ The study reported 2-3%SS at 9 month follow-up. Median rate of 0.8%SS in clinic and 2.95% at home after 4.2 years post treatment. SEC improvements in anxiety ratings also improved. Craig and Cleary used a single subject design of 3 boys aged 10-15 years with a



2-3%SS at 9 month follow-up with no SEC criteria monitored. A review in 2004 which met only 3 of the 5 methodological criteria and did not meet review inclusion had a mean result of 4.4%SS at 3 months post treatment that indicated only a 37% reduction from pretreatment values.

- Gradual increase in length and complexity of utterance (GILCU)-Two studies met the criteria however small sample sizes were noted 12 participants. Neither study measured SEC variables. Possible efficacy was reported due to 0.4% stuttering post therapy, a near 0% stuttering rate was noted at 15.2 months post therapy; however, there was a 50% attrition rate.
- Indirect treatments for children- One study met criteria for inclusion. A comparison of the Lidcombe program with Demands and Capacities (DAC) model were reviewed. Post treatment improvement was decreased from 7.2% stuttering syllables to 3.7 after 12 weeks in Lidcombe and 7.9% to 3.1% in the DAC model. The results reported suggested that the two approaches were nearly equivalent for children over the 12 week timeframe; the conclusion could be misleading due to absence of long term data and no-treatment control group. The evidence does not support effectiveness for this treatment.
- Language Training- One study compared language training with response contingent treatments. Only 3 of the 5 methodological data criteria were met but it was included as it met the secondary version of quality criteria. Results were shown to be ineffective with only 1-2 % stuttering reductions.
- *Masking* No comparison studies to a control group or with other treatment alternatives. Inconsistent results are reported including reports of ineffectiveness.
- Metronome-conditioned speech training- Only one study met criteria for inclusion. The treatment was
 found to be ineffective at changing stuttering frequency or SEC variables in adolescents and adults with
 initial mean nonfluency at 9.3% post treatment and with 14 month follow-up.
- Prolonged Speech- Thirteen studies were included in the analysis with all 13 meeting the 5% SS criterion for post treatment outcomes. Six studies provided follow up data at 6 months or longer that continued to meet the 5% criteria. Four of the 6 studies reporting post treatment follow-up showed improvements in SEC including avoidance and fears. Two of these studies met the trial criterion with all of the speech and SEC outcomes criteria. There were differences in the treatment programs categorized as prolonged speech. The participant ages ranged from 7 to 58 years with primarily adults. Conflicting evidence with methodological flaws.
- Regulated breathing and airflow- Nine studies met the criteria for inclusion for breathing treatments and two studies with similar airflow treatment. Mixed and inconsistent results were reported. Three reported post study outcomes at below 5% but post study follow-up were not performed for long term effectiveness evaluation. Three were above the 5% criterion and two were below the 5% criterion immediately post treatment but at 6-12 month follow up were above 5% criterion. The sample numbers were low and one of two study participants showed very little pretreatment stuttering. There was limited evidence to support efficacy based on study designs and results⁻ One study showed substantially more stuttering throughout the treatment and post treatment phases. There were also high relapse rates on follow-up in several studies and several participants did not improve.



- Response Contingencies- Eleven studies were included in the review. All having small sample sizes. One study reported percentage ranges that were low following the first two noncontingent phases but were higher than in the performance contingent phase. One study included one 18 year old man who learned to stop himself for at least 2 seconds immediately after self-stutters. These results were maintained at 6 and 12 month follow-ups. Improvement was noted from 5.1 to 7.3% syllables stuttered (SS) to 0.0-1.3%SS. The other nine studies included children with small sample sizes. Two children achieved near 0 in treatment with maintenance rate noted at 1 year. One child reduced from 8% to less than 1% and one from 18% to 1% of words stuttered with gains remaining at an 8 month follow-up check. Four children, ages 3 to 5 pretreatment had stuttering rates at 1% to nearly 16%SS. Stuttering post treatment remained below 2%SS through 9 months post treatment. Two of the 4 had decreased base rates in their pretreatment scores complicating the interpretation of results. The Lidcombe approach was also evaluated in this category with positive results however a small number of study participants were noted under powering the results.
- Self-modeling-One study met the criterion. Three participants used edited videotapes of their own speech as the treatment technique. Levels did not meet the 5% post treatment criterion. The study results were difficult to measure and summarize based upon unmeasured variables and small volume of patients and results were shown to be ineffective. Additional studies are needed for self-modeling.
- Shadowing- One study in a randomized group comparing other treatments was included in the review
 process. Four techniques: chorus reading, with the therapist changing text and stopping, immediate
 shadowing, delayed shadowing and whispering. The results did not meet outcome criteria and did not
 support the use of shadowing or whispering as effective treatment techniques.
- *Stuttering Modification-* Studies reported inconsistent results including reports of ineffectiveness. The best controlled-data are regarding atypical version or show ineffectiveness.
- *Token Economy* One single subject experiment that showed ineffectiveness.

Predictors of Relapse^{20,21}

The majority of literature available regarding relapse studies were undertaken in the adult populations. Various factors were evaluated including speech attitudes, locus of control, speech mastery, pre-treatment stuttering, emotions, anxiety, stress, speech naturalness, control studies and self-evaluation strategies. Follow-up was examined 12-18 months in four adult groups treated with smooth intensive speech therapy. Initial treatment was successful for the majority of patients within the four groups. Post-treatment percentage of syllables stuttered decreased from a mean of 12.7% to 0.3% immediately post-treatment. At follow-up the mean syllables stuttered increased to 2.6%. The increased severity of stuttering was the only variable to predict relapse.

Hayes, Cochrane, UpToDate, MD Consult etc.

Hayes does not have a directory report for speech therapy as a treatment for stuttering.



Professional Organizations

<u>The American Speech-Language-Hearing Association (ASHA)</u>³⁹ has outlined general guidelines for practice in stuttering treatment that includes the following:

- There is considerable variation in the timing and duration of treatment sessions and in the total duration of treatment. Some residential programs treat clients 6 or more hours each day for a number of weeks. Private clinicians may see clients one, two, or three times a week for a longer period of time.
- There are a number of ways to monitor a client's practice: (1) direct observation, in which the clinician is present during the practice session, (2) interviews with the client after practice sessions, and (3) listening, with the client, to audiotape recordings of practice sessions.
- A client's personal level of motivation and commitment to the treatment process will influence the duration of treatment. School-age, adolescent, and adult stutterers require longer durations of treatment than preschool children.
- Stuttering is typically a complex problem and treatments that do not address the complete problem in whatever complexity it presents are not within the guidelines of good practice.

The American Speech-Language-Hearing Association (ASHA)⁴⁴ has outlined a definition of stuttering and the recommends that there are four uses of the term stuttering for this fluency disorder. Two uses refer primarily to the behavior of stuttering, and two refer primarily to individuals who exhibit the behavior. The first two are essentially perceptual definitions (i.e., defined by a listener), the first from a specific symptom orientation and the second from a nonspecific orientation. The third defines stuttering in terms of private experience of the person who stutters, and the fourth focuses on the suspected cause or nature of stuttering:

- 1. Stuttering refers to speech events that contain monosyllabic whole-word repetitions, part-word repetitions, audible sound prolongations, or silent fixations or blockages. These may or may not be accompanied by accessory (secondary) behaviors (i.e., behaviors used to escape and/or avoid these speech events).
- 2. Stuttering consists of speech events that are reliably perceived to be stuttering by observers.
- 3. Stuttering refers to the private, personal experience of an involuntary loss of control by the person who stutters. As such, it often affects the effectiveness of the speaker's communication.
- 4. Stuttering refers to disordered speech that occurs as the result of: (a) certain physiological, neurological, or psychological deviations; (b) certain linguistic, affective, behavioral, or cognitive processes; or (c) some combination thereof.

In all four examples above, stuttering refers to a communication disorder related to speech fluency that generally begins during childhood or less frequently in early adulthood. This type of stuttering is referred to as "developmental stuttering." Stuttering has also been called a "syndrome," focusing on a set of symptoms that may coexist in any stuttering individual. Neurogenic stuttering and psychogenic stuttering are special cases that are not sub-types of typical or "developmental" stuttering. Generally, neurogenic stuttering is observed in adults who have undergone confirmed brain damage and has been observed in individuals who have lesions in diverse



areas of the central nervous system. Neurogenic stuttering has been labeled as "acquired stuttering," "stuttering secondary to brain damage," and "cortical stuttering." Psychogenic stuttering refers to stuttering that is the primary symptom of some form of verifiable psychopathology, such as a neurotic conversion disorder. Stuttering that began after a psychologically traumatic event is excluded from this category because, in most cases, the stuttering symptoms continue to develop in much the same way as do symptoms of stuttering that began in childhood after no such traumatic event. ASHA cautions clinicians to use the term psychogenic stuttering only in cases in which it is clearly related to diagnosed psychopathology. ⁴⁴

CODING INFORMATION	
СРТ	Description
92506	Evaluation of speech, language, voice, communication, and/or auditory processing
92507	Treatment of speech, language, voice, communication, and/or auditory processing disorder; individual
92508	Treatment of speech, language, voice, communication, and/or auditory processing disorder; group, 2 or more individuals
92521	Evaluation of speech fluency (eg, stuttering, cluttering)
92522	Evaluation of speech sound production (eg, articulation, phonological process, apraxia, dysarthria)
92523	Evaluation of speech sound production (eg, articulation, phonological process, apraxia, dysarthria); with evaluation of language comprehension and expression (eg, receptive and expressive language)
92524	Behavioral and qualitative analysis of voice and resonance

HCPCS	Description
G0153	Services of a speech and language pathologist in home health or hospice settings, each 15 minutes
G0161	Services performed by a qualified speech-language pathologist, in the home health setting, in the establishment or delivery of a safe and effective speech-language pathology maintenance program, each 15 minutes
S9128	Speech therapy, in the home, per diem
S9152	Speech therapy, reevaluation (Only one speech therapy evaluation (CPT 92506, S9152) is allowed for a course of treatment)

ICD-9	Description
307.0	Stuttering adult onset
315.35	Stuttering childhood onset

ICD-10	Description
	The following are non-covered diagnoses
F98.5	Adult onset fluency disorder
F80.81	Childhood onset fluency disorder



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