

**Recent Advances in**

**Paediatrics 28**

Jaypee Brothers



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## Paediatrics 28

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# Preface

It is a pleasure to introduce *Recent Advances in Paediatrics 28*. The wide-ranging list of topics chosen for this book represents the diversity of specialties within paediatrics. I have taken care to include topics that are not encountered on a regular basis; being informed on these helps clinicians to be more rounded in their approach to looking after children in daily practice and it provides insights into rapidly developing areas of paediatrics.

The physiology of shock and its relationship to fluid management, a very topical subject since the FEAST trial in Africa threw doubt on the value of fluid volume resuscitation, is discussed at length and a precise dissection of the key issues is presented. A chapter concerning the management and assessment of disabled children highlights the importance of a multidisciplinary approach, and a chapter concerning speech disorders provides guidance on the steps to take should a child be identified as having such a disorder. A chapter on tuberous sclerosis gives a thorough review of this rare genetic condition, and sheds light on promising developments in the field of mTOR inhibitors. Although the book is UK-focused, an international perspective is provided by Dr Zaw Lwin and his colleagues, whom I have invited to discuss the management of child abuse in Singapore.

This book is essential reading for paediatricians, specialists and trainees wishing to keep abreast of new developments in this field, and I hope you find its contents as interesting and absorbing as I have. Good reading!

Ian Maconochie

March 2017

Jaypee Brothers

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# Chapter 3

## Pre-school speech, language and fluency impairments: best practice in identification and management

*Sheena Reilly, Cristina McKean, Angela Morgan, Melissa Wake*

### INTRODUCTION

Although for many children, learning to speak is effortless, some of the most common developmental problems include disorders of communication affecting language, speech and fluency. This may flow on to school achievement, which is highly dependent on understanding and expressing one's ideas via spoken and written communication. Higher rates of unemployment and poorer health literacy may have intergenerational potentiating impacts on parenting and social inequalities.

Here we aim to:

- Assist family doctors, primary care paediatricians and child services to identify common childhood speech, language and fluency disorders
- Help understand their clinical course, so that practitioners can decide when to refer and for what services
- Outline treatment considerations

Although communication problems are prevalent, many will go undetected or resolve spontaneously. However, it remains difficult to predict individual children's pathways. Treatment success varies, being highly effective for some problems (e.g. articulation difficulties) while others (e.g. receptive language difficulties) remain recalcitrant. Here we identify the improvements that can be expected.

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We recognised randomised controlled trials as the gold standard for intervention. To establish best estimates of prevalence and incidence, we identified all known prospective longitudinal cohorts and cross-sectional population studies with direct child assessment.

## IDENTIFYING AND UNDERSTANDING THE CLINICAL COURSE OF COMMON PRE-SCHOOL COMMUNICATION PROBLEMS

This review focuses on speech impairment, language impairment, and fluency disorders known as stuttering or stammering. For each, **Table 3.1** outlines prevalence ranges, diagnostic criteria, age of participants and sampling frame. **Table 3.2** summarises long-term impacts.

### Speech impairment

Speech production involves the lips, tongue, teeth and palate forming vocalisations to convey sounds with meaning. Speech disorders arise from failure to accurately produce individual sounds or sound combinations (e.g. 'fl', 'str' and 'shr'). They can be further categorised into articulation, phonological and motor speech disorders.

Articulation errors are common. Mispronunciations (e.g. lipping of 's' and 'z') usually reflect an incorrect motor plan in the presence of intact orofacial structures. Sometimes (and usually in the context of syndromes) arise from ameliorable structural deficits such as cleft lip/palate, macroglossia and malocclusion.

In contrast, children with phonological disorders fail to learn that the individual sounds in their language convey meaning. These children misunderstand sound-based rules of their language. For example, they may substitute the sound 'f' for 'th' as in 'teef' for 'teeth', or miss out sounds altogether such as 'ock' for 'sock'. This can be typical of early speech

**Table 3.1 Prevalence/cumulative incidence estimates for speech and language impairments and stuttering in population ascertained samples using direct standardised validated assessment measures**

Study	Diagnostic term	Age (years)	Sample size	% with condition
Tomblin et al. [35]	Specific language impairment	6	7217	7.2
Reilly et al. [7]	Low language	4	1596	20.6
Beitchman et al. [17]	Language disorder	5	1655	8.0
Shriberg et al. [36]	Speech delay	6	1328	3.8
Beitchman et al. [17]	Speech disorder	5	1655	6.4
Eadie et al. [14]	Speech disorder	4	1494	3.4
Reilly et al. [9]	Stuttering	3	1619	8.5
Reilly et al. [10]	Stuttering	4	1619	11.2
Proctor et al. [37]	Stuttering	2–5	3164	2.5
Månsson [38]	Stuttering	3–5	1021	5.0
Andrews and Harris [39]	Stuttering	0–15	1142	5.0

Reproduced from Reilly et al., 2015 [40] with permission from BMJ Publishing Group Ltd.

**Table 3.2 Known impacts of and consequences associated with persistent language and speech impairment and stuttering**

Impact and consequence	Speech* [2,5,13–16]	Language [2,15,16,25]	Stuttering [2,8,11,37]
<b>Academic:</b>			
Poor readiness for school	Yes	Yes	–
Poor knowledge of letter sounds	Yes	Yes	–
Poor phonological awareness	Yes	Yes	–
Learning problems (spelling, reading, mathematics)	–	Yes	–
<b>Social and emotional development:</b>			
Increased teasing and bullying	Yes	–	Yes
Difficulties forming relationships with peers	Yes	Yes	Yes
<b>Mental health:</b>			
Poor psychosocial adjustment in adulthood	–	Yes	Yes
Increased anxiety and social phobia	–	–	Yes
Increased suicidal thoughts and truancy	–	–	Yes
<b>Employment:</b>			
Lower literacy	–	Yes	–
Reduced quality of life	–	Yes	Yes
Occupational underachievement	–	Yes	Yes

\*High relative risk of later reading difficulties (4.6–8.9) when there are comorbid impairments of speech and language [2]. Reproduced from Reilly et al., 2015 [40] with permission from BMJ Publishing Group Ltd.

development, but children are considered to have phonological ‘delay’ if they don’t master these phonological errors by age 5 years [1]. Phonological ‘disorder’ implies atypical or abnormal patterns of substitution, omission or addition of sounds, such as the addition of an ‘n’ at the start of each word (a ‘sound preference error’). Whereas a phonological delay tends to have a good prognosis, phonological disorders are longer lasting and associated with comorbidities including literacy [2].

Motor speech impairments, encompassing dysarthria and childhood apraxia of speech, are relatively uncommon. Dysarthria is a disorder of neuromuscular execution of the speech system, with potential breakdown occurring in one or more areas across voicing, respiration, articulation or resonance. Dysarthria is always associated with some form of neural lesion spanning diverse congenital and/or acquired medical diagnoses including cerebral palsy, stroke, traumatic brain injury, brain tumour and other neurogenetic conditions. Apraxia is a disorder of motor planning and control, with a core deficit in learning and automatically generating sounds into syllables, syllables into words, and words into sentences. Speech rhythm, stress and intonation are also impaired so that speech sounds segmented and effortful (for further information see Cochrane reviews) [3,4].

If a child is largely unintelligible by the age of 3 years, we recommend speech pathology referral to distinguish speech disorder sub-type and thus inform both the therapeutic approach and likely prognosis [5].

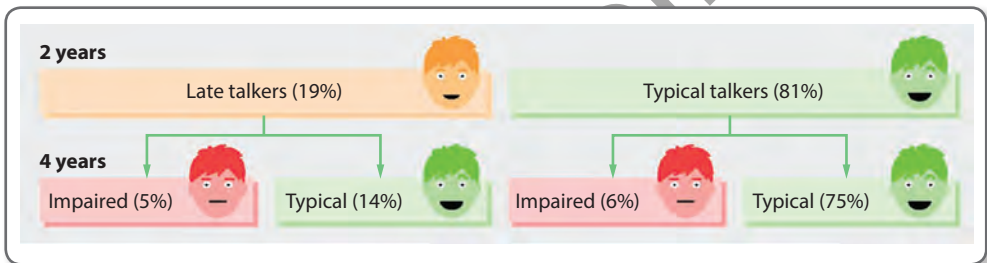


## Language impairment

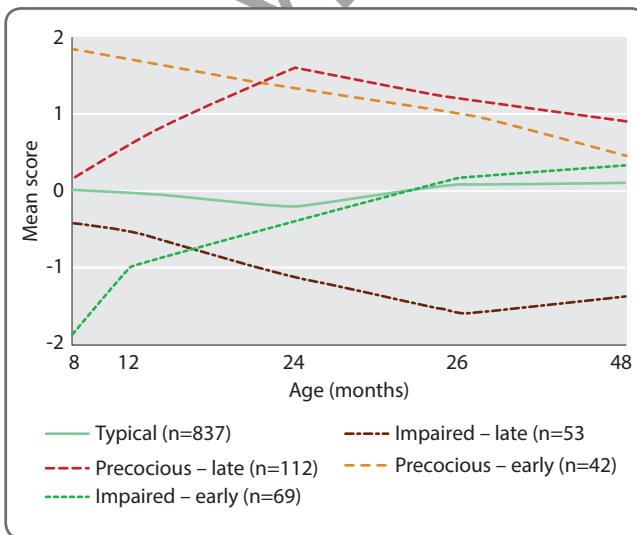
Language is the use of spoken and written words and sentences. It comprises words, grammatical markers and the rules that dictate how they are combined into sentences. Infants communicate by crying, vocalising and using body language and eye gaze, followed by communicative gestures (such as pointing) that are essential precursors to language.

'Language impairment' connotes language that is below developmental expectations. Infants may show limited use of communicative behaviours (e.g. pointing, requesting, trying to get an adult's attention); toddlers may be slow in developing first words and combining words to form phrases and sentences; older children may show inappropriate use of grammar, sentence construction and word order; and adolescents may struggle with narrative or exposition of argument. Language difficulties may be isolated or generalised.

At the time of writing, population screening for language impairment remains an unattained ideal [6]. Measurable language development is much more variable than was previously thought; pre-school children may not only grow out of, but into, language



**Figure 3.1** Trajectories of 2-year-old late talkers. Reproduced from Reilly et al., 2015 [40] with permission from BMJ Publishing Group Ltd.



**Figure 3.2** Mean standardised communication or language score at each age by latent class. Reproduced from Reilly et al., 2015 [40] with permission from BMJ Publishing Group Ltd.

problems [7] (see **Figures 3.1** and **3.2**). As a result, predicting which children will have a persistent rather than transient language impairment remains problematic [7,8]. Better predictive tools and algorithms and a better understanding of natural history could change this situation. We see these as research priorities with major policy significance.

## Stuttering

Stuttering interferes with the smooth flow of communication. Children may repeat sounds (e.g. 'd-d-d-d-d-dog'), words (e.g. 'I-I-I-I-I want...') or phrases; prolong individual speech sounds (e.g. 'M...ummy'); and exhibit hesitation and blocks. These may be associated with head and mouth movements, blinking, and hand and other body gestures.

Stuttering typically commences between ages 2 and 4 years. Onset is usually sudden and coincides with the explosion in expressive language development around age 2 years [9]. In the first 12 months, many children display periods of relatively fluent speech interspersed with more obvious stuttering episodes. Most of the 11% of children affected display only mild abnormalities and (contrary to popular belief) their psychosocial health, language, and non-verbal skills are at least as good as their peers [9-11]. While recovery is uncommon in the first 12 months [9,10], two thirds of children are reported to recover naturally within 4 years of onset.

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## THE CAUSES OF SPEECH, LANGUAGE AND FLUENCY IMPAIRMENTS

Early biological programming underpins communication trajectories in the first two years of life [12]. Social patterning becomes more evident by age 4 years, with steep social gradients entrenched by the mid-primary school years, especially in vocabulary size [7,13].

Speech and language impairments not only have similar risk factors (male sex, family history, low maternal education, low socio-economic status) [7,14] but may also co-occur [7,2,15]. Language impairments can also be core symptoms of neurodevelopmental disorders and have an increased association with conditions such as attention-deficit/hyperactivity disorder [16]. In contrast, stuttering is associated with higher, rather than lower, maternal education [9]. Despite these associations, however, known risk factors predict only a small amount of the variance in all three disorders in the pre-school years [7-17].

Inheritance is complex, with multiple genes interacting together with or without environmental influences to lead to the condition of interest. Single gene (Mendelian inheritance) explanations for speech and language impairments are extremely rare. One gene with autosomal dominant inheritance, *FOXP2*, has been reliably associated with speech disorder in the absence of marked intellectual impairment [18]. Single genes associated with stuttering in a consanguineous Pakistani family [19] have not been replicated. No single genes have yet been discovered specific to isolated language impairments.

Magnetic resonance imaging (MRI) studies indicate some brain structure and function differences in key regions traditionally associated with language impairment (Broca's area, Wernicke's area and the caudate nucleus) in children with speech and language disorders compared to controls [20]. It is challenging to interpret the neurobiological meaning of these findings because there is little consistency regarding directionality. For example, some functional MRI studies report hyperactivation of specific brain regions in children

with speech or language impairment, while others report hypoactivation [20]. We anticipate rapid advances in the complex genetic, environmental, and neural origins of normal and disordered communication.

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## IDENTIFYING AND REFERRING CHILDREN AT RISK OF SPEECH, LANGUAGE AND FLUENCY IMPAIRMENTS

Given the current state of evidence, recommendations to guide referral of young children to a speech pathologist are largely based on expert opinion. This reflects multiple factors including: the high cumulative incidence of problems; the fluctuant but as yet poorly documented natural history; the variable efficacy of treatment; and the important role of parents as major drivers of service use. Whether or not parents access services is more complex than simply being aware of their child's difficulty and knowing where to go for help. In one study, even when parents were provided with referral recommendations (based on standardised clinical assessments of speech, language and fluency) and helped to locate speech pathologists, over half of the children did not see a speech pathologist, and many others did despite their parents knowing their scores were within the normal range [21].

Parents and teachers are vital partners in referral decisions, and both can provide reliable information using standardised checklists. Communication should be considered in the context of the child's broader development, such as social and emotional development, motor skills, play, and cognition. Referral to a developmental paediatrician may be the appropriate first step if delay spans a number of developmental domains, the child has regressed, or features suggest autism, dyslexia or a syndrome. Prior information regarding the child's developmental progress, such as that recorded by universal well-child services, can be very helpful. **Table 3.3** shows a list of suitable questions for clinical settings, which may help form a case history of speech, language and fluency development, and highlight areas of concern.

Language and speech difficulties may be the first and only sign of hearing impairment. It is simply not feasible, nor has a balance of benefit over harm been established, to refer every child with low language at a single time point to audiology service. Nonetheless, we recommend a low threshold for audiologic referral, particularly if a parent or other expresses concerns about hearing – even though the positive predictive value of parent concern is low for individual children. Epidemiological studies show that conductive losses from otitis media with effusion (glue ear) do not predict poorer language [22] or academic outcomes. Decisions about a child's communication should therefore reflect the language difficulties being experienced, not middle ear disease.

While directly administered screening tools exist, we do not recommend their use by general practitioners or health visitors because they do not have adequate predictive ability and require training. Instead primary care providers should listen carefully to parents' concerns to elicit detailed and focussed parental reports to help decide who and when to refer. Exactly what tools to use is often specific to a service or country. Some tools were designed to be completed by parents (e.g. child development inventories), or by practitioners through direct observation or face-to-face assessment (e.g. the American Academy of Paediatrics policy on developmental surveillance and screening). Health visiting teams in the UK use the Ages and Stages Questionnaire (ASQ-3) in children aged 24–30 months, providing baseline information about communication and general development [23]. Many speech and language therapy services have referral guides and user-friendly checklists or 'milestone checkers'.

Table 3.3 Suggested case history questions

**BACKGROUND INFORMATION****1. Obtain information about the nature of the presenting problem**

- What difficulties is the child having with speech and communication?
- When was a concern first raised?
- Can the child understand what you and others say to him or her?
- Is the child aware of these problems? If so how does that affect him/her (withdrawal, frustration, avoidance)?
- Does the child have more difficulty in some than others (e.g. home, kindergarten)?
- Has there been any change in the problem since first noticed?

**2. Understand the home language environment**

- Are languages other than English spoken at home? If so which languages? Which is the main language spoken at home?
- Does the child speak and/or understand the languages?
- What is the child's language preference?

**3. Determine whether there may be a family history of problems**

- Has anyone in the family experienced similar problems (e.g. parents, siblings)?

**4. Ascertain if the child has a history of hearing difficulties**

- Has the child had a hearing test, if so when and what were the results?
- Is there on-going concern about the child's hearing?
- Depending on the age of the child the following questions may be relevant: does the child react to loud noises; hear you; respond when his/her name is called; respond to noises in the environment (e.g. TV, telephone).

**5. Milestones in speech and language development**

- When did the child say his/her first words; babble; play with sounds (e.g. repeating sounds for fun such as raspberry blowing or repeating strings of sounds (e.g. 'mamama', 'bagaba gagaga'))?
- When did the child combine words to form phrases and sentences?

**CURRENT INFORMATION****6. Expressive language skills (see milestone checkers for age-appropriate information, e.g. Talking Point)**

- How does your child communicate their needs and interests with you?
- Does your child use gestures and body language like pointing or holding up their arms to be picked up?
- Does your child make sounds, which are not readily recognisable/understood as words?
- Does your child use single words (shoe, doggy, up); combine words (e.g. Daddy car); use sentences longer than four words?
- Does your child repeat what you and others say?

**7. Receptive language skills (see milestone checkers for age-appropriate information, e.g. Talking Point)**

- How well does the child understand what you say to him/her?
- Does the child get or point to common objects when you ask for them (e.g. where is the ball, cup, shoe); follow simple instructions (shut the door, or get your shoes); respond correctly to yes/no questions?
- Does your child respond correctly to who, what, where, when, and why questions?

**8. Social interaction (see milestone checkers for age-appropriate information)**

- Is your child interested in other children and adults?
- Does your child: enjoy interactive games such as peek-a-boo or round and round the garden; make eye contact with you when playing these games?
- Does your child enjoy playing with others?
- Is your child willing to try new activities?
- Is your child happy to separate from you?
- How would you describe: your child's temperament; attention and concentration?

**9. Speech fluency**

- Does your child ever repeat sounds or words or 'get stuck' on a sound or word?

**10. Speech intelligibility (see Dodd et al., 2003 [1] for ages at which 90% of British children acquire speech sounds)**

- Do family members understand your child?
- Does your child have problems saying particular sounds? If so, which ones?
- Are you concerned about your child's speech difficulties?
- Is your child concerned about his/her speech?

Online, publically available progress checkers have been developed to enable professionals and parents to check developmental progress. These present a series of question to which parents and professionals reply 'yes' or 'no'. Responses are tabulated and advice is provided about next steps. Examples of single items from the checkers are as follows:

- 1 year: my baby can correctly tell where a voice is coming from, for example she/he turns to look towards someone that is talking on the other side of the room.
- 2 years: my child follows simple instructions with 2 or 3 important words in, like 'run to Daddy', 'show Grandma' or 'get your bricks', without me giving lots of visual clues like gestures.
- 3 years: my child is able to understand simple question words like 'who' and 'where'.

When appraising pre-school children in the clinic setting it is best to undertake observations during free play with age appropriate toys and preferably while interacting with a familiar adult. Gaining a representative view of a young child's abilities is challenging in the clinical setting and therefore short clinical consultations are unlikely to be helpful. These situations can however provide a snapshot about how the parent interacts with and communicates with the child and how the child responds. Ideally, information should be gathered from parents, carers and other professionals who interact with the child regularly. Collectively, this information can be used to inform the referral decision.

## Speech impairment

Diagnosing speech disorder sub-type is critical because, while phonological delays typically resolve, phonological disorders have a poorer speech prognosis and require intervention. Referral should occur when:

- A child's speech is not intelligible to family or significant others by the age of 3 [24]
- Children have difficulties producing sounds beyond the typical age of acquisition (see the Talking Point website described in Appendix 1)
- Children are concerned about their own speech

## Language impairment

The decision as to when to refer to a speech and language therapist/pathologist for specialist assessment and differential diagnosis differs according to the child's age. The guidelines we outline below build on those described in a previous publication [7] and refer to children where the main concern is language and/or communication. Where other aspects of development are also a concern then a referral should always be made.

Although bilingual children are sometimes thought to be at higher risk of speech and language impairments, these children are at risk of both over and under identification. Referral decisions should be considered in all languages spoken by the child. Ideally, interpreters should help to take a case history in the parent language and to observe the child interacting with the family.

Referral in the 0–3-year-old age group remains cannot always be made with accuracy given the poor predictive validity of existing tools, and is best driven by concern from more than one viewpoint (e.g. the parent, the paediatrician, the pre-school teacher) coupled with the child not meeting milestones. High parental anxiety may justify an assessment by a speech language therapist/pathologist regardless.

Children under the age of 3 years with low expressive language and otherwise normal development will usually catch up with peers by 4 years of age [7]. Within a preventative

public health framework we recommend that efforts should still be made to optimise the child's communicative environment. Families should be encouraged to access quality pre-school services and given resources (see Appendix 1). Families with low resources who find it difficult to provide an optimal home learning environment should be linked to broader family support services.

Referral to a speech and language therapist and a child developmental team should be triggered by any one of the following [10]:

- Low receptive language abilities – children do not understand spoken language at a level which is appropriate for their age, for example the instruction 'show me your nose' at age 24 months, or a simple question like 'where's Daddy?' at 3 years
- Regression in communication skills, such as no longer combining words into sentences after beginning to do so
- Concern about communication skills

If low expressive language abilities continue or become apparent after the age of 3, we recommend re-administering the developmental assessment tool used as part of child development surveillance systems (e.g. the ASQ-3) and referring for assessment of speech and language therapy where indicated.

After entry to school or kindergarten, children presenting with either low receptive and/or expressive language should be referred. At this age, children may also present to services due to learning difficulties in school, particularly in literacy [2] and attention or with social-emotional-behavioural [25] difficulties. The presence of unidentified language difficulties should be considered in these cases.

## Stuttering

Most early stuttering is mild. It may persist for well over a year, but resolves spontaneously without psychosocial or other harms. Referral for stuttering should be made in the following circumstances:

- Stuttering has not resolved 12 months after the onset [10]
- Family history of stuttering
- High levels of family anxiety
- The child is distressed

## Surveillance

Health professionals should retain an open door for further advice and consider referral if problems persist after 6–12 months or when parental concern continues. Speech and language therapy services in the UK and Australia operate an open referral system, with parent self-referral to local services therefore also being an option. Parents should be encouraged to use the resources listed in Appendix 1 and to enrol their child in high quality pre-school education.

# INTERVENTIONS FOR COMMON SPEECH LANGUAGE AND FLUENCY IMPAIRMENT

All intervention choices (including not to intervene) should integrate knowledge of the child's speech or language phenotype, their individual communication and learning needs, parents' wishes and values and current best evidence. Intervention should be designed to improve or prevent the disabling aspects of the disorder. Hence steps should be taken to

ensure the child engages fully in age-appropriate psychosocial and academic opportunities and has a high quality of life [26]. Delivery should include partnership with parents and educational settings and should adapt with changing needs through childhood.

## Speech impairment

Interventions for most phonological and articulation disorders can be implemented from age 3 years onwards [27]. There is empirical support for a wide range of approaches [27]. Minimal pairs therapy or sound contrast therapy is appropriate for most phonological disorders and traditional articulation therapy for most articulation disorders [27]. Given the negative consequences, a 'watch and wait' approach is not justified.

## Language impairment

Three reviews have found strong evidence that expressive language and vocabulary is improved where children receive interventions tailored to their specific requirements [28]. In Law et al., [28], large effect sizes were reported for interventions for expressive vocabulary and for expressive syntax to improve sentence construction and use of grammatical markers [standardised mean difference of 0.89 (95% CI 0.21 to 1.56) and 1.02 (95% CI 0.04 to 2.01) respectively]. Although the expressive abilities did not reach average values for the general population, interventions delivered both individually and in groups have been found to be effective when delivered by speech and language therapist/pathologists or practitioners trained and closely supervised by them [29]. Unfortunately, treatment effects for interventions for receptive language are considerably smaller if present at all (-0.04, 95% CI -0.64 to 0.56) [28].

For more significant difficulties, intervention is often directed towards modifying the child's learning and social environment to maximise their ability to participate socially and educationally [30].

Most available evidence regarding treatment efficacy and effectiveness relates to clinically referred populations. Where studies have applied population screening and population level randomised trials in children under 5 years of age there has been no evidence of treatment effects for the primary language outcomes [31]. This would appear to be related to difficulties with identifying which children have persisting and which transient language difficulties and hence high levels of natural resolution of these difficulties in the control groups [31,32].

## Stuttering

Many intervention approaches to pre-school stuttering have been described, but few have undergone rigorous evaluation. A randomised control trial evaluated the Lidcombe programme, a cognitive behavioural treatment program administered by parents, and stuttering was found to have been reduced in 77% of the children receiving the program compared with 15% of controls, and 5-year relapse rates were low (16%) [33]. Recently the Lidcombe program was compared to an alternative treatment based on the demands and capacities model [34]. While the Lidcombe program decreased stuttering more quickly in the first few months of treatment, clinical outcomes for both approaches were comparable at the 18-month follow-up.

Response to the Lidcombe program is not reduced if treatment was delayed for up to a year [33], and provided that the child and family are not distressed or anxious about

stuttering, then delaying treatment is recommended to allow some children to recover naturally. Treatment is recommended for significant stuttering in the pre-school period because in school-age children treatment seems to be less efficacious.

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## CONCLUSIONS AND FUTURE RESEARCH

Persistent speech and language impairments and stuttering may have significant consequences for an individual's long-term health, education and well-being, and require continuing health and educational support. There is now good evidence that treatment is very effective for: (i) articulation difficulties, interfering with intelligibility after the age of 3 years and (ii) significant, distressing stuttering that has been present for more than 12 months. In the pre-school years, language disorders do not develop in predictable or consistent ways, making it difficult to identify and predict which children will have persisting problems and the associated negative consequences on broader academic and social development. There is now firm evidence that treatment for expressive language difficulties beyond the age of 3 years is effective, but receptive language difficulties remain challenging, suggesting new treatment models may be needed.

Research is urgently needed to develop and evaluate public health interventions for pre-school children. These shift the focus in these early years from screening and clinical diagnosis to surveillance of changing needs and estimation of individual risk, and from rehabilitation to primary and secondary prevention. Service models are required that address a range of social and environmental risks and promote protective factors from birth to school entry, and allow children to step up and down levels of support as their needs change.

### Key points for clinical practice

- Impairments in speech, language and stuttering are common childhood disorders and have debilitating long term social, educational, and health consequences.
- These impairments can occur in isolation but may also be the first presenting symptom of a range of developmental conditions.
- Actively seeking for causes of speech and language impairments (e.g. hearing impairment) and associated problems (e.g. learning disability, autism) is important.
- Population studies have shown that the typical course of language development is more variable than previously thought. Children may not only grow out of language problems but may grow into them.
- There is evidence that treatment is effective for:
  - Speech disorders after 3 years of age.
  - Stuttering that has lasted for more than 12 months.
  - Treatment can improve difficulties with expressive language that are present beyond 3 years of age, but it has little impact on receptive difficulties.

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## Appendix 1: Resources for parents and professionals

### Online resources to provide to parents: UK examples

- Afasic provides online support to parents and represents children and young people with communication needs.
- Words For Life provides parents with communication milestones from birth to 11 years and activities to encourage their child's communication development.
- Talking Point, an online resource, was developed for parents concerned about their child's speech and language development. Parents can benchmark their child's development against milestones and access resources on how to support children with speech, language, and communication needs.
- British Stammering Association provides support, information and resources for people who stutter.

### Resources for parents and professionals: UK examples

- I CAN is a children's communication charity that provides a free call-back service with a speech and language therapist.
- The Communication Trust is a coalition of over 50 not-for-profit organisations working together to assist those who support communication in children and young people in England.
- Centre for Research Excellence in Child Language is an international collaboration of language, paediatric, epidemiology, biostatistics and health economics experts provides accessible online research snapshots on factors that affect and improve children's language development.
- The RALLI campaign was created to 'raise awareness of language learning impairments'. It has its own YouTube channel, with videos explaining what language impairment is, the impact it can have and how to get help.
- Special Kids in the UK offers a set of resources for parents and professionals wanting to understand how a range of developmental problems impact on speech and language development teachers and young people with language impairment are available.
- Raising Children Network provides a variety of resources explaining how language develops.

### Resources for healthcare professionals

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- Nye C, Vanryckeghem M, Schwartz JB, et al. Behavioral stuttering interventions for children and adolescents: a systematic review and meta-analysis. *J Speech Lang Hear Res* 2013; 56:921–932.
- Talking point, an online continuing professional development resources for general practitioners point.
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