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Resource Manual for Commissioning and Planning Services for SLCN

Professor Pam Enderby
Dr Caroline Pickstone
Dr Alex John
Kate Fryer
Anna Cantrell
Diana Papaioannou

Acknowledgements

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CONTEXT

The aim of this section is to set out the context for this resource. This work forms part of a range of tools which can support leaders with service planning and delivery, in line with both government and local priorities.

It is essential for service providers to demonstrate quality and productivity and to:
- show value for money
- be able to provide a strong financial argument for the need to invest in services for people with speech, language, communication and swallowing needs
- demonstrate improvements in outcomes for individuals, families and society

Value for money is not about being the cheapest option but about delivering the most return (impact, best outcomes) for a given investment over time.

The key drivers for change to services include:

1. The broad context, which can be divided according to the following factors:
- **P**olitical and **L**egislative factors
- **E**conomic factors
- **S**ocial factors
- **T**echnological factors

2. The near or local context, including:
- Localised policies
- Addressing local needs
- Service provision
- Workforce
- The evidence base

THE BROAD CONTEXT (MACRO-ENVIRONMENTAL ANALYSIS): FACTORS FROM THE WIDER WORLD

The Macro-environmental analysis commonly takes the form of a PEST analysis:

Political and legislative factors
Economic factors
Social factors
Technological factors

Political and legislative drivers

Devolution has resulted in changes to the powers of the different institutions across the UK.

The government in power at Westminster maintains responsibility for policy and legislation in relation to key areas including: tax, benefits, foreign affairs, international development,

trade and defence for the four countries of the UK. Government in Westminster is also responsible for health, social care and education in England, but these areas are devolved for Northern Ireland, Scotland and Wales.

As a result of devolution, each country of the UK may have different parties in power, with the possibility of increasing powers in the future. The impact of this is the diversification of policy and direction of travel.

Legislative drivers

The main areas of UK-wide legislation that are relevant include the following themes:
- Human Rights
- Disability Discrimination
- Equality

Though there is different local interpretation, these far-reaching legal instruments define the rights and responsibilities of people and those commissioning and providing services for them.

Public protection has also been strengthened through the introduction of registration of professionals, for example, through the Health Professions Council.

There is separate legislation relating to health, education and social services in each of the devolved administrations in England, Northern Ireland, Scotland and Wales.

Economic

The current challenging economic backdrop will have a significant impact on the financing of public services, with local planners and commissioners prioritising services which are value for money, evidence based and releasing cash through innovation.

Social

In order to plan and deliver services, it is essential to identify the demographic factors relevant to speech and language therapy (SLT) and the challenges that these bring.

- The population is aging: people are living longer.
- The birth rate is falling: most families are having fewer children
- The infant mortality rate is also falling, with more children surviving premature birth or health problems or injury in infancy.
- The urban population is growing.
- The proportion of the population in employment is falling.
- The proportion of the population with English as an additional language is increasing, particularly in urban areas.

THE NEAR OR LOCAL CONTEXT

Localised policies

Central to the new reforms is the emphasis on local decision-making within a national framework. Across the four countries of the UK there are requirements to provide services to accord with local need and influence. In England there is a particular focus on increasing the range of potential providers (plurality of provision) with commissioners having a role to stimulate the market.

For each country, arrangements have been established to assess whether commissioners are achieving better health outcomes for the local population. Part of this process will be an assessment of how well commissioners are performing against specified competencies/indicators/targets. For example, in Northern Ireland these targets are based upon high-level outcomes linked to local strategies.

With the devolution of power to local levels, there is a focus on developing more robust accountability. There is an emphasis on joint working to support integrated commissioning, service planning and provision across health, social care and education.

There are different approaches to this development with different structures and commissioning and performance management arrangements being established across the UK. The dominant theme in strengthening accountability is "putting service users at the centre" with respect to:
- Access and self–referral
- User voice at strategic to operational to individual case management
- Population/local engagement
- Information and advice for users, parents/ carers
- Patient Rights
- Self management of conditions

Some localities will be commissioning or planning speech and language therapy services as a single service whilst others will be commissioning integrated services, cutting across traditional boundaries, with health services integrated with education or social services. In many areas, this has already happened for children's services.

It is recognised that, often, no single agency can deliver best outcomes for their service users by working in isolation. Joint commissioning is advocated wherever the meeting the needs of individuals requires contributions from a number of agencies.

Similarly, some service planners or commissioners will be organising services around disease groups, such as services for persons who have survived a stroke. In either case, it will be important for speech and language therapy managers to liaise with other services to ensure that SLT provision is incorporated in their service plans.

Special arrangements are in place for commissioning services for unusual, low incidence or costly interventions. Speech and language therapy managers should identify the specialist commissioning procedures that may be required for individuals requiring

particular interventions such as costly augmentative communication aids, protracted or intensive interventions.

Addressing local needs

In general terms, the UK is experiencing a number of long-term demographic changes (some of which are identified above).

There is significant local variation within these general trends. It is important to understand what these changes and variations imply in relation to the provision of local SLT services. Other local factors to be taken into consideration include: employment, cost of living, housing, transport and, particularly, levels of deprivation.

There are information resources available online from which planners, commissioners and providers can find out more about local and regional demographic factors. Some of these can be found signposted on the RCSLT website www.rcslt.org .

Local public health teams will also be able to sign-post local services to relevant data and information for their area.

There will also be learning from data collected by services. The RCSLT has developed an online tool called Q-SET, the Quality Self- Evaluation Tool to help you collate local SLT service derived information http://www.rcslt.org/resources/qset . Q-SET should be used alongside national and local data to support service planning and evaluation of service delivery.

Through completing Q-SET, provider services can:
- use the resource every 9-12 months to review progress in meeting action plans and to demonstrate service enhancement
- compare their service with other similar service types e.g. urban, rural, acute, community, adult, paediatric, education, 3rd sector
- demonstrate that their service meets the needs of the service users
- identify areas of strength and generate action plans relating to areas of development.
- submit the results as part of the evidence for a clinical audit
- retain ownership of the monitoring and development of services ensuring that strong professional standards are maintained in the context of multi-agency teams

Service providers completing Q-SET will support commissioners to:
- reduce the 'postcode lottery' of service availability and quality
- have high quality information that is relevant and accessible
- have an overview of developments, trends and initiatives within the service
- have accurate and timely statistics to support performance management and monitoring
- collect data to contribute to the debates on benchmarking. Where benchmarks do not yet exist Q-SET will enable Commissioners to contribute to this in the future
- collect examples of good practice to inform other pieces of work and the development of services as a whole.

Locally derived information will help SLT services to illustrate:
- the numbers of patients/clients seen
- sources of referral
- amount of resource used in providing a service to the client e.g. number of sessions and skill mix
- nature and severity of the disorder, disability, psychosocial impact at the onset of intervention
- nature and severity of the disorder, disability, psychosocial impact at the completion of intervention.
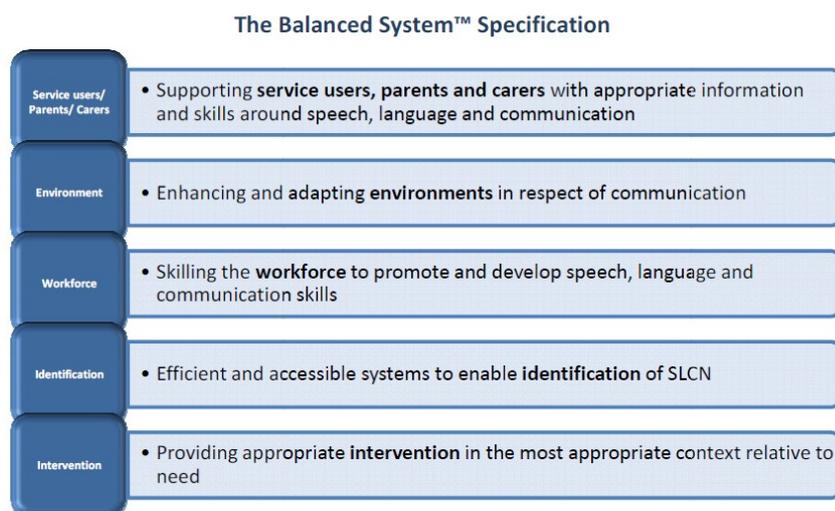- level of satisfaction with the service.

Service provision

Speech and language therapists have a role in delivering specialist and targeted support to clients, carers and their families. Speech and language therapists can also reduce long-term demands on services by addressing immediate needs that arise from circumstance rather than underlying impairment. Providing training for the wider workforce is integral to the speech and language therapists core role, as outcomes for people with speech, language and communication needs SLCN are improved when the whole workforce is able to contribute appropriately to care pathways.

SLTs also work with the wider workforce contributing to the public health agenda, promoting health and well-being in respect of communication and swallowing. There is little awareness outside the profession of the role of speech and language therapists in preventing the development of speech and language impairments and the further impact and consequences of different speech, language and communication disorders upon health, education, social integration and employment.

The challenges of meeting the speech, language and communication needs (SLCN) of a given population are best understood through a social (participative) model. Key elements of a total service specification will start with:
- identifying the needs of the service user, parent or carer for support and information
- identifying/assessing and diagnosing specific SLCN and providing appropriate intervention.
- considering needs of service users within the environments they encounter
- training the wider workforce that interfaces with them to maximise opportunities for positive outcomes.

The balanced system (diagram 1) below illustrates the wider context for how SLTs contribute to this range of activities. The needs of service users should be considered in service specifications. The role of SLTs in supporting the active participation of service users in service planning, adapting the environment and enskilling the workforce is as relevant as the SLT role in identification and intervention.

The Balanced System™ Specification

Service users/ Parents/ Carers	• Supporting **service users, parents and carers** with appropriate information and skills around speech, language and communication
Environment	• Enhancing and **adapting environments** in respect of communication
Workforce	• Skilling the **workforce** to promote and develop speech, language and communication skills
Identification	• Efficient and accessible systems to enable **identification** of SLCN
Intervention	• Providing appropriate **intervention** in the most appropriate context relative to need

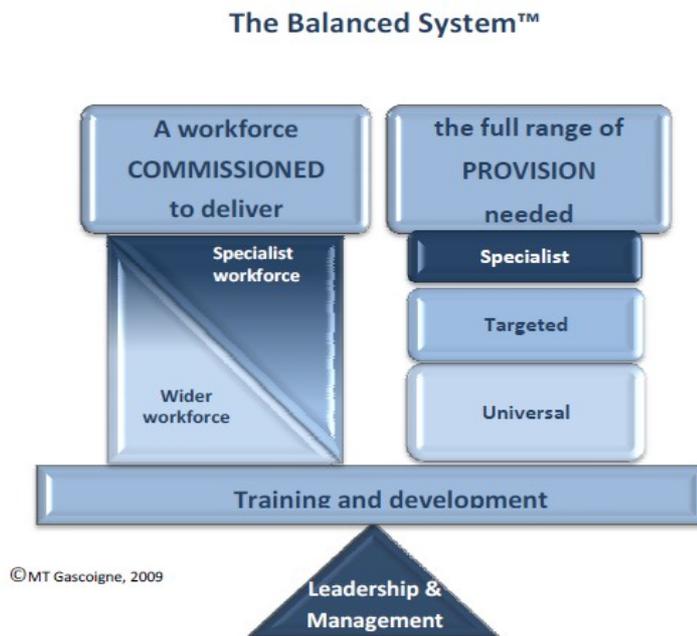©M.T. Gascoigne, 2009

Workforce

Careful planning of services, including joint commissioning, will help to shape the workforce and inform the skill mix required to deliver high quality services, improve outcomes and support value for money. Because the commissioning and planning of services relies on the evidence base for a given type of SLCN or model of practice, it is essential that clinical and managerial expertise from speech and language therapists is available to support innovation and quality of service design.

Speech and Language Therapists, as part of the wider workforce, may be employed by a range of organisations, including the third sector, social care and education or be working as private practitioners.

Equal Access to services is of importance to local decision makers. Local demographic profiling will inform workforce requirements. For example, bilingual staff and support workers are required in most areas to meet the needs of diverse communities. The appropriate skill mix should enable services to be family-centred and be culturally and linguistically appropriate and responsive. It may be necessary to consider increasing home delivered services or providing services in unusual locations.

The RCSLT also acknowledges the important role that Assistants and Support Workers have in the delivery of effective speech and language therapy services. Assistants and Support Workers are integral members of both speech and language therapy and multi-disciplinary teams, engaged in a wide range of clinical settings with diverse client groups, duties and responsibilities. http://www.rcslt.org/aboutslts/rcslt_statement_v3.pdf

In order to support more effective use of skill mix, SLT services also need to provide education and training of the wider workforce and not be focussed solely on direct patient / client care. For all services, this is critical to secure the appropriate balance of cost-effective universal, targeted and specialist services.

The Balanced System™

A workforce **COMMISSIONED** to deliver

the full range of **PROVISION** needed

Specialist workforce

Specialist

Targeted

Wider workforce

Universal

Training and development

©MT Gascoigne, 2009

Leadership & Management

PRACTICAL CONSIDERATIONS

Many people involved in strategic planning, commissioning or reviewing services will not be familiar with speech and language therapy, its objectives, the needs of clients requiring speech and language therapy, the principles driving the profession, or the evidence base and the following points may support people.

- Where possible, draw on the evidence base.
- Communicate clearly and succinctly.
- Avoid using acronyms and provide a glossary of terms.
- Do not assume knowledge of local arrangements or the requirement to interface with other agencies
- Set your service in the context of local priorities.

The RCSLT's Communicating Quality 3 (CQ3) provides clear guidance on care pathways, clinical standards and issues related to quality assurance. This information should be used in submissions to support commissioning quality services.

The following guiding principles have been adopted and apply to all client groups. Services are to:

- be family centred and culturally and linguistically appropriate and responsive
- be comprehensive, coordinated and team based
- work with and communicate effectively with other services meeting the needs of the client
- be evidence based
- ensure equal access
- involve the family and carers
- include training and education of co-workers
- ensure practitioners continuing professional development and appropriate support.

Evidence of the impact of the service will be important to commissioners and providers. Providers will need to demonstrate the impact of their service, particularly when services are being reviewed. Determining the objectives of the service will support the process of outcome measurement. SLT services will need to provide information on outcomes achieved and levels of client satisfaction. Some of this information can be gathered through use of the RCSLT's Q-SET tool, as detailed above.

Managers of speech and language therapy services will need to equip themselves to engage effectively and positively with those who are commissioning or monitoring services. They will need to:
- identify who is commissioning or responsible for overseeing different services. For example, health commissioners may be working with commissioners for education/head teachers. It is important to identify who is taking the lead for each aspect of the service delivery in the locality.
- establish good working relationships and effective communication with those commissioners and planners for their area of responsibility.
- be aware of local priorities and commissioning plans and strategies.
- have a good understanding of the commissioning/planning/monitoring framework for the locality
- be equipped with local data, knowledge and evidence to the tendering process
- be clear of the unique contribution of the service to improving health, employment, education and social outcomes
- be able to clarify and demonstrate local working partnerships and collaborations
- provide data describing the service provided, (numbers and types of patients, numbers of attendances, health and social outcomes etc).

The RCSLT has developed a range of resources to support its members with Continuing Professional Development. CPD is a regulatory requirement for all SLTs and this requires all HPC Registrants to demonstrate how the CPD they have undertaken has sought to enhance service delivery and to be of benefit to service users. The RCSLT has endorsed this requirement through its own CPD standards. http://www.rcslt.org/cpd/resources

THE EVIDENCE BASE

The commissioning and planning of services must be informed by the evidence base of effective practices.

This Resource Manual SLCN is based on a synthesis of existing published research. The threshold for inclusion in the syntheses has favoured the most scientifically robust research methodologies which have often reflected medical (impairment) rather than social (participative) models of care.

In the section summaries, emerging practices that have not been included in the evidence synthesis, are referred to and should be considered alongside the syntheses. This tension between empirical evidence resulting from robust research, which by definition is retrospective, and the needs to encourage innovation and service re-design to support improvements in outcomes for people with speech, language, communication and swallowing difficulties is natural and unavoidable. Emerging practice will not have the same evidence base and therefore less empirically stringent measures of evidence need to be taken into account for these areas including professional consensus and measures of service user, parent or carer experience. However, because of the value of some emerging innovative practice, they have been included in this resource.

An overview of the methodologies employed in identifying practices that are included in this resource accompanies this document.

Using these resources

Speech and language therapy managers can assist commissioners by understanding their agenda and the objectives that they are to be assessed on.

The Royal College of Speech and Language Therapists is providing these resources to assist speech and language therapists in gathering the core data required to support service tendering agreements, service planning, monitoring arrangements and/or where services require specification.

Each part of these resources is focused on a specific area.

The resources provide:

- *The Contextual Synthesis.* This includes definitions, information on the incidence and prevalence of the disorder, key contribution of speech and language therapists, consideration of the implications and broader consequences of the disorder.
- *The Synthesis of Key Literature.* This summarises the evidence of the impact of speech and language therapy.

Each section within these resources gives succinct information to inform the factual content for any service planning activity. These include:
- Key points
- Topic –What is [the condition]?
- How many people have [the condition]?

- What causes [the condition]?
- How does this condition affect individuals?
- What are the aims/objectives of speech and Language therapy interventions for [this condition]?
- What is the management for people with [this condition]?
- What is the evidence for Speech and language therapy interventions in [this condition]?
- Studies
- Assessment methods
- Speech and language therapy interventions
- Summary
- References

This information will need to be put into context, using local information.

Other guidance and resource materials

It is recognised that service managers may wish to amplify or clarify, an aspect of their service by providing reference to other national or local research of relevance.

The RCSLT has a range of resources which can be used to further support and inform the commissioning, planning and provision of services for people with speech, language, communication and swallowing needs. These can be found on the RCSLT website: www.rcslt.org

The RCSLT is grateful to the experts from within the SLT community who contributed to the evidence published in this document.

METHODOLOGY FOR SYNTHESIS OF LITERATURE

Introduction

The focus of the interventional synthesis within these briefings is to provide a synopsis on the effectiveness of speech and language therapy interventions for each specific condition.

The interventional syntheses are produced by reviewers within the Information Resources Section (within the Health Economic and Decision Science Section) at the School of Health and Related Research (ScHARR). Information specialists/reviewers for this bulletin were Diana Papaioannou and Anna Cantrell.

Methodology

The interventional syntheses are not intended to be a full systematic review within each topic area. However, they draw upon systematic review techniques to ensure that the syntheses are developed according to systematic, explicit and transparent methods. The intention of the syntheses is to consolidate twenty articles which represent some of the best research for each topic area.

Literature searching

Systematic literature searches were undertaken to identify a range of evidence for each interventional synthesis. The interventional syntheses do not attempt to consolidate all research within a particular topic area; rather they aim to present a careful selection of the most current research within that field. Therefore, the approach adopted for the literature search aims to be comprehensive reflecting this systematic and explicit approach.

Firstly, search terms were selected within the project team drawing on the expertise of four speech language professionals. This involved listing all possible synonyms describing the condition or population (for e.g. children/infant, stuttering/stammering) and combining those with terms to describe speech and language therapy. Terms were used in both free text and thesaurus searching. The following databases were used:

- ASSIA
- CINAHL
- The Cochrane Library (which includes the Cochrane Database of Systematic Reviews, Cochrane Central Register of Controlled trials, Database of Abstracts of Reviews of Effects, Health Technology Assessment Database and NHS Economic Evaluations Database).
- Linguistics and Language Behaviour Abstracts
- MEDLINE
- PsycInfo

All references retrieved from the literature searches were entered onto a Reference Manager Version 11 database using appropriate keywords.

Selecting and obtaining relevant articles

Articles for inclusion were selected to illustrate the range of good quality evidence within each topic area. An initial screening of articles was undertaken by the Information specialists/reviewers who adopted the following principles:

- Articles must be empirical research evaluating the effectiveness of a particular speech and language therapy intervention
- Only articles published in English language are included.
- In general, only the most current (1998-present) literature is included. However, exceptions were made to this if a particular article was felt to be important to include.
- Where possible higher level evidence was included (systematic reviews, randomised controlled trials). However, this research did not always exist in every topic area.
- Efforts were also made to seek out literature that provided a range of perspectives on interventions for each topic area, i.e. both quantitative and qualitative research.

Following initial screening, the remaining articles were examined by two members of the team; each having considerable speech and language therapy knowledge and experience. Approximately, twenty articles were selected by the two reviewers with disagreements being resolved by a third reviewer.

Assessing the quality of relevant articles

Formal quality assessment of the articles was not undertaken. Instead, quality assessment involved using checklists as a guide to give an indication of the overall quality of studies and highlight the main good and bad aspects of each study. For each interventional synthesis, the included study designs are listed and the problems with each study design noted. General observations on study quality are made and common errors within the studies, where appropriate, are specifically noted. The checklists used are one for quantitative and one for qualitative studies from the Alberta Heritage Foundation for Medical Research.1 Additionally, when an identifiable study design was used, the appropriate Critical Appraisal Skills Programme (CASP) checklist was selected.2

Syntheses of the twenty articles

Each article was read in turn by one of the Information Specialists/reviewers. The key points were summarised including the objective of the study, the participants' characteristics, the methodology, the intervention, results and limitations. From this, articles were grouped into themes according to the factor being investigated (for e.g., length of intervention, personnel carrying out intervention, family involvement in treatment, nature of disorder). Results were summarised and drawn together within each particular theme and a summary paragraph provided at the end.

These syntheses first went out for review by selected individuals, identified by the research team, with particular expertise in the delivery or management of services to the

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[1] LM Kmet, RC Lee, LS Cook (2004) Standard Quality Assessment Criteria for Evaluating Primary Research Papers from a Variety of Fields. Accessed at http://www.ihe.ca/documents/hta/HTA-FR13.pdf (Accessed on 25th September 2008, now no longer available)
[2] Critical Appraisal Skills Programme (2007) Appraisal Tools. Accessed at http://www.phru.nhs.uk/Pages/PHD/resources.htm on 9th January 2009.

specific client group. Comments were included in the second draft, which was then dispatched to those selected by the Royal College Speech and Language Therapists who were invited to attend a focus group day. These therapists gave detailed consideration to their specialist area and contributed to the more general discussion of one further area. Issues to be captured in the key points were also identified within the focus groups. These comments contributed to the third draft of the syntheses, which again went out to reviewers. In some cases, further work was required in order to modify the wording and reflect discussion.

Checklist for service managers involved in commissioning services

Have you presented incidence and prevalence figures and local demographic trends for the conditions in your area?

Have you provided information on local access and use of services in the context of the number expected and highlighted your approaches to inequalities?

Have you consulted systematically with users to inform development of this commissioning proposal?

Does your proposal fit/link with local cross agency priorities?

Have you outlined the range of services provided including training?

Have you made clear how this fits with future planning for your service over the next 3-5 years?

Have you stated the assumptions which underpin your thinking in the plan and for future developments?

Have you offered predictions about the likely impact of investment in the proposal?

Have you made clear where the risks are and what contingency plans you have put in place?

Professor Pam Enderby
Dr Caroline Pickstone
Dr Alex John
Kate Fryer
Anna Cantrell
Diana Papaioannou

RCSLT RESOURCE MANUAL FOR COMMISSIONING AND PLANNING SERVICES FOR SLCN

FLUENCY

Fluency

1. *Key points*

1. Speech and language therapists play a unique role in identification and assessment of children and adults with fluency disorders impacting on communication. The ability to diagnose the specific fluency disorder, associated consequences as well as retained communication abilities are unique skills of speech and language therapists.

2. Difficulties with communication are a predominant feature in reducing access to education, employment, peer relationships and social integration having a significant impact on quality of life. Speech and language therapist will assess the impact of the disorder on the individual situation.

3. The severity of the fluency problem is not linked to the severity of the overt presentation.

4. Improved communication has an impact on literacy, social skills, peer relationships, employment opportunities, self-confidence and behaviour

5. Early referral is advocated and associated with better outcomes in young children. However, fluency disorders may not become apparent until later in life, and access to services should be available at any point.

6. Persons with fluency disorders should have access to speech and language therapy in the local service, with access to specialist therapists who may be based elsewhere.

7. Children and adults with fluency disorders need regular review. Intervention needs to respond to the particular needs of the individual and further therapy may be required at significant transitions in the individual's life.

8. Advisory and educational programs for parents, teachers and carers should be part of speech and language therapy services.

9. Management of the difficulty with fluency, quality of life, self and family management are key drivers in speech and language therapy

10. There is research evidence that the Lidcombe program is effective in improving fluency. Features from this programme have been reported to be beneficial.

11. As part of all service delivery there is emerging practice and developing roles. Within Fluency this might include increasing agreement among practitioners for the need for early intervention, agreement on best practice for children, young people and adults, the development of good care pathways and increasing evidence of clinical based research evidence on effective practice.

2. *What is stammering?*

Dysfluent speech, where the fluent flow and timing of speech is disrupted by 'stoppages', may be called stammering or stuttering. These terms can be used fairly interchangeably. Breaks in fluency take different forms: repetition of sounds, syllables or words, prolongations of sounds, blocking on sounds, including silent blocking of airflow during speech with sound production (Enderby 1996). The listener/speaker relationship essential to conversation and communication is affected by dysfluent speech production. Communicative opportunities or situations, perceived to exacerbate the stammer, are frequently avoided because of anxiety and fear of stammering and a fear of negative evaluation by listeners (social anxiety). It is recognised that stammering frequently has an emotional and psychological impact caused by a breakdown in successful communication.

Cluttering refers to dysfluent speech which frequently co-exists with stammering, language and motor difficulties (RCSLT 2005). It has a series of identifiable features which may/may not include an abnormally fast and irregular rate. There is a difficulty in maintaining normal sound, syllable, phrase, and pausing patterns which cause incidents of dysfluency unlike those of a stammer. In cluttering, omissions and/or indistinct production of sounds and omission of syllables, particularly on polysyllabic words affect the intelligibility of speech (St. Louis et al, 2003).

The Royal College of Speech and Language Therapists Guidelines (2005) describes disorders of fluency as:

1.   Developmental stammering – in children
2.   Developmental stammering – in young adults
3.   Developmental stammering – in adults
4.   Acquired/Late onset stammering
5.   Cluttering

This synthesis outlines models of services provision for people who stammer and summarises provisions from childhood, for adolescents and adults, and assumes that individuals may be referred for services at any stage.

2.   *What is the incidence of stammering?*

In childhood 20% of children go through a period of non-fluency. Of these 5% will have a stammer that lasts longer than 6 months and, of these, 1% will have a persistent stammer.   Reilly et al (2009) reported a cumulative incidence of 8.5% by 3 years of age. Onset was often sudden (49.6% 1-3 days) and tended to occur on word combinations (97.1%).

Table 1: Incidence and prevalence of stammering

Incidence	Prevalence
Stammering is more common in males and the ratio of occurrence in males versus females ranges between 3:1 and 5:1 (Enderby & Emerson 1995)	5% in the under 6yr age group (Yairi et al 2005)

Incidence	Prevalence
4:1 male to female (Månsson 2006)	1.1% children develop a persistent stammer (Månsson 2006)
2:1 pre-school rising to 4:1 older children & more in adults 2.8% (Craig et al 2002) 3.75:1 chronic stammer (Yairi et al 2005)	1% adults (Bloodstein 1995)
50% of cases have a genetic factor (Yairi & Ambrose 1999, Cox et al 2005)	In Down's syndrome, reports vary between 15% and 48% (Bloodstein 1995)

There is an incidence of non-fluency in individuals with learning disabilities. Ferrier et al (1991) reported a mean percentage of stuttering in Fragile X Syndrome 4.9%, Autism 1.6% and in Down's syndrome 6.1%.

Between 75% and 80% of those who stammer grow out of the condition (Månsson 2006, Månsson 2000, Yairi & Ambrose 1999).

3.   *Contributing factors in stammering*

Stammering may have a range of different contributory factors in different people, and different influences which impact on whether it resolves, continues or deteriorates.
There are many different theories of the causes of stammering and although the cause is not known, the consensus is that it occurs when a combination of factors come together. A stammer most commonly develops in childhood, though it can be acquired later in adolescence or adulthood.

Table 2: Summary of factors relating to causation

	In children	
1.	Genetics	60% have a family member who stammers
2.	Child Development/linguistic	Associated with speech and language problems/delay
3.	Neurophysiology	Differences in how the brain processes speech and language
4.	Family influences	Communicative environment, high expectations, fast pace of life, social pressures
	In young people and adults	
1.	Neurophysiology	Brain injury causing damage to a specific part of the brain (e.g. Stroke, Head Injury, Brain Tumour, or progressive neurological disease (Alzheimer's Disease, Parkinson's Disease)
2.	Physiological	Post viral fatigue syndrome
3.	Pharmacological	Drug-related stammering as a side-effect of medication
4.	Psychogenic	Psychological response to stress and/or trauma. Coping strategies no longer meet communication demands
5.	Re-occurrence of a childhood stammer	Coping strategies no longer meeting communication demands
6.	Idiopathic	No identifiable cause

Genetics: A positive family history is an influencing factor (Buck et al, 2002) and a stammer would be present more frequently in the males with more fathers with a stammer than mothers, and more brothers than sisters. Costa & Kroll (2000) reported stammering in 9% of the daughters of adult male stammerers and 22% of sons, while adult female stammerers had a 17% risk of daughters stammering and a 36% risk in sons. In a study by Cox et al (2005) gender differences were reported in chromosomal signals for stammering. There is an incidence of non-fluency in learning disabilities most frequently associated with Down's syndrome.

Developmental: Dysfluency may first appear in young children during early language development when the demands of linguistic competence and articulatory skill may not meet the capabilities in the maturation of motor, linguistic and paralinguistic abilities and social skills (Adams, 1990). Some studies have reported linguistic difficulties (Anderson et al, 2006), while others show advanced linguistic skills (Millard 2008). In the majority of children with a developmental non-fluency, the dysfluency resolves within a year or less (Stewart & Turnbull, 1995). Of the remainder, approximately a third resolve within 18 months of onset and another third within 3 yrs post-onset. Early identification of children most at risk of persistent stammering is considered to be critical, and intervention with these children has been found to be effective.

Neurological: There is evidence to indicate a neurological basis for dysfluency. Studies have reported differences in the brain activities of dysfluent versus fluent speakers and in the use of the lateral versus medial pre-motor system. Watkins et al (2008, 2005), using brain imaging studies, found an over-activity versus under-activity relative to 'normal' speakers. The areas of the brain identified included the cortical and subcortical neural systems that support the selection, initiation and execution of motor sequences necessary for fluent speech production. There were abnormalities or abnormal development in the grey and white matter resulting in an imbalance of the primary motor cortex working with the basal ganglia (responsible for speech initiation) that could produce dysfluency. Alm (2004) noted that early non-fluency at 2.5 to 3 years occurs during a phase in basal ganglia development, when dopamine receptors peak. High levels of dopamine have been found in stammerers (Maguire et al, 1997). Fluency is also affected by perception and the demands on sensory input (Foundas et al, 2004). There is also often an onset of stuttering later in life, coinciding with the onset of Parkinson's Disease and side effects of medication, and often in those who had a stammer as a child which had resolved

Linguistic factors influence fluency, with stammering more common at the beginning of sentences and in sentences with long and complex syntactic structures. It is less common with single-words or word lists (Melnick & Conture, 2000). In children, stammering tends to occur on function words, and in adults on content words. School-age children who stammer have shown motor coordination difficulties with longer voice onsets on plosives, and less accurate articulatory movements (Howell et al, 1995).

Gender: Stammering occurs more frequently in males than females, with the ratio increasing exponentially with age (Craig et al, 2002). Females are more likely to recover without intervention while there is a higher incidence of males in those who go on to develop a chronic stammer (Yairi & Ambrose, 2005).

Environment: Environmental factors influence fluency and can act as stressors which precipitate and exacerbate dysfluency. Individuals who stammer may develop behaviours to avoid situations which they construe as difficult or they associate with previous dysfluency (for example, using the telephone, ordering in a restaurant or bar). Children as young as 3 to 4 years may be subject to bullying as a result of their dysfluent speech. This carries on throughout the school years, affecting their school days and

having long-term consequences which impact on their self-esteem and ability to interact with others in personal relationships (Hugh-Jones & Smith, 1999). In everyday situations, there is evidence of negative speaking experiences, such as being bullied or mocked and having someone hang up the telephone. This can cause individuals who stammer to develop social anxiety around speaking situations. This may result in attentional and interpretational bias, with the person attending only to negative responses and perceiving speech situations as threatening (Craig and Tran, 2006).

4.   *How does stammering affect individuals?*

Stammering affects a wide range of aspects of daily life from daily activities and occupational choice to developing and maintaining friendships and relationships with others. Most people who stammer show variation in frequency and severity of the dysfluency, ranging from mild to severe.

While there may be significant variability in an individual's experience of their stammering, the impact on their life is often significant and it is not associated with the severity of the disorder. Stammering can affect a wide range of life choices, ranging from every day activities to developing and maintaining relationships with others, and educational and career choices.

Parents may often be concerned about the dysfluency of their young child. This may be at odds with the child's own awareness of his own dysfluency. Timing of emergent awareness differs from child to child. Concern may be associated with school entry, transitions within school or up to secondary education. Children can experience bullying and negative experiences pre-school and in school which impact on their perceptions of self and general happiness (Langevin et al 2009, Crichton-Smith 2002, Davis et al 2002, Hayhow 1999, Hugh-Jones & Smith 1999).

By the time the child is a young adult (16 yrs +), he may have significant anxiety related to speaking events and a number of negative constructions of himself and his world as a result of his experiences of dysfluency. Recent research papers have also documented the negative adverse effects of living with a stammer and the impact it has on educational opportunities, work and relationships (Crichton-Smith 2002, Kathard 2004, Klompas & Ross 2004) Many effective interventions address these important issues alongside fluency strategies.
In several areas of disability there have been significant changes in social attitude; however, the social stereotyping of the stammerer is still prevalent in some areas of education and employment opportunity (Enderby & Emerson 1995, Hayhow 1999).

Environmental barriers influence what an individual can achieve. This can relate to specific situations or environments and affect which activities can be undertaken, either in school or in work. Opportunities to do different jobs may be curtailed by these specific difficulties. For example, the use of the telephone is difficult because there is no visual feedback and there is a time pressure to respond, while answer phones may be problematic because they do not give enough time to finish a message (Yaruss & Quesal 2006, James et al 1999, Leith et al 1983).

Commonly, the more the individual stammers the more anxious they are about communicating effectively. Anxiety affects how the individual perceives him/herself and individuals can learn negative behaviours which can build up over years to impact on self-esteem and a view of the world. These views, when combined with the attitudes of other people, may restrict what the individual feels they can do in their life (Yaruss & Quesal 2006). Work provides the highest stressors for some individuals, particularly if demands on spoken language increase and other people have negative attitudes and

beliefs around stammering (Hayhow, 1999). Recent research has documented the negative adverse effects of living with a stammer and the impact it has on educational opportunities, achievement in work and successful relationships (Crichton-Smith 2002, Kathard 2004, Klompas & Ross 2004). Adults with a stammer tend to have developed higher levels of social anxiety, fear of negative reactions and may become anxious in communicative situations, especially where they have no control. As a result, the adult with a stammer may not achieve their full occupational potential, as the majority of occupations in United Kingdom require communication skills (Klein & Hood 2004, Kraaimaat et al 2002).

Table 3: International classification of functioning (ICF) and presenting features

ICF	Factors
Impairment	All the following may be present in different degrees of severity – Repetition, prolongations and blocking on sounds Silent blocking on airflow Pitch changes Sound or word avoidance Facial and body movements Lip tremor
Activity	Limitations in communicative situations Communication disrupted Reduced production of conversation speech Listener understanding of message affected Listener completing sentences Reduced ability to use telephones
Participation	Avoidance of communicative situations Avoidance of social situations Restrictions in participation Reduced access to the curriculum Reduced participation in social activities Reduced participation in social interactions Reduced participation in school activities Reduced employment opportunities Impact on work engagement Potential for discrimination Impacts on ability to make and maintain friendships Autonomy affected
Well being	Anxiety Upset Frustration Anger Negative perception of self Depression

| 5. | *What are the aims and objectives of speech and language therapy for individuals with stammering?* |

Speech and language therapy follows a number of different approaches, depending on the age of the individual and the severity of the fluency problems and its consequences.

Speech and language therapy for children can include indirect work on environmental factors and family interaction, direct work on speech and language development, direct work on fluency strategies and in older children and adults' therapy on psychological change and reconstruction. SLTs will aim to assess, advise and plan a programme appropriate to the needs of the individual, the family and other professionals associated with their care and education. In adults, therapy will address the needs of the individual but will generally involve significant others in the person's home and work environments.

In young children, early referral is recommended to facilitate the differentiation of normal non-fluency and children at risk of persistent stammering (Bloodstein, 1987). Timing of intervention after onset is judged on a number of risk factors (Yairi, 2005) . As specified in the case history. SLTs can monitor the progression of the dysfluency over time, give parental advice on supporting the child through their dysfluent phase, manage parental anxiety and provide the best opportunity for developing natural fluency (Millard et al, 2008)

Therapy will involve direct work with the child and indirect work with those in their communicative environment,eg parents and care/nursery staff'. This usually involves training to aid understanding of the child's language and communicative needs (Kelman et al 2008). One approach is the 'Demands and Capabilities' model in which significant communicative demands on the child are identified and reduced at the same time as promoting and maintaining the child's positive capabilities or fluency strategies (Starkweather 1990, Adams 1990).

If the stammer proves to be persistent then children can be helped to develop appropriate management and controlling strategies and maintain a positive approach to their communication. One direct intervention approach, which has gained popularity related to the evidence of its success, is the Lidcombe Programme. This Australian behavioural programme aims for stammer free speech through selective reinforcement of the child's fluent speech (Onslow et al 1995, Jones et al 2005). The SLT trains the parents to provide systematic reinforcement of fluent speech to increase fluency and encourage the child to find ways of adapting their speech in order to deal with their speech disruption (Jones et al 2005).

In all management programmes, SLTs work closely with education staff to develop the right approaches to support the child in the school environment (Rustin et al 2001, 1998) and in supporting them in their social life (Stewart & Turnbull, 2008).

Therapy for adolescents and adults usually involve a mixed approach of promoting positive psychological change and teaching behavioural management of speech (Crichton-Smith, 2002).

Considerable time is spent on self identification and evaluation and the facilitation of monitoring skills in the client. This may be followed by therapy directed on "open stammering" including desensitisation, avoidance reduction, and self advertising including the use of voluntary or pseudo- stammering. Having achieved a positive approach to open or overt stammering the individual is then invited to find suitable

fluency controlling strategies through experimentation with a range of options (e.g. rate control, diaphragmatic breathing, easy vocal onset, block modification). The focus in therapy is client led experimentation with strategies in real situations outside the clinic, evaluating their effectiveness with a view to drawing together a comprehensive set of tools to manage communication in the long term.

Table 4: International Classification of Functioning: aims/objectives by dimension

Impairment	❑ Develop speech and language skills for sounds, grammar, vocabulary and appropriate use of language
	❑ Develop easy speech approach to production – e.g. light contacts, Lidcombe development of fluent speech
	❑ Develop strategies to produce speech that overcomes blocking, perseveration, repetition
	❑ Develop fluent production through strategies for controlling breathing & phonation
	❑ Target cognitions
Activity	❑ Develop ability to communicate confidently
	❑ Develop ability to understand use of language appropriate to the communicative situation
	❑ Develop strategies for speaking in stressful situations
	❑ Develop strategies for fluent speech in problem environments
	❑ Develop effective communicative interactions with others
	❑ Targeting avoidance and acceptance
Participation	❑ Develop ability to integrate socially with others
	❑ Develop positive approach to interacting in difficult communicative settings
	❑ Develop ability to cope in difficult social settings
	❑ Develop self-esteem as a communicator
	❑ Develop autonomy in different life skills
Well-being	❑ Reduce anxiety of adult or child and parents
	❑ Target emotions related to specific situations and events
	❑ Reduce negative attitudes to difficult environments
	❑ Develop positive feelings around concept of self, build confidence

6.   *What is the management for individuals with stammering?*

In practice, therapy models of care usually involve a mixed approach reflecting the wide range of influencing factors (physiology, linguistics. environment, learned behaviour and emotion) (Yaruss & Quesal, 2006). Considerable time is taken in identification and evaluation. Approaches involve work with the individual on specific features of the stammering behaviour, followed by teaching the child and/or parent how to handle and control the stammer. This may target impairment and activity work to reduce or eliminate stammering behaviours relating to speech production (blocking, repetition, prolongation, body movement) and communicating in different settings and with different communicative partners (familiar and unfamiliar). Participation and well-being work may focus on situation fears and environmental barriers, improving self-image by participating in many social speaking situations (e.g. talking on the telephone, to groups and classes, to counter staff, to strangers and in feared/avoided communicative situations).

Some approaches are more appropriate to specific age groups. For example, direct work on speech behaviours in children using 'Syllable Timed Speech' (STS) has resulted in fluent speech in children but this improved fluency was not sustained when STS was used in adults (Trajkovski et al, 2009). It has been postulated that this is related to the plasticity of neural pathways in children versus established pathways in adults. Other programmes, such as the Lidcombe programme, is designed for intervention in children with the SLT training parents to provide systematic reinforcement of fluent speech to increase fluency and encourage the child to find ways of adapting their speech to deal with their speech disruption (Jones et al 2005). Indirect approaches identify and alleviate stressors in the environment that may impact on stammering and utilize different strategies including cognitive, behavioural or reality testing e.g. Parent–Child Interaction Therapy (Millard, Nicholas, & Cook, 2008).

In both direct and indirect approaches, the SLTs will work closely with other relevant professionals. Most frequently this is with education staff to develop the right approaches to support the child in the school environment (Ruskin et al 2001, 1998) and in further and higher education. Work will also aim to support participation and well-being in their social life.

Therapy for adolescents and adults usually involve a mixed approach of promoting positive psychological change and teaching behavioural management of speech.

Considerable time is spent on self identification and evaluation and the facilitation of monitoring skills in the client. This may be followed by therapy directed on "open stammering" including desensitisation, avoidance reduction, and self advertising including the use of voluntary or pseudo- stammering. Having achieved a positive approach to open or overt stammering the individual is then invited to find suitable fluency controlling strategies through experimentation with a range of options (e.g. rate control, diaphragmatic breathing, easy vocal onset, block modification). The focus in therapy is client-led experimentation with strategies in real situations outside clinic, evaluating their effectiveness with a view to drawing together a comprehensive set of tools to manage communication in the long term.

Speech and language therapists work closely with the families and carers of children to meet the needs of the child in developing fluent speech, to control dysfluent speech and sustain a positive approach to communicating.

Augmentative and Alternative Communication

Altered auditory feedback (AAF) devices help speech fluency by either delaying the speech signal or altering the frequency of the signal or both. For some people, these devices may be very effective; for others it has a beneficial affect in reducing tension and associated headaches and fatigue from speaking. However, there are issues around habituation for some clients.

Cultural and language factors

Cultural and language factors will impact on the management of all disorders of communication. Individuals who do not speak English and have fluency difficulties may need help to access services and interpreters will be required to ascertain a full speech and language profile. Understanding the family perceptions of stammering fully will be essential to develop intervention which has the best chance of success.   The time and cost implications when working with interpreters/co-workers, for example, in taking a case history, completing a full assessment in all languages spoken by the child and

family need to be considered. Timings of services need to be culturally sensitive, for example, not offering appointment times which coincide with religious observations (Communicating Quality 3, 2006).

7.   *What is the evidence for SLT interventions for stammering?*

Studies

All studies were published in English, with the earliest being published in 1981. Ten studies were conducted in Australia, two in the UK, two in the USA, one in Canada, one in Norway, one in New Zealand, and one in the Netherlands. Two studies synthesised results from studies worldwide. The number of individuals who took part in the studies ranged from nine to 250. The studies investigated the effects of the Lidcombe Programme (efficacy and predictors of treatment success), time-out treatment, altered auditory feedback devices, pharmacological interventions and a range of other stuttering treatments in terms of efficacy, predictors and relapse.

Study Quality

The six randomised controlled trials (RCTs) were of adequate quality and this study design is the preferred method of determining an effect of treatment. Mostly the method of randomisation was described and validated measures were used. The RCTs all had small numbers of participants. The two systematic reviews were undertaken well with searching, critical appraisal and study selection methods well described. Eight studies were interventional studies, in which a group of individuals receive some form of intervention, of which the treatment effect is gauged by recording appropriate pre- and post-intervention measurements. The problem with this study design is that it is difficult to attribute effects to the treatment since they could be due to other variable factors. By including a comparison group with similar characteristics that does not receive the intervention being tested, evidence of treatment effects can be determined.
Some of the studies used small numbers of participants making generalising results to the wider population difficult. Where measures were used to record effects of a treatment programme, they were well tested and used by more than one assessor in order to calculate inter-rater reliability. A number of studies were published in the late 1990s or earlier and this limits the currency of information.

The LIDCOMBE Programme of Early Stuttering Intervention

Six studies undertook research on the Lidcombe Programme which is an early stuttering intervention. The Lidcombe Programme is a behavioural intervention for pre-school age children (under six years old) who stutter. It is conducted in two stages and the child's parents take the lead in delivering treatment. During Stage One, parent and child attend weekly sessions with the speech and language therapist. During these sessions, the parents are taught how to deliver 'verbal contingencies' to their child during stuttering and stutter-free speech. This includes acknowledging and praising stutter-free speech (e.g. 'that was smooth', 'great talking'), requesting the child self-evaluate speech (e.g. 'was that smooth?'), requests for the child's to self-correct ('can you say that without bumps?'). Between visits, the parent administers the verbal contingencies for set periods each day and measures the child's stuttering on a ten-point scale, with 1= no stuttering, 2 = extremely mild stuttering and 10 = extremely severe stuttering. During the weekly visits, the therapist measures the child's stuttering. Stage One ends when the speech and language therapist measures the child's stuttering as less than 1% syllables stuttered and the majority of the parent's ratings are 1 - no stuttering. During Stage Two, the parent withdraws treatment

and the clinic visits are reduced. The following studies investigate the efficacy of the Lidcombe Programme and predictors for treatment success.

Efficacy

Jones (2005) evaluated the efficacy of the Lidcombe Programme in a group of three 6 year olds. Twenty-nine children received the Lidcombe Programme and 25 acted as a no-treatment comparison group; assignment to groups was random. Parents were asked to provide three samples of their child's conversational speech outside the clinic before, three, six and nine months after being randomised to the two groups. At nine months after randomisation, the mean syllables stuttered was 1.5% in the treatment children stuttered compared with 3.9% in the no treatment comparison children, making the Lidcombe Programme very efficacious in reducing stuttering.

Harris (2002) compared the effects on stuttering of the Lidcombe Programme to no treatment. Twenty-three children (aged two-five years old, mean age four years and 11 months) were randomly allocated to receive 12 weeks of the Lidcombe Programme or no treatment. Whilst both groups improved over time, as demonstrated by a reduction in the mean percentage of syllables stuttered, the stuttering in the treatment group reduced twice as much as in the no treatment group.

Franken (2005) compared the effects of the Lidcombe Programme with another treatment for pre-school stutterers called the Demands and Capacities treatment model treatment (DCM). Thirty parent-child pairs were randomised to receive one of the two treatment programmes. The mean age of the children was just over four years old. The DCM focuses on decreasing the demands asked of the child and increasing the capacity in motoric, emotional, linguistic or cognitive domains of development. This was done in three ways: 1) Parents ensured their child had 15 minutes of their undivided attention each day to increase the child's self-confidence through talking, quiet games or reading; 2) Slowing down the parent's speech rate; and 3) Parents modelled speech rather than demand speech performance of the child, for example, by speaking in short simple sentences and asking questions that don't require long complex answers. Both programmes involved weekly sessions with the therapist. The DCM sessions began with a play period, after which the parent and therapist evaluated the child's speech. The mean number of sessions for DCM was 11.0 and for the Lidcombe Programme 11.5. Both the stuttering frequency and severity decreased significantly for both groups post-treatment, with no differences between the groups in terms of improvement. Parents in both treatment groups were highly satisfied with the programmes and co-operative in administering treatment.

Lewis (2008) evaluated the efficacy of telehealth delivery of the Lidcombe Programme to a group of nine preschoolers (aged three-four years) living within remote locations of Australia and unable to attend regular clinic visits. Thirteen children acted as a no-treatment comparison group. The parents and children were never seen face-to-face, with the entire programme being delivered via telephone conversations and video demonstrations. Additional support was available as requested via a toll-free phone number and/or email. Nine months after the programme began there was a 74% decrease in the frequency of stuttering in the treatment group compared with the no treatment group. Using the criterion that a treatment responder was to have, showed an 80% decrease in their percentage syllables stuttered score; six of eight treatment children were responders as compared with two of ten no-treatment children. Parents were highly satisfied with the treatment. It is important to note that telehealth delivery of the Lidcombe Programme cost around three times as much as the standard version of delivery.

Predictors of treatment outcome

Two studies investigated the potential for variables to affect the treatment outcomes of the Lidcombe Programme.

Jones (2000) investigated whether time between onset of stuttering and treatment, age, gender, and stuttering severity are related to the time required for treatment with the Lidcombe Programme. Two hundred and fifty Australian children (mean age 46 months completed the first stage of the Lidcombe Programme. Each parent-child pair attended the clinic for 45-60 minutes once per week and the study ended once the child had entered the second/maintenance stage of the programme. A median of 11 clinic visits were required to complete the first stage of the Lidcombe Programme. Children with more severe stuttering pre-treatment required more clinic visits than children with less severe stuttering. Age and gender did not affect the treatment length. When analysing the effect of time between onset of stuttering and commencement of treatment, children who had a longer onset-treatment time required fewer clinic visits (this effect was approaching statistical significance).

Kingston (2003) replicated Jones (2000) study in a group of 66 UK children (mean age 52 months). The findings confirmed those found in the Jones, M (2000) study: 11(median) visits were required for Stage One completion. Increasing severity of pre-treatment stuttering lengthened treatment time, and onset-to-treatment time decreased the number of clinic visits required. When data from the two studies was combined children with longer onset-to-treatment times were half as likely to require more than ten clinic visits in Stage One of the Lidcombe Programme. This provides strong evidence that delaying treatment for a short period in pre-school stutterers does not affect their chance of recovery. It is important to note the findings for the Jones (2000) and Kingston (2003) study are generalisable to this age group, the Lidcombe Programme (specifically the first stage short-term effects) only.

Altered Auditory Feedback Devices

Two studies examined the effects of devices that are fitted within or external to the patient's ear to provide altered auditory feedback.

Armston (2005) evaluated the use of the SpeechEasy device which uses digital technology to deliver delayed auditory feedback, frequency altered feedback and masking noise. Thirteen persons who stutter (mean age=35.3 years) were each fitted with the SpeechEasy device according to the manufacturer's instructions. For each individual, the optimal delayed auditory feedback and frequency auditory feedback settings were programmed. The participants were asked to complete a series of oral reading, monologue and conversational tasks four times; pre- and post-device fitting. Participants were subsequently given a brief training session in how to prolong vowels at the beginning of each new breath and allowed to practice the technique for five to ten minutes. A further set of pre-and post-device settings were taken. The entire session took two to three and a half hours to complete. Two graduate speech language pathologists counted the number of stuttering episodes for each recording. Stuttering was reduced significantly in all tasks post-device fitting. This effect was much more pronounced following prolonged vowel elongation instructions.

Stuart (2006) undertook three experiments to establish the effects of a self-contained ear-level device delivering altered auditory feedback. Twelve months after initial fitting of the device, nine participants (mean age of five adults 41.4 years, mean age of four adolescents 13.5 years) completed reading and conversational tasks whilst wearing and not wearing the device. Stuttering percentage and speech naturalness was measured. Participants were asked to answer questions relating to avoidance, struggle and expectancy in order to understand behaviours and/or compensatory mechanisms used when speaking or thinking about speaking. The proportion of stuttering decreased significantly when wearing

the device as compared to when not wearing the device. 'Naive' listeners rated speech as more natural when patients were wearing the device as compared with not wearing the device. Self-reported struggle, avoidance and expectancy significantly decreased when comparing the ratings from before the device was fitted and after 12 months of wearing the device. However, caution must be applied with this measure as participants were asked to recall how they felt for the pre-device fitting scores.

Time-out Treatment

Two studies investigated the effect of time-out treatment whereby individuals complete a time-out period following a stuttering episode.

Hewat (2006) assessed the effect of a self-imposed time-out period for adults and adolescents with persistent developmental stuttering. Thirty participants aged 14 to 52 years (mean age 29.7) took part. Two versions of the course were run; the first taking the form of individual sessions and the second being an intensive eight-hour group session. Similar findings were found for both versions and so results were collated. Twenty-two participants completed Stage One of the programme which was 'instatement and generalisation'. Participants learnt how to use self imposed time-out in everyday speech; firstly inside the clinic and then outside in shops, cafes etc. Self-evaluation was also taught. Once a low level of stuttering had been maintained in Stage One, 18 participants completed Stage Two; the maintenance part of the programme. Participants visited the clinic every six months bringing three ten-minute audio recordings and their self-evaluative stuttering severity ratings. The clinician worked with each participant to improve their use of self imposed time-out in everyday situations. Following treatment, stuttering frequency was reduced by more than 50% in more than half of the participants, with participants with more severe types of stuttering responding better. Speech naturalness was rated as OK and participants were very positive about the treatment, finding it easy to use and effective.

Franklin (2008) investigated the effect of response-contingent time-out to reduce stuttering frequency in adults who stutter. Sixty adults took part with a mean age of 32 to 33 years. Thirty received the time-out intervention and 30 received no treatment. Each participant took part in a two-hour session with an investigator. Prior to treatment, a series of speech samples were taken until three consecutive samples were recorded, demonstrating percentage of syllables stuttered as within 2% of each other. Two twenty-minute talking periods were completed on the participant's choice of topics or as suggested by the investigator. During these two talking periods, time-out participants were instructed to stop talking when a red light was lit. The red light was lit following each stuttering episode. After the 40-minute talking period, three further speech samples were taken from each participant. From the initial recordings to during treatment, stuttering decreased significantly for time-out participants. The mean reduction in stuttering frequency for time-out participants was 75.6%. The no-treatment group increased their percentage syllables stuttered significantly. Post-treatment, when the time-out intervention was withdrawn, the mean percentage syllables stuttered increased for time-out participants but remained significantly lower than the rating at the beginning of the study. In addition, time-out participants were seen to increase their speech rate whilst the comparison group did not. Participants who had a more severe stutter and those who had received previous treatment responded better to the time-out intervention. It is important to note that these findings are restricted to short term outcomes only. There is no evidence to demonstrate how this intervention may affect long-term stuttering outcomes.

Pharmacological Interventions

Two studies investigated the efficacy of using pharmacological agents in the treatment of stuttering.
Rustin (1981) assessed the efficacy of oxoprenolol versus placebo to treat stammering. Thirty-one stammerers aged 18-55 years (mean age 29) were split into two groups. Group A received a six-week

intensive speech and language therapy intervention which taught progressive relaxation and slowed speech training. Group B received no treatment. After the six-week treatment period, each participant undertook two identical tests on consecutive days to assess stammering. For one of these tests, they received oxoprenolol and on the other test a placebo. Group B then received the intensive speech and language therapy intervention whilst Group A received a one-week maintenance session. The two consecutive test process was repeated. Oxoprenolol reduced pulse rate and systolic blood pressure but did not alter speech performance before or after speech therapy. Contrastingly, speech and language therapy-trained individuals (Group A) scored better than untrained participants (Group B) at the first assessment. Group B showed a highly significant improvement at the second assessment after the intensive speech and language therapy and Group A continued to improve following the maintenance therapy.

Bothe (2006) undertook a systematic review on the pharmacological treatments for stuttering. Thirty-one studies were identified; 11 of which were deemed to be of sufficient methodological rigour to be included in the review. One study provided data to show stuttering frequency was reduced to less than 5% in individuals treated with risperidone. However, within this study, the placebo group almost performed as well, achieving a post-treatment stuttering rate of 5.1%. One study reduced stuttering to half the pre-treatment level (although not less than 5%) when individuals were treated with haloperidol. However, the remaining haloperidol studies did not show such positive effects. Three of the five haloperidol studies showed data that demonstrated at least one social, emotional or cognitive variable had improved. The results of this systematic review seem to show overwhelmingly that pharmacological treatment for stuttering is not efficacious.

Other stuttering treatments: efficacy, predictors and relapse

Smooth speech and electromyography feedback

Craig (1996) compared three treatments to treat childhood stuttering amongst 97 participants, aged 9 to 14 years. The participants were split into four groups: intensive smooth speech (INTSS), intensive electromyography feedback (EMG) home-based smooth speech (HOMESS) and a no treatment comparison group. Smooth speech trains participants to enhance airflow when speaking. INTSS involves a one-week intensive course in which children are taught in groups of three to five by two clinicians each day. Practice sessions and self-assessment form the core treatment. HOMESS teaches the same techniques with the emphasis being on the parent-child relationship. Parents and children visit the clinic one day a week over a four week period for a group session. Techniques are taught in fun activities. Parents are encouraged to act as clinicians and the majority of the treatment is delivered at home. EMG is delivered as an intense one-week period in which children are taught in groups of up to five by two clinicians. Children are taught to be aware of and self-regulate the EMG activity of the speech muscles, specifically to lower the tension in the muscles whilst speaking. An EMG monitoring system is used which is attached to a computer. By the third day, the child is weaned off the computer and takes in activities such as playing board games and telephone calls, without EMG feedback. All three treatment groups received maintenance sessions monthly for three months and every three months for the rest of the year. Results showed a significant difference between the levels of stuttering in the three treatment groups when compared with the no treatment group immediately, three and 12 months post-treatment. There were no differences between the three treatment groups; each were comparatively as effective. Over the three and 12 month post-treatment period, frequency of stuttering did not significantly increase within the treatment groups. The EMG and HOMESS groups showed a lower increase in stuttering frequency over time than the INTSS group. Speech rate increased for all

three treatment groups and was maintained over time, the no treatment group showing no such improvement. Speech naturalness improved for the treatment groups only, this effect being more pronounced in the EMG and HOMESS groups. Anxiety levels decreased within the treatment groups and this was maintained 12 months post-treatment. The authors make the important point that these treatments are intensive on both the patient's and clinician's time and resources.

Hancock (1998) undertook a five-year follow-up of the Craig, A (1996) study to determine the long-term effects of the three treatments. Sixty-two of the 77 children assessed at the one year follow-up were followed up for two to six years post treatment. The mean age of the children was 14.8 years and the mean time since the last assessment was 4.2 years. The rates of stuttering, level of anxiety and the rating of speech naturalness were very similar to those at the one year follow-up, demonstrating treatment gains were maintained. There were no differences between the three treatment groups. The speech rate for all the treatment groups was higher than that recorded at the one-year post-treatment assessment. Parents were asked to indicate whether they thought their child had experienced relapse following treatment. 13% believed they had, 53% thought their child's speech had deteriorated but not to pre-treatment levels, 29% believed their child had not relapsed. Interestingly, 71% believed their child's speech was cyclical and that whilst there may be episodes of dysfluency, fluency could be regained.

Hancock (2002) investigated re-treating 12 of the adolescents from the original Craig, A (1996) study who were experiencing difficulty in maintaining treatment gains. The 12 participants, age 11-17 years (mean age 14), had previously received one of the three previous therapies (INTSS, EMG or HOMESS) two-six years ago. Each had a level of stuttering that was considered to cause conversation difficulties. The re-treatment programme was delivered to groups of four parents and four children and involved twice weekly sessions over two weeks, with an optional fifth day if required. The programme incorporated smooth speech, electromyography feedback techniques and an additional cognitive behaviour therapy (CBT) component. The CBT component included self-management skills (e.g. self-monitoring, self-evaluation), cognitive techniques (e.g. self-instruction techniques) and physical relaxation. Percentage of syllables stuttered decreased and number of syllables spoken per minute increased immediately, three months and two years post re-treatment. The average improvement was 70% immediately post-treatment, had decreased to 50-60% at the three month follow-up but increased to 75% at the two-year follow-up. Participants were rated as more natural-sounding by parents and clinicians post-treatment. Interestingly, there were no reductions in anxiety and communication fears post-treatment. However, most participants had 'normal' levels of anxiety prior to treatment. Additionally, just under half of participants were rated as having negative attitudes to communication post-treatment, despite significant improvements in speech.

Block (2006) undertook a study to determine the predictors for success of a prolonged speech intervention (a variant of smooth speech). Eighty adults, aged 16-70 (mean age 28.2 years) received nine hours of the intervention for five days. This was followed by weekly group follow-up sessions for two hours per week for seven weeks. Additionally, there was unlimited access to voluntary seven hour 'booster' days which were offered every six months. Attitude to communication and locus of control were measured by self-assessment questionnaires to determine if they predicted success to treatment. For example, attitude to communication was measured by responses to statements like; 'I often feel nervous when talking'; 'I often ask questions at group discussions'. Locus of control referred to the extent to which people consider they can control their behaviour; for example, an external locus of control describes when a person believes they have little control over their behaviour. Percentage syllables stuttered had reduced to less than 1.0% immediately post-treatment. This was maintained at long term follow-up, being measured as 2.6% at 12 months post-treatment and 1.6% at 3.5-5 year post treatment.

Attitude to communication and locus of control did not predict treatment outcomes. Severity of stuttering prior to treatment did predict the treatment outcome; the more severe the stutter, the less effective the treatment.

Regulated Breathing Method of Treatment

Waterloo (1988) evaluated the regulated-breathing method of treatment in 32 adult stutterers, aged 17-58 (mean age 32.5 years). Participants were split evenly between a treatment and a no treatment group. Each participant in the treatment group received one single session of two to three hours of regulated-breathing treatment. This included examining the inconveniences of stuttering, awareness and anticipation of stuttering episodes, relaxation training, using the concept of incompatible activities, using deep breaths and formulation of words mentally after each stuttering episode, imagining themselves in stuttering situations and how they'd react, positive activities, social support, confronting situations/people/words avoided because of stuttering. Participants were assessed at two, three and eight months post treatment. At eight months follow-up, the number of words stuttered in spontaneous conversation, a reading task and a phone conversation had been reduced for the treatment group. The rate of speech also increased for the treatment group. No such changes were seen in the no treatment comparison group. It is important to note that not all participants improved; four of the 16 participants did not improve at all.

Successful Stuttering Management Programme

Blomgren (2005) evaluated the effects of an intervention called the Successful Stuttering Management Programme (SSMP). The three and a half week programme comprised of afternoon sessions, each lasting three and a half hours. Three stages were delivered by group and individual sessions. Firstly, participants confronted their stuttering by modifying their attitudes and perceptions to stuttering and eliminating avoidance strategies. This first stage lasted two weeks and was followed by one week instruction in how to reduce the severity of stuttering when it does occur. The final two days worked on a maintenance programme. A two day refresher course was offered six months later. Nineteen adults, aged 16-52 (mean age 26.3 years) completed the programme. Immediately following treatment, improvements were seen on four measures: stuttering severity, struggle, avoidance, and expectancy subscales of the Perception of Stuttering Index (PSI). Struggle denotes the presence of unnecessary physical tension or effort whilst speaking. Avoidance measures the tendency to avoid certain words or situations when the person anticipates stuttering. Expectancy is the assumptions and beliefs of individuals in relation to their ability to speak successfully and how their speech might interfere with their speaking. The improvements on the avoidance and expectancy PSI subscales were maintained at six month follow-up. Also improved at six months post-treatment were two affective functioning measures, psychic anxiety and somatic anxiety. Psychic anxiety measures worry, anticipation, sensitivity and social anxiety, amongst other things. Somatic anxiety measures autonomic disturbances, panic attacks, vague distress and distractibility.

Predictors of relapse

Craig (1998) undertook a literature review and examined a group of four adults who had been treated for stuttering to determine what variables may predict relapse. The majority of literature reflected the relapse studies were undertaken in adult populations. A range of factors were discussed that may predict relapse; this included severity of pre-treatment stuttering, speech attitudes, locus of control, speech mastery, emotions, stress, anxiety, speech naturalness, self-evaluation and control strategies.

Craig (1998) examined the 12-18 month follow-ups in four groups of adults who stutter who had been treated with an intensive smooth speech intervention. Treatment was successful for the majority of patients in the four groups. The percentage of syllables stuttered decreased from a mean of 12.7% pre-treatment to 0.3% immediately post-treatment. At follow-up the mean syllables stuttered was 2.6%. The only variable shown to predict relapse was severity of stuttering; the more severe the stuttering, the greater the chance of relapse. Age, sex, social status, locus of control and speech attitudes did not predict relapse.

Overview of Treatments

Bothe (2006) undertook a systematic review to determine the efficacy of behavioural, cognitive and related approaches for pre-schoolers, school-age children, adolescents and adults. Strict criteria were applied so that studies of high methodological quality were selected for the review. Studies were selected that included one or more of the following treatment outcomes: less than five percent of syllables stuttered, an improvement in social, emotional or cognitive variables and a follow-up of at least six months. Thirty-nine studies met the methodological quality criteria and identified a range of methods to treat stuttering: acupuncture, electromyographic feedback (EMG), gradual increase in length and complexity of utterance (GILCU), indirect treatments, language training, metronome-conditional speech re-training, prolonged speech, regulated breathing and airflow, response contingencies, self-modelling, shadowing, stuttering modification and token economy. For preschoolers (less than five to six years), the only studies that met the selection criteria were those looking at response-contingent treatment. Overall, preschool children receiving response-contingent treatments tended to show changes in the trend and level of their stuttering. When children who received treatment were compared with a no treatment group, children receiving the intervention progressed better. Several treatment types were included in studies with older children: EMG, GILC, prolonged or smooth speech, regulated breathing, response contingencies and a unique stuttering modification package. Each of the treatments was shown to have achieved improvement in at least one of the outcome criteria. For adolescents and young adults, regulated breathing or prolonged speech intervention studies demonstrated improvements in at least one of the outcomes criteria. In adults, the most effective treatments for both speech outcomes and social, emotional and cognitive outcomes seemed to include elements of prolonged speech, self-management and response contingencies. These interventions included intensive work, practice in front of groups, specific transfer tasks, self-evaluation of speech, focus on speech naturalness and an active maintenance programme.

Summary

The Lidcombe programme is effective for treatment of stuttering in preschoolers, and importantly is more effective when compared with no treatment. Despite this, it does not appear to be detrimental to a child's capacity to become stutter-free by waiting (one year post stuttering onset) to assess if the stutter will resolve itself. Severity of stuttering appears to lengthen the time needed within Stage One of the Lidcombe Programme. Altered auditory feedback devices are useful in the treatment of stuttering. Timeout treatment appears to be effective in the short-term. Individuals with severe stuttering appear to benefit most from time-out treatment. Other treatments such as smooth speech, electromyography feedback, regulated breathing and a programme called the 'Successful Stuttering Management Programme' appear to be effective in treatment of stuttering. There appears to be little evidence to support the use of pharmacological agents to treat stuttering.

Table 6: Studies reviewed

Study	Country	Study design	Subjects	Intervention
Armson, J (2006)	Canada	Interventional study	13 people who stutter Aged 21-54 years, mean age 35.3 years	SpeechEasy device
Block, S (2006)	Australia	Interventional study	80 adults who stutter, aged 16-70, mean 28.2 years	Prolonged speech intervention-assessment of factors that may predict outcome of treatment
Blomgren, M (2005)	USA	Interventional study	19 adult who stutter Mean age 26.3 years (age range 16-52)	Successful Stuttering Management Programme
Bothe, A (2006)	Worldwide	Systematic review	39 studies	Behavioural and cognitive interventions for treatment of stuttering in pre-schoolers, school-age children, adolescents and adults
Bothe, A (2006)	Worldwide	Systematic review	11 studies	Pharmacological treatments for stuttering
Craig, A (1996)	Australia	Clinical trial	97 children who stutter, aged 9-14 years	Intensive smooth speech vs. intensive electromyography vs. home-based smooth speech vs. no treatment
Craig, A (1998)	Australia	Interventional/ Observational study	160 adults who had previously received speech language therapy (intensive smooth speech) for stuttering	Predictors of relapse
Franken, MJ (2005)	Netherlands	Randomised controlled trial	30 parent/child pairs. Mean age of children 4.2-4.3 years old	Lidcombe programme vs. Demands and Capacities Treatment Model
Franklin, D (2008)	Australia	Clinical trial	60 people who stutter, age range 16-71, mean treatment group age 32 years, mean	Response-contingent time-out (following each stuttering episode)

Study	Country	Study design	Subjects	Intervention
			control group age 33 years	
Hancock, K (1998)	Australia	Clinical trial-long-term follow-up (2-6 years)	77 children who stutter, aged 11-18 years, mean age 14.8 years	Intensive smooth speech vs. intensive electromyography vs. home-based smooth speech vs. no treatment
Hancock, K (2002)	Australia	Interventional study	12 children, aged 11-17 years, mean 14 years who had previously been treated for stuttering by one of three speech language therapy treatments	Re-treatment programme
Harris, V (2002)	Australia	Randomised controlled trial	23 child/parent pairs. Children aged 2-5 years	Lidcombe programme vs. No treatment
Hewat, S (2006)	Australia	Interventional study	30 adults/adolescents, aged 14-52, mean age 29.7 years	Self-imposed time out treatment
Jones, M (2005)	New Zealand	Randomised controlled trial	54 children who had presented at speech clinics with stuttering Aged 3-6 years	Lidcombe programme vs. no treatment
Jones, M (2000)	Australia	Interventional/Observational study	250 children, mean age 48 months	Lidcombe programme- predictors of outcomes: Age, gender, stuttering severity and onset of stuttering to treatment time.
Kingston, M (2003)	UK	Interventional/ Observational study	66 children, mean age 52 months	Lidcombe programme- predictors of outcomes: Age, gender, stuttering severity and onset of stuttering to treatment time
Lewis, C (2008)	Australia	Randomised controlled trial	22 preschoolers, aged 3-4 years old	Delivery of the Lidcombe project via telehealth

Study	Country	Study design	Subjects	Intervention
Rustin, L (1981)	UK	Randomised controlled trial	31 stammerers aged 18-55, mean age 29 years	Oxprenolol and/or intensive speech language therapy
Stuart, A (2006)	USA	Clinical trial	Nine people who stutter. Five adults (mean age 41.4 years) and four adolescents (mean age 13.5 years)	Altered Auditory feedback device
Waterloo, K (1998)	Norway	Randomised controlled trial	32 adult stutterers. Age range 17-58, mean age 32.5 years	Regulated breathing method of treatment

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