ABSTRACTS
Presentations at the BACDA Study Day

Language Acquisition in Deaf Children
Professor Bencie Woll
Department of Clinical Communication Studies
City University

Professor Bencie Woll holds the only Chair in Sign Language and Deaf Studies in the UK, established in 1995. Her research covers a wide range of topics in the field, including linguistics, neurolinguistics, psycholinguistics and sociolinguistics relating to sign languages and deaf communities, as well as language acquisition, and she also has pioneered a part-time MSc in Human Communication. *The linguistics of BSL: an introduction* and *Assessing British Sign Language Development: Receptive Skills Test* have recently been published. She currently holds research grants from the Wellcome Trust, Medical Research Council and Leverhulme Trust. Involvement in external activities included consultancies with the British Deaf Association, SENSE and CACDP; and collaboration with the Science Museum on the creation of a new exhibit on the human brain and language.

Abstract

The development of language is a crucial factor in a deaf child's cognitive and social development. An understanding of this and of issues relating to the assessment of developing language are of importance to all professionals concerned with deaf children. Language development has been the focus of concern since the first deaf schools were established in the 18th century. The promotion of full and normal development of language is shared by all, but how this is to be achieved, and which language or languages are learned, is a continuing source of controversy.

Those most concerned with spoken language development have focused on the factors which may promote or hinder acquisition and on the extent to which language delay results in language deviance and difficulties. Interest in sign language acquisition is more recent. Following the recognition in the 1970's that sign languages were complete human languages, with their own grammars and lexicons, and were neither primitive gestural systems nor derived from spoken languages, sign languages have been seen as worthy of study not only in their own right, but as a means to develop understanding of human language generally, both spoken and signed. Thus much research on sign language and its acquisition has been designed to address such topics as whether sign language and spoken language are localised to the same brain areas, theories about neural plasticity and critical periods for language development; and the long term outcomes of late first language acquisition.

In this paper, consideration will be given to issues relating to the assessment of language. While there is an enormous body of assessment material for English, the administration of English measures to deaf children is itself problematic, raising questions of age norms, language of testing, etc. In contrast to the large number of English assessments, there are limited tools available for assessing sign language. Underlying principles of assessing sign will be outlined and assessment tools recently developed for BSL will be discussed.

Turn to page 13 for the presentation in full.

A Study of Prelingually Deafened Children Showing Stages of Language Development & Follow up at 17 years
Dr Susan Gregory
School of Education, University of Birmingham

Susan Gregory is Reader in Deaf Education at the University of Birmingham where she has responsibility for training teachers of the deaf as well as being involved in a number of research projects. Her research interests include families with deaf children, transition into school for deaf pupils, good practice in deaf education and the use of sign language at home and at school.

Abstract

This paper will consider families with a deaf child or young adult. It is based on a study of 82 families where parents were interviewed when their child was under five years old and again when their son or daughter was 18-22 years old. At this time the young people were also interviewed.

The main issue for these families was language and communication and the paper will look at aspects of these areas for young deaf children and young adults. It will also consider factors in early life that affect later language development.

Personal & Social Development of Deaf Children: Paths Curriculum
Helen Reed, NDCS

The National Deaf Children's Society recognises the fact that deaf children experience higher rates of mental health needs than their hearing peers, but this is not due to the actual deafness, but rather as a consequence of being deaf in a hearing-oriented society where the ability to hear is considered a necessity. Due to communication differences,

it is vital for deaf children to be equipped with a range of personal skills to deal with everyday life.

With funding from the Department of Health, a project was established at the National Deaf Children's Society in August 1994 to encourage deaf children to develop their personal and social skills. As a foundation, we used the PATHS - Promoting Alternative Thinking Strategies — curriculum that is designed to promote the development of self-control, emotional awareness and interpersonal problem-solving skills. This curriculum was developed specifically for deaf children in the USA by Greenberg and Kusche (1994).

As part of the PATHS work, we have adapted the PATHS curriculum for use with primary aged deaf children in a pilot project with both schools for deaf children and hearing-impaired units within mainstream schools, using a whole classroom approach. This was supplemented with PATHS Family weekends, where families were invited to discuss personal and social development issues related to the PATHS curriculum.

The PATHS curriculum is unique in offering a structured package to promote emotional wellbeing. It integrates five areas of personal and social skills needed to become well-adjusted and emotionally strong adults: self-esteem; behavioural self-control; emotional recognition; understanding of social relationships; and interpersonal problem-solving skills. PATHS aims to enhance emotional and social competence and as a result of this, children make better use of their academic skills. This is due to children being calmer and more aware of their feelings and how to deal with everyday situations. This curriculum is in great demand from teachers who recognise the need for personal development and emotional literacy for children to enable them to achieve academically. It is not just deaf children that need this kind of work, *all* children should be offered the opportunity to explore their personal and social needs, so that everyone is better equipped to deal with their everyday lives.

The NDCS is committed to see further development arising from this successful pilot project, as it has been shown that Personal and Social education play a vital part in children growing up. The PATHS activities are now a core element of the NDCS and we are exploring ways of expanding the work beyond the PATHS curriculum.

For more information on the PATHS curriculum or the personal and social needs of deaf children contact either:

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School Entry Screen: A Study of the School Entry Screen
BACDA Research Group

Despite the widespread implementation of School Hearing Screening programmes in the UK, there is little published information with regard to yield (in terms of types of hearing loss), present practice (as in what levels are tested when) and cost. Davis, Bamford et al. have summarised their findings from a questionnaire to co-ordinators of children's hearing services and found that:

- Only 7 of 108 districts did not have a School Entry Screen.
- Hearing is screened at a variety of levels.
- Screening is predominantly in schools.
- Costs are reported for a small number of districts.
- The yield for the school entry screen was higher than expected at close to four per 10,000 children (at≥ 50 dBHL) (it is not clear whether these were SNHL, conductive or mixed SNHLs, congenital, late onset or progressive). This information was based on 31 of 138 districts.

They speculated that the school entry screen uses screening levels that lead to a greater number of referrals than is efficient - this point needs further discussion later.

At present data from the various school screens is available to individual districts. It is proposed to look at practice, yield and costs nationwide. More valuable information can be gained by pooling numbers. However, since practice varies, it is important to establish:

- What practice is - i.e. local protocols
- What is the target population (e.g. special schools, independent schools?)
- Coverage
- One stage or two stage screen
- What is the yield for each local protocol
- Management of screen "failures"

It appears that the members of the British Association of Community Doctors in Audiology are ideally placed to co-ordinate this project, since the school Hearing Screening programmes are largely run by this group (Child Health in the Community).

It is likely that Universal Neonatal Hearing Screening will be introduced within the next five years. This will affect the incremental yield of the School Hearing Screen. However, there will still be a need to identify late onset losses, progressive losses, unilateral losses (since one ear "pass" is likely to be accepted in UNS) and perhaps conductive losses. Therefore it seems appropriate to evaluate School Hearing Screening now, and again perhaps in five years, when Universal Neonatal Screening will be in place and on an ongoing basis until it is clear whether or not it should continue on a long-term basis.

Dr Mary O'Sullivan
Consultant Community Pediatrician

Attention Deficit and Hyperactivity disorders in Children with Severe to Profound Hearing Loss

Dr Peter Hindley
Springfield University Hospital Tooting

Dr. Hindley writes:
"I am a consultant and senior lecturer in child and adolescent psychiatry at the Deaf Child and Family Service, South West London and St. George's Mental Health NHS Trust. As a Senior Registrar I trained with Professor Eric Taylor at the Institute of Psychiatry. I remain interested in Hyperkinetic Disorder but conscious of the complexity of working with deaf children in mental health settings and, I hope, cautious in my diagnostic practice."

Abstract

Disorders of hyperactivity (are common and can be disabling). Their aetiology is multi-factorial arising from an interaction of genetic, social and psychological factors. A plausible model suggests hypofunction in the frontostriatal area leading to impaired inhibition control. This acts as a predisposing factor with high levels of expressed emotion leading to hyperactivity and impulsivity and family communication style leading to inattention.

Two factors need to be born in mind when assessing hyperactivity disorders in deaf children. Firstly that the social and psychological consequences of being deaf in a hearing world can lead to delays in development that mimic impulsivity. Secondly that assessment of important differential diagnoses such as affective disorders are highly dependent on effective communication with the child.

Despite these caveats true hyperkinetic disorder in deaf children appears to have similar features to HKD seen in hearing children. A combination of medication, primarily methylphenidate, and psychosocial interventions is still the most appropriate approach for children with severe, pervasive and disabling HKD. Psychosocial approaches alone are more appropriate for less severe difficulties.

Two factors should be born in mind in managing HKD with deaf children. Firstly deaf children are said to be more sensitive to the side effects of stimulants, presumably reflecting some degree of generalised CNS disorder. Secondly that impairments of social understanding and awareness and delays in cognitive development, especially consequential thinking, are more common amongst deaf children.

An Introduction to Mental Health Problems in Childhood and Adolescence

Dr Margaret du Feu

Mental health problems in children and adolescents can be considered under three main headings: -

I. Organic Disorders.

2. Psychiatric illnesses.

3. Emotional and Behavioural Problems.

These are the same categories of disorder as in adult psychiatry but the overall pattern is different and in childhood and adolescence the development of the young person and family dynamics and environmental influences are particularly important. Emotional and behavioural problems are by far the most common mental health problems in children and adolescents but organic disorders and psychiatric illnesses must be considered in the assessment of any individual child. Many studies of the prevalence of mental health problems in childhood have shown that at any one time up to 25% of children have some symptoms of emotional or psychological distress which is evident to themselves and/or their carers. In child populations where there are additional risk factors the prevalence can rise to 40 or *50%*. This has been shown to be true in children with partial or profound deafness. Risk factors and protective factors have been identified.

RISK FACTORS FOR MENTAL HEALTH DISORDER

Factors in the Child

I. Genetic Factors - these may include genetic loading for specific disorders or for personality traits or levels of arousal.
2. General or specific learning problems especially problems in reading.
3. Specific developmental delay.
4. Communication difficulty - receptive/expressive or both.
5. Physical illness especially if chronic and/or neurological.
6. Low self-esteem.
7. Academic failure.

Family Risk Factors

1. Abuse including emotional abuse or neglect.
2. Parental conflict.
3. Unclear or inconsistent discipline.
4. Hostile or rejecting relationships.
5. Failure to adapt to the child's changing developmental needs.

Environmental Risk Factors

1. Discrimination.
2. Socioeconomic disadvantage.

Protective Factors for Mental Health in Childhood

1. Self esteem.
2. Sociability.
3. Autonomy.
4. Family warmth.
5. Social support encouraging personal coping skills.

As the child develops there are key learning areas, which need to be appropriate for his or her age. The child needs to develop psychologically, emotionally and intellectually. Appropriate relationships including in the family and with peer group need to be reciprocal and to develop with the child's age. The child needs to learn normal limits of behaviour both by direct instruction and peer group interaction. If these tasks are all achieved the child internalises a sense of right and wrong and is also enabled to learn from problems in order to facilitate further development.

Childhood mental health problems need intervention when there is a persistent or severe change in the child's mental state or behaviour which cause problems for the child or the carers. Assessment and intervention must take account of the child's overall situation and stage of development.

ORGANIC DISORDERS

1. Developmental Disorders

The milestones of normal physical and emotional development may be delayed either overall or in specific ways. There is often a clear history of problems before, at or after birth of physical illnesses or genetic disorders. However, in many cases either pervasive or specific types of developmental disorders may have no obvious cause. The most important pervasive developmental disorder is autism. The prevalence of autism is about two per ten thousand children with a male to female ratio of three or four boys to one girl. For an autistic disorder to be diagnosed the onset has to be before the age of 30 months and the main feature is an inability to relate to other people with a reluctance for physical contact and poor emotional responsiveness. There are specific abnormal patterns of language such as echolalia (repetition) and pronoun reversal. There is a resistance to change in behaviour or in the environment with attachment to objects and patterns of ritual behaviours. There may be outbursts of laughter or shouting without apparent cause. Some children have a milder form of the disorder with later onset and less severe symptoms. Aspergers syndrome is a specific milder form of autism with normal intelligence and language development and a withdrawn personality sometimes with elective mutism (voluntary silence or restricted speech in certain situations). Behavioural treatments and family support and counseling can help autistic children to a certain extent but overall the outlook is poor especially if there is also, as occurs in 70% of cases, some learning disability.

2. Hyperkinetic Disorders

Attention deficit hyperactivity disorder (ADHD) has a prevalence of between 1 and 7% depending on the criteria used for diagnosis. In Britain where there is a narrower definition for ADHD the prevalence is considered to be 1%. The core symptoms are short attention span, distractibility, overactivity, impulsivity and clumsiness. For the diagnosis to be made these have to be present for longer than six months. ADHD is more common in boys than girls by a ratio of three to one and usually starts between the ages of three and eight years. It may be associated with language delay and with conduct disorder. It is pervasive (occurring in all situations). Possible causes of ADHD include learning disability particularly where there has been brain damage or genetic loading, alcohol abuse during pregnancy, or diet (exposure to lead or tartrazine). The main management strategies are medication and behavioural treatment. Exclusion diets can be tried with variable results. Ritalin, an amphetamine like drug, raises the intrinsic stimulation levels and the child's need for external stimulation is reduced.

3. Learning Disability

Learning disability affects about 1.5% of the population. 80% of people with learning disability are only mildly affected and represent the end of the normal distribution curve of cognitive functioning. Severe learning disability can be due to genetic or chromosomal abnormalities or to brain damage before, during or after birth. Genetic causes include fragile X syndrome and rare disorders of metabolism such as phenylketonuria. The most common abnormality is Downs Syndrome in which people have an extra chromosome 21. Non-genetic causes include maternal rubella, lack of oxygen at birth and meningitis. These are also common causes of deafness and learning disability and deafness may coexist. People with learning disability may have any of the range of mental health problems but there may be delay in diagnosis as the problem may present as behavioural in the first instance. Difficulty in coping with stress and lack of awareness of social norms of behaviour and delayed language development may make assessment and treatment of mental health problems difficult.

4. Epilepsy

Epilepsy is not a mental disorder but may have an impact on the mental health of a child or adolescent. Firstly any ongoing physical illness can create problems for a child. Absence from school, side effects of medication, restrictions in activity and extra protectiveness from adults and the child's own fears can all make difficulties for a developing child. These issues would apply equally for conditions such as diabetes or asthma. Epilepsy however has an added significance because as a neurological disorder it may be a

symptom of other neurological problems. It is more common in children who have known risk factors for some brain damage such as neo-natal problems and meningitis. A careful assessment is therefore vital. It may be that the child has other subtle problems with neurological function or it may be that the epilepsy is the only problem but because of the various factors described above, the child is also wrongly assumed to have difficulties in concentration or learning. There are various forms of epilepsy in addition to tonic/ clonic (grand mal) fits. Petit mal is more common in childhood than in adult life and consists of only a momentary absence of attention of which the child is unaware. The diagnosis can be missed. Epileptic activity in the temporal lobe, which can be associated with partial fits may give rise to strange behaviours or abnormal moods and may be undetected in a standard EEG. Most forms of childhood epilepsy can be well controlled with medication and modern drugs have few sedative side effects.

PSYCHIATRIC ILLNESSES IN CHILDHOOD AND ADOLESCENCE

In adults the most common and serious mental illnesses are schizophrenia and manic depressive illness. Both have a 1% lifetime risk and have a fluctuating lifetime course. It is unusual for either schizophrenia or manic depressive illness to start in childhood but cases do occur and have to be considered in any differential diagnosis especially in adolescence. There are also specific disintegrative psychoses of childhood, which are the mental symptoms of degenerative disorders either due to rare metabolic syndromes or to rare infections such as that associated with measles.

1. Schizophrenia

The symptoms of schizophrenia include hallucinations especially auditory, delusions often persecutory and disorders of thought. There may be social withdrawal and bizarre behaviour. The peak age of onset of schizophrenia is between 17 and 35. It is therefore important that the assessment of a disturbed teenager should include a detailed mental state examination to detect the presence or absence of a schizophrenic illness which may be imitated. precipitated or masked by drug use. The lifetime risk for developing schizophrenia is 1% but this rises to about 12% if a close relative has schizophrenia and to 50% if there is an identical twin with the illness. With modern medication and emotional and practical support the outlook for a schizophrenic illness can be quite good even when there is an early age of onset. Pointers to a good recovery include no family history, previous good personality, sudden and florid onset of symptoms and disturbance of mood. If there has been an insidious onset of illness and markedly negative symptoms of social withdrawal and self neglect and a family history of schizophrenia the outlook for complete recovery is worse with a higher chance of relapses, especially if there is poor compliance with medication. About 10% of people with schizophrenia never have complete relief from their symptoms and overall there is a 10% risk of suicide often when people start to relapse.

2. Manic and Depressive Disorders

Depression can come in many forms ranging from simple unhappiness to a serious psychiatric illness. Depression in the illness sense can be associated with manic mood swings, though these are rarer. Recurrent manic illness without depressive episodes is rarer still. It can be difficult to distinguish between a biological depressive illness which needs treatment with anti-depressants and supportive psychotherapy and depression in the sense of sadness at a particular event or from ongoing unhappiness. This milder sort of depression needs psychological treatment from simple counseling to in depth psychotherapy. Anti-depressants can help but are a less important part of the treatment than for actual depressive illness. The key features of depressive illness are what are called biological symptoms; poor appetite, poor sleep with early morning waking, variation of mood during the day usually worse in the morning, poor concentration and memory, a feeling of mental and physical slowness, hopelessness, guilt and suicidal ideas. Even though these symptoms may be attributed to a specific event and indeed may have been precipitated by, for example, a bereavement, they need to be treated medically before emotional and psychological interventions can work successfully. Depressive illness is common affecting 7-10% of people during their life time and may occur during the turmoil of adolescence. It is important that the diagnosis is not missed as there is an overall 15% suicide risk.

Manic or hypomanic illnesses are the opposite of depressive illness. The hypomanic person is irritable, restless, overactive, sleepless and may be grandiose and deluded. Care must be taken in the treatment of such an episode as the mood may rapidly swing into depression. Both depressive illness and hypomania are usually recurrent with complete recovery between episodes. After more than one illness, ongoing preventative medication such Lithium should be considered.

3. Emotional and Behavioural Disorders

Emotional and behavioural problems constitute 80% of all referrals to child psychiatrists. Emotional difficulties are often related to anxiety and stress and sometimes behavioural problems can be an indication of an underlying emotional difficulty. The way in which a child presents these difficulties will vary depending on the child's age. It is important to consider the child's developmental age and not just their chronological age. Younger children who are less able to describe their feelings are more likely to present with behavioural difficulties whilst older children and adolescents are more likely to present in a similar manner to adult patients.

Pre School

Early childhood is characterised by rapid development and growing independence. Children develop communication

and motor skills as well as control of bodily functions. Social relationships initially develop within the family and later with others outside the family. Pre-school children are always referred by other people and the problems presented are mainly behavioural often related to eating, sleeping, toileting or relationships with others. Many of the emotional disorders of early childhood are exaggerations of normal behaviours but are abnormal if they persist longer than expected or if they interfere with social functioning or development. For example in separation anxiety the intensity of fear of separation from those to whom the child is attached is such as to impair social development or family functioning. The child might refuse to attend playgroup or school or to go to sleep at night.

Attachment Disorders

Children's earliest relationships are with their parents or primary care giver. Bowlby has emphasised the importance of these early "attachments" both for the well being of the developing child and for later personality development, self esteem and independence. Ainsworth has classified attachment as secure, anxious or anxious-avoidant. In reactive attachment disorder there is an abnormal pattern of relationships with carers. There can be a mixture of approach, avoidance and resistance to comforting with the primary care giver and indiscriminate sociability with inappropriate requests for attention and displays of affection with strangers. The child may appear miserable and withdrawn with a lack of emotional responsiveness. Fearfulness and hyper vigilance can also occur. Aggressive reactions occur to their own or others distress. This type of attachment disorder can be associated with neglect, abuse or early mishandling. It can also be affected by prematurity, disabilities and specific temperamental characteristics as well as parental ill health.

Phobias

Specific fears are common in early childhood and are usually related to real events such as darkness, thunder or animals. With increasing age fantasy and imagination play an increasing part. Some fears are normal but if the anxiety is affecting daily functioning then it needs to be addressed. Similarly with social sensitivity disorder avoidance of adult strangers is normal and even encouraged but if the avoidance of strangers includes other children and restricts the ability to take part in an expanding social environment, then treatment may be necessary. Treatment of phobias includes examination of current coping mechanisms and it is important to consider a family history of similar difficulties. It is important to help the child and family understand the nature of fears and anxieties and to reduce any anxiety provoking stress. Behavioural methods such as rehearsal and modelling are useful in specific fears and enhancing coping mechanisms is useful with all of these disorders. Generally the prognosis is good but some children go on to have similar problems as adults.

Separation Anxiety

There is often an underlying fear that the parent may not return and this may be related to an attachment disorder or to the recent loss of another care giver or parental ill health. Sometimes, particularly in older children, separation anxiety may present with nightmares or physical complaints or school refusal although older children may be able to express their worries more directly.

Sleep Disorders

Sleep disorders are common in early childhood and 10% of children between the age of one and two years wake frequently during the night. Sometimes this is related to a child's temperament but it may also be related to family stresses. A behavioural approach is often useful and is usually initiated by asking the parents to keep a diary of the problem behaviour. It is important that the parents are consistent in their handling of the behaviour and that they do not reward the unwanted behaviour.

Nightmares, sleep walking and night terrors are other common causes of concern. Night terrors occur usually about an hour after the child has gone to sleep when the child will sit up suddenly and appear very frightened and may shout or scream. The parents are unable to comfort the child who is not awake and the child has no memory of the event the next day. These episodes sometimes respond to waking the child just before they are due to occur. Nightmares usually occur later in the night when the child wakes in distress but is able to describe the content of the unpleasant dream and is able to be comforted by the parents. Nightmares are common but are usually short lived and occur most often between the ages of five and six. They can be associated with physical illnesses such as fever or anxiety and they are an important feature of post traumatic stress disorder. They usually disappear rapidly but if they persist then specific treatment may be required. Sleep walking often runs in families and although it occasionally follows stressful events, it is not usually considered as evidence of an emotional disorder. It usually resolves spontaneously but it is of course important to prevent children from harming themselves during the episodes.

Feeding

Feeding difficulties are very common in early childhood and are only a major problem if the child fails to gain weight or is losing weight.

Feeding difficulties often cause much anxiety for parents and thus can become a very powerful weapon for the child. Meal times can become a battle of wills with a great deal of time spent in confrontation. Sometimes the situation can be turned around by reassuring the parents that the child will not come to harm by them spending less time in confrontation over meals and more time in other more enjoyable activities. Of course it is important to be aware that sometimes failure to thrive can be a symptom of an

abnormal parent/child relationship and even in some cases a sign of neglect or abuse.

Temper Tantrums

Temper tantrums are very common in two and three year olds but usually subside as the child learns to accept the limits of their behaviour. In older children where temper tantrums are persisting it is important that parenting is consistent and that good behaviour is rewarded. It is sometimes better to try and divert or distract a child so that the temper tantrum is avoided.

Middle Childhood

Disorders often become more apparent in middle childhood. Children start school and they have to cope with not only the academic work but also relationships outside the family. Teachers may detect problems that have not previously been detected by the parents. Anxiety in middle childhood may present as fear of school or fear of being left alone. It may also present as sleep problems or physical complaints with no organic cause. Behaviour may regress to an earlier developmental level. Anxiety may be related to family factors such as parental over protection or a family history of anxiety or specific events such as bereavement, family break up or discord, or an acute traumatic event.

School Refusal

School refusal is considered as an emotional or anxiety disorder whereas truancy is considered a conduct disorder. In school refusal children usually stay at home whilst in truancy they are more likely to wander the streets often with other children. School refusal is most common at the ages of five, eleven and fifteen when children are starting new schools or approaching exams. Separation anxiety is the commonest cause of school refusal. It can also be associated with academic failure. A family history of over protection, anxiety or other psychiatric disorder is more common.

Conversion Disorders and Somatisation

Conversion disorders which were previously termed hysteria become more common in this age group. These disorders involve physical symptoms which have a psychological rather than an organic cause. Most commonly they present with disorders of walking and loss of limb function but they can also present with non-epileptic seizures and recurrent abdominal pain. Again the primary cause is usually an underlying anxiety but it is important also to assess the secondary benefits which the child may be gaining from their behaviour. Chronic fatigue syndrome may be considered as a somatisation disorder.

Other Disorders in Middle Childhood

Two specific disorders — obsessive compulsive disorder (OCD) and post traumatic stress disorder can first appear in this age group although they are probably more common in the older age group. In obsessive compulsive disorder the child experiences persistent intrusive and repetitive thoughts together with ritualised stereotyped behaviours. This disorder tends to run in families and 5% of parents will have a diagnosis of OCD and two thirds will have obsessional traits. The illness tends to run a fluctuating course but some response to behavioural or cognitive behavioural treatment usually occurs. Post traumatic stress disorder usually follows an acute highly stressful experience. The child presents with anxiety and fearfulness together with recurrent intrusive memories and dreams, sleep disturbance and avoidance of reminders of the situation.

Conduct Disorders

Conduct disorder becomes increasingly common in middle childhood and adolescence. Behaviours such as fighting, disobedience, tantrums. stealing, destruction of property, cruelty particularly to animals, fire setting and truanting occur. Often there are additional emotional problems as well as the conduct disorder. Conduct disorder is more common in children from disadvantaged backgrounds where there is a history of family violence or mental illness or loss of a parent. Family discipline is often chaotic. inconsistent or coercive and supervision tends to be poor. Parental alcohol problems or anti-social behaviour are more common. Conduct disorder is also associated with hyperactivity and specific reading difficulties. Particularly in this age group it is important to rule out a history of depression. Treatment can be difficult and prognosis can be poor with one third of boys continuing to have difficulties as adults. Those with good peer relationships tend to do better. Various treatment strategies including parent training, behaviour therapy and family and individual psychotherapy have been tried. It is important to consider areas of good functioning and not just to concentrate on difficulties.

Adolescence

Adolescence is a difficult time. Mood is often less stable and thinking becomes increasingly complex. Family roles and expectations change and the adolescent needs to develop more autonomy and receive more respect as an individual. Conduct disorders occur in up to 10% of adolescents. Adolescents tend to become involved in more delinquent behaviour such as theft and vandalism and the use of alcohol is increasingly common. Violent crime peaks in adolescence. Aggressive behaviour is one of the most stable patterns of behaviour from childhood through to adult life and is probably a learnt pattern of response. Conduct disorder may be associated with impulsiveness and an inability to see the consequences of actions.

Substance Abuse

Substance abuse including alcohol, tobacco, illicit drugs and solvents is an increasing problem in adolescence. Alcohol in particular is associated with anti-social behaviour and accidents. Substance abuse may be related to underlying psychological and personal problems but may also result

from peer pressure, boredom or an attempt to escape from difficult relationships particularly with parents.

Emotional Disorders

Emotional disorders in adolescence become more like adult disorders and can present with anxiety, obsessional features, conversion disorder or depressive symptoms. Transient depressive symptoms are common in adolescence but depression which is pervasive, unresponsive and prolonged should raised suspicion of a depressive disorder. Adolescents may be more likely to present with irritability and loss of enjoyment which may be presented as boredom. It may be associated with other symptoms such as school refusal, conduct disorder anxiety and social phobia or anorexia nervosa. Depression is more common where there is a family history of depression, following loss events and where there are features of perfectionism or pressure to achieve. Brief thoughts of self harm or suicide are not uncommon but feelings of hopelessness and premeditation or planning are more worrying. A history of child abuse or a family history of self harm or current family disturbance are other features which would raise the level of concern. Completed suicide is more common in boys but self harm which tends to be more impulsive, is more common in females and peaks in late adolescence.

Eating Disorders

Anorexia nervosa has a peak incidence at the age of 17. It is more common in girls than boys with a ratio of approximately 10 to I. It is rare in Afro-Caribbeans and Asians. Various aetiological theories have been put forward and anorexia is certainly more common in certain groups such as ballet students. Sometimes there appears to be a conflict over control or a fear of normal development. There are often perfectionistic or histrionic traits in the personality. Family dynamics can sometimes be unusual with over involvement and lack of emotional expression. Sometimes the anorexia can appear to be a tool, which is used to maintain family unity. Usually the presentation is with excessive dieting and weight loss with an intense fear of gaining weight and disturbed perception of body shape. Sometimes particularly in younger pre-pubertal children there is a failure to gain weight rather than actual weight loss.

There may be a delay in puberty and in older girls primary or secondary amenorrhoea. It is important to look for an underlying depressive illness. Particularly in younger children previous feeding and behavioural difficulties are common. A family history of eating disorder is not uncommon. Treatment usually involves two phases. Firstly it is important to ensure a return to a safe weight. Once this has been achieved it is important to address underlying issues such as autonomy, control, self image and family difficulties either through individual or family work. Approximately 50% do well and seem to make a full recovery. A quarter improve but have persisting problems particularly with relationships. Approximately 5% of people with anorexia die usually from medical complications of severe weight loss but sometimes through suicide.

Bulimia is more common in late adolescence and involves binging and purging with associated feelings of guilt. Often the weight is normal. Patients with bulimia tend to have low self esteem and feelings of insecurity but they tend to be more aware of their difficulties than anorexic patients. Again it is important to rule out depression. Cognitive behavioural therapy seems to be most effective.

Child Abuse

With all emotional behavioural difficulties in childhood it is important to bear in mind the possibility of child abuse. In particular child sexual abuse can present in a number of different ways, for example mood disturbance, feelings of low self esteem and guilt, self injurious behaviour, social withdrawal, discord with parents and teachers, complaints of physical illness, sleep disturbance, panic attacks or post traumatic stress disorder.

For further information regarding mental health problems in deaf children please contact:
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"We trained hard but it seemed that every time we were beginning to form up into teams we would be reorganised. I was to learn later in life that we tend to meet any new situation by reorganising; and a wonderful method it can be for creating the illusion of progress while producing confusion, inefficiency, and demoralisation."

Petronius Arbiter, 210 B.C.

Language Acquisition in Deaf Children

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City University, London

Prelinguistic communication

Infants are born with the potential to learn any human language. Which language or languages they actually learn depends on which languages they have access to. The term 'access' is preferred here, since for deaf children, there needs to be careful and separate consideration of parental language output and child language uptake. From birth to around 8 months in all infants, vocal babbling progresses from vocalic sounds, to syllabic combinations. These later syllabic combinations are influenced by the phonology of the spoken language heard by the baby. When well-formed syllabic combinations begin to appear, parents perceive these as intentional communication on the part of the infant, and respond accordingly. This in turn leads to changes in patterns of adult-child vocal interaction. Deaf babies exhibit early vocal babbling which is similar to that of hearing babies, but after the first few months, this decreases. The decrease is in contrast to the steady increase in quantity and syllabic variability in hearing babies. The absence of the normal babbling pattern in turn may lead to changes in interaction patterns with hearing parents and the usual vocal interactive turn-taking may not proceed normally. This impairment of interaction has implications for later social and cognitive development as well as for language development.

Recent research has indicated that 'manual babbling' can be observed in infants exposed to sign languages. All infants move their hands and arms, and those infants exposed to sign languages imitate hand and arm movements. Just as hearing/speaking parents respond with changes in their interaction patterns to syllabic vocal babbling, signing parents respond to manual babbling as if it were intentional communication on the part of the infant. Manual babbling thus provides a motivation for both infant and parent to engage in conversations in the same way as vocal babbling does (Petitto & Marentette, 1991).

Early research on child language tended to ignore the role of gesture in the development of language. It is now recognised that all children gesture, that there is a well structured pattern of gesture development, and that gestures continue to be used in conjunction with language throughout life. Gestures develop from early expressions of deixis (pointing or otherwise indicating objects or people) to referential gestures (labelling or naming of objects and actions). All children also progress to two-gesture combinations such as *THERE DOLLY.* It has been claimed, however, that only children exposed to sign language develop combinations of referential gestures. *DOLLY BIG.* (Volterra 1983). Gestures are particularly important in early social interaction with adults, and children use gestures to communicate their wants and interests. Thus all deaf children, including those who are not exposed to BSL, or who have only limited signed or gestural input show spontaneous and regular use of gestures for communication

First words and signs

Because of the difference in modality between gestures and words, the transition from pre-linguistic to linguistic communication appears more clearly in the development of spoken language (although the very first words are better interpreted as vocalic gestures or "proto-words" rather than as true linguistic structures) (Volterra & Caselli 1985). For a child learning sign language, the transition is obscured by the identity of modality between gesture and sign. This led some researchers in the 1980s to claim that sign language is acquired much earlier than spoken language (Prinz & Prinz 1979). However, research on the development of pointing in children exposed to sign language provides evidence of discontinuity between gestures and signs, even when they have the same surface forms (Abrahamsen et al.1985). Gestural pointing appears at about 9 months of age and is used independently and as an accompaniment to speech throughout life. Children exposed to sign language initially use pointing to indicate people, objects and locations, as do all children. From about 12 to 18 months of age, however, signing children do not use pointing to refer to people, although they continue to use pointing to refer to objects and locations. Pointing to people returns at around 18 months, but is assimilated to the linguistic requirements of personal pronouns in sign language, and thus has been recategorised as a linguistic, and not gestural form.

Some studies have reported that children learning to sign have larger vocabularies during the first 2 years than children learning spoken languages (Ackerman et al. 1990). Any such difference is only transitory. Hearing children generally have a lexicon of about 10 words at 15 months and 50 words at 20 months; studies of ASL report that children learning to sign have similar-sized lexicons.

It has been suggested that iconicity in sign language might make it easier to acquire signs. As we saw earlier, gestures and signs may appear identical in form and thus difficult to differentiate. Research on ASL has demonstrated however, that children of normal abilities find visually-motivated signs no easier to learn than arbitrary signs. It is also important to remember that signs which appear iconic to an adult may not be iconic to a child: the visual motivation of the sign MILK, which is historically derived from the action of hand-milking a cow, is likely to be opaque to a child growing up in Britain. This has resulted in either no assessment of sign language or ad hoc approaches to assessment.

A survey in 1995 of existing assessment practice in the UK revealed that signing was assessed through a variety of approaches: observations of conversation, adaptations of existing English language tests or adaptations of sign language assessments designed for hearing learners of BSL. The content of assessment also varied enormously: although there were attempts to code information about vocabulary, grammar or discourse, these were not based on information about developmental progression in the acquisition of these structures. In general, there was little overlap between what was assessed in different schools and units. Some of this variation arises from different perspectives about sign language and its assessment. In those programmes which described themselves as bilingual there was a more explicitly recognised need to have norm-referenced tests of BSL, based on Deaf language and culture; in those programmes which described themselves as total communication, there was a greater tendency to perceive assessment of signing as equivalent to assessment of English via a different modality.

It should be recognised that assessment of a deaf child's abilities in English raises other problems. Tests of English are often administered in spoken English accompanied by gestures or signs. One the one hand it is known that administration of test instructions to hearing children in gesture results in poorer scores, and reliance on gesture by deaf children may depress results, even on tests of non-verbal abilities. In contrast, use of accompanying signs or gestures may create falsely high scores (Crittenden et al. 1986). In one study, test items from the British Picture Vocabulary Scales were translated into BSL and administered to hearing children who knew no sign language (Kirk et al. 1990). Nineteen percent of items were guessed correctly by all children in the study; only *25%* were correctly selected at chance or lower than chance. The unsuitability of translation of test material is due to a number of factors: many vocabulary test items are names of body parts. Signing these requires pointing to or touching the body part. In a test situation, a child would only need to match the body part indicated with the picture: knowledge of BSL would not be assessed. The same is true for many visually-motivated signs, where, e.g. a gesture to the head might suffice to help the child to correctly select the word "hat" from the other pictures displayed. The opposite situation can also arise: a single word in English may not be expressed by a single sign in BSL. What may appear to be a simple concept when signed in BSL (e.g. PARALLEL) may be much more complex in English.

An assessment has been developed which provides norms for receptive BSL grammar for children aged 3-11. The assessment is the first to use the findings of BSL acquisition studies as a basis. As with studies of sign language acquisition, by using norms for deaf children of signing deaf parents, the effect of the non-optimal language environments often experienced by deaf children in hearing families can be explored. There ore two other important additional considerations in the assessment of BSL, which are discussed briefly below.

Acquisition of grammar

Signs and words also begin to be combined at similar ages. Although there are individual differences, children acquiring a specific language usually go through similar stages of development, with most of the syntax and morphology acquired before starting school, although development of the full use of discourse structures is not completed until the end of the primary school years, and there is evidence that the acquisition of some syntactic structures is also extended through the first 10 years of life. English is the language whose acquisition has been most studied and the pattern of English language development in normally-hearing populations is well-described

Deaf children acquiring English generally do not follow the normal pattern of acquisition in one or more areas of morphology, syntax and pragmatics, especially if language acquisition is delayed. Apart from deviant phonology, which can be ascribed to difficulties in hearing sound contrasts, other linguistic areas may not reflect the usual patterns. Productive vocabulary often reflects the different language experience of the deaf child: parents may have explicitly taught colour terms, for example (Ackerman et al. 1990). The vocabulary is also likely to reflect the child's chronological, rather than linguistic age, and so may not be comparable to that of a much younger hearing child with the same level of language development. It is beyond the scope of this chapter to discuss in detail the numerous studies of English language development in deaf children. It is important, however, to note that it seems unlikely that language delay can ever occur without a greater or lesser degree of deviance from the normal pattern (Geers et al. 1984; Geers & Schick 1988). The remainder of this section will describe studies of sign language development.

Sign Language Development

There have been a number of studies of normal BSL development from birth to 13 years, and the results of these studies have allowed us to begin to describe milestones in the same way as has been done for English (Harris et al. 1989; Kyle et al. 1987; Morgan 1996). It should be noted that studies of normal BSL development are based on research with children of deaf parents, who are exposed to BSL from infancy. It may be expected that children of parents not fluent in BSL may not follow this pattern exactly, although preliminary evidence from children in hearing families where there are alternative models of BSL from an early age (enrolment in bilingual early intervention programmes with fluent signers in the environment) appear identical to deaf children of deaf parents, and research on ASL fluency has found no difference between children exposed to ASL from infancy and those exposed to fluent ASL from 2 years of age (Mayberry & Eichen 1991).

The availability of information about normal patterns of BSL development has enabled the development of language assessment tools, closer monitoring of children's progress in learning BSL, and the possibility of identifying children

with general language disorders affecting both the development of signed and spoken language.

The recognition that the goal of fluent monolingualism in a spoken language is unattainable for many deaf children, has been accompanied by a shift to the ideal of bilingualism in spoken and signed language, and increasingly there have been moves towards bilingual and bicultural education in Britain and other countries. It is clearly important to have some way of monitoring the success for such programmes, and in particular the progress made by children in each of their languages. However, there have been to date no standardised measures which can be used by professionals working with deaf children to assess their developing competence in sign language.

Bilingualism

The British Deaf community must be regarded as a bilingual community, with individual members exhibiting varying degrees of fluency in BSL, written and spoken English. As in all examples of childhood bilingualism, a variety of factors may affect the course of acquisition and the final levels of fluency. Deaf children's bilingual balance will depend in part on the age of onset and degree of hearing loss. Other factors, such as parental fluencies (signing by hearing parents, speech by deaf parents) and type of educational setting, will also be important.

Variability in assessment

One of the main issues in assessing child BSL is the lack of appropriate assessors. Even within bilingual programmes, there is often no individual with bilingual skills: hearing staff may have limited knowledge of BSL and deaf staff may have limited knowledge of English and neither of these groups may have had any training either in the linguistics of BSL or in the acquisition of BSL. On occasion, language assessments are undertaken by professionals who do not know BSL or who have limited experience of deaf children. Sometimes interpreters are used, which is always unsatisfactory. The variability in language experience of deaf children in both spoken and signed language may also make it difficult to interpret the results of assessments and in the absence of norms, to distinguish delayed from deviant language.

Summary

Much work still remains to be done on language acquisition in deaf children, particularly on the pattern of language development in the context of BSL-English bilingualism and on the effects of delayed first language acquisition on subsequent linguistic, cognitive and educational achievement. Of equal importance is ensuring the successful communication of the results of such research to educators and others concerned with deaf children's development.

PARS for Windows

The well-established PARS (Paediatric Audiology Records System) software, developed by the Institute of Hearing Research and marketed and supported by Public Sector Software Ltd., has now been released as a Windows system using Microsoft Access 97.

PARS' functionality has developed over several years through a thriving user group, chaired by Dr. Jane Lyons. In addition to recording personal (Register) details, PARS records referral and consultation data and produces outcome letters, all enabling high quality management and audit information to be produced at the press of a button. PARS also manages the administration of clinics, including automatic production of appointment letters.

PARS has proven to be an excellent administration, management and audit tool and the Windows version contains all the old functionality and more.

The user group has often discussed the possibility of modifying PARS for use with the adult service, but no one has ever come up with the changes required! However, a modified PARS has been used to investigate resourcing issues pertaining to the supply of digital hearing aids and this entailed the incorporation of records for adult tests / questionnaires. When the dust has settled, we can look at the feasibility of a common product for the paediatric and adult services.

The total cost of PARS for Windows (including installation and training, but excluding Microsoft Office Professional *95* and hardware) is *£4,525*. If you want further details, a demonstration or reference sites near you, call David Turner on 01474 329932 or email him on dturner@pssltd.co.uk.

In case you need to ask, the minimum recommended specification for hardware is: An IBM (or compatible) computer with Pentium 200 processor, 32 Mb RAM, 1 Gb hard disc and a VGA monitor, together with a Laserjet printer.

David Turner

BACDA Research Group

The BACDA Research Group was formed in 1998 and held its first meeting early in 1999.

It was felt that the purpose of the group is to:

- foster research among and provide support for community doctors in audiology.
- organise national research in paediatric audiology
- act as an information resource
- identify sources of funding
- develop the "How?"
- facilitate multi-site applications

Members of the Group are:

Mary O'Sullivan (Leeds) - Convener
Elaine English (Bridgend, South Wales) - Co-ordinator
Wanda Neary (Warrington), Hope Forsyth (Liverpool)
Tim Williamson (Bath), Ruth Henderson (Edinburgh)

BACDA Research Study,
1st September 2000 to 31st December 2001

Title of Study: Survey of School Hearing Screening Test

Background

Most Districts in the UK screen children's hearing in the academic year following school entry. A considerable variation in practice has been indicated in previous publications. The majority of cases of significant sensorineural impairment should have been detected by early screens (targeted neonatal screening and the health visitor distraction test). However mild sensorineural losses may have been undetected by early screens, together with progressive sensorineural hearing losses. Cases of acquired hearing loss may have remained undetected. The commonest cause of hearing loss detected by school hearing screening will be otitis media with effusion.

Aims and Objectives

It is proposed to carry out a survey of school screening for hearing loss in the UK in order to:

- describe current practice
- document coverage of the test in Districts across the UK
- document :
  - and describe the total number of children affected with a hearing loss detected by the screen.
  - the total number of new cases of sensorineural hearing loss and conductive hearing loss identified by the screen.
- assess the cost of the screening test per child screened.

Methods

- A protocol for data collection has been devised, together with guidelines for collection of data.
- Districts will be invited to participate in the study.
- Applications will be made to the Multicentre Research Ethics Committee, and to the Local Research Ethics Committees of the participating Districts. Local management approval will be sought.
- Applications for Research Funding will be made.
- Data collection will be undertaken between 1/9/2000 and 31/12/2001.
- The data will be analysed using Microsoft Excel and SPSS.

Comments

As Districts prepare to move towards universal neonatal screening for hearing loss, it is important to have good information on the structure and process of the school screening protocol. It is important to identify which cases of permanent hearing loss are newly identified by the school screen. It is important to know the cost of the screening test for each child screened.

Proposed agenda to end August 2000

- A presentation on The School Hearing Screening Study was made at the BACDA Study Day 28th January 2000.
- Between 6 and 10 Lead Clinicians in Audiology from different Districts have been asked to consider and criticise the data collection sheet.
- The Lead Clinicians will meet in February/March 2000 to decide the final format of the data collection sheet and guidelines for completion of the sheet.
- Funding for the Study will be sought.
- Districts will be invited to take part.
- The MREC of the Lead Clinician will be contacted for Ethical approval for the study.
- LREC and local management approval for the study will be sought.
- 1st September 2000 - study to commence.

Wanda Neary
Consultant Community Paediatrician (Audiology)

THE BACDA PRIZE

The closing date for this year's BACDA Prize is September 30th and entries are invited from BACDA Members. Printed here are the rules.

1 The award is entitled the BACDA Annual Award.

2 Only full BACDA members will be eligible to submit work for consideration.

3 Work is to be submitted by September 30th, for consideration by the panel. If the panel agrees to make an award this will be presented at the Annual General Meeting in January. If the recipient is unable to attend the meeting the award will be presented in absentia.

4 The award will be a book token. At the time of the first presentation in January 1993, the value of the award was £100.

5 The panel of three assessors will comprise, two members of the BACDA committee nominated by the committee and one non-BACDA member of academic or other recognised standing in the field of audiology. This person will also be nominated by the committee.

6 The work to be considered for the award should be related to community audiology, but any subject concerned with audiology will be considered. The presentation may be a research project, a clear audit process, an article for teaching or informing other professionals or affected individuals and their families, a literature search or something similar.

7 The work should be presented with an upper limit of 7,500 words. It may summarise work presented in a longer form elsewhere. Submitted work may be published or unpublished. Work should be presented on A4 paper, typed, double spaced with margins on both sides, referencing should be in the Vancouver style. The author's name should be on a separate detachable front sheet and entries should be signed.

8 The entries are to be submitted to the chairman who will pass them on to the panel to be judged anonymously.

9 Members of the award panel are ineligible to submit work for consideration.

10 Work submitted should be wholly or predominantly the work of the author; any help should be declared

11 Work may be submitted by individuals or groups (where two or more BACDA members work together)

12 The award will be made at the discretion of the panel.

13 BACDA will be free to publish any submitted work in the newsletter.

14 The panel will be nominated annually at the March committee meeting.

AUDIOLOGY in MALAWI

My Involvement with the Meningitis Study in Blantyre has provided opportunities to extend the work beyond the limits of the Study.

The establishment of an Audiology Service for children based at the Paediatric Unit of the hospital has been an exciting development, and equally satisfying has been the establishment of stronger links with the Deaf School at Nguludi, 12 miles out of Blantyre. The school is run by committed teachers of the deaf trained in the U.K. Prior to my visit last year I was able to collect some hearing aids, functioning but either obsolete or surplus to requirements to give to this school -their first donation of aids for 3 years.

Should any BACDA members have hearing aids in the back of their cupboards that are no longer needed I would be very pleased to receive them. Aids of any variety and power are welcome - as long as they work!

I will be travelling to Malawi again in July and I am hoping to be able to help the school again. Contributions can be sent to me at::

Dr. Hope Forsyth, Consultant Community Paediatrician (Audiology)
Audiology Department, Alder Hey Hospital
Eaton Road, Liverpool. L12 2AP Tel: 0151 252 5943

THE BACDA PRIZE AWARDS
Paediatric Audiology towards the Millennium

Dr Hope Forsyth
Alderhey Children's Hospital
Liverpool

INTRODUCTION

1995 saw the 10th anniversary of the founding of the British Association of Community Doctors in Audiology. It was appropriate at that time that we, within the organisation, looked back over 10 years of the development of our organisation, and of progress within Community Paediatric Audiology services both locally within our own districts and further afield within the United Kingdom. Now as we approach the year 2000, it is equally important that we look forward to the next decade and beyond, looking to what we hope to achieve in improving services for hearing impaired children.

In some respects the way forward is all too apparent. Paediatric Audiology is no longer the low profile speciality, loosely attached to either Paediatrics or Ear, Nose, and Throat Surgery, but is now recognised in its own right. That at least has been achieved in the last decade or so of the 20th century. It is now difficult to avoid references to developments for hearing impaired children in the media, let alone professional journals. The year 2000 will undoubtedly see further discussion of, debate on, and hopefully implementation of Universal Neonatal Hearing Screening. With this will come earlier identification of congenital hearing impairment, increasing experience of and the development of expertise in the management of very young hearing-impaired babies. And with these advances surely will come closer multi-agency working within our 'family friendly', 'seamless' services. We read of advances in hearing aid technology. As hearing aids become smaller and more sophisticated, will our teenage and younger clients be demanding canal aids or digital technology? Will we provide all our children with ear level radio aids? And as cochlear implants become an option for increasing numbers, will we be able to negotiate budgets to meet all these demands?

But perhaps we should not only be looking forward, but also taking a wider perspective as we consider Paediatric Audiology towards the millennium. The world is in many respects becoming smaller, and as it does so we cannot fail to become more aware of gaps that widen. Should we therefore pause to consider the plight of hearing impaired children beyond our immediate responsibility, in areas of the world where the possession of the most basic hearing aid may never become a reality and is it possible that we as paediatricians working in Community Audiology in the West could or should contribute directly or indirectly to the setting up of services in areas where provision is minimal or nonexistent?

AUDIOLOGY IN MALAWI

BACKGROUND

I have had the opportunity recently to become involved in audiological aspects of a research project looking at the management of bacterial meningitis in children admitted to the Paediatric Unit of the Central Hospital in Blantyre in Southern Malawi. This has not only given me the opportunity to visit a very beautiful part of Africa, and to be involved in an interesting study, but has allowed me to take a broader look at some of the challenges in Paediatric Audiology, and in particular to consider the need for, and the practicalities of providing some form of hearing assessment service in a country where the priorities in health care inevitably lie elsewhere.

The need for hearing assessment facility is clear.

We have no prevalence data for congenital permanent hearing loss in Malawi, but there is no reason to suppose that it is less of a problem than in areas where prevalence rates are available. Studies carried out in other areas of Africa would tend to confirm this, with a prevalence of 4 per thousand quoted as the rate of profound bilateral loss in school children in Sierra Leone[1] and 2.2 per thousand as the rate of bilateral sensorineural hearing loss in school entrants in Swaziland. [2]

With acquired hearing loss in childhood, where in the UK, 90% is thought to be secondary to bacterial meningitis,[3] the likelihood is that, with the HIV epidemic in a country in which infection and in particular meningitis was already common,[4] that the proportion of the hearing impaired child population with acquired loss following meningitis will be greater than the 6% quoted from studies in the western world [5]

The needs of hearing impaired children and their families in Malawi are no different from those of hearing impaired children nearer to home.[6] There is a need to identify the loss as soon as possible, to discuss the nature of the loss and the implications with the family and to ensure that the child and his family can access such services as are available.

In Southern Malawi intervention is available. There is a School for the Deaf, run for many years by a Catholic Mission, now government funded. It is under-resourced, under-equipped, but it is functioning, with trained and enthusiastic staff. The limited resources necessitate prioritising children for admission who are likely to derive most benefit from attending the school. Children are considered for admission, which is a prerequisite for hearing aid provision, at the age of 6 - 'if they are doing well'. However with no hearing

screening or surveillance programme in the country and no Hearing Assessment service, there is no clear route of referral to the school for children with hearing loss. Many hearing impaired children remain in their villages, attending, or not attending the local school, their families unaware of the facilities available through the School for the Deaf. It is a minority that are referred for assessment and consideration for admission and / or amplification and a smaller number still who gain a place within the school.

Children with acquired hearing losses must represent a group of children for whom priority could be justified on grounds of likely benefit from intervention - as we in the UK negotiate priority for such children for cochlear implant funding on grounds of likely benefit. For some children with acquired hearing loss, amplification provided and supervised by the School for the Deaf, will allow them to continue at their local village school. For others admission to the school itself will be appropriate.

The Paediatric Unit of the Central Hospital in Blantyre acts not only as District Hospital for the children of the city and surrounding area but as referral unit for Southern Malawi. This unit, admitting around 10,000 children each year, treats around 300 children with bacterial meningitis annually. Delay in presentation and initiation of treatment due in part to difficulty in travelling to the hospital, and to the frequent assumption, both by parents and by health workers, that febrile illness is due to malaria, contributes to the mortality rate (around 40%) and to the high incidence of sequelae, including hearing loss.[4] Many children developing hearing loss secondary to bacterial meningitis are treated initially in this unit.

The National Deaf Children's Society Quality Standards document [7] stresses the importance of early diagnosis of hearing losses in children. The suggested targets are difficult to attain in the UK with present service provision [8], and are clearly impossible in this setting. However the underlying principles are equally applicable. As the children treated for bacterial meningitis in the Central Hospital in Blantyre are a clearly identified high risk group, likely to contribute significantly to the hearing impaired child population, it would seem appropriate to establish hearing assessment provision based at the Paediatric Unit and also to establish liaison with and a referral route to education staff at the School for the Deaf in order to ensure that children who may have developed hearing loss as a complication of their disease can be seen at the school as soon as possible after their recovery for further assessment and management.

Establishing Hearing Test Provision

It is easy to highlight the difficulties involved in initiating a hearing assessment provision in such a setting. In a country where health services are stretched to breaking point, audiology is unlikely to be awarded high priority in allocation of funds. Thus, the starting point in attempting to arrange hearing assessment provision, inevitably, was lack of a sound proof or even quiet room, lack of equipment, and lack of staff with knowledge of and experience in audiology!

This, arguably, may not be so very different from the experience of many Community Doctors in Audiology starting out to establish an Audiology Service based in local clinics or Health Centres during the last 10 or 20 years in the UK. There can be few members of our organisation who have not walked around a Health Centre looking for the quietest room and working out the quietest time at which to hold hearing assessment sessions.

In Malawi, a further difficulty arises in arranging outpatient assessment for children the majority of whom lack formal addresses so that it is not possible to rely on a postal service to send appointments for assessment to families after discharge. Arrangements have therefore to be made at the time of discharge from the ward. For some families, too, distance from the hospital and difficulties with public transport add to the problems encountered in running an outpatient service.

More than compensating for the negative aspects, was the willingness of staff to assist in finding the most appropriate area within the unit in which to work, and the enthusiasm and commitment of the 2 designated audiology nurses - trained paediatric nurses - in learning some basic principles and test techniques, in working to raise awareness amongst their colleagues, and in encouraging attendance at clinics- and at times even going out to collect families from their villages to ensure attendance.

The initial short term aim of providing audiology input as part of the Meningitis Study by annual visits to Malawi during the study period rapidly developed into an attempt to provide sufficient training to allow an ongoing hearing assessment service to be maintained between visits which will hopefully be able to continue in the future after the Meningitis Study is complete when the need for such a service will remain.

HEARING ASSESSMENT SERVICE

Hearing assessment service was developed on three levels.

1. Information obtained during the child's inpatient stay from observation of the child and discussion with parents and staff.

2. Information obtained during subsequent outpatient visits by discussion with parents and behavioural observation.

3. Information obtained by hearing assessment, occasionally prior to discharge, but more often as an outpatient by distraction testing, pure tone audiometry, and by simple tests of speech discrimination.

1 Information during inpatient stay

Increasing awareness of staff about hearing loss as a consequence of meningitis resulted in more regular recording in case notes of child's reaction to sound, and mothers opinion of hearing during the recovery phase of the illness. At the time of discharge, comments in the notes regarding hearing were reviewed, and there was further discussion with parents and staff. Hearing status on discharge was then included in discharge summary - recorded as YES / NO /?.

The difficulties associated with out-patient attendance makes obtaining maximum information during the inpatient stay essential. The disadvantage is that the child is being assessed formally or informally while he may still be quite sick, and it may be difficult for parents to be objective at this time. It was therefore important to look at the reliability of information obtained at this stage.

Hearing Status recorded at discharge compared with that defined by assessment.

120 children had hearing status defined by assessment following discharge as outpatients by behavioural testing, and / or transient evoked oto-acoustic emissions (available during my visits only). The results of these assessments were compared with recorded hearing status on discharge

Results

Opinion on discharge confirmed by testing children (73%)	8	8
Opinion on discharge not confirmed on testing	32 children (27%)	

Details of children where opinion on discharge was at variance with hearing status as defined by assessment.

At Discharge	Test result	
Normal	Bilateral sensorineural loss	9
Normal	Unilateral sensorineural loss	12
Normal	Bilateral sensorineural loss + neurological sequelae	1
Normal	Mild conductive loss	5
Hearing impaired	Normal + neurological sequelae	4
Hearing impaired	Normal	1

27 children thought to be normally hearing on discharge were eventually found to have a degree of hearing loss.

In 12 children the loss was unilateral and in 5, mild conductive. It is unlikely that such losses would have been obvious to observers in a busy children's ward. 1 child thought to be normal at the time of discharge was subsequently found to have hearing loss and also significant neurological sequelae. For none of these 18 children would referral to the School for the Deaf have been appropriate. Of the remaining 9 children whose hearing loss was missed at discharge, 2 had moderate losses, and a further 4 did in fact have concern expressed in the case notes although this had been overlooked on completing discharge summary. 5 children thought to he impaired had normal hearing demonstrated. Of these, 4 had significant neurological sequelae.

It is clear that for children with significant neurological sequelae, prediction of hearing status at discharge is unreliable. While it is helpful in the management of such children to define their hearing status, they would not be considered suitable for admission to the School for the Deaf and referral would be inappropriate.

If this method alone was used as criteria for referral for further assessment by Educational Audiology staff, 9 children (7.5 %) who should have been considered for admission to the school, would not have been referred. Closer scrutiny of the case notes would have reduced this to 5 (4%).

2. Information obtained at outpatient visit

Where threshold estimation was not possible usually due to the age of the child, a standard question sheet (appendix 1) was completed following discussion with the parents. This included details of the child's response to loud and quiet sounds in the home, his ability to understand speech in and out of vision following his illness and in comparison with prior to the illness, the child's speech and language development again in comparison with pre illness, together with details of ear infections and balance problems. In addition the child's response to sound, including speech both in and out of vision was observed.

This is acknowledged to be a fairly crude form of assessment but was found to be useful in conjunction with recorded hearing status at discharge. For some children where hearing status was doubtful at discharge, improved responses at follow up were presumably attributable to further recovery from the illness. In other children, optimism at the time of discharge was found to be unfounded following discussion at subsequent follow-up after the child had been observed for some time in his own home

Importantly this further contact with the audiology nurses provided the opportunity for explanation of the need for and encouragement to continue to attend clinic, the aim being to continue to review until pure tone audiometry could be obtained. Where pure tone audiometry was not obtained, discussion with parents on repeated occasions gave confirmatory evidence of hearing ability together with progress in language development.

Families who did attend for the initial follow up as outpatients did tend to continue to attend until discharged when it was felt that hearing status had been clearly defined.

3. Information obtained by hearing assessment

Assessment techniques included distraction testing, pure tone audiometry, and a simple form of speech discrimination test.

Distraction testing was carried out using conventional stimuli (Manchester rattle, 'sss' and low-pitched hum) and a free field audiometer.

Free field audiometer and a sound level meters were donated by a Community Paediatric Audiology dept. who were upgrading their equipment.

The nurses had written instructions on the distraction test, and on the use of the audiometer and the sound level meters. (Appendix 2) They also had the opportunity to practise the technique under supervision. Test conditions were less than optimal due to background noise levels but this tended to be intermittent and with patience, testing was possible. Wherever possible children were followed up until Pure Tone Audiometry could be obtained, where ambient noise was less of a problem.

We were fortunate to have a Kamplex audiometer donated by a hearing aid company and obtained a further screening audiometer as back up, again from an audiology dept. who were upgrading equipment. Play audiometry was carried out using reels in a box and balls on a stick. The children tested aged from 3 years onwards enjoyed the test and were not deterred by the unfamiliar equipment. The nurses had written instruction on pure tone audiometry and again practised initially under supervision.

Simple test of speech discrimination was carried out in the local language, Chichewa, using a collection of 12 toys familiar to the children - e.g. man, lady, dog, car, turkey etc. - using 2 voice levels - normal voice (60 - 65 dBA) and 'quiet as possible ' voice (45 - 50dBA) with and without lip reading. Levels were checked using a sound level meter. No attempt was made to have similar sounding pairs as in the McCormick Toy Test. As in more sophisticated settings, results of speech discrimination were interpreted in conjunction with threshold estimation, though for some young children speech discrimination results were obtained when children were unable to cope with pure tone audiometry. Children in Malawi appeared to enjoy this, too and were happy to cooperate.

TRAINING AND MONITORING OF STAFF

Hearing assessment carried out in the Paediatric Unit of the hospital, based on the 3 levels of information obtained during inpatient stay and subsequently at follow-up was initiated during a 3 week visit to Blantyre in May 1998.

During this time, the 2 Audiology Nurses had the opportunity to discuss aspects of normal listening behaviour in children, signs of hearing loss, and effects of hearing loss, especially in relation to post meningitic children. They became experienced in in-depth discussions with parents based on a standard form (appendix 1). They observed, assisted with, and practised under supervision distraction testing, pure tone audiometry, and simple speech discrimination testing.

Written instructions were provided for all aspects of their work: history taking, testing, and use of equipment. (appendix 2)

During 15 months following the visit, they continued to provide this service and subsequently in July 1999, their results were reviewed and their competence reassessed both in history taking and in test techniques. There was the opportunity during this further visit, for further training, discussion and monitoring of techniques.

DISCUSSION

The fact that a hearing assessment service, however basic, existed did much to increase awareness in other members of the paediatric department staff. The daily presence on the meningitis ward of the "Hearing Ladies" inquiring as to whether or not children were fit for testing, increased the frequency of discussion about the children's ability to hear. There was increased understanding of the reason for follow-up, and time was taken for explanation of this to families. Parents were alerted to the possibility of hearing loss following the illness and this helped in their observation of their children both in the ward and on discharge.

Our study comparing reported hearing status on discharge with the results of subsequent assessment, suggested that information obtained during admission was useful in predicting hearing status in children other than those with significant neurological sequelae. We were able to demonstrate to staff, ways in which the accuracy of prediction of hearing status at the time of discharge could be improved. Where it was thought likely that there were hearing problems at the time of discharge, particular efforts were made to convince the families of the need to return for review. For these children, as much information as possible about their whereabouts was recorded - if these children failed to attend, the nurses would visit the family and on occasions would collect the children to ensure that they were further assessed.

Review, following discharge, involving discussion, observation but not threshold information also proved useful. Wherever possible the nurses would continue to see the child until a pure tone audiogram had been obtained. But in the absence of this, discussion at 2 or more reviews tended to provide confirmatory evidence of hearing status. On reviewing results after 15 months, there were very few children where reports were conflicting other than those with intermittent middle ear infections.

The ability to perform Pure Tone Audiometry on many of the children (and to a lesser extent distraction testing) added significantly to the service. The Audiology Nurses performed Pure Tone Audiometry competently and reliably and found that the majority of children over 3 years 6 months, who had no additional problems, would cooperate with testing. Obviously there is a potential problem with the need for servicing, repairing and calibration of equipment. Currently there are 2 audiometers and it is hoped to obtain a third, allowing not only for a spare but also for 1 piece of equipment to be returned to the UK when the opportunity presents itself for servicing and calibration. Written guidelines for the use of the equipment includes careful listening checks.

It was never the expectation, in providing a service such as this, that we would be able to detect minor degrees of hearing

loss, and it is acknowledged that minor losses and unilateral losses on some occasions would be missed if pure tone audiometry was not obtained.

The aim of the service was to ensure that children with acquired hearing loss of a degree that would merit consideration for the provision available at the School for the Deaf were given the opportunity for assessment there.

A further aim was to raise awareness in staff and parents about hearing loss and its effects, particularly post-meningitic loss, which would contribute to the identification of hearing loss in the children for whom they were caring.

It was also considered important that the nurses were able to give appropriate advice to parents on the permanent nature of post meningitic hearing loss, and on how to continue to communicate with a child who had developed hearing loss after a period of normal hearing.

CONCLUSION

In conclusion, I would suggest that with the enthusiasm, cooperation and support of the Paediatricians working in the hospital, it has been possible to set up a useful and reliable Hearing Assessment Service in Blantyre in Southern Malawi which has to date been able to improve the provision for children in that area, acquiring hearing loss secondary to meningitis. This has been achieved with relatively little input from abroad - namely two 3 week visits from a Community Doctor in Audiology.

Much of the work involved in setting up this service, although in an unfamiliar setting, was no different from many of the day to day activities of a Doctor in Audiology in the UK, - namely, setting up of a reliable hearing assessment service with limited resources in less than optimal premises. As is the case in setting up a new service closer to home, this involved discussion with paediatric and nursing colleagues, to ensure enthusiasm and support from those not directly involved. For those involved in assessing the children, it was necessary to provide information and training, to allow them to become interested in the service, and to develop a degree of competence, while recognising their limitations. Advice is available to the Audiology Nurses, on a day to day basis from the paediatric staff, though for specifically audiological matters there is a difficulty in providing a point of contact between visits but the need for this was at least minimised by providing clear, unambiguous and written instructions for all procedures.

Equipment was minimal and all used to date has been donated. I suspect that country wide we must have a reasonable source of equipment that has been superseded and which could prove useful for similar projects. Requests to local services prior to my first visit resulted in more equipment than I could transport or use.

In addition to equipment, it was also possible to collect a quantity of hearing aids, again from local services, - mostly used aids, surplus to requirements or superseded. All those found to be functioning to specifications were donated to the School for the Deaf - their first donation of hearing aids for 3 years.
A hearing aid company donated a supply of batteries.

The invitation to be involved in a short-term study offered two alternatives. Firstly, a short term, hands on involvement with the study group, or secondly, an attempt to use available resources and manpower to feed into existing health care services to allow the development of a service with the potential to continue beyond the study period. The latter was clearly the preferred option.

The Audiology Nurses continue to provide assessment for children following bacterial meningitis and are also happy to see other children in the unit about whom concern is expressed. I will have the opportunity for a final visit next year funded by the research project, and will be able to review the work. I very much hope that this service will be able to continue in the future when the meningitis study has been completed, improving the provision for children with hearing impairment, congenital or acquired in that part of Africa.

The last 2 decades of the twentieth century have seen rapid developments in the world of Paediatric Audiology, both in technological advance and service development. The prospects for continuing progress in the early years of the twenty first century are exciting and challenging for those of us who are involved.

Equally exciting would be the prospect of contributing either directly for those fortunate enough to have the opportunity to spend even a short time involved in work overseas, or indirectly by becoming involved in the collection of equipment or hearing aids for use in developing services in the developing world
Perhaps these are roles we should consider, as individuals or as an organisation.

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Appendix 1

Written Instructions for Audiology Service

1. Discussion about listening behaviour, hearing and speech. Use of the Question sheet
2. Use of the Audiometer
   Technique for Pure Tone Audiometry
3. Technique for Distraction testing
4. Use of the Sound Level Meter
5. Use of the Free Field Audiometer
6. Procedure for Speech discrimination Test
7. Follow - up arrangements.

Appendix 2

Child's Name _____ Date _____

Date of birth _____ Diagnosis _____

Can he hear?

Loud sounds?
Quiet sounds?
When he is not facing you?

Does he understand what you say?

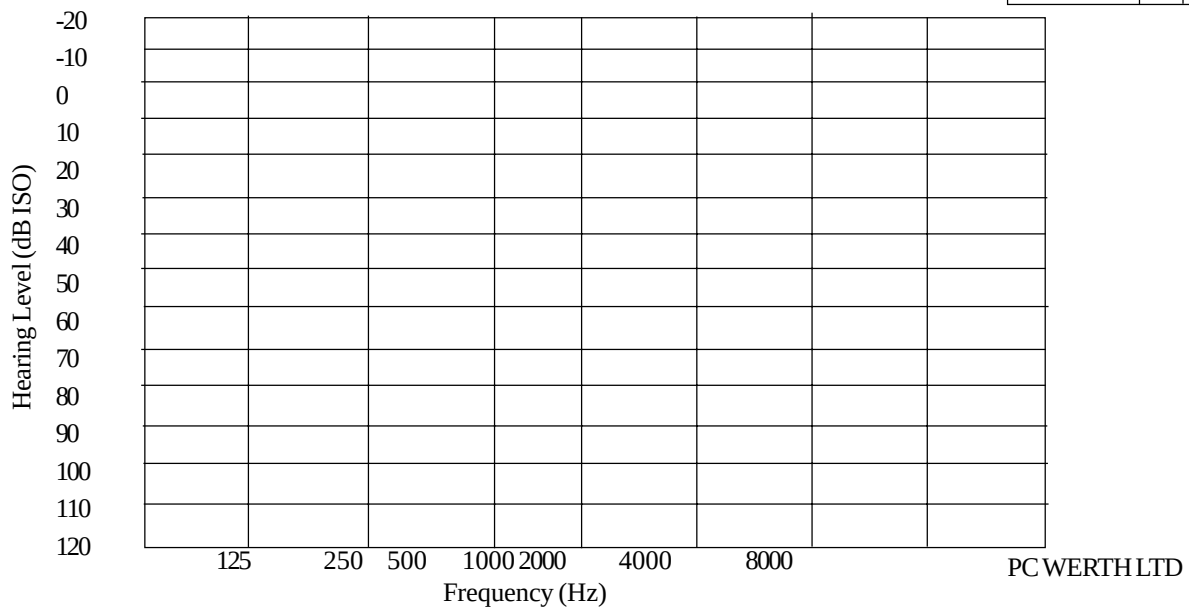
Does he speak?
Is his speech normal/clear?
Does he have ear trouble?
Discharge?

Speech Test

Normal voice
Normal voice (mouth covered)
Quiet voice (mouth covered)

AUDIOGRAM KEY	L	R
Air Conduction	X	O
BC Unmasked	△	△
BC Masked	]	[

PURE TONE AUOIOGRAM



THE BACDA PRIZE AWARDS
Paediatric Audiology towards the Millennium

Dr. Danny Lang
Launceston, Cornwall

An A to Z view

A

Audiology/audiologist
Never has one word in health care meant so many different things to so many different people. In the USA an audiologist is most likely to be a basic science graduate with a Masters in audiology usually obtained over two years including supervised practice. In the UK audiologists can come from a wide range of backgrounds and experience. In the new millennium we should define the tasks that need doing and ensure correctly trained staff are available.

Aetiology
When we confirm the presence of a significant permanent childhood hearing impairment (PCHI) we may consider this a diagnosis in itself. Parents/carers do want to know the cause in most cases; therefore we need a structured and family friendly approach to the diagnosis of cause.

B

Battery
We should recognise that paediatric audiology requires a systematic approach which includes history taking, physical examination and correctly selected audiometric, electrophysiological and other investigations. We should continue to be cautious of opinions based on one test.

Balance
PCHI / OME may be associated with permanent / transitory balance problems in childhood and we must recognise this in our assessment and management.

British Associations and Societies
There are many and I hope I have not left any out. It is important that we all work together to share our knowledge and skills in the new millennium.

British Association of Audiological Physicians	(BAAP)
British Association of Audiological Scientists	(BAAS)
British Association of Audiology Technicians	(BAAT)
British Association for Community Child Health	(BACCH)
British Association of Community Doctors in Audiology	(BACDA)
British Association of Otolaryngologists, H & N Surgeons	(BAO-HNS)
British Association of Teachers Of The Deaf	(BATOD)
British Cochlear Implant Group	(BCIG)
British Society for Mental Health and Deafness	(BSMHD)
British Society of Audiology	(BSA)
British Society of Educational Audiologists	(BAEA)
British Society of Hearing Therapists	(BAHT)
MRC Institute of Hearing Research	IHR (MRC)
National Committee of Professionals in Audiology	(NCPA)
Royal College of Paediatrics & Child Health	(RCPCH)
Royal College of Speech & Language Therapists	(RCSLT)
National Deaf Children's Society	(NDCS)
Royal National Institute for Deaf People	(RNID)

C

Communication
The debate surrounding communication options for deaf children has been described as "not so much a debate as a partisan war"[1]. Our speciality exists because deafness or hearing impairment can have significant effect on human communication.

We should do all that we can to facilitate effective communication without prejudice. Sadly the scientific evidence for best practice is limited for a variety of reasons including low prevalence and varying degrees of impairment. What advice should paediatric audiologists give in this area? In most cases the parents of children in whom deafness has been discovered approach us in the context of the medical model. They may hope for us to offer a medical "cure".
Doctors working in audiology should:

- inform them of all approaches to communication
- support them to see the deafness in the context of the whole child
- show positive aspects of deafness (including role models)
- recognise the long wait, even with cochlear implant, before words come
- consider use of sign support with oral / aural approaches in the early preschool years
- be involved in the developmental review of the child
- include the carer's views and feelings throughout childhood
- seek better evidence for all communication approaches

Child Health Promotion
Screening has been subjected to rigorous examination [2,3]. It appears we are headed towards a child health promotion approach, which will include fewer scheduled checks or screens. It is hoped that the approach will deliver effective information to carers about hearing and allow the family friendly services to respond quickly even when the family does not recognise significant hearing impairment.

D

Doctors in audiology
Let us hope that audiological physicians, ENT specialists and paediatricians can define the roles and work together to deliver the medical input to equitable, family friendly services.

E

Education
A recent review of the educational achievements of deaf children found that there has been no major study in the UK since that of Conrad (1979) and that there is no substantive evidence to demonstrate any overall improvement since that study .[4]
In the new millennium education for the deaf / hearing impaired should be inclusive, effective, equitable and available to infants referred from universal neonatal hearing screening (UNHS).

Evoked potentials/emissions
One cannot live on ABR / TEOAE alone. In this age of technology carers and professionals hold the high tech. investigations as being the gold standard. A presentation by Mike Vidler (BSA Conference 1999) stressed the importance of objectivity in reading ABRs. Pending a foolproof automatic objective system he suggested all childhood ABR results be double checked. We should be applying bone conduction and frequency specific ABR tests as routine in neonatal assessments. ABR / TEOAE are essential in millennial paediatric audiology but we should remember as physicians / paediatricians that we should retain the approach of history and examination before investigation tests when assessing any child.

F

Family friendly
The term is being used to describe the nature of paediatric audiology services that will receive referrals from universal neonatal hearing programmes.[5] Hopefully services across the country will be able to provide family friendly services as described by the authors.

G

Genetics
Advances into the genetics of deafness will continue into the new millennium and doctors working in audiology will have to keep abreast of the scientific developments and ethical issues. The National Deaf Children's Society has issued a policy statement on genetics and deafness, which addresses the key ethical points [6].

H

Hearing aids
There have been great advances in both the ergonomics and signal processing with the benefits of digital technology and programmable systems taking things forward. Killion, in his interesting editorial, stresses that we are still "moving towards normal conversations in noise".[7]

I

Implant
We have seen this tremendous innovation help so many individuals. The science behind it has accelerated our understanding of the cochlea and also led to multidisciplinary teams whose shared knowledge has moved (paediatric) audiology forward. In the next millennium it will be interesting to see how the criteria for implant alter. It would also be welcomed if the teams can work more closely with the up and coming family friendly district audiology services so that more of the assessment and rehabilitation can be done closer to home.

J

Jargon
Through the mists there came a "raft" of child health promotion measures drifting downwards on the river of efficiency and effectiveness, the rudder grounded again and again on crags of clinical governance until reaching the bay of evidence base. So was the raft sucked away by the rip currents of rationalisation into the sea of oblivion.

K

KEMAR
A model that simulates the acoustic properties of the average adult head and torso, incorporating a Zwislocki coupler (see Z). Should we really have such a model for neonates?

L

Language
Colourless green ideas sleep furiously. (Sentence to illustrate grammatical structure as independent of meaning) *Noam Chomsky* who, according to Pinker, is currently among the ten most cited writers in all the humanities (after Marx, Lenin, Shakespeare, the Bible, Aristotle, Plato & Freud). The message seems to be that language is innate [8]. Pinker goes on to illustrates the difficulties of English.

Beware of heard, a dreadful word
That looks like beard and sounds like bird,
And dead: it's said like bed, not bead-
For goodness' sake don't call it "deed"!
Watch out for meat and great and threat
(They rhyme with suite and straight and debt).
The Language instinct (1994,) Stephen Pinker

We should do all we can to make the process of language acquisition easier for children with hearing impairment or deafness.

M

Mild and Moderate PCHI
The Critical Review[3] and the BACDA EARly audit [9] show how easily moderate PCHI can be discovered late. Children with mild impairment are even harder to find. How are we going to manage neonates with ABR results in the region of 40-50 dBnHL? The answers are not simple and will require most careful consideration taking into account the overall needs of the child and family.

N

Nordic lands
I regret that the bulk of the literature informing decision making in public health / paediatric audiology is of Anglo / USA origin. We can learn from the long traditions of public health and audiology in the Nordic lands.

Norway
The first step towards public responsibility for primary health services in Norway was taken in 1603 when the King of Denmark, who also ruled over Norway, appointed a physician in Bergen. He was to concern himself with health in general and epidemics of contagious disease. Bergen has a long and continuing tradition in public health including pioneering work in showing leprosy to be an infectious disease, developing registers for leprosy and tuberculosis and more recently establishing a national register for congenital abnormalities.

Sweden
Aira Kankkunen produced a fascinating and thorough study of pre-school children with impaired hearing addressing issues of identification, assessment, aetiology and progressive impairment[10] The publication indicated that as far back as the 1970's the parent's of infants in Gotenberg were given an information leaflet on "The ear - an important sensory organ" which gave them information on early reactions to sound, normal language development and where to get help. Such approaches commenced later in the UK. Liden, also from Gotenberg developed osseo-integration for bone anchored hearing aids and prosthetic ears.

Denmark
Perhaps having Hamlet's father poisoned via the ear raised the Danish awareness of the ear. There is a great tradition of manufacture of audiological equipment and hearing aids and also the work of Angete Parving in paediatric audiology.

Finland
A study from Northern Finland showed that 88% of children with normal hearing or very minor hearing impairment are accepted into intermediate education (17-20 years of age) compared with 64% of children with a hearing impairment greater than 25dBHL in the better ear[11] The difference remained after adjustment for all significant perinatal and social factors. When they looked at outcomes at 25 they noted that the hearing impaired group were twice as likely to be unemployed. Such research would be difficult to replicate in the UK due to the fragmented nature of our health, education and social systems. The following messages can be taken from the study

- Finland has high ambitions for all their children with 88% going on to post 17 education.
- Even mild hearing impairment affects educational and social outcomes
- There is a multi-stage hearing screening programme in Finland
- The research team stressed the need for better awareness and training in primary care [12].
- The research team have not adopted the British "best buy" approach to hearing screening

O

Otitis media with effusion
So much has been said by so many about this issue. Perhaps it will disappear in the new millennium as it so mysteriously appeared in post war times. In case it does not we should be encouraging the installation of sound field enhancement in all classrooms as standard to help all children including those with OME, mild PCHI, unilateral losses and ADHD [13]

Otoacoustic emissions
A landmark discovery in audiology, allowing greater understanding of cochlear function and paving the way for neonatal screening. It is interesting to speculate on what will be the next great step in audiology.

P

Paediatrician or Physician
At present doctors working in paediatric audiology can be aligned to BACDA, BAAP or both. It seems inevitable that there will be a few boundary disputes as in all areas of health service provision but would seem most sensible for both organisations to work together sharing knowledge and experience. Should BACDA and BAAP unite in some form?

Q

Quotations

Words are only motion and form	Francis Bacon
You can do anything except hear.	1 King Jordan. President of Gallaudet University
Audiology will be done by audiologists	M P Haggard & C P Pullan
Otitis media with confusion	M P Haggard
Colour is the eye's music	Lorca
Paediatric audiology and the practice of cochlear implantation for the very young are now ideally positioned to take off in the fast lane	B McCormick

Most of the work in paediatric audiology will be done in the inside and the middle lanes.

R

Rurality

Academics, like politicians in central government, often fail to understand the problems of rurality. The difficulty of providing services for low prevalence conditions such as PCHI is compounded by the effect of distance. Solutions for cities will be different than those for rural areas. In terms of manpower provision for paediatric audiology the additional difficulties should be acknowledged.

S

Neonatal screening

What more can be said. Let us hope that UNHS can deliver the goods for that small but important group of children with moderate, severe and profound PCHI. We must ensure that we can identify mild, late onset and progressive cases with PCHI.

Screening in Finland

The programme for universal screening of hearing based on the proposal by the Finnish National Board of Health (1990) was:

- Newborn: evoked potentials **(** OAE is being introduced)
- 8 months: distraction test *45dB,* 3kHz warble tone*
- 2-3years: speech test + observation of speech development
- 5 years: audiometry
- School screening (age 7, 10, 15) audiometry

***** It is important to note the criteria for the distraction test in Finland. This protocol was found to be more efficient in defining sensorineural cases and cases of OME which reduced thresholds at higher frequencies, releasing OME cases only affecting the lower frequencies.

This comprehensive programme recognises the possibility of progressive / late onset and mild hearing impairment. It underlines the Finnish commitment to find as many cases as possible.

School age screening

Should it go or should it stay? The limited structured data we have in the UK shows a lack of a national protocol [14] and the impression, on informal discussion, is that few new cases come to light through the screen. Still there are some points to consider before tossing it off the "raft".

- Consider retaining the screen at a time of change to monitor outcome of new screens
- UNHS aims to detect moderate, severe & profound cases but the Finnish study [11], and our experience, show that mild PCHI can have significant effects
- Confirmation of normality may be useful when future hearing, developmental or behavioural conditions are suspected
- The screen can audit progress/management of cases identified pre-school
- The screen can make the school aware of cases with known PCHI/OME
- The screen is an opportunity to raise and maintain awareness about PCHI/OME in schools
- The screen data can contribute to public health studies about hearing impairment

T

Tinnitus

Tinnitus does occur in childhood but can be difficult to recognise[15]. We should be aware of the possibility especially in hearing aid wearers. Adults having cochlear implantation have noted improvement with implantation. So for some children decreased tinnitus may be an additional benefit of implantation[16]

U

Unilateral hearing impairment

We should recognise the difficulty the problem can cause even though the threat to language development is not so great. Why is it that unilateral microtia is right sided in the majority of cases. Microtia is a rare presentation (1: 10,000). The parents need quality information in the early weeks.

V

Visual reinforcement audiometry
This technique is most valuable in producing reliable audiometric information early in infancy. We should be establishing standardised procedures for carrying it out, both in the sound field and using inserts.

W

Wilde (Oscar)
Why should the son of an ENT surgeon have such good quotes? I could not find a direct reference to audiological practice but .....

It is very vulgar to talk like a dentist when one isn't a dentist. It produces a false impression.
The Importance of Being Ernest

A man who knows the price of everything and the value of nothing.
Lady Windermere's Fan

X = unknown

Number of paediatricians wishing to train in paediatric audiology in 2005=X
Number of doctors working in paediatric audiology in 2005= X
Median age of discovery / diagnosis of PCHI in 2005=X
Number of major research studies on achievements of deaf children by 2005=X

Y

Youth
Adolescents and young people with a disability including deafness will often go through a period of anger and resentment towards the disability and those that try to help, especially the parents or carers. Hearing aids and cochlear implants may be rejected. We must be sensitive and understanding to their needs and ensure they have access to all support that they may need from health, education and social services.

Z

Zwislocki coupler
A device that couples a hearing aid receiver to the microphone of a sound level meter and a great phrase to end on.

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