Influences on clinical practice: the case of glue ear

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Abstract

A case study of clinical practice in children with glue ear is presented. The case is part of a larger project, funded by the North Thames Research and Development Programme, that sought to explore the part played by clinicians in the implementation of research and development into practice in two areas: adult asthma and glue ear in children.

What is striking about this case is the differences found in every area of the analysis. That is, diversity was found in views about diagnosis and treatment of glue ear; the organisation of related services; and in the reported practice of our interviewees, both between particular groupings of clinical staff and within these groupings. The challenge inherent in the case is to go beyond describing the complexity and differences that were found, and look for patterns in the accounts of practice and tease out why such patterns may occur.

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There is growing interest in the potential benefits promised, both quality and the use of resources, by more effective implementation of evidence emanating from biomedical research and development. In the context of the UK NHS, this interest is evident in the discussions of evidence-based medicine and the more recent NHS policy initiatives that have created an array of organisational structures and processes designed to improve clinical effectiveness. The success of such national initiatives will be judged by the extent to which they result in significant change in clinical practice in line with the "evidence". Little is known, however, about how clinicians change their practice and, in particular, what the key influences are that shape clinical practice. The case study presented here is part of a research project designed to understand the social context in which decisions about clinical care are made in the UK NHS context,^{1a 1} and to identify the factors which clinicians in primary and secondary care see as encouraging or discouraging the development of evidence-based practice.

The research strategy used was based on comparative case studies.¹ An important advantage of this method is that it affords an opportunity for an holistic view of a process. Drawing on traditional methodologies associated with case studies (interviews, questionnaires, documentary analysis, and participant observation), we were able to generate rich descriptive accounts of approaches to clinical practice and improve our knowledge of the

social and organisational context in which clinical practice occurred. The case study method also allowed us to capture and control for the effects of several organisational variables thought to impinge upon clinicians' decision making and the diffusion of research and development findings.

The project focused on clinical behaviour and attitudes associated with the diagnosis of two conditions: adult asthma and glue ear in children. The conditions were chosen for their ordinariness as commonly occurring within the routine clinical experience of practitioners in primary and secondary care. Glue ear in particular was chosen because a national effective healthcare bulletin existed. The condition also offered us an opportunity to study an area where the evidence suggested discontinuing activities, whereas much previous research has examined the uptake of new innovations. The fieldwork was done by the research team that comprised two organisational sociologists in management analysis, a doctoral student in organisational behaviour whose previous career was in laboratory science, a health policy analyst, and a former general practitioner (GP).

The article is organised into three main parts. Firstly, a description of the research methodology is provided; secondly, the results of the case study are organised to provide a qualitative description of the findings on clinical organisation and management of glue ear in children, and an analysis of clinicians' objective accounts of the nature and reasons for their own and others' practice. Finally, we provide a concluding section that centres on emerging themes and their significance.

Research design and methodology

We studied four sites in two NHS regions: two of the sites were centred on teaching hospitals (Juniper and Chestnut), the third on a satellite teaching hospital (Wisteria), and the fourth on a district general hospital (Holly). As the research also aimed to explore differences between primary and secondary care settings, a representative sample of general practice in each location was included in the study. Data about each of the participating hospitals and general practices were collected. Relevant documentation was also sought from the health authority which was the major purchaser of clinical services from each participating hospital site and associated GPs.

Sustained efforts were made to collect any available process or outcome measures related to our chosen conditions, for example prescribing data, referral rates, waiting times for surgery, operating times for surgery, and systematic clinical audit. Regrettably, nothing systematic was available to us in any of our sites. Mentions

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Glue ear

Glue ear or otitis media with effusion is a condition characterised by the presence of fluid (effusion) in the middle ear cavity. Glue ear is the most common cause of hearing impairment and the most common reason for elective surgery in children. Glue ear should not, but often is, confused with acute otitis media characterised by the presence of an acute onset of symptoms (pain/fever) and signs (red, bulging eardrum). Episodes of acute otitis media may be more common in children with glue ear. Neither should glue ear be confused with chronic suppurative otitis media where there is persistent infection of the middle ear which can lead to structural damage and worsening deafness. At any point in time, approximately 5% of children aged between 2 and 4 years are likely to have a bilateral hearing impairment as a result of glue ear which persists for at least 3 months. Most episodes are of short duration and resolve spontaneously.¹ The average rate of surgical treatment for glue ear through the insertion of grommets in England is estimated to be 4.7/1000 children under the age of 15 each year.²

Reasons for seeking to influence current practice

Black, in several papers in the mid-1980s pointed out the marked increase over recent years in the number of grommet insertions, and expressed doubts whether current high levels of surgery were necessary.^{3,4} He details the history of the treatment of glue ear revealing a succession of "fashions" usually adopted with little concern for evidence, which are later shown to be either ineffective or actually dangerous.⁴ Further research suggested there was insufficient evidence to demonstrate a causal link between untreated glue ear and significant disability.⁵ Variations have been shown to exist in the rate of surgical treatment in different parts of the country.⁶ Further variation has been discovered in the proportion of children treated as inpatients and day cases.⁷ There are considerable economic advantages offered by day case surgery, and grommet insertion/myringotomy is currently recommended as a day case procedure.⁷ The arguments for changing current practice in treatment of glue ear were stated in an *Effective Health Care* bulletin which we believed at the start of the project to have been widely circulated to departments of public health, to ear, nose, and throat (ENT) departments in hospitals, and to GPs. The main thrust of the argument of the bulletin is that the evidence suggests that glue ear is in most cases a self limiting problem and

that, although improvements in hearing were observed immediately after grommet insertion, there was very little difference in hearing between children who had grommets inserted and those who did not when both were reviewed one year after the operation. Similarly, where grommets were inserted unilaterally for bilateral glue ear, little difference was found between the treated and the untreated ears at 12 months.⁸ Further evidence is given in the bulletin to the effect that any long term physical damage to the ear as a result of the presence of "glue" is negligible when compared with the risks associated with intervention. No benefits can be described to counter concerns that a policy of watchful waiting would produce unnecessary suffering for those children where the glue ear proved to be persistent and grommet insertion was finally recommended. However, overall benefit (clinical and fiscal) was perceived in lessening the number of children undergoing surgery.

Negative outcomes associated with grommet insertion

In addition to evidence that grommet insertion might not significantly improve outcomes in many cases of glue ear, evidence is cited of unwanted sequelae of grommet insertion. Tympanosclerosis (42% at five years), thin scars (13% at five years),^{9,10} and chronic perforation, although uncommon as a result of simple grommet insertion, were known to occur where grommets had been left in situ for long periods.¹⁰ Infection is common after grommet insertion, with 20–35% of children likely to experience discharge from an ear.¹¹ Finally, it is acknowledged that there is some risk attached to any procedure involving general anaesthetic.

Negative outcomes associated with the failure to treat glue ear in children

Various disabilities (for example compromised levels of social functioning, language competence and speech production, and learning or behavioural difficulties) may result from persistent hearing impairment. Concerns have been expressed that even a short period of diminished hearing can have serious consequences if occurring at crucial times during a child's development—while speech is being acquired and during early school years. Although there is a sizeable literature examining these links, most studies are of poor quality, small size, and include children who have had surgery for glue ear and therefore do not give a clear picture of what would happen without treatment.^{12,13}

Box The state of the evidence for glue ear

were made of audit or various sources of data, but very little was available. The project was therefore restricted to the analysis of subjective data, collected from clinicians who described their own and others' practice.

CHOICE OF INDIVIDUAL RESPONDENTS

An approach by letter and follow up with telephone calls were made to identify hospital based doctors, audiologists, and nurses involved in receiving, diagnosing, or treating

Table 1 Interview respondents

	Paediatrics				ENT				Audiology				Total
	Juniper	Holly	Chestnut	Wisteria	Juniper	Holly	Chestnut	Wisteria	Juniper	Holly	Chestnut	Wisteria	
Consultant	0	1	0	2	3	3	2	2	6	1	4	2	26
Senior registrar	0	0	0	0	3	0	2	1	0	0	0	0	6
Registrar	0	0	0	1	3	0	1	1	0	0	0	0	6
Senior house officer	0	0	0	0	0	2	2	3	0	0	0	0	7
House officer	0	0	0	0	0	0	0	0	0	0	0	0	0
Nurse/misc	0	0	0	0	1	0	0	1	3	0	1	4	10
Total site	0	1	0	3	10	5	7	8	9	1	5	6	55
GP	6	7	8	10									
Practice nurse/ health visitor	1	4	1	4									
Total primary care based	7	11	9	14	41								
Total secondary care based	19	7	12	17	55								
Total	26	18	21	31	96								

children with glue ear. In choosing GPs to interview, an attempt was made to select a sample which would be reasonably balanced according to several factors, including the number of principals in the practice, the proportion of fundholding and non-fundholding practices, and the age and sex of GPs. The age and sex of the GPs turned out to be difficult to control, and we were heavily dependent on the goodwill of whichever member of the practice would agree to be interviewed. In three of the areas, single handed GPs were particularly resistant to being interviewed, whereas in the fourth, they were positively eager. For glue ear there were some 95 respondents involved in monitoring or providing care. Table 1 gives the breakdown of the interview respondents.

DATA COLLECTION

Preliminary work was done by our medically qualified researcher to establish, as far as possible from the literature and scoping discussions with practitioners and experts, the state of evi-

dence for glue ear; the box reports this. This brief review of the "evidence" highlights the diversity of viewpoints among those who seek to contribute to debate in this area. Evidence pertaining to this condition is contested and problematic. Controversies include the appropriateness of medical approaches to management, such as the use of antibiotics, anti-histamines, decongestants, or anti-inflammatory agents; the actual choice of grommet design and materials; the advantages of the insertion of grommets alone or with an adenoidectomy or tonsillectomy to diminish rates of recurrence of glue ear; and advice about swimming after grommet insertion. The major debating point relates, however, to the appropriateness of maintaining a high threshold for surgical intervention given that the majority of cases of glue ear have resolved by the time a child reaches the age of 10 years old. The opposing view is that even though these children may recover normal hearing by the time they are 10, the social and developmental damage caused by their temporary deafness has not yet been adequately evaluated. There is no particularly strong evidence about which factors may help predict which children with glue ear will benefit most from grommet insertion. None the less it is accepted that where there is evidence of social and intellectual difficulties, improvement in hearing is more imperative.

A semi-structured interview schedule was piloted and refined. It asked respondents to reflect on their day-to-day practice, how practice had changed, the key influences, and how they kept up to date in this area. During each interview, respondents were asked to fill in a ticklist to show their assessment of the importance of various influences on their practice (table 2). The ticklist was designed by the research team.

DATA ANALYSIS

The interviews were taped and fully transcribed. We used NUD.IST (non-numerical unstructured data: indexing, searching, and theorising) qualitative data software to code the interview transcripts, placing the coded segments of text into designated "nodes" which corresponded either to demographic information (for example site, position, specialty) or themes emerging from the data. This enabled

Table 2 Ticklist data

Item	Level of importance: glue ear		
	High %	Medium %	Low %
Research evidence in journals	48	38	14
Research evidence from conferences	30	27	43
Royal colleges guidelines/statements			
<i>Effective Health Care</i> Bulletin	20	26	54
Local guideline	51	28	20
Other consultants in this trust/principals in practice	34	32	34
Junior staff in this trust	6	25	69
Referring general practitioners (secondary care respondents)	4	28	68
Hospital colleagues (primary care respondents)	53	26	21
Specialist nurses	23	27	50
Pharmacists			
Primary healthcare team	19	19	62
Ward rounds/case conferences	25	29	46
International/national experts	29	37	34
Local colleagues outside this trust	13	32	55
Financial considerations	7	19	74
Market considerations/competition	1	3	96
Contract specifications	9	17	74
Managers	7	4	89
Health authority managers	12	10	78
Your early training	28	32	40
Your ongoing training	57	36	7
Your own research	17	17	66
Your clinical experience	70	30	1
Your personal experience	21	19	60
Patient/parental views	60	28	12
Patient pressure groups			
Drug reps/companies	0	7	93
Mass media	1	19	80
Risk of litigation	10	16	74

us to explore the interrelationships between significant variables. The interview data were also coded using a frame derived from the research team's discussion of salient themes. This coding exercise was analysed using SPSS and enabled the derivation of frequency tables and content analysis which, when used in conjunction with NUD.IST analysis, facilitated an indication and spread of different responses.

Results

Specifically, the results of our case study work are organised to describe the various pathways children can follow as they are cared for, as well as the organisational and managerial arrangements that underpin this complexity. The variation in practice between, and within, categories of medical staff involved, is also discussed.

ORGANISATION AND MANAGEMENT

We found that targets set by health authorities for reducing grommet operations are, in practice, difficult to achieve. This is partly because of the variety of individuals, professional groups, and organisations involved in the diagnosis and treatment of glue ear, all of whom have opinions on appropriate practice and can, to a greater or lesser degree, affect treatment patterns, organisational arrangements, and, ultimately, outcomes in this area. Primary recognition of hearing impairment may occur naturally through observation by parents or other associates of the child (child minders, school teachers). In such cases, professional advice is likely to be obtained from the child's GP. Where the diagnosis of glue ear is made by GPs, the GPs have a choice. They can carry out their own "watchful waiting"; they can refer the child for audiometric testing which may be in the community audiology clinic or in the hospital ear, nose, and throat (ENT) department; they can ask for an audiological assessment by the community audiologists or, if there is one, by the hospital audiological physician; or they can make a direct referral to the ENT surgeons.

There are also organised hearing screening programmes which are intended to provide early diagnosis of sensory neural deafness which incidentally pick up cases of conductive hearing loss which is mostly caused by glue ear. Check ups on pre-school children are carried out regularly by health visitors who test hearing and language development. Children entering school are, in most areas, given a hearing test by the school nurse. Both health visitors and school nurses are given guidance for testing hearing by the community audiology department, which is also responsible for updating them. Children failing either the health visitor or school nurse screening tests are often referred directly for more detailed hearing assessment in an audiology clinic. This may be attached to a hospital ENT department or be situated in the community at a local health clinic.

Audiology clinics in the community and hospital may perform a gatekeeper role, and it is here that watchful waiting may take place. Audiologists' choices of treatment are partly

Figure 1 Referral paths and potential waiting points for glue ear.

determined by their seniority and training. If they are medically qualified they can make referral decisions and pursue a watchful waiting strategy. If not, their role is typically limited to conducting the hearing tests and ensuring the results are given to ENT specialists or back to GPs. For fundholding general practices, this may be a requirement.

ENT surgeons may receive referrals directly from GPs or from audiology departments. ENT surgeons have two main choices, they may accept the evidence of demonstrable hearing loss and abnormal clinical findings as sufficient reason for deciding to put the child on the waiting list for grommet insertion at the earliest opportunity, or they may decide to impose a further period of watchful waiting. ENT clinics are usually run by consultants or senior registrars, but work may be shared with more junior staff (senior house officers and junior registrars and sometimes locums). The diagrammatic presentation of the referral paths and potential waiting points for glue ear (fig 1) show the complexity discussed above.

Managerial groups may also affect treatment patterns. For example, public purchasers are in a position to refuse to finance grommets or to impose conditions which must be adhered to before such operations can be carried out. Purchasers are also able to affect organisational arrangements, for example by agreeing to finance larger or smaller community audiology departments. The *Effective Health Care Bulletin*, when assaying a cost analysis of improving current practice in relation to glue ear, suggests that from the point of view of the purchasers the provision of extra audiology services to offer watchful waiting to children who would otherwise have been referred earlier to an ENT clinic, would not only be intrinsically costly, it could also result in the uncovering of a previously unmet need resulting in an increase in appropriate surgical activity particularly in the younger age group. Public health physicians influence glue ear management as they formulate screening policies for the health authority. Trust provider management can influence particular staffing issues within the hospital, operating, of course, within the wider policy and resource context.

In our sites, considerable diversity existed in how the services were organised and how the various groups involved related to one another. Each hospital worked with a different screening procedure. Bearing in mind that the main aim of screening is to detect sensory neural deafness, one health authority (Wisteria) de-

cided to provide testing brain stem evoked response (BSER) for all children born in one of their hospitals. After a period of evaluation of the success of this procedure, it was agreed to drop the distraction test for 8 month old babies. This test was formerly given by health visitors on all babies and was a rich source of possible cases of glue ear. This should theoretically lessen the health visitors' workload and cut down on the number of unnecessary checks which have to be done in the local audiology department on babies with temporary hearing impairments. In none of the other sites was universal BSER available for neonates and there was no suggestion in these sites of dropping the distraction test for 8 month old babies. One authority, however, chose to do the distraction test earlier than 8 months (at 6 months) in an effort to ensure the earliest possible recognition of sensory neural deafness. There is some argument as to when this test becomes reliable, and 7–8 months was previously considered by most audiologists to be the appropriate age for doing the test. In Juniper, a decision has been made to drop hearing tests in primary schools and to rely on vigilant observation of children (by parents, teachers, special needs workers, etc) to recognise any hearing problems that might exist. In contrast to this, Holly tests children on school entry and again at ages 5 and 7. In this same area there were complaints that having no local audiology clinics meant the tests that were done were carried out in such unsuitable locations that they were of dubious reliability. Whatever system of screening in each site, it served to inform clinical practice in a primary and secondary context.

In the primary care setting we found differences in the relative involvement of GPs and health visitors in the initial screening of children. In some practices GPs were never involved, in others more of a partnership arrangement existed. We also found differences in the nature and extent of the involvement of the community audiology department in the training and development of health visitors.

We found considerable variation in the way audiology services were provided. The main differences were in the size and make up of the community audiology services and the extent to which they were integrated with the hospital services. In Wisteria, the lead community physician is also a part time member of the hospital ENT team. This dual role appeared to be an important bridge between what, in our other sites, were quite separate services. In Holly, there is no community audiology service, but a children's hearing clinic exists in the hospital site, although it is separate from ENT audiology. Chestnut and Wisteria have highly developed community audiology services led by physicians who are specialists in audiology. Juniper community audiology services is led by a community paediatrician, and its hospital services by an educational audiologist. In Chestnut, there are specialist audiology senior community medical officers based in the community, and in Wisteria the lead audiological

physician is hospital based and part of the ENT team as well as leading the community team.

In each hospital site there were differences in the numbers and seniority of the doctors involved. The make up of the specific ENT team proved important as it resulted in differing experiences of managing glue ear. The make up of the team was particularly important for junior staff. Where there was a shortage of senior staff, juniors were given more general responsibilities for consultation and follow up, but they were not always able to assist in the insertion of grommets because of the lack of seniors to supervise them.

There were also differences in the non-clinical resources deployed in each site. For example, two sites (Juniper, Chestnut) had a dedicated ENT office, two did not. Three sites had an ENT library, one (Wisteria) did not. These facilities proved important in facilitating access to research and discussion about clinical issues.

The particular organisational arrangements we found in each of our sites appeared to have emerged over time rather than being the subject of planning. We were often told stories of how current organisational arrangements came to be—for example in one of our sites, Wisteria, the large audiology set up emerged as a result of the efforts of a charismatic audiologist in the 1970s. In Holly, the children's hearing clinic is located in ENT because the clinician in charge developed the service there some years ago. There is little exchange of information between the clinic and the separate ENT audiology service. It is within a particular inherited context, such as the two examples given here, that the groups involved have negotiated patterns of practice which become shared and understood in the way that glue ear is treated. This understanding is often renegotiated as one group or an individual seeks to make changes.

Our data suggest that change is often ad hoc and generally led by individual clinicians. Rarely in our cases were there references to change being sought by managerial groups. Representatives of the managerial groups we interviewed revealed that glue ear was not a priority. In most cases the services were thought to be "adequate", "ticking over", or the service was an "agenda item for the future". One medical director confessed to being disappointed "with the lack of interest from the health authority" and linked it partly to the fact that public health training has not emphasised child health as it did in the past. In short there appeared to be few incentives for those overseeing these services to change current arrangements; indeed, one could argue that the organisational arrangements we have discussed, coupled with the complex interdependencies between groups, constitute significant disincentives to try to make more strategic changes.

DIFFERENCES IN PRACTICE RELATED TO THE ROLE OF THE RESPONDENT

For each category of clinician involved in the treatment of glue ear, we reflect on what prac-

tice entails and what clinicians say influences their practice.

General practitioners

In most cases the only instruction GPs spoke of having received in glue ear had been from other GPs during their trainee year. Although all vocationally trained GPs would have done six months as a paediatric senior house officer, this did not necessarily result in learning about glue ear.

There were differences in opinion among GPs as to what glue ear was and how it came about. For example:

"I personally think that it is because of the perennial rhinitis all the year round—you have a sort of catarrh in your nose, it does go and the first thing to go is the ear." (GP, Wisteria)

"Glue ear is when there is a lot of discharge in the children." (GP, Wisteria)

GPs in our sample did not feel that "evidence" helped. They appeared confused about the appropriate management of glue ear because of what they perceived to be ever changing advice:

"The problem with glue ear is that the fashion changes every five minutes, it is useless being taught about glue ear because as soon as you think you have got it cracked they will change the fashion again." (GP, Chestnut)

"We over a period of time have gone through a stage where first of all grommets were used intelligently and occasionally, and as time went on, they became used more and more and then suddenly in about 1987 they became the possession of the media and over a period of time if you didn't have grommets you were deprived and everyone had grommets. Now there is a little bit of a backlash coming on and people are beginning to say these things cause trouble." (GP, Wisteria)

Most of the GPs interviewed experienced glue ear mainly in relation to recurrent otitis media. It is as a response to this often distressing and painful condition that an early referral is often rationalised:

"If a child is in pain I will give analgesic and see how things go, but if it is no better I tend to give a five to seven days course of antibiotics... If it is a recurrent otitis media they keep on getting then I do refer rather than waiting till it gets worse because obviously it can affect their performance." (GP, Wisteria)

We found variation in the numbers of cases of glue ear diagnosed:

"I don't see glue ear very regularly and would not diagnose it more than once a year I would think." (GP, Chestnut)

Another GP, however, claimed to have referred at least 30 cases, maybe more, each year.

Many GPs mentioned the use of antibiotics or decongestants, or both, as part of their management of glue ear. Often GPs were aware that such management is considered inappropriate, but have rationalisations for disregarding the evidence in particular situations, often related to parental pressure. For example:

"Having given antibiotics for otitis media for such a long time, parents think it is essential. But then to say when somebody has got a grossly

infected ear, that it will settle without antibiotics so don't worry about it, parents won't accept it. And I'm not sure that many GPs actually accept it even with the research. Particularly when a lot of it says pain resolves more quickly when you give antibiotics, even if the long term problems are not any different." (GP, Holly)

"My colleagues may use drugs for all sorts of reasons because decongestants make people sleepy and if the child sleeps so does the parent then sleep. I would only use them with an awful lot of pressure and I am not desperately keen on them." (GP, Chestnut)

What emerged as a critical aspect of GPs' practice was when a referral was made and to whom. Earlier we outlined three main choices for GPs: (1) they can do their own watchful waiting, (2) they can refer the child for audiometric testing, or (3) they can make a direct referral to the ENT surgeons. Pursuing a watchful waiting strategy appeared to be influenced by several factors including: knowledge of the evidence although, as discussed, for most GPs it was confusing. Parental pressure was another important factor, as was the individual GP's experience and confidence in diagnosis and management. This varied considerably in our sample from those who always referred:

"I never hang on. Because...maybe I am too scared myself but I always think if the child develops deafness she will sue me." (GP, Wisteria)

to those who felt comfortable in waiting to refer:

"It is so common, so prevalent. We get a lot of otitis media and an awful lot develop into glue ear. But the vast majority of those resolve and either get it recurring or not recurring and I select the chronic difficult ones for referral." (Chestnut, GP)

Having access to, seeking, and acting on the advice of a specialist colleague proved to be a significant influence on GPs:

"We GPs can't see behind the tympanic membrane... I always speak to the ENT registrar and usually they have advised me to give antibiotic by mouth...and give ear drops sofradex in the ear also. But I see them a week later and see how it is. Still if I am not happy I refer them to the ENT department because that is a time I think they may need a grommet insertion." (GP, Juniper)

Personal knowledge of, and views on, what was likely to happen to a child once referred to specialist ENT care was also influential on action. Many GPs were concerned that if a child was referred to ENT they may be automatically put on the list for grommets and therefore felt under pressure to keep them under review.

"I think one of my greatest tasks is to divert people away from ENT specialists who would put grommets in at the drop of a hat. Negotiating the wait and see approach is quite tricky with families who say my child is not hearing very well." (GP, Chestnut)

Sometimes GPs referred the child for audiological testing to continue watchful waiting, thus avoiding this concern and, at the same time, dealing with parental pressure to do something.

Waiting times also played a part in GPs pursuing a watchful waiting strategy. There was a

wide discrepancy in the extent to which referrals allowed for spontaneous recovery to occur, but since a waiting time of several months is standard for NHS appointments, there will in effect be some opportunity for this. If waiting times for grommet operations were known to be long, GPs often referred to ENT rather than wait or use community audiology services, where further watchful waiting would occur.

A second choice GPs have, the referral for audiometric testing in community or hospital, seemed influenced by the existence and awareness of services; trust in the effectiveness of these services; not being unduly concerned that further watchful waiting would take place; a desire to do something to placate parents; and, sometimes, a way of ensuring surgical intervention was delayed.

The final referral choice, direct referral to ENT, appeared influenced by a confusion of glue ear with otitis media; not being aware of, or convinced by, the evidence on watchful waiting; parental pressure; the length of the waiting time and the belief that a child will have to wait in ENT so may recover spontaneously there, but if not, swift action can occur; and a belief that the ENT department pursues a careful watchful waiting policy.

This summary account of the elements of GPs' practice suggests few GPs feel confident about either recognising or managing glue ear. GPs appear ill prepared in this area partly because it is not an area of designated training but also because they do not see many cases.

Our work suggests that medical treatment for glue ear is an area where for GPs, the evidence is not sufficiently clear for them to take up strong positions which means that they may do one thing but accept that a colleague may do things differently. We have also suggested and discussed in detail, various factors that appear to influence GPs in a crucial aspect of their practice—the referral of a child.

Such influences are themselves mediated by other more general influences such as:

- Is the GP single handed or in a team where regular discussions occur about this topic?
- Are health visitors available and used in managing this condition?
- Do forums exist where glue ear management is discussed, perhaps with more specialist colleagues' influences as well as the range of services and specialists available?

Furthermore, we must not underestimate the influence of the personal approach of the GP to the doctor-patient relationship; pursuing a watchful waiting strategy takes time and skill to explain to a child and the parents. GPs vary in the extent to which they are prepared to invest time, or indeed have the time, to do this. This point is, of course, true of all our interviewees whatever their role in treating glue ear.

ENT surgeons

In the hospital context, practice itself is shaped by the hierarchies of medicine and the "apprenticeship" system of learning within medicine. Hospital doctors often have strongly

bounded areas of practice that loosen as they ascend the medical hierarchy. The defined areas ENT surgeons can operate in, coupled with their stage of development, underpin their explanations of why they practice in a particular way.

Junior doctors mainly listed audiometric criteria for the diagnosis of glue ear, but most profess commitment to at least minimal waiting time before grommet insertion, regardless of the bureaucratic built in waits in the system before the first outpatient department appointment and before surgery:

"The guidelines I have been told before are put [the patient] on a list for grommets if they have got more than 20–25 decibels hearing loss for longer than 3 months, or 15–20 conductive hearing loss in a child." (Senior house officer, Chestnut)

"Guidelines are important for very junior members of staff, they become less important when you are dealing with a clinical situation and you become more senior. We issue a guideline to the juniors, to the audiologists. We demand the juniors use the same criteria as we use, which is deafness and a tympanogram." (Consultant, ENT, Holly)

At registrar level the criteria appears to be broader and include aspects of the child's behaviour and development used in diagnosing glue ear:

"See the child with the parents to discuss with the parents the problem that glue ear may be causing: hearing loss, speech delay, or learning difficulties or behavioural problems; and to determine how long the episodes have been going on for and if there are any changes that we feel need any formal intervention." (Senior registrar, ENT, Chestnut)

Some ENT consultants added rarer disabilities, examples which might require great subtlety in diagnosis, perhaps using this to guard against charges of operating where there is no great apparent disability:

"Deafness is not the only problem that glue ear produces. A lot of these children have earache, they have recurring middle ear infections, they often have minor neurological problems... problems with balance, problems with coordination, with clumsiness. It builds a picture and these are the children that need to be treated." (Consultant, ENT, Wisteria)

Some ENT surgeons indicated a particular concern for the effect of glue ear on the early development of children:

"There is very clear evidence that children with persistent glue ear will end up with an educational disadvantage unless they are offered treatment." (Consultant, ENT, Juniper)

"If you are five or six you are likely to grow out of the disease, we are much more focused on the small child—the child who is learning speech and the brain is listening to learn to speak... somewhere between 9 months and 18 months. And if you miss out at that period of hearing then maybe your hearing gets better but you lose listening skills." (Consultant, ENT, Juniper)

These views contrast with a consultant community paediatrician who in one site (Juniper) described many ways children can be helped by modifying the child's immediate environment.

On the whole we found surgeons, particularly consultants, had little enthusiasm for medical approaches to the treatment of glue ear:

"The medical non-surgical options are in my view zero. Decongestants, antihistamines, antibiotics. I would only prescribe in children that are obviously very atopic and allergic and that is a very small group." (Consultant, ENT, Wisteria)

The value of antibiotics was often cited as controversial and evidence in favour of antibiotics is seen by some to be faulty:

"Antibiotics are obviously more controversial, even going through that article in the Lancet (Sept 14th, 1996) which shows a slight difference in the children on antibiotics in terms of clearing glue, as opposed to placebo, but they only looked at 2 weeks so it really means nothing. You need to look to see if it cleared it long term and it was a very small effect anyway. So I don't use antibiotics, I know the GPs do and I know that colleagues in 'X' have children on 3 months antibiotics." (Consultant, ENT, Juniper)

Several middle grade ENT surgeons did mention advising patients to try Otovent (a device aimed at inflating the Eustachian tube which is not available on an NHS prescription but can be purchased from a chemist), however our data again suggest variation in opinion:

"I have met seniors who have definitely recommended it but that doesn't necessarily mean that the next senior I meet will also definitely recommend it. Even within a department there are huge variations in opinion." (Senior house officer, ENT, Chestnut)

Few surgeons were in favour of prescribing decongestants but it is apparent that despite evidence against their usefulness they are often still subjected to pressures from drug companies to try using them:

"Some people give decongestants. There are so many of them on the market. There is a lot of pressure from drug companies to try their products." (Locum consultant, ENT, Wisteria)

Like the accounts of GPs there were many comments about the contested nature of evidence in this area (particularly in terms of watchful waiting) from ENT surgeons regardless of grade.

For individual clinicians, practice in a hospital setting had various influences, including other colleagues, knowledge of the various viewpoints about evidence, but mainly by the experience of treating glue ear. Surgeons tended to be affected by the immediate apparent improvement in hearing after grommet insertion, and the ease of grommet insertion:

"The parents often notice an instant improvement in the hearing and they are really pleased the child no longer has to sit at the front in the class—all that is much better. So short term I think it is a very successful operation. When the grommets drop out or get infected it does slightly temper your enthusiasm." (Senior house officer, Chestnut)

"The outcomes are very satisfying, that is the main thing about grommets they are lovely, they really are super for the kid. The kid walks out of the day surgery holding his ears because everything sounds so loud." (Senior registrar, ENT, Juniper)

Examination of hospital clinicians' comments about the importance of clinical experience in this area reveals two trends in practice: firstly, that more importance is placed on parental views, insights, and judgments:

"As you get more experienced, you tend to place more importance on the parents' history as well as the previous experience of your decision to insert grommets." (Senior registrar, Juniper)

However, sometimes interviewees argue parental pressure led to unnecessary intervention:

"I feel under enormous pressure from middle-class mothers whose child is not doing well at school, to put grommets in." (GP, Juniper)

Secondly, the experience of glue ear resolving naturally after a period of time appears to lead to more conservative practice.

A major influence on juniors was the pressure they felt to follow the practice of their current consultant. Although they may use the impressions gained from their clinical experience and evidence to reach a judgment, it was being accountable to the consultant that proved a dominant influence on practice:

"I like the practice of using trimethoprim but if I am working in a firm where the bosses are against it then I won't use it I can't go against their wishes." (Registrar, ENT, Chestnut)

"It partly depended on asking the consultant and he said 'oh yes I use them', so I use them. It is partly from previous consultants, partly from reading as well." (Senior house officer, ENT, Chestnut)

As discussed earlier, practice for junior staff is also shaped by the make up of the ENT team. The availability and willingness of seniors to discuss and inform practice and to supervise operations were also influences on their experience of practice.

Practice, with respect to watchful waiting in a hospital context, appears to be influenced by the nature of the referrals received. As discussed earlier, ENT surgeons may receive referrals directly from GPs or from audiology departments. Equally, children have been watched for longer if they are referred from an audiology department. The choice to impose a further period of watchful waiting is partly influenced by knowledge of where a referral comes from and the significance of this. More junior staff are less likely to be aware of the difference between GPs' and audiologists' referrals or, for that matter, between those GPs who are regarded as making appropriate referrals and those who are less reliable. In general we found that more junior doctors are likely to err on the side of caution, unless these issues are discussed with seniors.

The perceived quality of general practice and the audiology services also influenced ENT staff. Where ENT considers general practice to be extremely competent, then the effort that might be made to check the referral or follow up is greatly reduced.

"That's something else about Juniper. The GPs are very good in Juniper I think, particularly compared with London and a lot of them are very clued up on when to refer and when not to refer, and most of the children that are referred seem to be sensible referrals. Not that they tell you that anything has to be done with it, just to say well 'look this child has

glue ear what do you think needs to be done with it?' They genuinely need an answer to that question." (Consultant, ENT, Juniper)

The timing of a decision to insert grommets is therefore influenced by where a referral comes from and how much watchful waiting has already occurred. Some surgeons, however, attributed the tendency to operate rather than wait in the case of NHS patients to the problem of waiting times for all aspects of NHS ENT care:

"If we had the means and facilities to keep these children under regular review then I would probably not operate as much as I do. But when clinics are booked nine months in advance and I know if Kevin goes away now I probably won't see him again for another six or nine months." (Consultant, ENT, Wisteria)

Audiologists

The audiologists we interviewed saw themselves as important in the proper assessment of children with glue ear, protecting ENT departments from having to see the majority of children with unconfirmed glue ear, and protecting the children from unnecessary intervention in a self limiting condition.

Accounts of practice from audiologists emphasised the holistic assessment of audiological and developmental disabilities resulting from glue ear:

"If it is a child who had a certain degree of hearing loss, but who also had quite severe language delay, that child might be referred earlier than a child who didn't have any language delay and was coping with it very well." (Senior community medical officer, Chestnut)

In general, accounts stressed the importance of watchful waiting:

"Dr T had a very strong view that surgery wasn't always the answer and she used to try to monitor them and follow them up as long as possible hoping that they would resolve." (Audiological scientist, Wisteria).

Risks of surgery were sometimes cited as a reason for avoiding grommet insertion:

"If I know that the effusions clear intermittently and I can see that the tympanic membranes are healthy, then obviously I wouldn't want them to have an anaesthetic and a grommet and the risk of scarring from that angle. So I would prefer to watch and see." (Audiologist, Senior community medical officer, Wisteria)

The nature of practice is in part shaped by the clinical background and training of the audiologist. Senior community medical officers are not able to write prescriptions for the patients they see and this may explain why in their accounts of practice, they tend to discount the need for medical treatments:

"I suppose because by the time I started doing any amount of audiology I was well used to not being able to prescribe and so I didn't really feel frustrated by it. I think the only thing I am really frustrated by is when they have an acute ear infection..." (Audiologist, senior community medical officer, Chestnut)

Audiological physicians may have backgrounds in adult medicine, paediatrics, community medicine, surgery, or all of these. They

have an interest in detecting sensory neural deafness in children at the earliest possible opportunity. Detection of the presence of glue ear is a byproduct of the screening processes used to detect sensory neural deafness.

The practice of audiologists is also influenced by the various guidelines for the assessment of glue ear and when to refer on to the ENT surgeons, generated by either the head of community audiology or hospital audiology. The more senior audiologists with years of experience behind them tend to emphasise the importance of their own judgments in making such decisions and discount guidelines:

"Long ago I used to carry a file with all the details but now I think I use more my clinical sense rather than guidelines.... Sometimes I am not very keen to let go." (Audiologist, senior community medical officer, Chestnut)

Audiologists often spoke of parental anxiety as an important influence on their practice, particularly influencing the decision to refer.

Like other clinicians involved in managing glue ear, practice for audiologists is subtly shaped by a blend of influences, but mainly by:

- Experience
- Knowledge of evidence
- Influential colleagues
- Parental views.

The extent and type of training and views on the available guidelines also play a part. The watchful waiting aspect of practice appears to be mediated by their knowledge and views about the reputation, policy, and practice of the ENT department; the size and make up of the community audiology services; and the extent to which integration occurred with hospital services. In three of our sites, community and hospital audiology services appeared quite separate and although we cannot comment on the affects on clinical outcomes, it did appear to be unhelpful that these services did not have effective links.

Health visitors and school nurses

The responsibility of health visitors and school nurses for glue ear is to screen infants and schoolchildren for hearing loss, and to refer any children failing their screening test on two consecutive occasions to an audiology clinic:

"I don't make any diagnosis and I say that to the parents. But if I have got a flat impedance and the hearing reduced, obviously I do explain about glue ear to the parents that it is more than likely but I am not the diagnostician...I will be referring to the next stage." (School nurse/audiologist Wisteria)

Health visitors and school nurses (where they were involved in managing glue ear) in our sites were all expected to undertake regular updates and be aware of the guidelines for referral of children suspected of having hearing loss as outlined by the community audiology department. Their lines of communication tend to be clearly defined with support from professional managers, team leaders, and relevant medical colleagues. In recent years, some school nurses have received extra training in audiology and as a result have increased responsibilities which allow them more discre-

tion in relation to referring children to an audiology clinic.

Although able to refer to audiology, health visitors and school nurses are not usually able to refer children directly to ENT departments. In Chestnut, however, there are audiological nurses who are able to refer directly to an outreach ENT clinic and have responsibilities almost equal to their medically trained colleagues:

"I would only refer them to ENT if it was a case of referral for grommets, for surgery. If I need to refer any of the children that I see to any of the other primary care or hospital services that is fine, it is within my remit to do that. I refer to psychology, speech therapy, ENT, the whole spectrum really. I see the same kind of children as JT (senior community medical officer audiologist)... The only time JT would see a child over 5 is if a referral comes through and there is obviously developmental delay or quite severe speech and language difficulties and the child may be difficult to the point where you can't handle them on your own—then obviously we would put them in for two people to see." (Audiological nurse, Chestnut)

Accounts from health visitors and school nurses of their practice, indicated a defined role in the diagnosis and management of glue ear. This role is shaped by:

- Various guidelines
- Experience
- Knowledge of the evidence
- The type of general practice in which health visitors operate and their relationships with GPs.

Review and conclusions

Various themes emerge from the discussion of our results. Firstly, although evidence in this area is not discounted, many in our sample, whatever their clinical role, commented on the confusing and evolving state of the evidence. The quotation below is indicative of a distrust of what is claimed as, and for, evidence.

"The problem with research evidence in general is that it is biased information... It is important to review glue ear because of the systematic nature of it... But research evidence in general was so biased, if people say my practice is based on research evidence, then it is based on what they want to hear." (Consultant, ENT, Juniper)

The *Effective Health Care* Bulletin has not proved to be particularly helpful for our group of interviewees in clarifying appropriate practice. Rarely was it discussed spontaneously in relation to practice. Most interviewees, with the exception of the senior hospital staff and a few GPs, had never heard of it. Of those that had heard of it, some had strong opinions about the Bulletin, and felt it was unhelpful or that the wrong individuals had been involved in its formulation. Those whose views were not as strong, commented it was one influence among others on their practice.

A second theme is that clinical practice is subtly shaped by various influences. Drawing on data collected from our ticklists of influences (table 2), one gets a more quantitative overview of this subtlety. Here we see that experience (69% of our respondents rated this

of high importance) of the condition built up over time is the most significant influence on practice. None the less, ongoing training, parental views, hospital colleagues, and local guidelines all appear as significant influences. Turning to the influences of low importance, this data again points to the *Effective Health Care* Bulletin as being of relatively low importance as an influence on practice. It also points to a clear dismissal of organisation and managerial factors as being subjectively identified as important factors influencing practice.

A third theme centres around the influence of the organisation and management of services. Although not cited in the interviews or the ticklist responses as being at all important in shaping individuals' practice, our analysis of the influences on practice of each group of clinicians involved in managing glue ear points to inherited organisational arrangements and particular organisational issues being influential. Some examples we have discussed include the nature of the screening arrangements; the involvement of clinicians in groups where practice and evidence are discussed; the fact that medical careers are developed within relatively strict hierarchical structures, which means that juniors have to practise within the guidelines of seniors whether they agree with these guidelines or not; the composition of audiology services; the extent to which community audiology services are integrated with hospital audiology services; the nature of the referral and knowledge of its significance; and knowledge of waiting lists. These all appear as important, if unacknowledged, influences on individual practice.

A final theme relates to the unanticipated consequences of the intricacies of the referral patterns. A child will get referred to ENT more quickly if the referral is from a GP rather than from an audiologist, even though audiologists often keep children under review for longer. This has consequences for ENT surgeons. Although it may be appropriate to impose a further period of watchful waiting for children referred by GPs, it may not be so for children monitored and referred from audiology clinics. Furthermore, various referral patterns have an impact on how speedily the specialists refer a child for surgery. This was reported to be shorter in the NHS than in private practice because the resources do not exist to keep patients under regular review in the NHS, so operations may be prescribed without a period of waiting. In an ideal world, however, most ENT surgeons prefer a period of watchful waiting. A consultant ENT explains it thus:

"In the private practice I can sit on the fence if Johnny has just got a little bit of hearing loss, his behaviour's not bad, he is doing quite well at school and doesn't get a lot of ear infections—he very occasionally gets earache—can sit on that kid and see whether it gets better. Because I can bring him back and I know he will come back, it is just easier. In private practice I can be much stricter in my selection. It is a more personal thing. I have got more time with the patient. Whereas if that little Johnny's hearing is not good enough, not doing well at school, has had one or two infections, gets

frequent earache, I can get on and do the operation.” (Consultant, ENT, Wisteria)

Dawson has recently written about the importance of mutual understanding between the inhabitants of four very different worlds (clinical research centres; organisations that produce national guidelines; local guideline development; and clinical practitioners) if research is to relate to practice.¹⁵ This case has sought to enter the world of clinical practitioners. We have described the separate debates and differences in practice between and within groups. We have found variation in knowledge of evidence and variation in knowledge of what goes on in other groups involved in treating the same condition, and, more generally, variation in knowledge about how services are organised, the pattern of service delivery, and the interdependencies between groups. An important stage, it seems to us, in ensuring research relates to practice, is to recognise that the influences on an individual’s practice are varied and subtle. Furthermore, practice is influenced in equally subtle ways by a significant number of organisational and managerial factors. Also, our findings in this case study suggest that we cannot expect guidelines such as the *Effective Health Care* Bulletin alone to lead to change in clinical behaviour. As important as clarifying the evidence, is assisting individuals and groups involved in the treatment of particular conditions to acknowledge that they operate within and are part of a network of social relationships that affect their practice, and that their practice is influenced by the activities of their predecessors. That is, they work within an inherited set of organisational arrangements that set an important part of the context for the treatment in this case of glue ear. It is tempting to think that *A First Class Service* (the

document outlining changes to improve clinical effectiveness) will provide a consistent mechanism for agreeing evidence and disseminating it. Our work suggests that if these important national initiatives are to succeed, then some of the assumptions about how clinicians change practice need to be carefully and critically reviewed. This case is offered as a contribution to thinking in this area.

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