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HEARING LOSS IN ABORIGINAL CHILDREN

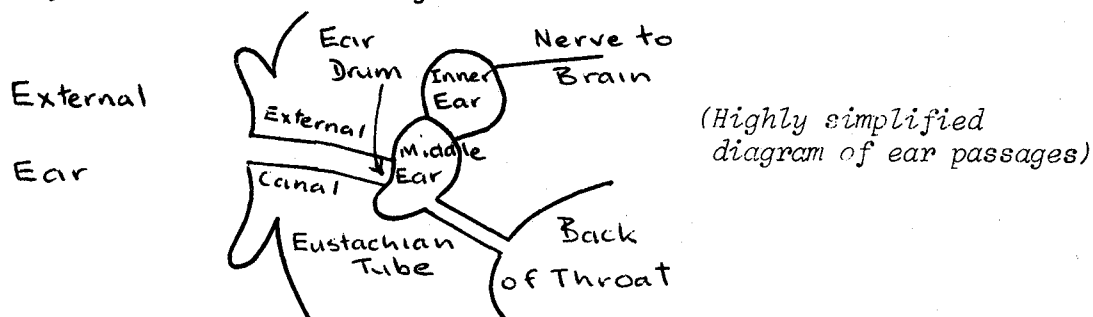
WHAT EVERY TEACHER SHOULD KNOW

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Aboriginal children are particularly susceptible to ear disease and therefore to loss of hearing. In fact, it is a reasonable generalization that at any one time, around 25% of Aboriginal children have significant hearing loss. *All* teachers should know something about hearing disorders and classroom management. It is even more important for those of us who teach Aboriginal children. I want to do three things, Firstly, I want to look at ear disease itself, because we must understand what we are talking about. Secondly, I want to talk about the implications for classroom management. Thirdly, and somewhat less importantly, I want to provide some medical statistical data, for those who perhaps in some other context may feel the need to justify concern in this matter.

EAR DISEASE

Many of us will have experienced a build-up of fluid in the middle ear ("Acute Otitis Media"). It quite frequently accompanies upper respiratory tract infections. The same fluids that are excreted into the nose are excreted into the middle ear. As the diagram shows, these can drain through the Eustachian tubes.



* A paper presented at the Narrandera Conference for Teachers of Aboriginal Children, June 1976.

One of the effects of infection of the back of the throat is that the fluid in the middle ear can be prevented from draining through the Eustachian tubes. This build-up of mucous in the middle ear is frequently referred to as "glue-ear", especially in its chronic form ("Acute Serous Otitis Media"). A person suffering from it will have headaches and some hearing loss. Children will thus appear irritable and inattentive. Even medical papers point to irritability and low scholastic performance as the only symptoms which may indicate that a child is slowly becoming deaf due to "glue ear". However, it is readily verified by those who are trained to do so by testing for conductive hearing loss and examination of the ear drum.

Right now (1976), my five year old daughter, Karina, is suffering from "glue ear". For a while we thought she was going through some problem stage. We thought she was irritable and inattentive. It was, in fact, *us*, her parents, who were becoming irritated by what we thought was disobedience when it was, in fact, hearing loss. Once we recognised the problem for what it was, we did a number of things. We altered our behaviour patterns such as giving ourselves the trouble of going over to her, rather than yelling at her from a distance, and trying to speak clearly and loudly without sounding angry (not very easy to do!). We took her to the National Acoustic Laboratory and had her ears tested (she registered a hearing loss of around 35 decibels in both ears, but more of that later). We took her to our own G.P. and had him refer her to an Ear, Nose and Throat Specialist.

Before I proceed, let me emphasize that there is a considerable level of awareness and sophistication in what we did. *We recognised the problem, modified our behaviour and operated the health services system effectively.* With all the good intentions in the world, this level of awareness and ability to operate the system is lacking in most Aboriginal families.

If the condition remains untreated, the fluid in the middle ear may become infected, the ear drum will then weaken and rupture. The result is the "suppurating ear", discharging pus and blood. If the infection clears up, the drum may heal or may remain permanently perforated. In some very neglected cases, the ears can become fly-blown and the ear-drums completely destroyed, resulting in total deafness. However, apart from such extreme cases, most Aboriginal children suffer "glue ear" at some stage of their school life, especially in infants and lower primary. Many have large numbers of perforations in their ear-drums, attesting to frequent infection and rupturing.

If a child becomes irritable and inattentive, or seems dull and uncomprehending, we should suspect hearing loss. If the child

obviously has a cold or some other upper respiratory tract infection, our diagnosis is very probable indeed. Professional assistance is available through your local community health services. Advice on classroom management and special techniques for teaching is available through the Education Department of your State or Territory.

CLASSROOM MANAGEMENT

"Glue ear" does not necessarily clear up quickly, and is highly likely to recur. If you teach Aboriginal children, you are more likely than most to have children with some hearing loss. Even *one* child is important enough to necessitate specific attention being given to modifying classroom arrangements or teaching techniques so as not to disadvantage that child. I am going to use my daughter, Karina, again as an example. What facts about sound intensity and hearing should her teacher know?

Sound intensity is measured in *decibels*. To get decibels in perspective, here are some approximations:

Whisper	20-30	decibels
Conversation	60	"
Shout	90	"

Teachers' classroom voices have been measured and averaged at about 65 decibels. Now Karina has a 35 decibel hearing loss. I must emphasize that this is not a severe loss. Here are some typical figures :

30 decibels loss	-	mild
60 " "	-	severe
125 " "	-	virtually deaf

So Karina (35 db loss) hears conversations (60 db) as:

$$60 \text{ db} - 35 \text{ db} = 25 \text{ db}$$

i.e. a whisper

Now this is fine in a conversational situation. The teacher, close to the child, speaks a little louder - say 65 db - and the child hears. But Karina is in a classroom and there are many other complications.

At one metre from the speaker, the intensity has dropped by about 6 db, at two metres by about 12 db and at four metres by about 18 db.*

Given perfect sound conditions, Karina, at the back of the room (say four metres from the teacher), receives the teacher's voice (say 65 db) less 18 db. However, with her 35 db hearing loss:

$$65 \text{ db} - 18 \text{ db} - 35 \text{ db} = 12 \text{ db}$$

i.e. probably below the threshold of comprehension.

But note that that was under perfect classroom conditions. The background ("ambient") noise in the average classroom is around 45 db, made up of conversation hum, paper rustling, desks scraping, traffic outside the window, class singing next door etc. Karina is lucky - her classroom is carpeted which reduces the background noise to about 25 db. However, putting it all together:

$$\begin{aligned} &65 \text{ db (teacher's voice)} - 18 \text{ db (intensity drop)} \\ &- 25 \text{ db (background)} - 35 \text{ db (hearing Loss)} \end{aligned}$$

= *less than zero.*

That is, at the back of the room, Karina does not hear the teacher's normal voice.

What must be done? If Karina sits close to the teacher, or the teacher goes over to her to speak to her, the 18 db intensity drop can be ignored. If the teacher speaks a little louder - say 80 db - Karina will just about hear her:

$$80 \text{ db} - 25 \text{ db} - 35 \text{ db} = 20 \text{ db}.$$

There are, of course, many other complicating situations. There is a loss of around 14 db if the speaker's voice is masked by an object between the teacher and the child. The child's own head can mask the voice if the head is turned away from the speaker. A noise source (for example, a busy group at a table) between the speaker and the hearer has much the same effect.

* I am quite aware of the inverse square law etc. and apologize to the physicists. These are *rule-of-thumb* figures, and quite accurate enough for ordinary purposes within a classroom.

Now I am not claiming that Karina's teacher should make the whole classroom revolve around Karina. But she can place Karina where she is least at risk in the room, she can make sure that Karina is spoken to reasonably often in a way in which she can hear, and she can understand why Karina may appear inattentive or disobedient and not become angry with her for it.

There is perhaps one other complication which must be mentioned. The statement that the teacher's voice is about 65 db is not only an average of many teachers. It is also an average of the *intensities of different sounds*. Speech consists of various sound intensities. In *clear* speech at 65 db:

Loud sounds such as a, o = about 75 db

Medium sounds such as m, b = about 65 db

Soft sounds such as p, t = about 55 db

Unclear speech is worse. Sometimes the intensity of sounds such as 'th' is less than 20 db. Even with clear speech the child with hearing loss *may not hear certain sounds*. This child, will not, for example, distinguish *spit* and *skit*. I will not dwell on this, but if you have grasped this concept you will see how this inability to differentiate certain sounds has ramifications in comprehension, speech, reading and so on.

It is also worth noting, with regard to all children, that a hearing loss of up to 25 db is regarded as *within normal limits* and that therefore even 'normal' children have a range of hearing ability.

SOME STATISTICS

As stated earlier, about 25% of Aboriginal children in the early school years, *at any one time*, are suffering hearing loss. This is a fairly uniform figure across the state with only a few places with a significantly higher or lower incidence. This 25% is a changing group and *most Aboriginal children* are affected some time in their childhood. "Glue ear" clears up spontaneously in later childhood, but about 15% of Aboriginal children carry some impairment for the rest of their lives.

I will quote some data from just one of many studies:-

Kamien⁽¹⁾ tested 594 children in Bourke and Enngonia, being 99%

(1) Kamien, M.: Ear disease and hearing in Aboriginal and white children in two schools in rural N.S.W. in *The Medical Journal of Australia*, Vol. 1, No. 4, May 1975.

of the school children. There were 212 Aboriginal children and 382 non-Aboriginal children. The following results are expressed as a percentage of the two groups:

HEARING DISORDER	ABORIGINAL CHILDREN	WHITE CHILDREN
Perforated ear drums	14%	0.3%
Hearing loss in one ear	35%	4.0%
Hearing loss in both ears	17%	1.0%

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Editorial Note

For further suggestions on what to do if you have a hearing impaired child in your classroom, see -

Armstrong, J.: "Otitis What"? *The Aboriginal Child at School*,
Vol. 3 No. 3, 1975.

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