Clinical Reports

Hearing Screening in Isolated Native Communities

RONALD FAHEY, *Ph.D.*

The principle purposes of this project were to provide hearing screening services to all the school age children in the Habay-Assumption and Fort Chipewyan, Alberta regions; and to provide hearing testing services to individuals referred by the nursing staff in each of the above mentioned regions.

Secondary goals of the project included hearing assessments of interested individuals in each community; and the provision of information regarding conservation to interested persons (re: noise-induced hearing losses, loss from trauma, etc.)

There was a need for such a program in these communities due to the high incidence of medical problems possibly related to hearing acuity and a lack of specific hearing-oriented medical aid programs.

Preschedule Testing

Prior to departure from Edmonton, the following preparations were necessary: (1) schedules for screening and pure-tone testing were established; (2) detailed procedural outlines were designed to standardize the testing procedures and the pass-fail criteria; (3) recording forms to be used throughout the project were developed; and (4) four Beltone audiometers were calibrated to ISO specifications. (All future references to intensity levels will be in accordance with ISO standards).

Upon arrival at the respective centers, the following steps were taken: (1) the program outline and timetable for testing was presented to the principals and teachers in the school systems; (2) class registers were recorded on hearing screening forms; (3) separate testing rooms were obtained for each audiometrist, and appropriate adjustments were made to the rooms to accomodate testing; (4) arrangements were made through the principals for the provision of interpretors when necessary; (5) time was allotted for the testing of the non-school population; and advertisement of the community hearing testing was accomplished through posters, personal contacts and through letters sent by the nurses to those they wished to refer.

AUDIOLOGICAL ASSESSMENT PROCEDURES

Schedule for Testing

The following order was established, and followed as closely as possible, in each of the regions:

1. Screening of the playschool, kindergarten, and grades one through three.
2. Second screening and puretone testing of failures in the above group.
3. Screening of grades four through six.
   Second screening and pure tone testing of failures in the above group.
3. Screening of grades seven through nine.
   Second screening and pure tone testing of failures in the above group.
4. Screening of individuals in the community referred by the nursing staff.
   Pure tone testing of the failures in the above group.
5. Screening of other interested members of the community.
   Pure tone testing of failures in the above group.

Children who were absent during the regularly scheduled time, those who required interpretors, and difficult to test children were seen at individually scheduled times throughout the project. Many adults in the community were seen in the evenings during the project in order to minimize interferences with normal working hours.

Clinical Records

Information was recorded on three forms. The **classroom screening form** consisted of separate class rosters with information regarding each child's name, age and treaty number. Separate columns were used to record the results for the first screening, second screening, and absentees. Those failing the second screening were recorded in a column marked "audio referral" and were scheduled for pure tone air and bone testing. A copy of the screening form is provided in Appendix A.

Individual screening forms summarized the findings for each child screened. Included on this form were: treaty number, date tested, pass or failure at 25 dB air conduction for both ears at four frequencies and the disposition of results (i.e. need for further audiological examination). This form is shown in Appendix B. Pure-tone air and bone results were recorded on **the pure-tone audiogram** as well as pertinent medical information obtained from the files supplied by the nurses. This form appears in Appendix C. Copies of the completed classroom screening forms were given to the appropriate teachers. Nurses received individual hearing screening report forms. Copies of the pure-tone air and bone audiograms were given to the Assistant Regional Director of Indian Health and the nursing staffs.

Initial Screening Procedures

At the beginning of each day, the audiometers were checked to be certain they were in operating order. Just prior to screening, the classrooms to be screened were visited in order to provide brief instructions. The children were informed that the evaluators wanted to find the softest sound, both high and low, that could be heard by each child. Demonstrations of the 90 dB tones were given with the earphones held toward the children. Two or three children were instructed to go to each testing room. As each returned to the classroom, another child was sent by the teacher for testing. During the initial screening of each child, more extensive instructions were given in the testing room. Each child was instructed to raise his hand on the same side that the sound was perceived. For kindergarten or playschool children, raising either hand was acceptable. The specific screening technique involved the following sequence:

> A 35 dB orientation tone at 500 Hz was originally presented to the subject. Indication by the subject that the tone was perceived resulted in the presentation of the pass-fail criterion tone at 25 dB for the same frequency. If the 25 dB tone was perceived at 500 Hz, tones at 1 kHz, 2 kHz, and 4 kHz were then presented to the subject at the 25 dB level. If the subject failed to respond to the 25 dB tone at any frequency, a 35 dB tone followed by another 25 dB tone was immediately presented at that respective frequency.

This failure to respond at either of the intensity levels was recorded on the classroom roster as a slash mark through the frequency in the corresponding column for that ear. An appropriate response was left unmarked. A child failed the hearing screening if he did not respond to one or more of the test frequencies at the 25 dB level in either ear.

Specific conditioning techniques were employed for those children who could not manage the usual task as outlined. A variety of tones were presented with earphones on the child at 40 dB ISO. The clinician guided the child in carrying out a specified motor activity simultaneous with tone presentation. After 5 to 6 trials, the child was encouraged to continue by himself; thus the screening and threshold testing (if needed) was accomplished.

Second Screening and Pure Tone Testing

Children failing the first screening were rescheduled for a second screening and possible pure-tone air and bone assessment. This was conducted within a week of the initial screening assessment. The procedure and pass-fail criteria during the second screening were the same as in the first screening. Those children failing this second screening immediately received a pure-tone audiometric evaluation. The Hughson-Westlake ascending method was used for the pure-tone testing. Both air and bone tests were administered. If failure occurred at only one frequency during both screenings, the pure-tone test was given for that frequency only. Otherwise, pure-tone testing was given at all frequencies in both ears. If a loss was indicated from the above results, the evaluators consulted the nurse's files on this child for pertinent medical information. This information was recorded on the back of all audiograms.

Follow-up

The teachers were given a copy of the screening form for their classrooms. The principals received a list of children to be referred. The nurses received copies of pure-tone audiograms, individual hearing-screening record forms, and a list of those persons to be referred for medical examinations.

A list of those persons referred for ENT examinations accompanied by their audiograms were sent to the Assistant Regional Director of Indian Health for the Department of National Health and Welfare. The nurses, principals, and Regional Director also received copies of the completed project report.

Results

Two hundred three, or 89 per cent of the 228 students registered in the schools at Assumption, Alberta, were screened. The remaining 11 per cent were not at school either on the originally scheduled day of testing or on subsequent days allotted for screening of previous absentees. Ninety (44 per cent) of the children screened failed the first screening and 26 of these (29 per cent of the 90) failed the second screening. Following air and bone threshold testing, all 26 children evaluated were referred for medical consideration. Thus, 26 of the 203 children tested, or 13 per cent were referred for medical examinations based on the hearing data. A detailed summary of the hearing assessments at the Assumption Public School are included in Table 1.

Twenty-six non-school members of the native population in the Habay-Assumption area were tested with 14, or 54 per cent, failing the selected criteria. These 14 individuals were recommended for medical examinations with audiograms being provided for the regional medical director. Upon request, members of the adult non-native community also received hearing tests. Of the sixteen who were screened, only two, both of whom were teachers, required threshold testing.

Children from two different school systems were screened in Fort Chipewyan, Alberta. Bishop Piche School was attended by the native treaty Indian children while the public school was comprised of non-native and Metis children. The public school, which had a smaller population, combined two grades into one classroom (1st and 2nd, 3rd and 4th, etc.), while two separate classrooms of the same grade level (grades 1A and 1B; 2A and 2B, etc.) were common in Bishop Piche School.

Two hundred seventy-four of the 292 students enrolled at Bishop Piche School were present for hearing screening. This figure represents 94 per cent of the school population. Fifty-one children (19 per cent) failed the first screning and 28 of these children (16 per cent of 51) failed the second screening. These 28 children then received pure-tone air and bone hearing tests and were referred for medical evaluations. Therefore, 28 or 10 per cent of the children screened demonstrated some hearing involvement, at the time of testing, and were referred. Table 2 presents the specific results of testing at Bishop Piche School.

Ninety-five children were enrolled in the public school at Fort Chipewyan and 92 (97 per cent) of these children were present for hearing screening. Eight (9 per cent) of the children failed the first screening test and two of these children (25 per cent of the 8 earlier failures) failed the second screening evaluation. These two children received pure-tone air and bone testing and were referred for medical evaluations. Table 3 shows the results of hearing screening in the public school in Fort Chipewyan, Alberta.

Thirty-four members of the adult community of Fort Chipewyan also received hearing evaluations. Of the adults screened, ten (29 per cent received pure-tone) hearing tests and were referred for medical evaluations.

TABLE 1

SUMMARY OF HEARING SCREENING RESULTS AT ASSUMPTION PUBLIC SCHOOL IN ASSUMPTION, ALTA.

GRADE	NUMBER ENROLLED	FIRST SCREENING			SECOND SCREENING			AUDIO REFERRALS & ASSESSMENTS
		PASS	FAIL	ABSENT	PASS	FAIL	ABSENT	
K	19	10	8	1	4	3	1	3
1	52	33	13	6	8	5	0	5
2	38	18	17	3	11	4	2	4
3	15	6	7	2	5	0	2	0
4	27	13	14	0	9	5	0	5
5	19	12	7	0	3	2	2	2
6	17	6	8	3	4	1	3	1
7	17	7	8	2	3	4	1	4
8	14	5	5	4	3	1	1	1
9	10	3	3	4	2	1	0	1
TOTAL	228	113	90	25	52	26	12	26

TABLE 2

SUMMARY OF HEARING SCREENING RESULTS AT BISHOP PICHE SCHOOL IN FORT CHIPEWYAN, ALTA.

GRADE	NUMBER ENROLLED	FIRST SCREENING			SECOND SCREENING			AUDIO REFERRALS & ASSESSMENTS
		PASS	FAIL	ABSENT	PASS	FAIL	ABSENT	
K	11	9	2	0	1	1	0	1
1	37	28	7	2	3	4	0	4
2	47	33	10	4	0	9	1	9
3	46	35	10	1	5	3	2	3
4	23	21	1	1	0	1	0	1
5	38	28	6	4	2	3	1	3
6	25	20	3	2	1	2	0	2
7	28	22	3	3	1	2	0	2
8	23	15	7	1	5	2	0	2
9	14	12	2	0	1	1	0	1
TOTAL	292	223	51	18	19	28	4	28

TABLE 3

SUMMARY OF HEARING SCREENING RESULTS AT THE PUBLIC SCHOOL IN FORT CHIPEWYAN, ALTA.

GRADE	NUMBER ENROLLED	FIRST SCREENING			SECOND SCREENING			AUDIO REFERRALS & ASSESSMENTS
		PASS	FAIL	ABSENT	PASS	FAIL	ABSENT	
PLAYSCHOOL	13	10	1	2*	1	0	0	0
1 & 2	24	22	2	0	2	0	0	0
3 & 4	22	19	2	1	1	1	0	1
5 & 6	19	18	1	0	0	1	0	1
8, 9 & 9	17	15	2	0	2	0	0	0
TOTAL	95	84	8	3	6	2	0	2

*These children were not tested due to behavioral characteristics or lack of parental consent.

TABLE 4

SUMMARY OF HEARING SCREENING RESULTS AT THE THREE SCHOOLS TESTED IN ASSUMPTION AND FORT CHIPEWYAN, ALBERTA

	ENROLLMENT	SCREENED	1st SCREENING FAILURES	2nd SCREENING FAILURES	AUDIO REF. & ASSESSMENTS
Fort Chipewyan:					
a) Bishop Piche School	292	274	51	28	28
b) Public School	95	92	8	2	2
Assumption School	228	203	90	26	26
TOTAL	615	569	149	56	56

TABLE 5

SUMMARY OF HEARING SCREENING OF SCHOOL CHILDREN AND COMMUNITY MEMBERS IN ASSUMPTION AND FORT CHIPEWYAN, ALBERTA

POPULATION	NUMBER SCREENED	AUDIO ASSESSMENTS & MEDICAL REFERRALS
Assumption:		
Schools	203	26
Community	42	16
Fort Chipewyan:		
Schools	366	30
Community	34	10
TOTAL	645	82

Table 4 represents the combined hearing screening results from the three schools involved in the project. Five hundred sixty-nine children from an enrollment population of 615 were screened. This represents 92.5 per cent of the enrollment of the three schools. Approximately, 26 per cent of the children failed the first screening and required a second screening at a later date. Following the second screening, 9.8 per cent (56) of the children screened were administered pure-tone air and bone hearing tests and were referred for medical evaluations.

Table 5 is a summary of the entire hearing screening project in Assumption and Fort Chipewyan, including school children and community members. The project resulted in the screening of 645 individuals with 82 being referred for medical examinations. This referral figure represents approximately 13 per cent of the population screened in the project.

Discussion

The procedures outlined for administration and screening proved to be both effective and efficient. A major change in procedures, from an earlier project conducted in Hobbema, resulted in a notable increase in efficiency. This change was the simultaneous utilization of two audiometers (and audiometrists) in screening and the elimination of "runners" to escort the children to and from the testing areas. The unique screening technique that was also designed and utilized in this project proved desirable.

The absentee rate in the schools was much higher at Assumption (11 per cent) than at Fort Chipewyan (6 per cent in Bishop Piche School and 3 per cent in the public school). Many of the children who were continually absent were males who reportedly were "in the bush" or assisting their families in hunting and fishing. In an attempt to decrease the percentage of absentees, perhaps a different time of year should be considered. This is a consideration which involves many variables (hunting seasons; seasons when illness is more prevelent, etc.).

The greatest difficulty encountered was a lack of communication among the personnel involved in the *total* project. Nursing personnel were uncertain when to expect the evaluators and school principals and personnel were relatively uninformed of the pending project and their involvements in such an endeavour. In the future the regional director and the project coordinator *must* carefully outline the responsibilities of the personnel involved, make the contacts with nurses and school principals well in advance and be certain that all goals of the project are well defined. A project similar to this has tremendous benefit to all involved (medical and school personnel) especially to the children and community members who participate. It must, however, have adequate pre-project preparation as well as coordination throughout the evaluative period

As a supplement to the hearing screening program, an articulation and language screening program was also conducted with most of the children in the schools. The *Peabody Picture Vocabulary Test* was utilized in an attempt to gain insight into receptive language behavior and the screening protion of the *Arizonia Articulation Proficiency Scale* was used to investigate articulation patterns. Data from these sections of the project will be analyzed and reported in the near future.

Summary

School children and adults in the communities of Habay-Assumption and Fort Chipewyan, Alberta received a hearing screening program. Two hundred forty-five individuals were screened in Habay-Assumption with 17 per cent receiving pure-tone air and bone audiological assessments and referrals for future medical examinations. Four hundred were screened in Fort Chipewyan with 10 per cent receiving pure-tone assessments and medical referrals. The results of this program were turned over to the Assistant Regional Director of Indian Health with the Department of National Health and Welfare in Edmonton for follow-up of a medical nature.

APPENDIX A

SCHOOL: ______________ CLASSROOM: ______________

TEACHER ______________ DATE: ______________

SCREENING CLINICIAN: ______________

____

NAME	AGE	TR. #	ATTEND-ANCE	1st SCR.		S.S. REF.	2nd SCR.		AUDIO REFERRAL
				R	L		R	L	
				5124	5124		5124	5124	
				5124	5124		5124	5124	
				5124	5124		5124	5124	
				5124	5124		5124	5124	
				5124	5124		5124	5124	
				5124	5124		5124	5124	
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				5124	5124		5124	5124	
				5124	5124		5124	5124	
				5124	5124		5124	5124	

Dr. Fahey is Assistant Professor of Speech and Audiology at the University of Alberta in Edmonton

Author's address: *Speech Pathology and Audiology, School of Rehabilitation Medicine, Corbett Hall, University of Alberta, Edmonton, Alberta.*

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APPENDIX B

HEARING SCREENING REPORT

NAME ____________________ TREATY NO. ________________

TRIBE ____________________ DATE TESTED ________________

Results of Hearing Screening
With Stimuli Presented at 25dB ISO By Air Conduction

	500 Hz	1000 Hz	2000 Hz	4000 Hz
Right Ear				
Left ear				

Disposition:

_______________ Referred for audiological examination

_______________ No referral necessary

WHAT IT IS TO BE A LARYNGECTOMEE: A SPECIFIC CASE STUDY

LINDA KOBITISCH

Abstract

This article is a specific case study of a laryngectomee, written while the author was a student at the University of Montana.

The following is a brief clinical study of a woman who underwent a total laryngectomy in 1966.

During the winter of 1963, the patient had developed hoarseness. The doctor prescribed antibiotics which reduced the hoarseness. Finally she was referred to an Ear, Nose and Throat specialist who discovered a nodule on the left fold. Biopsy disclosed cancer. The patient was given a choice of two courses of action: 1) cobalt treatments, or 2) removal of the fold. She chose cobalt treatments. After thirty treatments, during a six-week period, and a wait of thirty days, the biopsy was found negative. The patient was a school teacher at the time, (she taught for 35 years) so she continued teaching for a year believing that the cancer would not return. After moving to a new town, she became aware that there was "something wrong" with her voice. A check-up revealed the cancer had spread. Consequently, the left vocal fold was removed. The only noticeable affect of the removal of the vocal