

# Geriatric Audiology Curricula and Clinical Practice: A Canadian Perspective

## Les cours théoriques et la pratique clinique en audiologie gériatrique : la situation au Canada

by • par

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### ABSTRACT

The projected increase in the percentage of older adults in Canada and the high prevalence of hearing impairment among this group suggest that adults 65 years of age or older will place greater demands on the services provided by hearing health care professionals in the near future. To date, however, there are no published data that describe either the status of geriatric audiology curricula in Canadian universities or the clinical practice patterns of audiologists in geriatric audiology. The purpose of this study was twofold. The first was to examine the curricula relating to geriatric audiology in the six Canadian university audiology programs. The second was to survey audiologists in Canada concerning their clinical practice patterns in geriatric audiology. Completed questionnaires were received from all six Canadian university audiology programs and from 406 audiologists. Five of the six universities provide students with curriculum considered necessary by the national professional association for the identification and treatment of hearing-impaired older adults. Also, clinical education in geriatric audiology varies greatly among the university programs. Clinicians consider both academic and clinical education as effective tools for learning about geriatric audiology issues. They also indicated, however, that professional experiences are the most valuable method for learning about the hearing needs of older adults.

### ABRÉGÉ

L'augmentation prévue du pourcentage d'adultes âgés au Canada et la fréquence de la déficience auditive chez cette population amènent à penser que les adultes de 65 ans et plus provoqueront, dans un avenir rapproché, une forte croissance de la demande pour les services des professionnels de la santé auditive. Jusqu'à présent, toutefois, aucune des données publiées ne fait état des cours actuellement offerts en audiologie gériatrique dans les universités canadiennes ni des schémas de la pratique clinique des audiologistes en gériatrie. Cette étude avait une double fin : examiner les cours en audiologie gériatrique dans les six programmes d'audiologie des universités canadiennes et effectuer un sondage auprès des audiologistes du Canada pour connaître le schéma de leur pratique clinique en gériatrie. Les six universités et 406 audiologistes ont retourné le questionnaire après l'avoir rempli. Cinq des six universités offrent aux étudiants des cours que l'association professionnelle nationale juge essentiels pour le dépistage et le traitement des aînés malentendants. De plus, la formation clinique en audiologie gériatrique varie énormément d'une université à l'autre. Les cliniciens estiment que tant les cours théoriques que l'enseignement clinique sont des outils efficaces pour connaître les problèmes audiologiques en gériatrie. Néanmoins, ils ont fait savoir que l'expérience professionnelle était la méthode idéale pour apprendre à connaître les besoins audiologiques des personnes âgées.

### KEY WORDS

audiology • geriatrics • curriculum • clinical practice • Canada

In 1992, there were 3.2 million adults in Canada over the age of 65 who accounted for nearly 12% of the total population (Statistics Canada, 1992). It is predicted that the percentage of older adults will grow steadily over the next four decades such that by the year 2031 approximately 8.3 million individuals (nearly 22% of Canada's population) will be over the age of 65 (Statistics Canada, 1993). It also is well documented that the prevalence of hearing impairment increases geometrically with age (Health and Welfare Canada, 1988). Recent estimates indicate that 18% of Canadian older adults suffer from various forms of hearing impairment (Health and Activity Limitation Survey, 1992). The upward spiral in the overall percentage of older adults combined with the high

prevalence of hearing impairments among this group suggest that older adults will place great demands on the provision of hearing services in the coming decades.

### *The Canadian Perspective*

Currently, there are no published data that describe geriatric audiology curricula in Canadian university audiology programs. Moreover, there are no data that describe the clinical practice patterns of audiologists related to treating the hearing needs of older adults. A document published jointly by the Canadian Association of Speech-Language Pathologists and Audiologists (CASLPA) and Health and Welfare Canada (CASLPA, 1992) describes the knowledge necessary for the practice of audiology



and speech-language pathology. The comprehensive summary was formulated in consultation with faculty from Canadian university communication disorders programs as well as from practising clinicians from across Canada. The report outlines areas of knowledge that are "essential to clinical competence which is shared by all those at the point of entry into clinical practice" (p. iii). In part, the authors of the document recommend that audiology students, upon graduation, "demonstrate a basic knowledge of human development throughout the lifespan with a special emphasis on ... the aging process." (p. 8) The authors also recommend that graduates possess knowledge relating to the screening/identification, evaluation, and management of the hearing needs of older adults. No suggestions were made, however, regarding the implementation of these recommendations for Canadian university audiology programs.

#### *The United States Perspective*

Several studies in the United States examined the university curricula related to geriatric audiology. Nerbonne, Schow, and Hutchinson (1980) investigated gerontology-related education in communication disorders in 190 graduate university programs. They reviewed the content and number of geriatric audiology and gerontology courses as well as the extent and type of students' clinical experiences with older adult patients. Results revealed that a substantial majority of the programs did not provide a course in gerontology and were not planning to provide one in the near future. In fact, less than one quarter ( $n = 70$ ) of the surveyed programs offered or planned to provide geriatric or gerontology-related course work. Nerbonne et al. also found that the programs that did offer courses containing gerontology-related material had done so only recently, suggesting a new awareness of the hearing needs of the geriatric population. The authors predicted that increases in awareness would continue and would result in a "near doubling" of course offerings in the near future.

Raiford and Shadden (1985) also examined course offerings and clinical education in graduate communicative disorders programs in the United States. The purpose of their study was to investigate Nerbonne and colleagues' prediction. Although Raiford and Shadden found a 5% increase in gerontology-related course work, they stated that the scope of the gerontology-related content was limited.

The most recent survey to examine gerontology-related curricula in United States university programs was conducted by Clark, Ripich, and Weinstein (1994). Clark and colleagues found that more than three quarters ( $n = 78$ ) of the programs that they surveyed included the theme of the aging adult in course work. The majority incorporated aging-related issues into existing course work rather than offering a separate course. The theme of the aging adult was included as a separate unit in courses on rehabilitation, diagnosis, and amplification.

Although several programs offered a graduate-level course in gerontology, Clark et al. (1994) noted that the courses focused primarily on normal aging and communication, and lacked specific audiological content.

The results of these surveys indicate that the university programs in audiology and speech-language pathology in the United States have been slow to act upon recommendations to incorporate gerontology-related content into graduate level curricula and clinical education (Raiford & Shadden, 1985). Moreover, geriatric audiology content is evolving slowly in graduate level curricula. The recent curricula and clinical education options for audiology students enrolled in university programs in the United States do not provide them with the requisite knowledge and applied skills to address the hearing needs of older adults (Clark et al., 1994). It is imperative to know if the same situation exists currently for Canadian university audiology programs and students. The present study was designed to describe the academic curricula and clinical education experiences in geriatric audiology offered by Canadian university audiology programs, and to examine the clinical practice patterns of audiologists who identify and treat the hearing needs of older adults.

## **Method**

### *Participants*

The department chairpersons of the six Canadian university audiology programs and all practising audiologists from across Canada ( $n = 755$ ) were invited to participate in the survey. All department chairpersons were contacted by mail. Practising audiologists were contacted by mail using membership addresses provided by CASLPA and their provincial/territorial association counterparts. Five provincial associations did not provide addresses due to issues of confidentiality. In lieu of this, advertisements describing the study and inviting participation were placed in the professional newsletters of the five associations. Speech-language pathologists, hearing aid dispensers/dealers, and communicative disorders assistants were excluded from the sample.

All participants completed the questionnaire voluntarily with no remuneration. Questionnaires were coded numerically to ensure confidentiality. Group data only are reported.

### *Questionnaires*

Two questionnaires (i.e., one for university programs and one for clinicians) were developed based on the recommendations of several sources that outlined survey formats and circulation procedures (Fink & Kosecoff, 1985; Streiner & Norman, 1989) (see Appendix A for copies of the questionnaires). The frameworks of previous questionnaires used to gather information on the curricula and clinical practice patterns in communication disor-

ders were used as guides in the development of our two questionnaires (CASLPA, 1994; Clark et al., 1994; Hearing Health Care Research Unit, 1994; Nerbonne et al., 1980; Raiford & Shadden, 1985; Webb, Wulkan, Kricos, & LaPointe, 1986).

**University questionnaire.** The university questionnaire was divided into five sections. The first section contained questions about program demographics and admission prerequisites (e.g., degree levels, number of students enrolled, required courses). The second section requested information about the general philosophy of the program and the importance of providing gerontology related content in both academic curricula and clinical education. The third section included questions concerning teaching approaches (e.g., infusion, pyramid, single course). It also included questions on curriculum content specific to geriatric audiology (e.g., subtopic of Drug ototoxicity within the topic of Hearing and Aging). The fourth section dealt exclusively with the clinical education of audiology graduate students (e.g., number of hours, locations). The final section contained questions that asked for the respondents' perspectives of the audiology curriculum (e.g., whether or not the program provided adequate information about gerontology-related issues).

**Audiologists' questionnaire.** The second questionnaire was circulated to all identified practising audiologists in Canada. The questionnaire was divided into four sections. The first section contained questions related to clinical practice and client demographics (e.g., geographic location of work, population of catchment area, client age ranges). The second set of questions addressed respondents' professional experiences (e.g., number of years practising). The third section dealt with the respondents' educational background (e.g., highest degree held, sources of learning, overall current knowledge of geriatric audiology). The final section contained questions about current and future continuing education needs for clinical practice in geriatric audiology (e.g., topics relevant to the education in and practice of geriatric audiology, sources of continuing education).

### Procedure

A data package was mailed either in April or May of 1994 to each potential participant consisting of a letter of information, a consent form, a questionnaire, and a self-addressed stamped return envelope. The information letter outlined the nature of the study and contained instructions for completing the questionnaire. Return rates were monitored throughout the study. Approximately five weeks after the first mailing a reminder card was sent to all non-respondents asking them to complete and return the questionnaire at their earliest convenience. The same notice was sent nine weeks following the first mailing to the remaining nonrespondents. Approximately 12 weeks following the initial mailing, reminder phone calls were placed to non-

responding chairpersons of Canadian university programs, while a second data package was mailed to all remaining non-responding clinicians. Streiner and Norman (1989) recommended this protocol to optimise response and return rates.

## Results

### University Questionnaire

All six Canadian universities returned a completed questionnaire for a response rate of 100%. The following data reflect the status of geriatric audiology curricula in Canadian audiology programs as of April 1994 to August 1994.

**Audiology program demographics and admission prerequisites.** One Canadian university offers undergraduate education in audiology. Fourteen full-time students are enrolled in this program with an average of 10 graduates per year. All six universities offer a degree program at the *master's* level. The number of students enrolled ranges from 5 part-time and full-time students to 44 full-time students. The average number of graduates from each of these universities varies from 5 to 15 per year. Three universities offer *doctoral* level education in audiology. Two do not have doctoral students enrolled while the third has one full-time and two part-time doctoral students enrolled.

One university chair did not respond to the question on admission prerequisites. The remaining five university respondents indicated that psychology and research methods courses (or an equivalent course in statistics) are required prerequisite courses. Four respondents listed linguistics as a prerequisite. Other identified prerequisites include anatomy, neuroanatomy, physiology, physics, science, and mathematics.

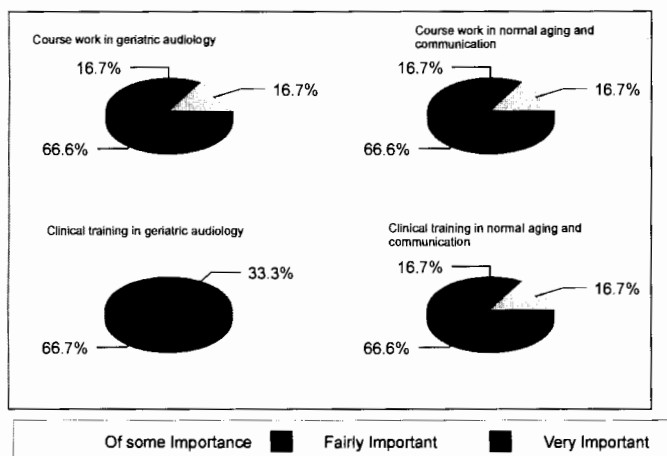
**Program philosophy and importance of providing gerontology content.** All six university respondents reported that geriatric education should be incorporated into existing graduate courses. This teaching approach is preferred over other frameworks including a single course in gerontology or continuing education credits.

Respondents were asked to rate the relative importance of providing students with course work and clinical education in both geriatric audiology and areas related to normal aging and communication. Two-thirds of the respondents rated the importance of providing course work and clinical education in these areas as very important (See Figure 1).

One university respondent reported that geriatric audiology is not provided in course work. The results contained in the next section, therefore, reflect the responses from the other five university representatives who reported that they do provide students with course work in geriatric audiology.

**Teaching approaches and curricula topics.** One university respondent reported that master's level students are required to take a single course in geriatric audiology. The course is offered

**Figure 1. University respondents' relative importance ratings of providing course work and clinical training in geriatric audiology and normal aging and communication.**



on an annual basis for one term and consists of three hours of lecture and two hours of laboratory or clinic work per week. The course has been taught for ten years by faculty within the department. Student performance in the course is evaluated based upon tests, examinations, and essays. In contrast to the single course approach, one university program uses a pyramid approach for instruction. In this approach, students take a series of courses containing aging-related content which progressively expand students' knowledge and practical experiences. An infusion approach, however, was the most commonly used among university programs ( $n = 3$  of 5). In this approach, gerontology and geriatric content is incorporated into each thematic unit within specific courses.

University respondents also were asked to identify gerontology-related topics and subtopics that are taught in their audiology curricula. Topic options included Normal Aging, Hearing and Aging, Screening/Identification, Assessment, Rehabilitation and Treatment, Professional Issues, and Other. All five university respondents reported that they provide students with information on Normal Aging including the following sub-topics; attitudes towards aging, biology, cognition, and neurology. Four respondents reported that they provide information on sub-topics such as language, physiology, and speech changes associated with aging.

All five university respondents reported including sub-topics related to Hearing and Aging such as common causes of impairment, physical audiological changes, and psychological effects. Four of the five respondents stated that they provide course work concerning demographics and drug ototoxicity in older adults.

All five university respondents reported that they provide

course work concerning Screening/Identification protocols. Four noted that they include issues related to hearing loss prevention.

All five university respondents identified several sub-topics under the heading of Assessment. None of these sub-topics are exclusive to geriatric audiology. However, respondents were asked to indicate the sub-topics that relate specifically to the hearing needs of older adults. Sub-topics include auditory evoked potentials, diagnostic single-frequency impedance, transient otoacoustic emissions, air and bone conduction, speech discrimination, and tests of cortical functioning. Four of the five respondents noted that they cover multifrequency tympanometry, distortion product otoacoustic emissions, and self-report scales.

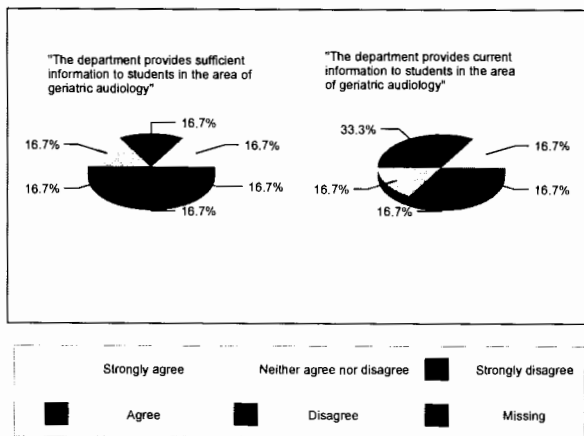
All five university respondents reported that they address Rehabilitation and Treatment topics in depth. Amplification, assistive listening devices, communication strategies, counselling and follow-up, as well as hearing aid orientation, are common subtopics that are covered.

Finally, four of the university respondents stated that they include discussions of various Professional Issues (e.g., roles of audiologists). Two university respondents also reported that they address multidisciplinary teamwork. One other university respondent reported that their curriculum includes content on research methods and design specific to geriatric audiology.

**Clinical education experiences in geriatric audiology.** All six university respondents stated that they provide students with clinical education in geriatric audiology through observation and practicum experiences. In four of the universities, clinical education is completed in conjunction with specific course work either in aural rehabilitation or amplification. The number of hours students spend with older adults varied widely across the six universities, ranging from 45 to 250 hours. Three university respondents did not indicate the number of clinical education hours spent in identification and treatment. The other three reported that students spend, on average, 5 hours in screening/identification, 77 hours in assessment, 47 hours in rehabilitation, and 15 hours in research and professional issues. For these three university programs, students obtain their clinical experiences either in hospitals, senior citizen/retirement homes, rehabilitation clinics, or nursing homes.

**Perspectives of the audiology curriculum.** University respondents were asked to rank their opinions on two statements concerning their audiology curriculum using a five-point Likert scale (strongly agree, agree, neither agree nor disagree, disagree, strongly disagree). The first statement was "In my view, the department provides sufficient information to students in the area of geriatric audiology." The second statement was "The department provides current information to students in the area of geriatric audiology." Figure 2 illustrates the respondents' broad range of rankings for both statements.

**Figure 2. University respondents' perspectives of their audiology curriculum**



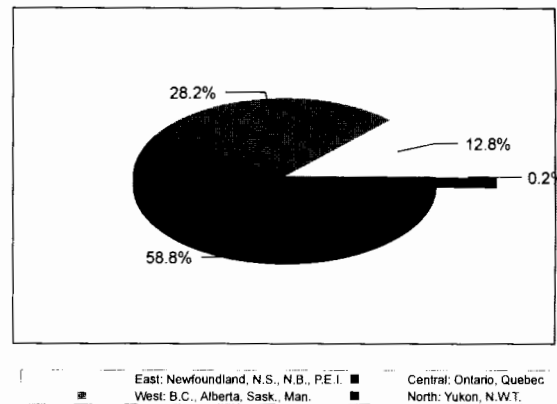
Two other questions concerning the balance of curricula for all age groups and reasons for a lack of sufficient information in the university's geriatric audiology curricula were included in this section. All university respondents stated that they do an adequate job of balancing the content of the curricula to cover all age groups. Reasons for a lack of geriatric audiology curriculum include a crowded curriculum (n = 4) a constrained budget (n = 2), and a lack of faculty time to provide sufficient information to students (n = 2).

**Audiologists' Questionnaire**

A total of 755 questionnaires were mailed to audiologists in current clinical practice in Canada. Four-hundred and seventy questionnaires were returned, of which 406 were fully-completed, yielding a response rate of 53.7%. Sixty-four incomplete data packages were returned. Of these, six potential respondents were working primarily as speech-language pathologists. Eight audiologists stated that they were not working currently with the geriatric population and did not wish to complete the questionnaire. Eighteen potential respondents were retired, on leave, or did not wish to participate. Thirty-two data packages were returned as undeliverable by Canada Post.

**Demographic information.** Figure 3 represents the geographic locations of respondents. The majority of respondents (58.8%) come from the central region of Canada identified as the provinces of Ontario and Quebec. Nearly three-quarters (73.7%) of the respondents live in large urban areas (n > 100,000). Slightly more than a quarter (25.3%) live in smaller centres (10,000 < n < 99,999). The remaining 1% live in areas with less than 10,000 residents. Respondents are predominately female (75%). The majority (n = 193; 48.4%) are between 30-39 years of age (see Figure 4).

**Figure 3. Geographic location of audiologists.**



**Figure 4. Age range of audiologists.**

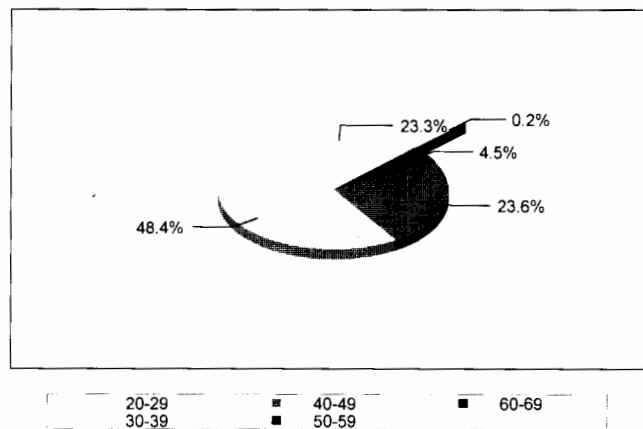


Table 1 presents the current work settings of the respondents. Nearly half (47.3%) work in a hospital setting. Audiologists working in a private clinic comprise 18.2% of the sample. The remaining individuals work in various centres including public health units, rehabilitation clinics, and physician's offices.

Table 2 shows the caseload percentages broken down by age groups. Ninety-four percent of the respondents (n = 382/406) used the age divisions provided in the questionnaire. Several respondents indicated that they do not provide service for particular age groups as shown by the last column in Table 2. Those audiologists who did not use the age divisions were excluded from the analysis for this question only. The data reveal a wide distribution in age groups that are served. However, on average half of the respondents' caseload time consists of serving adults and young-old adults.

**Table 1. Percentage of respondents for each work setting**

Work setting	Percentage of respondents
Hospital	47.3
Private clinic	18.2
Public health unit	8.4
Rehabilitation clinic	6.4
Physician's office	3.7
Centre for developmental disabilities	2.5
Public school	2.0
Other	11.5

**Table 2. Number of respondents working with age groups and mean percentage of respondents' caseloads for age groups**

Age group	N <sup>a</sup> (Total n = 382)	M (SD)	Number not servicing group (% of respondents)
Infant (0-12 months)	219	8.8 (10.8)	150 (38.6%)
Preschool (1-5 years)	286	18.2 (16.6)	83 (21.4)
School age (6-13 years)	292	15.1 (14.3)	73 (18.9)
Adolescent (14-19 years)	290	7.9 ( 9.7)	72 (18.8)
Adults (20-24 years)	318	26.9 (19.2)	50 (12.8)
Young-Old (65-75)	303	24.2 (14.4)	56 (14.7)
Old (76-85 years)	298	15.6 (10.6)	61 (16.0)
Old-Old (85+ years)	286	7.3 ( 6.4)	73 (19.2)

Note: <sup>a</sup>Number of respondents who reported providing service for the age group.

The demographic information obtained in this questionnaire was compared with the most recent demographic data collected during CASLPA's omnibus survey in 1990 (CASLPA Demographics Committee, 1990) (see Table 3). A comparison of the two data sets demonstrates that the audiology respondents who participated in the present study are representative of the audiologists who participated in the CASLPA 1990 study.

**Professional experiences.** The majority of respondents work full-time (94%), although a number of them reported both part-time and full-time work experiences. Most of the respondents (93%) indicated spending some time identifying and managing the hearing needs of adults 65 years of age or older. Of these respondents, 38% have five years or less of work experience, 27% have five to ten years of experience, and 28% have spent 10 or more years identifying and managing the hearing needs of older adults.

A majority of the respondents (53%,  $n = 216$ ) reported no preference for working with a particular age group, whereas 46% ( $n = 187$ ) indicated a preference. Of those indicating a preference, 48% ( $n = 90$ ) prefer to work with patients 20 years of age or younger, 25% ( $n = 47$ ) prefer to work with adults, and only 27% ( $n = 50$ ) prefer to work with older adults.

**Educational background.** The majority of respondents (60%,  $n = 247$ ) graduated from universities in Canada, of which one quarter ( $n = 103$ ) of the respondents graduated from universities

**Table 3. Demographic data from the CASLPA 1990 study versus present study demographic data**

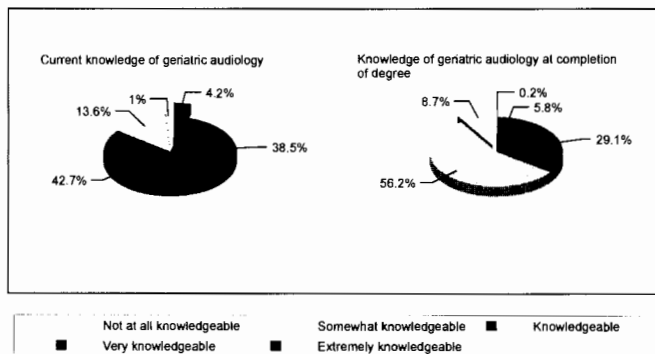
Parameter	CASLPA 1990 (n = 350)	Present Study (n = 406)
Geographic location		
West	27	28.2
Central	62	58.8
East	10	12.8
North	-	.2
Community size		
< 100,000	24	26.3
100,000+	76	73.3
Employment setting		
Hospital	51	47
Private Practice	15	18
Public Health	13	8
Rehabilitation Centres	8	6
Schools	5	3
Country of education <sup>a</sup>		
Canada	56	60
USA	37	36
Other	7	2.9
Highest degree		
Bachelor	0	1.1
Masters	94	97
Doctorate	5	1.5
Age		
20-29 years	25	23
30-39 years	53	48
40-49 years	19	23
50+ years	3	6.2
Sex		
Female	71	75
Male	29	23

Note: <sup>a</sup>Includes both speech-language pathologists and audiologists in the CASLPA 1990 study. Figures are percentages. Numbers may not add to 100 due to rounding.

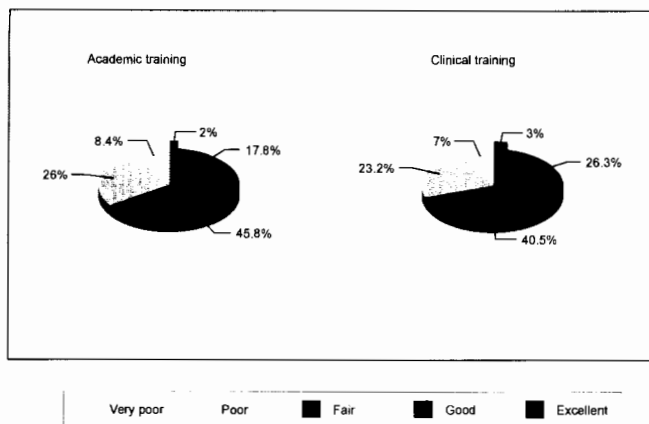
in Quebec, 16% ( $n = 65$ ) from universities in Ontario, 12% ( $n = 49$ ) from a university in Nova Scotia, and 7% ( $n = 30$ ) from a university in British Columbia. Thirty-six percent of the respondents ( $n = 144$ ) graduated from universities in the United States. The remaining respondents graduated from educational institutions in Argentina, Columbia, South Africa, England, and the United Kingdom ( $n = 12$ ). An overwhelming majority of respondents (97%) currently hold Master's degrees.

One third of the respondents (33%,  $n = 134$ ) graduated in the last five years, 26% ( $n = 107$ ) graduated five to ten years ago, and 41% ( $n = 165$ ) graduated more than ten years ago. The mean number of years since respondents received their highest degree is 9.8 years ( $SD = 7.0$  years). As these data show, there is wide variation in the respondents' educational background. The majority (58%) are not currently working in the province from which they graduated compared with 42% who do.

**Figure 5. Audiologists' knowledge of geriatric audiology.**



**Figure 6. Audiologists' education in geriatric audiology.**



The next series of questions asked about the respondents' knowledge of and educational background in geriatric audiology. Respondents were asked to rate their overall knowledge in geriatric audiology at the present time as well as following graduation. The ratings are presented in Figure 5. Over forty-two percent (42.7%) of the respondents rated themselves as either Extremely knowledgeable or Very knowledgeable at the present time, while a smaller percentage (6.0%) rated themselves as Extremely knowledgeable or Very knowledgeable at the completion of their degree.

Respondents also were asked to rate their academic and clinical education in geriatric audiology (see Figure 6). In general, respondents indicated that

both their academic (45.8%) and clinical education (40.5%) was Fair. Approximately one third rated their education as Poor or Very poor. As indicated previously, 60% of respondents graduated from universities in Canada. Over three-quarters (83.7%) of the respondents who graduated from Canadian university graduate programs rated their academic education in geriatric audiology as Fair or poorer. Similarly, 72.9% of respondents who graduated from universities in the United States rated their academic education in geriatric audiology as Fair or poorer. Respondents' ratings of their clinical education showed a similar pattern. Over two-thirds (68.1%) of the respondents who graduated from Canadian universities rated their clinical education in geriatric audiology as Fair or poorer. Almost three-quarters (73.0%) of those graduating from universities in the United States rated their clinical education in geriatric audiology as Fair or poorer.

An overwhelming 80% of all respondents stated that they were interested in learning more about geriatric audiology issues. When asked to indicate what topics were of current interest or in need of further research, amplification was noted most frequently (n = 115). Rehabilitation in general was identified by 53 respondents, while cognitive and/or central processing was noted by 60 respondents.

**Perspectives on education.** The next series of questions asked about audiologists' perspectives of their education in and clinical practice of geriatric audiology relative to specific topic and sub-topic areas. Topics included normal aging, hearing and aging, screening/identification, assessment, rehabilitation and treatment, and professional issues. Respondents were asked to rate the relative importance of a number of sub-topics within each topic area.

Table 4 shows the percentage ratings of sub-topics for the topic of Normal Aging. The sub-topic Attitudes towards aging was the only item rated consistently (52.2%) as Very important for academic and clinical education by the majority of respondents.

**Table 4. Percentage of respondents' ratings of sub-topics for the topic Normal Aging.**

Sub-topics	VI	FI	OSI	FU	NI	NR
Attitudes towards aging	52.2	33.3	10.6	1.5	.7	1.7
Biology	12.8	34.7	38.9	10.1	2	1.5
Cognition	41.4	43.6	12.6	1.2	.2	1.2
Language	19.2	37.4	33.7	6.9	1.0	1.7
Neurology	30.3	44.3	21.9	1.5	.2	1.7
Physiology	25.6	42.1	25.9	4.2	.5	1.7
Psychology	40.6	44.8	11.1	2.0	.2	1.2
Sociology	31.5	35.2	24.9	5.7	1.0	1.7
Speech	8.6	31.8	38.2	17.7	2.2	1.5
Voice	4.4	19.2	40.6	26.8	6.7	2.2

Note: VI = Very important; FI = Fairly important; OSI = Of some importance; FU = Fairly unimportant; NI = Not important; NR = No rating.

**Table 5. Percentage of respondents' ratings of sub-topics for the topic *Hearing and Aging*.**

Sub-Topics	VI	FI	OSI	FU	NI	NR
Sociological effects	49	34.2	12.8	2.5	.2	1.2
Psychological effects	62.3	32.3	3.4	.5	.2	1.2
Physical audio-logical changes	56.7	35.2	6.2	.5	.2	1.2
Drug ototoxicity	35	34.5	24.4	3.9	1.0	1.2
Demographics	16.3	27.3	42.4	11.1	1.7	1.2
Common causes of impairment	63.5	27.1	6.2	1.7	.2	1.2

Note: VI = Very important; FI = Fairly important; OSI = Of some importance; FU = Fairly unimportant; NI = Not important; NR = No rating.

**Table 6. Percentage of respondents' ratings of sub-topics for the topic *Screening/Identification*.**

Sub-Topics	VI	FI	OSI	FU	NI	NR
Screening protocols	30.5	34.5	24.9	6.4	2.0	1.7
Prevention	32.2	33.5	23.6	7.1	2.0	1.5

Note: VI = Very important; FI = Fairly important; OSI = Of some importance; FU = Fairly unimportant; NI = Not important; NR = No rating.

Table 5 shows the percentage ratings of sub-topics for the topic *Hearing and Aging*. All sub-topics except *Demographics* and *Drug ototoxicity* were rated *Very important* by the majority of respondents.

**Table 7. Percentage of respondents' ratings of sub-topics for the topic *Assessment*.**

Sub-Topics	VI	FI	OSI	FU	NI	DK	NR
Brainstem auditory evoked potentials	16.5	25.4	31.3	12.8	3.9	.7	9.4
Lates/P300 auditory evoked potentials	6.2	17.7	32.3	15.8	7.4	2.2	18.5
Single frequency impedance	27.6	34.2	24.4	4.4	.7	1.0	7.6
Multi-frequency impedance	11.1	25.6	29.6	13.3	5.4	2.0	13.1
Transient otoacoustic emissions	6.9	12.3	27.8	17.5	7.6	5.2	22.7
Distortion product otoacoustic emissions	6.9	13.8	26.6	16.5	6.9	5.2	24.1
Pure tone air/bone conduction	67.5	20.4	4.7	.5	.2	.2	6.4
Self-report scales	44.3	31.3	14.3	2.5	.5	0	7.1
Speech discrimination Tests of central/cortical functioning	59.6	26.1	6.4	1.0	.2	.2	6.4
	14.5	21.4	30.5	16.5	6.9	0	10.1

Note: VI = Very important; FI = Fairly important; OSI = Of some importance; FU = Fairly unimportant; NI = Not important; DK = Don't know; NR = No rating.

Table 6 shows the percentage ratings of sub-topics for *Screening/Identification*. Both of the sub-topics *Screening protocols* and *Prevention* were considered to be *Fairly important* or *Very important* by the majority of respondents.

Table 7 shows the percentage ratings of sub-topics for the topic *Assessment*. *Pure tone air/bone conduction*, *Self-report scales*, and *Speech discrimination* were rated as *Very important* by the majority of respondents. The data show that several assessment protocols and tools either were not rated or were unfamiliar to a high percentage of respondents.

Audiologists also were asked to indicate if assessment tools should be modified for older adults. The majority of respondents interpreted the question to mean procedural modifications versus adjustments to interpretations of normative data. The data in Table 8 show that the majority of respondents feel that modifications to self-report scales, speech discrimination tests, and procedures to test central/cortical function are necessary for interpreting the performance of older adults.



**Table 8. Percentage and number of respondents responding to question on assessment tool modifications.**

Assessment tool	Modify	Do not modify	Don't know	No rating
Brainstem auditory evoked potentials	35.5 (144)	39.7 (161)	2.5 (10)	22.4 (91)
Lates/P300 auditory evoked potentials	28.6 (116)	32.5 (132)	5.4 (22)	33.3 (135)
Single frequency impedance	9.9 (40)	64.3 (261)	3.4 (14)	22.4 (91)
Multi-frequency impedance	8.9 (36)	58.4 (287)	4.7 (19)	28.1 (114)
Transient otoacoustic emissions	11.1 (45)	39.9 (162)	9.6 (39)	39.4 (160)
Distortion productotoacoustic emissions	11.3 (46)	39.4 (160)	9.4 (38)	39.9 (162)
Pure tone air/bone conduction	33.5 (136)	42.1 (171)	2.2 (9)	22.2 (90)
Self-report scales	49.3 (200)	24.9 (101)	1.2 (5)	24.6 (100)
Speech discrimination	44.8 (182)	32.5 (132)	1.0 (4)	21.7 (88)
Tests of central/corical functioning	48.5 (197)	21.4 (87)	2.2 (9)	27.8 (113)

**Table 9. Percentage of respondents' ratings of sub-topics for the topic *Rehabilitation/Treatment*.**

Sub-Topics	VI	FI	OSI	FU	NI	NR
Amplification	82	15.8	1.0	0	.2	1.0
Assistive listening devices	76.6	19.2	2.7	0	.5	1.0
Communication strategies	84	12.1	2.0	.5	.2	1.2
Counselling and follow-up	88.4	8.9	1.0	.2	.2	1.2
Hearing aid orientation	85.2	11.3	1.2	.2	.2	1.7

Note: VI = Very important; FI = Fairly important; OSI = Of some importance; FU = Fairly unimportant; NI = Not important; NR = No rating.

**Table 10. Percentage of respondents' ratings of sub-topics for the topic *Professional Issues*.**

Sub-Topic	VI	FI	OSI	FU	NI	NR
Roles of an audiologist	56.9	28.6	10.3	1.2	.2	2.7

Note: VI = Very important; FI = Fairly important; OSI = Of some importance; FU = Fairly unimportant; NI = Not important; NR = No rating.

Table 9 shows the ratings of sub-topics for the topic of Rehabilitation/Treatment. All five sub-topics were rated as Very important by more than three-quarters of the respondents.

Table 10 shows the ratings of the sub-topic for the topic of Professional Issues. Information on the role of the audiologist in treating the hearing needs of older adults was rated as Very important.

Audiologists also were asked to suggest additional sub-topics related to geriatric audiology that should be covered in academic and clinical education. Sub-topics they identified include Sensory changes (associated with aging) (n = 16), Family education (n = 51), Residential setting issues (n = 7), Physical/social activeness of older adults (n = 10), Multiple medical conditions

(n = 12), and Funding sources for amplification and rehabilitation/treatment (n = 6). All of these sub-topics were rated as either Fairly important or Very important by these respondents.

With regard to a question concerning the best methods for learning about geriatric audiology, 84% and 92% of the respondents indicated that academic and clinical education, respectively, are appropriate sources for information. In addition, 92% reported that professional experiences (e.g., client and peer contact, interdisciplinary teamwork experiences, etc.) are effective for learning about geriatric audiology. Sixty percent of the respondents indicated that independent study is an effective method for learning about geriatric audiology.

Audiologists then were asked to indicate the topics that should be included in university graduate level curricula in order to prepare clinicians to practice in the speciality area of geriatric audiology. Topics such as Normal Aging, Rehabilitation/



Table 11. Percentage of respondents' ratings of sources of information.

Sources of information	VI	FI	OSI	FU	NI	NR
Undergraduate education	5.9	11.1	23.2	16.3	22.2	21.4
Graduate education	23.9	34.0	25.9	4.9	1.7	9.6
Workshops, seminars, conferences	19.5	35.2	23.9	3.2	3.0	15.3
Professional journals	16.3	34.7	30.8	6.2	1.7	10.3
Textbooks	11.1	34.7	31.8	8.6	3.2	10.6
Professional experiences	73.2	17.0	2.5	0	.2	7.1
Personal experiences	43.3	22.7	18.0	3.9	2.7	9.4

Note: VI = Very important; FI = Fairly important; OSI = Of some importance; FU = Fairly unimportant; NI = Not important; NR = No rating.

Table 12. Percentage of respondents' rank ordering for sources of information.

Sources of information	Rank order								NR
	MI-1	2	3	4	5	6	7	LI-8	
Undergraduate education	3.4	3.9	4.2	4.4	8.1	11.6	39.9	1.7	22.4
Graduate education	13.3	16.5	15.8	17.5	9.1	11.8	.5	0	15.5
Workshops, seminars, conferences	6.4	13.8	19.5	12.1	15.0	9.1	4.2	.2	19.7
Professional journals	1.7	6.4	14.3	21.9	19.2	13.5	6.9	0	16.0
Textbooks	1.2	3.9	13.5	12.1	19.2	21.7	10.8	.2	17.2
Professional experiences	50.2	19.5	6.7	5.9	1.5	.7	1.0	0	14.5
Personal experiences	8.4	22.2	11.3	10.8	11.1	10.6	8.4	.2	17.0

Note: MI = Most important; LI = Least important; NR = No rating.

Treatment, and Assessment were mentioned most frequently. The sub-topics that were identified include the Psychology of aging (n = 160), Physiological changes associated with aging (n = 126), Rehabilitation (n = 122), Counselling (n = 121), Amplification (n = 113), Assessment (n = 111), and Sociology of aging (n = 102).

The next series of questions asked respondents to rate the importance of various sources of information that they used to develop their knowledge of geriatric audiology issues. Only 42% of the respondents listed undergraduate education as a source of information. In contrast, 87% listed graduate education as a source. Workshops, seminars, and conferences are a source of information for 75% of the respondents. Professional journals and textbooks are sources of information for over 80% of the respondents. Professional experiences are listed as a source of information for 92% of the respondents. Finally, personal experiences

are listed as a source of information by 84% of the respondents.

Table 11 shows the respondents' ratings of the relative importance of information concerning geriatric audiology. Professional experiences are rated as Very important sources of information by 73.2% of the respondents.

Table 12 shows respondents' rank ordering (1 = Most important to 8 = Least important) of the sources used to generate their knowledge of geriatric audiology. The data show that professional experiences are ranked as Most important by the majority of respondents.

The final question asked respondents to identify the sources of information for which they learned about selected topics in geriatric audiology. Table 13 shows the percentage of respondents who indicated that the topic was covered for each source of information. Professional journals and textbooks, but especially

**Table 13. Percentages and number of respondents ( ) reporting topics covered in the sources of information.**

Sources of information	Topics covered					
	Normal Aging	Hearing & Aging	Screening Identification	Assessment	Rehabilitation	Professional Issues
Undergraduate education	48 (387)	32 (388)	23 (388)	29 (388)	23 (388)	11 (387)
Graduate education	59 (387)	84 (388)	65 (388)	82 (388)	84 (388)	50 (387)
Workshops, seminars, conferences	28 (390)	59 (390)	27 (390)	46 (390)	76 (390)	45 (389)
Professional journals	33 (390)	72 (390)	47 (390)	63 (390)	79 (390)	49 (389)
Textbooks	60 (390)	81 (390)	53 (390)	75 (390)	76 (390)	35 (389)
Professional experiences	62 (389)	79 (390)	64 (390)	86 (390)	89 (390)	68 (389)
Personal experiences	64 (390)	64 (390)	21 (390)	34 (390)	51 (390)	33 (389)

graduate education and professional experiences, are the primary sources of information on geriatric audiology.

## Discussion

### *University Questionnaire*

In the present study, all Canadian university audiology program respondents are aware of the need for students to obtain both academic and clinical education in geriatric audiology. Their awareness is reflected in their high ratings of the importance of the need to include academic and clinical educational experiences in the areas of geriatric audiology and normal aging and communication. In addition, all university respondents agree that geriatric education should be incorporated into their existing curricula. A consensus of opinion is clear among university respondents both in the importance they attach to providing geriatric audiology education and in the approaches they use to meet academic and clinical education learning objectives.

An examination of geriatric curricula content in Canadian university audiology programs suggests that similarities do exist in current programming. Three of the six programs incorporate gerontology-related issues into existing curricula. This is described as the infusion approach (Clark, Ripich, & Weinstein, 1994). In addition, these same three university programs provide students with an inclusive knowledge base in areas considered necessary for effective identification and management of hearing-impaired older adults. These topic areas include Normal Aging, Hearing and Aging, Screening/Identification, Assessment, Rehabilitation/Treatment, and Professional Issues. In fact, areas of knowledge identified as essential to practice by

CASLPA's Certifying Clinical Competency document (1992) are included in the curricula of five of the six programs. The same topics are rated as important areas of education by audiologists currently practising in Canada. The similarity in the responses of the university respondents and the audiologists indicates that Canadian programs include topic areas related to geriatric audiology that clinicians consider important for their knowledge base and practice.

The time spent in coursework on geriatric audiology topics was not investigated in this study. Consequently, we do not know the amount of time devoted to geriatric audiology components in each university's current curricula. It is important to note, however, that university respondents indicated that time limitations, a crowded curriculum, and reduced faculty availability are reasons for insufficient depth of coverage of geriatric audiology issues.

The current high status of gerontology-related content in university audiology graduate programs indicates that some universities recognise the increasing need for clinicians to be aware of and understand the hearing needs of older adults. It is important to note, however, that one university does not provide students with any course work in geriatric audiology.

While academic education is one avenue to establish knowledge, clinical practica also are integral to graduate level experiences. It was equally important to consider the clinical education components in university programs. In general, clinical experiences varied widely. The amount of time spent in clinical education differed substantially from program to program, ranging from a low of 45 hours to a high of 250 hours. Interestingly, the same group of students in the one university program which



does not require geriatric audiology coursework spend more time clinically in the identification and management of hearing-impaired older adults than do students in any of the other Canadian university programs.

It is difficult to draw conclusions about the education of graduate students in Canada with respect to the topic areas of Screening, Assessment, Rehabilitation/Treatment, and Professional Issues. Only three programs completed this question. The data from the three programs indicate that students spend a majority of their time in Assessment, with Rehabilitation/Treatment areas relegated to secondary levels of importance. This perspective on topic priorities is in stark contrast with the view of the practising audiologists who consider rehabilitation an area in need of further research and of primary importance for students.

Finally, the university respondents' perspectives of their geriatric audiology curricula revealed several interesting findings. University respondents' degree of satisfaction with current programming varies. Several respondents are quite satisfied with their current approach to teaching geriatric audiology-related content. Analysis of these respondents' questionnaires show that their programs provide academic education using either the infusion (i.e., incorporating geriatric information into each unit in a course) or the single course approach. In contrast, several university respondents note that students are not receiving sufficient academic content or current education in geriatric audiology. Responses from a representative of these programs indicate that either they are not providing education or that they are using an alternate teaching approach (e.g., pyramid).

#### *Audiologists' Questionnaire*

It was equally important in this study to examine the current clinical practice patterns of audiologists with respect to geriatric audiology. In particular, it was critical to know how much of a clinician's time is spent in the identification and rehabilitation of the hearing needs of older adults. Moreover, it was important to discover the types of educational experiences clinicians use to develop a knowledge base about geriatric audiology.

The data show that on average nearly half of the audiologists' time ( $M = 47\%$ ) is spent identifying and treating the hearing needs of older adults. This percentage of time shows clearly that knowledge of geriatric audiology issues is critical to respondents' caseloads. Respondents noted that this knowledge can be acquired through either professional experiences or formal academic programs.

On-site professional experience in geriatric audiology varies among the respondents. The greatest number of respondents possessed five or fewer years of experience. Respondents' ratings of their university-based educational experiences in geriatric audiology are not favourable. The majority of respondents rated their own academic and clinical education in geriatric audiology

as fair. Based on these ratings, the extent and quality of educational programming can be expanded and improved.

When audiologists were given the opportunity to indicate specific topics in geriatric audiology they would like to learn more about, the areas of Normal Aging, Assessment, and Rehabilitation are mentioned most frequently. As noted previously by the university respondents, time constraints play a role in determining the extent to which these topics are addressed in university curricula. It may be of benefit for university audiology programs to consider incorporating into a revised curriculum selected sub-topics within each of the aforementioned topic areas.

Respondents identified various sources of information they used to gather knowledge on geriatric audiology including graduate education, personal and professional experiences, and professional journals and textbooks. However, half of the respondents rated professional experiences as the most important source of information about gerontology-related issues. It is clear that substantial learning of geriatric audiology occurs following formal academic and clinical education for the current sample of respondents.

#### **Conclusions and Recommendations**

Several encouraging findings emerge from the data provided by the university respondents. There is agreement in principal for the need to implement education approaches that facilitate academic and clinical educational experiences in the area of geriatric audiology. Several university programs are striving to achieve this by providing students with a comprehensive academic and clinical knowledge base necessary for the identification and treatment of the hearing needs of older adults. The findings, however, are not reflected in all Canadian university programs. Therefore, a national effort to reach a consensus on a curriculum which ensures more than an adequate education for all audiology graduates is required. A delay in making effective changes to audiology curricula will only serve to frustrate new clinicians and delay implementation of the quality of care that hearing-impaired older adults require.

Responses from the clinical audiologists show clearly that their caseload is composed primarily of adults and older adults. The importance that the audiologists attach to formal academic and clinical educational experiences in geriatric audiology is quite high. However, on-going professional experience is considered currently by clinicians to be the most important source of information for them to learn about geriatric audiology issues. The limited formal education clinicians received in geriatric audiology may be due in part to budget and time restrictions, and a crowded university audiology curriculum, which, in turn, limits students' coursework and clinical practicum experiences in geriatric audiology. University programs may wish to consider implementing continuing education programs in geriatric audi-

ology in the near future. The curriculum could include those topics that the responding clinicians identified as important areas in which they require further knowledge.

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## Audiologists' Questionnaire

### I. THE FIRST SET of QUESTIONS DEALS with your GEOGRAPHIC LOCATION and CLIENT BASE.

Q-1 What is your geographic location in Canada? (Circle one).

1. East (Newfoundland, N.S., N.B., P.E.I.)
2. West (B.C., Alberta, Saskatchewan, Manitoba)
3. Central (Ontario, Quebec)
4. North (Yukon, N.W.T.)

Q-2 What is the population of your surrounding area? (Circle one).

1. Less than 1,000
2. 1,000 - 4,999
3. 5,000 - 9,999
4. 10,000 - 99,999
5. 100,000 or more

Q-3 In what setting do you currently practice the majority of the time? (Circle one)

1. Hospital
2. Industrial setting
3. Physician's office
4. Private clinic
5. Private school
6. Provincial Hearing Societies
7. Public school
8. Public Health Unit
9. Rehabilitation clinic
10. University clinic
11. Other (please specify):



\*ANSWER the FOLLOWING QUESTION BASED on the SETTING YOU IDENTIFIED in Q-3.\*

Q-4 What percent of your caseload involves each of the following age groups?

	Percent of Caseload
1. Infants (0-12 months old).....	
2. Preschoolers (1-5 years old).....	
3. School age (6-13 years old).....	
4. Adolescents (14-19 years old).....	
5. Adult (20-64 years old).....	
6. Young-Old (65-75).....	
7. Old (76-85 years).....	
8. Old-Old (85+ years).....	

**II. THE NEXT SET of QUESTIONS DEAL with your PROFESSIONAL EXPERIENCES.**

Q-5 How many years have you been a practicing audiologist? (Please indicate full and part time experiences).....

Part-time      years  
Full-time      years

Q-6 How many years have you spent identifying and managing the hearing problems of adults aged 65 years of age or older?..... years

Q-7 Do you have a preference for working with one particular age group?.....

Yes  
No

If "YES", with which age group? (Please specify)

**III. THE NEXT SET of QUESTIONS DEAL with your EDUCATION.**

Q-8 From which province/state, and country did you graduate?.....

Province/State:  
Country:

Q-9 What is your highest degree in audiology? (Please specify).....

Q-10 How many years has it been since you received your highest degree in audiology?..... years

Q-11 Are you currently working in the province from which you graduated? (Check one).

Yes  
No

**FOR THE PURPOSE OF THIS STUDY, GERIATRIC AUDIOLOGY IS DEFINED AS THE EDUCATIONAL EXPERIENCES AND CLINICAL ACTIVITIES WHICH ADDRESS THE HEARING NEEDS OF ADULTS AGED 65 YEARS OF AGE OR OLDER.**

**\*FOR Q-12 and Q-13 USE THE FOLLOWING SCALE\***

- 1 = Not at all knowledgeable
- 2 = Somewhat knowledgeable
- 3 = Knowledgeable
- 4 = Very knowledgeable
- 5 = Extremely knowledgeable

Q-12 Rate your overall current knowledge of geriatric audiology:..... 1 2 3 4 5

Q-13 Rate your knowledge of geriatric audiology at the completion of your highest degree. .... 1 2 3 4 5

**\*FOR Q-14.1 - 14.2 USE THE FOLLOWING SCALE\***

- 1 = Very poor
- 2 = Poor
- 3 = Fair
- 4 = Good
- 5 = Excellent

14.1 My **academic** training in geriatric audiology during my formal education was.....1 2 3 4 5

14.2 My **clinical** training in geriatric audiology during my formal education was.....1 2 3 4 5

Q-15 Are you interested in learning more about geriatric audiology and its related issues? (Check one).

Yes  
No

If "YES", please specify relevant topics in need of further research/interest:

**IV. THE NEXT SET of QUESTIONS DEAL with your PERSPECTIVES of EDUCATION in GERIATRIC AUDI- OLOGY.**

Should these tests be modified for the aged?

Q-16 Outlined below is a list of topics (A-G) relevant to the education in and practice of audiology. Rate the **relative** importance of **each** sub-topic for currently practicing audiologists who identify and treat the hearing problems of adults aged 65 years of age or older.

**\*USE THE FOLLOWING SCALE TO RATE YOUR OPINIONS.\***

- 1 = Not important
- 2 = Fairly unimportant
- 3 = Of some importance
- 4 = Fairly important
- 5 = Very important

**Topics Importance Rating**

A. Normal Aging

**NOTE:** These sub-topics may not include hearing-related issues.

Attitudes towards Aging .....	1	2	3	4	5
Biology.....	1	2	3	4	5
Cognition .....	1	2	3	4	5
Language.....	1	2	3	4	5
Neurology.....	1	2	3	4	5
Physiology.....	1	2	3	4	5
Psychology.....	1	2	3	4	5
Sociology.....	1	2	3	4	5
Speech.....	1	2	3	4	5
Voice .....	1	2	3	4	5
Other (Please specify) .....	1	2	3	4	5

B. Hearing and Aging

Common causes of impairment.....	1	2	3	4	5
Demographics.....	1	2	3	4	5
Drug Ototoxicity.....	1	2	3	4	5
Physical audiological changes.....	1	2	3	4	5
Psychological effects.....	1	2	3	4	5
Sociological effects.....	1	2	3	4	5
Other (Please specify) .....	1	2	3	4	5

**Topics Importance Rating**

C. Screening/Identification

Prevention.....	1	2	3	4	5
Screening protocols.....	1	2	3	4	5
Other (Please specify) .....	1	2	3	4	5

D. Assessment

Yes No

Auditory Evoked Potentials							
Brainstem (ABR).....	1	2	3	4	5	1	2
Lates/P300.....	1	2	3	4	5	1	2
Diagnostic impedance							
Single frequency.....	1	2	3	4	5	1	2
Multiple frequency.....	1	2	3	4	5	1	2
Otoacoustic emissions							
Transient.....	1	2	3	4	5	1	2
Distortion Product .....	1	2	3	4	5	1	2
Pure tone air/bone conduction.....	1	2	3	4	5	1	2
Self-report scales (Eg. Hearing Handicap Inventory).....	1	2	3	4	5	1	2
Speech discrimination .....	1	2	3	4	5	1	2
Tests of central/cortical functioning (Eg. Staggered Spondaic Words) .....	1	2	3	4	5	1	2
Other (Please specify) .....	1	2	3	4	5	1	2

E. Rehabilitation

Amplification .....	1	2	3	4	5
Assistive listening devices.....	1	2	3	4	5
Communication strategies.....	1	2	3	4	5
Counselling and follow-up .....	1	2	3	4	5
Hearing aid orientation .....	1	2	3	4	5
Other (Please specify) .....	1	2	3	4	5

F. Professional Issues

The roles of the Audiologist.....	1	2	3	4	5
Other (Please specify) .....	1	2	3	4	5

Include any additional topics identifying knowledge that you consider important for assessing and treating the hearing problems of adults aged 65 years of age or older. Indicate their relative importance using the same scale.

G. Additional Topics Importance Rating

Please specify:					
.....	1	2	3	4	5
.....	1	2	3	4	5
.....	1	2	3	4	5

Q-17. What methods are most effective for audiologists to learn about geriatric audiology? (Circle all that apply)

1. Formal **academic** education
2. Formal **clinical** education
3. Independent study
4. Professional experience
5. Other (Please specify):



Q-18. What topics should be included in university curricula to prepare **students** to practice in geriatric audiology?

Please list:

- 1.
- 2.
- 3.
- 4.
- 5.
- 6.
- 7.

Q-19. Complete the table for Sections A, B, and C by following the instructions for each section heading.

Section A. What were/are the sources of **your** knowledge for identifying and treating the hearing problems of adults aged 65 years of age or older?

Section B. What is the **relative** importance of each source of information for you in identifying and treating the hearing problems of adults aged 65 years of age or older?

**\*PLEASE USE THE FOLLOWING SCALE\***

- 1 = Not important
- 2 = Fairly **un**important
- 3 = Of some importance
- 4 = Fairly important
- 5 = Very important

Section C. **Rank order** the sources of information for you from **most** important (1) to **least** important (8).

Sources of information	A		B					C
	Source for me? (Circle)		Relative importance of source					Rank Order Sources
Undergraduate Education	Yes No		1	2	3	4	5	
Graduate Education	Yes No		1	2	3	4	5	
Workshops, Seminars, Conferences	Yes No		1	2	3	4	5	
Professional journals	Yes No		1	2	3	4	5	
Textbooks	Yes No		1	2	3	4	5	
Professional experiences	Yes No		1	2	3	4	5	
Personal experiences	Yes No		1	2	3	4	5	

Q-20. **\*PLEASE REFER** to the TOPICS PRESENTED IN Q-16 (PAGES 4-6) to **COMPLETE** this TABLE.\*

Check off the topics that were discussed, **specific to geriatric audiology**, for each source of information **you have used** in learning about the hearing problems of adults aged 65 years of age or older. For example, if you discussed **all** of the topics listed in your undergraduate education, you should check off **each** topic for that row; or, if you only discussed normal aging, then check that box only.

Sources of information	Topics covered					
	Normal Aging	Hearing & Aging	Screening/ Identification	Assessment	Rehabilitation	Professional Issues
Undergraduate Education						
Graduate Education						
Workshops, Seminars, Conferences						
Professional journals						
Textbooks						
Professional experiences						
Personal experiences						
Other (Please specify):						

Q-21 Circle your gender:

- a. Male
- b. Female

Q-22 Circle your age range:

- a. 20-29
- b. 30-39
- c. 40-49
- d. 50-59
- e. 60-69
- f. 70+



### Appendix A University Questionnaire

#### I. THE FIRST SET of QUESTIONS DEAL with the GENERAL OUTLINE of your AUDIOLOGY PROGRAM.

Q-1. What degree program(s) in audiology does your institution offer? (Circle all that apply)

- 1. Undergraduate
- 2. Master's
- 3. Doctoral

Q-2 How many full-time and part-time audiology students are currently enrolled in your program? (Please specify)

Full-Time          Part-time

- 1. Undergraduate students
- 2. Master's students
- 3. Doctoral students

Q-3 How many of these students graduate in an average year? (Please specify)

Graduates

- 1. Undergraduate students
- 2. Master's students
- 3. Doctoral students

Q-4 What are the pre-requisite courses for students entering your audiology program? (Circle all that apply)

**Pre-requisites**

- 1. Anatomy
- 2. Linguistics
- 3. Neuroanatomy
- 4. Physics
- 5. Physiology
- 6. Psychology
- Please specify; e.g., Introductory
- 7. Research Methods/Statistics
- 8. Sociology
- 9. Others (Please specify):

**FOR THE PURPOSE OF THIS STUDY, GERIATRIC AUDIOLOGY IS DEFINED AS THE EDUCATIONAL EXPERIENCES AND CLINICAL ACTIVITIES WHICH ADDRESS THE HEARING NEEDS OF ADULTS AGED 65 YEARS OF AGE OR OLDER.**

#### II. QUESTIONS in this SECTION DEAL with the GENERAL OUTLINE and PHILOSOPHY of your DEPARTMENT/PROGRAM'S GERIATRIC EDUCATION AND GERIATRIC AUDIOLOGY COMPONENTS.

Q-5. Which philosophy does your department/program adhere to with regard to incorporating geriatric education into the audiology curriculum? Circle the philosophy which most closely applies.

- 1. Geriatric education should be primarily emphasized in post master's **continuing education** activities.
- 2. Geriatric education should be incorporated into **existing** graduate courses.
- 3. Geriatric education should be taught in a single separate course on normal and pathological aging.
- 4. Geriatric education should be taught in a separate course on geriatric audiology.
- 5. There is no need for geriatric education in the audiology curriculum.

**\*USE THE FOLLOWING SCALE TO RATE YOUR RESPONSES FOR Q-6 and Q-7.\***

- 1 = Not important
- 2 = Fairly **un**important
- 3 = Of some importance
- 4 = Fairly important
- 5 = Very important

Q-6. How important is it that your department/program provide **course work** in:

- 6.1. Geriatric audiology ..... 1 2 3 4 5
- 6.2. Normal aging and communication..... 1 2 3 4 5

Q-7. How important is it that your department/program provide **clinical training** in:

- 7.1. Geriatric audiology ..... 1 2 3 4 5
- 7.2. Normal aging and communication..... 1 2 3 4 5

Q-8. Does your department/program provide students in audiology with course work in geriatric audiology?

- Yes
- No

**If YES, GO TO Q-9. If NO, GO TO Q-12.**



**III. THE QUESTIONS in this SECTION DEAL with TEACHING APPROACHES and CURRICULA CONTENT. WE ARE INTERESTED SOLELY in AREAS of CONTENT that RELATE to the AGING PROCESS.**

Q-9. What is the teaching approach that most closely describes the style used in presenting curriculum on geriatric audiology in your department/program? Circle one.

**Teaching Approaches**

- 9.1 Single Course  
Full or half-course offered by your program.  
-> GO TO Q-10.
- 9.2 Single Interdisciplinary Course  
Full or half-course shared by several programs.  
-> GO TO Q-10.
- 9.3 Pyramid Approach  
Series of courses pertaining to aspects of aging and older populations. Progressively expands the student's knowledge base and practical experience.  
-> GO TO Q-11.
- 9.4 Unit Approach  
Each course within the curriculum includes one or more units which focus on information relevant to aging and the older adult. Units can be presented in a variety of ways by a variety of individuals.  
-> GO TO Q-11.
- 9.5 Infusion Approach  
Gerontological content would be incorporated into each unit within a specific course. For example, the effects of aging on the approach used in hearing assessment would be covered in the hearing assessment section of the course.  
-> GO TO Q-11.

Q-10. COMPLETE THIS QUESTION FOR EACH HALF OR FULL-TERM COURSE IDENTIFIED IN Q9.1 or 9.2. Copy this page as required for additional courses.

- 10.1 Course Name \_\_\_\_\_
- 10.2 Course Number \_\_\_\_\_
- 10.3 Is the course offered by your department?(Check one)  Yes  No
- 10.4 What is the level of instruction? (Check one)  Undergraduate  Masters  Doctoral

- 10.5 What is the length of the course? (Check one)  One Term  Two Terms  Other (Please specify) \_\_\_\_\_
- 10.6 What is the course status? (Check one)  Required  Elective
- 10.7 When is the course offered? (Check one)  Each Term  Annually  Irregularly
- 10.8 What is the number of scheduled class hours per week? (Please specify)  
Lecture \_\_\_\_\_ hours  
Lab/clinic \_\_\_\_\_ hours
- 10.9 What is the department affiliation of the faculty member who teaches the course? (Please specify) \_\_\_\_\_ department
- 10.10 How many years has the course been taught? \_\_\_\_\_ years
- 10.11 What is the format of the course? (Check all that apply)  Lecture  Seminar  Independent Study  Other (Please specify) \_\_\_\_\_
- 10.12 How are students evaluated for their mastery/knowledge of the course material?  Tests/Exams  Essay  Presentation  Other (Please specify) \_\_\_\_\_

Q-11. Outlined below is a list of topics (A-G) relevant to the education in and practice of audiology. Indicate those sub-topics that are currently covered in your audiology curriculum. Do not consider the amount of time devoted to the topic.

Topics	Covered in Curriculum? (Check all that apply)
<b>A. Normal Aging</b>	
NOTE: These areas may not be specific to hearing related issues.	
Attitudes towards Aging ....	_____
Biology.....	_____
Cognition .....	_____
Language.....	_____
Neurology .....	_____
Physiology.....	_____
Psychology .....	_____
Sociology .....	_____
Speech .....	_____
Voice .....	_____
Other (Please specify) .....	_____

**B. Hearing and Aging**

- Common causes of impairment . \_\_\_\_\_
- Demographics..... \_\_\_\_\_
- Drug Ototoxicity..... \_\_\_\_\_
- Physical audiological changes.... \_\_\_\_\_
- Psychological effects ..... \_\_\_\_\_
- Sociological effects..... \_\_\_\_\_
- Other (Please specify)..... \_\_\_\_\_

**C. Hearing Screening and Identification**

- Prevention..... \_\_\_\_\_
- Screening protocols..... \_\_\_\_\_
- Other (Please specify)..... \_\_\_\_\_

**D. Hearing Assessment**

- Auditory Evoked Potentials
  - Brainstem (ABR) ..... \_\_\_\_\_
  - Lates/P300 ..... \_\_\_\_\_
- Diagnostic impedance
  - Single frequency..... \_\_\_\_\_
  - Multiple frequency..... \_\_\_\_\_
- Otoacoustic emissions
  - Transient ..... \_\_\_\_\_
  - Distortion Product ..... \_\_\_\_\_
- Pure tone air/bone conduction .. \_\_\_\_\_
- Self-report scales (e.g., HHIE) ... \_\_\_\_\_
- Speech discrimination ..... \_\_\_\_\_
- Tests of cortical/central functioning (e.g., SSW)..... \_\_\_\_\_
- Other (Please specify)..... \_\_\_\_\_

**E. Hearing Rehabilitation/Treatment**

- Amplification..... \_\_\_\_\_
- Assistive listening devices..... \_\_\_\_\_
- Communication strategies ..... \_\_\_\_\_
- Counselling and follow-up..... \_\_\_\_\_
- Hearing aid orientation ..... \_\_\_\_\_
- Other (Please specify)..... \_\_\_\_\_

**F. Professional Issues**

- The Roles of the Audiologist.... \_\_\_\_\_
- Other (Please specify)..... \_\_\_\_\_

**G. Additional areas of Audiological practice related to Adults aged 65 years of age or older**

- (Please specify)
- \_\_\_\_\_
- \_\_\_\_\_

Q-12. Does your department/program provide **clinical** training in geriatric audiology? (Training includes either observation or practicum.)

- Yes **GO TO Q-13.**
- No **GO TO Q-16.**

**IV. THIS NEXT SET of QUESTIONS DEAL with CLINICAL PRACTICUM EXPERIENCES COMPLETED by AUDIOLOGY STUDENTS in your DEPARTMENT.**

If appropriate, please ask your clinical coordinator to complete this section.

Q-13. Do students have practicum and/or observation with adults aged 65 years of age or older?

<u>Practicum</u>	<u>Observation</u>
Yes	Yes
No	No

Q-14 Is the practicum and/or observation conducted in conjunction with specific coursework? (Check one)

- Yes
- No

If **YES**, specify the course name(s) and number(s):

Course Name(s): \_\_\_\_\_ , \_\_\_\_\_

Course Number(s): \_\_\_\_\_ , \_\_\_\_\_

Q-15 What are the approximate number of clock hours of clinical experience with adults aged 65 years of age or older that students obtain upon completion of their degree requirements? (Please specify)

\_\_\_\_\_ hours

Q-15.1 Indicate the total number of clock hours spent in clinical practicum experiences for each area.

Area	Clock Hours
1. Screening/Identification	_____
2. Diagnostics/Assessment	_____
3. Rehabilitation/Treatment	_____
4. Research and Professional Issues	_____
5. Other (Please specify):	_____

Q-15.2 Where are these hours obtained? (Circle all that apply)

- 1. Adult Daycare Unit/Centre
- 2. Hospital
- 3. Nursing Home
- 4. Physician's Office
- 5. Private Clinic
- 6. Rehabilitation Centre
- 7. Senior Citizen Home/Retirement Home
- 8. University Clinic
- 9. Other (Please specify): \_\_\_\_\_



**V. THE LAST SET of QUESTIONS DEALS with your PERSPECTIVE of your AUDIOLOGY CURRICULUM.**

**Q-16 \*USE THE FOLLOWING SCALE TO COMPLETE STATEMENTS Q-16.1 - 16.3.\***

- 1 = Strongly agree
- 2 = Agree
- 3 = Neither agree nor disagree
- 4 = Disagree
- 5 = Strongly disagree

**In my view, the department:**

16.1 Provides sufficient information to students in the area of geriatric audiology ..... 1 2 3 4 5

16.2 Provides current information to students in the area of geriatric audiology ..... 1 2 3 4 5

16.3 Balances the content of the curriculum to cover **all** clientele, and does **not** deal specifically with one age group ..... 1 2 3 4 5

Q-17 If you feel that your curriculum does **not** provide sufficient information to students in geriatric audiology, indicate the possible reason(s) why. (Circle all that you feel apply).

- 1. Constrained budget
- 2. Crowded curriculum
- 3. Faculty member(s) lacks relevant background
- 4. Faculty member(s) lacks time
- 5. Faculty member(s) lack involvement
- 6. Faculty member(s) lack of agreement as to curriculum content
- 7. Content is offered by another department/program
- 8. This material should be covered through continuing education following graduation.
- 9. Other (Please specify): \_\_\_\_\_