

# *Newborn Hearing Screening: A Canadian Historical Perspective*

## *Dépistage de la surdité chez les nouveau-nés : une perspective historique canadienne*

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### **Abstract**

This paper discusses the initiatives that have been undertaken, in Canada, over the last thirty-five years to promote the importance of the early identification and management of hearing loss in children. Several task forces and conferences have taken place over the years and recurrent themes have consistently been identified. These include the methods to identify hearing loss in newborns and infants, the population to be screened and the need to educate primary care physicians, health care professionals, and parents on the signs of hearing loss in children. More recently data management and tracking systems have emerged as essential components of any screening program. Several recommendations have been formulated over the years but few have been followed. Recently, two provinces have announced that funding has been allocated to develop screening programs. These initiatives should allow Canada to start moving beyond the recommendation stage.

### **Abrégé**

Le présent article retrace les initiatives prises au Canada au cours des 35 dernières années pour faire valoir l'importance du dépistage et de l'intervention précoces et du contrôle de la surdité chez les enfants. Plusieurs groupes de travail et congrès ont eu lieu au fil des ans et ont fait ressortir des thèmes récurrents. Parmi ceux-ci, on retrouve les méthodes pour identifier la surdité chez les nouveau-nés et les bébés, la population chez qui il faut faire du dépistage et le besoin d'enseigner aux médecins, aux professionnels de la santé et aux parents les signes de la surdité chez les enfants. Plus récemment, des systèmes de gestion des données et de suivi sont venus s'ajouter aux composantes essentielles de tout programme de dépistage. Plusieurs recommandations ont été formulées au fil des ans, mais peu ont été mises en pratique. Récemment, deux provinces ont annoncé qu'elles avaient accordé un financement pour élaborer des programmes de dépistage. Ces initiatives devraient permettre au Canada de commencer à aller au-delà du stade des recommandations.

**Key words:** newborn hearing screening, children, hearing loss

In the last past 35 years, the importance of the early identification and management of hearing loss in children has been the subject of many conferences and task forces, some of which have taken place in Canada. During these three and a half decades, recommendations on newborn hearing screening have been formulated with three main themes being consistently identified from the Canadian experience. These include the methods to identify hearing loss accurately in newborns and infants, the population to be screened, and the need to educate physicians, health care professionals, and parents on the signs of hearing loss in children. What follows is a decade-by-decade historical perspective of newborn hearing screening in Canada.

### **The 1960s**

In 1964, in Toronto, a conference on the Young Deaf Child took place bringing together more than 30 experts from

North America, Great Britain, Scandinavia, and the Netherlands (Davis, 1965). Participants from North America included, among others, Hallowell Davis, Marion Downs, Aram Glorig, Isabelle Rapin, and Richard Silverman from the United States, with Daniel Ling, William Hawke, Hollie McHugh, and Page Statten from Canada. The intended purpose of the meeting was to find ways to alleviate the handicap to auditory communication imposed by early hearing loss. The participants were already sensitized to the importance of early identification and of consistent exposure of infants with a hearing impairment to sound. Considerable discussion took place at this conference on "definitive tests of hearing." Systematic reviews of available tests were presented including new electrical techniques to detect cortical evoked responses to sound in young infants "with the hope of ultimately identifying auditory impairments at or soon after birth" (Davis, p. 5). The conference did not reach consensus on certain issues. The range of opin-



ions was possibly the widest in the attitudes towards “neonatal tests of hearing,” and the age at which reliable and reasonably valid and definite tests of hearing could be performed. Neonatal “testing” was seen as presenting many advantages; however, because the technology was not available, a targeted approach was recommended. It is interesting to note that the concept of universal neonatal screening was in fact discussed. One interesting quote from the proceedings of the conference is as follows:

The participants who are actively engaged in neonatal testing do not believe that the possibility of effective and widespread neonatal tests of hearing should be minimized at this time or set aside entirely in favor of the concept of a high risk register.... Proponents agree that they are not yet ready to advocate immediate and universal neonatal testing and that until the tests can be further perfected and validated, the high risk register is the most logical and practical procedure. (Davis, p. 11)

Participants felt it was too early to form an opinion about auditory evoked responses as a test, and some were skeptical that an inexpensive, uncomplicated instrument could be developed to satisfy the requirements for clinical applications. All felt that more research was needed in the validity and reliability of tests to identify hearing loss early.

Consensus was also not reached on the age at which the use of amplified sound should be initiated. The majority agreed that two years was the maximum delay that could be accepted, but some advocated for the use of amplified sound by two months of age, even two weeks of age.

Although everyone agreed that the methods of routine auditory screening at birth needed to be perfected and validated, consensus was reached on the need to develop programs immediately. Participants felt that it would be ideal if impairment were detected and confirmed by six months of age. Two steps were recommended: the use of a high-risk register and the screening of healthy babies in well-baby clinics using simple, well planned tests and questionnaires. The success of programs was seen to depend on the education of physicians, public health personnel, and parents.

### The 1970s

Ten years later, in 1974, George Mencher organized the Nova Scotia Conference on the Early Identification of Hearing Loss (Mencher, 1976), which took place in Halifax. The focal point of discussion at this conference was the approval of methods for screening the hearing of newborns and for

identifying those children most likely to have a hearing loss. The recommended procedures included the use of the high-risk register together with behavioural screening. Considerable efforts were used to develop protocols for behavioural hearing screening, defining stimulus, infant responses, scoring criteria, pretest infant state, and test environment. It is now well known (Durieux-Smith, Picton, Edwards, Goodman, & MacMurray, 1985) that screening newborns and infants with behavioural tests is not sensitive, specific, nor valid. One of the major results stemming from the resolutions of the Nova Scotia Conference on the Early Identification of Hearing Loss was an increased awareness of the need to identify hearing loss in infants. Screening was seen as a way to identify newborns and infants who were likely to have a hearing loss. Yet what remained was whether accurate audiometric testing and diagnosis of hearing loss in a newborn could be achieved.

These queries became the focus of the second conference titled *Early Diagnosis of Hearing Loss in Children* (Gerber & Mencher, 1978), which took place in Saskatoon in 1978. This conference dealt with methods for the confirmation of the presence and degree of hearing loss within the first six months of life as accurately, rapidly, and economically as possible.

Jean-Marie Aran, Robert Galambos, Maurice Mendel, and Terrence Picton each presented a paper on electrophysiological methods for hearing assessment at this conference. The auditory brainstem response (ABR) was offered as a viable method to accurately identify hearing loss in graduates of a Neonatal Intensive Care Unit (NICU; Galambos, 1978; Picton, 1978). Although the need existed for more research on the ABR for babies residing in the NICU, it was still recommended that ABR be included as part of a comprehensive auditory assessment. Most important, the clarion call from the Saskatoon conference was that “it is possible to identify and diagnose hearing loss in the newborn” (Gerber & Mencher, 1978, p. xvii).

The high-risk register was also expanded and its use continued to be recommended, albeit with the recognition that not all infants with a hearing loss could be identified with this approach. It was felt that screening should be conducted on all infants, but one drawback was that ABR was too costly. One of the major recommendations of the Saskatoon conference was that children with a hearing loss be diagnosed by six months of age and that management be initiated immediately.

### The 1980s

Following the recommendations of the Saskatoon con-

ference, several centres in Canada began to carry out research projects using ABR, most often with babies from the NICU. Researchers included John Jacobson from Halifax, Paul Kileny from Edmonton, Martin Hyde from Toronto, Richard Sanders from Winnipeg, along with Andrée Durieux-Smith and Terry Picton from Ottawa. The various programs and projects came together and were presented at the Neonatal Hearing Assessment by Auditory Brainstem Response: The Canadian Experience symposium (Durieux-Smith & Picton, 1985). This symposium was presented at the biennial meeting of the Electric Response Audiometry Study Group held in Ottawa in 1983. The projects presented at the symposium clearly showed that the ABR was a very powerful tool for the identification of hearing loss in newborns and infants. Although, additional research was still warranted, it was clear that the technology, which could accurately identify hearing loss in the very young, was available.

In 1981, the Health Services Directorate, of Health and Welfare (now Health Canada), established a multidisciplinary task force on Childhood Hearing-Impairment. The impetus for this initiative came from an ad hoc group formed in 1979 that called itself the Canadian Advisory Coalition on Childhood Hearing-Impairment (CACCHI). Included in this group were representatives from the Canadian Otolaryngological Society, Canadian Speech and Hearing Association (now the Canadian Association of Speech-Language Pathologists and Audiologists), the Canadian Paediatric Society, and the College of Family Physicians. Dr. Murray Morrison, an otolaryngologist, provided the leadership for CACCHI.

The objective of CACCHI was to improve the age at which children with hearing loss were diagnosed and received intervention. CACCHI became the task force on Childhood Hearing Impairment, and representatives from the Association of Canadian Educators of the Hearing Impaired were added to the group. One of the objectives of the task force was to document the activities taking place in each province and territory in the areas of prevention, early detection, diagnosis, and management of children with a hearing impairment. Another objective was to develop consensus guidelines with respect to prevention, early detection, diagnosis, and management of children with a hearing impairment. Toward those ends, with the assistance of the Deputy Minister of the Department of National Health and Welfare, a questionnaire was sent to all provincial and territorial health and education ministers. The objective was to collect data on existing health services. There was a 100% response rate. In addition, an awareness campaign on hearing loss in children, funded by the Health

Promotion Directorate, was launched to alert primary care physicians to the importance of the early detection and management of childhood hearing impairment. To this end, an information kit was developed (Durieux-Smith, Shea, Gibson, Schloss, & Bernard, 1985) and sent to all family physicians, paediatricians, and otolaryngologists in Canada. A sample of 350 of physicians participated in an evaluation phase carried out by the College of Family Physicians.

The results of the questionnaires sent by the task force together with guidelines and recommendations were published in a report entitled *Childhood Hearing Impairment* (1985). The information indicated that no province-wide policies existed in the area of newborn hearing screening in Canada at the time, that regions were developing their individual programs, and that although hearing screening programs were not province-wide, they existed in isolated hospitals as a result of local initiatives. Some problems were identified in implementing hearing screening programs. These included a lack of standardized screening tools, a lack of audiologists, insufficient numbers of facilities, poor referral systems, and a lack of computerized provincial/territorial records which were seen as limiting adequate follow-up.

Recommendations were developed to address these issues and to ensure that children with a hearing loss are identified and managed early and that appropriate educational programs are available. The recommendations targeted the infant "at-risk," but also included strategies for well babies, addressed the need for increased awareness of hearing loss in children by medical students, physicians, nurses, and parents. The need for centralized record keeping for provinces and territories was also identified. Finally, it was recommended that a standing multidisciplinary joint committee be struck to monitor new knowledge about hearing loss in children.

### The Present

A recent survey (Brown, Dort, & Sauve, this issue) carried out fifteen years after the task force report was published, clearly show that very few of its recommendations were in fact followed. Although there have been many efforts over the past 35 years in Canada to ensure that children with a hearing loss are identified early, these have only given rise to a handful of isolated screening programs which have been the results of local initiatives.

Not only are simple, cost effective, valid, and reliable screening techniques using electrophysiological responses now available, they have been successfully implemented in large newborn hearing screening programs (e.g., Finitzo, 1998;



Spivak et al., 2000; Vohr, Carty, Moore, & Letourneau, 1998). The use of techniques using electrophysiological responses can only be implemented if they are part of provincial/territorial health systems that include screening, diagnostic, and intervention services (see Finitzo & Crumley, in press). Even though the many recommendations that were formulated over the years did address the well baby, it is now indicated that screening programs must be accessible to all babies, not just the "at-risk" group (Dalzell et al., 2000; Spivak et al.). What has clearly emerged is the need for a system of data management and tracking, which must be part of any program. The need for the education of primary care physicians, nursing personnel, and parents identified at the 1964 conference continues to be an integral part of any screening initiative.

At the time of preparing this special issue of the *Journal of Speech-Language Pathology and Audiology* on newborn hearing screening, Ontario has included in its 2000 budget funds for a program of early identification and intervention of children with a permanent hearing loss. In Alberta a grant from the Alberta Health Innovation Fund will lead to the development of a demonstration project on newborn hearing screening. The Bureau of Reproductive and Child Health, Health Canada has put in place a multidisciplinary working group to develop guidelines in the area of newborn hearing screening. It is time that Canada *moves* beyond the recommendation stage.

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