

## **A DELPHI STUDY TO DEVELOP A NATIONAL SURVEY OF ACCESSIBILITY OF MEDICAL INSTRUMENTATION**

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### **ABSTRACT**

The RERC on Accessible Medical Instrumentation evaluates and develops methods and technologies to increase accessibility and usability of diagnostic, therapeutic, and procedural healthcare equipment, and associated assistive technologies, for people with disabilities. This paper outlines the Delphi approach used to develop a national consumer survey aimed at identifying key types of medical instrumentation that present problems for individuals with a wide array of disabilities. The iterative nature of the Delphi technique allowed for feedback from 30 key informants/experts with disabilities and provided a framework for further refinement of the survey. Some medical instrumentation identified in the national survey will be targeted for modification in future research and development activities of this RERC.

### **KEYWORDS**

Medical devices, equipment, accessibility, Delphi, survey

### **BACKGROUND**

The Rehabilitation Engineering Research Center (RERC) on Accessible Medical Instrumentation is a five-year project that began on November 1, 2002. It is based at Marquette University, with major subcontracts to the Center for Disability Studies and the Health Professions at Western University of Health Sciences, and to the Ergonomics Lab at the University of California at Berkeley and San Francisco. It also has subcontracts to Human Spectrum Design, L.L.C., the University of Wisconsin at Milwaukee, and the University of Connecticut. Major collaborators on the project are Kaiser Permanente and the U.S. Food and Drug Administration. The project's website can be found at [www.erc-ami.org](http://www.erc-ami.org).

While the scope of the problem of access to and utilization of healthcare services is vast, one of the major barriers can be identified as the accessibility and usability of medical instrumentation used for diagnostic, procedural, and therapeutic purposes. Unfortunately, the extent of the problems caused by inaccessible equipment has not been documented. Little is known about the extent to which device manufacturers consider the needs of either patients or healthcare providers with disabilities. To date, there have been few studies focusing on access, utilization, and frequency of use and usability of the medical instrumentation used by and for persons with disabilities.

## METHOD

The purpose of RERC Research Program R1 is to analyze medical instrumentation needs of three major constituencies: consumers with disabilities, healthcare service providers, and medical instrumentation manufacturers through three distinct research projects, each targeted at one of these groups.

This paper focuses on the first project: *Project R.1.1 / Healthcare Consumer Needs Assessment*. In order to conduct a meaningful national needs assessment aimed at identifying the nature of obstacles related to medical instrumentation (and related policies) that prevent people with disabilities from receiving healthcare services, a comprehensive survey needed to be developed. A Delphi study was designed to develop the instrument for this national survey.

Prior to initiating the formal Delphi process, the research team constructed a survey, based on their previous experiences and information available in the literature. Several formats were examined for displaying the survey. The preliminary survey was then presented to the RERC's national advisory council for input. Based on lengthy discussion with the advisory council, the initial survey was revised and the Delphi process was initiated.

The Delphi technique is used to take advantage of the judgments of a group of experts for the purpose of making decisions, determining priorities, or making predictions (1) (2). It provides an opportunity to obtain opinions from a wide variety of experts across a defined geographic area, without having to physically convene a meeting. An advantage of using a Delphi approach is that it allows each expert to share his or her opinion, without being swayed or pressured by others in the group.

The research team formulated a list of approximately 50 key informants/experts, representing diverse disabilities, with a working knowledge of medical instrumentation, from various geographic locations, and with racial and age diversity. These identified experts were invited to participate in the Delphi process. Of the 50 individuals who were invited to participate, a final sample of 30 was obtained. It should be noted that some of the 30 participants had not been invited to take part in the process, but after hearing about the study, they contacted the investigators requesting to be included and were allowed to participate. As is typical in Delphi studies, identities of participants were not shared with the group.

The survey was posted on a secure Internet website. At the end of the survey, a series of questions seeking feedback about the survey was posted. The evaluative portion asked for specific feedback about survey content and layout, as well as addressing issues of usability, understandability, and appropriateness of items. At the end of the evaluation form, a question was added asking if there was anything else they would like to address. Participants were advised to visit the website and complete the survey and the evaluation form. They were allowed to complete the survey on the website or they could print a paper form, complete it, and mail it to the research team. Delphi technique uses an iterative approach in which there is a series of interactions between the investigators and the participants.

## RESULTS

In this study, the initial survey was distributed once for critique and feedback, and changes were made. Data were analyzed using both descriptive statistics and content analysis. Considerable changes were made to the layout of the survey, based on feedback from participants. Only minor changes in content were made. This process was repeated only once, as consensus was achieved from participants indicating

that the survey had been substantially improved from both content and structural perspectives. The second round yielded only minor editorial suggestions.

The final refined national survey was posted on the RERC website, and as of this writing, more than 300 participants have completed it. The survey is divided into two sections. The initial portion comprehensively addresses demographic data, health status, and functional abilities. The second portion addresses specific types of medical instrumentation, amount of experience individuals have had with these types of equipment, degree of difficulty they have encountered, and specific types of difficulties experienced. Suggestions for changes that would improve these devices were also elicited.

## **DISCUSSION**

The Delphi approach was used to construct an instrument to be distributed in the national survey. Through a structured, iterative process, nationally respected key informants/experts in the field of disabilities, who had a working knowledge of medical instrumentation, provided valuable insights into improving the initial survey that had been constructed by the research team. This process supported development of a survey that has met with overwhelming acceptance by participants and a higher than anticipated rate of participation by persons with a wide variety of disabilities.

## **REFERENCES**

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