Published in final edited form as:

Diabetes Educ. 2009 ; 35(4): 612–621. doi:10.1177/0145721709335005.

Making Diabetes Education Accessible For People With Visual Impairment

Ann S. Williams, PhD, MSN, RN, CDE

Diabetes Education Associates Cleveland, Ohio

Abstract

Purpose—The purpose of this study was to identify changes needed to make the diabetes education materials and programs of the Diabetes Association of Greater Cleveland (DAGC) accessible for people who have visual impairment and diabetes (PVID).

Methods—Using the principles and techniques of participatory action research (PAR), five PVID and four staff members of a local diabetes association met once a month for a year to plan, implement, and evaluate progress towards full accessibility of all diabetes education materials and programs. The researcher served as facilitator.

Results—Four “transformational moments” are presented through which the PAR process enabled PVID and diabetes professionals to learn to understand and trust each other. Changes made to increase accessibility included: production of two recordings for providing access to print information about diabetes; planning public education program publicity and locations for access; development of guidelines to help speakers make their diabetes education presentations accessible for people who cannot see slides and gestures. and presentation of an inservice for the entire staff of the diabetes association, including information about how they live with visual impairment, and common courtesies that make communication with PVID more effective

Implications—Diabetes education programs should include planning for full accessibility for PVID. Diabetes organizations should publish teaching materials in accessible format.

INTRODUCTION

Diabetes self-management education (DSME) is essential for effective self-management of diabetes. In order to manage diabetes well, people who have it must master a specific body of knowledge and skills that enable them to perform diabetes self-management tasks and make informed decisions that affect their health.^{1, 2}

Visual impairment and diabetes commonly co-exist in the United States. An estimated 3.2 million people live with both diabetes and visual impairment out of about 23.6 million people with diabetes.^{3, 4} Visual impairment can interfere with both the process of DSME and the performance of necessary diabetes self-management tasks.⁵ Most DSME programs present a large amount of necessary information and skills in a visual format, such as equipment demonstrations, videotapes, slides, pictures, and printed handouts. Additionally, most diabetes self-management equipment has been designed assuming that the user will be able to see the visual features of the equipment.⁶ Therefore, if a diabetes educator does not purposefully choose low-vision or non-visual teaching techniques, materials, and equipment, PVID are unable to fully access to the information and skills taught in the DSME program.

However, DSME can be made accessible for PVID. Many tools and techniques for accessible DSME already exist and are documented in the literature.^{5, 7-19} In addition, techniques for ensuring accessibility in adult educational settings already exist.²⁰⁻²⁴ Furthermore professional guidelines²⁵, national standards¹, and, in the United States (U.S.), the law require making DSME fully accessible for people with any disability, including visual impairment.²⁶

The purpose of this study was to identify changes needed to make the diabetes education materials and programs of the Diabetes Association of Greater Cleveland (DAGC) accessible for people who have visual impairment and diabetes (PVID). DAGC is a local, voluntary, non-profit diabetes association. Its mission is “to improve the lives of people affected by diabetes by leading the Northeast Ohio community in its prevention, management, and cure.” DAGC's programs include support of local diabetes research, education of the general public and of health professionals, diabetes prevention, advocacy with local, state, and federal governments, and support of a summer camp for children with diabetes.

Research Question

1. What changes are needed to make DSME materials and programs accessible for people with visual impairment and diabetes (PVID)?

Definitions

The words *blindness* and *low vision* are used in this paper with their usual definitions.²⁸ The phrases *visual loss*, and *visual impairment* are used in a functional sense to mean loss of vision that affects the way a person functions after the best available correction has been provided. The word *accessibility* is used as blind and visually impaired people themselves often use it, to mean either the availability of services in a location to which an individual with visual impairment can travel independently, or the presentation of necessary information and skills in a low-vision or non-visual format.

METHOD

The methodology for this project was Participatory Action Research (PAR), defined as “an approach to research that is based on a collaborative problem-solving relationship between researcher and client[s] which aims at both solving a problem and generating new knowledge.”²⁹ PAR is a local, action-oriented methodology. All major stakeholder groups are purposefully included in investigating, planning, and acting to solve a particular problem in a particular local situation. It is an overtly value-laden process, designed to be democratic, equitable, and empowering, and to include the participation of all stakeholders as equally valuable human beings. The overall purpose of any PAR project is to empower people to understand and interpret their experience in ways that enable them to more fully express their human potential.³⁰

In the context of these explicit values, Stringer proposed a general three-step framework for structuring PAR: *Look—Think—Act*. These phases correspond roughly to assessment, planning, and intervention. The *Look* phase is the time for gathering information, for defining and describing the present situation. The *Think* phase is the time of exploring, analyzing, interpreting, and explaining the situation. The *Act* phase is the time for planning, implementing, and evaluating changes. In any particular project, this cycle may be repeated many times.

For this project, five visually impaired participants (VIPs) who all have diabetes, and four staff members of DAGC worked together with the researcher as a Planning Group to make

DAGC's self-published patient education materials and community patient education programs accessible. Demographic information about participants is displayed in Table 1. The researcher served as a facilitator by beginning each meeting, asking questions, helping to keep discussion focused, and recording the process and decisions of the group.

This current project grew out of an earlier focus group project.⁵ All participants of the earlier focus group were invited to participate in the PAR project. Four responded and were able to make a year-long commitment to the new project. The fifth VIP was a DAGC volunteer.

The earlier focus group had produced general recommendations for making diabetes education accessible.⁵ These served as a beginning point for the new project, a first iteration of the “Look” phase. At the first meeting, the Planning Group members introduced themselves, then reviewed and prioritized the recommendations from the focus group project.

Following that initial meeting, the Planning Group met once a month for the coming year. At each meeting, the group “looked” by reviewing progress since the last meeting and reporting new information about needs or resources; “thought” by discussing reports and new information; and planned “acting” by setting goals for work to be done before the next meeting. Therefore, each meeting and the time that followed it represented one of Stringer's “Look—Think—Act” cycles.

At times, the entire Planning Group, or parts of the group, met outside of the monthly meetings to work together or to gather information. Examples include: a meeting of many members of the group at a recording studio to record print information; attendance at DAGC public education programs by PVID investigating ways to make those programs more accessible; and a meeting of the entire group with the entire DAGC staff to provide an inservice presentation on visual impairment.

The project design included some special features to make participation in the project itself accessible for the VIPs, and to acknowledge their expertise. Because none of the VIPs were able to drive, and public transportation is not always a realistic option in the area of this project, transportation was included in the budget and provided for all non-drivers for every event they attended for this project. Meeting notes were provided to the participants in their preferred format (large print or audio) and were read aloud at the beginning and end of each meeting. Finally, as an acknowledgement of the value of the VIP's expertise, they were paid for the time they spent on this project.

Evaluation of progress was a continuous feature of the Planning Group meetings. In addition, the Planning Group held a meeting entirely devoted to qualitative evaluation at the end of the project year.

RESULTS

As a qualitative methodology, PAR gains its power through the story of how the participants grew to understand each other.³¹ Stringer asserts that a report of PAR should help readers to have an empathic understanding of the “lived reality” of the participants. He suggests focusing on “epiphanic events” in the PAR process – “turning-point moments that have the power to be transformational” – as a way to communicate that reality.³⁰

Two types of results that are equally important are reported here: descriptions of four transformational moments that participants experienced during the PAR year, with brief

comments on the importance of the events in the collaborative process; and a summary of the steps that DAGC took as a result of this project to increase accessibility.

Transformational Moments

“How would I get here?”

The first meeting of the VIPs and the DAGC staff members was held at the DAGC office. Following the initial introductions and pleasantries, a VIP commented, “I have a question for the people from DAGC. You all know that visual impairment is a complication of diabetes. You know it's common. That's in all of your publicity materials. So why haven't you done something about this already? Why don't you have [recordings] for us?”

There was a moment of uncomfortable silence. Then one of the DAGC staff members responded, “I think maybe we haven't really understood the need before this. We do work to serve all the people who come here. And other than [the visually impaired spouse of a staff member], I don't think I have ever seen a visually impaired person come through our door before today.”

Another VIP asked, in a slow and firm tone of voice, “Do you know why that is?” After a short pause, he answered the question himself. “Your office here is way off the beaten path.”

Another DAGC staff member jumped into the conversation. “We're only about 2 blocks from [a major road], and just down the street from an interstate, so it's easy for people to get here from any part of greater Cleveland.”

Continuing in a slow and firm tone of voice, the VIP said, “I guess it's easy for people who drive to get here. But how would I get here? I am totally blind. Being near [a major road] and the interstate have no meaning for me. I have not been able to drive for 15 years.”

“Well,” said the DAGC staff member, “there is a bus that goes down [the major road near the office].”

“And suppose I took that bus and managed to get off at the right stop. Will you come meet me at the bus stop? Because I can tell you, the first time I would try to come by myself I wouldn't be able to find this building by myself. It seemed like the building is in the middle of a parking lot, and there are a lot of parking lots on this street. How am I going to tell which is the right parking lot? How am I going to find the front door behind the parking lot? Once I get in the front door, how am I going to find your office inside the building?”

There was a long pause here.

Another VIP added, “And how would I know to come here if I wanted to ask someone for help with my diabetes? I don't know how you let people know you are here, but I think it must be mostly in writing, because I have never heard anything on the radio or television about you. And, of course, I can't see the writing.”

There was another long silence. Then the DAGC program director said, “You are right. We should have thought of this a long time ago. But we didn't. So now we are aware that we're not meeting your needs, and we're ready to do something about it. Let's get to work.”

Comments: In this interaction, the VIPs honestly expressed their sense of exclusion from services and resources that were readily available to sighted people with diabetes. The

DAGC staff members, with equal honesty, responded initially with surprise, and then with acknowledgement. This set the stage for meaningful collaboration.

“We should all read on the recording.”

At the first meeting of the Planning Group, the 5 VIPs clearly stated that a top priority for them was to have diabetes information available in an accessible format. They described situations in which they had lacked the information they needed to make positive changes in their own self-management, while being aware that more complete information was available for sighted people. For example, all 5 VIPs were aware that carbohydrate counting was a useful tool for diabetes self-management, but 3 had not been able to learn enough about it to use it. Several mentioned that when they had called major national diabetes organizations to request information (including the American Diabetes Association, the International Diabetes Center, the Joslin Diabetes Center, and the Juvenile Diabetes Research Foundation) it was unavailable in a format accessible for them.

At the second meeting, a top priority was to begin planning to make recordings of DAGC's self-published diabetes education materials. Initially, the group assumed that sighted people would read the sheets for the recording, since that is common practice in recording print materials for people with visual impairment. While planning for the recording sessions, someone mentioned that one of the VIPs is a professional storyteller, and that she has sufficient low vision to read large print, so perhaps she could ask her to record at least some of the material.

A group discussion followed. “When I first lost my vision,” said one VIP, “I didn't know anyone else who had diabetes and was blind. It seemed as if I was the only person in the world who this had happened to.” “It was just so lonely,” said another. “No one I knew could understand what I was going through.” They liked the idea of having a VIP help with the reading, because they thought listeners would feel encouraged by hearing the voice of someone with both diabetes and visual impairment.

Someone else mentioned that 3 of the 5 VIPs had participated in a drama groups, and that all of them could do expressive readings if print material were supplied to them in accessible format. One of them said playfully, “Well then, we should all read on the recording.” A DAGC staff member asked, “Why not? You all have good voices. You could do this.”

All 5 VIPs agreed that hearing the voices of five people who had both diabetes and visual loss would have provided welcome emotional support when their vision loss was new. The entire group agreed that was an important goal.

Comments: This conversation shows that the VIPs and DAGC staff members had already begun to trust each other enough to share feelings and creative ideas. The plan of having the VIPs read for the recording is an excellent example of an innovative idea that resulted from a collaboration that was only possible with that trust.

“I missed a lot of the information because I could not see the slides.”

After several planning meetings, one of the VIPs decided to try attending a DAGC public education event at a community center, and reported on its accessibility at the next planning meeting.

She told the group that as soon as she entered the community center, she encountered a DAGC registration table. A DAGC staff member gave her a set of handouts, and guided her to the room for the presentation. “This gave me a

wonderful feeling,” she said. “I felt truly welcome. I had no trouble finding the room for the talk.”

“However,” she added, “when the doctor gave the talk, I missed a lot of the information because I could not see the slides. And he didn't always tell what was on the slides.”

“What would help? Asked a DAGC staff member. “Would you like to have a large print copy of what's on the slides?”

“That would not help *ME* at all,” said a VIP who is totally blind.

“And then for me there is the problem of glare,” said another. “I can see some of the things on a screen, but there has to be really good contrast. And if anything on the screen is bright, the glare makes it impossible for me to see anything else.”

“If you cannot see anything on the screen at all,” said a DAGC staff member, “maybe the speaker should read the slides to you.”

As a result of this conversation, the Planning Group decided to produce a paper entitled “Accessibility Suggestions: Making Your Talk Make Sense for People Who Have Visual Impairment.” DAGC staff members planned to give this handout to all of its speakers. The text of this paper is included in Table 2.

Comments: Prior to this conversation, DAGC staff members had assumed that a talk delivered by a speaker would be accessible to people who could not see. They realized after this how much typical speakers at health education events rely on the visual portion of their slides. The “Accessibility Suggestions” sheet resulted from both open conversation between the VIPs and the professionals and their collaborative problem-solving.

“It empowers me to help someone else.”

The Planning Group decided that it was important for DAGC staff to understand the methods that visually impaired people use to manage their everyday lives. To accomplish this, they decided to present an inservice program.

On the day of the presentation, all DAGC staff members were present, including the executive director, the professional staff, and the secretaries. Each of the VIPs presented at least one topic, sharing their experiences of living with vision loss. Some brought samples of adaptive devices that they use in their daily lives, such as a white cane, a talking clock, talking blood glucose and blood pressure monitors, an adaptive insulin measurement device, a set of nested measuring cups, and a talking scale. Several of them discussed common courtesies for interacting with visually impaired people, such as remembering not to raise one's voice; use of sighted guide techniques to help people get around easily; speaking when entering and leaving a room; and verbally describing such gestures as pointing to an object. One discussed helpful local resource organizations for services related to visual impairment, and another presented a simulated blindness experience, designed to promote understanding of the emotional difficulties and frustrations of a person with new blindness who has not yet learned rehabilitation skills.

The DAGC staff received the presentation warmly. A simple pre/post test provided evidence that many of them had gained both knowledge and a sense of understanding of visual impairment. Many included written comments on their post tests, expressing appreciation that people with visual impairment had presented the inservice.

DAGC staff members said of that presentation: “It had a great impact on everyone who was there. It really increased our sensitivity, and helped us all feel more comfortable working with people who can't see well”

“One of the biggest things it did was to give us an idea of the variety of visual impairments there are, an understanding that you can't assume you know what a person is experiencing.”

“The instructions for doing sighted guide properly were very important in helping staff feel comfortable to assist.”

“You don't want to appear insensitive by assuming the person doesn't need help, and you don't want to insult someone by assuming the person does need help for something they might be able to do on their own. The answer you gave us when we asked about this is the best answer: You have to ASK whether a person needs help, and how you can help them.”

One of the VIPs later described her feelings about presenting the inservice:

“It empowers me to be able to talk about this, and to help someone else – to help the person who is not visually impaired, and to help the person they will meet who is visually impaired.”

Comments: Because the VIPs (rather than a professional) presented the inservice, the impact was far greater. Not only did their presentation gain a sense of authenticity, but they also showed directly that they were all competent people with unique personalities and abilities. As an added benefit, they gained confidence in their ability to advocate for their own needs.

Steps to increase accessibility

DAGC made many changes in patient education materials and programs as a result of this project. The major categories included:

1. Printed patient education materials were made available in accessible format.
2. Public education events were made more accessible.
3. Staff was informed about visual impairment and given information about common low-vision courtesies.

Within each of these categories, there were numerous particular actions. Following is a summary of steps for increasing accessibility that DAGC took as a result of this project.

1. Making printed diabetes information accessible

The Planning Group decided PVID need two types of diabetes self-management information: the basic diabetes information that is needed by everyone with diabetes, and specialized information about self-management tools and techniques used by people with vision loss.

For the first type of information, the VIPs recorded a set of self-published information sheets that DAGC makes available to anyone within their service area who requests them. These cover basic, necessary diabetes self-management information in all of the content areas covered by the “National Standards for Diabetes Self-Management Education.”¹ For the second type of information, DAGC staff and volunteers recorded a series of articles about low vision and nonvisual tools and techniques.

If a person prefers large print, DAGC can easily make large print copies of their materials through the use of scalable fonts. If a person prefers Braille, DAGC can obtain Braille

copies of their materials through a cooperative agreement with a local blindness rehabilitation center.

2. Making patient education events accessible

DAGC now plans for accessibility of their public education programs through: choosing locations that are accessible to non-drivers; publicizing programs in audio formats (such as radio and the sound track of television) and through local blindness organizations; providing space on the registration form for requests for reasonable accommodations (such as large print or Braille copies of handouts); and coaching speakers to make their talks accessible (see Table 2).

As an added benefit of indicating a willingness to make reasonable accommodations, DAGC has found that people with other disabilities (such as hearing loss or mobility impairment) have also used the space on the registration form to request accommodations, enabling DAGC to effectively serve even more people.

3. Informing staff about visual impairment

As discussed above in the section, “It empowers me to help someone else,” the VIPs planned and delivered an inservice presentation for the entire DAGC staff. This background was crucial to increasing the DAGC staff’s sensitivity to the needs of PVID and their ability to understand specific accessibility requests.

DISCUSSION

Although this was a local project that focused on accessibility for one particular diabetes organization, the implications of this project may extend beyond the local area. Factors to consider about generalizing the findings of this project include: the prevalence of visual impairment among people with diabetes compared to the prevalence of other special populations; professional, ethical, and legal requirements to provide DSME to PVID; the extent to which the recommendations produced in this project match general educational recommendations for people with visual impairment and blindness; and the cost of providing such accommodations.

As mentioned above, an estimated 3.2 million people live with both diabetes and visual impairment.³ In comparison, an estimated 3.7 million African Americans have diabetes. About 1-2 million people have type 1 diabetes, and an estimated 0.183 million children have diabetes.⁴ An estimated 19% of the adult U.S. population has low literacy,³² so it seems reasonable that at least a similar percentage of people with diabetes has low literacy, or about 3.9 million. The prevalence of visual impairment is large enough that the needs of PVID should be included in the planning process for all diabetes education programs, as is required for the needs of the above-mentioned cultural, diagnostic, age and literacy groups in any target population. Standard 3 of the National Standards for Diabetes Self-Management Education requires that diabetes education programs assess the target population to “identify the needs of all individuals with diabetes, not just those who frequently attend clinical appointments.” Standard 3 explicitly states, “Identification of access issues is an essential part of the assessment process,” and mentions “reading ability and barriers to participation in education:” as factors to consider.¹ According to these criteria, assessment of the access needs of PVID in the target population qualifies as an important factor to consider.

All ethical, professional, and legal requirements concur that diabetes educator should provide diabetes education services to PVID in ways that are fully accessible to the individuals involved.^{1, 2, 25, 26} According to this general principle, diabetes education for

PVID should include all the same options that are offered to fully sighted people. For example, if a basic DSME program routinely provides print handouts for sighted people who attend, it should also provide large print or audio handouts with similar content for PVID who attend. Similarly, if a DSME program offers intensive management to sighted people who have the ability, resources and desire to carry it out, that program should offer reasonable accommodations for intensive management to PVID who have similar ability, resources and desire.²⁵

The steps DAGC took to make their diabetes education opportunities accessible for people with visual impairment closely match national and international recommendations for making college and adult education experiences accessible.²⁰⁻²⁴ Specifically, these recommendations concur on the importance of making print information available in accessible formats; planning program locations for accessibility to non-drivers; publicizing learning opportunities through accessible media; coaching instructors on making their talks accessible by speaking all necessary information; and informing staff of basic facts about people with visual impairment and their needs. This close concurrence implies that these steps taken in this local project may have wide general applicability.

Finally, cost of reasonable accommodations cannot be considered a significant barrier to the provision of diabetes education for PVID. The cost of nearly all of the changes recommended by the VIPs and implemented by DAGC was minimal. Only the recording project had significant cost. It is worth noting that many bookstores include a large selection of published audio books (not about diabetes) at reasonable cost, and that these are quite popular among sighted readers who prefer to listen to books. With recent wide availability of digital recording equipment and editing programs, and with the use of sighted readers, the cost of creating recordings of printed information could be quite low.

IMPLICATIONS

There are two major implications of this study. First, all diabetes education programs in the U.S. should plan for full accessibility for PVID. This requires inclusion of the needs of visually impaired people in the assessment of and planning for the program. Planning to serve PVID should include: locating programs where non-drivers can access them; publicizing programs in ways that non-readers can learn of them; coaching for speakers to make talks accessible; providing inservice presentations about visual impairment for program staff; and providing handout materials in accessible format.

Second, diabetes organizations should publish teaching materials in accessible formats, especially as recordings. The scarcity of recorded diabetes information contrasts markedly with the evidence of need for such recordings. Diabetes organizations have recognized for many years that they should publish diabetes information designed for particular cultures, age groups and literacy levels. Similarly, they should publish audio materials for people who cannot read standard print. The popularity of recorded books in the commercial marketplace suggests that recorded diabetes information might possibly find a market among sighted people who prefer listening to visual reading – for example, people who listen to recordings while commuting or exercising, or who simply prefer audio learning.

Acknowledgments

The American Association of Diabetes Educators (AADE) Education and Research Foundation provided the initial funding for this project, as the “Type 2 Diabetes Education Project Grant.” In addition, the Ohio Chapter of the American Council of the Blind, Pearle Vision Foundation’s Ophthalmology Worldwide Fund, and Mike Taigman gave financial support to the project. Mike Taigman also donated expert assistance in planning the recording process and in the initial recording session. Harrison Leslie Adams donated use of his original music for the recordings. I thank Barbara Bodzin, MSN, RN, CDE; Connie Kleinbeck, BSN, RN, CDE; Debra Sokol-McKay,

CVRT, CLVT, OTR/L, CDE; Anne Whittington, MBA, MSN, RN, CDE; and Anne's guide dog, Karl Whittington for their freely given expertise in support of this project.

REFERENCES

1. Funnell, et al. National standards for diabetes self-management education. *The Diabetes Educator* 2007;33(4):599–614. [PubMed: 17684162]
2. American Association of Diabetes Educators. The scope of practice, standards of practice, and standards of professional performance for diabetes educators. *The Diabetes Educator* 2005;31(4): 487–512. [PubMed: 16100327]
3. Centers for Disease Control and Prevention. Data & trends: national diabetes surveillance system, visual impairment. [March 17, 2008]. <http://www.cdc.gov/diabetes/statistics/visual/fig1.htm> Updated March 26, 2007.
4. Centers for Disease Control and Prevention. Data & trends: national diabetes fact sheet. [March 17, 2008]. <http://www.cdc.gov/diabetes/pubs/factsheet05.htm> Updated February 3, 2006.
5. Williams AS. A focus group study of accessibility and related psychosocial issues in diabetes education for people with visual impairment. *The Diabetes Educator* 2002;28:999–1008. [PubMed: 12526640]
6. American Diabetes Association. Resource Guide – A Supplement To Diabetes Forecast. 2008 [March 17, 2008]. <http://www.diabetes.org/diabetes-forecast/resource-guide.jsp>
7. Bernbaum, M.; Stich, T. Eye disease and adaptive diabetes education for visually impaired persons.. In: Franz, M., editor. *A Core Curriculum For Diabetes Education: Volume 1, Diabetes And Complications*. 5th ed.. American Association of Diabetes Educators; Chicago: 2003.
8. Cleary, M., editor. *Diabetes And Visual Impairment: An Educator's Resource Guide*. American Association of Diabetes Educators; Chicago: 1994.
9. Cobb, A., editor. *Serving Individuals With Diabetes Who Are Blind Or Visually Impaired: A Resource Guide For Vocational Rehabilitation Counselors*. Mississippi State University; Mississippi State: 1997.
10. International Diabetes Federation, Consultative Section on Diabetes Education. *International Consensus Position Statements For Diabetes Education, 2000*. Class; London: 2000. Position statement on diabetes education for people who are blind or visually impaired..
11. National Federation of the Blind. Literature about diabetes. [March 17, 2008]. http://www.nfb.org/nfb/diabetes_lit_list.asp?SnID=806860041 Updated 2007.
12. Sokol-MacKay D, Buskirk K, Whittaker P. Adaptive low-vision and blindness techniques for blood glucose monitoring. *The Diabetes Educator* 2003;29:614–630. [PubMed: 13677174]
13. Sutton, J. A guide to making documents accessible to people who are blind or visually impaired. [March 17, 2008]. <http://acb.org/accessible-formats.html> Updated 2002.
14. Williams AS. Teaching nonvisual diabetes self-care: Choosing appropriate tools and techniques for visually impaired individuals. *Diabetes Spectrum* 1997;10:128–134.
15. Williams AS. Accessible diabetes education materials in low-vision format. *The Diabetes Educator* 1999;25:695–715. [PubMed: 10646468]
16. Williams, A.; Kleinbeck, C.; Whittington, A.; Petzinger, R. A quick guide. When your patient has visual impairment: What to do?. [March 17, 2008]. <http://tde.sagepub.com/cgi/reprint/30/3/420.pdf?ck=nck> Updated 2004.
17. Kleinbeck C, Williams A. Disabilities, diabetes, and devices. *Home Healthcare Nurse* 2004;22(7): 469–475. [PubMed: 15241198]
18. Williams A. Diabetes information for the visually impaired. *Diabetes Self-Management* January/February;2007 :38–44. [PubMed: 17283509]
19. Williams A. Talking meters: what's new? *Diabetes Self-Management* May/June;2007 :6–16. [PubMed: 17582866]
20. Heath Resource Center. Students who are blind or visually impaired in postsecondary education. [March 18, 2008]. http://www.eric.ed.gov/ERICDocs/data/ericdocs2sql/content_storage_01/0000019b/80/1a/68/7a.pdf 2001.

21. National Institute of Adult Continuing Education. Visually impaired older learners. [March 18, 2008]. http://www.niace.org.uk/information/Briefing_sheets/VisuallyImpSep00.htm 2000.
22. Faculty & Administrator Modules in Higher Education. Adapting classroom instruction: blind or visually impaired. [March 18, 2008]. http://www.ols.org/ILT/ada/Fame/cw/f4_47_455.html
23. University of Washington DO-IT: Disabilities, Opportunities, Internetworking, and Technology. Low Vision FAQ. [March 18, 2008]. <http://www.washington.edu/doit/Faculty/Strategies/Disability/Vision/> 2004.
24. University of Washington DO-IT: Disabilities, Opportunities, Internetworking, and Technology. Blindness FAQ. [March 18, 2008]. http://www.washington.edu/doit/Faculty/Strategies/Disability/Blindness/blindness_faq.html 2004.
25. American Association of Diabetes Educators. Position statement: Diabetes education for people with disabilities. *The Diabetes Educator* 2002;28:916–921. [PubMed: 12526632]
26. Americans with Disabilities Act of 1990: Public Law 101-336, 101st Congress; Washington, DC: U.S. Government Printing Office. July 26, 1990; 1990.
27. Merriam-Webster's Collegiate Dictionary. 11th edition. Merriam-Webster, Inc.; Springfield, MA: 2003.
28. Centers for Disease Control and Prevention. Vision Impairment. [March 17, 2008]. <http://www.cdc.gov/ncbddd/dd/vision2.htm> Updated October 29, 2004.
29. Coughlin, D.; Brannick, T. *Doing action research in your own organization*. Sage; Thousand Oaks, CA: 2001.
30. Stringer, ET. *Action research*. 2nd ed.. Sage; Thousand Oaks, CA: 1999.
31. Greenwood, DJ.; Levin, M. *Introduction to Action Research*. Sage; Thousand Oaks, CA: 1998.
32. Rudd, R.; Kirsch, I.; Yamamoto, K. *Literacy and health in America*. Educational Testing Service. 2004 [March 21, 2008]. <http://www.ets.org/Media/Research/pdf/PICHEATH.pdf>

Table 1

Demographic Information About Participants

	Visually Impaired Participants	DAGC Staff Members
N	5	4
Age Range (years)	42-79	35-59
Gender (F/M)	3/2	4/0
Ethnicity	3 African Americans; 2 European Americans	4 European Americans
Educational level	2 college graduates; 1 community college graduate; 2 high school graduates	4 college graduates
Duration of Diabetes	>20 years for all	NA
Level of vision loss	3 can read large print; 1 can see areas of light and darkness; 1 has no light perception	NA
Current employment	NA	2 dietitians; 1 nurse; 1 outreach coordinator

Table 2**Accessibility Suggestions: Making Your Talk Make Sense For People Who Have Visual Impairment**

There are about 3.2 million people with both diabetes and visual impairment in the United States, and an estimated 140,000 of these individuals live in Ohio. Because people with visual impairment and blindness need diabetes education just as much as fully sighted people, the Diabetes Association of Greater Cleveland (DAGC) is taking steps to serve people with visual impairment on an equal basis as everyone else.

When you speak at a DAGC-sponsored event, it is likely that people who have low vision or blindness will be in the audience. Furthermore, you may not be able to easily identify that people with low vision or blindness are present, since they may arrive without a visible sign of visual disability, like a white cane, guide dog, or dark glasses. Therefore, we request that you assume that people with visual impairment are present, and consistently adhere to the following suggestions to help make your talk make sense to everyone who is present.

1) In preparing your slides, pay attention to font size. For people with low vision, anything below 28-point font on slides is likely to be illegible.

2) Make all of your slides simple and uncluttered. Busy slides are difficult for everyone to see clearly. They are impossible to see for people with low vision.

3) Use high contrast between the background and the type on your slides. Generally, a darker colored background with a lighter colored type is more legible for most people with low vision—for example, yellow or white type on a dark blue or green background. Many slide programs use such contrasting colors in their standard formats.

4) While you are giving your talk, be aware that some people may be present in your audience who cannot see your slides at all. Therefore, you should describe verbally all the important information that appears on your slides. It will help a lot if you think ahead of time how to clearly describe the important part of the visual material succinctly. Here are a few examples:

a) Read lists on your slides out loud.

For example, when showing a list of foods containing carbohydrate, instead of saying, "Here are some examples of one serving of carbohydrate," say "Each of these foods contain about 15 grams, or one serving, of carbohydrate: a slice of bread, ½ cup of pasta, 1/3 cup of rice, a small piece of fruit, and one cup of milk."

b) Describe graphs.

For example, when showing a graph that depicts the relationship between A1C and diabetes complications, "This graph shows the relationship between A1C and the development of diabetes complications. As the A1C gets larger, the development of diabetes complications increases. The line is smooth throughout its entire length. There is no point from normal A1C's up where there is a sudden jump in complications."

c) Describe pictures. Be sure to include a description of the important details.

For example, when showing a picture of a plate with a heart-healthy meal, instead of saying, "Here is an example of a moderate, heart-healthy meal," say "Here is a plate showing moderate portions of heart-healthy foods. A piece of fish covers ¼ of the plate. A scoop of mashed potatoes fills about ¼ of the plate. About half of the plate is filled with a tossed green salad, and there is a roll to the side. A cup of tea is nearby."

d) Describe cartoons, including key details from the drawing and the dialog.

For example, "A man is kneeling in front of a refrigerator with the door open. The top shelf has nothing on it. A box of cookies, and several other food containers are on the bottom shelf. He is holding a pop bottle, which he is about to place on the lowest shelf. A woman standing next to him says, 'I don't think this is what your doctor meant by lowering your carbs, honey.'"

e) At the beginning of your talk, introduce the idea that you will be describing your slides.

This will assure your visually impaired audience that they will not miss anything, and your sighted audience will understand why you are describing visually presented material. For example, you could say, "I will use slides as part of my presentation, and I will describe what is on the slides so anyone who has trouble seeing them will know what the slides contain."

5) If you prepare your own handouts, consider using large print. In general, 16-point font is a good large print size, and Arial Bold is an easy font to read for people with low vision. An ivory or light yellow paper reduces glare, which is a problem for many people with low vision.

If your handouts are long, you might choose to make most of your handouts in smaller print. In this case, you should make about 10% of all your handouts in large print, and offer to your audience to make more if more people need them.

If you do these things, everyone in your audience will benefit. Clear, uncluttered, high-contrast slides, and presentation of information in both visual and audio formats facilitates effective learning for fully sighted people. And these steps are essential for visually impaired and blind people to make sense of your talk.