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## **Using Assistive Technology to Maximize Communication Development: Gareth's Story**

*by Janice Light, Brandy Prebble, and Travis Prebble*

[Gareth's Story](#) appears in "Success Stories 2004: Consumer Perspectives," published by the National Center for Dissemination of Disability Research (NCDDR). The Fall 2005 issue of our eNewsletter contained "[Tracy's Story](#)," which also appears in this publication. To view the publication in its entirety, visit NCDDR's [Success Stories 2004: Consumer Perspectives](#).



Gareth is 2 years old. Like many children his age, he loves to read books with his mom or dad and play games like "Go Fish" or "Concentration". Yet Gareth faces significant challenges in his life.

His parents, Brandy and Travis explained, "During birth, Gareth's umbilical cord prolapsed, depriving him of oxygen for quite some time. Due to this trauma at birth, Gareth now has cerebral palsy. He has very low muscle tone and is functioning at about a four month level in both his fine and gross motor skills. Gareth had no gag reflex shortly after birth and to this day cannot swallow consistently. Because of this, Gareth has a tracheotomy. He cannot speak due to the trach, and his low muscle tone inhibits his ability to use sign language. However, Gareth is not delayed cognitively."

"Early on, he started to show signs of frustration because he could not communicate his wants and needs with us. When Gareth was 22 months old, we took the initiative to start a simple picture communication system with him, consisting mostly of photographs of all of his toys so that he could choose with which toy he wished to play. Gareth learned this system quickly and was happy to at last have some small way to communicate. With the help of his speech language pathologist, we introduced some simple voice output communication aids to Gareth as well. He was able to use all of these with ease, but it was clear that none of these devices provided Gareth with enough opportunities to communicate. Nor did they allow him to communicate on his own, without our intervention in providing his initial selection of choices."

When Gareth was 24 months old, his speech language pathologist introduced him and his family to Janice Light, a professor in the Department of Communication Sciences and Disorders at Penn State University. Dr. Light is a principal investigator on a research grant funded by the National Institute on Disability and Rehabilitation Research (NIDRR) as part of the Rehabilitation Research Engineering Center on Communication Enhancement (the AAC-RERC). Dr. Light, along with her co-investigator Dr. Kathryn Drager, head up a 5-year research study designed to improve the design of augmentative and alternative communication (AAC) assistive technologies for young children to maximize language learning and functional communication.

In the past, young children like Gareth often found it difficult to learn to use AAC assistive technologies. Current AAC technologies were all developed by adults and their designs tend to reflect adult ways of thinking. The representations of language concepts used in these technologies and the organization and layout of these concepts on the computer screen are not developmentally appropriate for young children. As a result, it is difficult for very young children to understand and learn to use traditional AAC technologies. Through the

NIDRR-funded research project, Janice Light, Kathy Drager, and colleagues have investigated new ways to design AAC technologies to reduce their learning demands and increase their appeal for young children like Gareth. With improved "child-friendly" designs for AAC technologies, it has been possible to intervene with children at much earlier ages to maximize their language development and communication.

As participants in the research grant, Gareth and his parents worked with the research team in weekly sessions at their home to develop appropriate AAC assistive technology to meet Gareth's needs, to implement these systems within his daily life, and to evaluate the impact on Gareth's language and communication development.

Gareth made rapid progress learning to use his new AAC assistive technology. When Gareth first started in the research project at 25 months of age, he had approximately 50 pictures that he used to communicate, mostly to request favorite toys. He typically took approximately one turn in 5 minutes of interaction. After 12 weeks of intervention through the study (at 28 months of age), Gareth had acquired more than 400 words /concepts. He learned to express a wide range of language concepts including people, actions, objects, places, social words, descriptors, questions, and relational concepts. In fact, he learned approximately 4-5 new concepts a day, keeping pace with rates of typical language acquisition. He began to combine concepts into 2 and 3 word sentences to communicate more complex ideas. He was much more active and engaged, taking more than 10 times the number of turns that he used to take in interactions with others. At last count (at 30 months of age), Gareth had over 700 words and concepts.

His parents described Gareth's progress: "The use of AAC technology was a natural fit as Gareth has inherited his father's love of computers. His enthusiasm was evident every time Janice brought the system during her visits. At first, the system was programmed with a few of Gareth's favorite songs and books. Gareth thoroughly enjoyed his new ability to sing and read through the system, and we delighted in listening to him! More concepts and choices were then added to Gareth's system, including menus and levels of options to accommodate his growing vocabulary. Gareth quickly learned how to navigate through the menus so that he could find the ideas he wished to convey. Using strings of images, he was able to start creating two and three word sentences, such as "Bus go fast" in describing how he wished us to manipulate his toy bus. Gareth now uses his AAC system to communicate to a variety of people. He can finally talk with other children, can sing in groups, and can use his system to engage in imaginative play. Others around Gareth are now starting to realize his strengths and abilities and are interacting with him more frequently and for longer periods. As his parents, we are thrilled to hear our son and to watch him show off his new found abilities! Now Gareth truly has his own voice."

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