

National Survey of Parents and Providers Using AT in Early Intervention



Assistive technology devices and services offer one way to create opportunities for infants and toddlers to participate in activities and routines in everyday settings (Langone, Malone, & Kinsley, 1999). Viewed from a broad-based perspective, assistive technology (AT) is a tool that allows infants and toddlers with disabilities to “engage in everyday activities that promote development” (Mistrett, 2001). Assistive technology can help families support their children’s development and learning and promote their participation in the activities and routines that take place in everyday settings (Campbell, 2000; Campbell, McGregor, & Nacik, 1994). A number of early research studies demonstrated that infants/toddlers with severe disabilities could learn successfully from interacting with their environments when AT was used as a mediator between environmental demands and the infants’ physical limitations (Bambara, Spiegel-McGill, Shores, et. al, 1991; Place & Soukup, 1992; Sullivan & Lewis, 1990, 1993, 2000). Despite these benefits of AT in early intervention, state reports of AT identify a surprisingly small and consistently stable percent of infants and toddlers with AT listed on their Individual Family Service Plans (IFSP’s).

The use of AT with infants and toddlers appears limited in scope as well as breadth (Sullivan & Lewis, 2000; Mistrett, 2001). Indeed, data from the past four annual reports to Congress on the implementation of IDEA, reveals that the inclusion of AT on the IFSP has remained relatively flat, at around 4 %. A fuller understanding is needed of parameters that influence the selection and use of AT as an early intervention service. In particular, we need to understand what functions AT is intended to accomplish for infants and toddlers and the specific ways in which AT supports children’s growth and learning in natural context. This brief summarizes the results of our national survey of early intervention providers and parents of children receiving early intervention services. The purpose of the survey was to:

1. Gain an understanding of patterns of AT prevalence and use;
2. Describe and understand policy and resources that promote AT in early intervention;
3. Understand and improve individualized AT decision making and practices in early intervention;
4. Identify optimal training and technical assistance (TA) practices for establishing and maintaining knowledgeable adults to support children’s use of AT;
5. Multi-media dissemination of Institute findings and products.

METHOD

The process for development of each of the five surveys included (a) input from our Advisory Board members and selected members of the constituent groups, (b) development, review, and modification of draft surveys, (c) pilot testing of the surveys with a sample of the target group, and (d) final revisions of surveys.

A nationally-representative probability sample was recruited for these surveys. Parents and providers were recruited from a 14 state sample, selected on population and geographical distribution, and from a recruitment notice placed on our website and advertised through the NECTAC website. We randomly selected a total of 17,126 early intervention providers (e.g., occupational & physical therapists; speech and language pathologists) from lists supplied by the 14 sample states. These providers were contacted by mail and asked to return a card indicating their willingness to be contacted for the phone survey. <http://tnt.asu.edu/appendix/PracQue-Final.pdf>. A total of 2100 providers responded from which a sample of 967 providers who worked with a minimum of three children per week completed the phone interviews. Similar procedures were used to recruit the parent sample. From the same 14 states, we recruited a sample of 12,729 parents of which 1700 agreed to be contacted and 924, whose children were under the age of three years and currently enrolled in early intervention, completed the phone interview. <http://tnt.asu.edu/appendix/ParQueRev.pdf>

A private survey research organization was contracted to complete the field-tested phone interview protocol. Computer-assisted (CATI) phone interviews were used to collect data from all groups surveyed. The research organization was provided with a list of possible participants, their contact information and the interview format. The survey research organization uses CATI procedures to enter individual response data directly into a computer software program during the actual phone interview. Following completion of the phone interviews, the research organization provided with SPSS and ASCII files to use in data analysis.

RESULTS

Results of the analysis were arranged in response to the five primary question areas (use and prevalence; policies and resources; decision-making and practices; training; and funding).

1. AT Use and Prevalence by Infants and Toddlers

To gain information about AT use from the perspectives of providers, the national sample of providers (n=967) were asked to describe AT use patterns in terms of children on their caseloads by indicating if all, most, some, or none of the children who should be are using AT. Analysis revealed that only 18.1% of providers believed that all of the children on their caseload who need AT were receiving it, 37% reported that most who needed AT were receiving it, 28.7% reported that some children who needed AT were receiving it, and 15.7% reported than none of the children who needed AT were receiving it. These data indicate, from the perspective of EI providers that a significant number of infants and toddlers who need AT are not receiving AT at present.

To gain an understanding of what providers viewed as AT for infants and toddlers, the providers were asked to give examples of what they viewed as high technology and low technology and trends were identified. First, computers and computer-based augmentative communication devices were generally viewed as high tech (e.g., computer software, touch windows, Dynovox, etc). Second, powered mobility was also viewed as high tech. Third, there was a tendency for all electronic items to be labeled as high tech, even if it were a simple,

inexpensive item (e.g., foot pedal, switches to activate toys). Fourth, non powered items, often Durable Medical Equipment (DME), that supported movement or positioning were typically viewed as high tech (e.g., AFOs, braces, standers, splints). When asked to describe low tech devices, many of the items that some viewed as high tech were viewed as low tech by others. Typical mentions for those who did list low tech items were communication boards, trays, switches, and switch toys. Very few providers mentioned common items that can be purchased off the shelf such as boppies, oversized crayons, Velcro, and so on.

To gain a better understanding of how AT is used as a component of EI services, we asked our national sample of parents of infants or toddlers who were using AT (n=845) a series of questions, about the types, function, and success of AT, the settings in which their children used the AT, and the age when the children began using AT. Table 1 provides an overview of devices, functions, and success. As can be seen in the table, devices or items that were reported as used most frequently included Velcro (52.2%), plastic links (58%), oversized crayons (59.5%), boppies (41.4%), and attention-getting devices such as bells or whistles (46.4%). When these data are compared with provider reports of high and low technology it appears that devices parents used more frequently were often not identified by the providers. Devices used with less frequency by the parents typically corresponded to items the providers identified as high technology. Parents were also asked to indicate who introduced them to the AT. Most of the devices with higher frequencies of use were either discovered by the parents themselves or suggested by a friend. The devices typically viewed as higher tech (communication devices, hearing devices, electronic scooters) were usually introduced to the parents by professionals.

The percentage of parents reporting successful use for specific devices ranged from a low of 33% (plastic links) to a high of 62.1% (bathtub inserts). The mean success rate across all items was 46.6%. In terms of functions or purposes of the devices, as can be seen, eating, caregiving, and independence were the least frequently reported functions. Mobility, play, and communication were more frequently cited.

Parents were also asked to indicate contexts/settings where their children used the AT. Parents could report more than one setting. Frequency data revealed that home was mentioned 89.9% of the time, daycare 12.1%, community center 3.4%, therapist's office 9.1%, other locations 9.6%, and 1.0% were unsure of the locations.

Based on data from the providers, we know that only 18.1% report that all the children who should be using AT are receiving it. We know, also, that the "definition" of devices that would be considered AT is not uniform across reporting groups. Providers were more likely to identify as AT those devices that would meet Medicaid definitions for DME which may indicate that they have aligned their definitions to match payment sources or requirements. Additionally, providers were more likely to identify high-tech devices and many providers were unable to provide examples of low-technology. Devices parents used more frequently were often not identified at all by the providers. Devices used with less frequency by the parents typically corresponded to items the providers identified as high technology. Furthermore, most of the devices that were reported by parents with higher frequencies of use were either discovered by the parents themselves or suggested by a friend. The devices typically viewed as higher tech (communication devices, hearing devices, power mobility) were usually introduced to the parents by professionals. The overall success rate reported by parents for use of a device was under 50%. Overall, these data suggest that only the high-tech devices viewed by providers are listed on the IFSP and that AT services/devices may have come to be viewed as those devices considered to be high-tech (or DME). Given that the adaptations and devices that are the most useful with infants and toddlers are likely to be commonly available, off-the-shelf commercial toys, equipment, or low-

cost modifications/adaptations, it is disturbing that these devices do not seem to be made available to parents by their providers.

Table 1**Parent Reports of Frequency of Device Use, Success, and Functions**

Item/Device	Used	Successful	Eating	Mobility	Play	Communication	Caregiving	Independence	Other	Not Sure
Velcro	52.2%	38.3%	3.4%	19.5%	21.8%	5.2%	6.3%	23.1%	28.1%	5.4%
Plastic links	58.0%	33.9%	0.8%	22.0%	50.8%	3.1%	0.2%	4.7%	25.1%	5.3%
Touch Screen	18.9%	35.0%	0.6%	8.1%	23.8%	37.5%	0.0%	5.6%	29.4%	5.6%
Roller Ball Mouse	14.3%	37.2%	1.7%	17.4%	33.9%	13.2%	0.0%	6.6%	19.0%	14.0%
Oversized Crayons	59.5%	54.1%	0.2%	16.7%	43.3%	3.2%	0.4%	7.8%	37.2%	3.2%
Dycem	3.9%	57.6%	9.1%	18.2%	12.1%	3.0%	18.2%	15.2%	33.3%	3.0%
Boppie	41.4%	57.1%	10.6%	23.7%	8.3%	0.6%	7.7%	24.0%	39.1%	2.6%
Wedge	32.5%	44.2%	1.8%	27.9%	7.1%	0.4%	12.8%	9.3%	42.9%	4.0%
Floor Mats	25.9%	44.9%	3.7%	27.8%	13.4%	9.0%	4.2%	18.5%	36.6%	8.8%
Bathtub Inserts	38.2%	62.1%	0.0%	9.3%	5.5%	0.3%	32.8%	6.8%	48.6%	3.2%
Switches	37.3%	49.0%	0.3%	17.3%	35.4%	8.5%	1.0%	14.6%	25.2%	11.9%
Communication Devices	27.6%	49.0%	0.5%	3.1%	10.3%	72.7%	0.5%	3.1%	19.6%	4.1%
Computer Software	29.6%	41.2%	0.0%	6.0%	32.0%	28.8%	0.4%	6.4%	42.4%	3.2%
Loop Tapes with Recorder	17.2%	46.2%	0.0%	7.6%	22.1%	35.2%	1.4%	2.1%	39.3%	6.2%
Choice Boards	24.9%	44.3%	0.5%	7.6%	12.4%	41.4%	2.4%	7.6%	29.5%	11.4%
Attention-Getting Devices	46.4%	52.8%	0.3%	8.7%	17.6%	23.0%	1.8%	4.8%	50.3%	3.3%
Hearing Devices	9.3%	62.0%	0.0%	6.3%	6.3%	36.7%	3.8%	2.5%	51.9%	6.3%
Electronic Scooters	3.2%	40.7%	0.0%	33.3%	33.3%	3.7%	0.0%	0.0%	18.5%	18.5%
Crawler Boards	14.9%	40.5%	0.0%	46.0%	10.3%	3.2%	0.8%	0.0%	34.9%	9.5%
Mobile Standers	21.2%	42.5%	0.0%	62.0%	8.9%	1.1%	0.6%	10.1%	22.3%	7.3%
Totals		46.6%	1.7%	19.4%	20.4%	16.5%	4.8%	8.6%	33.7%	6.8%

2. Policy/Resources

We asked questions in each survey to assess what types of procedures were in place to ensure that the use of AT devices is supported with appropriate AT services; however, we have little clear information about the relationship between devices and services. A majority of the providers reported that AT services, including AT assessment, are provided as therapy or special instruction services and, therefore, not distinguishable activities within the provision of these services. Parents reported that when various devices had been used by their children that they were successful less than 50% of the time.

The survey also attempted to assess the extent that EI providers and parents understand and use available AT resources to support children's development. We considered resources in a broad way and included funding (discussed as a separate category) and programs such as cash loan assistance, demonstration centers, and lending libraries. Providers rated the number of AT resources in their communities as a lot (23.6%), some (48.0%), only a few (25.3%) and none (2.3%). Less than half (49.6%) of the providers reported having access to a loan library. About a third (34.1%) of the parents reported having access to a lending library; 23.8% did not know if a library existed.

States offer a variety of resources to support use of AT but the extent to which these resources are available for providers and families in a given community is not known. The ability to try out devices with children was identified as important by both providers and families. Lending libraries offer this possibility, however both provider and parent reports that this resource is used infrequently for infant-toddlers.

3. Decision Making

A series of four research questions were designed to begin examining decision making in AT. *Our first question examines situations/issues that providers might consider when evaluating the need for AT for an infant or toddler.* Providers were asked to indicate their likelihood of listing AT on the IFSP with regard to each of 13 different situations or conditions. Table 2 includes their responses to each situation. As can be seen, a majority of providers reported that they are likely or very likely to list AT on the IFSP in 10 of the 13 situations. The situations most likely to result in a recommendation for AT were (a) when a child cannot participate in an activity without the assistance of AT (93.9%), (b) when the child needs AT to continue to demonstrate acquisition of developmental milestones (94%), and (c) when new AT becomes available and makes sense for a child (90.8%). The situations in which less than half of the providers reported that they would be very likely or likely to recommend AT were when (a) there is a change in where a child spent time during the day (43.7%), (b) the IFSP outcomes had not been achieved (45.4%), or (c) there is a change in parental expectations for a child (48.6%).

Our second question examined, from the providers' perspective, *the importance of varying factors in their decision-making about the selection and use of particular devices or services.* The providers were asked to rate 13 variables in terms of importance on a four-point scale, ranging from extremely important to not at all important. Table 3 lists the variables and the percentage of providers viewing them as extremely important or important. As can be seen, 12 of the 13 variables were rated as important or extremely important by more than half of the providers. The least important variable was red tape or excessive requirements associated with using AT for infants and toddlers. The top variables were the appropriateness of a particular device for an infant or toddler (97.8%), the parent's attitude toward AT (91%), and the opportunity to borrow a device for a trial time period (88.4%).

Table 2. Conditions that Influence Early Intervention Providers' Likelihood of Listing AT on the IFSP

Condition/Situation	Very Likely	Likely	Total
1. The child or family want to participate in some activity and can't without the assistance offered by a device	82.1%	11.8%	93.9%
2. The AT will promote family-child-sibling interaction	76.8%	16.6%	93.4%
3. The child's parent requests the use of AT	55.3%	23.0%	78.3%
4. The child is having difficulty with something he or she wants to do	43.6%	24.8%	68.4%
5. There is a change in the child's condition, such as detection of a vision, hearing, or motor problem	51.9%	24.2%	76.1%
6. There is a change in the parents' expectations for a child	25.1%	23.5%	48.6%
7. The child meets a developmental milestone and needs AT to proceed	78.7%	15.3%	94.0%
8. Other IFSP team members suggest AT for the child	64.8%	23.7%	88.5%
9. There is a change in where the child spends time during the day	24.4%	19.3%	43.7%
10. New AT is available and makes sense for the child	73.7%	17.1%	90.8%
11. Someone on the team finds out new information about AT that may help the child	56.8%	27.1%	83.9%
12. The IFSP outcomes have not been achieved	25.0%	20.4%	45.4%
13. Consideration of AT is required as a part of the IFSP process	58.4%	15.9%	74.3%

Our third question focused on provider and parent beliefs. *We hypothesized that provider and parent beliefs might be a strong influence in the decision-making process.* We assessed broad-based beliefs by asking the providers and parents to indicate if they agreed or disagreed with a series of four statements. The selected statements represent those that have been proposed as an explanation for the underutilization of AT during early intervention. The specific statements with parent and provider responses included:

1. Young children need to have certain skills (e.g., using their hands or ability to recognize symbols) before they can use AT. *(44.6% of parents and 73.9% of providers disagreed)*
2. AT requires extra effort from a child and it is much easier to just do things for the child instead. *(73.7% of parents and 94% of providers disagreed)*
3. Using AT means giving up on doing things the natural way and may prevent the child from learning certain things. *(77.6% of parents and 96.4% of providers disagreed)*
4. AT costs a lot of money and it is a good idea to wait until the child is older to decide what will work. *(78% of parents and 92.9% of providers disagreed)*

Our final area of focus for decision-making was *policies and resources and their links with the decision-making process.* Our sample of providers was asked two questions that inform this issue. First, they were asked if established policies and procedures were a factor that they would consider in listing AT on the IFSP, and 56.6% reported this to be an important or very important variable. Second, providers were asked if they would consider a recommendation of AT if required by the IFSP process, and 74.3% indicated that they would be likely or very likely to consider AT under this condition.

Our initial examination of AT practices focused on identification of *options that are available for families and providers to learn about and try out devices.* When asked about trial periods, only 34.1% of families of AT users knew of a center or agency that has AT devices that they could borrow and try out. In contrast, 49% of providers reported having a place in their communities where families could try out or borrow a device.

Overall, the data on practices are both encouraging and indicative of areas in need of improvement in order for families and their infants and toddlers with disabilities to derive maximum benefit from early AT. Most encouraging were the providers' ratings of factors important to consider in the decision-making process and the likely conditions under which they would consider including AT as a service on the IFSP. Further, many common myths about underutilization of early AT are clearly not issues for providers. Further, from the provider perspective, infants and toddlers don't need certain skills or abilities in order to consider AT use.

Families' beliefs about AT were concordant with provider beliefs with one exception. Although a strong majority of providers believed that prerequisite skills are not necessary for AT, less than half of the families shared this belief. This difference may be indicative of a gap between parent and provider decision-making processes, which may in turn influence parent expectations about success and use of AT for their children.

Somewhat surprising was the fact that policy and procedures or IFSP requirements were not universal factors that providers would consider in decision-making about listing AT on the IFSP. Forty-three percent (43.4%) of providers would not consider policies and procedures as a factor, and 25.7% indicated that IFSP requirements would not be a factor they would consider. This pattern would suggest that although a majority of providers do consider policies, procedures, and requirements in the decision-making process, the linkages between policy and practices could be strengthened. This potential weakness could also be due to the fact that many states don't appear to have detailed policies, procedures, or guidelines about AT nor do states universally provide training for either providers or families. However, the requirement to consider AT during formation of the IFSP is clearly delineated in Part C regulations. Therefore, it may be that some providers need more education about Part C requirements.

Table 3. Providers' Views of the Importance of Variables in the Use and Selection of AT Devices and Services

Variable	Extremely Important	Important	Total
The availability of assistive technology	53.4%	28.1%	81.5%
The parent's attitude toward assistive technology	66.5%	24.5%	91.0%
Provider knowledge of assistive technology	40.1%	33.2%	73.3%
Technical support for using assistive technology	49.6%	32.8%	82.4%
Availability of funding	51.2%	23.9%	75.1%
Opportunity for trial by borrowing	64.3%	24.1%	88.4%
Cost of the device	28.7%	29.7%	58.4%
Red tape or excessive requirements associated with using assistive technology for infants and toddlers	18.4%	21.0%	39.4%
Provider's previous experience with a specific device	24.5%	32.1%	56.6%
Appropriateness of the device for an infant or toddler	91.5%	6.3%	97.8%
Established policies and procedures related to assistive technology	28.6%	28.0%	56.6%
Support of supervisor or colleague	30.0%	27.1%	57.1%
The physical environment where the child will use the device	44.5%	35.9%	80.4%

4. Training/Support

The providers in the national sample were asked to describe the amount of training they had regarding AT for infants and toddlers. One-hundred seventy-seven (18.3%) reported that they had “a lot” of training, 484 (50.1%) said they had “some” training, 255 (26.4%) said they had “little” training, 49 (5.1%) said they had had “no” training, and .02% were unable to judge the amount of training they had received. This finding appears to support the perception that a lack of provider knowledge and training is a primary barrier to optimal AT services.

Our initial surveys asked broad questions about training and were not designed to elicit specific information about ways of providing training, content, scheduling, etc. We don’t know about the specific content or skill needs of providers and parents about AT services and devices nor do we know about optimal ways of addressing training needs or the impact of particular training approaches on optimal outcomes with infants and toddlers.

5. Funding

Data from the national provider survey indicated that AT services were most likely to be provided by various discipline groups including occupational therapy, physical therapy, and speech and language pathology. Medicaid, private insurance, and Part C funds were the most frequently cited funding sources. Professionals identified parents as infrequent payers (3.2%-7.5%) for AT devices. The parent survey did not ask direct questions about funding. However, when parents were asked about devices that they had tried with their children, 25% of parents in the national survey reported that if they tried a device and it was successful, in order to keep the device, they had to find funding for the device themselves. Of the 25% of parents who identified finding funding themselves, 61.1% used their own funds, 18.1% obtained funding through insurance, and 8.1% through Medicaid.

High tech devices are more likely than low tech devices to be paid for by third party payers such as state Medicaid programs or private insurance. Medicaid considers many high tech devices under the category of Durable Medical Equipment (DME) or “medically necessary” – two standards that are used to define Medicaid-eligible devices.

Providers were asked to rate the importance when considering AT for an individual child of a number of items, including sources of funding. A total of 51.2% of the providers identified “availability of funding” as an extremely important and 23.9% as a very important factor when considering AT for a child while only 28.7% and 29.7% rated the cost of the device as a very important or important factor.

A primary source of funding for AT services appears to be billing by discipline to Medicaid, private insurance, or other funding sources meaning that if AT services are provided, they are likely to be provided as OT, PT, or SLP, discipline services that are billable to Medicaid and private insurance programs. Medicaid appears to be the primary funding source for AT devices and, as such, devices billed to Medicaid

must meet state-defined criteria for DME or medical necessity. There do not appear to be well-established guidelines or practices within most states concerning billing practices for either devices or services with the exception of Part C funding for devices which in most states, requires listing of the device on the IFSP. Part C funds for payment of devices may be used only as the “payer of last resort” in all states. The trends in this area indicate that high-tech devices (those most likely to meet DME or medical necessity requirements) are more likely to be paid for and that low-tech off-the-shelf items are least likely to be paid for by Medicaid, private insurance, or Part C funds. Parents reported higher use of low-tech than high-tech devices and also reported that family funds were the primary source of payment for successful devices that they borrowed and then wished to have for their children.

DISCUSSION

Results of these national surveys clearly indicate that we need to know more about how providers learn about AT practices and how they use these practices in their work with infants and toddlers. While we have learned that providers disagree with typical statements about AT underutilization (e.g., child is too young; AT is too expensive), we don’t know what they do in actual practice and how other factors (e.g., funding/payment, AT availability, state policy) may influence their actual use of practices. We need more information about practitioners’ views of the relationship between devices and services and the extent to which, and the ways in which, AT services (e.g., assessment, teaching device use) are provided. Further, we need more information about how AT practices promote child and family outcomes and allow children to participate in activities and routines in natural environments.

REFERENCES

- Bambara, L., Spiegel-McGill, Pl, Shores, R., & Fox, J.J. (1984). A comparison of reactive and nonreactive toys on severely handicapped children’s manipulative play. *JASH*, *9*, 142-149.
- Campbell, P.H. (2000). Using natural settings as opportunities for teaching and learning: Promoting participation and learning. Submitted for publication (*Young Exceptional Children*).
- Campbell, P. H., McGregor, G., &Nacik, E. (1994). Promoting the development of young children through use of adaptive and assistive technology. In P.H. Safford, Ed. Yearbook in early childhood education: Early childhood special education (192-217). New York: Teachers College Press.
- Langone, J., Malone, D.M., & Kinsley, T. (1999). Technology solutions for young children with developmental concerns. Infants and Young Children, *11* (4), 65-78.
- Mistrett, S. (2001). Synthesis on the use of assistive technology with infants and toddlers (Birth through age two). Final Report to OSERS, Contract No. HS97017002.

Place, P. & Soucup, C. (1992). Easy as 1-2-3, A first augmentative communication system. Hearsay, 1(1), 1-5.

Sullivan, M.W. & Lewis, M.L. (1990). Contingency intervention: A program portrait. Journal of Early Intervention, 14, 367-375.

Sullivan, M.W. & Lewis, M.L. (1993). Contingency, means-end skills, and the use of technology in early intervention. Infants and Young Children, 5, 58-77.

Sullivan, M.W. & Lewis, M.L. (2000). Assistive technology for the very young: Creating responsive environments. Infants and Young Children, 12, 34-52.