

**ACT Today!**

Autism Care & Treatment Today!  
21600 Oxnard Street, Suite 1800  
Woodland Hills, CA 91367

Dear Sir/Madam:

We request a grant in the amount of \$2,500 to provide for adaptation for our daughter Jane Smith. Jane is disabled, diagnosed with both ASD and apraxia. These disabilities have caused Jane to fall short of her potential, due to her inability to communicate well, and from her anxiety caused by her inability to manage anything more than very basic routines. Her social development suffers for these same reasons.

We believe that this grant, if approved, will give Jane the adaptations to live a richer and more productive life – as a student, a family member, and as a friend.

We ask you to read our application, and respectfully consider the professional opinions we have sought to help our daughter, and the collaboration we have with Jane's teachers and therapists. We believe these opinions are accurate, and while current therapies seem to help, we also believe that the adaptations this grant would provide could do so much more for Jane.

**Purpose of Intervention**

Jane Smith is a 13-year old girl who has been diagnosed with ASD. In addition, she also has apraxia. She is currently enrolled in a special-needs classroom in her middle school. She evidences an average level of intelligence and moderately good receptive communications skills. She is mainstreamed into the middle school curriculum for physical education and music. However, her academic progress is hindered by certain aspects of her ASD and her apraxia.

Jane is technology literate. She enjoys using with her family's computer for school work and other tasks. She can type well (around 15 wpm). In her spare time, Jane likes to use her small iPad (an older version). She likes to play games and music, and to surf the web for fun. Her parents have installed safety software to prevent Jane from revealing her identity or visiting unsafe sites.

Her autism manifests itself in several ways:

- She can perform most of her school work in a timely and acceptable manner, but only if she receives structured guidance with time management, task coordination, and proofreading
- She can sit and work in a structured situation, but has difficulty in interactive situations
- She demonstrates great anxiety when experiencing an unfamiliar environment
- She also shows anxiety when placed into new social situations
- Her social skills are undeveloped, including her ability to effectively communicate on a social level, and to decode social cues

In addition, Jane's apraxia impacts her school performance in several ways:

- She is limited in her expressive language capabilities, and is thus unable to consistently and clearly communicate her needs and wants through spoken language
- She has difficulty in relating the knowledge she has and transferring information to her teachers and to other students
- She has difficulty in establishing social closeness with other students
- She experiences frustration with her disabilities and can act out (e.g., screaming), or display breaches of social etiquette (e.g., blurting angry words at inappropriate times).

To help Jane develop more independent learning and social skills, we have retained several professionals to assess and to counsel Jane. Our goals were to help Jane with:

- 1) her social skills, including reading and interpreting social cues
- 2) her confidence in mastery of unfamiliar settings
- 3) her ability to work through routines
- 4) her ability to structure her time and perform school work more independently

The results of these assessments are presented in the next section.

## **Assessment**

Jane has been diagnosed as ASD by a Lisa Adams PhD, a licensed psychologist. Specifically, her diagnosis of Jane is represented as Autism Spectrum Disorder: DSM-5 299.00 (F84.0), Level 3. A Level 3 patient such as Jane exhibits the following characteristics:

- 1) Severe deficits in verbal and nonverbal social communication skills cause severe impairments in functioning, and

- 2) Very limited initiation of social interactions, and minimal response to social overtures from others, with inflexibility of behavior, extreme difficulty coping with change, or other restricted/repetitive behaviors markedly interfere with functioning in all spheres.

Jane's apraxia was diagnosed by a psychologist and is represented by Developmental Coordination Disorder DSM-5 315.4 (F82). Jane exhibits the following characteristics:

- 1) Impaired control of the vocal apparatus
- 2) Difficulty suppressing breathing and salivation while speaking
- 3) Central difficulties forming speech sounds and sequencing words

These symptoms manifest in speech and language impairment, and is termed "childhood apraxia of speech".

Jane's diagnosis of apraxia was confirmed by Robert Davis, PhD, a speech pathologist and therapist, who coordinates Jane's speech therapy and other accommodations. Dr. Davis works closely with Jane's psychologist, Dr. Adams, who provides counseling for Jane's social skills, her time and task management skills, and her anxiety.

Mr. John Jones, a RESNA-certified Assistive Technology Professional, was retained to perform an assessment to determine whether Jane could benefit from adaptations to her disabilities. Mr. Jones holds a Master's degree in Rehabilitative Counseling and has a strong reputation among local practitioners in working with children and adults with disabilities such as ASD. Specifically, Mr. Jones was asked to assess Jane's functional capabilities and limitations, and to discover whether a solution (or solutions) could be brought to bear to help Jane with her social, educational, and personal development, and for her to gain greater independence.

Mr. Jones reviewed Jane's formal medical diagnoses, met with her school teachers and counselors, and interviewed Jane and her parents. He then applied the Adaptations Framework, which was developed by Bryant and Bryant (2003), and has been used successfully in many assessment scenarios involving students on the autistic spectrum, like Jane.

An outline of Jane's Assistive Technology assessment is presented below.

Setting Specific Demands		Person Specific Characteristics		Adaptations
<i>Task</i>	<i>Requisite Abilities</i>	<i>Functional Capabilities</i>	<i>Functional limitations</i>	<i>Simple to Complex</i>
<b>What needs to be done?</b>	<b>List the abilities required to complete this task.</b>	<b>List the functional capabilities of the student</b>	<b>List the functional limitations of the student</b>	<b>List possible AT solutions from low tech to high tech</b>
Jane needs to communicate using spoken language	<p>Jane needs to be able to:</p> <p>Hear and listen to spoken English</p> <p>Utilize receptive communications skills</p> <p>Process information</p> <p>Formulate her response</p> <p>Articulate her response</p>	<p>Jane has the ability to:</p> <p>Hear and listen to spoken English</p> <p>Apply receptive communication skills</p> <p>Process information</p> <p>Formulate her response</p> <p>Use a keyboard</p>	<p>Jane does not have the ability to:</p> <p>Articulate her response using the spoken word in an intelligible manner</p>	<p>Potential solutions for Jane include:</p> <p>Dictating to a human interpreter to scribe and articulate her thoughts</p> <p>Using speech recognition software enter text via a keyboard</p>
Jane needs to manage her personal schedule and manage her time	<p>Jane needs to be able to:</p> <p>Know the tasks she needs to accomplish</p> <p>Know the timing and the duration of each task</p> <p>Know how to tell when each task is completed</p>	<p>Jane has the ability to:</p> <p>Understand at a high level what she needs to do</p> <p>Read a list of tasks</p> <p>Read a clock and tell time</p>	<p>Jane does not have the ability to:</p> <p>Keep track of many tasks</p> <p>Know how to prioritize tasks</p> <p>Know when each task is completed, so she can move to the next task</p>	<p>Potential solutions for Jane include:</p> <p>Use a chart or poster to list her tasks</p> <p>Use a visual scheduling software to organize her tasks and guide her through a sequence of tasks</p>
Jane needs to manage anxiety in her	<p>Jane needs to be able to:</p>	<p>Jane has the ability to:</p> <p>Recognize and learn</p>	<p>Jane does not have the ability to:</p>	<p>Potential solutions for Jane include:</p>

Setting Specific Demands		Person Specific Characteristics		Adaptations
<i>Task</i>	<i>Requisite Abilities</i>	<i>Functional Capabilities</i>	<i>Functional limitations</i>	<i>Simple to Complex</i>
social interactions and environmental experiences	<p>Know how to navigate familiar spaces with confidence, even when slight changes are made (e.g., new furniture)</p> <p>Know how to adapt to new spaces and environments without anxiety</p>	<p>simple routines</p> <p>Recognize and learn simple environments</p> <p>Navigate familiar environments without anxiety</p>	<p>Learn more complex routines</p> <p>Recognize familiar environments that have changed slightly</p> <p>Navigate unfamiliar (but safe) environments without anxiety</p>	<p>Use a chart or poster to outline each space or environment she uses</p> <p>Use a visual modeling software to create a simulation of new and existing spaces to adapt her to each before experiencing it physically</p>

Mr Jones' stated that his assessment of Jane showed remarkable similarities to certain other cases involving ASD and childhood apraxia that he worked with in the past. He found that, in those cases, the use of software provided each person with the ability to move more closely toward an independent mode of living. After carefully reviewing Jane's demands and her characteristics, as well as her family's financial situation, Mr. Jones recommends the following adaptations for Jane:

- Apple iPad Air 2 Wi-Fi 64Gb (\$499)
- Zagg Folio Case with Bluetooth keyboard for iPad (\$100)
- AutisMate 365 software (\$179)

The total investment for the recommended adaptations is \$798, less taxes. Mr. Jones will provide software configuration services, and 5 hours of training for Jane, for an additional \$200. He will also provide ongoing support for 1 year, for up to 25 hours, for an additional \$1000, and thereafter for \$40/hour. The total amount for hardware, software, updates, and services is expected to come to \$2,500.

### Justification

Mr. Jones summarized his recommendation in terms of the following six criteria:

1. The technology package recommended by Mr. Jones provides adaptations for Jane's most urgent demands, in the context of her characteristics. AutisMate 365 is a holistic software package that runs on an iPad and utilizes several modalities to accept input, including a keyboard. Specifically, AustiMate 365 has several capabilities that can help Jane become more independent:
  - a) A voice generation capability generating speech from text entered from a keypad. This addresses Jane's disability (apraxia) and it offers her a method for generating spoken responses. It can also provide Jane with a method to pattern her speech and improve her articulation and muscle control
  - b) A time-management capability through creating a "visual schedule" to help Jane keep track of her tasks, to sequence her tasks, and to let her know when each task is completed
  - c) A virtual reality capability enabling the creation of "visual stories" that can help Jane acclimate herself to new environments (e.g., the doctor's office) as well as familiar ones (e.g., her home after new carpeting and drapes have been installed).
2. The iPad requires no particular customization, and the Zagg keyboard interfaces with it seamlessly in a plug-and-play manner. The requirements for AutisMate 365 are less than the out-of-the-box configuration for the iPad. Installation of AutisMate 365 requires an Internet connection (which Mr. Jones can provide initially) to access the Apple Store for downloading the AutisMate 365 app, which loads and self-configures.
3. The AutisMate 365 software will provide Jane with three distinct accommodations that are expected to alleviate or ameliorate her disabilities, and improve her classroom performance and her social development:
  - a) The voice generation capability will enable Jane to vocally communicate more effectively with teachers, counselors, peers, and new friends. It will also serve as a training device to help Jane improve her speech through guided practice. This addresses Jane's apraxia and is expected to lessen its impact.
  - b) The visual scheduling capability will help Jane move through the sequence of tasks, ranging from hygiene to household chores to school assignments. Jane can use this capability to check tasks off as they are completed, and save incomplete tasks for the future. This addresses several diagnosed symptoms of Jane's ASD, particularly that of staying on task in the face of distractions.
  - c) A virtual reality capability enabling the creation of "visual stories" that can help Jane acclimate herself to new environments (e.g., the doctor's

office) as well as familiar ones (e.g., her home after new carpeting and drapes have been installed). This addresses several diagnosed symptoms of Jane's ASD, particularly those involving her anxiety over changing environmental features and of new situations.

4. During the assessment performed by Mr. Smith, Jane was able to try out various software packages and computing options (including desktop computers and laptops). She strongly preferred the iPad, since she uses one at home, and some of her friends also have an iPad and she uses theirs on occasion. She is also a moderately good typist (tested at 15 wpm) and so can use the iPad in conjunction with the Zagg keyboard. Jane and her parents also liked the iPad because of its portability and its ability to connect with both the home and the school network in a secure and reliable way.

Jane also was exposed to several combinations of software solutions. She liked the AutisMate 365 interface and found it easy to work with, once shown the various options. Its highly visual properties typically appeal to those with ASD. Jane's parents and teachers also liked AutisMate 365 because it incorporates all of the features for Jane's accommodations in a single integrated package.

5. AutisMate 365 is recommended not purely on the strength of its capabilities, but also because of its very competitive pricing at \$179. The iPad configuration selected costs \$499, which is less than the most expensive iPad configuration but is more than sufficient to run the AutisMate 365 software suite. The Zagg keyboard is one of the most cost-effective peripherals on the market, and since it also includes a hardened case, is noted for its durability and reliability. It was deemed that a solution based on an iPad was superior to other options put forward (i.e., using a human scribe/interpreter, using paper charts, etc.) for two reasons. First, there are ongoing costs for each of those alternatives. Second, portability and availability of those resources is limited and awkward. With the iPad based solution, Jane can bring her accommodations with her wherever she goes, and can use it in conjunction with her teachers, therapists, and others.
6. Jane's parents, David and Susan Smith, are high-school graduates with some college. They both work at a local factory on an hourly basis. In 2015, their combined gross household income was approximately \$58,000, placing them in the 51<sup>st</sup> percentile of all US households. They have a medical benefit package that provides mainly for catastrophic circumstances, and carries a high deductible for office visits. They also have an HSA that they self-fund at a rate of \$100/month. They cover Jane's medical and therapy expenses from the HSA and out of their income, and rely upon support from their parents, grants, and loans to cover the remainder.

In order to afford the adaptation package recommended for Jane, Mr. Jones estimates that the Smith's require a grant in the amount of \$2,500.

### **Literature/Research Review**

Currently, over 19% of all students served under the Individuals with Disabilities Education Act (IDEA) have a speech or language impairment (1,129,260 students). However, IDEA doesn't cover all of the expenses needed for adaptation of the kind that Jane requires.

Current research clearly indicates that Augmentative and Alternative Communication devices (AAC) have a significant impact on improving speech among those with ASD. A 2013 study was conducted through the Kennedy Krieger Institute's Center for Autism and Related Disorders and John Hopkins University School of Medicine. This study, involving 535 children, ages 8 to 17, with autism and severe speech delays, found that nearly half became fluent speakers with the proper AAC and therapeutic support. (Wodka, 2013). This evidences the potential for students like Jane to develop her spoken language capabilities through adaptations like AutisMate 365.

For Jane to benefit, her apraxia therapy must involve regular treatment with a speech pathologist, coupled with practice at school and at home (ASHA, 2015). Because Jane already enjoys using her iPad, voice activated game apps could provide an additional method for Jane to practice her speech. She could be motivated to use her voice in a fun, educational and rewarding way. She could be given incentive not only to request basic necessities but to describe objects in her environment. (Enders, 2013)

The effectiveness of AAC to improve speech in children with autism and severe speech delays relies on additional therapies to achieve the best outcome. (Potts-Satterfield, 2015) The iPad has proven to be highly motivating and can supplement the existing tool sets in both an assistive and recreational way. AutisMate 365 addresses an area of need that is missing from Speech Generating Devices and other AAC technologies, while furnishing additional capabilities including time management and visualization (as noted above).

AutisMate 365 is rated at the very top end of comparable AAC apps. Where it shows indisputed market leadership is in its holistic range of capabilities, including Visual Scheduling, Visual Stories, and many others.

Mr. Jones has furnished the following links with reviews of AutisMate 365 that illustrate its strong reputation and value proposition.

<http://www.friendshipcircle.org/apps/browse/autismate/>



<http://www.iautism.info/en/2012/04/29/review-autismate/>

<http://its.uiowa.edu/campus-software-program/autismate-365>

<https://www.youtube.com/watch?v=bLmcCOyRxJA>

<http://venturebeat.com/2013/01/29/autismate-ipad-app-therapy/>

Other citations are:

ASHA. (1997–2014). *Childhood Apraxia of Speech*. Available:  
[http://www.asha.org/public/speech/disorders/childhoodapraxia/#what\\_do](http://www.asha.org/public/speech/disorders/childhoodapraxia/#what_do). Last  
accessed 25th June 2014.

Autism Speaks. (2014). *Applied Behavior Analysis (ABA)*. Available:  
<http://www.autismspeaks.org/what-autism/treatment/applied-behavior-analysis-aba>.  
Last accessed 26th June 2014.

Autism Speaks, (2014). *I Want to Say*. [online] Available at:  
<http://www.autismspeaks.org/hacking-autism/i-want-to-say> [Accessed 13 Jul. 2014].

Autism Speaks. (March 04, 2013). *Many Nonverbal Children with Autism Overcome Severe Language Delays*. Available: <http://www.autismspeaks.org>. Last accessed 26th June 2014.

Autism Speaks, (2009). *Researchers Focus on Non-Verbal Autism at High Risk High Impact Meeting*. [online] Available at: <http://www.autismspeaks.org/science/science-news/researchers-focus-non-verbal-autism-high-risk-high-impact-meeting> [Accessed 17 Jul. 2014].

Enders, S. (2014). *Voice Activated/Voice Playback Apps*. Available:  
<http://www.pinterest.com/lasenders/voice-activated-voice-playback-apps/>. Last  
accessed 26th June 2014.

Potts, CCC-SLP, Meredith, and Ben Satterfield Ed.D. *Studies In AAC And Autism: The Impact Of LAMP As A Therapy Intervention*. 1st ed. 2015. Web. 7 June 2015.

Wodka, E. Mathy, P. and Kalb, L. *Pediatrics* 2013;131:e1128; originally published online March 4, 2013; DOI: 10.1542/peds.2012-2221

## **Methods**

We intend to retain Mr. Jones to implement this technology for Jane in the following ways:

- Hardware acclimation. Jane and her parents will learn to operate the iPad and the Zagg keyboard including turning it off and on, charging the battery, and connecting to the Wi-Fi in her home and school.
- Software acclimation. Jane will learn to operate the main features of the AutisMate software, including the Visual Scene, the Visual Schedule, and the Sentence Builder. Jane's parents will learn how to set up Visual Scenes, Visual Schedules, and the Sentence Builder. Mr. Jones knows that Jane's teachers are already literate in the use of AutisMate, and therefore require no additional support.
- Maintenance. Mr. Jones expects there to be ongoing support with software and hardware updates, to a limit of 25 hours per year. He will offer a support package to the Smith family for that purpose.
- Continued support. Mr. Jones will be available to work with the Smith family as well as Jane's teachers and therapists on an as-needed basis at no charge for the first 10 hours, and for \$40/hour thereafter.

## Goals

The expectation is that these adaptations will improve Jane's functions across several different dimensions:

1. Operational Competence
  - Physical skills – continued use of AutisMate 365 is expected to improve Jane's apraxia, in conjunction with her continued therapy
  - Cognitive demands – Jane's ability to more ably communicate her thoughts and receive feedback are expected to reduce her frustration and free up her cognitive capabilities, thus increasing her ability to focus on her academic work, and experience greater academic success.
2. Linguistic Competence
  - Jane's use of integrated AAC and writing tools through AutisMate 365 are expected to enhance her ability to understand and utilize the English language symbol systems for usage, punctuation, and spelling
  - Jane's use of integrated AAC and writing tools through AutisMate 365 are expected to augment her ability to organize her thoughts and create written work at a higher level of quality.
3. Social Competence

- Jane's use of AutisMate 365 in the form of social coaching and cue interpretation is expected to enhance her knowledge of social conversation issues
  - Jane's use of AutisMate 365 for both AAC and social coaching is expected to reduce her anxiety and promote good judgment in social contexts
  - Jane's use of AutisMate 365, in conjunction with her therapy, is expected to improve her understanding of the rules and protocols of conversation
  - Jane is expected to better understand the social contract and the rules of interaction for authority figures, family members, peers, and strangers.
4. Strategic Competence
- Over time, and with appropriate training and coaching, is it expected that Jane will develop her own strategies to make best use of the system of AutisMate 365 and even to enhance her own experience with it.

Specifically, our goals for Jane include the following:

- In 2 months, Jane will be able to track and follow a sequence of up to 5 tasks, with timely completion of each task with 80% accuracy.
- In 3 months, Jane will improve her diction by using five different messages 3 times throughout the day independently and appropriately initiated using AutisMate 365 as the exemplar.
- In 4 months, Jane will apply the Visual Stories to interact with the receptionist at her therapists' office, to ask questions with 90% accuracy and intermittent cueing, given 3/5 opportunities
- In 6 months, Jane will expand the topic of conversation with peer or staff by retrieving the appropriate message on AutisMate with 80% accuracy and occasional cueing, given 3/5 opportunities.

### **Intervention Evaluation Methods**

Success will be evaluated on several levels. First, Jane's results corresponding to the goals established above will be measured and calibrated. New goals will be established based upon success in reaching the stated goals.

Second, Jane's therapists will confer to determine if certain testing is warranted to evaluate improvement in socialization, speech and diction, or other criteria.

Third, Jane's teachers will be involved in determining how Jane is meeting the targets established in her IES, and if improvements are observed.

In summary, we respectfully request that the grant committee for ACT Today! (Autism Care & Treatment Today!) review our grant application favorably, and confer upon us our requested amount of \$2,500.

If you have questions, or require further information, please let us know.

Sincerely yours,

David and Susan Smith