**Autism Telehealth Programs**

**Telehealth**

* Defined as the use of telecommunications and information technology to provide access to health assessments, diagnosis, intervention, consultation, supervision and information across distance (www.medicaid.gov, Feb 7, 2012).
* Used in the U.S., in academic medical centers, community hospitals, managed-care companies, and rural hospitals for patient care, professional and patient education, research and public health applications.

**Autism Spectrum Disorders (ASD)**

* As ASD diagnosis rates rise, there is a resulting overall shortage of trained professionals.
* Rural area families find it difficult to identify/access regular professional resources.
* Given the shortage of specialists and the rising incidence of ASD diagnoses, the viability and effectiveness of ABA telehealth service delivery options for ASD evaluation and treatment has been addressed in the ABA literature across multiple research designs.

**Telehealth and Autism Overview**

* Telehealth can be considered a supplemental tool to current standards of practice.
* Telehealth may improve access to professional services for remote geographic locations.
* Research results indicate the effectiveness of ABA telehealth evaluation and treatment for individuals diagnosed with ASD.
* Research and pilot telehealth programs indicate high parent satisfaction with service.
* Technological advances have resulted in more powerful and less expensive equipment.
* Basic forms of technology applicable to ASD related services:
  + Laptop computers
  + Internal/external web-cameras and microphones
  + Video conferencing software/applications
  + File sharing
  + Applications for mobile platforms (i.e., data collection methods)
  + High-Speed internet

**Research Outcomes**

**Clinical Efficacy:**

* Applied Behavior Analysis (ABA) is widely recognized as an evidence-based, effective treatment for ASD
* The viability and effectiveness of ABA telehealth service delivery options for ASD evaluation and treatment has been addressed in the research literature.
* Results from an analytic literature review of a variety of service delivery methods found that 7 of 8 studies reported successful implementation of tele(health) methods to deliver the intended ABA services (Boisvert et al., 2010), including:
* Training to Parents and Specialists
* Brief Functional Analysis/Functional Analysis
* Treatment of Severe Problem Behavior
* Functional Behavior Assessment
* Intervention Development
* Guided Implementation of Prevention and Intervention Strategies
* Treatment Recommendations and Implementation
* Evaluation and Data Collection
* Community-Based Early Intervention
* Functional Skills and Communication Training
* Early Intervention and Academic Skills Development
* Parent Implemented Approaches
* Increasing Spontaneous Words, Gestures, and Imitative Behaviors

**Parent Satisfaction:**

* Research indicates high parent satisfaction ratings, as it allows for availability of immediate interactive assistance when a problem arises.
* Parents are able to rely on regular access to professionals, providing direct observation, evaluation, and feedback in the natural environment regardless of weather or geographic location.
* Consistent and real-time access to trained professional fosters a strong collaborative relationship between the professional team and the family, resulting in positive cognitive, behavioral, and adaptive gains for participating children with ASD and positive effects on the entire family’s overall quality of life (www.celestefoundation.org/research.html, Feb 7, 2012).

**Technology:**

* In the studies included for the literature review and analysis, it was reported that despite technological obstacles, the researchers stated that the individuals involved in the case study still clearly benefited from the services provided via tele(health) (Boisvert et al., 2010).
* The majority of the studies reviewed used widely available technology to implement telehealth.
* Such technology included laptop computers, internal and external webcams and microphones, consumer-grade high-speed internet connection, and teleconferencing software. Several studies used more sophisticated and permanent telecommunications technologies.
* There are several ethical and legal issues to consider when delivering services via telehealth. The Health Insurance Portability and Accountability Act of 1996 (HIPAA) requires specific safeguards to ensure the privacy of patient information transmitted electronically (www.hhs.gov/ocr/privacy/hipaa/understanding/index.html, 8 Feb 2012).
* Privacy may be protected during telehealth practice procedures by utilizing a virtual private network (VPN). A VPN can provide various types of data protection including confidentiality, integrity, data origin authentication, replay protection and access control. The National Institute of Standards and Technology has a manual available from the HIPAA website that provides specific recommendations concerning VPN’s and Telehealth.

**Telehealth Applications**

Since 2007, Capitol Autism Services has participated in two pilot projects reviewing telehealth procedures as they related to providing ABA services to children diagnosed with ASD and their families. Below is a summary of the findings of each pilot project.

**2006 Telehealth Study – Celeste Foundation**

Celeste Foundation conducted a one-year pilot study utilizing telehealth services to provide live in-home support in their homes from remote locations. The service delivery included program development, interactive video, professional consultation and training. The project enrolled families from three states, with 12 children between the ages of two and five diagnosed with autism.

**Findings:**

* The study confirmed that telehealth systems are capable of providing access, clarity, specificity and interactivity by professionals to train, assist and support.
* Parent satisfaction indicated these technologies and remote interactions to be useful, effective and desirable enhancements to traditional service delivery.
* Results from parenting stress index indicate that having a telehealth system installed in the home may produce an ancillary effect of reduced family stress and contribute to an improvement in a family’s perception of their overall quality of life (e.g., diminish feelings of isolation, lack of understanding or support and increase feelings of confidence, optimism, and empowerment to help their child).

Further information regarding the Celeste Foundation study is available at www.celestefoundation.org/research.html.

**2007 Telehealth Follow-Up Pilot – Capitol Autism Services**

Capitol Autism Services had the opportunity to provide independent, follow-up consultation in a pilot project for five children involved in the initial one-year study, approximately eight months after its completion.

**Objectives:**

* To gain experience with telehealth model of delivering ABA consultation.
* Review the viability of the technological requirements.

**Outcomes:**

* Clinical Satisfaction (average on scale 0-5)
  + Parents: 4.9
  + Professionals: 4.7
* Technology Satisfaction (average on scale 0-5)
  + Parents: 4.8
  + Professionals: 4.6
* The pilot was challenged by cost of equipment and frequent connectivity issues.

**2010 Telehealth Pilot – Capitol Autism Services**

With advancements of technology, Capitol Autism Services ran a second pilot. The Parents of four children currently receiving in-home ABA services received one hour per week of telehealth services concurrently over the course of 10 weeks, targeting specific communication and self-help skills not addressed in face-to-face services at that time.

**Objectives:**

* To test the technology to determine the effectiveness and feasibility.
* To gain feedback from parents/families on telehealth service delivery.

**Outcomes:**

* + Parent Satisfaction (average on scale 0-5)
    - Clinical: 4; measured maintenance of skills learned in parent training, problem solving behaviors, addressing family priorities, receiving effective feedback.
    - Technology: 3.75; measured ease of use, efficiency in resolving technical difficulties, effectiveness of receiving services via video technology.
  + Parenting Stress Index
    - The Parenting Stress Index Short Form (PSI-SF) scores decreased by an average of 25 points from baseline, demonstrating a reduced stress level across participants after accessing the telehealth service.

**Technology:**

* + - HIPAA-compliant internet based platform utilized.
    - Consumer-grade computers, cameras and internet connection
    - Integrated features allowed for data-sharing and secure information exchange including: file transfers, video hosting, polling and testing, session recording.
    - Ability for simultaneous feeds during a session.
    - A simple end-user configuration before the sessions to ensure appropriate configuration of audio and video settings was sometimes required.
    - Professionals reported the technology was easy and convenient to use, however at times connectivity, freezing of picture and document sharing was challenging. They recommended continued troubleshooting in reduction of echoing, providing a larger screen, and mobile camera.

**Conclusions:**

* + - The 2010 pilot demonstrated that families could effectively learn teaching strategies and successfully implement them with their child across targeted self-care and communication skills with the support of the ABA professional via telehealth.
    - All participants made gains across targeted domains consistent with the rate of progress in their traditional in home services.
    - The service delivery option allowed parents the flexibility to record their implementation for review by both themselves and the ABA professional at a later time, which allowed for ease of procedural fidelity checks and additional learning opportunities.

**Summary**

The future for implementing telehealth programs as a method to supplement traditional service delivery for provision of parent training, feedback and recommendations, as well as to access to remote locations for individuals with ASD is encouraging.

If current technological development trends continue, advancement will continue to result in more powerful, less expensive and more compact equipment. Given the rates of ASD diagnosis, a shortage in specialists, and ongoing research regarding the capabilities of technology as a service delivery model for those with ASD, telehealth will likely become increasingly more efficient, effective, versatile, and potentially even more viable means to provide access to treatment for individuals with ASD (Boisvert et al., 2010)**.**