

August 22, 2012

Speech Therapist Directed use of Video Modeling for Patients with Autism Spectrum Disorder

Clinical Question

P	<i>(Population/Problem)</i>	Among pediatric patients with Autism Spectrum Disorder (ASD)
I	<i>(Intervention)</i>	does speech therapist directed use of video modeling*
C	<i>(Comparison)</i>	
O	<i>(Outcome)</i>	improve functional* and imaginative* play skills?

***Definitions** for terms marked with * may be found in the [Supporting Information section](#).

Target Population for the Recommendation *(Inclusion / Exclusion Criteria for the recommendation)*

Inclusion: Pediatric patients, ages 2-9 years, that have been diagnosed with ASD, including pervasive developmental disability-not otherwise specified (PDD-NOS).

Exclusion: Patients with developmental disabilities other than autism, patients unable to attend to audio/visual scenes for less than 1 minute.

Recommendation *(See [Dimensions for Judging the Strength of the Recommendation](#))*

It is recommended that speech-language pathologists working with children with autism spectrum disorder incorporate the use of video based modeling into treatment plans to target either functional or imaginative play* skills (Boudreau, 2010 [4b]; Paterson, 2007 [4b]; Hine, 2006 [4b]; Charlop-Christy, 2000 [4b]; Charlop, 2010 [4b]; Sancho, 2010 [4b]; Cardon, 2011[3b]; Ozen, 2012 [4b]; MacDonald, 2009 [4b]; MacDonald, 2005 [4b]; D’Ateno, 2003 [5a]; Kleeberger, 2010 [5a]; Gena, 2005 [4b]).

Note 1: Targeting Functional Play Skills includes materials such as a flower planting activity (digging hole, put soil in, put flower in, cover with soil), shape sorters, or stacking toys, blocks, beads, musical toys (Cardon, 2011 [3b]; Hine 2006 [4b]).

Note 2: Targeting Imaginative Play Skills includes materials such as play sets (airport, zoo, veterinary, construction), baking sets and shopping carts (Boudreau, 2010 [4b]; D’Ateno, 2003 [5a]; MacDonald, 2009 [4b]; Kleeberber, 2010 [5a]; Paterson, 2007 [4b]).

Discussion/Synthesis of Evidence Related to the Recommendation

A moderate grade of evidence was found to support the use of video modeling based interventions to target play skills and related scripted language skills in preschool and adolescent aged patients with the diagnosis of ASD. Following an extensive literature search, 14 articles met the inclusion criteria for critical appraisal. Study subjects all had the diagnosis of autism, ages ranged from 20 months-11 years of age.

All studies reported small sample sizes (n= 1-6) therefore results were measured via formal observation using task performance analysis methods. Children with autism vary across a wide clinical spectrum; therefore, well designed descriptive studies are generally the most feasible approach for researchers to examine how video modeling effects play. Minus the resources to attain a sufficiently large randomized sample, researchers are

relegated to studying children within their preexisting practice settings that meet defined inclusion criteria. To add to the current body of knowledge, researchers must study the intervention of video modeling as appropriate to each child's current treatment goals in correlation to play.

Despite statistical limitations, clinically significant results were reported specific to play skills: 10 studies demonstrated functional gains in imaginative play, three studies demonstrated gains in functional play skills, nine reported gains in the use of scripted verbalizations and three reported a decrease in unscripted verbalizations (Ayers, 2005 [5b]; Boudreau, 2010 [4b]; Cardon, 2011 [4b]; Charlop-Christy, 2000 [4b]; Charlop-Christy, 2010 [4b]; D'Ateno, 2003 [5a]; Hine, 2006 [4b]); MacDonald 2005 [4b]; MacDonlad, 2009 [4b]; Ozen, 2012 [4b]; Paterson, 2007 [4b]; Sancho, 2010 [4b]).

MacDonald (2005 [4b]) reported that the implementation of video modeling yielded extended imaginative play sequences of scripted play for 2 subjects. It was noted that video modeling was effective for increasing scripted play across 3 commercially available play sets. Results from Boudreau study (2010 [4b]), indicated that the introduction of video modeling led to rapid acquisition of modeled actions and scripted verbalizations for both participants in the study. Both individuals substantially increased their performance of modeled play behaviors during the video modeling phase, compared to baseline levels. These findings support research suggesting that video modeling promotes rapid acquisition of both motor actions and verbal responses in preschoolers with autism.

The Cardon study (2010 [4b]) reported that all participants using video modeling for functional play tasks (shape sorters, stacking toys, blocks, beads, musical toys) demonstrated increased gains in the frequency of actions imitated (50%) by their second session. Two of the three participants demonstrated higher than baseline levels of imitation across all treatment sessions.

Additionally, studies addressed scripted verbalizations and social play. However, there was not sufficient evidence to make a recommendation. All studies displayed an increase in the production rate of scripted utterances. Three studies reported a reduction in the amount of spontaneous/novel commenting (Sancho 2010 [4b]; D'Ateno, 2003 [5a]; Boudreau 2010 [4b]). Studies that targeted social play interaction (joint attention, novel commenting) with another child or adult reported gains in these skills (Ayers, 2005 [5b]; Charlop-Christy, 2000 [4b]); Charlop, 2010 [4b]; Ozen, 2012 [4b]; MacDonald, 2009 [4b]; Gena, 2005 [4b]).

Reference List (Evidence Level in []; See [Table of Evidence Levels](#))

Ayers, K., & Langone, J. (2005). Intervention and instruction with video for students with autism: a review of the literature. *Education and Training in Developmental Disabilities* 40(2), 183-196. [5b].

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- Charlop-Christy, M., Le, L., & Freeman, K. A. (2000). A comparison of video modeling with in vivo modeling for teaching children with autism. *Journal of Autism & Developmental Disorders, 30*(6), 537-537. [4b]
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- MacDonald, R., Clark, M., Garrigan, E., & Vangala, M. (2005). Using video modeling to teach pretend play to children with autism. *Behavioral Interventions, 20*(4), 225-238. [4b]
- Ozen, A., Batu, S., & Birkan, B. (2012). Teaching play skills to children with autism through video modeling; small group arrangement and observational learning. *Education and Training in Autism and Developmental Disabilities, 47*(1), 84. [4b]
- Paterson, C., & Arco, L. (2007). Using video modeling for generalizing toy play in children with autism. *Behavior Modification, 31*(5), 660. [4b]
- Sancho, K., Sidener, T., & Reeve, S. (2010). Two variations of video modeling interventions for teaching play skills to children with autism. *Education and Treatment of Children, 33*(3), 421. [4b]
- Schlosser, R. (2004). Goal attainment scaling as a clinical measurement technique in a communication disorders: a critical review. *Journal of Communication Disorders, 37*, 217. [5a].
- Toth, K., Munson, J., Meltzoff, A., & Dawson, G. (2006). Early predictors of communication development in young children with autism spectrum disorder: joint attention, imitation, and toy play. *Journal of Autism and Developmental Disabilities, 36*, 993. [4b]

IMPLEMENTATION

Applicability Issues

Video based modeling has been shown to be a cost- and time- efficient intervention method (Charlop-Christy, 2000 [4b]). Implementation of the recommendation requires video recording capabilities and target play materials. Informal videos created via personal computer applications may bypass the need to acquire formal video equipment. Optimally, the establishment of an organized and accessible video database would be beneficial.

The perspective in which the video is recorded is left to the discretion of the treating therapist. Video based methods are unique in that they provide clinicians the ability to structure learning environments that minimize background stimuli/distractions, while the focus of the target behavior is maximized. The types of scenes or videos that can be utilized with video modeling include: self/other*, point of view*, and scene*. Recording specific clips of target behaviors allows the individual with autism to focus on a restricted visual field highlighting relevant stimuli and desired outcomes, while decreasing, if not, removing irrelevant stimuli (Charlop-Christy, 2000 [4b]).

Relevant CCHMC Tools for Implementation

NONE

Outcome or Process Measures

At the present time, the use of video modeling to improve play skills does not have standard methods to measure outcomes. A goal attainment scale could be used to measure the percentage of progress towards a goal. The development and usage of a goal attainment scale involves the following steps: creation of a specific set of goals; designation of a weight for each goal based on priority; definition of a range of possible outcomes (worst expected outcome (-2), less than expected outcome (-1), expected outcome (0), more than expected outcome (+1), and best expected outcome (+2); establishment of the guidelines for scoring at each level; identification of current or initial performance; delivery of intervention for a specified period of time; analysis of performance attained on each objective; and evaluation of the degree of attainment (Schlosser, 2004 [5a]).

SUPPORTING INFORMATION

Background/Purpose of BES Development

Currently, there is variation among speech language pathologists in the use of video modeling for targeting play skills with children with autism spectrum disorder. An individual's ability to acquire spoken language is a solid predictor of long-term developmental outcomes related to joint attention, and play skills. Early acquisition of language and the development of meaningful speech by 5-6 years of age has been linked to future academic achievement and social competence (Howlin, 2000 [4a]). The project was initiated to improve consistency of care, to improve the flow of patients through outpatient rehabilitation, to improve patient satisfaction and to potentially decrease expense and increase revenue for the hospital.

Children typically learn how to socially interact with others through play: the first phase being through independent or functional play (Toth, 2006 [4b]). However, children with autism typically show deficits in independent or functional toy play. This can be manifested in ritualistic and repetitive patterns of behavior, such as lining up toys by shape or color or showing excessive interest to particular toys and not relating to others. Such deficits may hinder the development of interactive play with other children and can consequently contribute to social isolation (Paterson 2007 [4b]). Therefore the building block of functional play must be established prior to targeting later developing play skills such as imaginative and or social play.

Imaginative play is noted, when an individual is able to accept the use of objects in novel manners and incorporate verbalizations to enhance play, (Toth, 2006, [4b]). For example, when interacting with a pretend play doll set, a child uses a doll to replicate daily scenarios with corresponding language. Early symbolism is noted in the child's ability to pretend the doll is talking and completing tasks (Toth, 2006, [4b]). This play is different from functional play, because dolls or objects are now playmates that can take on voices and complete novel actions; and it does not have a defined beginning and end to the play scheme (Toth, 2006 [4b]).

Video modeling interventions have been found to be effective in assisting individuals with autism to acquire new skills. When incorporating video modeling into intervention, a short video clip demonstrating the completion of an activity is played for an individual. The video is able to be replayed as often as needed, because it is recorded. It establishes consistency of the presentation with each viewing. Video modeling targets four core learning components: attention, retention, production, and motivation (Cardon, 2011 [3b]). In addition to the consistency of viewings, the efficiency of video based modeling may contribute to the specific use of observational learning*. Video-based methods are unique, in that they provide clinicians the ability to structure learning environments which minimize background stimuli/distractions, while the focus of the target behavior is maximized. As defined, the types of scenes or videos that can be utilized with video modeling include, self/other*, point of view*, and scene*. Recording specific clips of target behaviors allows the individual with autism to focus on a restricted visual field highlighting relevant stimuli and desired outcomes, while decreasing, if not removing, irrelevant stimuli (Charlop-Christy 2000 [4b]).

Definitions

Functional Play: using objects appropriately; using an object for its intended function. (e.g., shape sorters, puzzles, stringing beads) (Toth 2006, [4b]).

Imaginative Play: entails play in which a child substitutes one object for another; and pretends with objects. One item/object is utilized to represent another (e.g., using a spoon as a phone/drumstick/hairbrush). Play scenarios as well as verbal scripts are used (Toth 2006, [4b]).

Other Model Perspective: either a peer or a teacher act as a model to perform desired behaviors (Hine 2006, [4b]).

Point of View Perspective: the camera angle is in line with the participant's eye level and footage is recorded showing only what the participant may see. The entire person who is modeling the behavior is not shown. Point of view perspective may illustrate only hands manipulating objects while completing a task (Hine 2006, [4b]).

Self-Model Perspective: the child serves as own model for desired behavior (Hine 2006, [4b])

Self-play: engaging in play by one's self (could be either functional or imaginative play) (Toth 2006, [4b])

Scene Perspective: also referred to, in general, as video modeling. This vantage point depicts a model (peer or adult) within an activity context completing and activity/task. The entire person, as well as parts of the room, is visible (Hine 2006, [4b]).

Social play: play in which peers are involved. This type of play requires the ability to express emotions/feelings through play. Play may include socio-dramatic play, such as acting out plays/skits, or cooperative play, such as red rover or Simon Says (Toth 2006, [4b]).

Video Modeling: a procedure in which an individual watches a videotaped demonstration of a desired behavior and is then provided an opportunity to imitate the actions (Boudreau 2010, [4b])

Search Strategy

Databases: CINAHL, Medline, Cochrane Library, ASHA, PsychInfo, ERIC, Google Scholar

Search Terms: Video modeling, Video Modeling AND autism, Video modeling AND autism AND play

Limits, Filters, Search Dates: English language, Search Dates: 1995-2012

Date Search Done: 5.8.2012

Relevant CCHMC Evidence-Based Documents

CCHMC Policy number MCP-G-115: Recording devices/cell phones/cameras

CCHMC Policy number MCP-F-121: Video and DVD Viewing at CCHMC

CCHMC Policy number MCP-G-114: Photographs, Films, and/or Vocal Recordings of Patients

SG Form No. 100216: Authorization for Use and/or Disclosure of Limited Protected Health Information

Group/Team Members

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Conflicts of Interest were declared for each team member:

- No financial conflicts of interest were found.
- No external funding was received for development of this BEST.
- The following financial conflicts of interest were disclosed:

Note: Full tables of the [LEGEND evidence evaluation system](#) are available in separate documents:

- [Table of Evidence Levels of Individual Studies by Domain, Study Design, & Quality](#) (abbreviated table below)
- [Grading a Body of Evidence to Answer a Clinical Question](#)
- [Judging the Strength of a Recommendation](#) (dimensions table below)

Table of Evidence Levels (see note above):

Quality level	Definition
1a [†] or 1b [†]	Systematic review, meta-analysis, or meta-synthesis of multiple studies
2a or 2b	Best study design for domain
3a or 3b	Fair study design for domain
4b or 4b	Weak study design for domain
5a or 5b	General review, expert opinion, case report, consensus report, or guideline
5	Local Consensus

†a = good quality study; b = lesser quality study

Table of Language and Definitions for Recommendation Strength (see note above):

Language for Strength	Definition
It is strongly recommended that... It is strongly recommended that... not...	When the dimensions for judging the strength of the evidence are applied, there is high support that benefits clearly outweigh risks and burdens. (or <i>visa-versa</i> for negative recommendations)
It is recommended that... It is recommended that... not...	When the dimensions for judging the strength of the evidence are applied, there is moderate support that benefits are closely balanced with risks and burdens.
There is insufficient evidence and a lack of consensus to make a recommendation...	
<i>Given the dimensions below and that more answers to the left of the scales indicate support for a stronger recommendation, the recommendation statement above reflects the strength of the recommendation as judged by the development group. (Note that for negative recommendations, the left/right logic may be reversed for one or more dimensions.)</i>	
Rationale for judgment and selection of each dimension:	
1. Grade of the Body of Evidence	<input type="checkbox"/> High <input checked="" type="checkbox"/> Moderate <input type="checkbox"/> Low
<i>Rationale: Based on the CCHMC legend for grading a body of evidence, included studies fulfill criteria for a moderate degree of evidence (5+ studies with 4a or 4b).</i>	
2. Safety/Harm (Side Effects and Risks)	<input checked="" type="checkbox"/> Minimal <input type="checkbox"/> Moderate <input type="checkbox"/> Serious
<i>Rationale: No known harmful side effects or risks associated with video modeling</i>	
3. Health benefit to patient	<input checked="" type="checkbox"/> Significant <input type="checkbox"/> Moderate <input type="checkbox"/> Minimal
<i>Rationale: Play as the foundation for speech, language, and learning has been correlated to verbal language ability and peer interactions later in life (Paterson 2007 [4b]).</i>	
4. Burden on patient to adhere to recommendation	<input checked="" type="checkbox"/> Low <input type="checkbox"/> Unable to determine <input type="checkbox"/> High
<i>Rationale: Low burden of adherence in clinical use. Moderate burden to adhere at home due to cost of equipment, if families do not already possess video equipment.</i>	
5. Cost-effectiveness to healthcare system	<input checked="" type="checkbox"/> Cost-effective <input type="checkbox"/> Inconclusive <input type="checkbox"/> Not cost-effective
<i>Rationale: Videos can be used with a multitude of patients and can be reused.</i>	
6. Directness of the evidence for this target population	<input type="checkbox"/> Directly relates <input checked="" type="checkbox"/> Some concern of directness <input type="checkbox"/> Indirectly relates
<i>Rationale: The identified purposes of the reviewed studies were to investigate the effectiveness of using video modeling with children with autism spectrum disorder.</i>	
7. Impact on morbidity/mortality or quality of life	<input checked="" type="checkbox"/> High <input type="checkbox"/> Medium <input type="checkbox"/> Low
<i>Rationale: Targeting skills that facilitate play, communication and socialization can positively impact quality of life.</i>	

Copies of this Best Evidence Statement (BEST) and related tools (if applicable, e.g., screening tools, algorithms, etc.) are available online and may be distributed by any organization for the global purpose of improving child health outcomes.

Website address: <http://www.cincinnatichildrens.org/service/i/anderson-center/evidence-based-care/bests/>

Examples of approved uses of the BEST include the following:

- Copies may be provided to anyone involved in the organization's process for developing and implementing evidence based care;
- Hyperlinks to the CCHMC website may be placed on the organization's website;
- The BEST may be adopted or adapted for use within the organization, provided that CCHMC receives appropriate attribution on all written or electronic documents; and
- Copies may be provided to patients and the clinicians who manage their care.

Notification of CCHMC at EBDMinfo@cchmc.org for any BEST adopted, adapted, implemented, or hyperlinked by the organization is appreciated.

Please cite as: Cincinnati Children's Hospital Medical Center: Best Evidence Statement Speech Therapist Directed use of Video Modeling for Patients with Autism Spectrum Disorder, <http://www.cincinnatichildrens.org/svc/alpha/h/health-policy/best.htm>, BEST 138, pages 1-9, August 22, 2012.

This Best Evidence Statement has been reviewed against quality criteria by two independent reviewers from the CCHMC Evidence Collaboration. Conflict of interest declaration forms are filed with the CCHMC EBDM group.

Once the BEST has been in place for five years, the development team reconvenes to explore the continued validity of the guideline. This phase can be initiated at any point that evidence indicates a critical change is needed. CCHMC EBDM staff perform a quarterly search for new evidence in an horizon scanning process. If new evidence arises related to this BEST, authors are contacted to evaluate and revise, if necessary.

For more information about CCHMC Best Evidence Statements and the development process, contact the Evidence Collaboration at EBDMinfo@cchmc.org.

Note

This Best Evidence Statement addresses only key points of care for the target population; it is not intended to be a comprehensive practice guideline. These recommendations result from review of literature and practices current at the time of their formulation. This Best Evidence Statement does not preclude using care modalities proven efficacious in studies published subsequent to the current revision of this document. This document is not intended to impose standards of care preventing selective variances from the recommendations to meet the specific and unique requirements of individual patients. Adherence to this Statement is voluntary. The clinician in light of the individual circumstances presented by the patient must make the ultimate judgment regarding the priority of any specific procedure.