CHAPTER 4

Interventions

Someone you love has been diagnosed with autism – what treatments are available for autism? What can you do to help them to reach their full potential? Cope in the world?

Autism has no common cause and no known cure. Be wary if someone claims to be able to "cure" autism, especially if the only information available is from the person promoting the "cure". This chapter will describe a variety of treatment options for autism, guidelines for choosing treatments, things to consider when choosing treatments, and how to determine if a treatment really helped.

Because there is no common cause, because autism is a spectrum disorder – that is, symptoms range from mild to severe – and because each individual with autism is "uniquely autistic", there is no "one-size-fits-all" treatment. This puts the burden of determining what treatments will work best for a particular individual directly on the family and the professionals working with the family. Treatments and therapies can vary widely in cost and focus.

Research on Autism Interventions

Individuals with autism spectrum disorders require individually designed interventions that meet their needs. In fact, no one intervention has been universally identified as being effective for all children with ASD. It is important, however, that parents and school professionals working together as a team select empirically valid techniques (National Research Council, 2001; Olley, 1999).

Carefully research and review the information available on the intervention you are considering. Many books and research journals can aid you in your search. As you read about various autism therapies, keep in mind the research that has been conducted on whatever therapy you intend to implement.

To say that a methodology is grounded in scientifically based research means there is reliable, independent evidence that a given program or practice works. To obtain reliable evidence about a reading strategy or instructional practice, for example, an experimental study may be done that involves using an experimental group that uses the intervention and a control group that does not to see if the method is effective in teaching children to read. Ultimately, family members and professionals together must determine whether a particular strategy or method is effective, or if a scientifically based method is suitable for an individual student.

Research is derived from theory and practice. While not all methodologies are currently founded in empirically based research (studies that follow specific scientific rules), many are backed by anecdotal reports (observations of individual cases by parents, caregivers, and professionals) of effectiveness. Care must be taken to evaluate each methodology on its merits and appropriateness for the particular needs of the individual with ASD.

Choosing Interventions

Choosing appropriate intervention(s) for your child can be confusing; the amount of information available in print and on the Internet is overwhelming. The following are some important questions to help parents and caregivers make decisions regarding the best interventions for their child.

Questions for Parents/Caregivers to Ask Regarding Specific Treatments and/or Programs

- What characteristic behaviors of ASD am I trying to target?
- Does the program/therapy and anticipated outcomes address these targeted concerns?
- Does the method meet the unique strengths/challenges/goals for my child?
- Are there any harmful side effects associated with this treatment? What are the potential risks? Is there any risk of discontinuing the intervention?
- Are there any activities, foods, and so on, that will be restricted during treatment?
- What positive effects of treatment would I hope to see?
- What are the short-term and long-term effects?
- Can the treatment be integrated into my child's current program?
- How will the goals/outcomes be evaluated? How will I know if the child is making progress toward desired outcomes? What method will be used to evaluate the child's progress?
- What is the cost of treatment? Will my insurance company pay for the treatment?
- How much time does the treatment take? Can I realistically devote the time required to the treatment?

- Has this treatment been validated scientifically? Have I collected information about this from a variety of sources?
- Was I able to interview other parents and professionals about the treatment? If so, list pros, cons, and other areas of interest.
- Do proponents of the treatment claim that this procedure can help nearly everyone? If so, this should be seen as a "red flag" to slow down and be more careful in consideration of this technique, considering the wide range of abilities represented on the autism spectrum.
- What do my pediatrician and other professionals involved with my child think about the treatment's appropriateness?
- Are there alternatives that are: less restrictive? better researched?

Determining Effectiveness

Stephen M. Edelson, Ph.D., Center for the Study of Autism, Salem, OR (2007), offers these important tips for parents and caregivers to help determine if a particular treatment is effective:

- **Implement one treatment at a time.** Change one thing at a time, allowing plenty of time to see the effects of a treatment. (Edelson suggests at least two months)
- **Keep your own data.** Keep a daily record prior to the intervention as well as during the intervention. Your personal record can help you determine if any changes are taking place.
- **Seek objective information.** Consider, if possible, not telling other adults your child may come in contact with about the new treatment to prevent biased feedback.
- **Collect data from those involved in treatment implementation.** Ask teachers or clinicians to keep written data. After a period of time, compare others' data with your own.
- **Note unexpected or unanticipated changes.** Make note of surprising or unexpected changes your child may exhibit.
- **Educate yourself about the treatment.** Be sure you learn as much about the treatment as possible before beginning. Look for both positive and negative information. Be aware of possible side effects.

As mentioned, no one treatment will have the same impact on all individuals with ASD. For this reason, it is important to make informed choices and use written data to monitor effectiveness.

Interventions

The following are common therapies, program models, biomedical interventions, and strategies used with individuals with ASD. The section begins with the core deficit areas of autism and corresponding interventions, some of which are available to children in the school setting. It does not include research studies for effectiveness of treatment; rather, the selections are for informative purposes only.

Communication

Communication difficulties, both verbal and nonverbal, are inherent in the diagnosis of ASD. The typical sequence of communication development is disrupted. As a result, communication skills can range from nonverbal, gestural, the use of single words, to verbal conversation, and may include:

- Perseveration (repetitive verbal and physical behaviors)
- Echolalia (immediate and/or delayed "echoing" of words, music, phrases or sentences)
- Hyperlexia (precocious knowledge of letters/words or a highly developed ability to recognize words but without full comprehension)
- Dactolalia (repetition of signs), pronoun reversals, inappropriate responses to yes/no questions, and difficulty responding to "wh" questions

When designing intervention strategies, it is important to understand both the individual's receptive (comprehension) and expressive communication skills. Stressful situations that increase anxiety often interfere with the ability to communicate. Difficulty understanding humor, idioms ("keep your eye on the paper"), sarcasm, and other complex forms of verbal and written expression is common. Even the highly verbal individual may understand and use literal (concrete) language, but have difficulty with abstract concepts needed for higher order thinking skills.

A person's communication ability usually changes over time. Therefore, it is important to maintain an ongoing communication assessment from diagnosis through adulthood as this provides current information, which is necessary to support appropriate communication strategies.

Supporting all forms of communication – verbal, signing, pictorial, augmentative devices (and often a combination of more than one) – promotes learning.

Therapies

Speech-Language Therapy

During therapy, the child's functional communication skills, or the child's *intent*, such as requesting and protesting, are assessed, and programs are developed to address communication deficits and improve communication skills. Therapy may occur in individual settings or in small groups. Families will always be involved in the therapy process in order to facilitate functional communication across various situations. Parent and caregiver training is a large component of speech-language therapy to maximize its benefits.

Be sure to choose a speech-language pathologist (SLP) who holds a Certificate of Clinical Competence from the American Speech-Language-Hearing Association (ASHA). The SLP is a skilled professional who can address the following areas of concern:

Receptive language – the understanding of spoken or written messages as well as other forms of language. This includes identifying objects, actions, adjectives, prepositions, people, and so on.

Expressive language – the production of language. This includes sentence structure, verb tenses, regular/irregular plurals, length of utterance, and so on.

Articulation/phonology – includes developing speech sound production, the use of tongue, lips, teeth, and so on, to produce speech sounds.

Oral-motor skills – includes improving the range, rate, complexity, strength, and coordination of oral motor movements. May also include massage of cheeks, lips, and gums, brushing teeth, and decreasing teeth grinding.

Feeding and swallowing – includes ability to close lips, manipulate food with tongue, age-appropriate chewing pattern, and safe swallowing. Other areas that can be addressed include oral desensitization to different tastes, textures, smells, temperatures, and consistencies of foods.

Social skills/play skills – includes appropriate social language, ability to read facial expressions, ability to understand social cues/body language, and age-appropriate play skills such as sharing, turn taking, and playing independently or with others.

Pragmatics – the use of language in social context.

Cognition – the mental process of knowing, including aspects such as awareness, perception, reasoning, and judgment. (Source: dictionary.com)

Alternative or augmentative communication (AAC) – the use of any device, technique, symbol system, or combination thereof to supplement, enhance, or increase a person's communication abilities.

Common Communication Options

Sign language – use of signs alone or paired with speech.

Picture Exchange Communication System (PECS) – involves using picture symbols to communicate wants/needs, label, and so on. The child goes through a learning process that teaches initiation of communication and then expands to the use of sentences. Many children who use PECS develop some verbal skills and may graduate to speech as the primary form of communication.

Communication boards – can be made with pictures or objects that the child points to or removes from the board to communicate wants/needs.

Other communication devices – a wide range of devices designed to enable the user to create longer messages. These devices can also act as a universal remote, allowing the user to operate electronic devices in the environment such as the TV, lights, and so on. The speech-language therapist can assess the child's abilities to use high-tech devices and make recommendations about the type of device that is best suited for the child's individual needs.

Facilitation – involves holding the child's hand or having the child hold the facilitator's hand to help her write or keyboard messages.

Total communication – communication system that pairs simultaneous production of speech with manual signs or another augmentative devices or symbol systems. The child is encouraged to use the words/phrases that he is capable of producing and supplementing communication with signs, symbols, and so on, for what he cannot communicate verbally.

Resources

American Speech-Language-Hearing Association: www.asha.org

Ohio Speech Language Hearing Association: www.ohioslha.org

Physical Therapy

Physical therapists (PT) are specialists in sensorimotor development, muscle and joint function, posture, balance and coordination, and gait and functional mobility. They are knowledgeable about orthotic and prosthetic devices, and assistive technology. Physical therapists identify movement problems and determine what is interfering with a child's ability to develop age-appropriate gross-motor skills.

Physical therapists help young children with autism learn to walk, run, jump, ride a tricycle, and catch a ball. They assist preschoolers and school-aged children in becoming safe in their environments, walking up and down stairs, and climbing, and help children acquire the gross-motor skills necessary to play on the playground or participate in physical education classes with their peers.

Physical therapy may work closely with occupational therapy, sensory integration and/or speech therapy to help maximize the effects of each therapy.

Resources

American Physical Therapy Association: www.apta.org

Ohio Physical Therapy Association: www.ohiopt.org

Occupational Therapy

Occupational therapy (OT) is concerned with an individual's ability to participate in desired daily life tasks, or "occupations," that give life meaning. If a person's ability to perform life tasks is impacted by an illness, disease, and/or disability, occupational therapy can be important.

Performance areas include:

- activities of daily living (grooming, oral hygiene, toilet hygiene, dressing – as related to school performance), feeding and eating, socialization, functional communication, and functional mobility;
- work and productive activities (educational and vocational activities) and home management such as meal preparation, shopping, or clothing care; and
- play or leisure activities (play or leisure exploration and play or leisure performance).

Following an evaluation of the child's functioning, OT intervention is targeted towards those areas that are interfering with the child's ability to function. Tasks that may be targeted include writing, improving hand-eye coordination, buttoning a shirt, tying one's shoes, getting dressed, and feeding oneself. OT intervention with persons with autism often includes a sensory-integrative approach, which focuses on providing controlled sensory input during specific activities (see next section on Sensory Integration).

School-based occupational therapy is focused on educationally relevant goals and tied to curriculum standards. In order for school-based therapy to be effective, a consultative approach is necessary. Therapy may encompass the more traditional "pull-out"/ direct service approach, working with the student within the classroom, consulting with the parent, student and educational team to ensure that interventions and accommodations (in the home as well as in the classroom) are effective.

Areas addressed by occupational therapy may include the following:

Fine-motor control/written output – The OT may implement a fine-motor strengthening and coordination program, and/or recommend adaptations (i.e., use of pencil grips, specially lined paper, use of keyboard, extended time, shortened work load, use of note-taker or adapted software programs).

Visual-motor and visual-perceptual skills — Occupational therapists may also address the student's ability to control eye movements to smoothly shift visual focus, track objects across midline, and perform the visual motor control needed to read text as well as write. Accommodations may include slant boards, copy of all work on chalkboard available at desk, paper window guided, and colored transparencies.

Postural stability and control — Occupational therapists may address difficulties students may have in maintaining efficient seating postures. Recommendations may include dynamic seating using a partially inflated beach ball or camping pillow, or a Move n' Sit Cushion.

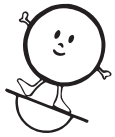
Sensory Processing

A. Jean Ayres, Ph.D., an occupational therapist, first researched and described the theories and frame of reference that we now call sensory integration. Briefly, sensory integration is a process used by the brain to locate, sort, and make sense out of incoming sensory information. This process is important to successfully accomplish
life tasks.

Ayres described sensory integrative dysfunction as a sort of "traffic jam" in the brain. Some bits of sensory information get "tied up in traffic" and certain parts of the brain do not get the sensory information they need to do their jobs. Children who have ASD may experience this.

For example, a child may scream when wearing certain clothing because her sensory system is hypersensitive to the sense of touch. This same child may crave bear hugs (deep touch) because her proprioceptive system is hyposensitive. (See Proprioception below.) These hypersensitive and hyposensitive sensations impact the child's independent functioning in many facets of life, including peer interaction, attention at school, and activities of daily living at home.

Proprioception (sensation from joints, muscles and tissues that lead to body awareness), obtained by lifting, pushing and pulling heavy objects as well as engaging in activities that compress (push together) or distract (pull apart) the joints. It is the sense that allows a person to guide his arm or leg movements without having to observe the movement to make sure it is happening.



Vestibular (the sense of movement, centered in the inner ear), obtained by spinning and swinging and, to a lesser extent, any type of body movement or change in head position. It coordinates the movement of one's eyes, head, and body and tells the body where it is in space. The vestibular sense is central in maintaining muscle tone, coordinating two sides of the body, and holding the head upright against gravity.

Tactile (sense of touch) obtained by providing a variety of input from textures, temperature, and pressure.

Auditory (what we hear and closely connected with the vestibular sense), obtained by listening to various types of music or natural sounds. Some auditory input can have an organizing and calming effect. Music containing 60 beats per minute can be particularly organizing, whereas irregular beats and contrasts in volume may be energizing.

Visual (what we see), can be used to calm or alert the system. Care must be taken that the child's environment is not too visually stimulating or distracting.

Olfactory (smell) input can stimulate, calm, or send a child into sensory overload.

Taste, obtained by the use of sweet, salty, crunchy, or chewy foods, can help calm, alert, or organize the system.

*Sensory Gang used with permission from the Autism Asperger Publishing Company; http://www.aapcpublishing.net

Sensory Diet

Once the child's sensory processing abilities and needs have been evaluated, the therapist may work with the educational team as well as the family to develop a *sensory diet*, a term coined by Patricia Wilbarger, OT. The sensory diet is a carefully designed personalized activity schedule that provides the sensory input a person's nervous system needs to stay focused and organized throughout the day. Because sensory needs vary from individual to individual and from day to day, careful monitoring and collaboration is crucial.
Components of a sensory diet might include brushing, swinging, heavy work (lifting, carrying), swimming, wearing weighted vests, wrist or ankle weights, wearing earphones, tactile play, trampoline jumping, chewing hard or crunchy objects, among many others.

Occupational therapists may also elect to use a system of tactile and proprioceptive input called the Wilbarger Protocol. This is a system using a soft bristle brush to provide carefully controlled sensory input, always followed by a deep pressure/joint compression system. While this protocol has been anecdotally reported to be effective in regulating sensory processing for some individuals, if done incorrectly, it can have harmful or dangerous results. Therefore, this procedure should only be used by trained personnel, and under the supervision of a trained occupational therapist.

Resources

Books

Cohn, E. S. (2001). Parent perspectives of occupational therapy using a sensory integration approach. American Journal of Occupational Therapy, 55, 285-294.

Kranowitz, C. S. (1998). The out-of-sync child. New York: Perigee Book.

Linderman, T. M., & Stewart, K. B. (1999). Sensory integrative-based occupational therapy and functional outcomes in young children with pervasive developmental disorders: A single subject study. American Journal of Occupational Therapy, 53, 207-213.

Myles, B. S., Cook, K. T., Miller, N. E., Rinner, L., Robbins, L. A. (2000). Asperger Syndrome and sensory issues: Practical solutions for making sense of the world. Shawnee Mission, KS: Autism Asperger Publishing Company.

VandenBerg, N. L. (2001). The use of a weighted vest to increase on-task behavior in children with attention difficulties. American Journal of Occupational Therapy, 55, 621-628.

Websites

A more extensive version of this explanation of OT services is available at these websites:

Action Based Learning: http://abllab.com

The American Occupational Therapy Association: http://www.aota.org

Brain Gym: www.braingym.com

The Kid Foundation: http://www.spdfoundation.net

Jenny's Kids Inc.: http://spdconnection.com

Occupational Therapy and Autistic Children: http://autism.ca/occther.htm

Occupational Therapy Innovations: http://www.ot-innovations.com/component/option,com_weblinks/catid,16/Itemid,34/

The Ohio Occupational Therapy Association: www.oota.org

OT Exchange: www.OTExchange.com/

SI Focus magazine: www.SIFocus.com

Vision Therapy

Some children with ASD experience difficulties related to visual-perceptual problems, or the means by which a person becomes aware of his body's relationship to external space, or the relationship in space between one object and another (Kranowitz, 1998). Vision therapy is a process of retraining the visual-perceptual system so it functions with optimal efficiency. The process follows a sequence of steps aimed at improving the visual system. Therefore, it is a procedure with therapy activities prescribed by the vision therapist which are carried out in the office, and frequently reinforced with home activities.

Resources

Kranowitz, C. S. (1998). The out-of-sync child: Recognizing and coping with sensory integration dysfunction. New York: Perigree.

Optometrists Network: www.visiontherapy.org

Recreational Therapies

Recreational therapy is a general term used to describe the practice of using leisure activities as therapeutic interventions. Such therapies provide opportunities for supporting and enhancing communication and social and motor activities, and may include, but are not limited to, the following.

Aquatic Therapy

Aquatic therapy is the use of water and specifically designed activities to help restore, maintain, and increase function. Aquatic/swimming therapy focuses on therapeutic play activities that improve range of motion and increase balance, endurance, and body awareness. Swimming provides movement that can help enhance motor planning. Water pressure can be soothing and calming for individuals with ASD.

Resources

Aquatic Resources Network: www.aquaticnet.com

Aquatic Therapy and Rehabilitation Institute: www.atri.org

Art Therapy

Art therapy is an established profession that uses the creative process of art to improve and enhance the physical, mental, and emotional well-being of individuals of all ages. It can increase fine-motor, visual motor, visual perception skills, organization, planning, and artistic expression.

Resources

American Art Therapy Association, Inc.: www.americanarttherapyassociation.org

Art Therapy Credentials Board: www.atcb.org

Music Therapy

Music therapy is the prescribed use of music and musical interventions to work towards specific therapeutic goals and objectives. Goal areas include communication, academic, motor, emotional, and social skills. Music therapy can also have a positive effect on self-esteem and reduce anxiety while developing appropriate expression of emotions.

Music is a nonverbal form of communication. It is a natural reinforcer – it is immediate in time and provides motivation for practicing nonmusical skills. Parallel music activities are designed to support the objectives of the child as observed by the therapist or as indicated by a parent, teacher, or other professional. A music therapist might observe the child's need to socially interact with others. Musical games like passing a ball back and forth to music or playing sticks and cymbals with another person might be used to foster such interaction. Eye contact might be encouraged with imitating clapping games near the eyes. Preferred music may be used contingently for a wide variety of cooperative social behaviors like staying in a chair or remaining with a group of children in a circle.

Resources

American Music Therapy Association, Inc.: http://www.musictherapy.org

Autism Research Institute (ARI): http://www.autism.com/families/therapy/music.htm

Therapeutic Horseback Riding

Hippotherapy, or therapeutic horseback riding, uses horses as a source of treatment to improve balance, posture, and mobility. It can also improve the cognitive, behavioral, and communication functions of individuals of all ages. Riding enables an individual to participate in an enjoyable activity while increasing attention span, independence, and self-esteem. While learning from the horse, riders often bond with the horse as well as the other riders, thus providing a good foundation on which to build relationships with others.

Resources

American Hippotherapy Association: http://www.americanhippotherapyassociation.com/

PATH International: http://www.pathintl.org/path-intl-centers/find-center

Other possibilities for recreational therapies include tumbling/dance, camping, 4H, animal therapy, peer play groups, community sports activities, swimming/aquatics, yoga, martial arts, and tae kwon do.

When deciding on recreational therapies, the child's needs and interests must be considered.

Program Models

Applied Behavior Analysis

Applied behavior analysis (ABA) is the scientific study of the principles of human behavior. The Florida Department of Children and Families defines ABA as:

> *The design, implementation, and evaluation of systematic environmental modifications for the purpose of producing socially significant improvements in and understanding of human behavior based on the principles of behavior identified through the experimental analysis of behavior. (*www.abatherapy.net*)*

ABA includes finding out the connection between an individual's behavior and his/her environment. In other words, what is causing the behavior? ABA uses direct observation and measurement of behavior and environment. Measurement looks at how often, what time, how long, to whom, or how intense a behavior occurs. ABA also looks at what happens in or to the environment right before a behavior occurs, otherwise known as the *antecedent behavior*. Antecedent behavior includes verbal, gestural or physical prompts, cues, materials, language, and environmental factors (sensory input: noise, light, smell, taste, touch), either naturally occurring or intentionally manipulated to affect a behavior. The consequence of the behavior is what occurs after the behavior. *Consequences* include reinforcement, both positive and negative, and punishment. *Reinforcement* increases the likelihood of the behavior occurring again. Punishment procedures increase the likelihood of the behavior diminishing or disappearing (known as *extinction*).
The sequence of ABA is sometimes referred to as ABC: antecedent, behavior, consequence.

A substantial amount of research has shown that ABA can be effective for children with ASD.

Resources

Association for Behavior Analysis International: www.abainternational.org

Clinical Behavior Analysts: www.abatherapy.net

Cooper, J., Heron, T. E., & Heward, W. L. (2006). Applied behavior analysis (2nd ed.). New York: Macmillan.

Discrete Trial Training

ABA is not synonymous with discrete trial training (DTT), although many erroneously use the terms interchangeably. DTT is an ABA strategy. DTT is a distinct and complete behavioral event that includes a discriminative stimulus or the antecedent (what happens before the behavior), the response or behavior (what the child is required to do), and the consequence for the behavior (reinforcement). The term "Lovaas Therapy" comes from Dr. O. Ivar Lovaas, whose landmark research led to the application of DTT techniques to teach children with autism.

Resources

Association for Behavior Analysis International: www.abainternational.org

Harris, S. L., & Weiss, M. J. (1998). Right from the start: Behavioral intervention for young children with autism: A guide for parents and professionals. Bethesda, MD: Woodbine House.

The Lovaas Institute for Early Intervention: www.lovaas.com

Wisconsin Early Autism Project: www.wiautism.com

Verbal Behavior (VB) Intervention

Also called *applied verbal behavior*, this is a type of ABA that is based on B. F. Skinner's 1957 analysis of verbal behavior. Like the Lovaas model, VB emphasizes the importance of using very structured and organized learning environments, including readily accessible reinforcers delivered after a correct response. The model teaches both speaker and listener behavior. The VB format uses discrete trial instruction as well as natural environment training (NET), a practice that differentiates itself from the Lovaas model. The NET supports the generalization of responses in different settings and different stimulus conditions.

The VB model focuses on teaching the functions of language. This includes teaching children the many uses of language such as requesting, labeling, speech imitation, describing, categorizing, reading and commenting (Skinner used the words *mand, tact, echoic,* and *intraverbal* to describe these functions). VB begins with teaching "mands", which are commands, demands, requests; then "what do you want?" to elicit language; moving on to echoic, receptive, "tacting" (labeling objects); then receptive language by function ("what does it do?"), feature ("what does it look like or what are characteristics?"), and class (category); and finally "intraverbals", both simple and complicated, which are word "associations."

Partington and Sundberg (2005) developed the Assessment of Basic Language and Learning Skills – Revised (ABLLS-R). The ABLLS-R is an assessment, curriculum guide, and skills tracking system for children with autism or other developmental disorders based on Sundberg's and Partington's (1998) book, *Teaching Language to Children with Autism and Other Developmental Delays*. The ABLLS assesses a child's skills and deficits to establish a baseline for programming. The curriculum guide uses task analysis to teach the skills needed for speaking and listening. It also includes scoring instructions and a skills tracking system.

Resources

B. F. Skinner Foundation: www.bfskinner.org

Dr. Vincent J. Carbone: www.drcarbone.net

Partington, J. W., & Sundberg, M. L. (1998). *Teaching Language to Children with Autism and Other Developmental Delays.* Pleasant Hill, CA: Behavior Analysts, Inc.

Partington, J. W., & Sundberg, M. L. (2005). *The Assessment of Basic Language and Learning Skills* – Revised (ABLLS-R). Pleasant Hill, CA: Behavior Analysts, Inc.

Pivotal Response Training (PRT)

PRT is a comprehensive service delivery model that uses both a developmental approach and applied behavior analysis (ABA) procedures. PRT aims to provide opportunities for learning within the context of the child's natural environments (Koegel & Koegel, 2005).

> PRT was designed based on a series of studies identifying important treatment components. It includes clear and appropriate prompts, child choice, turn taking, maintenance tasks, reinforcing attempts, responding to multiple cues, and a direct response-reinforcer relationship. PRT does not define the specific types of prompts to use: however, implementation of the procedure usually involves the same prompting strategies as those used in milieu teaching and interrupted behavior chains. In contrast to the other procedures that have focused almost exclusively on increasing verbal and nonverbal communications, PRT has been adapted to teach a variety of skills including symbolic and sociodramatic play and joint attention. (Schreibman & Ingersoll, 2005, p. 884)

Resources

Koegel, R., & Koegel, L. (2005). Pivotal Response Treatments for Autism: Communication, Social, and Academic Development. Baltimore: Paul H. Brookes.

Schreibman, L., & Ingersoll, B. (2005). Behavioral interventions to promote learning in individuals with autism In F. R. Volkmar, R. Paul, A. Klin, & D. Cohen (Eds.), Handbook of autism and pervasive developmental disorders: Volume II: Assessment, interventions, and policy (pp. 882-896). New York: John Wiley.

TEACCH

Developed in the early 1970s by Eric Schopler, the TEACCH (Treatment and Education of Autistic and Related Communication Handicapped Children) approach focuses on the person with autism and designing a program around her skills, interests, and needs. Thus, the individual, rather than the instructional method, is the priority.

The program uses structured teaching in a variety of settings. Organizing the physical environment, developing schedules and work systems, making expectations clear and explicit, and using visual materials have been found to be effective ways of developing skills and allowing people with ASD to use these skills independently of direct adult prompting and cueing.

Cultivating strengths and interests, rather than drilling solely on deficits, is another important priority. The relative strengths of those with autism in visual skills, recognizing details, and memory, among other areas, can become the basis of successful adult functioning (Mesibov & Shea, 2006).

Resources

Division TEACCH: www.teacch.com

The Hanen Approach

The Hanen Centre based in Montreal, Canada, supports the belief that parents can be their child's language facilitators. Since parents have the strongest bond with their children and also have multiple opportunities to interact with their children on a daily basis, parents are the obvious choice for language facilitators. Parents involved in the program are trained by Hanen-certified speech-language pathologists.

Through training, parents learn how to adapt the Hanen approach to meet the needs of their own child. There are three programs for parents:

- *It Takes Two to Talk* – The Hanen program for parents.
- *More Than Words* – The Hanen Program for Parents of Children with ASD
- *Target Word* – The Hanen Program for Parents of Children who are Late Talkers.

In order to support special educators, the Hanen Centre has developed special materials for teachers, including *Learning Language and Loving It – A Guide to Promoting Children's Social, Language, and Literacy Development* (2nd ed.) (Weitzman & Greenber, 2002).

The Hanen approach puts parents and others who work with young children in the forefront as language facilitators. The child is recognized as having the most important role in the learning process and experiences provided by adults are the learning opportunities.

Resources

Hanen: www.hanen.org

Weitzman, E., & Greenber J. (2002). Learning language and loving it: A guide to promoting children's social, language, and literacy development (2nd ed.). Toronto, Canada: Hanen Centre.

Integrated Play Groups

The concept of Integrated Play Groups was developed by Pamela J. Wolfberg, Ph.D. Based on the nature of play among peers without disabilities, Dr. Wolfberg established a format that promotes socialization and imagination in children with autism and other developmental delays. Integrated Play Groups follow rules for creating an appropriate play environment, including play areas and selected materials; preparing the typical peers for play; use of assessments and measurements of progress; as well as play guidance. Integrated Play Groups focus on social communication, especially in the autistic deficit areas of imitation, joint attention, and imaginative and creative play.

Resources

Wolfberg, P. J. (2003). Peer play and the autism spectrum: The art of guiding children's socialization and imagination. Shawnee Mission, KS: Autism Asperger Publishing Company.

SCERTS Model™

SCERTS stands for Social Communication, Emotional Regulation, and Transactional Support. The SCERTS Model™ is a comprehensive model that is based on a developmental perspective and was designed to support individuals with ASD. The SCERTS Model™ is interdisciplinary in its approach, in that it addresses social communication and emotional regulation throughout the child's daily activities and routines, and guides and supports parents and caregivers through a multidisciplinary team effort. The model uses the knowledge base and experience of general and special educators, speech language pathologists, occupational therapists, child psychologists, psychiatrists, and social workers.

The SCERTS Model™ is not prescriptive, nor is it a curriculum. Instead, it is based on fundamental beliefs and values that address the core deficits of ASD. The model is systematic, semi-structured, but flexible, so that the individual goals of the family and child with ASD can be addressed at specific developmental levels. The model is based on the belief that children learn best when they are emotionally regulated and can communicate within a social context. The SCERTS Model™ was systematically developed to be implemented based on those beliefs. It is does not exclude other educational models, but accepts them within its framework of intervention as appropriate.

Resources

Prizant, B., Wetherby, A., Rubin, E., Laurent, A., & Rydell, P. (2006). The SCERTS model™: A comprehensive educational approach for children with autism spectrum disorders. Baltimore: Brookes.

Relationship Development Intervention (RDI)

Relationship Development Intervention, created by Steven Gutstein, Ph.D., is modeled on how typical children become competent in the world of emotional relationships. It is an intervention approach quite different from the typical social skills programs currently available.

RDI uses assessment information to develop clear, specific, developmentally appropriate treatment objectives and customized activities. The RDI curriculum is composed of six levels, each representing a dramatic developmental shift in the central focus of relationships. The six levels are: Novice, Apprentice, Challenger, Voyager, Explorer, and Partner. RDI provides a path for people on the autism spectrum to learn friendship, empathy, and a love of sharing their world with others. Language comes alive when integrated with real emotion. People with ASD learn not only to tolerate but to enjoy change, transition, and going with the flow. The path begins at the edge of each person's current capability and carefully, systematically teaches the skills needed for competence and fulfillment in a complex world.

Resources

Connections Center: www.rdiconnect.com

D.I.R./Floortime

Dr. Stanley Greenspan and his colleague Serena Weider created the Developmental-Individual Differences-Relationship (D.I.R.)-based model as an intervention for children with autism and other developmental delays.

Greenspan and Weider (1998) specify six functional milestones of development in this order: self-regulation and interest in the world, intimacy, two-way communication, complex communication, emotional ideas, and emotional thinking. According to the authors, these milestones lay a foundation for more advanced learning since they are based upon emotional interactions usually developed early in life.

The D.I.R. model uses a comprehensive evaluation, including developmental history, biomedical assessment, current functioning, child-caregiver interactions, auditory processing, sensory processing, sensory modulation, motor and perceptual motor functioning, and family patterns, to develop a comprehensive intervention plan for the child and family. The primary goal of the D.I.R.-based intervention is to enable children to form a sense of themselves as intentional, interactive individuals and to develop cognitive language and social capabilities from this basic sense of intentionally.

Part of the D.I.R. method uses "floortime", which is an intensive, one-to-one experience during a 20- to 30-minute period when a caregiver physically gets down on the floor and interacts with the child. The focus is on relationships, based on Greenspan and Weider's belief that the more intellectual functions of the brain do not develop without a constant source of relating. During floortime, the adult follows the child's interest or intent, even if the interest is a self-regulatory behavior, in order to encourage interaction. For example, if the child spins the wheels on a car, the adult may help him or spin a different wheel. The adult may limit the number of toys available so that the child has to interact to get more toys. The goal is not just to follow the lead of the child but to help the child expand his interactions. According to the authors, the four goals of floortime are two-way communication, logical thought, attention and intimacy, and the expression and use of feelings and ideas.

Resources

Floortime/DIR Model: https://www.autismspeaks.org/what-autism/treatment/floortime

Greenspan, S., & Weider, S. (1998). The child with special needs. Reading, MA: Addison-Wesley.

Individual Strategies

The following table identifies individual strategies that have been found effective in supporting individuals with ASD. These strategies can be effective in a variety of settings, such as home, community, and educational settings. The name of each strategy is listed in the first column, followed by an explanation and description of the strategy in the second column. The last column lists where to find more information on the strategy.

Strategies Found Effective in Supporting Individuals with ASD

Strategy	Description	Resources
Social Stories™	Created by Carol Gray, a Social Story™ is a short story written from the child's perspective to encourage appropriate behavior in a particular situation. The story includes a description of the situation, a positive statement of what the child will do (that is, the appropriate behavior the story is written to encourage), and how others react to the situation. The final sentence in the story is added with the child after reading the story. It offers a connection to something the child knows, or another strategy to help her remember the appropriate behavior. Depending on the individual, Social Stories™ may include pictures.	Carol Gray offers information on how to write Social Stories ™ as well as other related information on her website: www.thegraycenter.org. In addition, the book *The New Social Story Book* by Carol Gray is available in the OCALI Lending Library.
Video modeling	Video modeling is the use of videos of someone behaving appropriately in a given situation to model appropriate behavior for a child. While the video can be of the child behaving appropriately in his own environment, the technique is also effective if someone else, a complete stranger, exhibits the behavior in a different environment.	This websites offers information on video modeling: http://www.iidc.indiana.edu/index.php?pageId=3766
Priming	Priming is a way of letting a child know what to expect or what is coming. You can prime for a short or a long period of time. For example, you may prime a child for a Saturday shopping trip by going over where you will go, when you will go, how long you will be there, and the things you need to accomplish at each place. You may also identify what behavior is expected for each stop. Typically, you would put the same information in a visual format to cue the child throughout the trip. For example, you may have a visual schedule for the day that you look at with the child as you discuss the day.	A practical manual on priming may be accessed from http://www.iidc.indiana.edu/index.php?pageId=409 and http://www.txautism.net/uploads/target/Priming.pdf The following books offer explanations and ideas for using priming: • *Children and Youth with Asperger Syndrome: Strategies for Success in Inclusive* • *Settings* by Brenda Smith Myles *Finding Our Way* by Kristi Sakai Both books are available in the OCALI Lending Library.

5-Point Scale	The 5-point scale is a technique used to help a child break down an abstract concept into a visual system that is easier to understand. For example, a concept such as using appropriate voice volume can be broken down into a 5-point scale, with 1=no voice, 2=whisper, 3=normal voice/dinnertime, 4=loud voice/playing outside, and 5=screaming. A visual representation of the scale is used as the scale is introduced and explained tothe child. It is reviewed repeatedly so it becomes very familiar. A picture of the scale is later used as a visual support to remind the child to use an appropriate voice level. The teacher points first to the level the student is using, and then slides her finger down to the appropriate level for a given situation. For example, if the child was screaming while the family was in the store, the parent would point to number 5, then move her finger down to 3 – an acceptable level.	More information about this technique, which was developed by Kari Dunn Buron and Mitzi Curtis, may be found at www.5pointscale.com. The books The Incredible 5-Point Scale by Kari Dunn Buron and Mitza Curtis and When My Worries Get Too Big! by Kari Dunn Buron are both available in the OCALI Lending Library.
Power Cards	The Power Card, developed by Elisa Gagnon, is a strategy to teach a child appropriate behavior for a particular situation. The Power Card strategy relies on the power of a child's special interest. It includes a story in which the person or object of special interest behaves appropriately in a situation in which the child is having difficulty. The child is given a small card, which includes approximately three points to guide appropriate behavior, along with a picture or some visual reference to the person or special interest to cue the child.	http://www.education.com/reference/article/social-scripts-stories-asperger-ASD/ and http://www.ocali.org/project/resource_gallery_of_interventions/page/power_cards Elisa Gagnon's book Power Cards: Using Special Interests to Motivate Children and Youth with Asperger Syndrome and Autism is available in the OCALI Lending Library.
Visual strategies (First ... Then Board, Visual Schedule)	For individuals with ASD visual learning is generally a strength. Therefore, it is often helpful to present information in some visual form in place of, or in addition to, verbal information or directions. There are a number of visual strategies, including first-then cards, visual schedules, visual lists, prompt/cue cards. In addition, many other strategies include visual strategies, such as Power Cards and the 5-point scale.	The following websites provide information on visual supports: http://autismdigest.com/visual-strategies-valuable-support-at-any-age/ and http://education.jhu.edu/PD/newhorizons/Journals/specialedjournal/Harris The following helpful books, Visual Strategies for Improving Communication by Linda Hodgdon and Do-Watch-Listen-Say by Kathleen Quill, and books and videos on the specific visual support listed, are available from the OCALI Lending Library.

Social Interpretation Strategies	Social interpretation strategies are an important element of social skills instruction. Strategies involve systematically breaking down hypothetical or past social experiences of the child in a visual manner. An adult facilitates this breakdown, and then discusses other choices the child could make in a similar situation, as well as the consequences of different choices. Examples of social interpretation strategies include: social autopsies, Situation Options Consequences Choices Strategies Simulation (SOCCSS), cartooning, and flowcharts (i.e., The Way To A).	The website http://www.txautism.net/uploads/target/SOCCS.pdf and http://www.erinoakkids.ca/ErinoakKids/media/EOK_Documents/Autism_Resources/5-Social-Autopsy-for-interacting-with-someone-you-like.pdf offers information on these strategies. More information on social interpretations strategies may also be found in Do-Watch-Listen-Say by Kathleen Quill, and Children and Youth with Asperger Syndrome: Strategies for Success in Inclusive Settings by Brenda Smith Myles, which are available from the OCALI Lending Library. In addition, there are other sources detailing the specific strategies listed, including The Way to A by Hunter Manesco.
Home Base	For many individuals with ASD, the world, in particular the school environment, can cause a great deal of anxiety. In such cases, a Home Base may be assigned. The Home Base is a place where the child feels comfortable and can relax. The child is always allowed to leave her current setting and go to Home Base when she feels her anxiety level rising. A self-calming technique, this strategy recognizes that a child may have to remove herself from an environment in order to calm down.	http://www.ocali.org/project/resource_gallery_of_interventions/page/home_base describes the home base strategy and how it can be used for children and youth with ASD. The book Children and Youth with Asperger Syndrome: Strategies for Success in Inclusive Settings by Brenda Smith Myles explains Home Base and is available from the OCALI Lending Library.
Graphic Organizers	Graphic organizers are visual ways to organize information or materials. These can range from idea webs and Venn diagrams to color-coding folders and books for each school subject. Graphic organizers can be effective tools for helping a child organize the environment, as well as organize information to enable learning.	Graphic organizers can be found at the following website: http://do2learn.blogspot.com/2012/01/graphic-organizers-lets-make-it-visual.html There is also information in the book Children and Youth with Asperger Syndrome: Strategies for Success in Inclusive Settings by Brenda Smith Myles, which is available from the OCALI Lending Library.

Biomedical Interventions

Medications

A variety of medications have been prescribed for individuals with ASD, and several have been researched. However, no one medication works for every person with ASD. Hyperactivity, sleep problems, obsessive tendencies, anxiety, aggression, and self-injury are some of the symptoms that may be targeted with specific medications.

When medication is being discussed or prescribed, it is important to ask:

- What is the safety of its use in children with autism?
- What is the appropriate dosage?
- How is it administered (pills, liquid)?
- What are the long-term consequences?
- Are there possible side effects?
- How will my child be monitored and by whom?
- What laboratory tests are required before starting the drug and during treatment?
- Are there possible interactions with other drugs, vitamins, or foods?

Given the complexity of medications, drug interactions, and the unpredictability of how each patient may react to a particular drug, parents should seek out and work with a medical doctor with expertise in the area of medication management.

Medications should be given on a trial basis with close monitoring of positive and negative effects. Since there are few objective measures of a person's response to a medication, reliance on subjective information (parent, teacher, and caregiver reports) is common. This is particularly important for children with ASD, who have difficulty understanding and expressing feedback from their bodies and their emotions. The observations of parents and caregivers should be systematically collected by logs, charts, scales, or other accepted behavioral documentation. Occasionally, a trial of medication tapering and discontinuation is a way to determine its efficacy and/or whether it is still needed. Like any medical treatments, medications should be reviewed at every follow-up visit.

Resources

Autism Society of America: www.autism-society.org

Nutritional and Dietary Interventions

Individuals with autism may exhibit low tolerance or allergies to certain foods or chemicals. While not specific causes of autism, food intolerances or allergies may contribute to behavioral issues. Nutritional therapies may be used for a variety of reasons. Some parents and professionals have reported changes when specific substances are eliminated from the child's diet.

Parents wishing to pursue dietary interventions should consult a gastroenterologist or nutritionist who can help ensure proper nutrition. Be sure to consult with a doctor, nutritionist, or dietician before beginning any dietary or nutritional supplement interventions.

The Gluten-Free/Casein-Free Diet (GFCF)

According to theory, some individuals are unable to completely digest the protein in cereals (gluten) or in dairy products (casein). The molecular structure of the partially undigested proteins, known as peptides, resembles opiates. Such peptides are thought to have an effect much like opiates on the brain and nervous system. From this premise it follows that long-term exposure to these peptides can have damaging effects on the developing brain and can also affect behavior, just as any narcotic would.

Beginning a GFCF diet can be difficult but not impossible. Gluten is most commonly found in wheat, rye, and barley, and sometimes contaminates oats grown nearby or processed on the same equipment as gluten-containing cereals. Casein is found in dairy products. Wheat and dairy make up a large proportion of the Western diet. One of the biggest obstacles parents face is that children needing GFCF diets often crave these foods. In fact, parents often report withdrawal symptoms when gluten and casein are eliminated from their child's diet.

Although there are reports of immediate improvement, it may take as long as six months for gluten and one month for casein to clear out of the system. Advocates of the diet recommend trying it for at least a year as it can take that long for some children to show improvement. The diet affects changes in the body at a cellular level and promotes healing of the stomach and intestinal lining, both of which can take time.

Calcium is very important in bone development and maintenance. Most people get their calcium from dairy sources. If your child is on a dairy- or casein-free diet, a calcium supplement may be necessary.

Resources

Autism Network for Dietary Intervention: http://autismlink.com/dir/autism-network-for-dietary-intervention-andi/

GFCF Diet Support Group: www.gfcfdiet.com

Feingold Diet

The Feingold diet is a food elimination program developed by Ben F. Feingold, MD, to treat hyperactivity. The diet is free of artificial colors, artificial flavors, aspartame, three petroleum-based preservatives, and (on Stage One) certain salicylates. All (except for the salicylates/phenols) are made of petroleum, and breaking them down into digestible compounds uses up the PST enzyme, which is the main enzyme for detoxification in the body. If you remove artificial foods from the diet, people with a marginal amount of natural PST enzyme (proponents suspect individuals with ASD fall into this group) will have it available to detoxify the body, including the brain. Salicylates and phenols also depress the levels of PST enzyme.

Resources

Feingold Association: www.feingold.org

Wikipedia: en.wikipedia.org/wiki/Feingold_diet

Specific Carbohydrate Diet

The specific carbohydrate diet (SCD) is a strict grain-free, lactose-free, and sucrose-free dietary regimen. Initially developed for individuals with celiac disease and other intestinal disorders, the diet may help individuals with ASD who experience gastrointestinal problems.

The theory behind this diet is that carbohydrates, being forms of sugar, promote and fuel the growth of bacteria and yeast in the intestines, causing an imbalance of and eventual overgrowth of bacteria and yeast. Bacterial overgrowth can prevent the digestion and absorption of carbohydrates. This causes the carbohydrates to remain undigested in the intestines, providing even more fuel for bacteria and yeast. Toxins and acids can be formed by the bacteria and yeast and injure the small intestine lining. Excessive mucus may be produced as a defense mechanism against the irritation caused by toxins, acids, and undigested carbohydrates.

Resources

Horvath, K. (1999). Gastrointestinal abnormalities in children with autistic disorder. Journal of Pediatrics, 135, 533-535.

Anti-Yeast Diet

This diet was developed to address the overproduction of or allergies to Candida albicans, a single-celled yeast that is impossible to keep out of the body. Normally, it does no harm, because it is kept in check by beneficial bacteria, but if there is an imbalance in the beneficial bacteria, candida can grow uncontrolled, releasing extremely acidic toxins into the bloodstream. These chemicals slow the brain down so that it no longer works correctly. The chemicals should be cleared by the liver so that they never reach the brain. However, in some, they are apparently not cleared, causing problems. The anti-yeast diet consists of removing fermented foods from the diet. The worst offenders are alcoholic beverages and non-alcoholic beer, vinegar, barley malt, chocolate, pickles, soy sauce, and aged cheese. Some believe that individuals with ASD are likely to have an allergy to or overproduce Candida albicans.

Resources

Nutrition Institute: www.nutritioninstitute.com

Supplements

Over the past 10 years or more, claims have been made that vitamin and mineral supplements may improve the symptoms of autism in a natural way.

If you are considering adding vitamins or minerals to your child's diet, a laboratory and clinical assessment of her nutritional status is highly recommended. The most accurate method for measuring vitamin and mineral levels is a blood test. It is also important to work with someone knowledgeable about nutritional therapy. While large doses of some vitamins and minerals may not be harmful, others can be toxic. Once supplements are chosen, they should be phased in slowly (over several weeks), and the effects should be observed for one to two months. The reported benefits of supplements range from behavioral changes, to improved language.

Supplements can include the following.

B6 and Magnesium

B6, often combined with magnesium, is reported to help improve language, eye contact, brain electrical activity, behaviors, and immune system function. Magnesium is needed with high doses of B6 because, when taken alone, B6 may cause a deficiency in magnesium and other B vitamins. Also, magnesium may decrease some possible side effects, such as irritability, bed-wetting, and sensitivity to sound.

Vitamin B12

Vitamin B12 deficiency is characterized by the inability to absorb food. Vitamin B12 is essential for metabolism of fats and carbohydrates and the synthesis of proteins. Vitamin B12 is involved in the manufacture of the myelin sheath, a fatty layer that insulates nerves in the brain.

DMG/TMG

Dimethylglycine (commonly known as DMG) is classified as a food substance rather than a vitamin. It is found in very small amounts in brown rice and liver. Parents have reported positive results with a similar product, tri-methyl-glycine (TMG). TMG breaks down into DMG and SAMe in the body. SAMe is a nutritional supplement and is sometimes used to treat mood disorders such as depression. There are, as yet, no published reports on the efficacy of DMG or TMG for individuals with ASD.

Melatonin

Melatonin is a hormone made by a part of the brain called the pineal gland. Melatonin may help our bodies know when it is time to go to sleep and when it is time to wake up. Melatonin supplements come in two pill forms, natural and synthetic (man-made). Natural melatonin is made from the pineal gland of animals.

Children with ASD often have sleep disturbances, which suggests that there may be some problem associated with the body's production and use of melatonin. Children receiving melatonin regularly exhibit benefits that cannot be explained in simple terms, like better sleep. It may be a combination of better sleep and better control of biological rhythms.

Especially in children, melatonin should be given only under the supervision of the child's regular physician.

Vitamin A
For years, high doses of this vitamin have been used successfully to treat the measles virus. Using cod liver oil, Megson (2004) began vitamin A therapy with some of her patients and observed some positive results. Some patients spoke more frequently and clearly; others made gains in eye contact. Megson has reported that vitamin A in the natural form, such as cod liver oil, helps to rebuild areas in the brain, called receptors, that are dramatically affected by ASD. The natural form of vitamin A is claimed to also improve cell growth, repair of epithelial cells found in the gut wall, immune system function, and gene expression and transcription.

Consult your doctor if you are considering a Vitamin A supplement as too much vitamin A or D, which is also found in cod liver oil, can be toxic.

Vitamin C
The benefits of vitamin C are widely known in the general public, and it may be of help for children with autism as well. Vitamin C is an antioxidant that helps the brain utilize oxygen. Without this vitamin, confusion and depression can develop. Vitamin C can also help support the immune system, aid in detoxification, and fight viruses and bacteria. Vitamin C is nontoxic, even in high doses.

Folic Acid
Folic acid is a nontoxic B vitamin, and a nutrient essential to the brain's health. It has been reported as helpful in treating autism. It is widely recommended that pregnant women take extra folic acid during their pregnancy to help prevent some birth defects. It is most effective when taken with vitamins B12 and C.

Other supplements can include essential fatty acids, zinc, probiotics, and cod liver oil, but should be carefully researched and taken only under the supervision of a physician.

Resources

Autism Research Institute: www.autism.com

Kirkman Labs: www.kirkmanlabs.com

Megson, M. (2004). Autism and vaccination. Retrieved January 7, 2007, from http://www.sciencedirect.com/science/article/pii/S0306987799909994

Defeat Autism Now! Protocol (DAN)

The Defeat Autism Now!, or DAN, protocol is a guide for clinical assessment of individuals with autism developed by participants in the DAN conferences organized originally by the Autism Research Institute. (ARI is the Autism Research Institute, a non-profit organization, founded in 1967 by Dr. Bernard Rimland. ARI is focused on conducting research and providing information on ASD to both parents and professionals.)

Some practitioners who know the DAN! protocol regularly use the medical tests to assess a child's health. There are also practitioners who will be willing to read the DAN! protocol and implement it. The basic premise of the DAN! protocol is that heavy metal toxicity in the form of thimerosal in vaccines, amalgams, or some other source, is the cause of the symptoms of autism. Most also recommend the use of the GFCF diet.

Resources

Autism One: www.autismone.org

Autism Research Institute: www.autism.com

Defeat Autism Now!: www.defeatautismnow.net

Generation Rescue: www.generationrescue.org

Chelation

Chelation therapy is a process involving the use of chelating agents to remove heavy metals from the body. For the most common forms of heavy metal intoxication, those involving lead, arsenic or mercury, the standard of care in the United States dictates the use of DMSA Dimercaptosuccinic acid. This, in addition to other chelating agents such as DMPS, EDTA, and alpha lipoic acid (ALA), is used. Chelation originally had to be administered intravenously. Now prescription chelating creams are available that can be applied to the skin.

Chelation must be done under the supervision of a doctor familiar with the DAN! protocol – it is only part of what should be an interconnected medical-based treatment.

Resources

See DAN! resources above