

# VIEWPOINT

## HOW RECENT CHANGES HAVE CONTRIBUTED TO AN EPIDEMIC OF AUTISM SPECTRUM DISORDERS

■ Patricia S. Lemer, M. Ed., NCC

**T**his summer I will become a grandmother. Comparing my daughter's experience as a pregnant woman to mine over 30 years ago boggles my mind. Her pregnancy is planned, mechanically monitored and managed. Prior to conception, she checked her thyroid function and completed a detoxification program. For a year she has been eating an organic, gluten- and dairy-free diet, and practicing yoga and Pilates. She used a non-toxic alternative for pest control, and has avoided nail salons and beauty parlors. She hired a doula and midwife to assist with her pregnancy and birth. Her husband is attending to her every need from foot massage to grocery shopping. They have purchased toxin-free bedding, paint and flooring. My children know they will be having a daughter. They have read up on vaccines and their ingredients and the importance of "tummy time" for the newborn in the development of binocularly and eye hand coordination. I have already given them a book of black and white designs to hang on the wall to stimulate my granddaughter's vision from birth.

My daughter's precautionary behavior is the culmination of all I have learned about possible causes and treatments for autism and related delays. During my career over the past 35 years, as a counselor with families whose children have a variety of delays, I have watched the world

change. I have observed how changes in healthcare, society, education and the environment have been at least partially responsible for the epidemic of autism spectrum disorders. With conservative estimates at one in six children having developmental delays requiring intervention, we are forced to consider prevention. Skeptics suggest that identification of an increasing number of affected children is a result of better diagnostic techniques and more comprehensive categories. Others argue convincingly that a clash of genetic susceptibility with environmental triggers, such as mercury, pesticides and other known neurotoxins, is responsible.

Could these factors also be exacerbated by the slow, subtle changes that have occurred in healthcare, the environment, society, schools and families?

Following are my impressions of changes that have occurred during the last 30 years. My comments, opinions, perceptions and beliefs are a combination of clinical experiences, observations and interactions with parents, professionals and educators, and are supported by the literature, both printed and electronic. All have profoundly influenced my thinking. I am grateful to my clients, colleagues and, especially the children, for teaching me what I know today. Based on what I have learned and observed, I propose some common sense guidelines for healthcare professionals, educators, and parents on

which to formulate a collaborative plan in the best interest of today's children.

### Changes in Healthcare

Healthcare providers of all types practice much differently than they did 30 years ago. While extending the life span significantly, some aspects of personal care have been sacrificed. Following is a list of some differences I believe are not in the best interest of today's children.

- **From house calls to managed care**  
In the past, the family doctor knew each family and came to the house when a child was sick. He took the time to chat and learn what preceded the onset of symptoms and to minister to a child personally. Today's child is a part of a huge managed care conglomerate, where doctors spend a very limited time per patient. One doctor may examine a child initially, and often, at succeeding visits, a different attending physician must rely on the previous doctor's hastily written notes for information. Both take little time for history-taking, let alone establishing a personal relationship. The goal is "treat the symptom."
- **Antibiotics to the rescue**  
Antibiotics have saved the lives of millions of people. However, some believe they are being used too frequently, and that the increase in auto-immune disease starts with too many antibiotics in childhood. When

an antibiotic “does the job”, the body’s immune response becomes less reactive.<sup>1,2</sup> Without good research, scientists can’t know the short and long term effects of these powerful drugs on children’s immune systems. Some physicians reach for the prescription pad without taking a thorough history or running laboratory tests. I have heard several relate that parents expect, and at times demand, today’s miracle drugs, which are far more potent than earlier drugs, such as penicillin. Women are familiar with yeast infections, which result from antibiotic overuse. Many children with developmental problems also suffer from yeast overgrowth in their guts.<sup>3</sup> If their bodies are fighting colonies of yeast, less energy is available for learning and development. Months of returning good bacteria to their damaged digestive tracts are necessary to produce normal stools. Once the body is healthier, language, learning and behavior can improve spontaneously.

- **Increase in the numbers of vaccines**  
The American Academy of Pediatrics mandates that today’s children receive over 50 individual vaccines before entering school,<sup>4</sup> compared to a single shot for smallpox 50 years ago. One doctor, who wishes to remain anonymous, called the American Academy of Pediatrics vaccine schedule one of the largest medical experiments ever. As the number of vaccines has increased, so has the incidence of developmental delays, especially autism and attention deficits. The mercury-containing preservative thimerosal and toxic metals such as mercury and aluminum have received recent attention.<sup>5</sup> The effect of poisons, such as pesticides and formaldehyde are less well-known. The long-term effects of all these substances are presently unknown.

### Changes in the Environment and Society

- **Increase in environmental toxins**  
I believe that we now live in a toxic world. The cautious among us are buying organic food and filtering our air and water to remove neuro-toxic chemicals, that did not exist 50 years ago. The classic “Body Burden” study by the Environmental Working Group

at New York’s Mt. Sinai Hospital, uncovered how many cancer-causing toxins “healthy” people are harboring in their bodies.<sup>6</sup> Is health only the lack of symptoms? Are there degrees of health? Truly healthy people must take daily measures to rid their bodies of environmental toxins that they inadvertently eat, drink and breathe.

- **Increase in food additives**  
Label reading is now an inherent part of grocery shopping. In the past 50 years, artificial colors, flavors and preservatives have crept into most foods to enhance their taste, smell and shelf-life. Many like mono-sodium glutamate and aspartame are “excitotoxins” which over-activate the nerves so that they literally excite themselves to death.<sup>7</sup> Today’s children drink gallons of sodas and eat colored cereals and baked goods that have virtually no nutritional value. Consumption of fresh fruits and vegetables is waning as the consumption of processed foods rises.
- **Increase in technology**  
My personal experience indicates that at least some optometrists agree that an increase in the use of technology has fostered an increase in visual problems. Playing video games on a computer or Game Boy, renting a DVD or watching TV have replaced playing ball against the steps, as entertainment for today’s children. A possible result is that attention spans become shorter because youngsters are constantly entertained by moving objects on screens. Few are permitted to venture out into the woods (if they can find any woods) for safety reasons. Even if they were, they would be connected to home by a cell phone, “just in case.” Gone are the days when children would literally disappear into a safe neighborhood and come home when the street lights came on.
- **Changes in infants’ sleeping practices**  
Doctors today encourage back sleeping to prevent sudden infant death syndrome (SIDS). On its back, a baby is neurologically upside down. As an antidote, doctors are prescribing “tummy time.” An hour a day of wakeful placement on the stomach cannot replace 12-18 hours of prone position

sleep. Without adequate “tummy time” some children enter kindergarten with under-developed hands, weak neck muscles, poor binocularity, weak eye-hand coordination, and retained reflexes. These anomalies contribute to learning and behavioral problems. Only by spending time on their stomachs can infants’ primitive reflexes emerge properly, serve their purpose and become integrated. Occupational therapists I know observe that the weakened hands of this generation of children are having difficulty holding pencils and cutting with scissors, and require hand strengthening to be able to accomplish these simple tasks. Their weak necks can hardly hold up their heads. Eyes and hands work poorly together.

- **Increased safety measures restrict movement**  
In attempts to keep our children safe, we have severely restricted their movements from the day they are born. We place them in car seats, back packs, play pens and walkers. In addition to further impeding the emergence and integration of reflexes, these modern day pieces of equipment are limiting children’s natural sensory needs to touch and move. By restricting and limiting touch and movement, we impede their innate abilities to know where they are in space and to use their bodies purposefully.

### Changes in Schools

It is obvious to many parents and experienced teachers that curricula and expectations in today’s schools are different than they were 30 years ago. I believe that the following changes may not in the best interest of today’s children.

- **An accelerated academic curriculum**  
What was once taught in first grade is now included in kindergarten. Our youngest students are expected to “sit still and pay attention.” Many of them still have poor control over their own bodies, let alone pencils and scissors. Despite the fact that they have not had the experience of sitting through a 15-minute meal, they are expected to sit through 45 minutes of circle time in kindergarten and a 6-minute lesson in first grade. Many stare out the window

for visual relief, or wiggle and squirm to keep alert.

- **Early reading initiatives**

The lack of understanding of normal childhood development has resulted in unrealistic expectations for young children. Recent federal legislation that proposes “leave no child behind” has hastened the teaching of reading and writing to a generation of children who still may not be able to sleep through the night, tie their shoes or speak in complete sentences. Pushing them ahead academically without the establishment of a strong foundation of motor, sensory-motor, vision and language skills, forces them to learn by rote, at best. At worst, they are labeled “learning disabled” or as having an “attention deficit disorder.”

- **Recess and physical education are becoming extinct**

Seasoned educators know that a great deal of learning takes place on the playground and in the gym. Today’s schools are decreasing opportunities for movement and some are eliminating recess and physical education altogether. Developmental specialists I work with recognize that movement is food for the nervous system, and that young students’ bodies need movement as much as a nutritious breakfast.

- **Decrease in time for art and music**

The arts are being replaced by computer time and foreign language study. I believe strongly that children need “free” time to use their imaginations with paints, paper, scissors and instruments. Lessons in music and drawing are not the same as providing materials and allowing freedom of expression.

- **Increase in class size**

Many of today’s teachers must contend with up to 30 children of varying abilities and achievement levels, often without the assistance of an aide. As schools cut back on their budgets, classes can also span two or more grades. If a system has 40 first graders and 20 second graders, they might make a one-two combination. I believe that placing higher level first graders with lower functioning second graders is a questionable practice.

- **Increase in inclusion**

Parents often request that their students with disabilities be included

with typical students. “Mainstreaming” puts a further burden on already stressed-out teachers. A solution can be to hire an aide or “shadow” to assist the student. While a shadow can help keep a student on task, many act as policemen, further limiting and ignoring the needs of students with developmental delays to move and touch.

### Changes in Families

- **Increase in the number of two employed parents**

For various reasons, stay-at-home moms have become the exception. Consequently, grandparents, nannies, day care centers and babysitters have assumed parenting roles. Arguments can be made for the benefits of both parents having a life outside of the home. There is some evidence that children in day care are just as well adjusted as those who are raised at home with both parents.<sup>8</sup> The problems stem from the stress that arises from parents who think about their children while at work, and who attend to work responsibilities while at home. The most successful families I know keep strict boundaries between these two parts of their lives.

- **Distance separates close relations**

It is the rare family with aunts, uncles, and grandparents who live nearby. The support of having relatives in the same town is ancient history for many. Many of today’s children hardly know their aunts, uncles and grandparents; a usual scenario is spending a few precious days a year with them in a whirlwind of vacation time full of ice cream, movies and other Disneyland treats.

- **Increase in fast food and eating out**

The rare family eats more than three meals a week together at home, according to my informal surveying. Compare that to three meals a day I ate with my family when growing up. Children are missing out on not just home-cooked foods, but the experiences that accompany them, such as waiting for dessert, passing the peas, and seeing who gets the last bite of mashed potatoes. One kindergarten teacher suggested that sitting through a 15-minute dinner with the family should be a pre-requisite to circle time at school. Eating micro-waved Chi-

nese beef and broccoli from a take-out container in front of the television or in the car on the way to soccer is not the same as a sharing meat loaf and broccoli at the table. Mom’s version is made with virgin olive oil, fresh onions and love.

- **Less time for unstructured play**

Group sports and lessons are replacing “free” play even for our youngest children. Over-zealous parents, hoping to raise the next Tiger Woods, Venus Williams or Sasha Cohen start three year olds on golf, tennis or ice skating lessons. By requiring children’s bodies to conform to motor poses and their minds to rules of the game, few are learning how to control their bodies spontaneously and by trial and error. Instead, they are acquiring “splinter” athletic skills and playing games by rote.

- **More reliance on technology reduces inter-personal interactions**

Enter the electronic baby sitter. Busy parents use television, DVDs and movies to keep children entertained. What happened to board games such as Clue, Checkers and Monopoly? Playing games teaches so much: how to wait your turn, anticipate, strategize, lose, count, sequence, think. Zoning out in front of a screen implants many of the wrong kinds of images in the mind’s eye. Some youngsters cannot fall asleep after watching frightening scenes. Which brings us to the last item.

- **Sleep deprivation**

School-aged children need 10-12 hours of sleep a night, teenagers 8½ - 9 hours, and adults 7- 8½ hours. Sleep deprivation impairs metabolism, immune function and motor skills. It increases stress hormones, and cripples sugar metabolism. One study found that a majority of children diagnosed with Attention Deficit Disorder (ADD) no longer qualified for that label once they caught up on their sleep.<sup>9</sup>

### Total Load Theory

We can neither turn back the clock nor undo these changes, many of which are beneficial as well as detrimental. Even though medical, environmental, societal, educational, and familial factors alone cannot account for the rise in the numbers of children with issues, collectively their

synergistic interactions are working against this generation of children.

Nutritionist Kelly Dorfman labels the cumulative effect of individual assaults on the body as a whole as “total load.”<sup>10</sup> Each individual has a personal load limit, as does a bridge. When that limit is exceeded, immunological, digestive, respiratory, skin, language, motor and attention symptoms occur. These issues co-exist with developmental, cognitive, sensory and social/emotional problems, and their relationship is very complex.

While early signs of stress on the immune system, such as allergies and infections are the most prominent, many prenatal conditions add to the total load. Babies who endured complications of pregnancy, or had subtle birth trauma, such as oxygen deprivation or breech presentation, and are born to mothers with a large number of “silver” dental amalgams, or have conditions such as thyroid problems, severe allergies, chronic fatigue syndrome or fibromyalgia, are much more at risk for later developmental problems.<sup>11</sup>

Children on the autism spectrum have a huge total load of the above risk factors that set them up for developmental problems. Infants and toddlers are far more susceptible to a load of stressors than adults, because their small, less mature systems cannot handle the assault.

The end of the second year of life is a particularly vulnerable period, when development is taking place at a rapid rate. As self-awareness expands to other-awareness, in typical children, language develops and social skills emerge.<sup>12</sup> Unfortunately, this is also the time when the vaccine schedule accelerates. Some believe that it is a coincidence that many children regress at this time when so many forces collide. Others blame vaccines, at least in part, for their children’s loss of skills.<sup>13</sup>

### Every Child is Unique

Despite their commonalities, children with autism vary markedly. While they may have an identical diagnosis and similar symptoms, the causes of the symptoms in those diagnosed with “autism” are not the same. Sidney Baker, MD, co-founder of the Defeat Autism Now (DAN!) movement, urges doctors and therapists to treat each child on the autism spectrum as a unique individual with a unique health and developmental history.<sup>14</sup>

Dr. Leo Galland likens restoring health to the body to restoring a fine painting.<sup>15</sup> First, you must know its history, which includes pre-natal, natal and post-natal factors. Galland views disease as the appearance of symptoms related to an accumulation of load factors in the body. Peel back the layers, one by one, until the body is well. People become sick from the outside in: first skin, then digestive, respiratory, nervous system and finally cognitive factors are affected. Wellness takes place from the inside out. Parents report that their children become more aware cognitively before their respiratory and gut symptoms disappear. The final phase of healing often includes serious skin eruptions, such as boils and hives.

### Where to Start?

New approaches are emerging every day, claiming to be the missing link in curing autism. Therapies for eliminating toxic metals,<sup>16</sup> healing a leaky gut,<sup>17</sup> enhancing social skills,<sup>18,19</sup> improving eye contact,<sup>20</sup> increasing expressive language<sup>21</sup> or a plethora of other miracles<sup>22</sup> all have efficacy, but at a high price. The disability business is a thriving marketplace of therapies delivered by talented and experienced practitioners, and many do have at least something of value in the treatment of children with autism spectrum diagnoses.

I offer the following easily implemented action plans to counteract the negative effects of changes that have occurred over the past several decades.

### What Healthcare Practitioners Can Do

- **Listen to and work with parents as a part of your team**

Be sure to allot enough time to listen to and hear parents’ concerns. Take a thorough patient history, including pre-natal, natal and environmental factors. Ask what a child is eating, drinking and breathing, how much sleep, screen time and exercise a child is getting. Encourage a healthy diet, sufficient sleep, good hydration and daily exercise. Trust a mother’s intuition and a father’s faith. Parents know their children best. They sense when their children are not right, and have good hunches about what they need. If they ask you to work with them on a

modified vaccination schedule, cooperate, rather than chastise.

- **Immunize responsibly**

The National Vaccine Information Center (NVIC) at [www.nvic.org](http://www.nvic.org) tells parents to “Ask Eight Before you Vaccinate.” All eight guidelines are compatible with “First do no harm.” Vaccination is the number one arena to consider individual differences. Never vaccinate a sick child, or one on or just coming off of antibiotics, which depress the immune system and lessen the body’s ability to fight pathogens. Take a previous vaccine reaction seriously. Most children have a “warning” reaction before a serious one. A fever, redness and irritability are all signs of an over-whelmed immune system.<sup>23</sup>

Refrain from using acetaminophen as an antidote to a reaction, as it depletes the baby’s glutathione, which assists in removing toxic metals.<sup>24</sup> Draw blood titers before giving booster shots. Most children gain immunity with a single shot. Schools require proof of immunity, not proof of shots. Individual differences determine the length of a person’s immunity; some youngsters need frequent boosters, others do not. Use only thimerosal-free vaccines. Yes, most are mercury-free now, but some flu shots are still preserved. Give only single valent vaccines. Vaccine cocktails are too much for some youngsters. Space out shots; this allows the body to recover. Suggest supporting shots with vitamin C before and after, boosting the immune system’s ability to fight the pathogen and the other vaccine ingredients. Dr. Donald Miller’s complete guide “A User Friendly Vaccine Schedule” is available at [www.donaldmiller.com](http://www.donaldmiller.com).

- **Consider natural alternatives to antibiotics and stimulant medications**

Many healthcare practitioners are turning to herbal, dietary and homeopathic treatments for ear infections, colic, asthma, constipation, diarrhea, eczema and other childhood ailments,<sup>25</sup> all conditions which occur frequently in children later diagnosed with autism.<sup>11</sup> Recent FDA warnings of the possible negative effects of psychiatric drugs<sup>26</sup> have caused some parents to seek other avenues of

treatment. These include special diets, biofeedback, auditory, occupational and vision therapies, all of which focus on the causes of the problems rather than the symptoms.

- **Learn about local resources**

Become familiar with the local school system and what services they have to offer. Take time to visit the practices of private occupational therapists, speech and language pathologists, and chiropractors. Read their literature and collaborate with them on appropriate patients. Many individuals in these disciplines have special interest and expertise that complement optometry.

### What Teachers and Therapists Can Do

- **Add tools to your tool chest**

The best educators and therapists I know avail themselves of continuing education courses from a variety of disciplines.

Homeopathy

([www.homeopathic.org](http://www.homeopathic.org)),

Autonomic Response Testing

([www.neuraltherapy.com](http://www.neuraltherapy.com)),

CranioSacral therapy

([www.upledger.com](http://www.upledger.com)),

Touch for Health

([www.touch4health.com](http://www.touch4health.com)) and

Brain Gym

([www.braingym.org](http://www.braingym.org))

can all hasten development for many children. These and other techniques are being prescribed by some professionals as an adjunct to their own therapies.

- **Make willing parents your teaching partners**

Some parents are willing and able to work with their children. Discuss the importance of a home program to reinforce what you are doing in the classroom and clinic. Help them understand that a few minutes a day at home can shorten the time necessary for in-office therapy and solidify new skills. Encourage good sleeping, eating and movement to provide a good foundation for learning.

- **Incorporate movement into a lesson**

Learning is not all in one's head! Whatever the goal, adding movement gives the body muscle memory, which reinforces all the other senses. Use a variety of seating options, swings, and

irregular surfaces. Children love three-legged stools, balls and beanbags for chairs. Avoid hard, unforgiving plastic and wooden chairs. Consider partially inflated seat cushions if only hard chairs are available.

- **Promote social interactions**

If our goal is for children on the autism spectrum to talk and interact, allow them freedom of expression in the context of a classroom or therapy session. Encourage talking rather than turn taking. Adults interrupt each other and don't raise their hands to speak; they read body language to determine when it is their turn. Youngsters can do the same in friendly, informal learning environments. Place them in small groups for projects, matching those who have issues with kind and gentle peers. Prevent bullying by teaching victims how to advocate for themselves using "Bullies to Buddies," the innovative program by school psychologist Izzy Kalman

([www.bullies2buddies.com](http://www.bullies2buddies.com)).

### What Schools Can Do

- **Have a summer cut-off for school entrance**

Make sure that children are fully five years old before entering kindergarten. Give those with summer and fall birthdays "the gift of time" to develop foundational skills before introducing academics prematurely. A tremendous amount of learning precedes reading and writing. Make sure children have adequate motor control of both the upper and lower parts of their bodies before requiring them to sit still and pay attention. Extra time in pre-academic pursuits avoids unnecessary labeling, testing and individualized educational plans for those who will catch up, if allowed.

- **Incorporate movement activities into the school day**

Encourage teachers to use Brain gym

([www.braingym.org](http://www.braingym.org))

or other "warm-up" activities first thing in the morning before academics begin. Allow children to play outdoors even in bad weather; connecting with nature is good for them. Assure that they receive adequate "food" for their nervous systems by including at least as much time for recess and physical education as for computer lab.

- **Use non-toxic materials for renovations, cleaning and art materials**

Assure that the school building has no asbestos or lead paint. Use cork, bamboo and other natural flooring instead of carpet with chemicals that "off-gas" for years. Clean up walls with paints lacking volatile organic compounds (VOCs). Buy natural cleaning products such as "Greening the Cleaning"

([www.imusranchfoods.com](http://www.imusranchfoods.com)).

In the art room, allow only non-toxic paints, glues, pastes, clay and paper.

- **Support teachers with in-service training and extra hands**

Permit teachers at least two conferences per year to learn new skills and recharge their batteries. So many special education teachers I know suffer from burn-out so extreme they are considering leaving their chosen profession. Offering them new skills that deal productively with difficult behaviors will help them cope better. Support them with parent volunteers and aides whenever the pupil teacher ratio exceeds 10:1.

- **Supply good water**

Install water fountains or bring in bottled water. Allow youngsters to have water bottles at their desks. Encourage hydration.

### What Families Can Do

- **Eat together at least once a day... and in the car doesn't count!**

Choose one meal a day and give it the respect it deserves. Sit together without stress for at least 10 minutes. Make meals an enjoyable experience. Turn off the television and computer; do not answer the phone. Let the children take their time to accept or not eat what is put in front of them. Don't force feed, prod, plead or bribe.

- **Serve a varied menu of organic and home-cooked food**

Reconnect with your kitchen. Buy cookbooks; take a cooking class; download gluten-, dairy- and sugar-free alternatives from

([www.AutismNDI.com](http://www.AutismNDI.com)),

([www.pecanbread.com](http://www.pecanbread.com)), and

([www.allergygrocer.com](http://www.allergygrocer.com)).

Good quality "fast" food is available online, by mail order, and at local super markets. Avoid packaged, processed empty calories, fast food, pizza and pasta. Steam nutrient dense vege-

tables. Serve with the ancient gluten-free grains millet, quinoa and amaranth. Make soup. Crack young green coconuts and make natural probiotics with the water and immature meat

([www.bodyecologydiet.com](http://www.bodyecologydiet.com)).

- **Buy natural fiber clothing and bedding**

Many children have dysregulated and disrupted sleep, which interferes with their bodies' ability to heal. Cotton is the only fabric that allows their bodies to breathe naturally. Traditional pajamas and mattresses are coated with flame retardants that send toxic chemicals through their skin while they sleep. Organic mattresses and sleepwear are available from [www.ecobaby.com](http://www.ecobaby.com) and other sites.

- **Use natural alternatives for personal care products**

Watch for phthalates, toxic additives used in body lotions, soaps, shampoo and powders. Seek safer, usually natural alternatives.

- **Establish day and night-time routines**

Introduce your children to the concept of lapsed time. Use words like "next week, tomorrow, in five minutes." Keep the same sequence of events, such as: washing hands, setting the table and pouring water before meals; having a snack and then sitting down to a specific place to do homework; and having a bath, reading two stories, and singing a song, as a bed-time ritual. Be stalwart in sticking to the familiar sequence, except in very special circumstances, such as on a birthday or holiday. Youngsters like the safety and security of routine. They do not push limits if they know you are serious.

- **Limit screen time**

Encourage alternatives to TV, game boys and computer games, especially close to bedtime. Help children use their imaginations to find something to do when there is nothing to do. Join them to build forts out of the living room furniture, dig for worms in the garden, rake leaves and jump in the piles, plant flowers, grow vegetables, play ball games.

## What are the Outcomes?

The most recent statistics from California show evidence that the autism epidemic has begun to decline.<sup>27</sup> I believe that if professionals, parents, educators and others recognize and appreciate how changes in healthcare, society, education and the environment have added to this epidemic, a continuing decline is possible. Incorporating some of the above suggested antidotes to today's practices can also result in happier, more functional families, more productive schools, fewer burned-out teachers, more contented healthcare practitioners and savings of millions of dollars in healthcare and education. And best of all, I am also confident that by living in a healthy fashion, my daughter, my grand-daughter and yours will have a much safer and friendlier planet on which to grow up and prosper.

## Editors Note

An earlier version of this article appeared in *Medical Veritas* 2006,3:916-20. I wish to thank editor-in-chief Gary S. Goldman, Ph.D. for his cooperation in the publication of the present version.

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## References

1. Levy SB. *The Antibiotic Paradox: How Miracle Drugs are Destroying the Miracle*. New York: Plenum, 1992.
2. Shnayerson M, Plotkin MJ. *The Killers Within: The Deadly Rise of Drug Resistant Bacteria*. Boston: Little Brown, 2002.
3. Shaw W. *Biological Treatments for Autism and PDD*. Lenexa, KS, Great Plains Laboratory, 2002.
4. American Academy of Pediatrics. [www.aap.org](http://www.aap.org). "Recommended Childhood and Adolescent Immunization Schedule," Accessed June 19, 2006
5. Kirby D. *Mercury in Vaccines and the Autism Epidemic: A Medical Controversy*. New York: St. Martin's Press, 2005.
6. <http://www.ewg.org/reports/bodyburden1/methodology.php>. Accessed May 20, 2006.
7. Blaylock RL. *Excitotoxins: The Taste That Kills*. Santa Fe, NM: Health Press, 1997.
8. Ceglowski D, Bacigalupa C. Keeping current in child care research, annotated bibliography: An Update. *Early Child Res Pract* 2002;4:1.
9. Van der Heijden KB, Smits MG, Gunning, WB. Sleep-related disorders in ADHD: A Review. *Clin Pediatr* 2005;44:201-10.
10. Dorfman K. Why so many children have developmental problems: the total load theory. *New developments newsletter* 1996;1:3.

11. Larsson HJ, et al. Risk factors for autism: perinatal factors, parental psychiatric history, and socioeconomic status. *Am J Epidemiol* 2005; 916-25.
12. Kavner RS. *Your Child's Vision*. New York: Simon and Schuster, 1985.
13. O'Meara, KP. Vaccines may fuel autism epidemic. *Insight Magazine* 1999;15:11.
14. Baker SM, Pangborn, J. *Autism: Effective Biomedical Treatments*, San Diego: Autism Research Institute, 2005; 1-51.
15. Galland L. *The Four Pillars of Healing*. New York: Random House, 1997:xiii-xvi.
16. Rimland B. Chelation: the story behind the headlines. *Autism Res Rev Int* 2005;19:3
17. Lipski E. *Digestive wellness*. Los Angeles: Keats Publish, 2000.
18. [www.connectionscenter.com](http://www.connectionscenter.com). Accessed May 25, 2006.
19. [www.autismtreatmentcenter.org](http://www.autismtreatmentcenter.org). Accessed May 25, 2006.
20. [www.floortime.org](http://www.floortime.org). Accessed June 2, 2006.
21. [www.verbalbehaviornetwork.com](http://www.verbalbehaviornetwork.com). Accessed May 29, 2006.
22. [www.ihausa.org](http://www.ihausa.org). Accessed June 2, 2006.
23. Miller N. *Vaccines: Are They Really Safe and Effective?* Santa Fe, NM: New Atlantean Press, 1992.
24. Slattery JT, Wilson JM, Kalhorn TF, Nelson SD. Dose-dependent pharmacokinetics of acetaminophen: evidence of glutathione depletion in humans. *Clin Pharmacol Ther* 1987;41:413-8.
25. Zand J, Rountree B, Walton R. *Smart Medicine for a Healthier Child*. New York: Avery, 2003.
26. [www.fda.gov/cder/drug/advisorySSRI200507.htm](http://www.fda.gov/cder/drug/advisorySSRI200507.htm). Accessed June 2, 2006.
27. Maugh TH. New autism cases level off in state. *Los Angeles Times*, July 13, 2005.

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Date accepted for publication:  
June 7, 2006

Autism Spectrum Disorders - Etiology, pathophysiology, symptoms, signs, diagnosis & prognosis from the MSD Manuals - Medical Professional Version.Â Autism spectrum disorders are neurodevelopmental disorders characterized by impaired social interaction and communication, repetitive and stereotyped patterns of behavior, and uneven intellectual development often with intellectual disability. Symptoms begin in early childhood. Autism spectrum disorder is a condition related to brain development that impacts how a person perceives and socializes with others, causing problems in social interaction and communication. The disorder also includes limited and repetitive patterns of behavior. The term "spectrum" in autism spectrum disorder refers to the wide range of symptoms and severity. â€Autism spectrum disorder (ASD) and autism are both general terms for a cluster of complex disorders of brain development. These disorders are categorized, in varying degrees, by having problems in social interaction, verbal and nonverbal communication and repetitive behaviorsâ€ (Frith , 1991). Discover the world's research.Â Recent studies suggest that some children with autism prefer robots as tutors for improving their social interaction and communication abilities which are impaired due to their disorder. Autism spectrum disorder (ASD) is a complex developmental condition that involves persistent challenges in social interaction, speech and nonverbal communication, and restricted/repetitive behaviors. The effects of ASD and the severity of symptoms are different in each person. ASD is usually first diagnosed in childhood with many of the most-obvious signs presenting around 2-3 years old, but some children with autism develop normally until toddlerhood when they stop acquiring or lose previously gained skills.