A Biological Basis for Neurological Disorders:

Autism, Hyperactivity, Attention Deficit Disorder, Depression, Obsessive-Compulsive Disorder, Tourette Syndrome, and Violence

An Interview with William Walsh, PhD

Q Thank you for serving on our Advisory Board since our first issue, Dr. Walsh. Tell us, how and why did your focus shift from chemical engineering to nutritional therapy?

After getting my degree in chemical engineering, I made the decision to pursue a career in nuclear engineering and chemistry. During the late '50s through the '60s, I developed a love for experimentation and ended up at Argonne National Laboratory.

I also got involved as a volunteer in local reformatories and prisons. I founded an organization to help adult criminals and former offenders, with the goal of crime prevention. We focused on efforts like providing clothes and finding jobs upon release.

My real education began while working with ex-convicts and their families. I'd always assumed that criminal behavior was the result of poor life experiences—lack of love, child abuse, living in a horrible neighborhood. Yet every once in a while I ran into a family that seemed perfect. Mother and father were caring and competent, brothers and sisters were fine, often exemplary.

Yet the parents said they knew something was wrong before the child was six months old. Many of the children tormented family pets, were oppositional and defiant, had violent tempers and loved to set fires — a typical syndrome. These parents often had to bear a double tragedy: seeing their beloved child turn into a violent delinquent, while being blamed by mental health professionals for their child's behavior.

After years of volunteer work, we finally began to ask the right questions: What is the root cause of violence? How can one infant develop into a law-abiding, productive adult while another baby born into the same family becomes a violent criminal? In the mid '70s I began to explore the subject in medical libraries.

By this time I personally knew most of the Death Row residents at Statesville Penitentiary, considered one of America's three toughest prisons. My group worked with hundreds of prisoners and ex-convicts, hoping it might enable them to avoid future crimes. But I never thought of it in terms of science or chemistry until I explored the medical literature on behavior disorders.

I discovered several studies that yielded strong evidence of an inborn predisposition to schizophrenia, bipolar disorder, depression, and ADHD. The research indicated the most powerful predictor of any of these disorders was not life experience or environment, but genetic predisposition.

I began to wonder if this might be true for the behavior-disordered people we were working with. We began to analyze blood, urine, and hair samples from some of the most violent prisoners and ex-convicts, looking for biochemical abnormalities that they may have in common.

Q How did you go about this?

Two of our death-row volunteers were helpful in selecting inmates with extremely violent tendencies and obtaining samples for chemical analysis. By 1976 we had accumulated a lot of data but hadn't found any correlations. A turning point occurred when I attended a lecture by Dr. Carl Pfeiffer of New Jersey. He had just been nominated for a Nobel

***William Walsh, PhD**, an advisory board member for* Latitudes*, is cofounder and senior scientist at the Health Research Institute-Pfeiffer Treatment Center near Chicago. He received a doctorate in chemical engineering from Iowa State University and has more than 30 years of research experience, with extensive work at Argonne National Laboratory in Illinois.*

Dr. Walsh became interested in biochemical disorders while volunteering with inmates at Statesville Penitentiary, where he founded the Prisoner Assistance Program. His research, along with the work of renowned nutritional pioneer Carl Pfeiffer, MD, forms the basis for the diagnostic testing and treatment protocols used at the Pfeiffer Treatment Center. Dr. Walsh has authored more than 200 scientific articles and reports and has made numerous presentations to the American Psychiatric Association, U.S. Senate, Society of Neuroscience, and the National Institutes of Mental Health, among others.

Prize by Dr. Linus Pauling.

While listening to his terrific lecture, I realized he had spent the last 20 years of his life doing for schizophrenia what I was just beginning to do for behavior disorders. He had collected data from more than 10,000 schizophrenics, grouped them into chemical classifications, and developed effective nutrient therapies for each subgroup.

He had quite a bit of success, much to the chagrin of mainstream psychiatry. He was brilliant and ahead of his time. A friend arranged a meeting with him the next day. When I described our violence research, Carl urged me to continue. He recommended I concentrate on trace metals such as copper, zinc, magnesium, calcium, manganese, cobalt, and lithium. Trace-metal data had led to his original findings for schizophrenia in the 1960s.

Q What did you find?

We learned that the metal levels of the ex-convicts and behavior-disordered children were consistently abnormal, based on hair analysis and blood chemistry. We simply gave this condition the term "weird metals."

(By the way, you may have seen the recent reports that question the reliability of hair analysis. An article on this in the *Journal of the American Medical Association* is terribly flawed. At Argonne Laboratory, we created the world's first hair standards of known composition and determined that the Doctor's Data lab in West Chicago consistently got the right answers for 12 elements.)

Our first double-blind, controlled experiment involved 24 pairs of brothers from the Chicago area. Each pair consisted of a violent, assaultive child and a sibling with ideal behavior and no history of aggression. The subjects were ages six to 16 and balanced in family position—first, middle and youngest. The experimental data showed that the well-behaved children exhibited expected levels of metals, while the violent siblings had highly abnormal levels.

We identified two distinctive patterns of trace metals in the assaultive youngsters: Type A and Type B. Type A children exhibited an elevated copper/zinc ratio, along with elevated lead and cadmium and low sodium and potassium levels. Most parents of Type A children reported episodic violent rages followed by remorse. This population had a high incidence of ADHD, learning disabilities, and hyperactivity along with the behavior disorder.

Type B children exhibited low copper/zinc ratios, along with elevated sodium, potassium, lead, and cadmium. Their behaviors were often described as oppositional, defiant, remorseless, violent, and cruel. It's quite clear that Type B chemistry is associated with antisocial or "sociopathic" behavior.

From there we did a number of double-blind, controlled experiments in prisons, jails, and ex-convict populations. Over the past 25 years we have amassed the world's largest and most comprehensive chemistry database for behavior, with roughly 100 separate chemical analyses of blood, urine, and hair for more than 10,000 behavior-disordered persons. I eventually quit my job at Argonne Laboratory to work full time on behavior research.

Q What happened to your connection with Dr. Pfeiffer?

Dr. Pfeiffer invited me to present our findings at a 1977 symposium in Princeton, N.J. After my lecture he urged me to send some ex-convicts to his Princeton clinic for study

The first group consisted of four ex-cons and a violent 12-year-old. During our trip to New Jersey I asked one of the criminals to survey them privately and estimate the total number of crimes between them—murder, attempted murder, aggravated assault, rape, theft, burglary, etc. Our lab results had indicated they were all Type B, the most violent, antisocial type.

I was horrified the next morning when I saw the numbers. The crimes included more than 50 murders! Apparently one of my companions had been a hit man. In addition there were hundreds of rapes, assaults, and many other crimes.

Q With so many crimes, how did they get released from prison?

According to statistics, for every 10 felonies you get arrested once. For every three arrests you get sentenced once. So on average, the odds of going to prison for a felony are one in 30. These are fearless people who assume they won't get caught. An intelligent, creative criminal might improve the odds to one in one hundred.

After studying the five desperadoes for six hours, Dr. Pfeiffer excitedly called me into his office and said, "Bill, they're all the same! They all have high blood histamine, low blood spermine, pyrroluria (*see next page*), and are hypoglycemic." He invited me to send more criminals and behaviorally disordered children for him to study. Then he handed me five pieces of paper and said, "These are their treatment programs."

He explained that each of these chemical imbalances could be corrected using nutrient therapy. "They'll feel a lot better if the imbalances are corrected," he said. I hadn't considered the possibility that Pfeiffer's evaluation would result in treatment, and found the prospect exciting. I raised some additional funds and purchased a six-month supply of nutrients for each of them.

Q How did this initial group respond to the nutritional therapy?

The hit man refused to take them. I never saw him again. The other three adults complied with Dr. Pfeiffer's treatment for more than a year. They reported that their criminal tendencies disappeared. However, each eventually stopped taking the nutrients and wound up back in prison.

The best result was achieved with the violent 12-year-old. His mother reported that his violence and delinquency had stopped. He had become an "A" student. By 1989, Dr. Pfeiffer had developed treatment pro-

Pyrroluria

Pyrroluria is a feature of many behavior and emotional disorders. It is an inborn error of pyrrole chemistry that results in a dramatic deficiency of zinc, vitamin B_6 and arachidonic acid. Common symptoms include explosive temper, emotional mood swings, poor short-term memory, and frequent infections. These patients are easily identified by their inability to tan, poor dream recall, abnormal fat distribution, and sensitivity to light and sound. The decisive laboratory test is analysis for kryptopyrroles in urine. Treatment is centered on zinc and B_6 supplements together with omega-6 essential fatty acids.

grams for 500 behavioral-disordered adults and children I was working with.

I discovered the treatments are highly successful in correcting behavior disorders in children, but the success rate drops off sharply during the teen years. We believe the main reasons are involvement with alcohol and drugs, and an ingrained negative self-image. The treatments also have limited success with adult criminals. Some of the ex-cons reported early improvements, but most eventually stopped the therapy and resumed a life of crime.

Q: It's difficult to effect change in behavior disorders through traditional methods. Your work is so encouraging that one would expect the approach to grow in popularity. Do other clinics provide this type of evaluation and treatment?

We have provided testing and treatment protocols to many doctors who have incorporated individualized nutrient therapy into their practices. Indeed, the Pfeiffer Treatment Center in Naperville, Illinois has experienced explosive growth since its beginning in 1989. Our staff has increased from three to 55, and we serve patients from all 50 states and dozens of foreign countries. To meet the increasing demand, we now provide "outreach" programs in California, Maryland, Arizona and Minnesota.

Q: What are some of the most common reasons for noncompliance with this therapy?

It's especially difficult for oppositional, defiant patients to comply. Several of our patients have never taken a single dose of the prescribed nutrients. An effective approach is to persuade the patient that our treatment may improve his or her health, athletic ability, complexion, etc. We tell them about NBA players, PGA golfers, and other athletes that come to us for athletic enhancement.

If a troubled teenage girl comes to our clinic with acne, we rejoice. She may not be willing to undergo treatment for delinquency, promiscuity, etc. But she might do anything to improve her complexion. About five years ago we developed a compounding pharmacy, which greatly reduces the number of capsules to be taken. This is especially helpful when dealing with teenagers.

Q: Would you discuss some additional areas we focus on in* Latitudes*, such as learning problems?

There's a high incidence of learning problems among violent youngsters or those with oppositional-defiant disorder. As we followed the results of nutrient therapy on behavior, we noticed that learning often improved, sometimes dramatically. I recall a violent, emotionally disturbed girl who was in Educable Mentally Handicapped classes with a reported I.Q. of 62. (The average is 100.) Within three months on the nutrient protocol she was mainstreamed into high school. She became highly motivated and did well in college. When retested, her resulting I.Q. was 135. The family was shocked.

Another case was of a little boy with bad behavior who had been diagnosed with Attention Deficit Disorder (ADD) in the 3rd grade. A school psychologist recommended Ritalin and a special-education classroom. Instead the father, a physicist I'd worked with, tried the boy on nutrient therapy.

Years later, I was at a high school banquet for my son and was seated across from a young man about 17 years old. I noticed he was taking supplements. I asked him about it and he said it was his "nutrient therapy." It turned out he was the same boy I'd seen ten years before. He had just finished his first semester at the University of Chicago—one of the most challenging schools in the country. I located his father and learned that his son was put into a regular classroom after the first year on the nutrients. The next year he moved to a gifted classroom. Then he received a full college scholarship.

While not everyone experienced such amazing results, we began to realize that the application of nutrient therapy could extend beyond behavior problems to ADD, learning disabilities, dyslexia and hyperactivity. Sometimes it simply made the difference between Bs instead of Cs and Ds, or of no longer being a "space cadet." Most parents reported a significant improvement after nutrient therapy.

Q: Did Dr. Pfieffer ever work at your clinic?

He offered to evaluate each of our patients by long-distance during the first six months of operation. Shortly before the clinic opened in September 1988, he died. He was 81. We named our clinic after this remarkable man. He never asked for anything. He studied and treated most of the prisoners and children at no charge. He just wanted to help.

Carl was also one of the happiest men I ever met. He and his wife lived in a simply furnished home. His hobbies

were organic gardening, woodworking, and listening to the Prairie Home Companion. He could have been a multimillionaire, but chose a life of helping people. His organization was a charity, not a business.

Q: What percentage of learning problems and other types of problems do you think you can help?

We've now seen about 16,000 patients and have conducted several outcome studies. They indicate success rates for young, compliant patients to be about 90% for behavior, 85% for depression, 80% for many types of learning disabilities, and 75% for ADHD.

Metallothionein (MT) Protein

MT is a family of short, linear, cysteine-rich proteins composed of 61 to 68 amino acids. Very versatile, MT proteins are involved in many important functions in humans, including detoxification of heavy metals, immune function, development of brain cells and synaptic connections, and regulation of copper and zinc levels. In studying more than 1,200 published articles on MT proteins, we learned that virtually all of the classic features of autism could have resulted from disabled or defective MT.

The MT protein family is composed of four primary types:

MT I and II exist throughout the body, with high concentrations found in brain, liver, and intestinal mucosa.

MT III is found mainly in the brain, where it has a primary role in neuronal growth inhibition and apoptosis. Recent studies have shown low levels of MT III in the brains of Alzheimer's patients.

MT IV is found primarily in the epithelia of skin and upper G.I. tract.

Some of our studies yielded bad news. For example, most Down syndrome kids have crazy chemistry levels. We expected balancing their chemistry would help them. It was a complete zero. If they were depressed we could make them happier. If they were hyperactive we could make them calmer. But we couldn't improve the retardation. That was a tremendous disappointment.

Another disappointment was an outcome study for Obsessive-Compulsive Disorder (OCD). We'd had some success with patients who claimed to be completely free of OCD with our therapy. Most had high blood histamine, a marker for under-methylation (*see side-bar page 13*) and low levels of catecholamines. But when we did the statistics we found that only one out of six OCD patients improved significantly.

Interestingly, we've had good success, about 65%, with people who have obsessive-compulsive *tendencies*, not a full expression of the condition.

Q: How do you measure success?

Our outcome data are obtained in interviews with parents and teachers. Our most recent study involved 207 consecutive behavior cases over a select time frame. That's called a "census sample." We tracked down families and used standardized measurements of behaviors to obtain the data. The results show that 11% of our patients did not initiate treatment, and a total of 23% became totally non-compliant within eight months.

However, 91% of the compliant patients exhibited fewer assaults and destructive behaviors, with half reporting a complete remission of these behaviors. These findings were reported at the American Psychiatric Association. A formal paper is being prepared for the journal *Physiology and Behavior.*

In 1992 we began accepting cases of depression and measured an improvement rate of 85% of the patients after the first year. We can help most victims of depression, but not all. We have extensive

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chemistry data on 3,000 adults with clinical depression.

Some depressed patients have a genetic pyrrole disorder that renders them grossly depleted in vitamin B_6. These individuals cannot efficiently create serotonin since B_6 is an important cofactor in the last step of its synthesis. Many of these people report benefits from Prozac, Paxil, Zoloft or other serotonin-enhancing medications. However, similar benefits may also be achieved by simply giving these patients sufficient amounts of B_6 along with augmenting nutrients.

We have separated them into five major chemical categories:

Hypercupremia (elevated copper) This condition is especially prevalent in women who experience postpartum and other forms of hormonal depression. We have very high success here. Treatment focuses on promoting the metallothionein protein system to achieve a good balance of trace metals.

Under-methylated (high histamine) These patients often have addictive or obsessive-compulsive perfectionism. They tend to have allergy and seasonal onset of depression.

Over-methylation These patients usually exhibit a nasty combination of anxiety and depression, and are prone to panic attacks. Treatment centers on nutrient therapy aimed at reducing dopamine and norepinephrine levels.

Toxicity A small percentage of depressive patients exhibit heavy-metal or organic toxicity as their primary chemical imbalance.

Pyrrole disorders This chemical imbalance is associated with depression, high-anxiety and poor stress control. It involves a severe deficiency of B_6, which is a cofactor for serotonin. These patients

also have symptoms of severe zinc deficiency.

Q: I've had families dealing with Tourette's syndrome (TS) report that they went to your clinic with varying degrees of success. What can you tell us about TS?

We discourage Tourette syndrome patients from visiting the clinic since outcome studies indicate a treatment success rate of only 15 percent. While we've had a few dramatic successes, most TS patients do not improve with this treatment alone.

Having said that, I do have some insight into the underlying profiles of TS. Lab results suggest nearly all of them are under-methylated. They often respond to cesium, a nutrient metal in the same family as lithium and sodium. In addition, some TS patients are helped by supplementation with free-form amino acids.

We did a TS study in the late '70s in cooperation with the Chicago Tourette Syndrome Association. We enrolled 24 pairs of brothers in the study—one brother with TS and the other without it. We found three completely different chemical types. One group primarily had coprolalia—the socially-unacceptable inability to control speech. Another group had a high incidence of learning disabilities, ADD/ADHD, and dyslexia. Their chemical imbalances were similar to those found in patients with learning disabilities. The third group had peculiar trace-metal patterns that were unfamiliar to us.

We believe TS is not a single condition. The individual phenotypes may require completely different treatment approaches. Our data indicates that TS is associated with under-methylation and resultant low levels of norepinephrine, dopamine and serotonin. The obsessive compulsive disorder aspect of TS is consistent with under-methylation.

The most striking result of our study was discovering that more than half the TS subjects had developed the condition while taking Ritalin. A physician with the national Tourette Syndrome Association said they weren't aware of such a correlation but they would look into it. A few years later I received a letter stating they also found a high incidence of Ritalin during TS onset, but didn't know if it was real or coincidence. They suggested these patients might have developed TS anyway and the Ritalin just triggered it. We've seen hundreds of kids who took Ritalin and had to stop because they developed facial or shoulder tics. Nowadays, I think most physicians monitor the possible development of tics when prescribing stimulant medication.

We may have discovered the primary cause of autism. In June 2000, we created a database of lab chemistries for 503 autism-spectrum patients . . . Between 95 and 160 separate analyses of blood, urine, and scalp hair were evaluated for each patient. The primary finding was that 499 of the 503 subjects exhibited evidence of a metallothionein (MT) disorder. Copper/zinc ratios were extremely high—ranging from 1.5 to 2.5 in most cases—compared to a normal value of about 1.0.

Q: I know you have exciting results based on a recent study on autism at the Health Research Institute.

We believe we may have discovered the primary cause of autism. In June 2000, we created a database of lab chemistries for 503 autism-spectrum patients who had been evaluated at the Pfeiffer Treatment Center. Between 95 and 160 separate analyses of blood, urine, and scalp hair were evaluated for each patient. The primary finding was that 499 of the 503 subjects exhibited evidence of a metallothionein (MT) disorder. Copper/zinc ratios were extremely high — ranging from 1.5 to 2.5 in most cases — compared to a normal value of about 1.0.

In May 2000, we reported this work at the annual meeting of the American Psychiatric Association. We proposed that autism is caused by the intersection of two factors: (1) a genetic defect that results in impaired MT functioning, and (2) an environmental insult during early development that disables MT.

Q: Wasn't a copper to zinc ratio imbalance in autistics previously reported in the literature?

High copper levels have been mentioned since the 1970s, but the connection with MT and brain development was never understood. An MT-function abnormality can cause impaired brain development and extreme sensitivity to toxic metals or vaccines. It appears we can explain every aspect of autism from this single disorder. Pick one and I'll tell you how impaired MT functioning explains it.

Q: How about the fact that autism begins within a set time period — usually by age three?

MT proteins are directly involved in brain development. By age three, the brain has usually matured to the extent that an environmental insult can no longer provoke autism in at-risk children.

Q: How does this relate to growing concerns that some vaccines are causing autism?

Until recently, most childhood vaccines contained a mercury-compound additive used as a preservative. Many expectant mothers are also given flu shots that contain mercury. Children with a genetic MT protein dysfunction would be expected to be hypersensitive to mercury.

Also, MT is involved in the development of the immune system. A dysfunction in MT might well result in hyper-

sensitivity to the viruses in a vaccine, especially if several vaccines are bundled together like the MMR (measles, mumps, rubella).

How does MT functioning relate to the need for some autistics to avoid casein from milk products, and gluten?

If MT is not functioning properly, you would predict intolerance and hypersensitivity to casein and gluten. The enzymes that break down these proteins in the small intestine are zinc-dependent. The zinc for these enzymes is delivered by zinc metallothionein. A serious MT dysfunction would diminish enzyme activity and the ability to completely break down casein and gluten.

It's interesting to note that one of the functions of MT is to kill *candida albicans.* An MT dysfunction could explain why so many autistic kids have a tendency for yeast overgrowth.

What about the wide range of symptoms among autistic children?

The specific symptoms depend on the intensity of the insult and the age at which it occurred. Insults in-utero and early infancy generally have a more profound impact on brain development than those later in childhood when brain organization and development is more complete. It's also possible that the insults *temporarily* shut down MT, and the symptoms may depend on the stage of brain development at that time. For example, a heavy-metal insult during development of the speech center could result in speech delay. A severe insult at that time may result in mutism.

These environmental insults could be prenatal?

Absolutely. Using mercury in vaccines is a bad idea, but allowing pregnant women to have flu shots with mercury stabilizers can be worse. There is clear evidence in the literature that mercury goes to the fetus preferentially. This would be especially serious if the mother herself had a metal-metabolism disorder. About one out of three autism families report that the symptoms were evident at birth.

What about the fact that autism mostly affects boys? And why has the rate of autism increased so dramatically that it's being called an epidemic?

About 80 percent of autistic-spectrum patients are males. Estrogen and progesterone help promote the body's production of metallothionein. As a result, males have less protection against mercury and other environmental insults that may provoke autism.

Over the past 20 years there's been a dramatic increase in the incidence of autism, which is known to be a genetic disorder. An epidemic of a genetic disorder is possible only if environmental factors are involved. Many observers believe that the genetic defect results in hypersensitivity to vaccines, and that the increased incidence of autism parallels the increased number of vaccinations given to children.

Some families report success with secretin therapy. Does this fit into your theory?

MT IV (*see page 11)* is in high concentration in parietal cells of the stomach. An MT dysfunction might be expected to impair the production of stomach acid. The acidity of food entering the small intestine signals the pancreas to send secretin, which stimulates the release of carbonate, digestive enzymes, etc., to enable proper digestion. An insufficient amount of stomach acid could result in a weakened or absent secretin response. The metallothionein theory is consistent with reports of efficacy of secretin in some autistics.

Assuming that a metal metabolism disorder is the underlying cause of autism, how can this information help families?

Prevention of autism through early

Over-Methylation

Many people who suffer from anxiety and depression are over-methylated, which results in excessive levels of dopamine, norepinephrine and serotonin. Typical symptoms may include chemical and food sensitivities, underachievement, upper body pain, and an adverse reaction to serotonin-enhancing substances such as Prozac, Paxil, Zoloft, St. John's wort and SAMe. They have a genetic tendency to have depressed levels of folates, niacin and vitamin B_{12}. Biochemical treatment focuses on supplementing these nutrients. These people are also overloaded in copper and methionine. Supplements of these nutrients must be strictly avoided.

Under-Methylation

Many patients with obsessive-compulsive tendencies, oppositional-defiant disorder or seasonal depression are under-methylated, which is associated with low serotonin levels. They generally exhibit seasonal allergies, perfectionism, competitiveness, and other distinctive symptoms and traits. They have a genetic tendency to be very depressed in levels of calcium, magnesium, methionine and vitamin B_6, with excessive levels of folic acid.

These under-methylated individuals may benefit nicely from Paxil, Zoloft and other serotonin-enhancing medications, although nasty side effects are common. A more natural approach is to directly correct the underlying problem using methionine, calcium, magnesium and B_6. SAMe, St. John's wort, Kava and inositol are also useful in treating these individuals. Many persons with Tourette syndrome fall into this biochemical category.

infant screening for the MT dysfunction may be practical. Children identified with this disorder could then be sheltered from environmental insults that could provoke autism until the age of three or four years.

The infant screening test has not yet been developed. The possibilities include: (1) a genetic test for MT dysfunction, (2) direct analysis for MT in blood, and (3) chemical analysis for copper, zinc, and ceruloplasmin in blood.

Babies found to be predisposed to autism could be sheltered from exposure to toxic metals, vaccines and other environmental hazards until three years of age. In addition, parents would need to limit the child's intake of copper and take steps to avoid zinc depletion.

For the more than 500,000 autism-spectrum patients in the U.S., nutrient therapy to promote metallothionein may be a very effective therapy. Restoring MT to proper function has the potential of (1) eliminating food allergies, (2) eliminating malabsorption, (3) detoxifying heavy metals, (4) overcoming taste/texture sensitivities, (5) achieving homeostatic control of copper and zinc, and (6) reducing the tendency for yeast overgrowth.

Best of all, improving MT function may dramatically improve the child's ability to develop new brain cells and synaptic connections. The brain is constantly forming new cells, which requires proper metallothionein function that we can address nutritionally.

Q What should a family expect if they decide to bring their autistic child for treatment at your clinic?

We provide a summary of the protocol on our web site (www.hriptc.org). The initial visit involves an interview, medical history, physical examination, and laboratory testing. It requires about three hours to complete. While awaiting the lab results, we begin the process of zinc loading and detox using our "Metabolic Primer" oral supplement. Our staff will recommend dietary changes, important environmental controls, and other steps to enhance G.I. function.

Four to six weeks later, we prescribe individualized nutrient therapy to address specific biochemical imbalances and promote MT function. We ask parents to send progress reports during the first four months of treatment, and recommend a follow-up evaluation and lab testing after four to six months. Comprehensive follow-up is important so we can adjust dosages for growth and incorporate advanced treatment protocols.

Q Do you use chelation in your clinic when treating children? If so, why?

We believe that therapy based on promotion of metallothionein is more effective and longer-lasting than chelation. Whereas DMSA (Dimercaptosuccinic Acid) can effectively remove mercury, lead, and other toxic metals from the body, it is relatively ineffective at reducing copper levels, and does little to protect the patient from future toxic exposures.

MT promotion therapy does it all. It eliminates toxic metals, removes excess copper, restores toxic-metal barriers in intestinal mucosa and blood-brain barrier, and promotes development of new neuronal connections. We do occasionally use clatheration or chelation for patients with especially severe toxic levels.

Q Why is there so much professional disagreement over megadoses of nutrients?

Many professionals seem oblivious to genetic differences in metabolism and biochemistry. Everyone is not the same nutritionally and biochemically. If we carry out a complete biochemical analysis on anyone, we will typically find this person to be unusually low in four to six important nutrients because of genetics. He or she would profit from many times the RDA level for those nutrients if they only knew which few out of the hundreds they were.

This same person would also have a genetic tendency to be overloaded in certain nutrients. Overloading nutritional supplements can be very harmful. After studying the biochemistry of 10,000 individuals, I've learned that the greatest mischief is usually caused by nutrients stored in excessive amounts rather than at depleted levels. The most common nutrients in overload include copper, iron, folic acid, calcium, methionine, manganese, choline and omega-6 fatty acids. Of course, these same nutrients may be deficient in others. That's why multiple vitamin/mineral supplements are usually limited in benefits, and may do more

Malabsorption

Although only 10 percent of our database case histories involve serious malabsorption, more than 90 percent of autistics exhibit this problem. There are three primary classes of absorption problems: (1) stomach problems, including excessive or insufficient HCl levels, (2) incomplete digestion in the small intestine, and (3) problems at the brush-border of the intestine where most nutrients are absorbed into the portal blood stream.

Heavy Metals

Occasionally we encounter a patient whose condition has resulted from a heavy-metal overload (lead, cadmium, mercury, etc.) or toxic levels of pesticides or other organic chemicals. Our database indicates that those people with a metallothionein (MT) disorder are especially sensitive to toxic metals, and that over-methylation is associated with severe chemical sensitivities. Effective treatment requires a three-step approach.

harm than good. For example, giving supplements of copper to hyperactive or autistic children would probably make them much worse. Giving folic acid supplements to an under-methylated person with Tourette syndrome or seasonal depression would likely worsen symptoms.

The basic principle of the Pfeiffer Treatment Center is biochemical individuality. We strive to identify each patient's biochemical tendencies. Then we employ individualized nutrient therapy to put their blood and tissue levels in proper balance. We focus especially on nutrients directly involved in neurotransmitter synthesis, since genetic differences here can profoundly affect mental function and behavior.

Q Studies show that behavioral approaches can be useful in addressing some autism symptoms and other problems. Do you have any comment on that approach related to metallothionein?

I think the combination of MT-promotion therapy and behavioral therapies would make a great marriage. Behavioral treatments are an effective way to shower the brain with impulses, which can stimulate the development of brain cells and new neuronal connections. However, efficient development of neuronal connections requires good MT functioning. If we can improve that function, then the behavioral treatments may work dramatically faster and more successfully.

Q ACN believes that while TS and OCD are conditions with genetic predispositions, environmental factors determine the onset and severity of the symptoms to a very great extent—just as you've proposed for autism. If we raised the necessary funds, would you be willing to analyze the data you have on all the Tourette syndrome patients in your database?

Certainly. That would be most interesting and could help identify subtypes of Tourette syndrome. Hopefully, this would lead to more effective treatments than currently exist for this disorder. ■

Interview by Sheila Rogers
Editor, *Latitudes*

HRI-Pfeiffer Treatment Center
4575 Weaver Parkway
Warrenville, IL 60555

Ph:630-505-0300 Fax: 630-505-1907
www.hriptc.org
Questions or Comments:
info@HRIPTC.org