ABOUT AUTISM

"....in many autistic children, bacterial and fungal overgrowths are etiologically significant in the cascade of events that result in autism or one of the other autism spectrum disorders."
By Jaquelyn McCandless in ***Children with Starving Brains.***

"A sensible and harmless form of warfare on the aberrant population of intestinal microbes is to manipulate their energy (food) supply through diet... By depriving intestinal microbes of their energy source, their numbers gradually decrease along with the products they produce."
By Elaine Gottschall in ***Breaking the Vicious Cycle***.

"Janie played with a doll for the first time ever today; I almost fainted. She initiated a hug and kiss for the first time ever in her 14 years of life."
From Mom of Janie with Down's syndrome, autism and gastrointestinal issues after a short time on the Specific Carbohydrate Diet.

The Specific Carbohydrate Diet has entered the world of autism through "the back door"- the intestinal tract. And what may have first appeared to be "the back door," via the digestive system, is rapidly becoming one of the most scientifically researched areas in determining what may be one of the underlying causes of many autism spectrum disorders. Because the Specific Carbohydrate Diet's goal is to heal the intestinal tract and to rid it of bacterial and fungal overgrowth, it is proving to be a very successful dietary intervention in treating many autistic children and leading them back

to a life of normalcy.

This chapter will review some of the research dealing with the Gut-Brain Axis in child developmental disorders. It will point out how dietary intervention with the Specific Carbohydrate Diet addresses and often overcomes conditions thought to be at the root of autism spectrum disorders as well as some cases of epilepsy and attention deficit disorder (ADD).

The previous chapter, The Brain Connection, highlights the research of many years in which it had been shown that various neurological problems originate in the digestive system. And when the number of autistic children soared within the last two decades, attention has again been directed to the gastrointestinal tract.

Parents of autistic children have always known that, among their children's symptoms, there exists symptoms of chronic constipation, periods of diarrhea, and abdominal pain. But until recently, the parents' reports were treated as of no consequence. Now, fortunately, attention is being focused on these physical symptoms as well as on behavior, and many gastroenterologists are in agreement that "these children are ill and are in distress and pain, and not just neurologically dysfunctional." [1]

Some physicians, recognizing that diet was playing a part in causing the intestinal symptoms focused their attention on treating these gastrointestinal symptoms as allergies and/or sensitivities. When testing these patients, they found evidence of sensitivities to various food components, mainly the gluten of grains and various components of dairy products. The behavior of many autistic children, although not all, showed improvement with the removal of these foods from their diet but, unfortunately, although behavior often improved, intestinal function did not. It was not unusual for the author to receive letters from parents as follows:

"My son is almost six years old and has autism. He was gluten/casein free for two years and while, during the first six months I thought I saw improvement in his exhibiting less stimmy (repeating the same action over and over again), his stimming returned. Even while on this diet, he still had constant stomach problems - being hospitalized four times for throwing up and dehydration. One time he suffered with a bowel obstruction; the other times they weren't sure what brought on his violent vomiting attacks. No doctor even bothered to do a colonoscope. I have mentioned to our doctor for years that he seems to be addicted to potato chips, french fries, ketchup, and waffles. When I learned of the Specific Carbohydrate Diet, it addressed this carbohydrate addiction and I intend starting this diet promptly."

And another letter from Patricia :

"…Meanwhile, my younger child's health was failing. He was on a strict gluten-free diet because of celiac disease. But it wasn't helping. He was ghost white and rail thin, with little energy and with chronic diarrhea and black circles under his eyes. Deep down, I worried he was dying. The team of pediatric specialists we were seeing had no clue how to make my little boy healthy, nor did my daughter's "alternative" DAN (Defeat Autism Now) physician. Fortunately, for us, this was August. And every doctor treating my son was on vacation.

In desperation, I picked up a book called Breaking the Vicious Cycle: Intestinal Health through Diet by Elaine Gottschall. A stranger had mailed this book to me two months earlier after meeting my Mother and hearing about my son's deteriorating health.

The book explained why my son wasn't thriving on the regular celiac diet. His intestines were so damaged he couldn't digest any grains, or complex carbohydrates. The next day, he started the so-called Specific Carbohydrate Diet (SCD) described in this book. His stools became normal, and he started growing and gaining weight. He's now a strong, healthy seven-year old.

What about my daughter? She had no obvious digestion troubles, but she did have "autism" and a recently discovered yeast overgrowth. One British researcher found a link between the MMR shot, intestinal problems, and autism. Wouldn't a diet that promised to heal her intestines and help with yeast overgrowth be her best shot at normal life?

We put Maria on a dairy-free version of the SCD. She had a terrible yeast die-off that lasted a week even though she was taking Nystatin, a popular antifungal drug. But once she recovered from the die-off, about a week later, we were confident she'd someday grow into an independent adult, thanks to this remarkable diet. Her remaining speech peculiarities, such as mixing up the order of words in a sentence, disappeared. Her eye contact became normal. By the time she was 4-1/2, one year after her diagnosis, no one would guess she was ever "autistic."

These parents' reports are echoed throughout the autistic community: although various dietary proteins appear to aggravate behavioral symptoms, their removal is not addressing the gastrointestinal problems. In addition it becomes increasingly apparent that as a few dietary proteins are removed, more and more must be taken out of the diet to hopefully achieve and sustain progress until these children have little to eat in the way of nutritious food. Parents continuously complain of their children's addiction to carbohydrates.

Dr. J. O. Hunter in 1991 described this dilemma of treating patients with gastrointestinal symptoms as food allergies or sensitivities. He stated that patients who exhibit sensitivities do not follow classical Type I allergic reaction. If these intolerances are not allergies, then they may be a disorder of bacterial fermentation in the colon and the disorders might be more appropriately named "enterometabolic (intestinal) disorders."[2]

The Specific Carbohydrate Diet approaches these gas-

trointestinal challenges in autism as it has been successfully doing for inflammatory bowel disease - as a disorder of bacterial fermentation and the ensuing problems which occur because of bacterial fermentation. These problems resulting from bacterial fermentation are: (1) production of excess amounts of short chain volatile fatty acids (organic acids): (2) lowering of the pH of the blood as these acids are absorbed: (3) overgrowth of bacteria as the undigested carbohydrates provide food for bacterial proliferation: (4) mutation of some bacteria such as E. coli because of the change in pH in their colonic environment; and (5) excess toxin production caused by the overgrowth of some pathological bacteria.

Bacterial fermentation occurs when undigested carbohydrates escape digestion and absorption and end up in the lower parts of the small intestine and colon. Unlike diets that eliminate only certain proteins, based on tests showing sensitivities to proteins, and that allow unlimited intake of starches and sugars, the Specific Carbohydrate Diet (SCD) is designed to nourish the child optimally and to minimize bacterial fermentation.

Coleman and Blass in 1985 in ***The Journal of Developmental Disorders*** reported the first evidence that autism might be linked to carbohydrate metabolism (digestion).[3] These researchers reported that the syndrome of D-lactic acidosis was found to be present in autistic children. Their work was based on reports of the 1970's and 1980's showing that undigested carbohydrates were being changed by bacterial action in the intestine to a substance, D-lactic acid. High amounts of D-lactic acid in the bloodstream have been found to cause bizarre behavioral symptoms. This book discusses earlier research relating to D-lactic acidosis in Chapter 7, The Brain Connection.[4, 5, 6, 7, 8, 9, 10]

There are two approaches to treating this abnormal production of D-lactic acid: (1) use of antibiotics to kill the bacteria producing the substance, a method often used med-

ically, and (2) decreasing the amount of fermentable carbohydrates upon which bacteria feed in order to produce D-lactic acid. Since antibiotic therapy often is accompanied by other side effects, it seems reasonable to suggest dietary changes to accomplish the same thing or as a support for medical intervention with antibiotics.

The year 2000 yielded landmark research in linking autism to the gastrointestinal tract. It was reported that among 385 children on the autism spectrum, significant gastrointestinal symptoms occurred in 46% compared with only 10% of almost 100 children without autism confirming what parents already knew. [11]

A flurry of remarkable scientific papers appeared, first, in the British medical journal, Lancet[12] and then in The American Journal of Gastroenterology (Wakefield)[13], demonstrating conclusively that serious intestinal pathology was found more than half of autistic patients. These intestinal problems ranged from moderate to severe including esophagitis, gastritis and enterocolitis along with the presence of lymphoid nodular hyperplasia. Some of these intestinal pathologies resembled Crohn's disease as well as ulcerative colitis. As would be expected, from previous research done on intestinal problems (see pages 22-24), it was also found by Horvath et al [14] that there was low carbohydrate digestive enzyme activity (see diagrams of injured microvilli in the chapter on Carbohydrate Digestion) although the pancreatic function was normal.

Horvath's report concluded by saying unrecognized gastrointestinal disorders, especially reflux esophagitis and disaccharide malabsorption, may contribute to the behavioral problems of the non-verbal autistic patients.

Additional reports from findings at Harvard Massachusetts General Hospital conclusively showed that carbohydrate digestion is being hampered at the locus of the intestinal absorptive cell.[15]

Initial autism research findings at Harvard Massachusetts General testing 400 autistic children found that (1) lactase deficiency was found in 55% of ASD children tested; (2) combined deficiency of disaccharidase enzymes was found in 15%; and (3) enzyme assays correlate well with hydrogen breath tests. (The hydrogen breath test measures the amount of hydrogen gas given off when intestinal microbes ferment unabsorbed carbohydrates.)

This current work, on decrease in digestibility of dietary disaccharides leading to malabsorption, forms the basis for therapy of the Specific Carbohydrate Diet. Its goal is to keep disaccharide ingestion to a minimum by avoiding lactose, sucrose, maltose and isomaltose (remnants of starch digestion) and to provide a nutritious, healing diet without these double sugars and to deprive the microbial world of the intestine from a surplus of fermentable carbohydrates.

It is well known that compounds arising in the intestinal tract can enter the bloodstream and cross the blood brain barrier.[16] (Gastroenterologists have been aware of this in treating the neurological effects of liver disease, hepatic encephalopathy. Reports have been published on how these toxins from the intestinal tract affect neurotransmitter substances in the brain.[17] Other research by E.R.Bolte[18] in an effort to correlate autism behavioral symptoms to the intestinal tract, investigated how the toxin of one bacterium, Clostridium tetani, could find its way from the intestinal tract to the central nervous system via the vagus nerve.

But there is still disagreement among researchers as to what constitutes the toxins from the gastrointestinal tract and what their origins are. Again, are they derived from proteins or are they products of intestinal bacterial action? This question was addressed in an outstanding research paper published in Neuropsychobiology in 2002 and authored by Dr. Harumi Jyonouchi et al.[19] Dr. Jyonouchi's group were the first to explain how bacterial toxins from the intestine can result in

sensitivities to certain dietary proteins, and casts light on the conundrum of which comes first: allergies/sensitivities which might lead to intestinal inflammation, or bacterial and yeast overgrowth (infections) which can lead to sensitivities to certain dietary proteins. The question can be viewed as "can the body's innate immune system, by reacting to the toxins of certain bacterial cell walls, cause the sensitivities to proteins such as casein and gluten?" The authors suggest that the root cause of the food protein sensitivity may be an underlying sensitivity to endotoxin, which arises from the surfaces of gram-negative bacteria in the gut flora: the lipopolysaccharide component of the cell wall of certain bacteria present in the intestine.[20]

This response to an endotoxin of intestinal bacterial cells is considered an innate immune response, an ancient form of defense and coded in the genes as an inherited trait. This innate immune response to the bacterial toxin could stimulate the production of antibodies and cytokines, initiators of an inflammatory response, part of an adaptive immune response.[21] Dr. Jyonouchi's research is an attempt to answer the question of why there is gastrointestinal pathology in children exhibiting autism spectrum disorders and invites the research community to explore dietary intervention in order to ameliorate the behavioral symptoms of autism.

It is the hope of the author that this book will be of help to the research community in understanding how the molecular components of commonly eaten foods affect this problem and how changing the child's diet can, indeed, break the vicious cycle.

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Important note to parents of autistic children:

When implementing The Specific Carbohydrate Diet, it is important to remember that during the first week to ten

days, profound changes are occurring in the digestive tract: the hundreds of different families of microorganisms are changing their metabolic functions due to the lack of nutrients to which they have been accustomed and of which they are now being deprived Some children may do well even during the first week. But others will go through a period of adjustment which some refer to as "detoxification." It will be helpful during this period to find support from the many other parents who have been through this change. Going to the following websites can give you this support.

It is especially important that you read the information on these websites relating to the introduction of dairy products. A decision can then be made if the Specific Carbohydrate Diet should be implemented with or without dairy.

http://www.pecanbread.com/

http://www.breakingtheviciouscycle.info

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