

AUTISM: The science behind the mysterious affliction that's become a hot election issue

What causes autism?

The answer is hotly debated – scientists even disagree whether it's on the rise or not. With no agreement on what causes it, writes **TOM SPEARS**, doctors disagree on how to treat it

As soon as doctors identified autism, back in the 1940s, they blamed the “cold” mothers of toddlers with the disorder. Early theory said that these mothers — doctors actually called them “refrigerator mothers” — withheld affection from their babies with terrible results. No one believes that today. But science is still struggling to narrow down the list of theories about what *does* cause this baffling disorder.

Just this summer, two Pittsburgh professors suggested the brain cells of people with autism aren't connected in the same way as everyone else's. While each area of an autistic brain looks normal, the Pittsburgh professors wrote in a journal called *Brain*, different areas are missing connections. They can't talk to each other. And that's a new possible biological basis for a disease whose cause — or, more likely, causes — are hotly debated.

“There's a lot of disagreement among autism practitioners and researchers about just what it is,” says psychologist David Wilder of Florida Institute of Technology. “The consensus would be that it's at least in part genetically determined. I think there's consensus on that. But beyond that — no.”

One theory, particularly widespread in Britain, but now fading, has been that a combined vaccine for measles, mumps and rubella, or MMR, causes autism. (Tens of thousands of British parents wouldn't let their children get the MMR vaccine since the late-1990s. Now there are clusters of measles outbreaks in Britain. Measles in young children is sometimes fatal.)

The Centers for Disease Control and Prevention in the U.S. tells parents: “The weight of currently available scientific evidence does not support the hypothesis that vaccines cause autism.” But it leaves the door open a crack by adding: “We recognize there is considerable public interest in this issue, and therefore support additional research regarding this hypothesis.”

MMR just won't go away as a theory, Dr. Wilder notes. “As time goes on, people are less and less confident that that's a trigger, but ... some people still do advocate for it.” There's talk of water or air pollutants. (A cluster of autism cases in New Jersey seems to be centred in a region full of industrial toxins.)

As well, public health statistics in Texas show that the largest increase in rates of autism took place in counties that also have the largest discharges of industrial waste, mainly from refineries and petrochemicals. It's not proof, but it's a red flag.



An autistic child plays after a demonstration for better treatment at Liberal leader Dalton McGuinty's Ottawa office last summer. MIKE CARROCCETTO, THE OTTAWA CITIZEN

“Certainly,” he adds, “people would disagree on that.” Dr. Wilder's main business is treating children with autism. With no agreement on a cause of the disease, he says, it's hard to argue for or against various treatments. Some people believe vitamins should be used, he notes. Some want pressurized oxygen chambers to push more oxygen into the children's brains. Some want chelation — using chemicals to remove metals, such as lead and mercury, from the bloodstream.

“There's probably no one cause for this,” he says. “In fact, I think we're going to find out that what we call autism is really a whole range of disorders.” This would explain the “huge range of variability,” from children with subtle gaps in their social skills to those who can't talk and injure themselves. Patients (and drug makers) often hope to find The Gene — one gene that's entirely responsible for a disease. But heart disease probably combines the effect of dozens of genes with diet, exercise and smoking. And autism is currently believed to involve from a dozen to as many as 100 genes, each with some effect, but none responsible alone.

This is a boom time for scientists tracking those genes, says Peter Szatmari, director of the Offord Centre for Child Studies at McMaster University. He teaches psychiatry, behavioural neurosciences and pediatrics at the Michael G. DeGroote School of Medicine. Three or four autism-related genes have been recently discovered and more are sure to come, he says. All of those found so far are involved in synapses — the “architecture” of how neurons connect.

Nail down the responsible gene and diagnosis can take place years earlier than it does today. “The earlier the intervention, the better the outcome.” Others echo this need for faster identification. “Introducing behavioural interventions even one year earlier can make a tremendous difference in the lives of children with autism, and their families,” said Dr. Rebecca Landa, director of the Center for Autism and Related Disorders at the Kennedy Krieger Institute in Baltimore. “If we are able to educate professionals to identify red flags in development, we can then recognize and diagnose the disorder at one-and-

a-half or two years of age, instead of three or four, allowing for earlier intervention and, ultimately, better outcomes.” Dr. Szatmari has seen the number of cases shoot upward, but doesn't produce a toxic environment is suddenly producing far more cases than in the past. He thinks they've always been there, undiagnosed. “When I've been to work here at Chedoke (Hospital, in Hamilton), there were like five kids who had a diagnosis of autism. “I started to see other kids who had other diagnoses. But when I applied the more up-to-date criteria, all those kids had autism. In the old days, they had mental retardation, childhood schizophrenia, learning disabilities, obsessive-compulsive disorder. They just weren't being recognized as having autism. Now we've got 400 or 500 kids with the diagnosis.”

But many researchers strongly believe autism is spreading at a rate higher than improved diagnosis alone can explain. These include Dr. Derrick MacFabe of the University of Western Ontario. “You're looking at increased incidence of the disease, particularly in the past 10 years,” he says. That's an indicator of difference in environmental conditions, he argues, because the human race's genes don't change that fast.

A clue that environment is part of the key to autism, identical twins, born with the same genes, may have differences — either one with autism and one without, or the two showing different levels of autism. (In Hamilton, Dr. Szatmari uses the same example of twins to support the opposite argument — that identical twins are more likely than non-identical twins to share autism, and that genetics is far more important than environmental effects.)

Dr. MacFabe's own route of inquiry focuses on what we eat, and especially what drugs we take as young children. A major clue that popped out was that a sizeable minority of children seem fine for about two or three years. They're social, happy and learning language. Then their parents report a sudden change. The toddlers stop speaking, stop interacting with others, all in a matter of days or weeks.

Dr. MacFabe wonders if it's something that came from the doctor's office — not likely MMR vaccine, but antibiotics for those endless childhood infections. Antibiotics can dramatically change the balance of the “friendly” bacteria in the digestive system, which digest food and also balance the immune system. And autistic children often have digestive problems — diarrhea or constipation.

“Some families also report their interests, craving carbohydrates.” As well, some find that changing diet improves the system, often when they abandon milk products and wheat. The link between the gut and the brain, he believes, could be a type of chemical that's produced by some intestinal bacteria as they break down carbohydrates, called a short-chain fatty acid. These compounds could represent a link, he believes, between the bacteria in the digestive system and what's happening in the brain. He gave a common fatty acid to rats, and they quickly developed symptoms.

“I think we're going to find out that what we call autism is really a whole range of disorders.” This would explain why some children have subtle gaps in their social skills while others can't talk and injure themselves severely.

“What we found that was interesting was that the compound only happened when the compound was in the rats.” Once the rats burned up this compound, they went back to normal behaviour — until the next injection. Then they became even more sensitive to the chemical.

“It may be a possible link.” But the experiments are in adult rats only, not in human children. And medical research is full of drugs that cure or control cancer and other disease in such animals, but not in people. “It's such a loaded thing,” he cautions. He doesn't want parents to withhold antibiotics from their children. Autism is a complex disorder, he notes, “and you can have tunnel vision in only looking at one thing.” But he feels his research is validation of the idea that some form of “gut problem” is involved in autism. “These kids are, in the vernacular, sick. Their bodies are sick.” And if so, “then these diseases are potentially treatable or preventable.”

Doctor says disorder must be seen ‘as a medical illness’

BY ROGER COLLIER

When her son, Patrick, was diagnosed with autism more than four years ago, Wendy Edwards, a southern Ontario pediatrician, reviewed the science about the disorder, which seemed to indicate there was no treatment. Patrick, then three years old, would stare at toys for hours, ignoring the people around him, and sometimes flap his arms or walk in circles. At first, Dr. Edwards felt there was nothing she could do to help him.

“Then I let the mother in me take over,” she said. Dr. Edwards, along with Derrick MacFabe, director of an autism research group at the University of Western Ontario, and Martha Herbert, a professor of neurology at Harvard Medical School, were the featured speakers at “Autism: A Medical Condition,” a conference presented by the

Autism Canada Foundation at the University of Ottawa yesterday. Their message: autism is a full-body condition, and not limited to the brain. “The paradigm of autism is changing,” said Dr. Edwards. “This needs to be viewed as a medical illness.”

In addition to the popular behaviour therapies, such as IBI (intensive behaviour intervention), Dr. Edwards says people should consider biomedical treatments. When parents ask her to help their autistic children, Dr. Edwards' advice sometimes catches them by surprise. “I insist that parents work on helping the gut first,” she said.

Autistic children have “skewed” immune systems, Dr. Edwards said, which means that viruses and fungi in the stomach cannot be handled properly. This leads to inflammation in the digestive tract. As a result, the immune system re-

leases chemicals called cytokines, which reach the brain and can affect mood, sleep, appetite, memory, learning and social interaction.

A gluten- and casein-free diet, said Dr. Edwards, may reduce immune system reactions that lead to inflammation. She also recommended ridding the digestive tract of unwanted bacteria, fungi and viruses by using supplements such as garlic, cranberry, oregano oil, grapefruit seed extract and olive leaf extract.

Dr. Edwards admitted that her approach to treating autism does not yet have solid scientific backing. But sometimes, she said, waiting for a conclusive study is not the best approach.

“Why not do what we feel is working while we wait for the study to prove or disprove it ... if we're not out there doing all these things and telling the researchers, ‘What about this?’ the research

won't get done.” Dr. Edwards also recommended ridding the body of toxins with antioxidants like Vitamin C, taurine and carnosine. Parents of autistic children should also avoid using toxic cleaners in their homes, she said.

Autistic children also have trouble sleeping, said Dr. Edwards, which may be hurting their overall health. She recommended parents try melatonin to help their children sleep better and said that it may have other biochemical benefits, as it is also an antioxidant.

Dr. Edwards said her son, who is now seven, has improved remarkably since she adopted these practices. His verbal skills are excellent, he makes eye contact and last June he graduate at the top of his Grade 1 class.

“Not all children will recover all the way, but many, and in fact most, will improve to some degree with this treatment.”