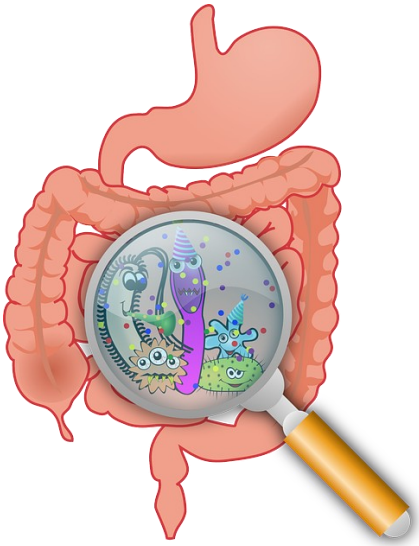
Gastrointestinal Issues in ASD Children
What is the research telling us?



Until recently, autism, along with other developmental disabilities, was regarded as a central nervous system disease. Medical professionals have by enlarge ignored the various other disorders coexisting with autism, such as dysfunction of the gastrointestinal and immune systems. What is very apparent, when you look at the scientific literature, is the very strong evidence that children with autistic spectrum disorder (ASD) tend to suffer from a wide variety of gastrointestinal (GI) symptoms and abnormal pathologies. Sometimes these may be severe GI problems that are neglected and not considered in routine ASD evaluations. The rate of GI symptoms is much higher than children with either typical development or other developmental disorders. The most frequent complaints are chronic ***constipation and/or diarrhoea***, ***flatulence, and abdominal discomfort/pain and distension***.

Many ASD children exhibit abnormal GI symptoms, pathology, microbiology and immune status. All these important areas of gut function are being researched and published. However, how many medical specialists are aware of what is being discovered, let alone what they should be assessing more seriously with the view to treatment?

Gastrointestinal Symptoms

- Constipation
- Diarrhoea
- Alternating constipation and diarrhoea
- Bloating
- Pressure on abdomen or "pain posturing"
- Sleep disturbances
- Behavioural outbursts

Gastrointestinal Pathology

- Eosinophilic esophagitis
- Subtle diffuse inflammation
- Erosion of the gastrointestinal lining
- Ileo-colonic lymphoid nodular hyperplasia
- Abnormal intestinal permeability

Gastrointestinal Microbiology

- Changes in the gut microbiome
- Certain microbial clusters are over represented in ASD including:
  - Clostridia which are toxin producers
  - Parasites
  - Yeasts
  - Viruses

A study published in 2012 in the *Journal of Abnormal Child Psychology* linked GI issues with behaviour, showing that ASD children who have GI issues often experience extreme anxiety as well as regressions in behaviour and communication skills. What's worse, the side effects of the psychotropic drugs that are prescribed to many autistic children may be intensifying the digestive issues.

A more recent study (2014) in Pediatrics concludes that:

"At a minimum, ... GI dysfunction in ASD ***warrants the adoption of a lower referral threshold by practitioners for evaluation and treatment by a gastroenterologist if an underlying problem is suspected. Children with ASD often present with limited verbal communication, and as a result, their symptom presentation may be unusual compared with that of their peers. For example, the emergence or exacerbation of problem behaviors, such as aggression, self-injury, sleep disturbance, or irritability, without clear environmental influence (ie, antecedents or consequences), may be the only indication of an underlying GI problem."***

Gastrointestinal Symptoms in Autism Spectrum Disorder: A Meta-analysis. Barbara O. McElhanon, Courtney McCracken, Saul Karpen and William G. Sharp. PEDIATRICS Volume 133, Number 5, May 2014.

Changing the way we think about treating autism.

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All Natural Advantage

Helping Children Achieve Their Full Potential

Many ASD children adopt a characteristic posture designed to put ***pressure on the lower abdomen***, which is an adaptive behaviour designed to reduce pain. From a clinical perspective, ***it is valuable to consider intestinal inflammation in the differential diagnosis of children with autism who present with constipation, diarrhoea, or alternating diarrhoea and constipation, sleep disturbances, behavioural outbursts, or unusual posturing***. Clinicians treating autism must be ever-vigilant for the presence of organic pain in children who have limited ability to communicate their agony. Gastrointestinal status has been positively correlated with severity of autism in children. Clinicians who evaluate children with autism should consider ***self-abusive behaviour as a possible indicator of pain***, difficulty toilet training as potential gut pathology, and trouble sleeping as a sign of ***gastrointestinal reflux or abdominal pain*** until proven otherwise.

The positive impact of treatments aimed at the GI problems in ASD children is widely reported by parents.

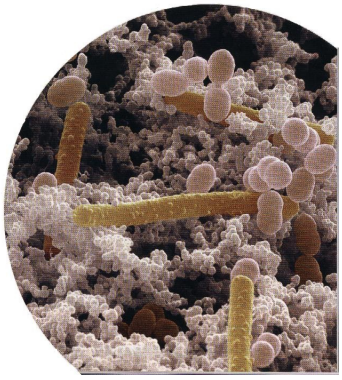
TABLE 2 Biomarkers as Potential Outcome Measures

Biomarker	Clinical Significance
Intestinal permeability	Leaky gut
Calprotectin	Intestinal inflammation
Celiac disease serology tests	Celiac disease and gluten sensitivity
Food allergy panel	Food allergies
Organic acid testing	Vitamin B_{12} or folic acid deficiencies
Analysis gut microbiota	Gut dysbiosis

Source: Gastrointestinal Conditions in Children With Autism Spectrum Disorder: Developing a Research Agenda. Daniel L. et al. Pediatrics 2012;130;S160

It would help substantially to identify specific subgroups of ASD children who may better benefit from GI interventions. Many of these approaches involve life-long interventions such as implementation of a gluten-free diet and or casein free diet. Better identification of the individuals likely to respond to particular treatments can reduce the costs and burden on families. It has been suggested that by using clinical phenotypes or through the identification and use of specific biomarkers (see Table 2) sub-groups of ASD children can be identified so that GI treatments can be more effectively targeted. These biomarkers as suggested from the research paper listed are not the only ones that can be considered, others like dietary peptides, lactoferrin, secretory IgA and others may also be useful. Which tests to choose depends on the clinical experience of the health professional and the clinical symptoms displayed by the ASD child.

What does our gastrointestinal microbiome have to do with it?



Studies of faecal DNA extracts have found certain microbial clusters overrepresented in children with ASD and gastrointestinal complaints compared with children with similar GI complaints but typical neurobehavioral development. Certain *Clostridium* clusters have been shown to produce a neurotoxin that can affect behaviour. Also the antibiotic vancomycin has been shown to be effective in reducing autistic symptoms and is also effective against *Clostridia* and Gram negative organisms. PANDAS (pediatric autoimmune neuropsychiatric disorders associated with Streptococcal infection) manifests with symptoms often shared with autism, such as cognitive inflexibility, obsessive and compulsive behaviours and vocal and/or postural tics. Changes in the gut microbiome may help explain anecdotal reports of improvement in behavioural functioning in response to dietary changes if such changes serve a probiotic function and improve symptoms of irritable bowel syndrome (eg, bloating, abdominal pain, flatulence) among certain children with ASD. Such reports help propagate interest in the use of dietary manipulation (eg, gluten and casein-free diets) as an ASD-focused treatment. Dietary interventions, including the gluten- and casein-free diets, nutritional supplements, enzymes, and antimicrobial agents, have not been substantiated by empirical investigation. However, parents faced with no time to lose as their children are growing and developing, are willing to push the boundaries and trial treatments that anecdotally have shown benefit in other children.

More research your child's health professional or professionals may not be aware of.
From the American Academy of Pediatrics.

A multidisciplinary panel reviewed the medical literature with the aim of generating evidence-based recommendations for diagnostic evaluation and management of gastrointestinal problems in ASD children. Below are 2 tables taken from their recommendations in the journal Pediatrics (reference below).

TABLE 2 Behaviors That May Be Markers of Abdominal Pain or Discomfort in Individuals With ASDs

Vocal Behaviors	Motor Behaviors[a]	Changes in Overall State
Frequent clearing of throat, swallowing, tics, etc	Facial grimacing	Sleep disturbances: difficulty getting to sleep, difficulty staying asleep
Screaming	Gritting teeth	Increased irritability (exaggerated responses to stimulation)
Sobbing "for no reason at all"	Wincing	Noncompliance with demands that typically elicit an appropriate response (oppositional behavior)
Sighing, whining	Constant eating/drinking/swallowing ("grazing" behavior)	
Moaning, groaning	Mouthing behaviors: chewing on clothes (shirt sleeve cuff, neck of shirt, etc), pica	
Delayed echolalia that includes reference to pain or stomach (eg, child says, "Does your tummy hurt?" echoing what mother may have said to child in the past)	Application of pressure to abdomen: leaning abdomen against or over furniture or kitchen sink, pressing hands into abdomen, rubbing abdomen	
Direct verbalizations (eg, child says "tummy hurts" or says "ouch," "ow," "hurts," or "bad" while pointing to abdomen)	Tapping behavior: finger tapping on throat	
	Any unusual posturing, which may appear as individual postures or in various combinations: jaw thrust, neck torsion, arching of back, odd arm positioning, rotational distortions of torso/trunk, sensitivity to being touched in abdominal area/flinching	
	Agitation: pacing, jumping up and down	
	Unexplained increase in repetitive behaviors	
	Self-injurious behaviors: biting, hits/slaps face, head-banging, unexplained increase in self-injury	
	Aggression: onset of, or increase in, aggressive behavior	

A functional behavioral assessment would be useful in interpreting these behaviors.
[a] Motor behaviors also may be markers of pain or discomfort arising in other parts of the body.

TABLE 6 Key Take-Away Messages

Individuals with ASDs whose families report gastrointestinal symptoms warrant a thorough gastrointestinal evaluation.
All of the common gastrointestinal conditions encountered by individuals with typical neurologic development are also present in individuals with ASDs.
The communication impairments characteristic of ASDs may lead to unusual presentations of gastrointestinal disorders, including sleep disturbances and problem behaviors.
Caregivers and health care professionals should be alert to the presentation of atypical signs of common gastrointestinal disorders in patients with ASDs.
If a person with an ASD is on a restricted diet, professional supervision can help to identify and treat nutritional inadequacy.
Integrating behavioral and biomedical approaches can be advantageous in conceptualizing the role of pain as a setting event for problem behavior, facilitating diagnosis, and addressing residual pain symptoms to enhance quality of life.
Genetic assays should be included as part of the data to be collected in research protocols.
At present, there are inadequate data to establish a causal role for intestinal inflammation, increased intestinal permeability, immunologic abnormalities, or food allergies in ASDs.

Source: Evaluation, Diagnosis, and Treatment of Gastrointestinal Disorders in Individuals With ASDs: A Consensus Report. Timothy Buie, Daniel B. Campbell, George J. Fuchs, III, Glenn T. Furuta, Joseph, et al. Pediatrics 2010;125;S1-S18

The Take Home Message

As a parent, if you suspect that your child may have gastrointestinal problems or shows any of the above symptoms it would be highly advisable to have your child professionally assessed. If your paediatrician or other health-care professional dismisses your concerns, find one that will take your concerns about your child seriously.

As a health professional, do not dismiss treatable underlying conditions (as listed in the tables above) as being "autistic traits". Recent research is confirming that there are underlying medical issues that may be making the child miserable. Referral to someone that specialises in assessing and treating these issues will result in a much calmer and happier child who will be more receptive to and make greater gains from any ongoing therapies.

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