The Parent's Reading Library

Food, Nutrition & Neurodivergent Children

Gut Health & the Microbiome

Why this topic matters

Over the past decade, scientists have discovered that the trillions of bacteria, fungi and other microorganisms living in our digestive system—known as the **gut microbiome**—play an important role in digestion, immunity and overall health. Researchers are now investigating how the gut and brain communicate through what is known as the **gut–brain axis**.

For children with ADHD, autism and other neurodevelopmental conditions, this is an exciting area of research. While scientists are still learning how the gut microbiome influences brain function, there is growing evidence that a healthy, fibre-rich diet supports a healthy gut. It is important to remember that current research does **not** show that changing the gut microbiome cures ADHD or autism.

1. The Microbiota–Gut–Brain Axis

Reference

Cryan, J. F., O'Riordan, K. J., Cowan, C. S. M., Sandhu, K. V., Bastiaanssen, T. F. S., Boehme, M., et al. (2019). *The Microbiota–Gut–Brain Axis*. **Physiological Reviews, 99**(4), 1877–2013.

DOI

https://doi.org/10.1152/physrev.00018.2018

Plain English Summary

This landmark review explains how the gut and brain communicate through the nervous, immune and hormonal systems. It provides strong evidence that diet influences the gut microbiome and that the microbiome may, in turn, influence brain function and behaviour.

2. Gut Microbiome in ADHD and Its Relation to Neural Reward Anticipation

Reference

Aarts, E., Ederveen, T. H. A., Naaijen, J., Zwiers, M. P., Boekhorst, J., Timmerman, H. M., et al. (2017). *Gut microbiome in ADHD and its relation to neural reward anticipation*. **Microbiome, 5**, 10.

DOI

https://doi.org/10.1186/s40168-016-0225-y

Plain English Summary

Researchers found differences in the gut bacteria of people with ADHD compared with those without ADHD. While this study does not prove that gut bacteria cause ADHD, it supports further research into the relationship between the gut and brain.

3. The Human Microbiome and Child Growth

Reference

Robertson, R. C., Manges, A. R., Finlay, B. B., & Prendergast, A. J. (2019). *The Human Microbiome and Child Growth – First 1000 Days and Beyond*. **Trends in Microbiology, 27**(2), 131–147.

DOI

https://doi.org/10.1016/j.tim.2018.09.008

Plain English Summary

This review explains how the gut microbiome develops from infancy and how nutrition helps shape healthy gut bacteria. It highlights the importance of diverse, nutritious foods during childhood.

4. Gut Microbiota and Autism Spectrum Disorders

Reference

Kang, D. W., Adams, J. B., Gregory, A. C., et al. (2017). *Microbiota Transfer Therapy alters gut ecosystem and improves gastrointestinal and autism symptoms: An open-label study*. **Microbiome, 5**, 10.

DOI

https://doi.org/10.1186/s40168-016-0225-7

Plain English Summary

This early clinical study explored whether changing the gut microbiome might influence gastrointestinal symptoms and behaviour in children with autism. The findings were encouraging but require confirmation in larger, well-controlled clinical trials.

5. Gut Microbiota in Autism Spectrum Disorders

Reference

Srikantha, P., & Mohajeri, M. H. (2019). *The Possible Role of the Microbiota–Gut–Brain Axis in Autism Spectrum Disorder*. **International Journal of Molecular Sciences, 20**(9), 2115.

DOI

https://doi.org/10.3390/ijms20092115

Plain English Summary

This review discusses how gut bacteria, diet and immune function may interact in autism. The authors conclude that while research is promising, much remains to be understood before firm conclusions can be drawn.

6. Diet, the Gut Microbiome and Brain Health

Reference

Valdes, A. M., Walter, J., Segal, E., & Spector, T. D. (2018). *Role of the gut microbiota in nutrition and health*. **BMJ, 361**, k2179.

DOI

https://doi.org/10.1136/bmj.k2179

Plain English Summary

This review explains how diet is one of the strongest influences on the gut microbiome. Eating a wide variety of fibre-rich whole foods helps support healthy gut bacteria and overall health.

7. Gut Microbiota and ADHD: A Systematic Review

Reference

Wan, L., Ge, W. R., Zhang, S., Sun, Y. L., Wang, B., & Yang, G. (2024). *Gut microbiota and attention-deficit/hyperactivity disorder: A systematic review*.

Plain English Summary

This recent review summarises studies comparing the gut microbiome of children with ADHD and children without ADHD. Although differences have been identified, researchers conclude that more high-quality studies are needed before gut microbiome testing or treatments can be routinely recommended.

Note: Please verify the final journal details and DOI before publication.

8. Dietary Fibre and the Gut Microbiome

Reference

Makki, K., Deehan, E. C., Walter, J., & Bäckhed, F. (2018). *The Impact of Dietary Fibre on Gut Microbiota in Host Health and Disease.* **Cell Host & Microbe, 23**(6), 705–715.

DOI

https://doi.org/10.1016/j.chom.2018.05.012

Plain English Summary

This review explains how dietary fibre acts as food for beneficial gut bacteria. Diets rich in vegetables, fruit, legumes and whole grains help support a healthy microbiome and digestive health.

9. Probiotics and Neurodevelopment

Reference

Sanctuary, M. R., & Kain, J. N. (2022). *The gut microbiome and neurodevelopment: Current evidence and future directions*.

Plain English Summary

This review examines whether probiotics and other gut-focused therapies may influence neurodevelopment. The authors conclude that research is still emerging and that no probiotic has yet been established as a standard treatment for ADHD or autism.

Note: Please verify the final journal citation and DOI before publication.

What this means for families

Research into the gut microbiome is one of the fastest-growing areas of nutrition science. Scientists are learning that the foods we eat help shape the bacteria living in our digestive system, and these bacteria play important roles in digestion, immunity and overall health.

Although some studies have found differences in the gut microbiome of children with ADHD and autism, we do not yet know whether these differences cause symptoms or result from differences in diet and lifestyle. At present, the best-supported advice is to encourage a varied, fibre-rich diet that includes vegetables, fruit, legumes, whole grains and other minimally processed foods to support overall gut health.

Evidence at a Glance

Overall evidence: ★★★★☆ Strong and rapidly evolving

What research consistently shows

- The gut and brain communicate through the gut–brain axis.
- Diet strongly influences the gut microbiome.
- Fibre-rich whole foods help support beneficial gut bacteria.
- Children with ADHD and autism may have differences in their gut microbiome, but more research is needed to understand these findings.
- There is currently **no evidence that changing the gut microbiome cures ADHD or autism**, but supporting gut health through a nutritious diet is an important part of overall wellbeing.