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Thursday, June 10, 2021

Room 1

08:30 AM - 10:30 AM WS #5: Integrative Medicine Masterclass - Part 1

11:00 AM - 01:00 PM WS #13: Integrative Medicine Masterclass - Part 2

02:00 PM - 04:00 PM WS #20: Integrative Medicine Masterclass - Part 3

04:30 PM - 06:30 PM WS #27: Integrative Medicine Masterclass - Part 4

Autism

How can we help?

Dr Debbie Fewtrell

MB ChB, Dip Obs, RNZCGP, FACNEM

June 2021

OVERVIEW

1. Nutritional interventions – Fe, Zn, Vit D, Omega 3
2. Diet – Gluten free casein free
3. GI assessment in ASD
4. Sleep –melatonin

- ASD's diagnostic features
 - Issues with speech and communication and social interaction
 - Restrictive and repetitive and ritualised behaviours, stimming
 - Restricted interests and excessive resistance to change and need for routines

Autism spectrum – a complex disorder:
There are simple interventions that may help the child



JAMA Netw Open. 2018;1(2):e180279. doi:10.1001/jamanetworkopen.2018.0279

Autism Rates

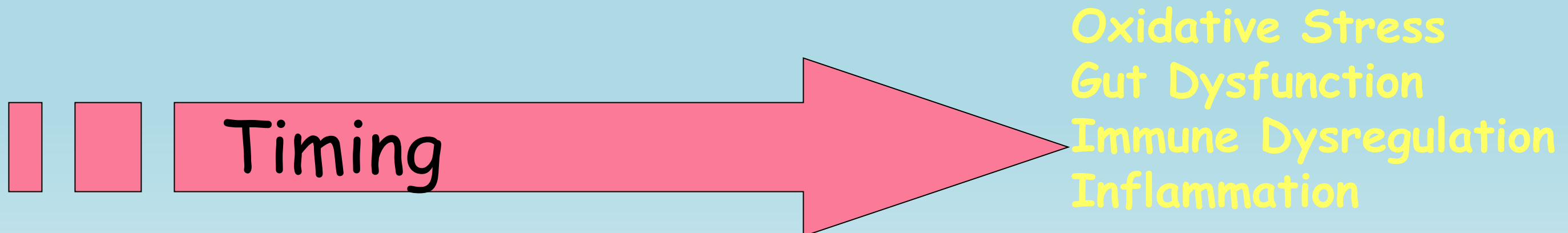
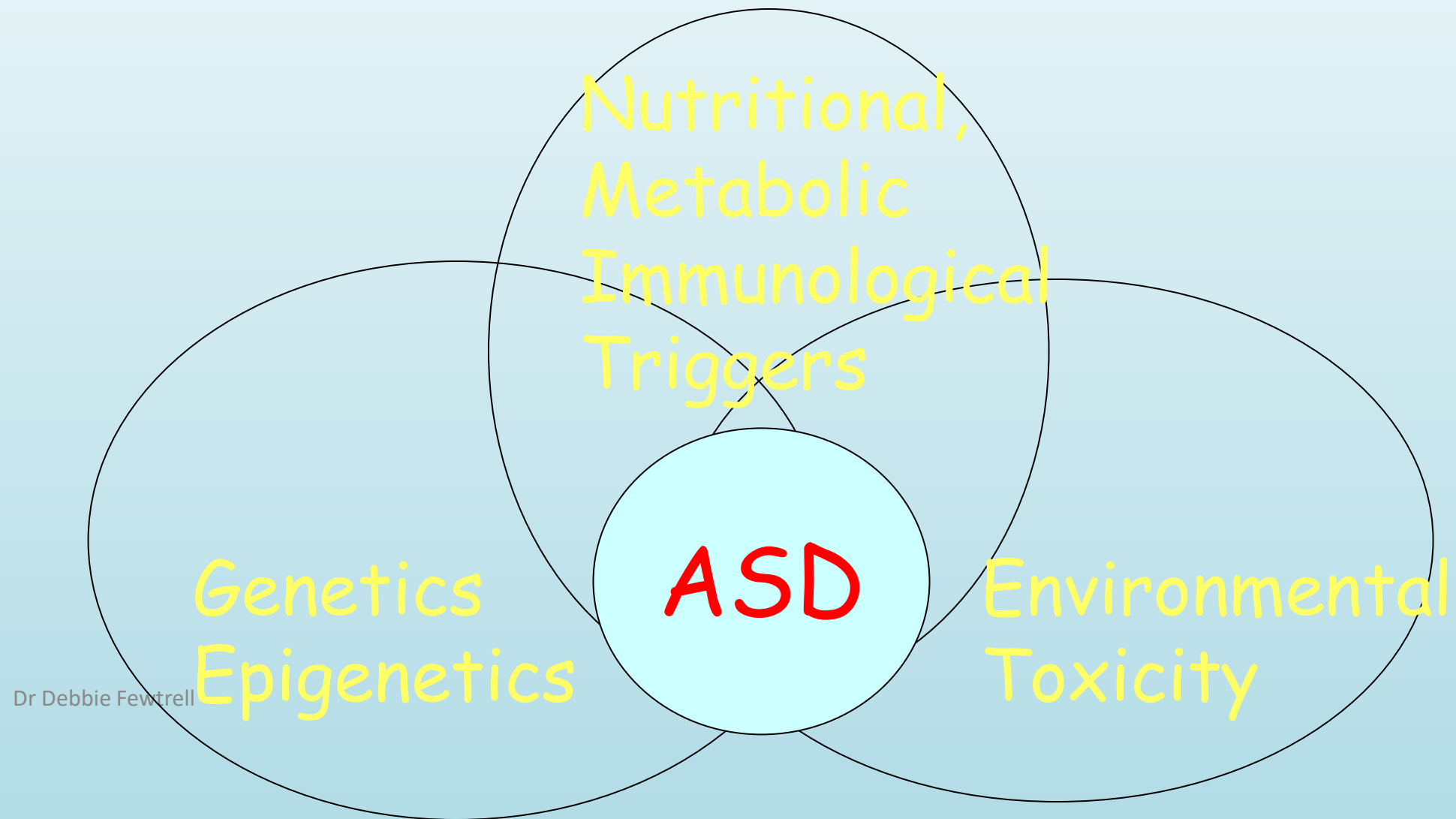


- Increase in cases of autism in USA from 1:2500 in 1990 to 1:68 in 2012. In 2015 1:45 children between aged 3-17 years has ASD dx
- 1 in 36 children(2.76%) (95% CI, 2.20%-3.31%) in 2016 USA
- Prevalence of Autism Spectrum Disorder Among US Children and Adolescents, 2014-2016
- [Guifeng Xu, MD¹](#); [Lane Strathearn, MBBS, PhD²](#); [Buyun Liu, MD, PhD¹](#); et al [Wei Bao, MD, PhD¹](#)
- Author Affiliations [Article Information](#)
- JAMA. 2018

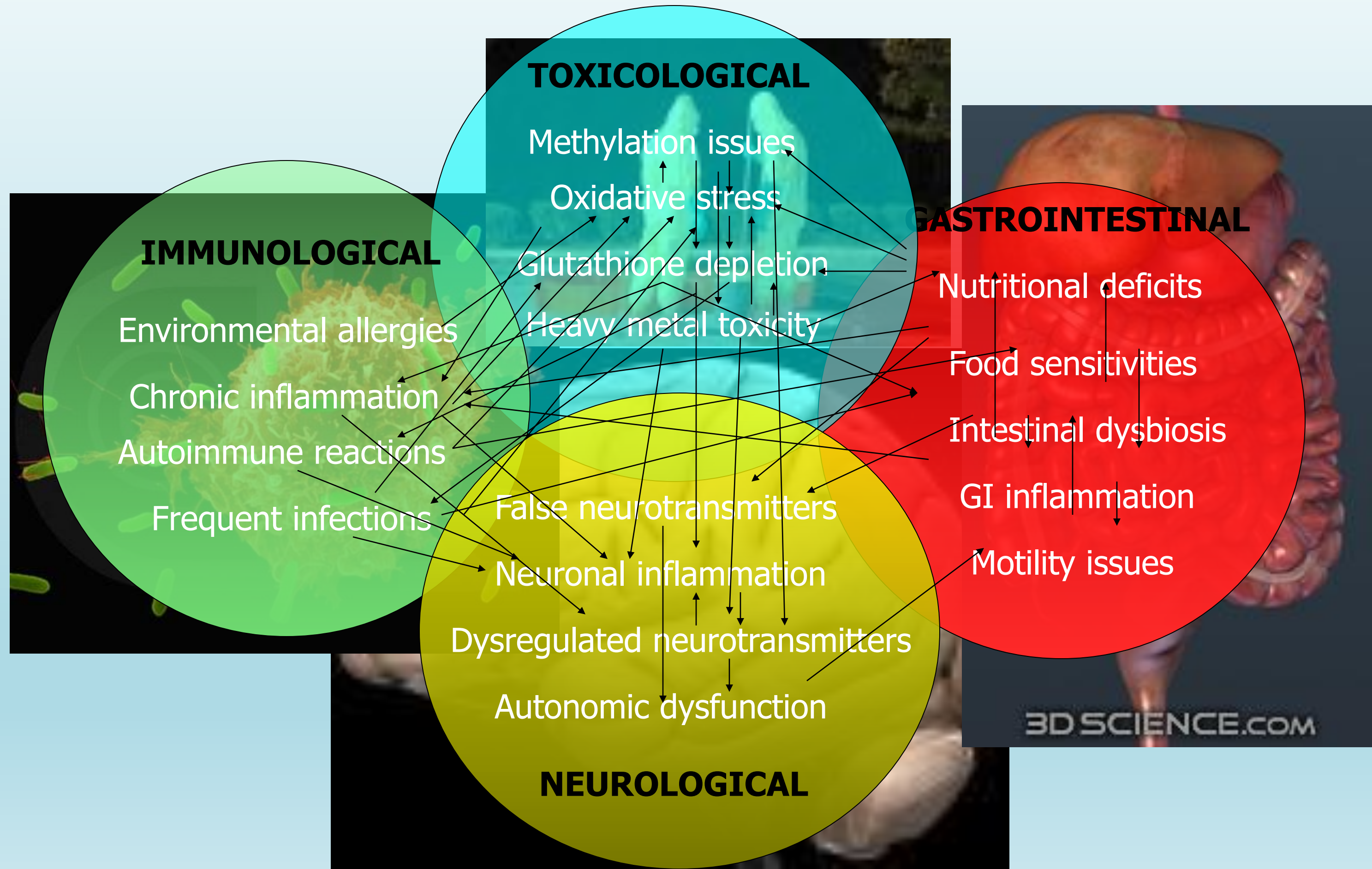
Higher rates in Maori than European

Causes: genetic 38% and environmental 58%

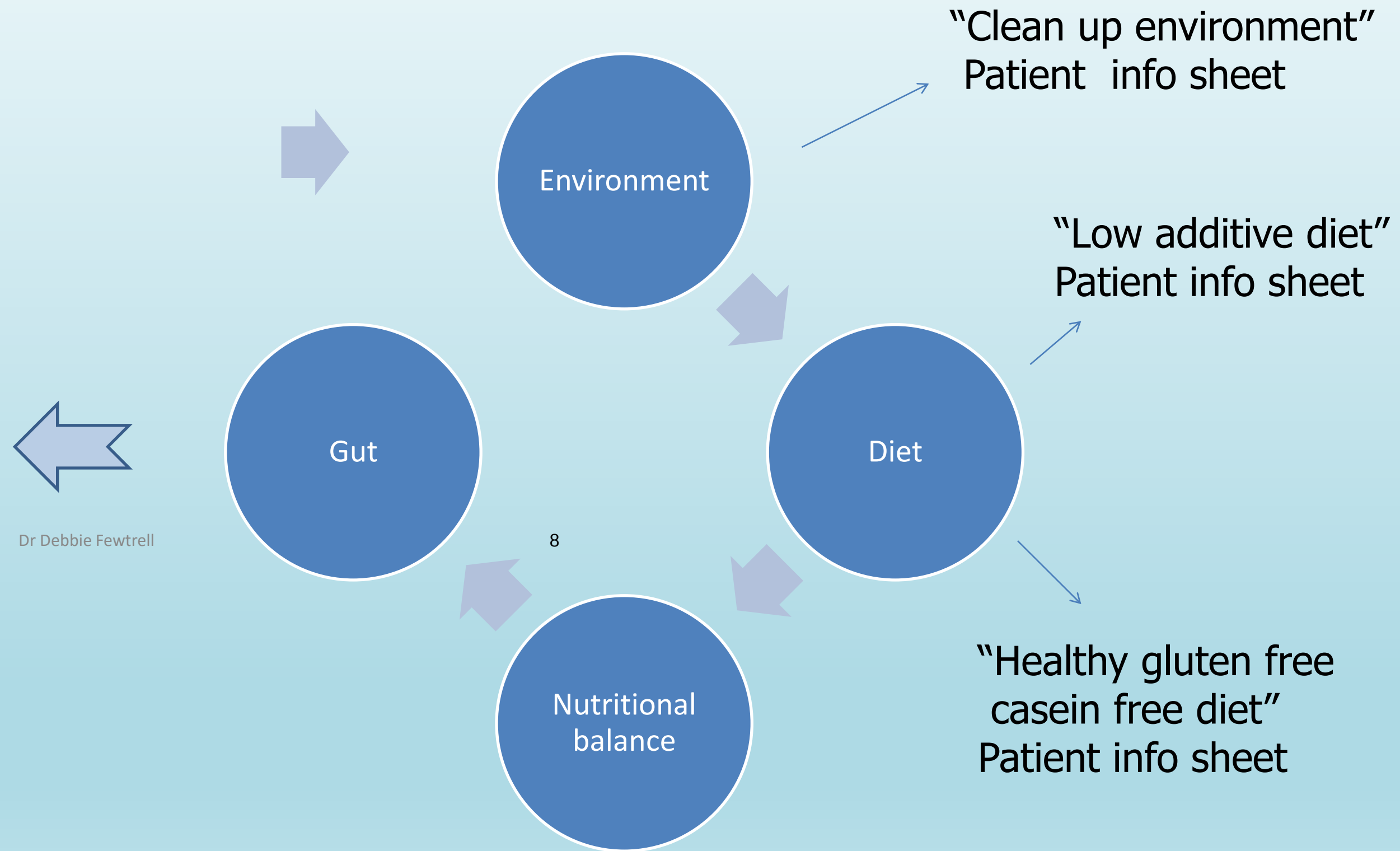
Causation Theories and the Web of Interactions



The autism web



Simplistic approach to ASD



Complex spectrum but there are some simple steps that may help

- - Clean up environment
- Assess nutrient deficiencies and supply missing nutrients
 - Fe, Zn,
 - vitamin D
 - Omega 3
- Trial of gluten and casein free diet
- Assess GI problems – constipation, diarrhoea , pain and treat
 - Treat as you would a neurotypical child!



Cleaning products

Sprays/fragrances

Water purity

Building chemicals

Air purity

10

Clothing

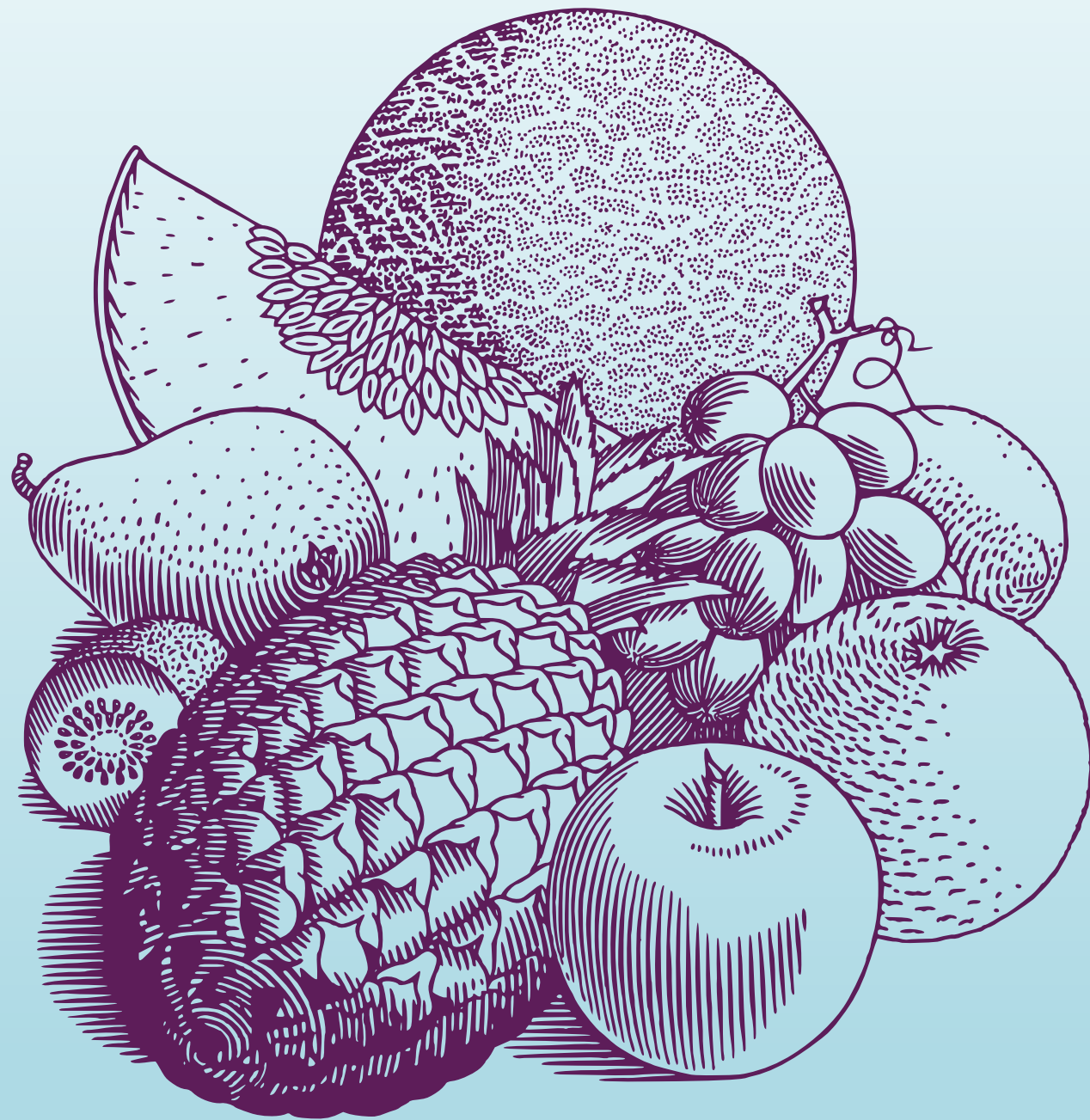
Heavy metals

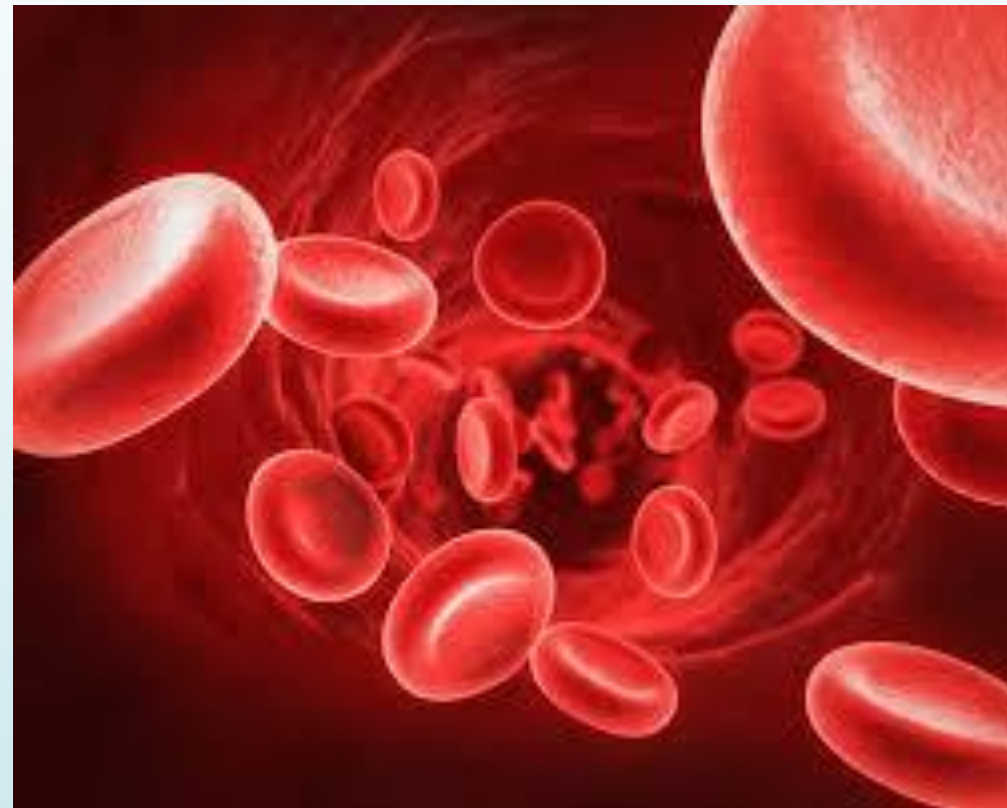
Medications

Developmental origins of
disease. Consensus
PPTOX 2012

NUTRITIONAL INTERVENTIONS

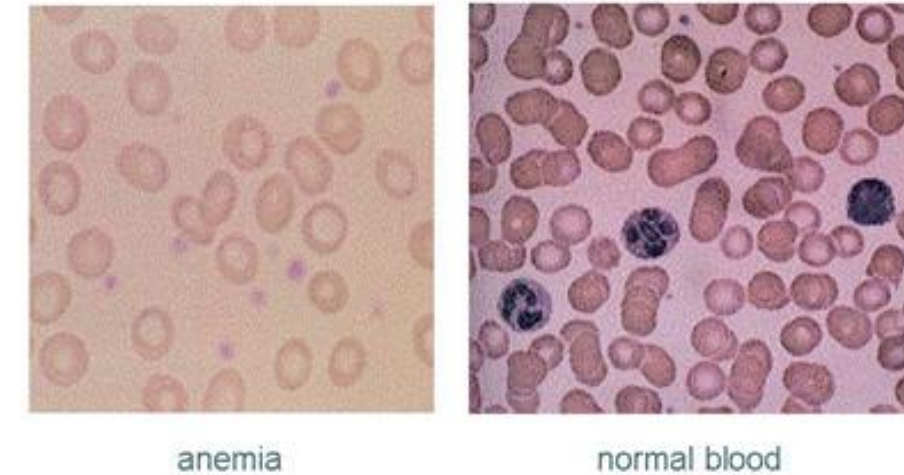
- Are they safe?
- Are they effective?
- Are they available?
- What is the evidence?





IRON

Iron Deficiency Anemia



- Low iron: pale, tired child, no energy
- Very common deficiency
- Low iron can cause problems with
 - Development (if iron low in first year)
 - Focus, attention and hyperactivity
- Sleep problems – trouble falling asleep, waking in the night
- Fingernails spoon shaped – koilonychia



IRON



- Meats especially liver
- Plant sources non-heme iron - most people consume more non-heme iron: legumes, dark green vegetables, enriched cereals
- Increased absorption with vitamin C

Which deficiency ?



ZINC DEFICIENCY

- Frequent infections: ears, throat, skin...
- Irritable child
- Poor memory, slow processing
- Poor appetite or very restricted diet
- Acne
- White spots on nails
- Stretch marks
- Poor growth

Food source: whole grains, meat, seeds

Testing not great for mild deficiency.



Vitamin D

Randomized controlled trial of vitamin D supplementation in children with autism spectrum disorder

**Khaled Saad,¹ Ahmed A. Abdel-Rahman,² Yasser M. Elserogy,² Abdulrahman A. Al-Atram,³
Amira A. El-Houfey,⁴ Hisham A. K. Othman,⁵ Geir Bjørklund,⁶ Feiyong Jia,⁷
Mauricio A. Urbina,^{8,9} Mohamed Gamil M. Abo-Elela,¹⁰ Faisal-Alkhateeb Ahmad,¹
Khaled A. Abd El-Baseer,¹⁰ Ahmed E. Ahmed,¹⁰ and Ahmad M. Abdel-Salam¹¹**

- Most children on the spectrum are low
- Treatment for 4 months
- Supplements improve autism symptoms esp if ended up with level > 100nmol/L



VITAMIN D

- Conclusion of Meta-analysis 2020 Song et al:

Vitamin D supplementation improves the typical symptoms of autism spectrum disorder, as indicated by reduced Social Responsiveness Scale and Child Autism Rating Scale scores; thus, it is **beneficial for children with autism spectrum disorder**.

- Vitamin D deficiency during pregnancy and childhood: known risk factor for developing ASD

Mechanism-

- Reduces inflammation
- Production of neurotransmitters: serotonin
- Neuroplasticity

OMEGA 3 fatty acids

Keratosis pilaris, bumpy, dry skin on upper arms: low EFA



Omega 3 fatty acids:



- 50-60% of brain made up of lipids
- 35% of those lipids are HUFA – highly unsaturated fatty acids
- Essential - not produced by humans – have to be ingested
- Signs of low omega 3 in children:
 - I. Problems with focus and attention
 - II. Low mood; mood swings
 - III. Fatigue
 - IV. Poor memory
 - V. Aggression and violent behaviour
 - VI. Suppressed immunity
 - VII. Increased auto-immunity

OMEGA 3

- Omega 3 needed for brain structure and function
 - EPA antiinflammatory
 - DHA neuroprotective
- Omega 3: low dose studies show moderate improvement: speech, sociability, repetitive behaviours
- Need more than 3 months Rx

Suggested treatments for deficiencies

	Aim	Dose if deficient	Recheck	
Zinc	12-20umol/L	1 mg/kg	3 months Clinical assessment	Zinc chelate, picolinate, gluconate Avoid zinc oxide and sulphate
Vitamin D	50-150nmol/L	Mild (30-49)- 2000iu/day Mod-severe (<30) 4000iu/day or equivalent	3-6 months	
Ferritin	>35	Usual approach	3 months	
Fish oil	Monitor clinical response	5 mls twice daily (20Kg child)	By observation	

Dietary interventions for autism:

- Some diets seem to work clinically for some children
 - Organic diet
 - Additive free diet
 - Gluten free casein free diet
- Proposed mechanism of action:
 - Abnormal gut flora
 - GI inflammation
 - Opioid theory
 - Mitochondrial dysfunction



Increased risk of food allergies in children with autism

The odds ratio (OR) of ASD increased in association with

- food allergy (OR, 2.29; 95% CI, 1.87-2.81),
- respiratory allergy (OR, 1.28; 95% CI, 1.10-1.50), and
- skin allergy (OR, 1.50; 95% CI, 1.28-1.77)

when comparing children with these conditions and those without.

Association of Food Allergy and Other Allergic Conditions With Autism Spectrum Disorder in Children 2019 [Guifeng Xu](#), JAMA Netw Open. 2018;1(2):e180279.
doi:10.1001/jamanetworkopen.2018.0279

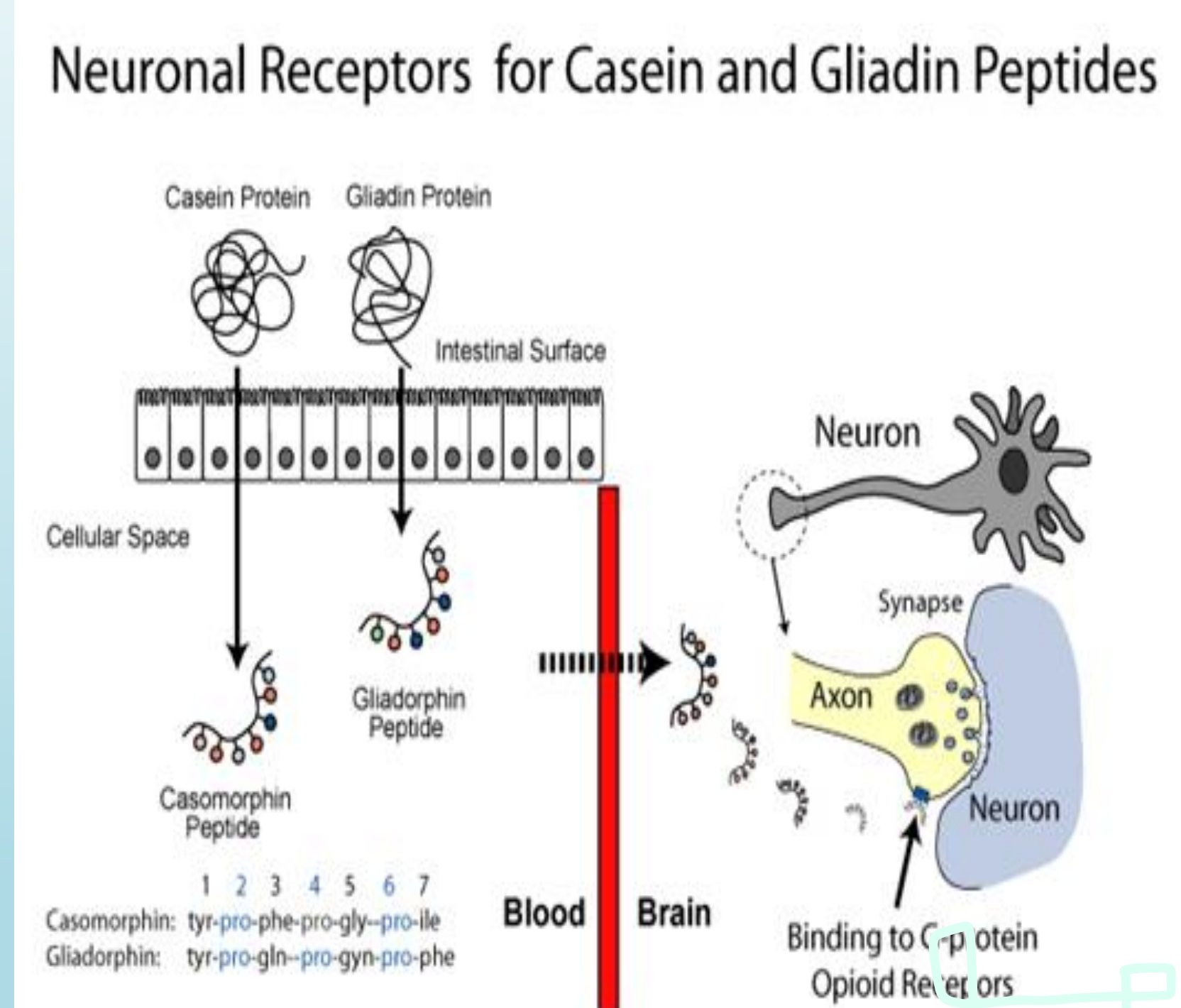
How to test ?

Difficulty with dietary research

- Research is very limited – and hard to do
- Diet has to be kept 100% all of the time
- How to ensure that?
- Subset of children with more GI problems more likely to respond
- Can take 3-6 months to see full response

SPECIAL DIET –Gluten free Casein Free

- Gluten and dairy free diet
 - Peptides with endorphin/opioid effect
 - ↑ oxidative stress and inflammation
 - Best responders have GI symptoms



GFCF diet – Gut-Peptide theory

- Peptides are short chains of amino acids derived from incomplete digestion of proteins especially -gluten (wheat, oat, rye and barley)
-casein (milk protein)
- Interfere with neurotransmission in brain
perception- opiate-like activity
behaviour
mood
emotion



Diet

Opioid Peptide Theory

- Abnormal peptides can be measured in the urine of many ASD kids
- Insufficient gut enzyme DPP4 in intestinal brush border
- Inability to fully digest gluten and casein
- Gluteomorphine and caseomorphine with opioid activity cross into the blood stream and into the brain and attach to endorphine receptors
- Opioids from gluten and casein cause behaviour changes in rats
- Removing offending proteins from diet may help

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LATEST META-ANALYSIS OF GFCF DIET: OCT 2020

- 9 RCT were included (521 participants) with age range between 2 to 18 years. Four of these studies did not show a significant improvement regarding the symptoms of ASD. The rest of these studies (n=5) showed improvement in communication, stereotyped movements, aggressiveness, language, hyperactivity, tantrums, and signs of attention deficit hyperactivity disorder compared to control group.
- The studies that showed a benefit were >12 months long; the negative studies 12 weeks - *Alamri, 2020*

Considerations

- Nutrient density – some children eat GFCF junk food diet
- Diet needs to be unprocessed, whole food based, with plenty of vegetables
- Calcium intake may be a concern in dairy free diets



GI DISORDERS - THE GUT - BRAIN AXIS

- GI disorders are common in children with ASD
- Severity of GI symptoms correlates with ASD behaviours
- Abnormal microbiome
 - Endotoxins cause inflammation
- Diarrhoea reduces absorption of nutrients
- Constipation may cause pain and reduce appetite

Increased risk of GI problems in children with autism

- Meta-analysis 2014: About 4 fold increase in gastrointestinal symptoms, diarrhoea and constipation
 - Increased behaviour problems in ASD children with GI problems
 - Autism symptom severity correlated with higher odds of GI problems
-
- McElhanon BO, McCracken C, Karpen S, Sharp WG. Pediatrics. Gastrointestinal symptoms in autism spectrum disorder: a meta-analysis. 2014 May; 133(5):872-83.
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 - Wang LW, Tancredi DJ, Thomas DW. The prevalence of gastrointestinal problems in children across the United States with autism spectrum disorders from families with multiple affected members. J Dev Behav Pediatr. 2011;32(5):351–360.

Symptoms of gastro-intestinal problems in children with ASD



Abdominal pain

- Crying
- Unexplained tantrums
- Night time waking
- General irritability
- Vocalizing complaints
- Posturing
- Irritability just prior to bowel movement
- Hyperactivity and distractibility
- Self injurious behavior

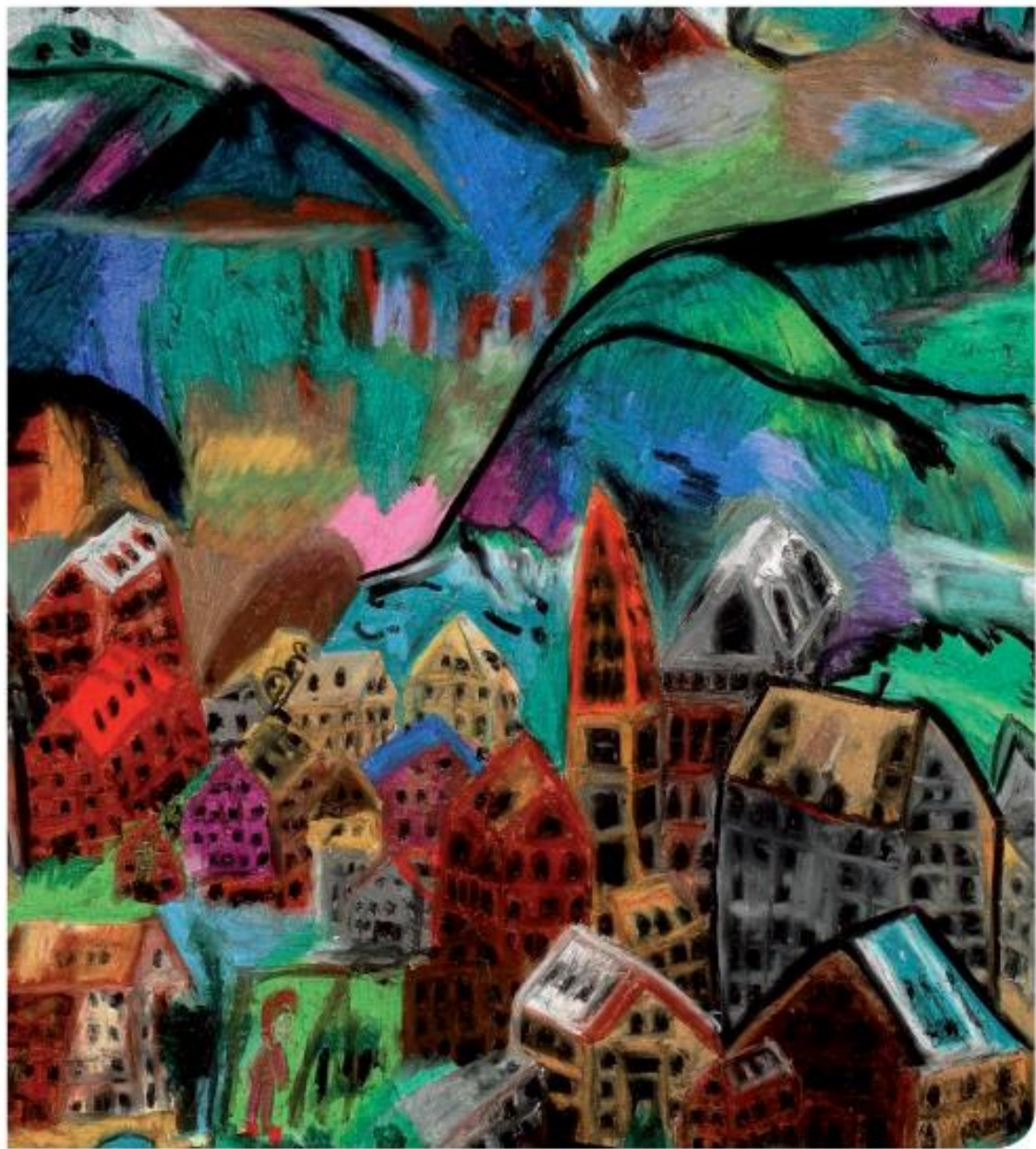
Pediatrics

January 2010, VOLUME 125 / ISSUE Supplement 1

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 Levy, Judy VandeWater, Agnes H. Whitaker, Dan Atkins, Margaret L. Bauman, Arthur L. Beaudet, Edward G. Carr, Michael D. Gershon, Susan L. Hyman, Pipop Jirapinyo, Harumi Jyonouchi, Koorosh Kooros, Rafail Kushak, Pat Levitt, Susan E. Levy, Jeffery D. Lewis, Katherine F. Murray, Marvin R. Natowicz, Aderbal Sabra, Barry K. Wershil, Sharon C. Weston, Lonnie Zeltzer, Harland Winter

New Zealand
Autism Spectrum Disorder
Guideline



New recommendations relevant to gastrointestinal problems in children and young people with ASD

Reference	New recommendations	Grade
4.1.4a	Gastrointestinal problems, specifically constipation, chronic diarrhoea, altered bowel habits, and encopresis (faecal soiling), are more common in children and young people with ASD compared with typically developing peers.	B
4.1.4b	Children and young people with ASD should have a full evaluation that includes a thorough assessment of gastrointestinal function. Some children, particularly those with social communication difficulties, may have atypical presentations such as increased anxiety, irritability, disordered sleep patterns, and unusual vocalisations and movements.	C

Faecal retention

- Approximately 50% of ASD children
- Incomplete emptying of the bowel
- Child may still “go” daily
- May have alternating constipation and diarrhoea
- Sometimes dramatic improvements in ASD behaviour when treated.



Treating constipation



36

- Clean 'em out
- Magnesium oxide
- Vitamin C
- Increased fiber
- Diet changes

Sleep

Revised recommendations	Grade
4.4.7 Melatonin may be useful for improving sleep in children with ASD who have impaired sleep. Living guidelines group recommendation 2014 <i>Changed to:</i> 4.4.7 Melatonin can be recommended for use in children and young people with ASD who are experiencing significant sleep problems.	B
New recommendations	Grade
4.4.7a Benefits and adverse effects of longer term treatment of melatonin require further investigation.	C
4.4.7b Behavioural strategies (eg, sleep hygiene) should always be used in conjunction with melatonin.	C

Placebo controlled double blind trial – 13 weeks
2-17

Schroder, C. M., Malow, B. A., Maras, A., Melmed, R. D., Findling, R. L., Breddy, J., Nir, T., Shahmoon, S., Zisapel, N., & Gringras, P. (2019). Pediatric prolonged-release melatonin for sleep in children with autism spectrum disorder: Impact on child behavior and caregiver’s quality of life. *Journal of Autism and Developmental Disorders*, 49(8), 3218-3230. <https://doi.org/10.1007/s10803-019-04046-5>

Slow release melatonin in for sleep in ASD – Impact on ASD behaviour and caregivers quality of life

- Sleep issues more common in ASD
- Sleep hygiene addressed first
- Placebo controlled double blind trial – 13 weeks
- 2-17yrs – 125 subjects
- 2(-5)mg melatonin SR
- **54% improvement in treatment group- 27% in placebo**
- 1 hour longer sleep on average v placebo
- Fell asleep 40 mins quicker on average v placebo
- Particular improvement in hyperactivity and inattention
- Caregivers life improved



- Schroder, C. M., Malow, B. A., Maras, A., Melmed, R. D., Findling, R. L., Breddy, J., Nir, T., Shahmoon, S., Zisapel, N., & Gringras, P. (2019). Pediatric prolonged-release melatonin for sleep in children with autism spectrum disorder: Impact on child behavior and caregiver's quality of life. *Journal of Autism and Developmental Disorders*, 49(8), 3218-3230. <https://doi.org/10.1007/s10803-019-04046-5>

Sienna presenting picture

Age 3 (refs) ATEC 76

1. Head banging – bruises if didn't get her own way
2. Screaming episodes may last up to 30 mins
3. Sleep pattern – sleeping 7pm-2am

Symptom assessment

Stimming- rubbing soft ribbons, repetitive behaviour particularly with music

Poor eye contact

Sideways glancing

Speech delay particularly receptive

Echolalia

Scripting

Poor socialisation,

Dr Debbie Fewtrell

ACNEM Aug

Lack of imaginative play and inappropriate play

Will not eat all colours of food.

Poor fine and gross motor skills

Fidgety , inattentive

Poor wound healing

Not toilet trained – stool

Sienna

Past medical history

Pregnancy

Moderate stress

2 fish meals per week

Mother 8 amalgams- no dental work whilst pregnant

Painted house whilst pregnant

Some first trimester bleeding

Birth

Full term

LSCS foetal distress CPD

0-1

Exclusively breastfed 10 weeks then diary formula introduced with breast .

First solids 5 months

Reflux

Dry skin from birth

No antibiotics received.

Sienna

Age 1-3

No obvious regression just slow development in language

Dry skin continues

Food intolerances develop

Alternating diarrhoea and constipation – could go 3 days between bowel motions

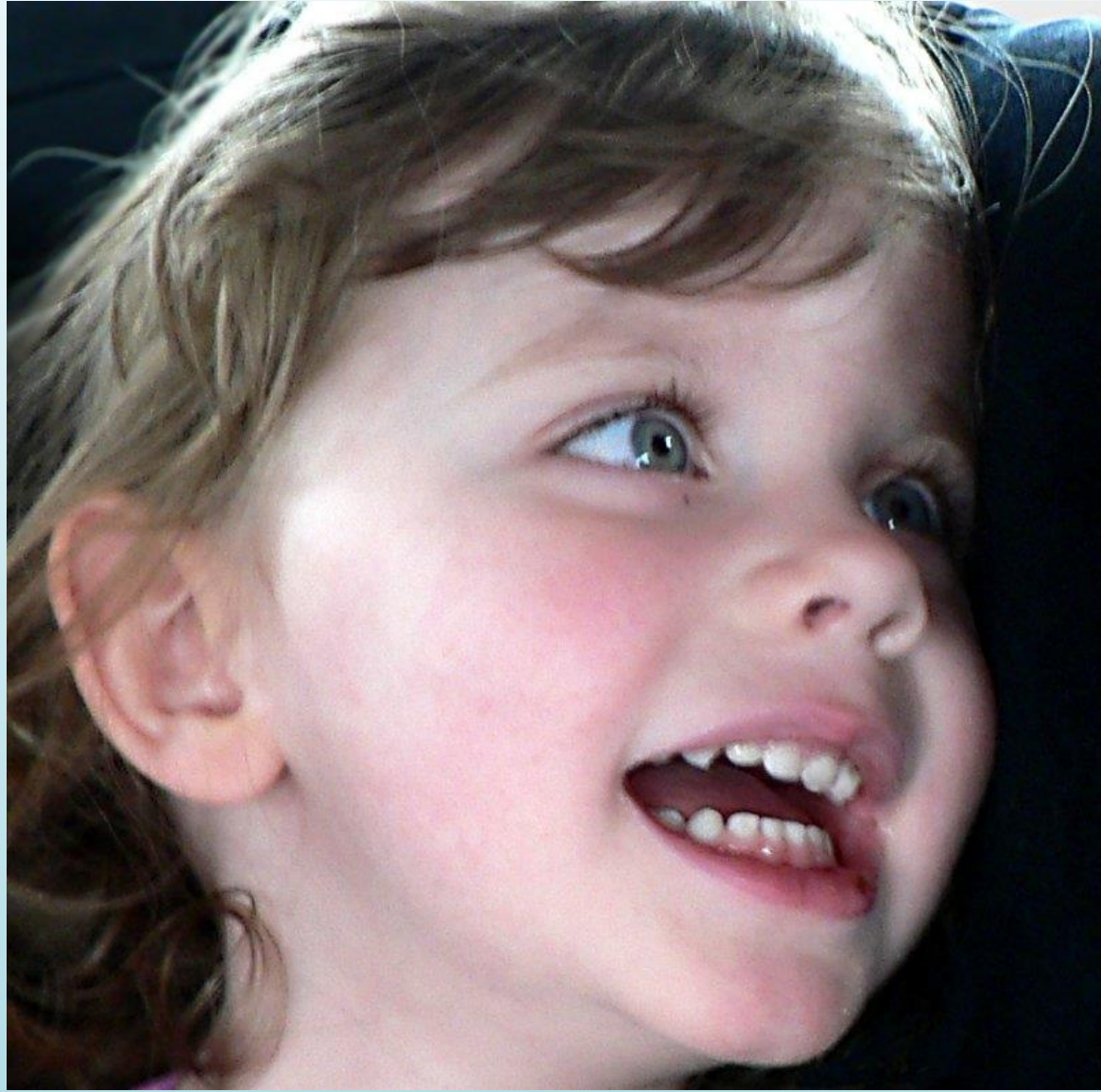
No significant illnesses or admission

Family History

Mother has food intolerances

Lives with mother and father in UK . Father – pop star

Younger sister neurotypical with some food intolerances



Sienna non-regressive ASD

Treatment 6 weeks GFCF + additive
free diet only

Before

- Few single labeling words
- BO every 3rd day, fowl loose
- Could only sit for 2 mins

After

- 200 words and 2 word sentences, “Hello Mummy”, counting 1-20, spelling “Amici
- BO daily , less offensive
- Able to sit for 30mins

Sienna ASD- the power of GFCF diet

- Pale doughy complexion, dark circles
- Tantrums at least daily lasting 30mins
- Minimal eye contact
- Rosier glow
- Tantrums alt days 5 mins
- Eye contact increased

Summary

- Nutritional interventions –
look for clinical signs
- Diet – consider gluten free casein free
- GI assessment in ASD – don't overlook
- Sleep !

Where do I learn more?

ACNEM

- Australasian College of Nutritional and Environmental Medicine
- www.acnem.org
- RNZCGP accredited education



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CONFERENCE**
Healthy Ageing



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