

Our soil influences society's brain health

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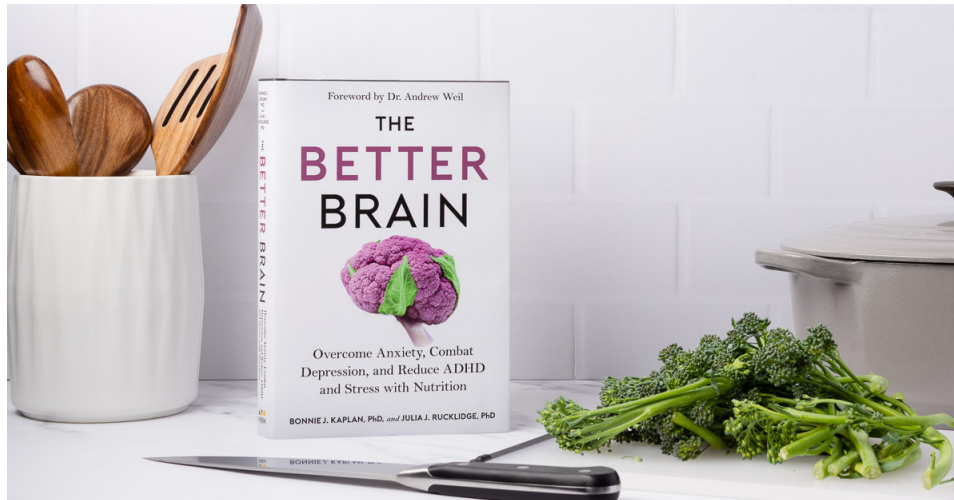
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Disclosure

- No commercial interest in any company or sale of any natural health product



UNIVERSITY OF
CALGARY

Alberta
Children's
HOSPITAL 
RESEARCH INSTITUTE 
FOR CHILD AND MATERNAL HEALTH

People's Home Library
(1910): practical
knowledge for North
American homesteaders

Treatments for everything
from minor burns up to
tuberculosis and heart
disease

The number one cause of
acquired insanity was
“imperfect nutrition”

My message today is:

What you do is VERY important
for the health of our brains



Prevalence of mental disorders

- **1% - prior to 1960**
- **3% - around 1960**
- **20% - now**

- **50% -- lifetime prevalence now**

Our brains



account for
 \approx **2%** of our
body weight
but,



represent
20-50% of our
metabolic
demands



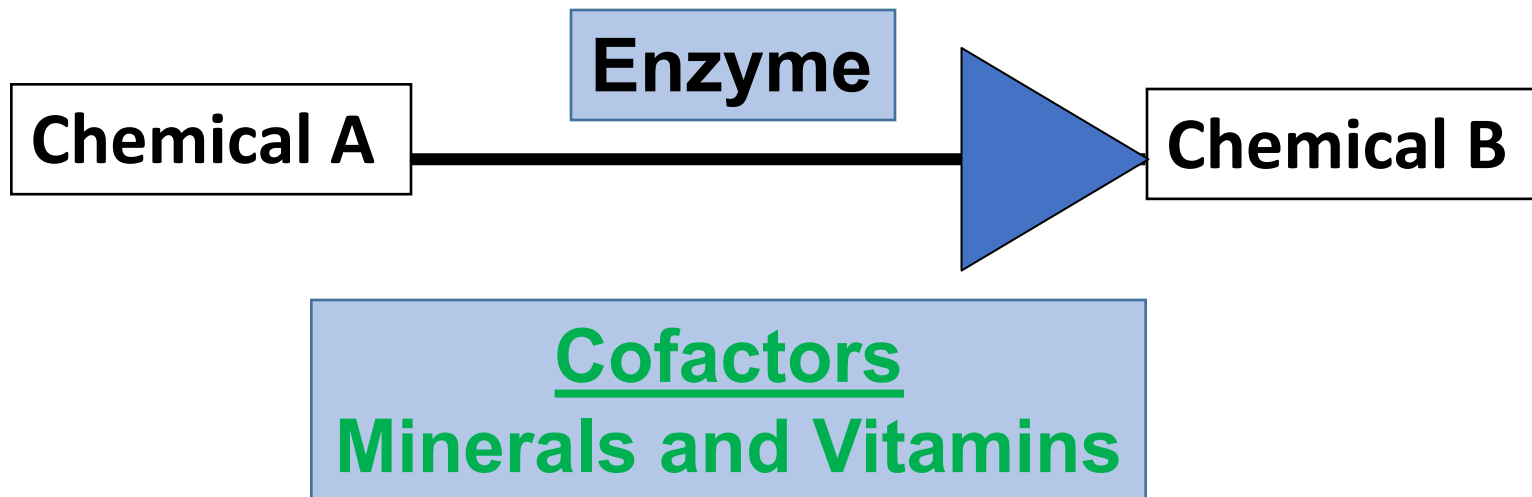


- Each of us has 4-6 liters of blood inside us
- ~1 liter passes through our brain every minute, carrying nutrients and oxygen especially

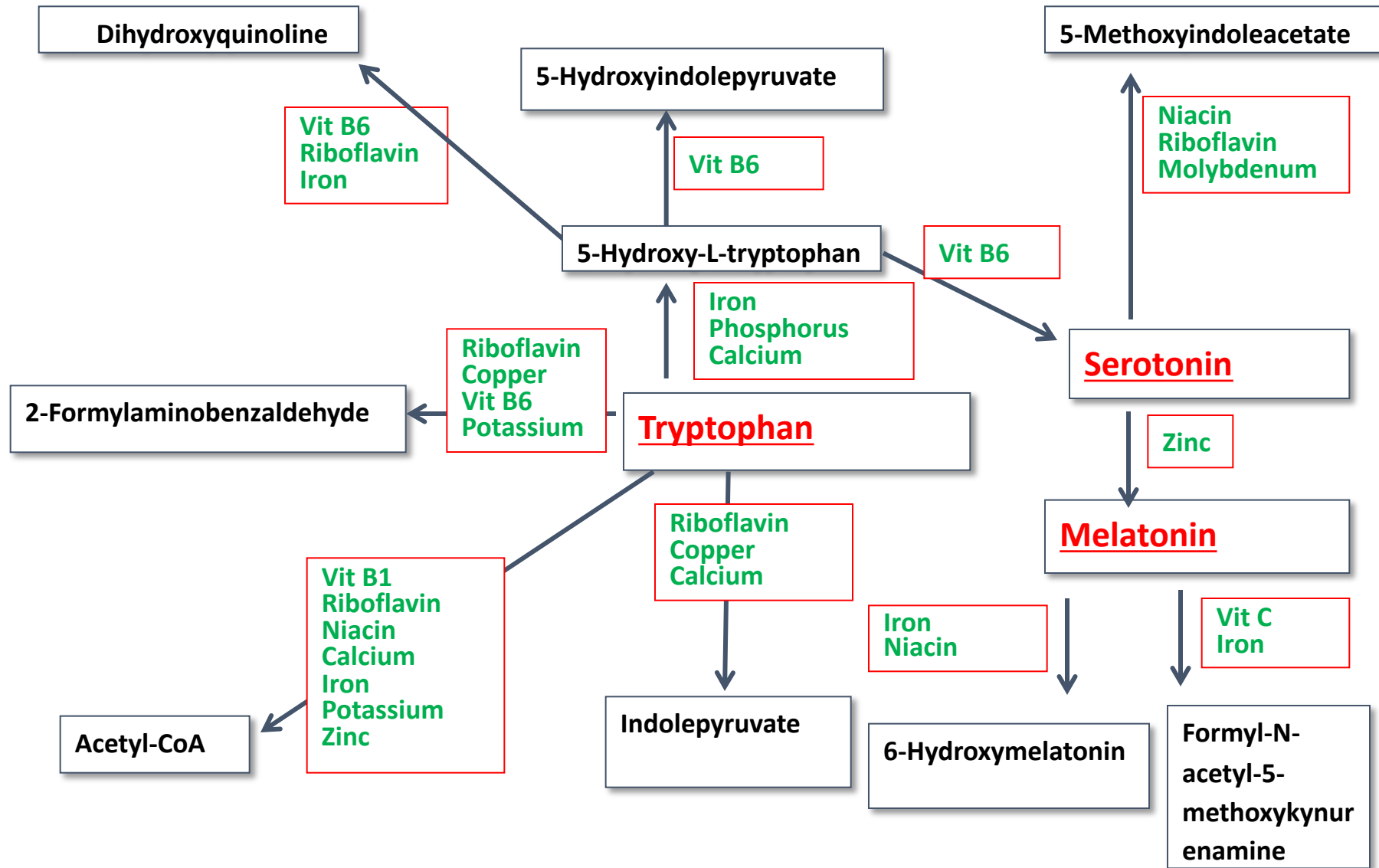


Why have we evolved to need so many nutrients every minute?

BRAIN METABOLISM.....the transformation of one compound to another



Abridged Tryptophan Metabolism









48% of the caloric intake of all Canadians
Data from 2004; Moubarac et al, *Appetite*, 2017



67% of the caloric intake of young Americans was
ultra-processed, as of 2018
Wang et al. *JAMA*, 2021

Wang L et al. Trends in Consumption of Ultraprocessed Foods Among US Youths Aged 2-19 Years, 1999-2018. *JAMA*. 2021;326(6):519–530.

from 10 cycles of the National Health and Nutrition Examination Survey (NHANES) from 1999-2000 to 2017-2018.

cross-sectional study of nationally representative data

33,795 US youths aged 2-19 years

percentage of total energy consumed from ultraprocessed foods now is 67.0%



57% of adult food intake was found to be ultra-processed

Filippa et al. 2021, *The American Journal of Clinical Nutrition*

Nutrition
is the
foundation
of our
physical and
mental
resilience

What happens to people
whose nutrient intake is
<50% of what it
should/could be?

What do these characteristics resemble?

- ✓ Depression
- ✓ Hysteria
- ✓ Irritability
- ✓ Self-mutilation
- ✓ Apathy, lethargy
- ✓ Social withdrawal
- ✓ Inability to concentrate

Suboptimal nutrition

Minnesota Starvation Experiments, 1950

6 months of nutrient deprivation, 50% of normal caloric/nutrient intake, in 36 normal healthy men:

- ✓ **Depression**
- ✓ **Hysteria**
- ✓ **Irritability**
- ✓ **Self-mutilation**
- ✓ **Apathy, lethargy**
- ✓ **Social withdrawal**
- ✓ **Inability to concentrate**

Depression



Poor food choices

Example of a prospective study
in children
to show direction of causality

Lowen et al., *Pediatrics*, 2019

3,436 children aged 10-11 yrs

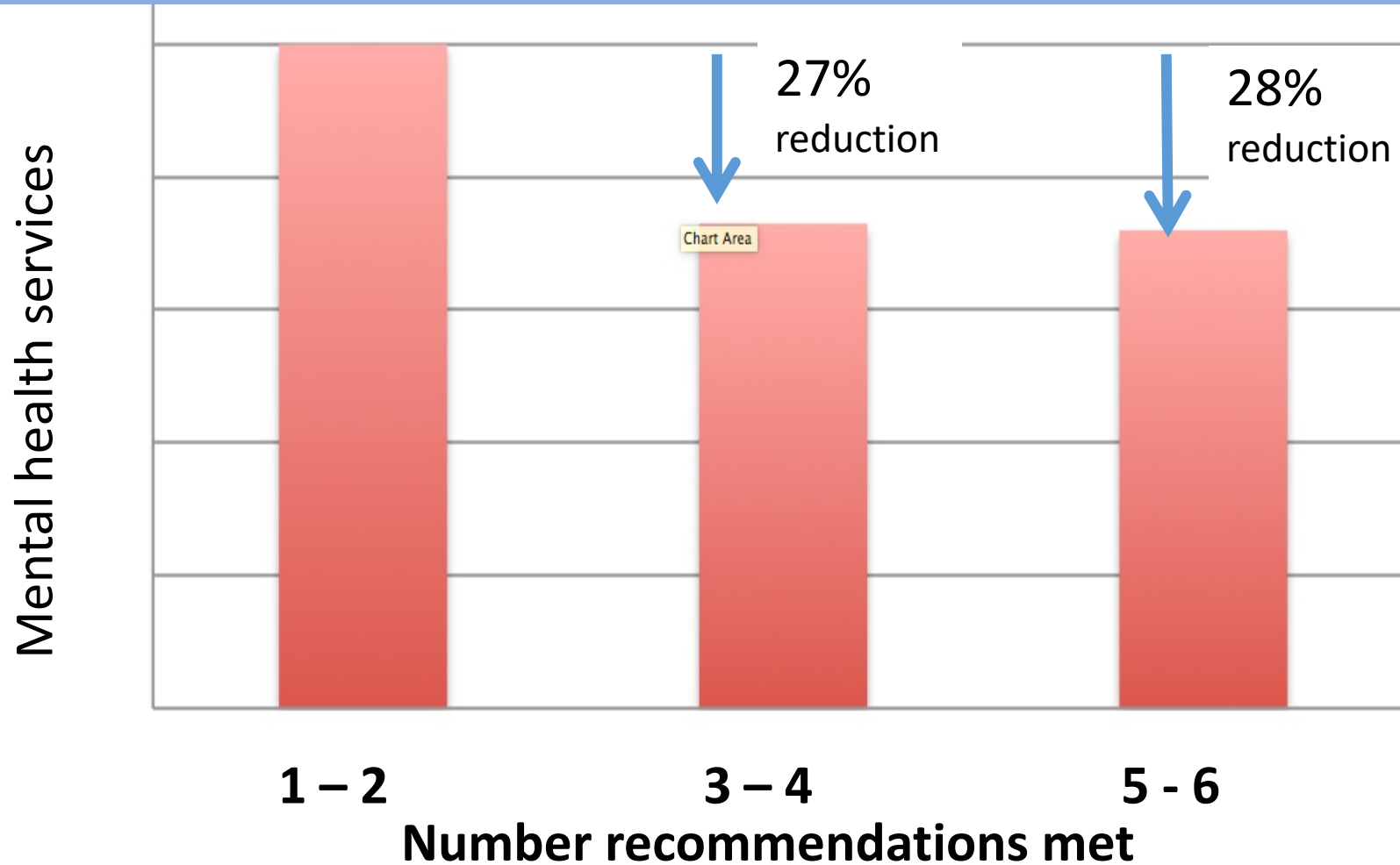
2011: dietary intake, screen time, physical activity

Children were divided according to how many of the **9 health recommendations** were met: **6/9 were dietary**

2011-14: Administrative health data provided *physician-diagnosed mental health conditions*

Dietary Recommendations and Mental Health

Loewen et al 2019 *Pediatrics*





**Every additional recommendation
that was met was associated with
15% fewer physician visits for
mental disorders**



Is it also important to consider nutrients in pill form?

- What about people who already eat a really healthy, whole food diet?
- Is nutrition relevant for *them*?

Scientifically, it is an important proof of principle



**A good diet might
not be sufficient
for optimal brain function**

- **1. Individual differences**

some people have a congenital need for more than the typical amount of cofactors for optimal enzymatic activity [Ames, *Am J Clin Nutr* 2002 – summary of 50]

- **2. Currently no test of what an individual 'brain' needs for optimal function!**

What is IMPERFECT for you may differ from what is IMPERFECT for me!

- **3. Impoverished soil**

Affects us all

Types of research using nutrients in pill form

More than 60 good studies

- Single nutrients – only modest effects – *ignore them*. *There are no single magic bullets for brain health!*
- “Favorite Few” – very little useful scientific data, *except for B Complex*
- **Broad-spectrum** (those ~30 minerals and vitamins that we should be getting from our food)

Multinutrient placebo-controlled RCTs directed at improving mental health symptoms

- Studies on aggression (5+ RCTs)
- Studies on autism (2+ RCTs)
- Studies on addiction (2+ RCTs)
- Studies on mood/PMS (19+ RCTs, 7- RCTs)
- Studies on stress (many B Complex; 8+ RCTs, 1- RCT)
- Studies on attention/hyperactivity/cognition (9+ RCTs, 2- RCTs)
- **COMMON THEME:** emotion regulation, lowering irritability, managing anger

$$45 \div 55 = 82\% +$$

Some *clinical*, some *nonclinical* populations

See Rucklidge & Kaplan, 2013 or Blampied et al., 2020, *Expert Reviews in Neurotherapeutics* for reviews

The MADDY Trial:

Micronutrients in ADD Youth

**Johnstone JM et al.,
2021, *J Am Acad Child
Adolesc Psychiatry***

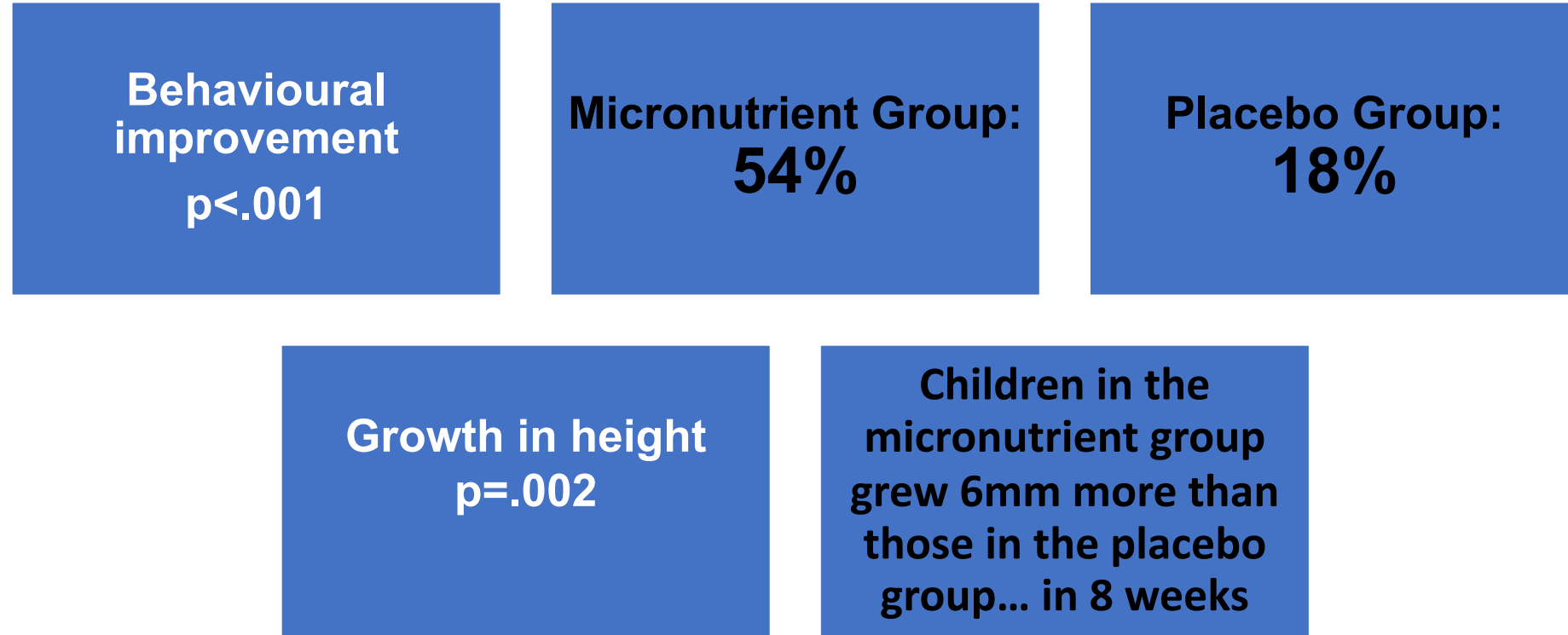
Replication and extension of previous blinded RCT in children with ADHD (Rucklidge et al. 2018, *J Child Psychol Psychiatry*)

Children aged 6-12 yrs, not medicated

ADHD and at least 1 impairing irritability symptom by parent report on the Child and Adolescent Symptom Inventory 5 (CASI-5)

3 centres, 2 countries: Oregon Health & Science Univ (OHSU), Ohio State University (OSU), Univ of Lethbridge (Canada)

Treatment responders*



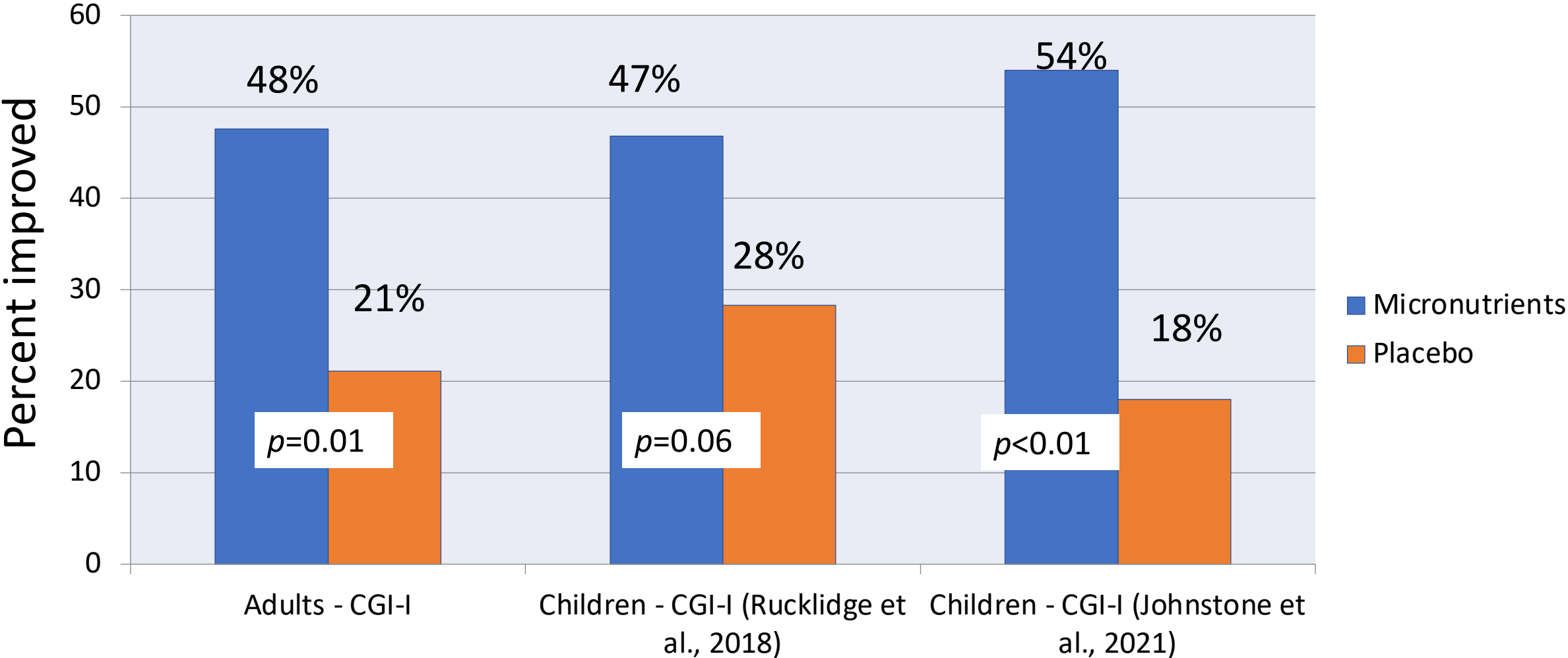
*Based on blinded clinician ratings on the CGI-I of 1 or 2, “much” or “very much” improved

Parent report not as supportive for overall ratings, but did reveal greater change in peer conflict for those in micronutrient group

Responders across 3 RCTs

Adults: Rucklidge et al., 2014, *BJP* (n=80)

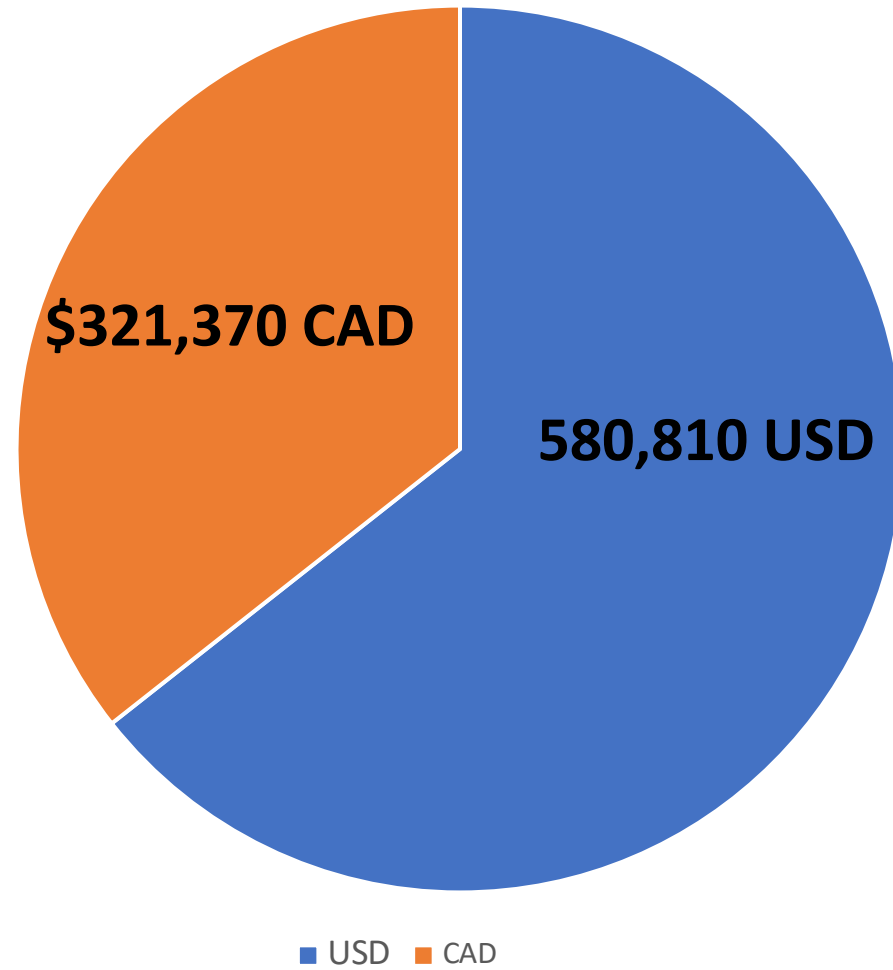
Children: Rucklidge et al., 2018, *JCPP* (n=93); Johnstone et al., 2021, *JAACAP* (n=126)



Biological Samples



Donations since 2016



Every mental health setting, every family practice, every elementary school, and *certainly every medical school* could **educate** about nutrition and mental health
INCLUDING THE IMPORTANCE OF HEALTHY SOIL

- Think of it as pre-treatment for every mental health referral
- Educate about whole foods, and about what the brain needs
- Teach about cofactors and brain metabolism
- Do workshops on how to decrease levels of processing
- Offer cooking classes!!
- Ask clients to track their \$\$\$ as they change their diet

And to save



Resources: 3 recent articles

For mental health clinicians

- Rucklidge JJ, Johnstone JM, Kaplan BJ. **Nutrition provides the essential foundation for optimizing mental health.** *Evidence-Based Practice in Child & Adolescent Mental Health* 2021; 6:1, 131-154. [email me if you cannot access a copy through your library]

For people interested in ADHD and childhood mood dysregulation

- Johnstone JM et al. **Micronutrients for Attention-Deficit/Hyperactivity Disorder in Youths: A Placebo-Controlled Randomized Clinical Trial.** *J Am Acad Child Adolesc Psychiatry.* 2021 Jul 22:S0890-8567(21)00473-1. doi: 10.1016/j.jaac.2021.07.005. Epub ahead of print. PMID: 34303786.

For people wanting SR of clinical benefits

- Johnstone JM, Hughes A, Goldenberg JZ, Romijn AR, Rucklidge JJ. **Multinutrients for the treatment of psychiatric symptoms in clinical samples: A systematic review and meta-analysis of randomized controlled trials.** *Nutrients* 2020 Nov 4; 12(11):3394 doi: 10.3390/nu12113394.

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- **MOOC:** go to EdX.org and search for Rucklidge

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