

Dartmouth
Health Children's



WELCOME to the

*Pediatric Integrative Medicine ECHO:
Changing Health Care for Children*


Series Learning Objectives

Participants will be able to

- Explain the importance of a health-based, integrative approach to care of the whole person and motivate patients to become active and informed partners in their care
- Articulate evidence and indications for use of diverse integrative, health-based therapies in patient care in different contexts, including: mind-body approaches, nutrition, movement and manual therapies, botanicals and supplements, acupuncture, and other integrative approaches
- Strategically and effectively implement health-based, integrative approaches into the care of patients to nurture wellness and address existing health conditions

Table of Contents

- [Session 1, Introduction to Integrative Care](#)
- [Session 2, Motivational Interviewing](#)
- [Session 3, Nutrition/Food in our Health](#)
- [Session 4, Movement in our Health](#)
- [Session 5, Mind Body Therapies](#)
- [Session 6, Botanical Boot Camp](#)
- [Session 7, Acupuncture](#)
- [Session 8, Manual Medicine](#)
- [Session 9, Anxiety/Depression](#)
- [Session 10, Sleep Disturbances](#)
- [Session 11, Developmental Pediatrics](#)
- [Session 12, Heme/Onc](#)
- [Session 13, GI](#)
- [Session 14, Cardiology](#)
- [Session 15, Neuro](#)
- [Session 16, Rheum](#)
- [Session 17, Endocrine](#)
- [Session 18, Pulmonary](#)
- [Session 19, TBD](#)



Pediatric Integrative Medicine How do we Heal our children?

Matthew Hand DO

Section Chief, Pediatric Nephrology and Integrative Medicine
Children's Hospital at Dartmouth/Dartmouth Health, Children's



Disclosures

Medical Advisor Davinci Labs/FoodScience



IM/CAM in Pediatrics

- ▶ Goals
 - ▶ What is IM/CAM
 - ▶ Prevalence/Epidemiology
 - ▶ Things that I get called about/Cases
 - ▶ IM “tools for your tool box” for all practitioners
 - ▶ Our primary concept: All patients have more wellness than disease. Promote disease, decrease illness.
 - ▶ Giving control back to the patient
 - ▶ Finding balance in medicine: Principle of Yin/Yang



Thoughts




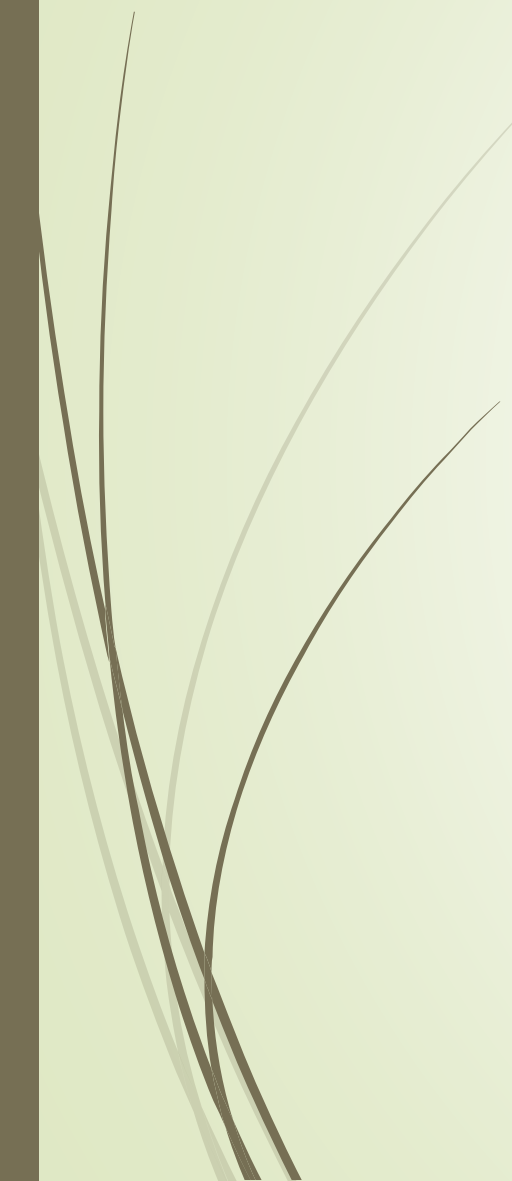
- ▶ Healing vs. curing
- ▶ Is there research?
- ▶ Cross over in modalities
- ▶ Not clearly toward the disease but more the experiences/life of the patient (sleep, wellness, anxiety etc)
- ▶ Many names, many tools, don't get frustrated
- ▶ Opening the mind
- ▶ You can't go back
- ▶ "this isn't complementary and alternative medicine, it is just good medicine"
- ▶ 3 BIG concepts: Inflammation, Upregulation, Neuroplasticity

What is IM

- Broad Categories
 - Conventional Med
 - Nutrition/Diet
 - Exercise/Physical Activity
 - Whole systems (TCM, Ayurveda, Naturopathy, Homeopathy)
 - Botanical med
 - Energy Medicine (Reiki, Healing touch, Qi Gong etc)
 - Supplements
 - Spirituality
 - Manual Medicine (OMM, Chiropractic, Massage, PT, Zero balancing, reflexology etc)
 - Mind-Body Medicine (Hypnosis, Biofeedback, Guided imagery, Creative therapy etc)


Who is using it and what are they using

- ▶ In the US, (1997) ~1/3 of all adults use CAM
- ▶ Visits to CAM providers
 - ▶ 1990:420 million, 1997:629 million (up by47%)
 - ▶ 1997 estimated 21.2 billion dollars ~12billion out of pocket
 - ▶ 2007 14 Billion spent out of pocket to treat pain, 33.9 total out of pocket for all issues (NIH)
 - ▶ 2015 40 Billion dollars spent on botanicals and supplements alone
- ▶ More recent estimates~40-62% adults using CAM (40% NIH)
 - ▶ Higher levels of education and economic status

- 
- 
- ▶ In Children: ~12-30% of healthy children seen in outpt clinics use CAM (NIH, Kemper)
 - ▶ >50% of children with chronic, recurrent or incurable illness use CAM
 - ▶ ALMOST ALL STILL CONTINUE WITH WESTERN TREATMENTS!
 - ▶ Prior study in early 2000's, <20% pediatricians felt they had IM knowledge >70% wanted more info.
 - ▶ For specific conditions:
 - ▶ For Asthma: 33-89% pediatric patients using CAM to some degree.
 - ▶ For GI issues, studies with >50% of all patients using some form of CAM.

Problems and the Future


- ▶ Zealots and the extremes
 - ▶ Ex: Vaccines, Chelation, Alternative labs, ?DAN . How do we find the balance?
 - ▶ Our own people creating a divide.
- ▶ Research:
 - ▶ Incorporating other scientific models into our Western scientific thoughts. Ex: TCM, Ayurveda, Homeopathy. Possibly more complexity than reduction model
 - ▶ Outcomes studies: Ex Ulcerative Colitis-Western vs Integrative GI, what are the outcomes
 - ▶ Acceptance in mainstream Journals
- ▶ Supplements/Herbs
 - ▶ Regulation, consistency, contamination, adulteration

- 
- Education:
 - Clearly needed given patient demands
 - Consistency, accuracy, availability
 - Payment
 - Licensing of practitioners
 - Commonly state regulated
 - Who do you trust
 - Pediatrics
 - Dosing
 - Safety
 - Research



So What Is The (My) Goal?

- Create a true wellness based health system that incorporates all healing modalities
- How do we get there
 - Cultural shift
 - Education of health care providers (everyone in the system)
 - Education of students/residents/fellows
 - Deliverable to all regardless of pay: ex. Evaluation of supplements, community acupuncture, covered manual therapies etc
 - Sustainability/Marketability
 - Using local networks (vetting practices- costs/peds/licenses etc)

- 
- ▶ “Value in volume system”
 - ▶ Creating educational program to improve each visit
 - ▶ Throughout the whole health care system (inpatient, outpatient, radiology, ER etc). Can no longer be in silo
 - ▶ Ex: OMT in inpatient unit (NAS babies/Newborn/NICU, Acupuncutre inpatient for children, Pet therapy, Mind body treatments, music therapy etc)
 - ▶ Greening the hospital
 - ▶ Healing environments
 - ▶ Creating a health model for the nation-really doing it!
 - ▶ And MORE!

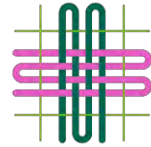
Course Plan

- ▶ Give the participants the tools to understand all the principles of Integrative care
- ▶ Give the participants deliverables to take back to their practice no matter where you work or what you do.
- ▶ Start with modalities (IE food, movement, motivational interviewing, TCM, botanical bootcamp etc) that will form the base to develop on.
- ▶ Followed by programs targeting specific for both primary care and subspecialties based on what each program has asked for.
- ▶ Lots of overlap!
- ▶ Cases each week can be anything that people are interested in so PRESENT ONE! 😊
- ▶ Very important: We are reaching across the whole system and need to know anyone or program that we can incorporate under our umbrella including community programs. Please speak up!! 😊
- ▶ In the end want to have essentially a practical, deliverable program that people feel trained and can bring the techniques throughout the DH system.

Forty-Three

In ancient times, people lived holistic lives. They didn't overemphasize the intellect, but integrated mind, body, and spirit in all things. This allowed them to become masters of knowledge rather than victims of concepts. If a new invention appeared, they looked for the troubles it might cause as well as the shortcuts it offered. They valued old ways that had been proven effective, and they valued new ways if they could be proven effective. If you want to stop being confused, then emulate these ancient folk: join your body, mind, and spirit in all you do. Choose food, clothing, and shelter that accords with nature. Rely on your own body for transportation. Allow your work and your recreation to be one and the same. Do exercise that develops your whole being and not just your body. Listen to music that bridges the three spheres of your being. Choose leaders for their virtue rather than their wealth or power. Serve others and cultivate yourself simultaneously. Understand that true growth comes from meeting and solving the problems of life in a way that is harmonizing to yourself and to others. If you can follow these simple old ways, you will be continually renewed.

Lao Tzu, Hua Hu Ching



Dartmouth
Health Children's



WELCOME to the

*Pediatric Integrative Medicine ECHO:
Changing Health Care for Children*

Session 2, Motivational Interviewing, June 15 2023

*Please let us know you are here: Type your name, email,
organization into CHAT*

Today's Program

- Brief housekeeping
- Didactic: Motivational Interviewing – Catherine Schuman
- Case presentation – Megan McMahon Martel
- Role Play – Catherine Schuman, Andy Wegman
- Summary
- Up Next



Motivational Interviewing

Helping People Improve their Diabetes Self-Care



Catherine Schuman, Ph.D.
Family Medicine Residency
Cheshire Medical Center

Training Objectives

- **Understand the basics of MI**
- **Strengthen your ability to elicit change talk and commitment language**
- **Learn communication techniques that encourage medication/treatment adherence**

Medication Adherence Facts

- **Medication nonadherence is prevalent: 3 out of 4 Americans report not taking medications as directed**
- **For every 100 prescriptions written, 50 to 70 make it to the pharmacy, and 48 to 66 are filled and leave the pharmacy. Of those in patients' possession, 25 to 30 are taken properly, and only 15 to 20 are refilled as prescribed (1)**
- **Adherence problems are more prevalent when regimens are time consuming, complicated, make the disease visible or offer no 'perceived' immediate benefits (2)**
- **Medication nonadherence results in a 33% to 69% increase in medication-related hospitalizations, 89,000 to 125,000 premature medicine-related deaths, and an additional \$2,000 per patient in medical costs and medical provider visits. All are preventable; however, until prevention is achieved, direct and indirect health care costs will increase annually by \$300 billion (3,4)**

The Facts

- **40-80% medical information given forgotten immediately; half retained is incorrect**
- **Physicians thought 89% of patients understood medication side effects, only 57% of patients understood**

Kessels, R. P. (2003). Patients' memory for medical information. *Journal of Social Medicine*, 96(5), 219-222.
Training to Advance Physicians' Communication Skills. (n. d). Retrieved from AHRQ Website.

MI and Good Communication

- **Results of a meta-analysis focusing on communicating with patients about medication adherence found a 19% increase in nonadherence among patients whose health care provider communicated **poorly** (5)**

Teach-Back Method

- **Method to confirm patients understand their medication/treatment:**
 - “Tell me why you need this medication”
 - “Tell me how you take this medication”
- **Teach Back not a test of patients’ knowledge**
- **Is a test of how well we explain something**

Kessels, R. P. (2003). Patients' memory for medical information. *Journal of Social Medicine*, 96(5), 219-222.

Why Don't People Do What We Tell Them to Do?

- **They don't understand** – poor provider communication or low health literacy
- **Reactance** – When freedoms drift away people reach out to hold onto them tightly
- **Ambivalence** – Our internal committee
- **Costs a lot to change** - Even those at goal struggle constantly
- **Depression, substance use, mental health or cognitive issues**
- **Finances** – **Monitoring supplies and medication are not cheap**
- **Dependence** – don't want to be addicted to something
- **What other concerns have you heard?**

Do We Sometimes Inhibit Change?

- **Discord (arguing for change)**
- **The Righting Reflex (instilling change)**
 - Working persuasively without permission
 - Working harder than the patient, in an attempt to “install change”

The **RIGHTING REFLEX** often fails because:

- **STATUS QUO** is perceived as easier, change is hard work
- **AMBIVALENCE** is unresolved and the patient has concerns about success
- There is a cost to making changes

Remember: IN CONVERSATIONS WITH PATIENTS THE MOST INFLUENTIAL AND PERSUASIVE VOICE IS WITHIN THE PERSON YOU'RE SEEING

MI is a style of practice:

“MI is a collaborative, goal-oriented style of communication with particular attention to the language of change. It is designed to strengthen personal motivation for and commitment to a specific goal by eliciting and exploring the person’s own reasons for change within an atmosphere of acceptance and compassion.”

Empathy

- **MI begins with open-ended questions, and ideally come from a place of genuine interest in the patient's situation**
- **Goal is to normalize talking about why someone isn't taking their meds so that they feel comfortable opening up to you about this**
 - **“I wanted to talk to you today about your DM meds and how you feel about taking them. I've worked with a lot of patients who struggle with taking meds every day, and I know it can be a really difficult thing to do. Some of my patients struggle with remembering to take the pills/injections, or they don't like how it feels to have to take something everyday. What's it like for you?”**

Developing Discrepancy

- Goal is to increase the reasons for making a **change from the patient's point of view**
- Ideally, the question & answer exchange will answer: How does **not** taking your meds as prescribed fit into your greater value system?
- Accomplished by asking specific types of questions, and by using reflective listening

Developing Discrepancy

- **What types of questions should I be asking?**
 - **Open ended**
 - **Ask for pros/cons of not taking meds**
 - **Ask for elaboration and/or examples**
 - **What happens if things continue as they are?**
 - **What would be different if you took your meds?**
 - **Explicitly side with the negative aspects of making a change**

Sail along with Sustain Talk

- **Come from a place that understands that resistance to change is completely normal, and not rooted in pathology or denial**
- **Based on the principle that efforts to push someone to change often result in an equal or greater push back to not make that same change**

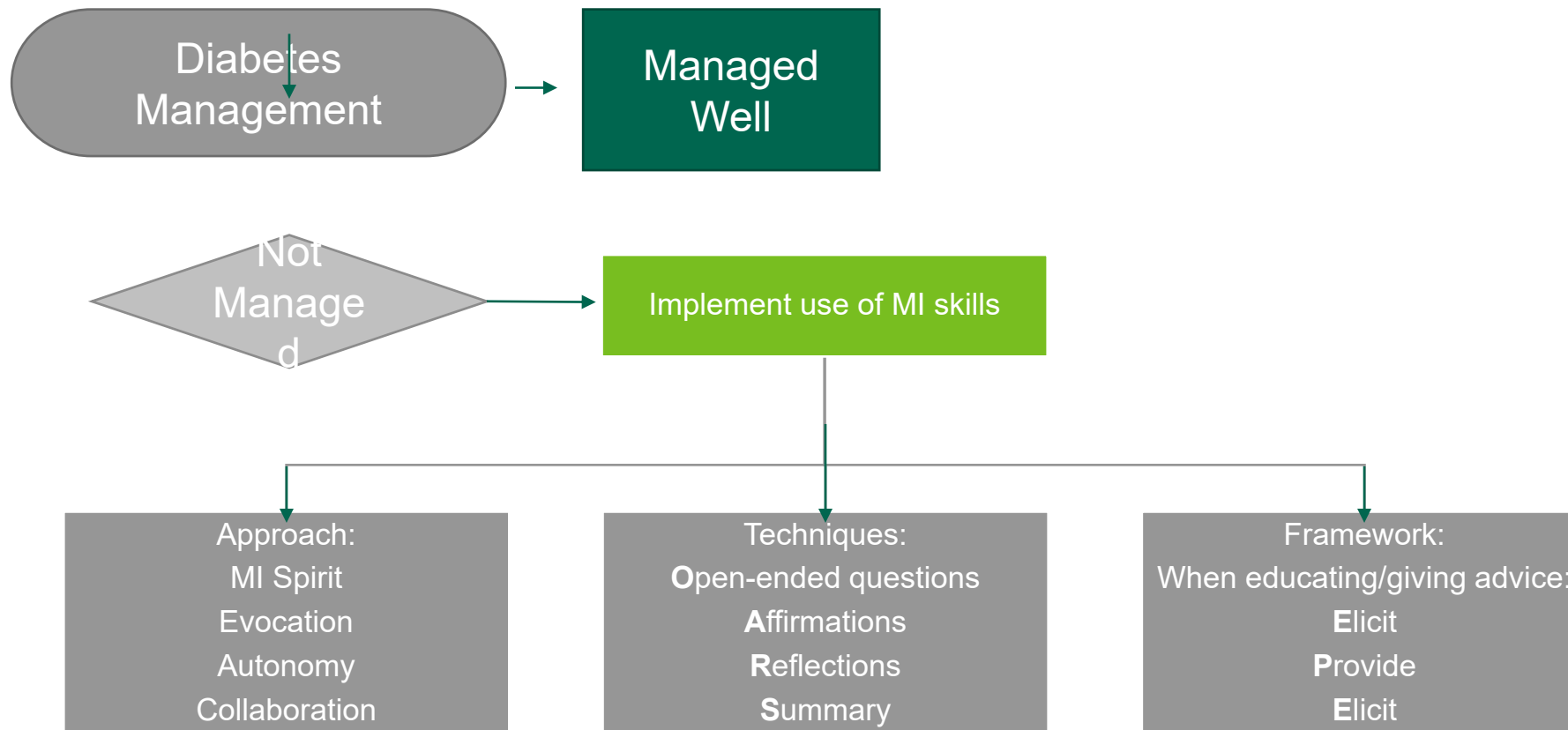
Supporting Self-Efficacy

- **Patients can feel that making change is not possible for them, either because they have failed in the past, or because they don't see another way to do things**
- **By highlighting genuine strengths, MI can rekindle interest in making an attempt and change, and can allow the patient to think differently about themselves and the likelihood of their success**

MI

- **MI works best when you hold back on telling the patient why he/she needs to change, no matter how difficult this may be to do**
- **The patient needs to develop his/her own reasons & motivations for changing**
- **MI is a process, and many patients may be very reluctant to consider any change at all - This does not mean that your MI techniques are not worth continuing**
- **MI does not have to take a huge amount of time**

Where MI Fits In



Motivational Interviewing

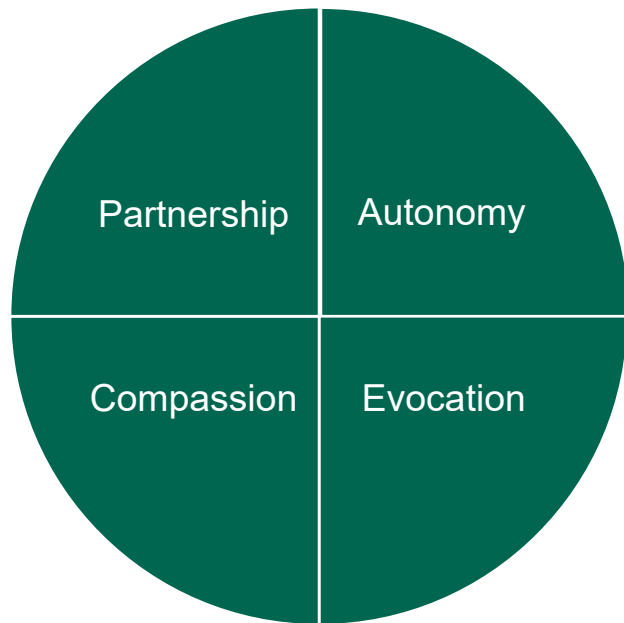
Motivational interviewing is a client centered, guiding communication style for enhancing a person's own motivation for change or behavioral activation.

“People don't care how much you know until they know how much you care.”
- John Hanley

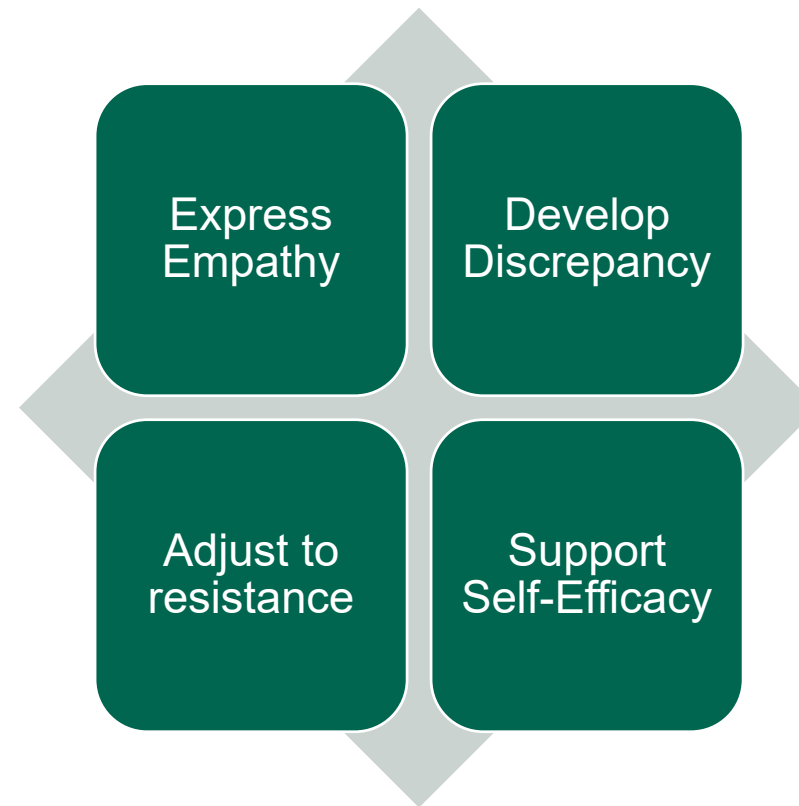
Listening in MI

- **Change Talk** : “I want to lose weight.”
- **Activated Change Talk – or Commitment Language**: “I’m thinking about going to a gym so that I can get some activity. That might help me lose weight.”
- **Sustain Talk**: “I really enjoy eating. I’m not going to try again to lose weight. I’ve never been able to keep my lost wait off.”

MI SPIRIT



Principles



Core Skills: OARS



Affirmations

- **You see the benefit of nighttime blood glucose testing. It helps you avoid lows at night**
- **You worked hard to get into the habit of regular physical activity - You enjoy long walks and you've lost weight since starting it**

Reflective Listening

- **Ready**
 - Reflect back all the reasons (pros) the Patient has stated
- **Unsure**
 - Reflect back what you hear (stating the cons before the pros so that you end on the positive)
 - You have not taken either side of the internal argument but reflected back both sides
 - The patient sees his/her ambivalence and is not pressured to defend his/her stance.
- **Not Ready**
 - Reflect back that you hear the parent's concerns and affirm that their concerns make sense in the context of how they are thinking

Reflections: Statements that evoke the patient's ideas or perspectives

- Listen for change talk and use it in your reflections
- Listen to what is said rather than thinking about your next question
- What feelings does the person wind around the words?
- Levels of reflection:
 - Simple Reflection – Rephrase or repeat
 - Complex reflection – Paraphrase or add more than one idea
 - Can amplify by adding feeling/emotion

Types of Reflective Listening

Simple reflections are short statements that reflect the content or emotion of what the person said. You can choose which element or aspect to reflect back

- If patient said: I know you keep saying it is important to measure my blood sugar levels, but I'm just not sure it's necessary...
- A reflection is: Even though you have been encouraged to monitor your blood sugar levels, you're still unsure if it's needed

Complex reflections go beyond what was said and offer a new perspective There are several types of complex reflections:

Amplified – the person's statement is taken to the extreme

Double-sided – reflects back the ambivalence or pros and cons

Guessing the unexpressed – guess at what is underlying the statement

Affective (feelings) – reflect back the feelings or emotions expressed

Continuing the paragraph – the listener finishes the statement

Metaphor – uses a metaphor to restate the person's statement

Sustain Talk - Resistance

- **Psychological Reactance (J.W. Brehm) – a motivational reaction that occurs when a person feels that their sense of freedom or personal choice is being threatened or the range of alternatives is being limited**

Sustain Talk - Resistance

Common Cues to Resistance or Sustain Talk

- Arguing
- Interrupting
- Ignoring/not paying attention
- Crossing arms
- Being dismissive (“whatever!”)

MI-Adherent Response

- Slow down
- Come along side and try to understand
- Reflect what you hear
- Support autonomy – “I can’t make you monitor your blood sugar levels, and I wouldn’t want to. What I can do if you give me permission is share my view and provide any information that will be helpful to your decision. In the end, this is your decision.”

Information and Advice: 3 Kinds of Permission

- The person asks you for advice or info “Which option is best for you?”
- You ask permission to give advice or info: “Would it be helpful for me to suggest some choices?”
- You qualify the advice or info to emphasize autonomy “I can provide you with some ideas and you could decide what would work best for you.”

Offering Info or Advice When Risks are Great or When Approaching Sensitive Topics

- **Ask permission**, “May I speak with you about something important, something that could make you quite ill?”
- **Express your concerns**: “It’s important for you to know that skipping some of your insulin every day causes your blood glucose levels become uncontrolled. You could develop DKA and end up in the hospital. Some people with DKA die.
- **Evoke further exploration of the topic**: “I am interested in what you think about this.”

Elicit-Provide-Elicit

Elicit

- Ask parent what they already know or would like to know more about
- Ask permission to offer information

Provide

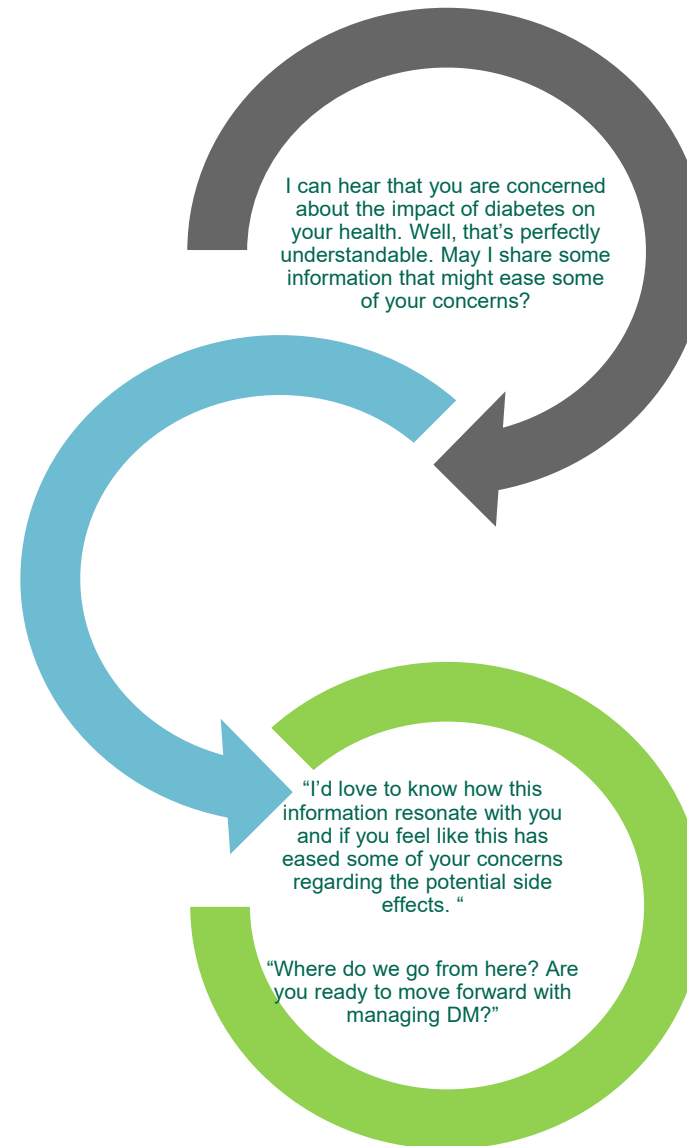
- Give information in a neutral, nonjudgmental fashion
- Avoid “I” and “You”

Elicit

- Gather parent's understanding of the feedback provided
- Ask what else the patient would like to know
- Ask what they make of the information

E-P-E MI Scripting

<p>Elicit: Ask what the patient knows or would like to know. Or ask if it's okay if you offer them information</p>	<ul style="list-style-type: none"> • "what do you already know about the effects of diabetes on your health?" • "Do you mind if I express my concerns about not treating diabetes?" • "Would you be open to me sharing some information about the behavioral changes and medication for diabetes management with you?" • "Would it be ok if I tell you what we know?" • "Would you be open to learning more?"
<p>Provide: Give information in the neutral, nonjudgmental fashion. Avoid "I" and "you."</p>	<ul style="list-style-type: none"> • "Research suggest..." • "Studies have shown..." • "Others have found benefit from ..." • "Folks have found..." • "What we know is..."
<p>Elicit: Gather what the patient's interpretation was, what else they would like to know, or what they make of the information.</p>	<ul style="list-style-type: none"> • "How does this impact your decision?" • "What does this mean to you?" • "How can I help?" • "Where does this leave you?" • "What else would be helpful for you to know that would help you make your decision?" • "Where do we go from here?"



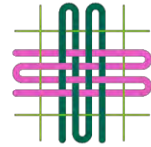
Role Play

Resources

1. U.S. Surgeon General joins Baltimore launch of the national script your future campaign to highlight importance of taking medication as directed. Script Your Future. <http://scriptyourfuture.org/wp-content/themes/cons/m/release.pdf>. Accessed December 18, 2014.
2. Improving medication adherence among patients with hypertension. A tip sheet for healthcare professionals. Million Hearts Initiative. http://millionhearts.hhs.gov/Docs/BP_Toolkit/TipSheet_HCP_MedAdherence.pdf. Accessed December 18, 2014. 7.
3. Cutler DM, Everett W. Thinking outside the pillbox—medication adherence as a priority for healthcare reform. *NEJM*. 2010;362:1553–55.
4. Duff AJA & Latchford GJ. Motivational interviewing for adherence problems in cystic fibrosis. *Pediatr Pulmonol* 2010;45:211–220. [doi: 10.1002/ppul.21103](https://doi.org/10.1002/ppul.21103)
5. Zolnierok KB, DiMatteo MR. Physician communication and patient adherence to treatment: a meta-analysis. *Med Care*. 2009;47(8):826–34.

Additional Resources

1. Steinberg, MP and Miller, WR; Motivational Interviewing in Diabetes Care. New York: The Guilford Press, 2015.
2. Miller WR and Rollnick S; Motivational Interviewing: Helping People Change, Third Edition. New York: The Guilford Press, 2013.
3. Miller WR, Moyers TB. Eight Stages in Learning Motivational Interviewing. Journal of Teaching in the Addictions 2006;5(1):3-17.
4. Amherin, PC, Miller WR, Yahne CE, Fulcher L: Client Language During Motivational Interviewing Predicts Drug Use Outcomes. Journal of Consulting Psychology; 862-78, 2003.
5. Miller WR, Rose, GS: Toward a Theory of Motivational Interviewing; American Psychologist; 527-37, 2009.
6. Miller WR, Rollnick S: Ten things that motivational interviewing is not. Behavioral and Cognitive Psychotherapy 37: 129-140, 2009.
7. Miller WR, Rollnick S. The effectiveness and ineffectiveness of complex behavioral interventions: impact of treatment fidelity. Contemporary clinical trials 2014;37:234-41.
8. Rosengren, D; Motivational Interviewing Practitioner Handbook. New York: The Guilford Press, 2007 47 1. Channon, S. J., Huws-T



Dartmouth
Health Children's



WELCOME to the

*Pediatric Integrative Medicine ECHO:
Changing Health Care for Children*

Session 3, Nutrition/Food in our Health, July 20 2023

*Please let us know you are here: Type your name, email,
organization into CHAT*

Today's Program

- Brief housekeeping
- Didactic: Nutrition/Food in our Health
 - Filomena Kersey, RDN, LD – Clinical Dietician
 - Kiah Williams, RDN, LD – Clinical Dietician
- Case Presentation
- Case Discussion
- Summary
- Up Next

Food For Health and The Science Behind It

Key Learning Objectives

- What uniquely qualifies a dietitian to help clients
- Nutrients to reduce inflammation
- Foods/dietary patterns that provide these nutrients
- Prevention and Intervention

A Dietitian's Role

- Our unique training allows us to translate the science of nutritional biochemistry into practical application, meeting families where they are in that moment to educate and coach families in the implementation of nutritious food choices for them.
- The most challenging piece to this work is breaking through the misconception that the dietitian is there to judge choices.
- The reward is working with the patient and family –seeing them set and achieve their goals toward better health.



Questions we hope to answer:

- What are the best food choices?
- How do families even start, particularly when there are limits to both time and money?
- What intervention(s) is effective?
- How does a dietitian help with this dilemma?
- What resources are available?

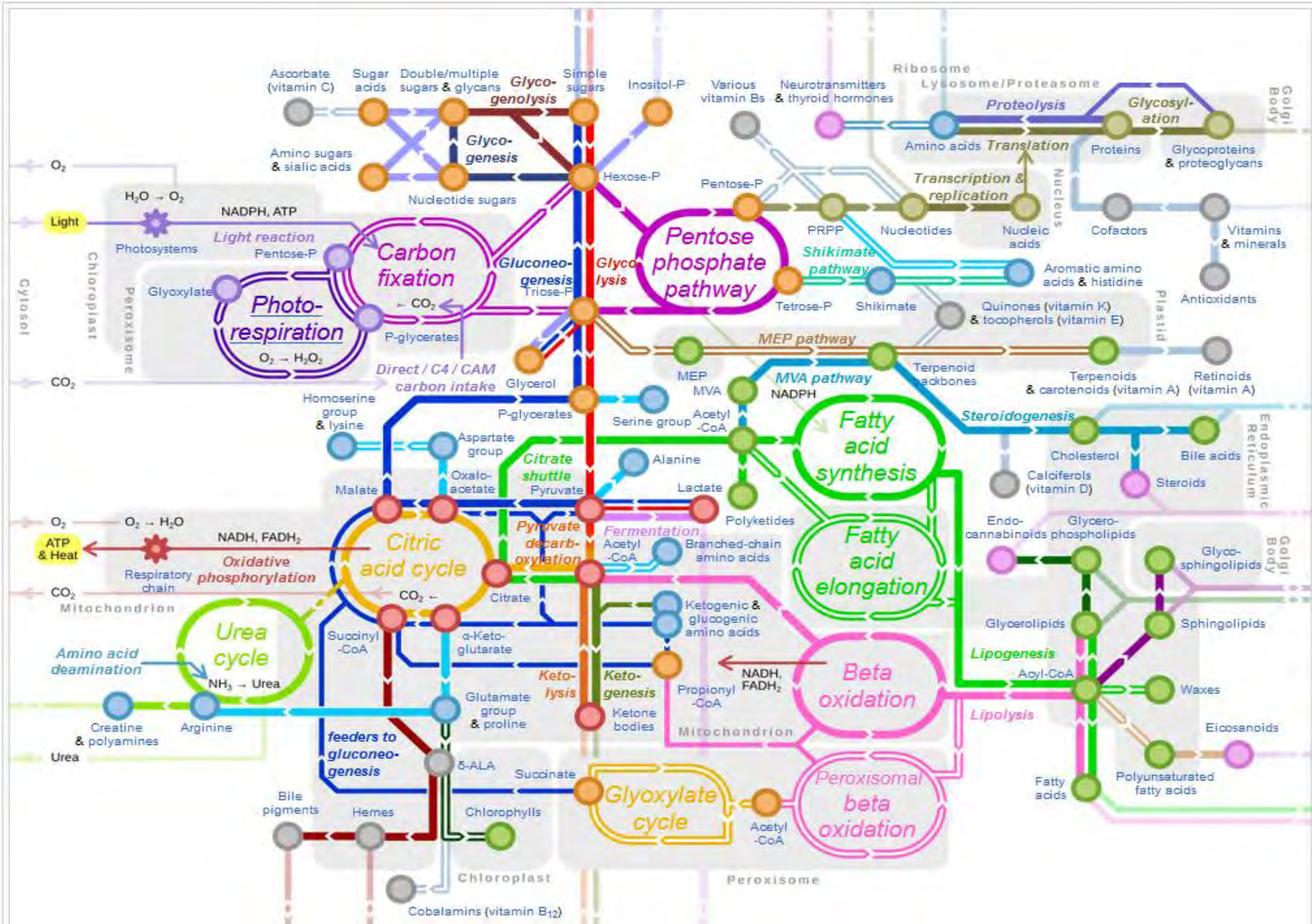
Integrative & Functional Medical Nutrition Therapy

Includes personalized nutrition care which considers all aspects of the individual:

- Food, Lifestyle, and Environment
- Nutrition Physical Signs & Symptoms
- Biomarkers/genetics
- Metabolic Pathways and Systems
- Toxins
- Pathogens
- Allergens & Intolerances
- Stress

We are what we Eat!

The nutrients from foods are involved in all of these pathways.



Nutrients Involved in the metabolism and energy production

Glutathione	Glutamine	Histidine	Proline
Isoleucine	Methionine	Tyrosine	Asparagine
Magnesium	Vitamin D3	Zinc	L-Carnitine
Vitamin B1	Vitamin B2	Vitamin B3 / NAD	Vitamin B5
Vitamin B6	Vitamin B12	Folic Acid	Water
Vitamin C	Iron	Selenium	Alpha Lipoic Acid

Improving Nutrition is Important for the following conditions and more:

- ADHD
- Autism
- Cancer
- Cardiovascular disease
- Diabetes
- Inflammatory Bowel Disease
- Irritable Bowel Disease
- Juvenile Idiopathic Arthritis
- NAFLD

It Is Not Just About the Vitamins

Include more:

- High fiber foods
- Unsaturated fats
- Phytosterols
- Flavonoids
- Minerals/trace elements/electrolytes
- Exercise/Activity



It Is Not Just About the Vitamins

Include Less:

- Ultra processed foods
- Excess salt
- Added sugars
- Saturated fats
- Trans fats
- Sedentary lifestyle



Nutrient and Medication Interactions

- Proton pump inhibitors: vitamin B12, C, folate, zinc and other minerals
- Tylenol: glutathione
- NSAIDS: folate
- Ritalin, Adderall, caffeine: can lead to low magnesium levels
- Metformin: vitamin B12
- Methotrexate: folate (may not want to supplement during treatment of certain patient groups)
- Oral contraceptives: folate, vitamin B12, B6, and C, and Zinc
- Smoking: Vitamin C, B-carotene, selenium and zinc

Food Sources of Affected Nutrients

- Folate – edamame, legumes, leafy greens, wheat germ, beets, fortified grains
- Magnesium - legumes, edamame, leafy greens, nuts, pumpkin seeds, wheat germ, bran
- Selenium – brazil nuts, meat, fish, eggs, dairy, spinach, cashews
- Vitamin A – apricots, carrots, cantaloupe, broccoli, milk, spinach, sweet potato
- Vitamin B6 – legumes, fish, potatoes, meats, dairy
- Vitamin B12 – meat, poultry, clams, eggs, milk, nutritional yeast
- Vitamin C – broccoli, brussels sprouts, cabbage, strawberries, potatoes, tomatoes
- Zinc – legumes, eggs, meats, fish, peanuts, wheat germ

New American Plate



Dietary Guidelines for Americans 2020-2025

Healthy Mediterranean-Style Dietary Pattern for Ages 2 and Older, With Daily or Weekly Amounts From Food Groups, Subgroups, and Components

CALORIE LEVEL OF PATTERN ^a	1,000	1,200	1,400	1,600	1,800	2,000	2,200	2,400	2,600	2,800	3,000	3,200
FOOD GROUP OR SUBGROUP ^b	Daily Amount ^c of Food From Each Group (Vegetable and protein foods subgroup amounts are per week.)											
Vegetables (cup eq/day)	1	1 ½	1 ½	2	2 ½	2 ½	3	3	3 ½	3 ½	4	4
	Vegetable Subgroups in Weekly Amounts											
Dark-Green Vegetables (cup eq/wk)	½	1	1	1 ½	1 ½	1 ½	2	2	2 ½	2 ½	2 ½	2 ½
Red and Orange Vegetables (cup eq/wk)	2 ½	3	3	4	5 ½	5 ½	6	6	7	7	7 ½	7 ½
Beans, Peas, Lentils (cup eq/wk)	½	½	½	1	1 ½	1 ½	2	2	2 ½	2 ½	3	3
Starchy Vegetables (cup eq/wk)	2	3 ½	3 ½	4	5	5	6	6	7	7	8	8
Other Vegetables (cup eq/wk)	1 ½	2 ½	2 ½	3 ½	4	4	5	5	5 ½	5 ½	7	7
Fruits (cup eq/day)	1	1	1 ½	2	2	2 ½	2 ½	2 ½	2 ½	3	3	3
Grains (ounce eq/day)	3	4	5	5	6	6	7	8	9	10	10	10
Whole Grains (ounce eq/day) ^d	1 ½	2	2 ½	3	3	3	3 ½	4	4 ½	5	5	5
Refined Grains (ounce eq/day)	1 ½	2	2 ½	2	3	3	3 ½	4	4 ½	5	5	5

Dietary Guidelines for Americans 2020-2025

Healthy Mediterranean-Style Dietary Pattern for Ages 2 and Older, With Daily or Weekly Amounts From Food Groups, Subgroups, and Components

CALORIE LEVEL OF PATTERN ^a	1,000	1,200	1,400	1,600	1,800	2,000	2,200	2,400	2,600	2,800	3,000	3,200
FOOD GROUP OR SUBGROUP^b	Daily Amount^c of Food From Each Group (Vegetable and protein foods subgroup amounts are per week.)											
Dairy (cup eq/day) ^d	2	2 ½	2 ½	2	2	2	2	2 ½	2 ½	2 ½	2 ½	2 ½
Protein Foods (ounce eq/day)	2	3	4	5 ½	6	6 ½	7	7 ½	7 ½	8	8	8
	Protein Foods Subgroups in Weekly Amounts											
Meats, Poultry, Eggs (ounce eq/wk)	10	14	19	23	23	26	28	31	31	33	33	33
Seafood (ounce eq/wk) ^e	3	4	6	11	15	15	16	16	17	17	17	17
Nuts, Seeds, Soy Products (ounce eq/wk)	2	2	3	4	4	5	5	5	5	6	6	6
Oils (grams/day)	15	17	17	22	24	27	29	31	34	36	44	51
Limit on Calories for Other Uses (kcal/day) ^f	130	80	90	120	140	240	250	280	300	330	400	540
Limit on Calories for Other Uses (%/day)	13%	7%	6%	8%	8%	12%	11%	12%	12%	12%	13%	17%

DASH Eating Plan

The Benefits: Lowers blood pressure & LDL "bad" cholesterol.



Eat This



Limit This

Vegetables	Fatty meats
Fruits	Full-fat dairy
Whole grains	Sugar sweetened beverages
Fat-free or low-fat dairy	Sweets
Fish	Sodium intake
Poultry	
Beans	
Nuts & seeds	
Vegetable oils	

www.nhlbi.nih.gov/DASH











Food Group	Daily Servings
Grains	6-8
Meats, poultry, and fish	6 or less
Vegetables	4-5
Fruit	4-5
Low-fat or fat-free dairy products	2-3
Fats and oils	2-3
Sodium	2,300 mg*
Weekly Servings	
Nuts, seeds, dry beans, and peas	4-5
Sweets	5 or less

Added Sugars

- Some foods have sugar naturally—like fruits, vegetables, and milk. The sugars in these foods are not added sugars.
- Added sugars include: granulated/powdered sugar, high fructose corn syrup, molasses, cane sugar, corn sweetener, raw sugar, syrups (ex. maple), honey, fruit juice concentrates
- There is about 4.2 grams sugar in 1 teaspoon granulated sugar
- Goals:
 - Less than 2 years of age avoid added sugars
 - Preteens and younger: aim for less than 25 to 30 grams daily
 - Adolescents and adults: 25 to 35 grams daily (10% or less of total calories)



Sugar in Common Drinks

Drink (12-ounce serving)	Teaspoons of Sugar	Calories
Bottled Water	0 teaspoons	0
Diet Cola	0 teaspoons	0
Sugar-Free Drink Mix	0 teaspoons	0
Sugar-Free Lemonade	0 teaspoons	0
Unsweetened Tea	0 teaspoons	0
Sports Drink	2 teaspoons 	75
Lemonade	6¼ teaspoons 	105
Orange Juice	7½ teaspoons 	160
Sweet Tea	8½ teaspoons 	120
Powdered Drink Mix (with sugar)	9 teaspoons 	145
Cola	10¼ teaspoons 	150
Fruit Punch	11½ teaspoons 	195
Root Beer	11½ teaspoons 	170
Grape Juice	12 teaspoons 	200
Orange Soda	13 teaspoons 	210

Cola Label where to find the added sugar content

Nutrition Facts	
1 serving per container	
Serving size	1 Bottle
Amount per serving	
Calories	240
% Daily Value*	
Total Fat 0g	0%
Sodium 75mg	3%
Total Carbohydrate 65g	24%
Total Sugars 65g	
Includes 65g Added Sugars	130%
Protein 0g	
<small>* Not a significant source of saturated fat, trans fat, cholesterol, dietary fiber, vitamin D, calcium, iron and potassium.</small>	

INGREDIENTS

CARBONATED WATER, HIGH FRUCTOSE CORN SYRUP, CARAMEL COLOR, PHOSPHORIC ACID, NATURAL FLAVORS, CAFFEINE.

Caffeine Content: 57 mg/20 fl oz

Ketchup:

With Sugar added:

Nutrition Facts		Amount/serving	% DV	Amount/serving	% DV		
About 23 servings per container		Total Fat	0g	0%	Total Carb.	5g	2%
Serving size 1 Tbsp (17g)		Sat. Fat	0g	0%	Fiber	0g	0%
Calories per serving 20		Trans Fat	0g		Total Sugars	4g	
		Cholest.	0mg	0%	Incl. 4g Added Sugars	7%	
		Sodium	190mg	8%	Protein	0g	
		Vit. D 0% • Calcium 0% • Iron 0% • Potas. 0%					
INGREDIENTS: ORGANIC TOMATO CONCENTRATE FROM RED RIPE ORGANIC TOMATOES, ORGANIC DISTILLED VINEGAR, ORGANIC SUGAR, SALT, ORGANIC ONION POWDER, ORGANIC SPICE, NATURAL FLAVORING.							

Without Sugar Added:

Nutrition Facts		Amount/serving	% DV	Amount/serving	% DV		
About 52 servings per container		Total Fat	0g	0%	Total Carb.	1g	0%
Serving size 1 Tbsp (16g)		Sat. Fat	0g	0%	Fiber	0g	0%
Calories per serving 10		Trans Fat	0g		Total Sugars	<1g	
		Cholest.	0mg	0%	Incl. 0g Added Sugars	0%	
		Sodium	190mg	8%	Protein	0g	
		Vit. D 0% • Calcium 0% • Iron 0% • Potas. 0%					
INGREDIENTS: TOMATO CONCENTRATE FROM RED RIPE TOMATOES, DISTILLED WHITE VINEGAR, SALT, NATURAL FLAVORING, ONION POWDER, SUCRALOSE*, SPICE.							
<small>*NOT NORMALLY FOUND IN KETCHUP</small>							

- Small bagel has
5.8 grams added sugar

- Large bagel has
~11 grams added sugar

www.nhlbi.nih.gov - 2013

30 Years ago



140 calories
3-inch diameter

Present



350 calories
6-inch diameter

Calorie Difference: 210 calories

30 Years ago

Present

- Small has about 7 grams added sugar
- Large has about 13 grams added sugar



333 calories



590 calories

Calorie Difference: 257 calories

- Small has about
~7 grams added sugar
- Large has about
~14 grams added sugar

www.nhlbi.nih.gov

30 Years ago



390 calories
1 ½ cups

Present



790 calories
3 ½ cups

Calorie Difference: 400 calories

Summary

- Dietitians use motivational interviewing techniques to help patients find 1-2 goals to work towards a healthier diet and lifestyle
- Include more: physical activity and foods with fiber, unsaturated fats, phytosterols, flavonoids, and minerals
- Include less: ultra processed foods, excess salt, added sugar, alcohol, saturated fats, and trans fats
- Following a healthy eating pattern such as Mediterranean style eating or the DASH diet can lead to better health outcomes

References

- Anti-Inflammatory diet for IBD. (n.d.). <https://pathway.ntforibd.org/nutritional-therapy-information/explore-diets/anti-inflammatory-diet-for-ibd/>
- Austerman J. ADHD and behavioral disorders: Assessment, management, and an update from DSM-5. *Cleve Clin J Med*. 2015 Nov;82(11 Suppl 1):S2-7. doi: 10.3949/ccjm.82.s1.01. PMID: 26555810.
- Campmans-Kuijpers, M.J.E.; Dijkstra, G. Food and Food Groups in Inflammatory Bowel Disease (IBD): The Design of the Groningen Anti-Inflammatory Diet (GrAID). *Nutrients* 2021, 13, 1067. <https://doi.org/10.3390/nu13041067>
- Cristofori F, Dargenio VN, Dargenio C, Miniello VL, Barone M, Francavilla R. Anti-Inflammatory and Immunomodulatory Effects of Probiotics in Gut Inflammation: A Door to the Body. *Front Immunol*. 2021 Feb 26;12:578386. doi: 10.3389/fimmu.2021.578386. PMID: 33717063; PMCID: PMC7953067.
- Elder JH, Kreider CM, Schaefer NM, de Laosa MB. A review of gluten- and casein-free diets for treatment of autism: 2005-2015. *Nutr Diet Suppl*. 2015;7:87-101. doi: 10.2147/NDS.S74718. Epub 2015 Dec 1. PMID: 28111520; PMCID: PMC5242335.
- FoodData Central. (n.d.). <https://fdc.nal.usda.gov/>
- Food Facts Archive. (n.d.). American Institute for Cancer Research. <https://www.aicr.org/cancer-prevention/food-facts/>
- Grammatikopoulou MG, Gkiouras K, Syrmou V, Vassilakou T, Simopoulou T, Katsiari CG, Goulis DG, Bogdanos DP. Nutritional Aspects of Juvenile Idiopathic Arthritis: An A to Z for Dietitians. *Children (Basel)*. 2023 Jan 23;10(2):203. doi: 10.3390/children10020203. PMID: 36832332; PMCID: PMC9955348.
- Grimaldi R, Gibson GR, Vulevic J, Giallourou N, Castro-Mejía JL, Hansen LH, Leigh Gibson E, Nielsen DS, Costabile A. A prebiotic intervention study in children with autism spectrum disorders (ASDs). *Microbiome*. 2018 Aug 2;6(1):133. doi: 10.1186/s40168-018-0523-3. PMID: 30071894; PMCID: PMC6091020.
- Hyman SL, Stewart PA, Schmidt B, Cain U, Lemcke N, Foley JT, Peck R, Clemons T, Reynolds A, Johnson C, Handen B, James SJ, Courtney PM, Molloy C, Ng PK. Nutrient intake from food in children with autism. *Pediatrics*. 2012 Nov;130 Suppl 2(Suppl 2):S145-53. doi: 10.1542/peds.2012-0900L. PMID: 23118245; PMCID: PMC4536585.
- James SJ, Melnyk S, Fuchs G, Reid T, Jernigan S, Pavliv O, Hubanks A, Gaylor DW. Efficacy of methylcobalamin and folinic acid treatment on glutathione redox status in children with autism. *Am J Clin Nutr*. 2009 Jan;89(1):425-30. doi: 10.3945/ajcn.2008.26615. Epub 2008 Dec 3. PMID: 19056591; PMCID: PMC2647708.

References

- Mediterranean Diet. (n.d.). <https://pathway.ntforibd.org/nutritional-therapy-information/explore-diets/mediterranean-diet/>
- Minich DM, Brown BI. A Review of Dietary (Phyto)Nutrients for Glutathione Support. *Nutrients*. 2019 Sep 3;11(9):2073. doi: 10.3390/nu11092073. PMID: 31484368; PMCID: PMC6770193.
- Olendzki B, Bucci V, Cawley C, Maserati R, McManus M, Olednzki E, Madziar C, Chiang D, Ward DV, Pellish R, Foley C, Bhattarai S, McCormick BA, Maldonado-Contreras A. Dietary manipulation of the gut microbiome in inflammatory bowel disease patients: Pilot study. *Gut Microbes*. 2022 Jan-Dec;14(1):2046244. doi: 10.1080/19490976.2022.2046244. PMID: 35311458; PMCID: PMC8942410.
- Ríos-Hernández A, Alda JA, Farran-Codina A, Ferreira-García E, Izquierdo-Pulido M. The Mediterranean Diet and ADHD in Children and Adolescents. *Pediatrics*. 2017 Feb;139(2):e20162027. doi: 10.1542/peds.2016-2027. PMID: 28138007.
- Rossignol DA, Genuis SJ, Frye RE. Environmental toxicants and autism spectrum disorders: a systematic review. *Transl Psychiatry*. 2014 Feb 11;4(2):e360. doi: 10.1038/tp.2014.4. PMID: 24518398; PMCID: PMC3944636.
- Sanctuary MR, Kain JN, Chen SY, Kalanetra K, Lemay DG, Rose DR, Yang HT, Tancredi DJ, German JB, Slupsky CM, Ashwood P, Mills DA, Smilowitz JT, Angkustsiri K. Pilot study of probiotic/colostrum supplementation on gut function in children with autism and gastrointestinal symptoms. *PLoS One*. 2019 Jan 9;14(1):e0210064. doi: 10.1371/journal.pone.0210064. PMID: 30625189; PMCID: PMC6326569.
- Trudeau MS, Madden RF, Parnell JA, Gibbard WB, Shearer J. Dietary and Supplement-Based Complementary and Alternative Medicine Use in Pediatric Autism Spectrum Disorder. *Nutrients*. 2019 Aug 1;11(8):1783. doi: 10.3390/nu11081783. PMID: 31375014; PMCID: PMC6724073.
- Campmans-Kuijpers MJE, Dijkstra G. Food and Food Groups in Inflammatory Bowel Disease (IBD): The Design of the Groningen Anti-Inflammatory Diet (GrAID). *Nutrients*. 2021 Mar 25;13(4):1067. doi: 10.3390/nu13041067. PMID: 33806061; PMCID: PMC8064481.
- Kittana M, Ahmadani A, Al Marzooq F, Attlee A. Dietary Fat Effect on the Gut Microbiome, and Its Role in the Modulation of Gastrointestinal Disorders in Children with Autism Spectrum Disorder. *Nutrients*. 2021 Oct 27;13(11):3818. doi: 10.3390/nu13113818. PMID: 34836074; PMCID: PMC8618510.
- Gumprich E, Rockway S. Can ω -3 fatty acids and tocotrienol-rich vitamin E reduce symptoms of neurodevelopmental disorders? *Nutrition*. 2014 Jul-Aug;30(7-8):733-8. doi: 10.1016/j.nut.2013.11.001. Epub 2013 Nov 15. PMID: 24631384.

WELCOME to the

Pediatric Integrative Medicine ECHO: Changing Health Care for Children

Session 4, August 17, 2023

Today's Program:

- Brief housekeeping
- Didactic: Movement in Our Health
– Michele Guerra
- Case Presentation: Erik Shessler
- Case Discussion
- Summary
- Up Next

Notes:

- Enter name, organization into chat
- Raise virtual hand or enter comments in chat at any time. We will call on you when it works. Please mute otherwise.
- To protect individual privacy, please use non-identifying information when discussing cases.
- We will be recording the didactic part of these sessions. *Participating in these session is understood as consent to be recorded. Thank you!*
- Closed Captioning will be enabled during sessions
- [Submit cases](#)



Movement and our children's health

Michele Guerra

(Former) Employee Wellness Manger, Dartmouth Health CGP

Learning objectives

- Review the benefits of physical activity for children and adolescents
- *Understand the public health physical activity guidelines for children and adolescents*
- Know where youth stand in relation to the guidelines
- *Explore tactics to use during office visits to motivate children and their parents to be more active*
- Comprehend the power of parents in helping children & teens be more active
- *Tap into some behavior change theories and techniques to enhance conversations with patients and their parents.*

Benefits of PA in youth

Improved cognition

- performance on academic achievement tests,
 - executive function,
 - processing
 - speed,
 - memory

Reduced stress

Enhanced sleep

Improved mood

Reduced risk of depression
& depressed mood

Health Benefits of Physical Activity FOR CHILDREN

- Academic Performance**
Improves attention and memory
- Brain Health**
Reduces risk of depression
- Heart and Lung Health**
Improves blood pressure and aerobic fitness
- Long-term Health**
Reduces risk of several chronic diseases, including type 2 diabetes and obesity
- Healthy Weight**
Helps regulate body weight and reduce body fat
- Bone Strength**
Strengthens bones
- Cardiometabolic Health**
Helps maintain normal blood sugar levels
- Muscular Fitness**
Builds strong muscles and endurance

Source: Physical Activity Guidelines for Americans, 2nd edition
To learn more, visit: <https://www.cdc.gov/physicalactivity/basics/adults/health-benefits-of-physical-activity-for-children.html>

October 2021

PA guidelines for children and teens

Ages 3 - 5

- Be active through the day
- Caregivers encourage active play whenever possible



Ages 6 - 17

- Overall – 60 minutes per day
- Include
 - Aerobic
 - Muscle Strengthening
 - Bone strengthening

Where are we at?

<u>Adolescents Goal</u>	<u>Adolescents Progress</u>	<u>Children Goal</u>	<u>Children Progress</u>
Increase proportion who do enough muscle strengthening activity	Little or no detectable change	Increase proportion (ages 2 – 5) who get no more than 1 hour of daily screen time	Getting worse
Increase proportion who do enough aerobic activity	Getting worse	Increase proportion who do enough Aerobic activity	Getting worse
Increase proportion who do enough aerobic and muscle strengthening activity	Getting worse	Increase proportion of children and adolescents who play sports	Getting worse
<i>Healthy People 2030</i>	https://health.gov/healthypeople/objectives-and-data/browse-objectives/physical-activity		

Keep in mind...



- Activity can be moderate
 - 5 – 6 on intensity scale of 1 – 10
 - Walk to school with friends – moderate
 - Run while playing tag or other active games - vigorous

Keep in Mind ...

- Activity can be accumulated
 - Short bouts throughout the day can be very effective



What you can do during a visit

Assess current levels of PA,
interest level, etc.

Educate/ empower patients
to increase PA

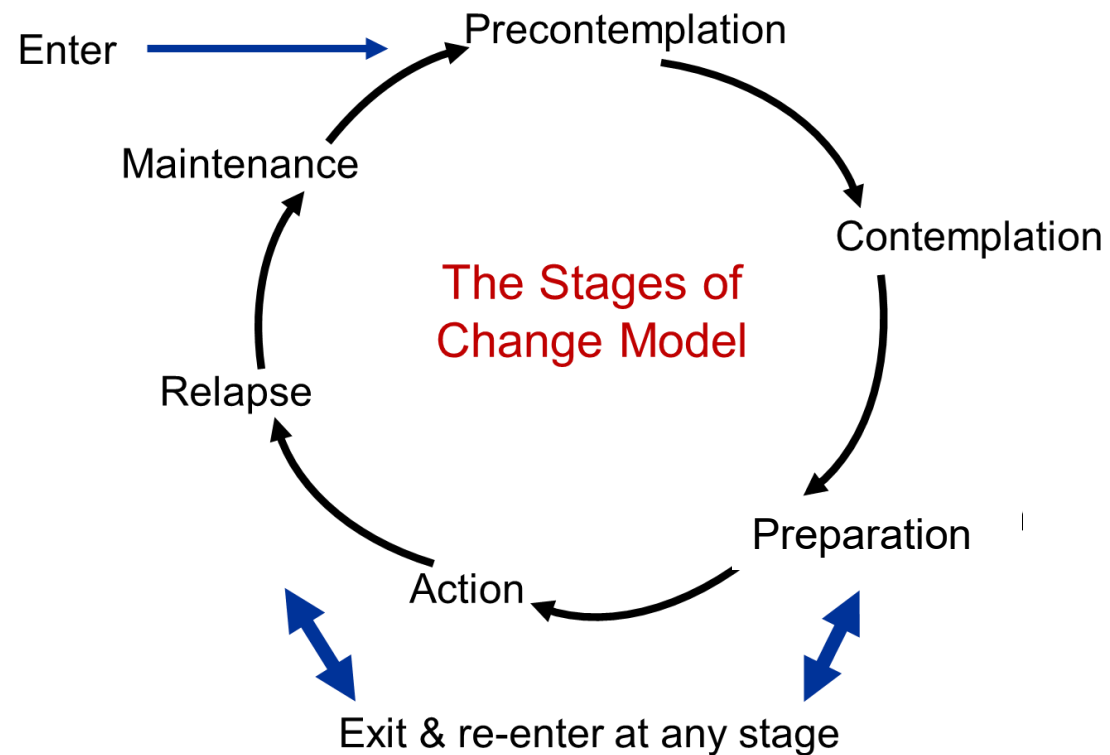
Encourage/ empower
parents to support PA



Assess

- Current level of PA
 - (define broadly)
- Lifestyle
- Barriers
- Likes & dislikes
- Overall attitude toward PA
- Stage of change related to PA
- Confidence to be more active

Match approach to readiness to change



STAGES OF READINESS FOR CHANGE



Prochaska, J.O., Velicer, W.1997. The transtheoretical model of health behavior change. September 1997. American Journal of Health Promotion. 12(1). 38 - 48

Assess readiness– two questions

1. “How **important** is it to you to make this change, on a scale of 0 to 10 with 10 being extremely important?”
2. “How **confident** are you that you can make this change, on a scale of 0 to 10 with 10 being extremely confident?”



Educating/empowering – it's a DIALOGUE, not a lecture

COLLABORATIVE CARE: PROMOTING SELF-MANAGEMENT

	Traditional	Collaborative
Interactions	Based on the caregiver's agenda	Based on a shared agenda
Behavior change	Comes from knowledge	Comes from self-efficacy plus knowledge
Goal	Compliance	Self-efficacy
Decisions	Made by the caregiver	Made by the patient and caregiver in partnership

Educate/empower patients

- Meaningful benefits
- Redefine what PA is
- Enjoyable
- Realistic
- Ability & confidence
- Barriers
- <https://healthy.kaiserpermanente.org/health-wellness/health-encyclopedia/he.abp8455#>



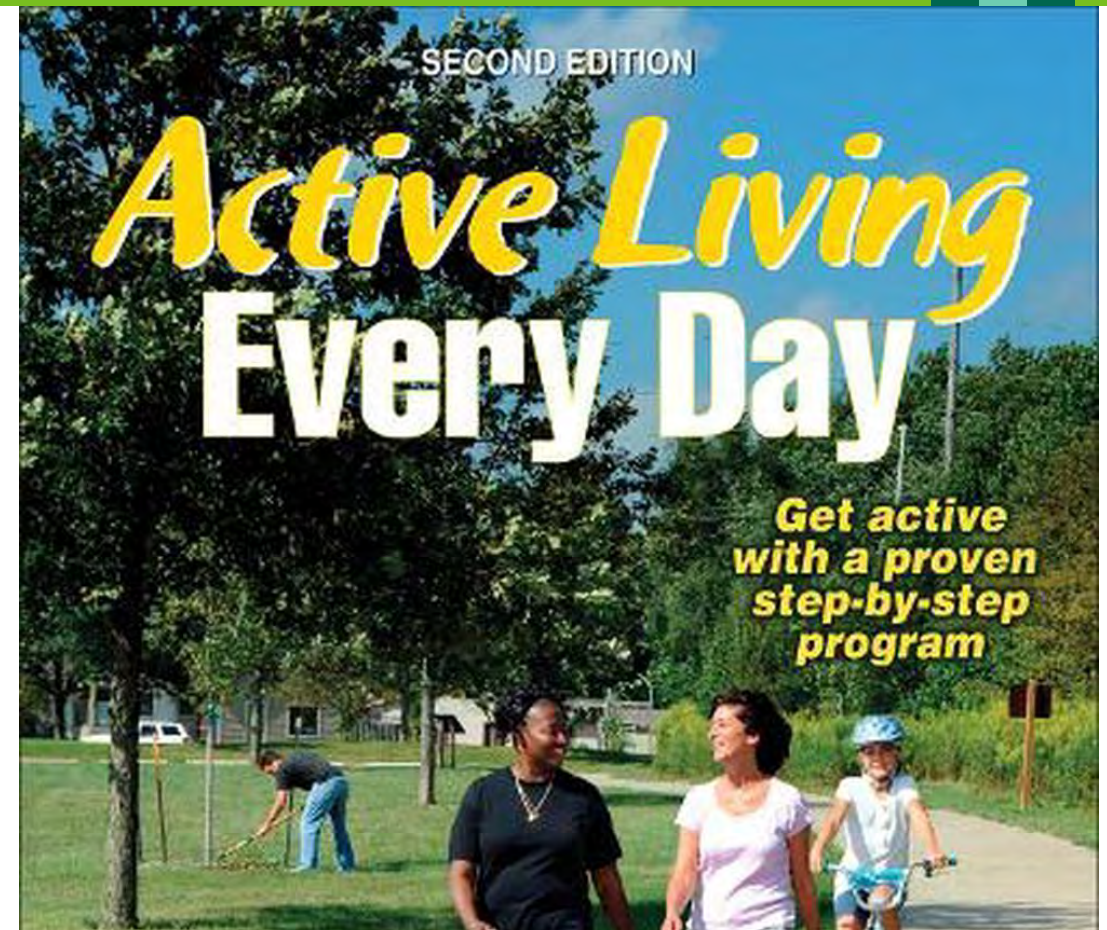
Encourage/empower parents

- Be a role model
- Actively play with children
- Reduce screen time
- Incorporate lifestyle PA
- Integrate PA into
 - family routines
 - special celebrations
 - vacations, etc.



Behavior change tools

- Include lifestyle physical activity
- Enlist support
- Make substitutions
- Build confidence
- Identify and problem solve barriers
- Explore new activities
- Seek out resources
- Reward yourself
- Monitor self talk
- Plan for high-risk situations



Kohl, HW, 3rd; Dunn, AL; Marcus, BH, Blair. SN. (1998). A randomized trial of physical activity interventions: design and baseline data from project active. *Medicine in Science and Sports Exercise*. 01, Feb 1998, 30 (2), 275 - 283



Some things to remember

- Moderate PA
- Lifestyle PA
- Accumulating short bouts
- Behavior change is not linear
 - small changes can be significant
- Have a dialogue
- Make it relevant to the patient
 - meet the patient where they are at
- Address barriers/confidence
- Engage the parents



<https://www.youtube.com/watch?v=yitf2gUYMAk>



Questions?
Thanks for participating!

WELCOME to the

Pediatric Integrative Medicine ECHO: Changing Health Care for Children

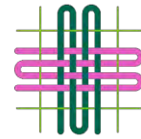
Session 5, September 5, 2023

Today's Program:

- Brief housekeeping
- Didactic: Mind body therapies: MBSR, hypnosis, guided imagery, biofeedback (access, evaluating, usage etc)
– Gerri Rubin
- Case Presentation: Gerri Rubin
- Case Discussion
- Summary
- Up Next

Notes:

- Enter name, organization into chat
- Raise virtual hand or enter comments in chat at any time. We will call on you when it works. Please mute otherwise.
- To protect individual privacy, please use non-identifying information when discussing cases.
- We will be recording the didactic part of these sessions. *Participating in these session is understood as consent to be recorded. Thank you!*
- Closed Captioning will be enabled during sessions
- [Submit cases](#)



Dartmouth
Health Children's



Mind Body Medicine

Gerri Rubin, MD

Chair, Pediatrics, DH Keene, Cheshire Medical Center

Associate Clinical Professor of Pediatrics, Geisel School of Medicine

Mind Body Medicine

- Aristotle (384–322 BC)
 - Believed every person has both physical & spiritual properties, no separation between mind & body
- René Descartes (1596–1650)
 - Worried scientific materialism would make the conscious mind vulnerable to manipulation & control
 - Aimed to separate the mind from the body to protect spirit from science
 - Mind & spirit should be the focus of the church, the body the focus of science.
 - “Cartesian split”- mind–body duality
- John Locke (1632–1704) & David Hume (1711–1776)
 - Furthered the Reductionist movement shaping modern science and medicine: if reduce natural phenomena to simple components, can better understand the larger whole.
 - Reductionism facilitated great discoveries that helped humans gain control over the environment.
- Early 20th century
 - Applied science transformed medicine through the development of medical technologies.
 - Reductionism and the scientific method stimulated the growth of allopathic medical institutions.

Mind Body Medicine

- Scientific model led to greater understanding of the pathophysiological basis of disease and the development of tools to help combat it.
- Sub-specialization of medical care facilitated application of the new information: practitioners focused on the pieces and society appreciates their abilities to fix problems.
 - Does not work well for chronic disease that involves more than just a single organ.
 - All body organs are interconnected, so repairing parts without addressing underlying causes provides only temporary relief
 - Responsible for a very expensive health care system in the United States with poor health outcomes.

Mind Body Medicine

- Current medical system
 - Encourages patients to believe that technology, medication and procedures are the answer to their physical woes
 - Discourages them from paying attention to the complex interactions of body, mind, community, and spirit.
- Technology has widened the barrier of communication between the patient & provider.
- Old tools of the trade—rapport, gestalt, intuition, and laying on of hands—used less often as powerful drugs and high-tech interventions became more available
- Rising interest in integrative medicine now, due to
 - Deterioration of the patient–provider relationship,
 - Overuse of technology and pharmaceuticals, and the
 - Inability of the medical system to treat chronic disease adequately

Mind Body Medicine

- Health is defined by the World Health Organization (WHO) as “a state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity.”²⁹ Cure, on the other hand, refers to doing something (e.g., giving drugs or performing surgery) that alleviates a troublesome condition or disease. Healing does not equal curing.

Mind Body Medicine

Biological perspective doctor patient relationship- reciprocal altruism- complex biological/neurologic reactions that we leverage daily

- Feeling sick - seeking relief - meeting the therapist - receiving the therapy
- Healer's brain- compassion and empathy
 - Native Healer quote: “I come to you in a good way”
- Patient's brain- trust and hope
- Placebo/nocebo mechanisms and brain changes induced by therapeutic rituals, expectation and learning

Mind Body Medicine- Stress

- Estimates that 80% of Primary Care visits related to stress
- Dr. Bruce McEwen describes
 - Three stress categories
 - Good stress: “eustress”- leads to adaptive change and resiliency
 - Tolerable stress: “distress”- can cope but may need support- resiliency
 - Toxic stress- cannot cope
 - **Allostasis**: adaptive processes that maintain homeostasis through the production of mediators such as adrenalin, cortisol, and other chemical messengers.
 - Promote adaptation in the aftermath of acute stress
 - But can contribute to **allostatic overload**: the wear and tear on the body and brain that result from being 'stressed out.'”

Mind Body Medicine

- In normal stress states we have a top-down control from prefrontal cortex downward(inhibitory).
- With allostatic overload we have bottom-up control with the amygdala activating first.
 - -Dysregulation HPA axis, inflammation, hormone derangements, disrupted neuronal activity on fMRI
 - Chronic stress leads to chronic disease states
- About 25% of pediatric patients have anxiety!

Mind Body Medicine The Relaxation Response

- Dr. Herb Benson- The Relaxation Response, 1970's study of BP in Transcendental meditators
 - Quantified what others had know for centuries before the “Cartesian split”
 - Taught four elements usually elicited the relaxation response:
 1. Mental device: repeating a word, prayer, or mantra
 2. Passive attitude: thoughts that occur during meditation are disregarded, not judged, or followed
 3. Decreased muscle tone: sitting in a comfortable position
 4. Quiet environment: closing the eyes

Relaxation Response

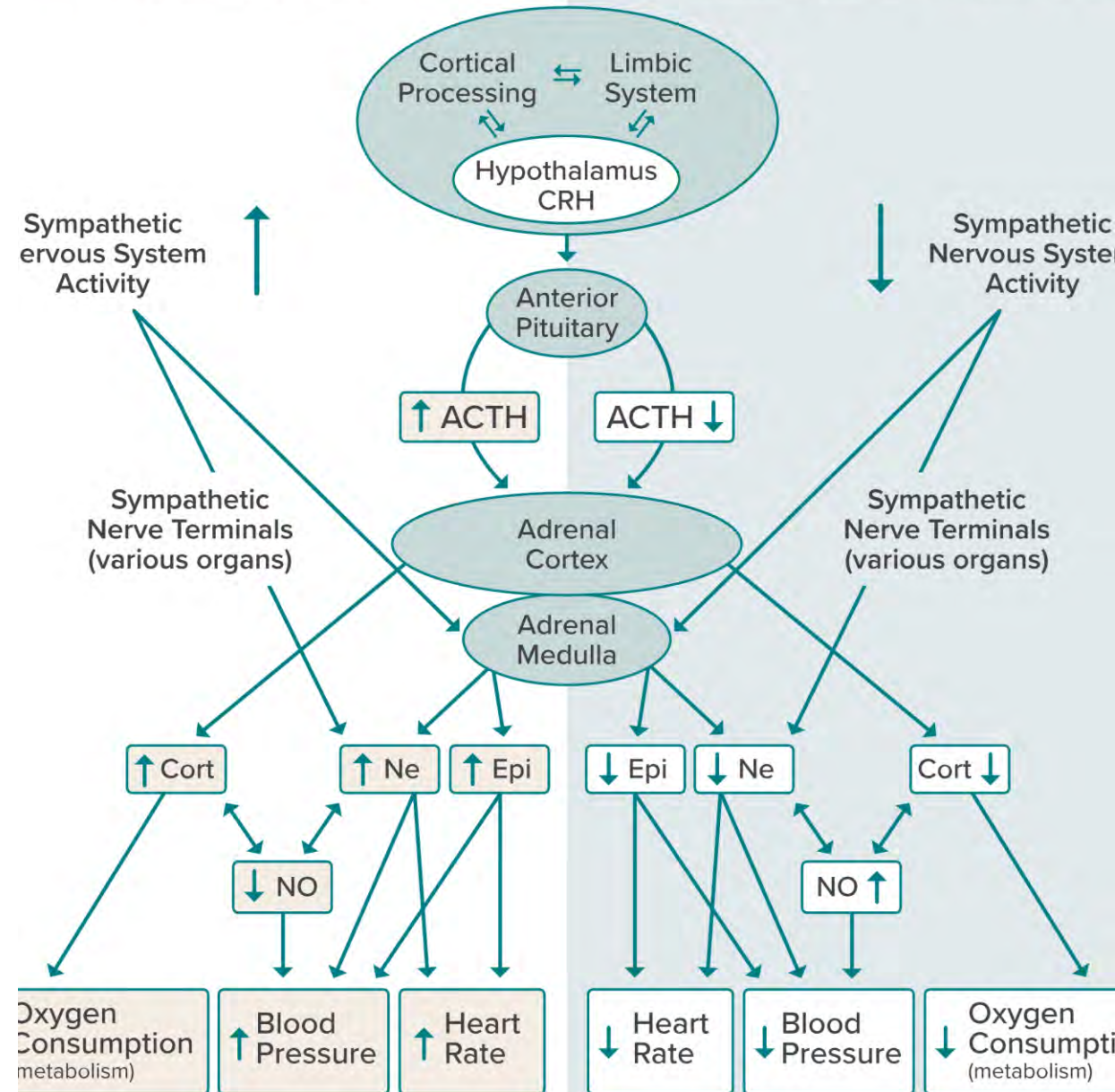
- Improved heart rate variability
- Improves telomere lengths
- Altered gene expression
- Improved immune function
- Alteration in microbiome and gut brain axis

STRESS RESPONSE

(Involuntary/Reflective)

RELAXATION RESPONSE

(Requires conscious elicitation and repeated practice)



Mind Body Modalities to Down-Regulate the Nervous System

- Breathing- general concept is to decrease to 6 breaths per minute impacts HRV, BP, pain, memory i.e bellows breathing, 4-7-8 breathing
- Meditation
- Mindfulness/MBSR-changes in prefrontal cortex, amygdala and connectivity
- Yoga
- Guided Imagery
- Hypnosis
- Progressive muscle relaxation
- Biofeedback-HRV, EMG, thermal feedback, neurofeedback/EEG
- Tai Chi/Qi gong
- Emotional Freedom Technique
- CBT

Mind Body Medicine- The Evidence in Pediatrics

- Researching mind body intervention is challenging.
 - Double blind, randomized, placebo-controlled trials do not fit well the complex biopsychosocial framework, a short fall of reductionism and research methodology in allopathic medicine
 - No big pharma to pay for research studies.
- Last AAP review article, Section on Integrative Medicine, Hillary McClafferty 2016
 - Biofeedback- evidence in headache, asthma, enuresis, neurofeedback ADHD?, chronic pain- expensive
 - Clinical hypnosis-evidence functional abdominal pain, procedural and chronic pain
 - Guided Imagery-stress reduction, pain management, improved psychological function-caution in trauma
 - Meditation/MBSR- evidence mental health, coping, self regulation, HTN, negative school behaviors
 - Yoga- pain, emotional, mental and behavioral conditions-studies had limitations
- Adverse event reporting of Mind Body intervention is limited.
 - 2021 systematic review showed 85.5% of studies did not report AEs.
 - Grade 3 was highest grade of AE's, majority Grade 1.
 - Causality not clear in many cases.

Mind-Body Therapy in Children & Youth, Mclafferty H et al, Pediatrics Volume 138, number 3, September 2016

Adverse Events in Mind-Body Interventions in Children: A Systematic Review

Lyszczuk et al, Children 2021,8,358

Pediatric Evidence for GI disorders

- Functional GI Disorder- IBS, functional abdominal pain, functional constipation, functional dyspepsia
 - Disturbance in the gut brain axis- disruption of bidirectional communication between gut and brain via ANS, endocrine and immune pathways
 - Leads to changes in endocrine pathways, immune response, motility, sensation
- Brain-gut therapy effective in functional GI disorders & inflammatory bowel disease
 - Best evidence for CBT, exposure-based therapy, hypnotherapy & mindfulness in functional GI disorders
 - But also important in IBD as well

Pediatric Evidence Clinical Hypnosis/Guided Imagery

- Kids < 14 years- highly susceptible to hypnotic state
- 14-20 years 90 % susceptible to hypnotic state
- Scripts used to fit child and their interests- post hypnotic suggestions to provide symptom relief, gain control of symptoms or build self confidence
- Online therapy & home-based self exercises are non inferior to individual, in person therapy
- Strong evidence for
 - Pain reduction in acute procedures involving needles,
 - Decreased use of sedatives and analgesics, decreased length of hospital stay
 - GI pain, headaches, asthma, anxiety
- Possible effectiveness in ADHD

Other Findings

- Mindfulness based interventions evidence -anxiety, depression, eating disorder, SUD, pain
- 2020 review of nonpharmacologic management of **ADHD** showed meditation, yoga, Tai chi had impact on inattention, increased executive function, improved self esteem and remarkably a systematic review of 34 trials showed tai chi comparable to methylphenidate in short term, more stable effect in long term. Mindfulness lacked adequate data in children but significant improvement in inattention in adults
- 2020 review yoga, meditation and mindfulness in **pediatric oncology** shows improved QOL, sleep, activity and fitness level, increase appetite, decreased anxiety, decreased fatigue- need better designed studies- no conclusions

Non-pharmacologic management of attention deficit/hyperactivity disorder in children and adolescents: a review

Shrestha et al, Translational Pediatrics 2020;9(Suppl1):S114-S124

Yoga, Meditation and Mindfulness in pediatric oncology: a review, Stritter et al, Complementary Therapies in Medicine

63(2021) 102791

Mindfulness based intervention for adolescent health, Lin et al, Current Opinion Pediatrics; Volume 31, Number 4, August

2019

What You Can Deliver

- Always introduce the biopsychosocial model of health as you approach a complaint
- When recommending Mind Body techniques to patients, do so in the context of the patients' personal health, and in relation to their daily lives, families, communities, belief systems, and sociocultural locations
- Breathe with your patients and families in the office- find a couple techniques and practice with them- emphasize the power of breath
- Watch the Magic Glove video and try it with a patient for IV or vaccines, teach parents the technique, send them home with a glove!!!
<https://www.bing.com/videos/search?q=magic+glove+video&view=detail&mid=5C1D45FCF532934F68E15C1D45FCF532934F68E1&FORM=VIRE>
- Figure out what patients have learned at school- lots of breathing, yoga and mindfulness being taught- have them teach you
- Recommend resources: gonoodle.com- yoga and relaxation; Insight timer free app- sleep, meditation, mindfulness, CHOC Guided Imagery recordings <https://www.choc.org/programs-services/integrative-health/guided-imagery/>
- Try guided imagery with a patient in the office for a vaccine or procedure
- Find local referral resources

WELCOME to the

Pediatric Integrative Medicine ECHO: Changing Health Care for Children

Session 6, September 21, 2023

Today's Program:

- Brief housekeeping
- Didactic: Mind body therapies: MBSR, hypnosis, guided imagery, biofeedback (access, evaluating, usage etc)
 - Matt Hand
- Case Presentation: Andy Wegman
- Case Discussion
- Summary
- Up Next

Notes:

- Enter name, organization into chat
- Raise virtual hand or enter comments in chat at any time. We will call on you when it works. Please mute otherwise.
- To protect individual privacy, please use non-identifying information when discussing cases.
- We will be recording the didactic part of these sessions. *Participating in these session is understood as consent to be recorded. Thank you!*
- Closed Captioning will be enabled during sessions
- [Submit cases](#)

Botanical Boot Camp: Common Supplements and Herbs and How to Evaluate Them

Matthew Hand DO

Section Chief, Pediatric Nephrology and Integrative Medicine
Dartmouth Health, Children's/Children's Hospital at Dartmouth

Disclosure

- ▶ As previously disclosed: Davinici labs/foodscience.

The background features abstract, overlapping geometric shapes in various shades of green, ranging from light lime to dark forest green. These shapes are primarily located on the left and right sides of the frame, creating a modern, layered effect. The central area is a plain white space where the text is located.

Is The Supplement World The
Wild, Wild West?

Who is using it and what are they using

- ▶ In the US, (1997)~1/3 of all adults use CAM
- ▶ Visits to CAM providers
 - ▶ 1990:420 million, 1997:629 million (up by47%)
 - ▶ 1997 estimated 21.2 billion dollars ~12billion out of pocket
 - ▶ 2007 14 Billion spent out of pocket to treat pain, 33.9 total out of pocket for all issues (NIH)
 - ▶ 2015 40 Billion dollars spent on botanicals and supplements alone. New estimates up over 200 Billion dollars per year spent

Clear as Mud!

- ▶ Events in NY and the NY AG regarding Walmart, Target, GNC etc is the recent event raising the issues about supplements/botanicals
- ▶ Multiple botanicals tested negative for what they claimed and had in them contaminants.
- ▶ Critics point out that this is a common occurrence and show that the **FDA doesn't regulate products.**
- ▶ Critics also say that it re-enforces that there is no place for these supplements in health care even though the two would be unrelated

- ▶ Once this hit the news: multiple reports in all media
- ▶ Who has seen any follow up?
- ▶ Is it true?
- ▶ Is there regulation?
- ▶ Is there a direct correlation to price?
- ▶ How do we know?
- ▶ What do I like to use for the conditions we will discuss today?

Follow up

- ▶ Testing called into question:
 - ▶ **DNA testing doesn't pick up extract**
 - ▶ Also misses treated plants where DNA breaks down.
- ▶ GNC:
 - ▶ showed testing process-met all regulations
 - ▶ Agreed to more stringent testing
- ▶ No news: Hardly anyone carried it.

Preparations

- ▶ Infusion -- a water extraction of soluble compounds from fresh or dried flowers, leaves, or seeds in hot water. Infusions prepared by steeping the herb in hot water for a minimum of 5 -10 minutes.
- ▶ Macerate -- an herbal infusion made with cold or room temperature water to minimize loss of important volatile oils, which can be destroyed by heat.
- ▶ Decoction -- a water extraction prepared by simmering roots, barks or other hard plant parts for a prolonged period of time. Decoctions can be made from fresh plant material but they are generally prepared from dried. Prolonged heat is necessary to rehydrate dried roots and barks, which will allow for maximum extraction of water-soluble constituents. Decoctions are the most popular method for preparing herbs throughout most of the world.
- ▶ Tincture -- a hydroethanolic preparation of plant material usually obtained using 1 part of herbal drug and 5 parts of extraction solvent (1:5).
- ▶ Fluid extract -- a hydroethanolic preparation of plant material where 1 part by mass or volume is equivalent to 1 part by mass of the herbal drug (1:1). (Also referred to as liquid extract.)
- ▶ The strength of a hydroethanolic extract is based on the relative metric weight of herb to the total metric volume of the solvent used for extraction. The dilution may vary from 1:1 to 1:5 (or greater) when preparing a fluidextract and tincture, respectively.
- ▶ *1kg of herb has been fully exhausted to yield 1L of extract in a fluidextract (1:1).*
- ▶ *1kg of herb has been fully exhausted to yield 5L of tincture (1:5).*

From Dr. Tieraona
Low Dog, AZCIM

Supplement Facts

Serving Size: 2 Capsules
 Servings per Container: 40

Amount Per Serving		% DV
Calories	2	
Calcium	40 mg	4%
Echinacea root 6:1 extract	112.5 mg	†
From <i>Echinacea purpurea</i> root (Containing alkylamides 2.1 mg)	675 mg	
Golden Seal root and rhizome 3:1 extract	166.7 mg	†
From <i>Hydrastis canadensis</i> root and rhizome 500 mg		

Percent Daily Values are based on a 2000 calorie diet.
 † Daily Value (DV) Not Established

Other ingredients: Calcium acid phosphate, cellulose, silica, magnesium stearate

1. "Serving Size". 2. "Servings per Container" 3. "Percent Daily Value" (%DV)

4. Common Name 5. Plant Part - 6. Extract Ratio -

7. Botanical Name 8. Quantity of Starting Material 9. Quantity of Extract

10. Standardization 11. Other ingredients

From Dr. Tieraona Low Dog, AZCIM content

Supplement Facts
 Serving Size: 2 Capsules
 Servings per Container: 30

Amount Per Serving		% DV
Calcium	72 mg	8%
Proprietary Blend	800 mg	†
Valerian root, Passionflower herb, Hops strobiles, Lemon balm herb, Chamomile flowers		

Percent Daily Values are based on a 2000 calorie diet.
 † Daily Value (DV) Not Established

Harmony Pills Unlimited
 Costa Mesa, California

Lot # 33175
 Exp. Mar 2009

1. Herbal formulas with multiple ingredients -- the herbs must be listed in descending order of predominance. If the herbs are grouped as a proprietary blend, only the total milligrams of the blend is required to be listed.
2. The amount in milligrams of each herb must be listed unless the herbs are grouped as a proprietary blend -- then only the total amount of the blend need be listed.
3. The label must include the name and place of business of manufacturer, packer, or distributor.
4. Lot numbers -- are used to trace a product's journey through the supply chain so that the origin of its ingredients can be determined. This is useful for checking the quality of the product or in the rare event that a product needs to be recalled. Most reputable manufacturers include a lot number on their products.
5. Expiration date -- the date after which a product may no longer contain the labeled potency levels. While some botanical products include an expiration date, it is often only an estimate, as many manufacturers do not conduct stability trials.

From Dr. Tieraona
 Low Dog, AZCIM

How do we know

- ▶ Strongly recommend looking at 3 party reviewers
 - ▶ Look not only at individual products but also trends
 - ▶ In general avoid proprietary blends unless trusted supplier and tells individual doses

What Are My Common Resources

- ▶ Natural Standards and Natural Medicine Database
- ▶ NSF International
 - ▶ <http://www.nsf.org/>
- ▶ United States Pharmacopia
 - ▶ <http://www.usp.org/>
- ▶ Consumerlabs.com
 - ▶ www.consumerlabs.com

What Are My Common Resources

- ▶ Natural Standards Natural Medicine Database
- ▶ www.consumerlabs.com

- ▶ Lets take a look!

So what do I use for things we see every day

- ▶ Anxiety/Insomnia
- ▶ Depression
- ▶ ADHD
- ▶ Abdominal pain/Colic

Anxiety

▶ Valerian

- ▶ 2-6 grams per day

- ▶ "A combination of valerian and lemon balm is effective in the treatment of restlessness and dysomnia in children." Muller SF, Klement S. *Phytotherapy : international journal of phytotherapy and phytopharmacology* 2006
- ▶ "Treating depression comorbid with anxiety--results of an open, practice-oriented study with St John's wort WS **5572 and valerian extract in high doses.**" von den Driesch V et al. *Phytotherapy : international journal of phytotherapy and phytopharmacology* 2003

- ▶ Smells bad

▶ L-theanine: amino acid from green tea

- ▶ "L-Theanine: **properties, synthesis and isolation from tea.**" Roach PD et al *Journal of the science of food and agriculture* 2011
- ▶ L-theanine relieves positive, activation, and anxiety symptoms in patients with schizophrenia and schizoaffective disorder: an 8-week, randomized, double-blind, placebo-controlled, 2-**center study.**" Lerner V et al. *J Clin Psychiatry.* 2011
- ▶ "Time for tea: mood, blood pressure and cognitive performance effects of caffeine and theanine administered alone **and together.**" Pleydell-Pearce CW et al. *Psychopharmacology (Berl).* 2008

▶ Rhodiola

- ▶ Popular with the Vikings for enhancing mental and physical endurance
- ▶ Purported to treat depression, enhance work performance, decrease fatigue, and prevent high altitude sickness.
- ▶ In Sweden and other Scandinavian countries it is used to increase the capacity for mental work and as a general strengthener.
- ▶ Possible actives in rhodiola: rosavins, rosiridin and salidroside.
 - "A pilot study of Rhodiola rosea (Rhodax) for generalized **anxiety disorder (GAD)**." Feusner JD et al. *Journal of alternative and complementary medicine* 2008

Depression

▶ Omega 3s

- ▶ A number of meta-analyses/systematic reviews evaluating the effectiveness of omega-3 fatty acids in depression
 - ▶ "A meta-analytic review of double-blind, placebo-controlled trials of antidepressant efficacy of omega-3 fatty acids." Su KP et al *The Journal of clinical psychiatry* 2007
 - ▶ Omega-3 fatty acids: evidence basis for treatment and future research in psychiatry." Freeman MP, Hibbeln JR, Wisner KL, Davis JM, Mischoulon D, Peet M, Keck PE, Marangell LB, Richardson AJ, Lake J, Stoll AL. *The Journal of clinical psychiatry* 67(12):1954-67 Dec, 2006
 - ▶ Efficacy of omega-3 fatty acids in mood disorders - a systematic review and metaanalysis. Unal SS et al
- ▶ More recent meta-analysis of 15 trials involving 916 subjects suggests that omega-3 fatty acid supplement with EPA greater or equal to 60 percent of total EPA and DHA showed highest benefit against primary depression

- ▶ B vitamins
- ▶ Iron
- ▶ Zinc
 - ▶ studies have reported an association between low zinc status and depression, and evidence that zinc supplementation has an antidepressant effect
 - ▶ "Zinc: the new antidepressant?" Levenson CW. *Nutrition reviews* , 2006

▶ Vit D

- ▶ Association in adults with vit D def and mood disorder
 - ▶ "Some new food for thought: the role of vitamin D in the mental health of older adults." Roos BA et al, Levis S. *Current psychiatry reports*, 2009
 - ▶ Association between low serum 25-hydroxyvitamin d and depression in a large **sample of healthy adults: the cooper center longitudinal study.** Brown ES et al. *Mayo Clin Proc.* 2011
- ▶ ? Proper level
- ▶ Roughly 400-800 U when little, 1000 U when older, 2000 Units adolescents.

▶ SAMe: serotonin precursor

- ▶ A meta-analysis of placebo-controlled studies on SAMe in depressed mood confirms efficacy and safety equivalent to conventional anti-depressants
 - ▶ "St. John's wort and S-adenosyl methionine as 'natural' alternatives to conventional antidepressants in the era of the suicidality boxed warning: what is the evidence for clinically relevant benefit?" Carpenter DJ. *Altern Med Rev.* 2011
- ▶ Patients not responded/partially responded conventional antidepressants, titrating SAMe 800mg to 1600mg/day improves response rate of clinical improvement
 - ▶ "S-adenosyl-L-methionine (SAMe) as an adjunct for resistant major depressive disorder: an open trial following partial or nonresponse to selective serotonin reuptake inhibitors or venlafaxine." , Fava M et al. *Journal of clinical psychopharmacology* 2004
- ▶ Expensive, commonly use 200-400 mg

▶ Rhodiola:

- ▶ Several clinical trials: rhodiola extract (SHR-5)- anti-fatigue, increases mental performance
- ▶ **Reduces “burnout” in patients with chronic fatigue**
- ▶ 340 or 680 mg/day over a 6-week period vs placebo-sig improvement
 - ▶ "Clinical trial of Rhodiola rosea L. extract SHR-5 in the treatment of mild to moderate depression." Panossian A et al. *Nordic journal of psychiatry* 2007

▶ St johns wort

- ▶ 29 trials (5489 patients)
- ▶ 18 with placebo
- ▶ 17 standard antidepressants
- ▶ Conclusion: St. John's wort (SJW)
 - ▶ superior to placebo in patients with major depression
 - ▶ are similarly effective as standard antidepressants
 - ▶ have fewer side effects than standard antidepressants
 - ▶ "[St. John's wort for depression--development of a Cochrane review from 1993 to 1996]" Linde K Cochrane Review 1993-1996 *Zeitschrift für Evidenz, Fortbildung und Qualität im Gesundheitswesen* 2008

- ▶ Placebo-controlled studies
 - ▶ Equivalent efficacy to tricyclic anti-depressants
 - ▶ 3 studies equivalent efficacy to SSRIs: fluoxetine, sertraline, and paroxetine
 - ▶ "Equivalence of St John's wort extract (Ze 117) and fluoxetine: a randomized, controlled study in mild-moderate depression." Schrader E. *International clinical psychopharmacology* 2000
 - ▶ "Effect of Hypericum perforatum (St John's wort) in major depressive disorder: a randomized controlled trial." Hypericum Depression Trial Study Group *JAMA : the journal of the American Medical Association* 2002
 - ▶ "Acute treatment of moderate to severe depression with hypericum extract WS 5570 (St John's wort): randomised controlled double blind non-inferiority trial versus paroxetine." Kieser M et al. *BMJ* 2005
 - ▶ The dose is 900-1500 mg per day in 2-3 divided doses of an extract standardized to 0.3% hypericin and/or 3-5% hyperforin.

ADHD+Supplements/Herbs

- ▶ Omega-3 Fatty acids/Essential fatty acids (EFAs).
 - ▶ Important for brain development and function.
 - ▶ EPA (eicosapentaenoic acid) and DHA (docosahexaenoic)
 - ▶ Evidence towards low EFAs in ADHD (Burgess 2000)
 - ▶ Appears it may help in ADHD developmental coordination disorder, learning disabilities and certain behavioral issues

- ▶ Recent Review out of Yale: Nutritional Supplements for the Treatment of Attention Deficit Hyperactivity Disorder
 - ▶ MH Bloch, J Mulqueen; Child Adol Psych Clinics of North America 2014

Clear as mud

- ▶ **Sinn (2009):** “Although further research is required, the current evidence supports indications of nutritional and dietary influences on behavior and learning in these children, with the strongest support to date reported for omega-3s and behavioral food reactions.”
- ▶ **Raz (2009):** “Current findings do not support the use of EFA supplements as a primary or supplementary treatment for children with ADHD.”
- ▶ What do I do: Recommend DHA and EPA, trying to get 1-2 gms per day in.
- ▶ Good recent review
 - ▶ The Diet Factor in Attention-Deficit/Hyperactivity Disorder *Pediatrics*J. Gordon Millichap and Michelle M. Yee

Botanical Medicine

- ▶ Ginkgo and American Ginseng
 - ▶ Believed to have a positive effect on memory and learning
 - ▶ **Lyon's et al: 36 children, up to 17 yo, Ginseng 200mg, Ginkgo 50 mg**
 - ▶ Over one month 30-74% improvement of social issues, 2 w/ side effects reported.
 - ▶ No control/placebo group.

Other Supplements

▶ Zinc

- ▶ One of the common ones discussed
- ▶ Bilici et al (2004): 400 children randomized, blinded high dose zinc (150 mg) improvement in hyperactivity, impulsiveness and socialization but not inattentiveness.
- ▶ Akhondzadeh et al (2004): Zinc, 15 mg elemental zinc, with improvement, placebo and blinded, 40 children on Ritalin.

▶ Valerian

- ▶ Muller et al (2006): valerian and lemon balm in restlessness and dyssomnia, 900 children, no placebo, 70-80% improvement.

▶ Iron:

- ▶ Iron deficiency in ADHD greater than controls (some studies/reviews)
- ▶ Ferritin <30 in 84% ADHD patients
- ▶ When levels low, correlated with worse ADHD scores.
 - ▶ Konofal et al Arch Peds Adol Med 2004
- ▶ Follow up study (with placebo)
- ▶ Given iron- better Clinical global impression scale, not in placebo
- ▶ Also Conners better (not stat sig)
 - ▶ Konofal et al Peds Neurol 2008
- ▶ More studies comparing medication response, Australian study with Brain Ferritin with ADD
- ▶ Will test prior to treating (2-6 mg/kg elemental iron)



Peppermint oil:

Carminative- gas relieving

Menthol- component which acts to relax smooth muscle by blocking calcium channels; most products have 44% menthol

Also found to have mild topical anesthetic effect

In children found to be both safe and effective.

Dose: 0.2-0.4 ml per day

Forms: enteric coated, peppermint oil soft gels, oil

Randomized, double-blind, controlled 2-week trial:

50 children; dose- 1-2, 187mg peppermint oil 3X/day for 2 weeks

76% receiving enteric coated peppermint oil caps with decrease Sx

19% decrease in placebo group

From Mark Integlia MD,
Dir. Peds GI Elliot Health
System

Kline et al. *J Pediatr* 2001;138:125-8.

Complementary and Alternative Therapy

Probiotics:

Ecosystem of gut may differ at times of illness and health

Anti-inflammatory effect of probiotics

Barrier effect with alteration of mucus layer

Treatment- traveler's diarrhea and viral gastroenteritis

Lactobacillus and Bifidobacterium studied most often

Forms- powder, yogurt, capsules, chewable tablets, freeze-dried powders, wafers and beverages.



From Mark Integlia MD,
Dir. Peds GI Elliot Health
System

Colic

- ▶ Two good reviews
 - ▶ Rosen et al *Pedi* in review 2009
 - ▶ Rosen : *Explore* July 2007
- ▶ Fennel seed oil
 - ▶ 125 colicky babies, placebo controlled
 - ▶ 65% improvement in treatment group vs 24% control
- ▶ Botanical blends
 - ▶ Fennel, chamomile, vervain, licorice, lemon balm
 - ▶ Large volume (3 oz/day)
 - ▶ 57% improved crying vs placebo 26%
 - ▶ Fennel, chamomile, lemon balm, rosemarinic acid, b vit
 - ▶ Crying decreased by 85% in treatment group, stat sig vs placebo
 - ▶ 200->76 min per day



- ▶ Probiotics

- ▶ 2009 L. Reuteri 100 mill CFUS

- ▶ Compared to simethicone

- ▶ Improvement in one week, increased over 4 weeks, 200min/d->159->51min/d

- ▶ 95% response vs 7% in simethicone group

- ▶ 2010 repeated with placebo only

- ▶ Again stat significant in probiotic group

WELCOME to the

Pediatric Integrative Medicine ECHO: Changing Health Care for Children

Session 7, October 3, 2023

Today's Program:

- Brief housekeeping
- Didactic: Acupuncture
– Britton Mann
- Case Presentation: Andy Wegman
- Case Discussion
- Summary
- Up Next

Notes:

- Enter name, organization into chat
- Raise virtual hand or enter comments in chat at any time. We will call on you when it works. Please mute otherwise.
- To protect individual privacy, please use non-identifying information when discussing cases.
- We will be recording the didactic part of these sessions. *Participating in these session is understood as consent to be recorded. Thank you!*
- Closed Captioning will be enabled during sessions
- [Submit cases](#)



BU TONG ZE TONG, TONG ZE BU TONG
不通這痛, 痛則不通

“when there is blockage, there is pain...
with free-flow, there is no pain”

Crash Course for DH Peds Echo: Traditional East Asian Medicine

Britton Mann, DAOM, L.Ac.
Open Door Integrative Wellness
White River Junction, Vermont

Crash Course for DH Peds Echo: Traditional East Asian Medicine

- I have no conflicts of interest.





Acupuncture and herbal medicine in the wild



Learning Objectives

- Questions about IM/CAM/teAm that I might loop into this discussion.
- Bringing you up to speed on Chinese medical anatomy and physiology.
- Crash course in diagnostics and treatment – you too can think like a teAm practitioner.
- Bringing something like the teAm mindset (IM of any kind) immediately to your patient care.

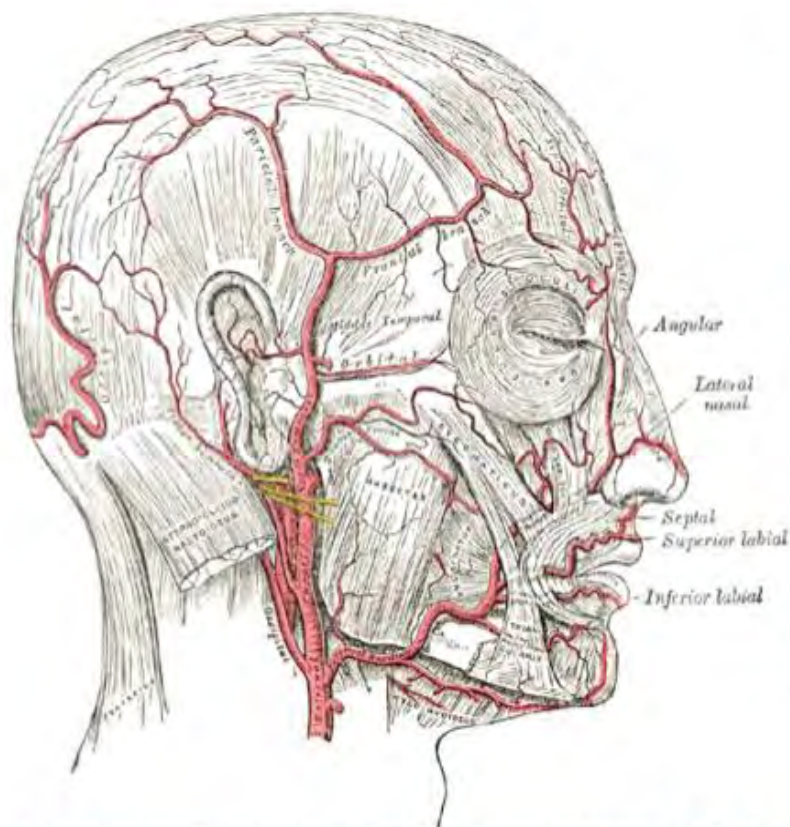
Questions? Write them into the chat and we'll leave plenty of time to "answer"

Learning Objectives

- Questions about IM/CAM/teAm that I might loop into this discussion.
- Bringing you up to speed on Chinese medical anatomy and physiology.
- Crash course in diagnostics and treatment – you too can think like a teAm practitioner.
- Bringing something like the teAm mindset (IM of any kind) immediately to your patient care.



morphology of the channels and collaterals



Līngshū 10: Translation by Dr. Edward Neal, MD, LAc

1. The stomach foot yangming (陽明 yang brightness) mai vessel arises from the crossing point at the bridge of the nose near the taiyang mai vessel (胃足陽明之脈起於鼻之交頰中旁納太陽之脈).
2. Descending along the outer aspect of the nose it enters the upper teeth (下循鼻外入上齒中). Turning back it emerges from the mouth, encircles the lips and descends to meet chengjiang (承漿 sauce container) (還出挾口環脣下交承漿).
3. Passing along the lower border of the cheek, it emerges at daying (大迎 great welcoming) (卻循頤後下廉出大迎).
4. Crossing jiache (頰車 jaw axle) it ascends in front of the ear and passes kezhuoren (客主人 guest's host) (循頰車上耳前過客主人). Following the border of the hairline it arrives at the forehead (循髮際至額顙).

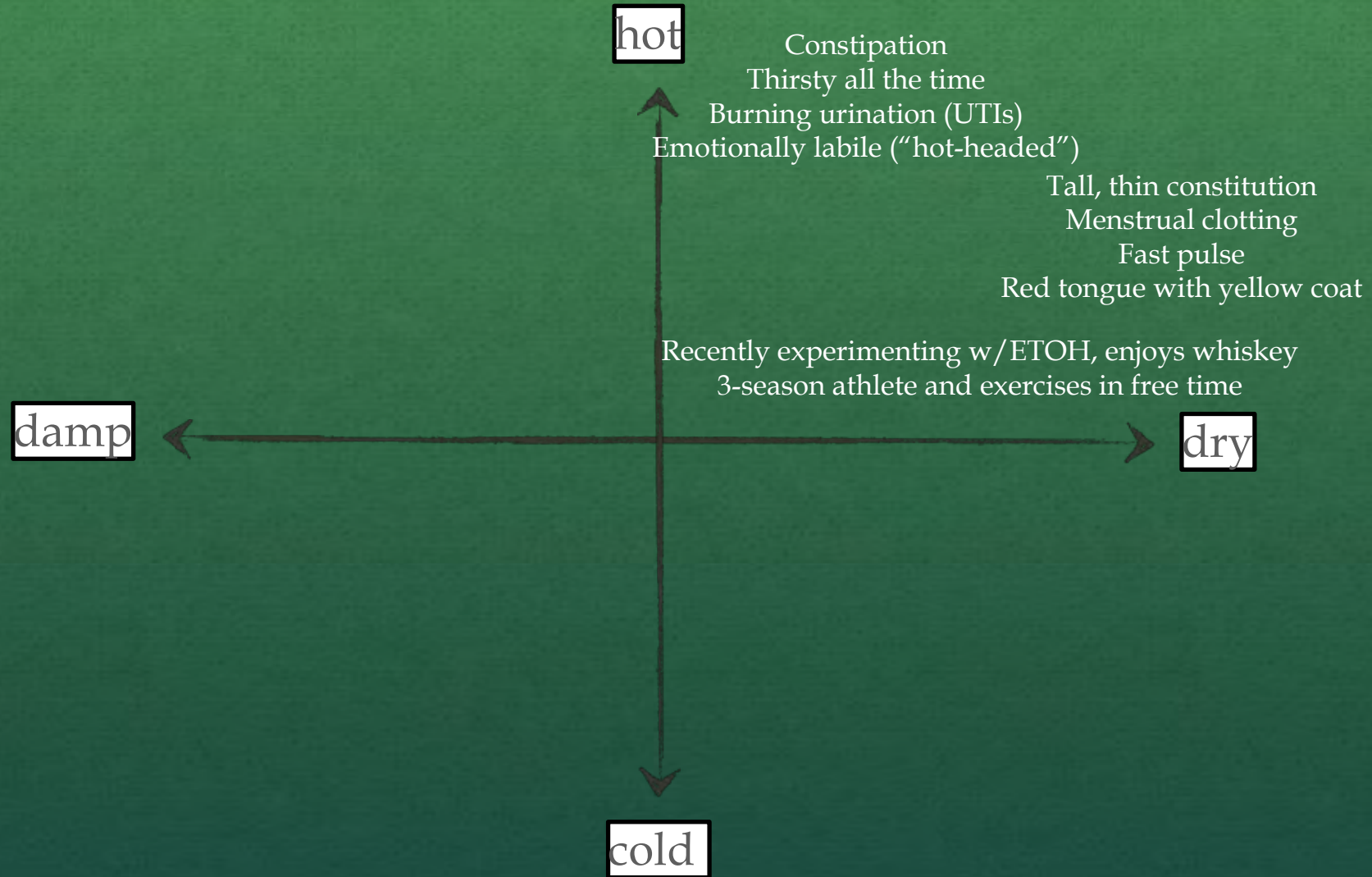




Learning Objectives

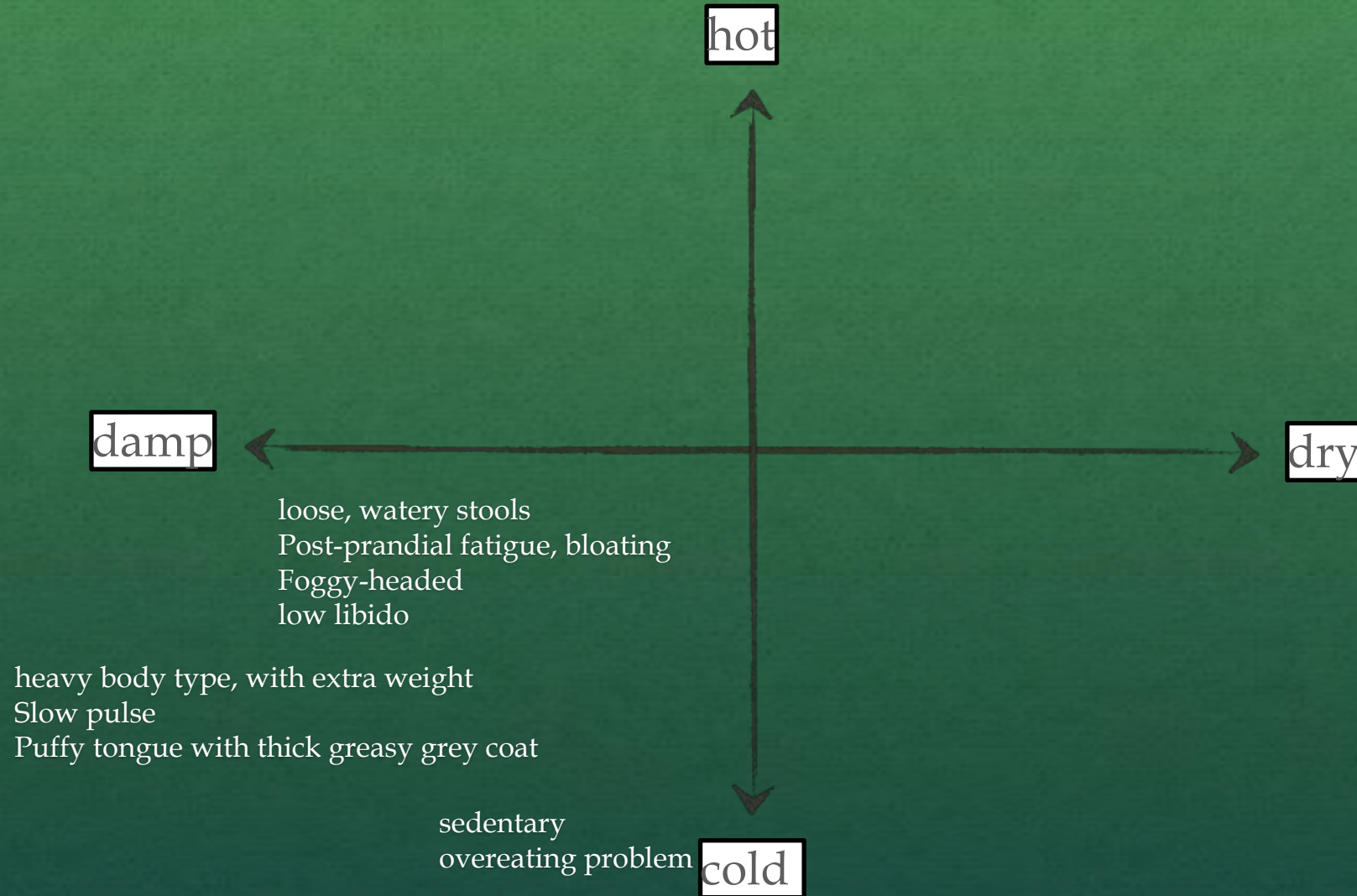
- Questions about IM/CAM/teAm that I might loop into this discussion.
- Bringing you up to speed on Chinese medical anatomy and physiology.
- Crash course in diagnostics and treatment – you too can think like a teAm practitioner.
- Bringing something like the teAm mindset (IM of any kind) immediately to your patient care.

Angelique's Internal Landscape





Danny's Internal Landscape

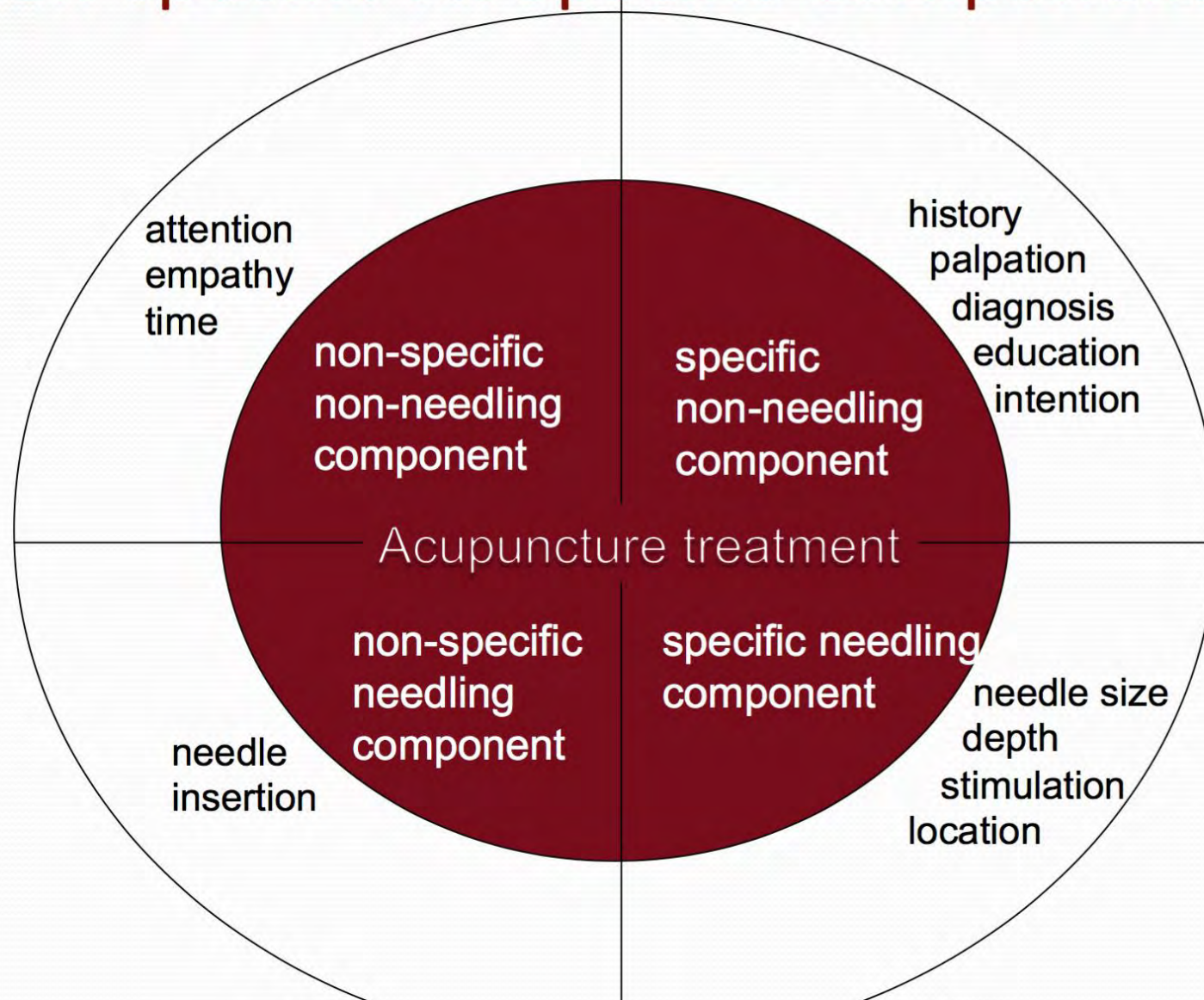




Learning Objectives

- Questions about IM/CAM/teAm that I might loop into this discussion.
- Bringing you up to speed on Chinese medical anatomy and physiology.
- Crash course in diagnostics and treatment – you too can think like a teAm practitioner.
- Bringing something like the teAm mindset (IM of any kind) immediately to your patient care.

Non-specific vs. Specific Components



This is where I have to go a bit philosophic, because though I've told you a bit about acupuncture, I can't give out needles and encourage you to adopt this in clinic tomorrow.

I'd suggest that acupuncture – and the model I just showed you – can be a metaphor for whatever integrative medicine modality you are drawn to.

If you are not already proficient in that modality, it'll take not very much training or tutelage to get you to a place where you can practice it safely and effectively.

It doesn't matter what "technique" in particular represents your lower right quadrant practice. If it is diet therapy like (x) presented on, use it. If movement therapy similar to what Michele presented, or if is some of the botanical medicines that Dr Hand spoke about last month.

The ECHO format of these lectures is similar in spirit to the "see one, do one, teach one," model of medical education.

Regardless of what particular modality you choose, having that extra tool makes you a bit of a jackknife for those patients who are not responding or not being served best by the more traditional biomedical interventions you find at DH.

I would suggest that by thinking about that recalcitrant condition or challenging patient with the IM mindset, the off-the-beaten path diagnostic and treatment framework, you're opening a new door for those folks. And a more diverse skill set for you as a clinician. This is expanding the upper right quadrant for you quite a bit. You're going to go back to Danny, the 16 y-o, and explain to them that a pint of ice cream every night before bed is like putting a damp wool blanket on your stomach's digestive fire, and all that cold, heavy, sticky sludge sinks right through your intestines and pushes the trap door open. That's why he has loose stools every morning. And if you explain it to him like that, he might make some lifestyle changes.

the ordinary states of consciousness

- Activities
 - Driving
 - Laundry
 - Making lunch
 - Checking email
 - Studying, working
 - Jazzercise class
- Mindset
 - Alert and oriented
 - Ego in effect
 - Cognizant of DOB, beliefs, level of education, etc. etc.
 - Participating in ADLs

non-ordinary states of consciousness

- Mindset
 - “Light trance state”
 - In touch with precognitive or intuitive self
 - Heightened sensitivity to self, others, world at large
 - Sense of peace or contentment
 - Able to interact normally and come back to ordinary state of consciousness easily

WELCOME to the

Pediatric Integrative Medicine ECHO: Changing Health Care for Children

Session 8, October 19, 2023

Today's Program:

- Brief housekeeping
- Didactic: Manual Medicine
 - Matt Hand
- Case Presentation:
- Case Discussion
- Summary
- Up Next

Notes:

- Enter name, organization into chat
- Raise virtual hand or enter comments in chat at any time. We will call on you when it works. Please mute otherwise.
- To protect individual privacy, please use non-identifying information when discussing cases.
- We will be recording the didactic part of these sessions. *Participating in these session is understood as consent to be recorded. Thank you!*
- Closed Captioning will be enabled during sessions
- [Submit cases](#)

Manual Medicine In Pediatric Care

Matthew Hand DO

Section Chief, Pediatric Nephrology and Integrative
Medicine

Children's Hospital at Dartmouth/Dartmouth Health
Children's

Disclosure

- ▶ Davinci Labs/FoodScience/Little Davinci
 - ▶ Medical advisory board, speakers board, consultant

What Is Manual Medicine?

- ▶ Massage
- ▶ Physical Therapy
- ▶ Chiropractic
- ▶ Therapeutic touch
- ▶ Acupressure
- ▶ Osteopathic manipulation

Massage

- ▶ Multiple different techniques
 - ▶ Swedish, Bodywork (craniosacral, lymphatic work, Rolfing, Shiatsu etc), Deep tissue, Stretches, Muscle energy etc
- ▶ Credentialling/How to evaluate
 - ▶ Variable from state to state
 - ▶ AMTA, NCBTMB, Accredited schools

Chiropractic

- ▶ Founded in 1895 by DD Palmer
- ▶ Idea on how the structure of the body impacts health
 - ▶ Subluxation: malalignment of spine
 - ▶ Innate intelligence: healing ability and improving through alignment
- ▶ Quite a bit of variability from provider to provider
- ▶ Credentialling/Licensing
 - ▶ Licensing and what is allowed varies from state to state
 - ▶ Some allow more supplements, other recommendations beyond manipulation.

What is Osteopathic Manipulation?

- ▶ OMT: Hands-on treatment
- ▶ Founded by a physician, Andrew Taylor Still in 1874.
- ▶ Belief: body functions best when it is aligned in a normal structural relationship.
- ▶ In addition to all other aspects of modern medicine, OMT is taught to physicians who attend osteopathic medical schools
- ▶ Infants: very gentle manipulation of the muscles and bones.

- ▶ Myofascial release
- ▶ Soft tissue
- ▶ Deep tissue
- ▶ Muscle energy
- ▶ Counter strain
- ▶ High velocity Low amplitude

Infant Massage

- ▶ Multiple studies showing benefits in newborns/neonates/premature infants
- ▶ Has demonstrated improve weight gain, earlier DC, and improved parasympathetic response.
- ▶ Multiple factors
 - ▶ increased insulin
 - ▶ Increased IGF-1
 - ▶ Increased vagal activity
 - ▶ Improved gastric motility.

Heart Rate Variability (HRV)

- ▶ Heart rate and rhythm are largely under the control of the autonomic nervous system.
- ▶ The parasympathetic influence on heart rate is mediated via release of acetylcholine by the vagus nerve.
- ▶ Baseline function is based on parasympathetic response, fluctuation with sympathetic impact.
- ▶ HRV: Change measured between beats.
- ▶ Demonstration

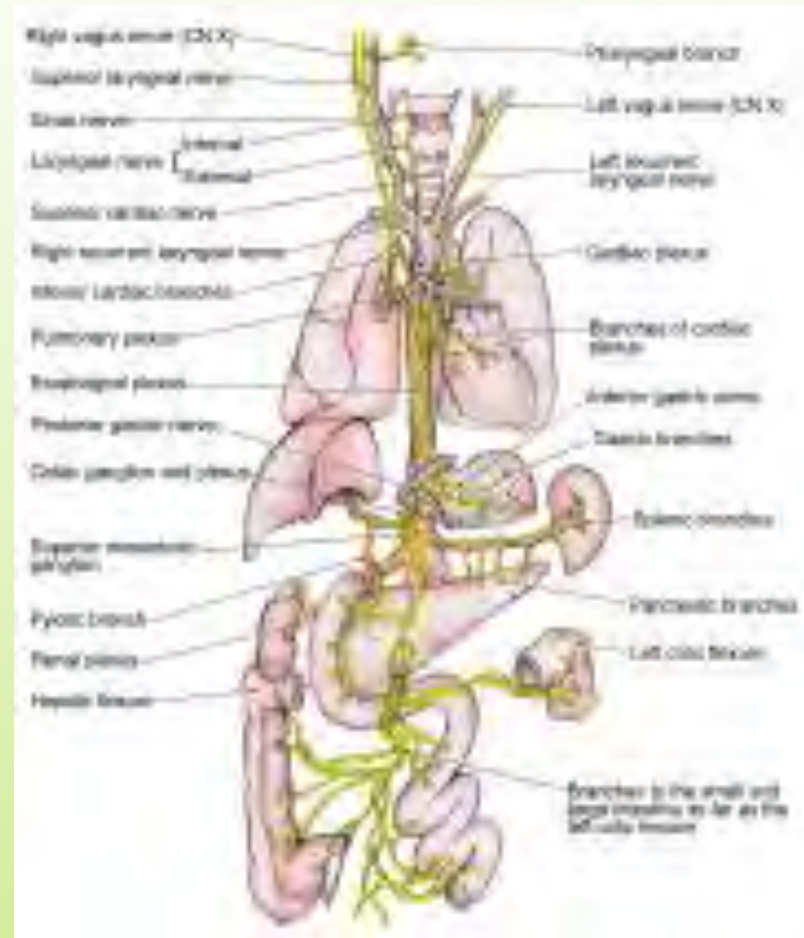
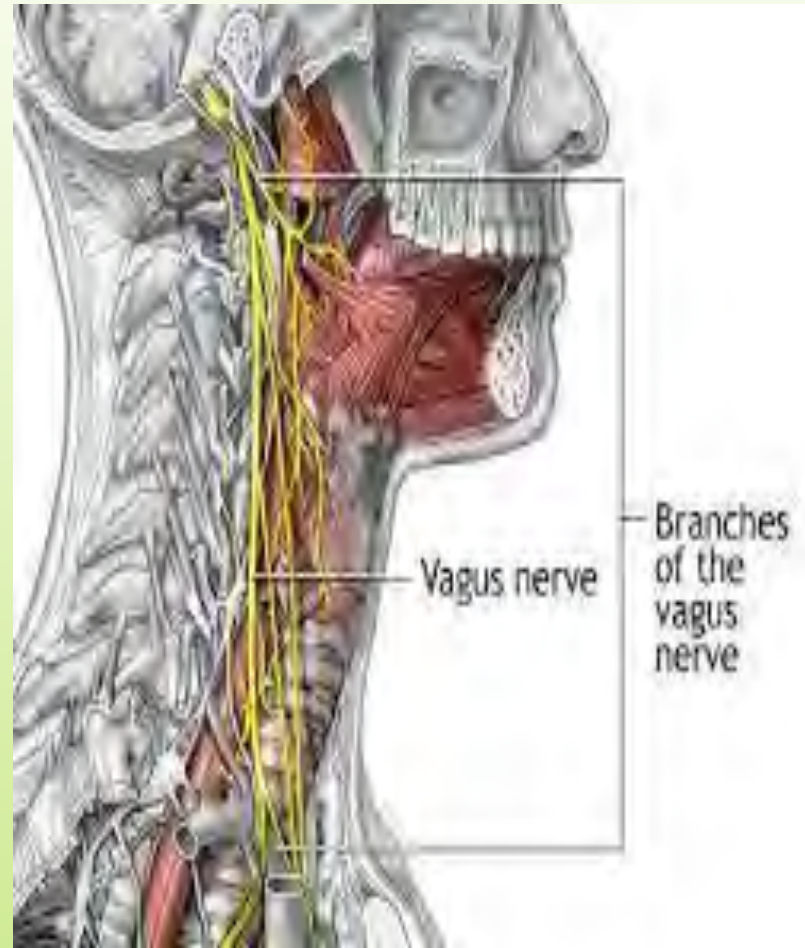
Vagus Nerve: ? The key

- ▶ Key component
 - ▶ regulation of the autonomic nervous system
 - ▶ socioemotional function
 - ▶ Afferent (sensory), efferent (motor) fibers
- ▶ Innervates
 - ▶ Gastrointestinal
 - ▶ Cardiovascular
 - ▶ Ears, mouth and voice
 - ▶ (Chang, Mashimo & Goyal, 2003; Kandel, Schwartz & Jessel, 2000).
- ▶ Heart rate variability:
 - ▶ Estimate vagal activity
 - ▶ Noninvasive measure of autonomic nervous system function
 - ▶ Reflects vagal regulation Cardiac and GI systems
 - ▶ (Fox & Porges, 1985; Katoh, Nomura, Iga, Hiasa, Uehara, Harada et al., 2003; Task Electrophysiology, 1996).

- ▶ Vagal activity from heart rate variability used to study infant development, affect, social interactions.
- ▶ Low vagal activity: found in depressed mothers and their infants
 - ▶ (Field, Diego, Dieter, Hernandez-Reif, Schanberg, Kuhn, Yando & Bendell, 2004; Jones, Field, Fox, Lundy & Hart, 1998)
- ▶ Depressed mothers: lower vagal tone than non-depressed mothers, greater relative right frontal EEG activation-Their newborns with lower vagal tone and greater right frontal EEG activation
 - ▶ Field et al. (2004)

- ▶ Same studies: lower vagal activity was significantly correlated with elevated cortisol and lower levels of serotonin and Dopamine (moms and babies).
- ▶ Lower vagal activity: mothers who have high prenatal anxiety levels and prenatal anger.
- ▶ Women high or low anxiety during the second trimester of pregnancy
 - ▶ High anxiety women: high scores on depression and anger scales, lower postnatal vagal activity, greater relative right frontal EEG activity, elevated prenatal norepinephrine, low dopamine in prenatal period
 - ▶ Newborns: lower vagal activity, lower dopamine and serotonin levels, greater relative right frontal EEG activation

- ▶ High anger mothers: low vagal tone, high prenatal cortisol and epinephrine, low dopamine and serotonin levels
- ▶ Mimicked by their neonates
 - ▶ (Field, Diego, Hernandez-Reif., Salman., Schanberg., Kuhn, Yando & Bendell, 2002-2003)



Infant Massage

- ▶ Low vagal tone: therapies that enhance vagal activity-massage therapy
 - ▶ (Field, Diego, Hernandez-Reif, 2006).
 - ▶ Increased vagal activity with massage therapy
 - ▶ (Diego et al., 2005; Lee,2005).
 - ▶ Also used with depressed adults
 - ▶ (George M et al2000).

OMM

- ▶ Myofascial release
- ▶ Soft tissue
- ▶ Deep tissue
- ▶ Muscle energy
- ▶ Counter strain
- ▶ High velocity Low amplitude (not in the newborns!)

Experience

- ▶ Significant improvement noted by PT with babies treated with OMM
- ▶ Significant improvement in oral feeding and in particular breast feeding (hypoglossal/glossopharyngeal nerve and hyoid bone)
- ▶ Improvement in irritability in chronic condition babies
- ▶ Improvement in NAS scores (particularly the more severe babies)

Treatment

- ▶ Based on babies position (IE can they be picked up)
- ▶ Start low on legs and hips, gentle movement of strain patterns as tolerated by the baby.
- ▶ Position in head flexed position
- ▶ Work up back for gentle positioning based on strain patterns
- ▶ Gentle chest wall movements for improved rib movement
- ▶ Sub-occipital release!!
 - ▶ May be the key.

Safety

- ▶ A number of reviews
- ▶ Adults: Hurwitz 1996
 - ▶ Stroke 5-10 for 10,000,000 treatments
 - ▶ Impairment 3-6 per 10,000,000 treatments
 - ▶ Death <3 per 10,000,000 treatments
 - ▶ Most revolved around HVLA/HVHA in high risk patients (conflicting reports)
 - ▶ Some say under reported
- ▶ Children
 - ▶ Vohra et al in 2007 looked at 13 studies. 14 cases of significant injury. Subsequent study said rare complications
 - ▶ Review of the events showed the children most had primary issues that should have limited cervical manipulation

WELCOME to the

Pediatric Integrative Medicine ECHO: Changing Health Care for Children

Session 9, December 5, 2023

Today's Program:

- Brief housekeeping
 - Didactic: Anxiety/Depression: Matt Hand
- Case Presentation:
- Case Discussion
- Summary
- Up Next

Notes:

- Enter name, organization into chat
- Raise virtual hand or enter comments in chat at any time. We will call on you when it works. Please mute otherwise.
- To protect individual privacy, please use non-identifying information when discussing cases.
- We will be recording the didactic part of these sessions. *Participating in these session is understood as consent to be recorded. Thank you!*
- Closed Captioning will be enabled during sessions
- [Submit cases](#)



Integrative Medicine in Pediatric Mental Health ECHO: Anxiety/Depression

Matthew Hand DO

Section Chief, Pediatric Nephrology and
Integrative Medicine

Children's Hospital at Dartmouth/Dartmouth
Health Children's

Clinical Assistant Professor, Geisel Medical School



Disclosures


Davinci/FoodScience/Little Davinci: Medical advisor






My Thoughts

- Overwhelmed by mental health issues
- Numbers hard to know but so extensive it seems like everyone is dealing with something
- Part of all conditions to some degree or another.
- “Genes load the gun, environment pulls the trigger”. Can we modify both?
- Lets delve into the triggers
- Take all of this and increase it since COVID started
- For those of us that do this, COVID unmasked it but we knew it was there.



So lets look at some of what's out there: IE what are the triggers.

- ▶ Bullying: CDC-unwanted aggressive behavior; observed or perceived power imbalance; and repetition of behaviors or high likelihood of repetition.
 - ▶ Highly discussed in the media.
 - ▶ Multiple, highly publicized cases
- ▶ Internet sites on bullying:
 - ▶ Reports of about 1 in 7 school kids are bullied
 - ▶ 1 of every 10 students drops out or changes schools because of repeated bullying.
 - ▶ 15 percent of all students who don't show up for school report it to being out of fear of being bullied while at school
 - ▶ 2.7 million students being bullied each year
 - ▶ School bullying statistics including cyberbullying report about one in four kids impacted
 - ▶ Around half of teens have been the victims of cyber bullying

- 
- ▶ 28% of U.S. students in grades 6–12 experienced bullying. 20% of U.S. students in grades 9–12 experienced bullying.
 - ▶ Approximately 30% of young people admit to bullying others in surveys.
 - ▶ 70.6% of young people say they have seen bullying in their schools. 70.4% of school staff have seen bullying. 62% witnessed bullying two or more times in the last month. 41% witness bullying once a week or more. When bystanders intervene, bullying stops within 10 seconds 57% of the time.
 - ▶ 9% of students in grades 6–12 experienced cyberbullying. 15% of high school students (grades 9–12) were electronically bullied in the past year.

Stopbullying.gov



Impact



- Bullying associated with
 - ADHD
 - Personality disorder
 - Anxiety
 - Depression
 - Substance use
 - Offline victimization
 - Aggression
 - Anger

Psychiatric conditions associated with bullying.

[Kumpulainen K](#)

The co-occurrence of Internet harassment and unwanted sexual solicitation victimization and perpetration: associations with psychosocial indicators.

[Ybarra ML](#)¹, [Espelage DL](#), [Mitchell KJ](#).



Electronics



- ▶ The bane of my existence as an integrative doc and father (along with school systems)
- ▶ Taken as a whole can include TV, video games, computer games, internet, cell phones, etc and all of them together on one device!
- ▶ Variable studies on impact
- ▶ What I see is a profound impact on children influencing almost every aspect of kids lives.
- ▶ “try and take away and see response”



4 Components of an Internet/Videogame Addiction

- Negative Consequences – The use of the internet or technology has negatively affected quality of life. Some examples would be - deteriorating social relationships, social isolation, poor work or school performance and arguments about time spent online.
- Excessive time spent online – Most internet addicts will spend a great deal of time online, will lose track of time while surfing, and will forget to meet basic needs such as for sleep or food, while on the internet.
- Tolerance – A need to spend more time online to feel satisfied. Also, a preoccupation with acquiring new and better technology or software.
- Withdrawal – Feeling irritable, depressed or angry when they cannot be online.

➤ Choosehelp.com



Gaming

- ▶ Pathologic Gaming: Not sure exactly what this means but essentially is describes videogame/internet addiction. Experts recommend differentiating from “strong engagement”
- ▶ Difficult to know, most info is self reported studies
Prevalence : 9-10%
- ▶ Depression, anxiety, social phobias, and lower school performance : outcomes of pathological gaming

[Pediatrics](#). 2011 Pathological video game use among youths: a two-year longitudinal study.

[Khoo A](#) et al



Studies on impact of video game use

- ▶ Amount of time spent on video games is associated with
 - ▶ Higher levels of depression (Lemona et al., 2011), (Gentile et al., 2011; Mentzoni et al., 2011),
 - ▶ Lower academic achievement (Anand, 2007; Gentile, Lynch, Linder & Walsh, 2004) (Skoric, Teo & Neo, 2009)
 - ▶ Increased alcohol consumption (Ream, Elliott & Dunlap, 2011)
 - ▶ Conduct problems (Holtz & Appel, 2011) (Rehbein, Kleinmann, Mediasci & Möble,)

- ▶ Good review: J behav addiction 2014, Froyland, L et al
- ▶ Television and video game exposure and the development of attention problems." Walsh DA et al. *Pediatrics* Aug, 2010
- ▶ Other studies without the same findings, difficult to evaluate



School


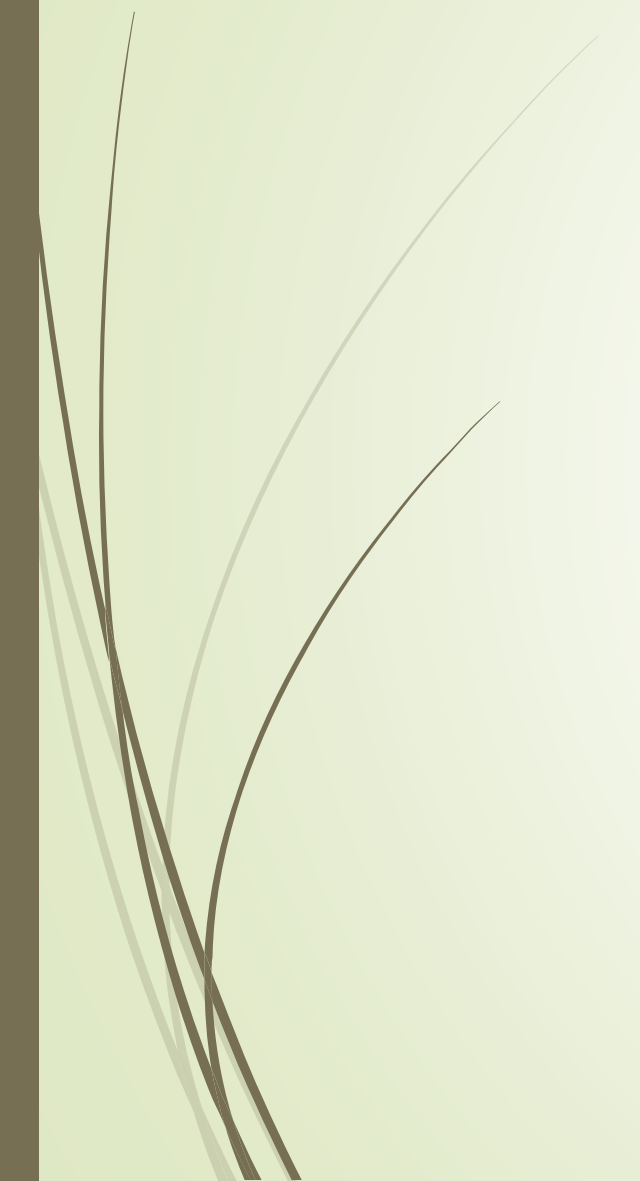



- By far the single greatest stressor on almost every child I see.
- Academics, social interactions, homework, sports etc
- Very often patients and family state “it can’t be school, they/I love school”
- Dramatic “denial” is the best way to describe it.
- Very common in high performing students
- I found it hard to find studies that address the process, more focused on patient/student issues.
- I admit I am biased: hated school-“legislated child abuse” 😊



Common scenarios

- ▶ 15 year old female
 - ▶ “Excellent student, loves school”-Her whole life her image was formed by being a good student
 - ▶ Headaches started about 4 years ago –start of middle school- and last year became unbearable-start of high school.
 - ▶ Wakes with headaches every day, improved by late afternoon, becomes worse again at night.
 - ▶ Still gets work done at home.
 - ▶ Tries to go back to school but headache worse
 - ▶ Overweight
 - ▶ Starts to get “panicky” when discussing returning to school.
 - ▶ Mom feels school doesn’t understand
 - ▶ Work up negative

- 
- 
- ▶ Associated nausea, abd pain, dizziness and fatigue
 - ▶ “Can’t be school, must be MSG”
 - ▶ Now homeschooled.
 - ▶ Can’t sleep-cell phone in the room-“doesn’t use it at night” but panics and absolute refusal to remove it from the room.
 - ▶ About 10-14 hours a day of electronics

- 
- ▶ 15 year old male
 - ▶ ADD
 - ▶ “very smart but can’t focus”
 - ▶ Abdominal pain and headache every day and night.
 - ▶ ?Lyme/chronic lyme
 - ▶ Marked anxiety
 - ▶ Poor social interactions.
 - ▶ Refuses exercise
 - ▶ Video game/tv/electronics 12-16 hours per day
 - ▶ COD, Mind craft
 - ▶ Can’t sleep so has to be on electronics, fatigued all day and not sure why.
 - ▶ Craves carbohydrates
 - ▶ Hasn’t been to school consistently in 2 years because of his “medical problems”



How much is out there?

- ▶ Over 60 billion dollars a year on anxiety disorders!
 - ▶ Economic burden of anxiety disorders : 1998 was \$63.1 billion, including direct health care costs, indirect costs such as lost wages caused by missed work, decreased work productivity, increased medical morbidity, and suicide (Langlieb, 2005).
- ▶ Anxiety disorders: lifetime prevalence of 25.1% in 13-18 year olds
- ▶ ~ 40 million American adults age 18 years and older (about 18%) with anxiety disorder in a given year.
- ▶ **2023: Federal data Census Bureau's Household Pulse Survey: 50% 18-24 year old's report anxiety and depression symptoms, Adol females: 57% hopelessness + sadness, ~30% of males (Kaiser Foundation)**



So what happens with stress/anxiety

- ▶ Stress response:
 - ▶ Change in glucocorticoids, catecholamines, IL6
 - ▶ Impacts
 - ▶ Cognitive function, fear, anger, wake-sleep, thyroid axes GI, CV and immune response
 - ▶ Metabolic/Immune responses:
 - ▶ Corticotropin RH, stimulate gluconeogenesis, hepatic glucose secretion
 - ▶ Impact on TH-1 and th-2
 - ▶ "Stress and disorders of the stress system." Chrousos GP. *Nature reviews. Endocrinology* 5(7):374-81 Jul, 2009



Stress in Chronic conditions

- ▶ Primary Cause of headaches
- ▶ Highly associated with abdominal pain
- ▶ Autoimmune conditions and long term symptoms
 - ▶ Clin Exp Rheum 2012. Autoimmune rheumatic disease associated symptoms in fibromyalgia patients and their influence on anxiety, depression and somatisation: a comparative study.
- ▶ Abdominal pain and IBD
 - ▶ J Clin Psychv2001; Depression, anxiety, and the gastrointestinal system. Naliboff BD et al



Depression:

- ▶ Important public health issue in the United States estimated total annual cost of \$247 billion.
- ▶ A total of 13%-20% of children living in the United States experience a mental disorder in a given year
- ▶ Surveillance during 1994-2011: prevalence increasing.
- ▶ Suicide: second leading cause of death among children aged 12-17 years in 2010.
 - ▶ Mental health surveillance among children--United States, 2005-2011. Huang LN et al, Centers for Disease Control and Prevention (CDC) MMWR Surveill Summ. 2013;62 Suppl 2:1.

Conditions associated with stress

"Stress and disorders of the stress system." Chrousos GP. *Nature reviews. Endocrinology* 5(7):374-81 Jul, 2009

Acute

- Allergic reactions
- Asthma
- Eczema
- Fear reactions
- Hypertension
- Indigestion (constipation, diarrhea)
- Migraine
- Pain
- Panic attacks
- Psychosis
- Urticarial

Chronic

- Anxiety
- Autoimmune disorders
- Behavioral maladjustment (poor planning and decision making)
- Cardiovascular disease
- Cognitive dysfunction
- Depression
- Growth delay
- Irritable bowel syndrome
- Loss of libido
- Metabolic disorders (obesity, metabolic syndrome, type-2 diabetes)
- Neurovascular degenerative disease
- Osteopenia
- Polycystic ovarian syndrome
- Reduced fertility
- Sleep disorders



So What Can We Do

- ▶ Address the issue
 - ▶ Always assume stress plays a role, how can it not.
 - ▶ Don't be afraid to recommend Modalities
- ▶ Modalities
 - ▶ Biofeedback
 - ▶ Guided imagery
 - ▶ Hypnosis (self-hypnosis)
 - ▶ Numerous forms of meditation and deep relaxation (MBSR, PMR, breath work)
 - ▶ Mindfulness in all we do (eat, drink, sleep, exercise etc)
 - ▶ Supplements/herbals



Moving Meditation

- ▶ Yoga

- ▶ Tai Chi

- ▶ "Effects of yoga and meditation on clinical and biochemical parameters of metabolic syndrome.", Agrawal RP. *Diabetes research and clinical practice* 2007
- ▶ "Yoga and qigong in the psychological prevention of mental health disorders: a conceptual synthesis Glass N et al *Chinese journal of integrative medicine* 2010
- ▶ Qigong for schoolchildren: a pilot study. *J Alt Comp Med* 2005
- ▶ "Yoga as a Complementary Treatment of Depression: Effects of Traits and Moods on Treatment Outcome, Abrams M. et al *Evidence-based complementary and alternative medicine* 2007
- ▶ NIH: > 40 research trials on the effects of yoga in patients with hypertension, stroke, irritable bowel syndrome, PTSD, cystic fibrosis, asthma, depression and chronic pain



Yeah but does it Work?


- ▶ The ancients thought so
- ▶ Almost all cultures include mind body therapies in their treatments
 - ▶ TCM: Tai chi/ Chi Kung, breath work
 - ▶ Ayurveda: yoga, breath work
 - ▶ American Indian: Sweat lodges, breath work
- ▶ Almost all teach some form of breath work.
- ▶ Historically the mind was closely connected to the body
- ▶ Our Western beliefs focused on reduction theory and thus the brain/mind was considered separate.



Can we change our Brain: Neuroplasticity

- ▶ Neuroplasticity refers to structural and functional changes in the brain that are brought about by training and experience. The brain is the organ that is designed to change in response to experience. Neuroscience and psychological research over the past decade on this topic has burgeoned and is leading to new insights about the many ways in which the brain, behavior and experience change in response to experience. This basic issue is being studied at many different levels, in different species, and on different time scales. Yet all of the work invariably leads to the conclusion that the brain is not static but rather is dynamically changing and undergoes such changes throughout one's entire life. "

—Mind-Life Institute



Stress reduction correlates with structural changes in the amygdala." Holzel BK, Carmody J, Evans KC, Hoge EA, Dusek JA, Morgan L, Pitman RK, Lazar SW. *Social cognitive and affective neuroscience* 5(1):11-7 Mar, 2010

- ▶ Amygdala as a brain structure crucial in stress responses.
- ▶ Hyperactive amygdala function observed during stress conditions
- ▶ MRI study: relationship between changes in perceived stress with changes in amygdala gray matter density following a stress-reduction intervention.
- ▶ Stressed healthy individuals (N = 26) ,8-week mindfulness-based stress reduction intervention.
- ▶ Perceived stress was rated on the perceived stress scale (PSS)
- ▶ Anatomical MR images were acquired pre- and post-intervention. Following the intervention, significantly reduced perceived stress.
- ▶ Reductions in perceived stress correlated positively with decreases in right basolateral amygdala gray matter density.
- ▶ Neuroplastic changes are associated with improvements in a psychological state variable.




Can we change our genes

- ▶ Shortening of the telomere (nucleoprotein end caps on chromosomes) increased vulnerability of aging cells to DNA damage and dysregulation
- ▶ Shortened telomeres may lead to inadequate replacement of damaged or dead cells from their respective precursor cell populations, IE aging.
- ▶ Studies show stress life style changes can directly impact telomerase activity, thus improving telomere function.
 - ▶ Lancet Onc 2008. Increased telomerase activity and comprehensive lifestyle changes: a pilot study. Ornish D, et al
 - ▶ Lancet Onc 2013 Effect of comprehensive lifestyle changes on telomerase activity and telomere length in men with biopsy-proven low-risk prostate cancer: 5-year follow-up of a descriptive pilot study. Ornish D, et al
 - ▶ Orv Hetil 2010 The 2009 Nobel Prize in Medicine and its surprising message: lifestyle is associated with telomerase activity]. Falus A.



Relaxation response

- Two steps are usually required to elicit the relaxation response:
- Repetition: The repetition of a word, sound, prayer, phrase or muscular activity.
- Passive Return: When thoughts unexpectedly intrude, there is a passive return to the repetition.
- The relaxation response counters the harmful effects of the stress response, referred to as allostatic loading

- 
- ▶ Gene analysis of 20 subjects and 20 controls
 - ▶ Subjects did RR
 - ▶ Showed alterations in cellular metabolism, oxidative phosphorylation, generation of reactive oxygen species and response to oxidative stress

"Genomic counter-stress changes induced by the relaxation response." Libermann TA. et al. *PloS one* 3(7):e2576 2008



Mindfulness



- ▶ Meta-analysis:
 - ▶ 39 studies- 1,140 subjects
 - ▶ Mindfulness therapy for anxiety, depression and other medical and mental health conditions.
 - ▶ Improvement of symptoms for those with anxiety and depression
 - ▶ Mindfulness-based therapies were noted to be a promising intervention with minimal downside
 - ▶ (Hofmann, 2010; Vollestad, 2011).

Botanical Boot Camp for Calming the Mind

Note: As was discussed in a previous session of our ECHO program, Supplements and Botanicals are not regulated by the FDA. The current presentation offers an overview of supplements/botanicals but cannot cover all the data/references related to individual therapies. It can also not cover all the side effects/benefits/drug-herb interactions related to the individual treatments. For more detailed look at these areas we would refer you back to the ECHO on “Botanical Bootcamp” and the following independent reviewers:

- Natural Medicine Comprehensive Database
- United States Pharmacopia
- ConsumerLabs.com
- NSF



Anxiety



- ▶ L-theanine: amino acid from green tea
 - ▶ "L-Theanine: properties, synthesis and isolation from tea." Roach PD et al *Journal of the science of food and agriculture* 2011
 - ▶ L-theanine relieves positive, activation, and anxiety symptoms in patients with schizophrenia and schizoaffective disorder: an 8-week, randomized, double-blind, placebo-controlled, 2-center study." Lerner V et al. *J Clin Psychiatry*. 2011
 - ▶ "Time for tea: mood, blood pressure and cognitive performance effects of caffeine and theanine administered alone and together." Pleydell-Pearce CW et al. *Psychopharmacology (Berl)*. 2008



- Valerian

- 2-6 grams per day

- "A combination of valerian and lemon balm is effective in the treatment of restlessness and dyssomnia in children." Muller SF, Klement S. *Phytomedicine : international journal of phytotherapy and phytopharmacology* 2006

- "Treating depression comorbid with anxiety--results of an open, practice-oriented study with St John's wort WS 5572 and valerian extract in high doses." von den Driesch V et al. *Phytomedicine : international journal of phytotherapy and phytopharmacology* 2003

- Smells bad



- 5-htp+L tryptophan

- precursors for serotonin synthesis

- Small studies with potential benefit

- "Effects of tryptophan depletion on carbon dioxide provoked panic in panic disorder patients." Griez E et al. *Psychiatry research* 2000

- 25-400mg per day

- Lemon balm

- Mint family, commonly combined with Valerian

- Most studies done in Germany,

- Modulation of mood and cognitive performance following acute administration of *Melissa officinalis* (lemon balm)."


- Wesnes KA et al. *Pharmacology, biochemistry, and behavior* 2002

- ? Increased anxiety at higher doses



CBD

- ▶ Extremely hot topic
- ▶ Almost all patients' parents asking
- ▶ Mechanism of action
 - ▶ Counterbalance of THC, potentiate the effect
 - ▶ Potentiate endocannabinoids
 - ▶ May impact GABA receptors (particularly related to anxiety and PTSD)
- ▶ Blessing 2015: review “existing preclinical evidence strongly supports CBD as a treatment for generalized anxiety disorder, panic disorder, social anxiety disorder, obsessive–compulsive disorder, and post-traumatic stress disorder when administered acutely; however, few studies have investigated chronic CBD dosing. Likewise, evidence from human studies supports an anxiolytic role of CBD, but is currently limited to acute dosing, also with few studies in clinical populations.”

- 
- ▶ Our anecdotal experience
 - ▶ Marked improvement in behaviors reported by teachers and parents.
 - ▶ Dosing unclear 2.5-50+ mg
 - ▶ Commonly dosed 2-3 times a day



- ▶ Hops

- ▶ Numerous studies with valerian combinations. Small numbers per study but effective

- ▶ Chamomile

- ▶ Believed to be helpful, small human studies

- ▶ Safe



Depression

▶ Omega 3s

- ▶ A number of meta-analyses/systematic reviews evaluating the effectiveness of omega-3 fatty acids in depression
 - ▶ "A meta-analytic review of double-blind, placebo-controlled trials of antidepressant efficacy of omega-3 fatty acids." Su KP et al *The Journal of clinical psychiatry* 2007
 - ▶ Omega-3 fatty acids: evidence basis for treatment and future research in psychiatry." Freeman MP, Hibbeln JR, Wisner KL, Davis JM, Mischoulon D, Peet M, Keck PE, Marangell LB, Richardson AJ, Lake J, Stoll AL. *The Journal of clinical psychiatry* 67(12):1954-67 Dec, 2006
 - ▶ Efficacy of omega-3 fatty acids in mood disorders - a systematic review and metaanalysis. Unal SS et al
- ▶ More recent meta-analysis of 15 trials involving 916 subjects suggests that omega-3 fatty acid supplement with EPA greater or equal to 60 percent of total EPA and DHA showed highest benefit against primary depression



▶ Vit D

- ▶ Association in adults with vit D def and mood disorder
 - ▶ "Some new food for thought: the role of vitamin D in the mental health of older adults." Roos BA et al, Levis S. *Current psychiatry reports*, 2009
 - ▶ Association between low serum 25-hydroxyvitamin d and depression in a large sample of healthy adults: the cooper center longitudinal study." Brown ES et al. *Mayo Clin Proc.* 2011
- ▶ ? Proper level
 - ▶ Roughly 400-800 U when little, 1000 U when older, 2000 Units adolescents.
- ▶ Smaller study not as helpful-not depressed, Australia
 - ▶ "Effects of vitamin d supplementation on cognitive and emotional functioning in young adults - a randomized controlled trial." McGrath JJ et al. *PLoS One.* 2011



- ▶ SAMe: serotonin precursor

- ▶ A meta-analysis of placebo-controlled studies on SAMe in depressed mood confirms efficacy and safety equivalent to conventional anti-depressants
 - ▶ "St. John's wort and S-adenosyl methionine as 'natural' alternatives to conventional antidepressants in the era of the suicidality boxed warning: what is the evidence for clinically relevant benefit?" Carpenter DJ. *Altern Med Rev.* 2011
- ▶ Patients not responded/partially responded conventional antidepressants, titrating SAMe 800mg to 1600mg/day improves response rate of clinical improvement
 - ▶ "S-adenosyl-L-methionine (SAMe) as an adjunct for resistant major depressive disorder: an open trial following partial or nonresponse to selective serotonin reuptake inhibitors or venlafaxine." , Fava M et al. *Journal of clinical psychopharmacology* 2004
- ▶ Expensive, commonly use 200-400 mg



- ▶ St johns wort

- ▶ 29 trials (5489 patients)

- ▶ 18 with placebo

- ▶ 17 standard antidepressants


- ▶ Conclusion: St. John's wort (SJW)


- ▶ superior to placebo in patients with major depression

- ▶ are similarly effective as standard antidepressants

- ▶ have fewer side effects than standard antidepressants

- ▶ "[St. John's wort for depression--development of a Cochrane review from 1993 to 1996]"
Linde K Cochrane Review 1993-1996 *Zeitschrift für Evidenz, Fortbildung und Qualität im Gesundheitswesen* 2008

- 
- ▶ Ten placebo-controlled studies
 - ▶ Equivalent efficacy to tricyclic anti-depressants
 - ▶ 3 studies equivalent efficacy to SSRIs: fluoxetine, sertraline, and paroxetine
 - ▶ "Equivalence of St John's wort extract (Ze 117) and fluoxetine: a randomized, controlled study in mild-moderate depression." Schrader E. *International clinical psychopharmacology* 2000
 - ▶ "Effect of Hypericum perforatum (St John's wort) in major depressive disorder: a randomized controlled trial." Hypericum Depression Trial Study Group *JAMA : the journal of the American Medical Association* 2002
 - ▶ "Acute treatment of moderate to severe depression with hypericum extract WS 5570 (St John's wort): randomised controlled double blind non-inferiority trial versus paroxetine." Kieser M et al. *BMJ* 2005
 - ▶ The dose is 900-1500 mg per day in 2-3 divided doses of an extract standardized to 0.3% hypericin and/or 3-5% hyperforin.



Commonly used, but I don't use much, also part of the controversy for Kava

- ▶ Kava kava

- ▶ Member of the pepper family. Effective for treating anxiety, liver toxicity concern, thought to be carrier but possibly not
- ▶ 100-200 mg/day
 - ▶ "Kava: a comprehensive review of efficacy, safety, and psychopharmacology." Schweitzer I. et al. *Aust N Z J Psychiatry*. 2011
- ▶ Compared with placebo, kava extract appears to be an effective symptomatic treatment option for anxiety.
- ▶ Kava is relatively safe for short-term treatment (1 to 24 weeks)
 - ▶ "Kava extract for treating anxiety." Pittler MH, Ernst E. *Cochrane database of systematic reviews (Online)* CD003383 2003



➤ Inositol

- Part of B complex , for cell membranes. some studies show improvement
 - Double-blind, placebo-controlled, crossover trial of inositol treatment for panic disorder." Belmaker RH et al *The American journal of psychiatry* 1995
 - "Double-blind, controlled, crossover trial of inositol versus fluvoxamine for the treatment of panic disorder." Benjamin J. et al *Journal of clinical psychopharmacology* 2001
- Use powder, 2-6gms used



Forty-Three

In ancient times, people lived holistic lives. They didn't overemphasize the intellect, but integrated mind, body, and spirit in all things. This allowed them to become masters of knowledge rather than victims of concepts. If a new invention appeared, they looked for the troubles it might cause as well as the shortcuts it offered. They valued old ways that had been proven effective, and they valued new ways if they could be proven effective. If you want to stop being confused, then emulate these ancient folk: join your body, mind, and spirit in all you do. Choose food, clothing, and shelter that accords with nature. Rely on your own body for transportation. Allow your work and your recreation to be one and the same. Do exercise that develops your whole being and not just your body. Listen to music that bridges the three spheres of your being. Choose leaders for their virtue rather than their wealth or power. Serve others and cultivate yourself simultaneously. Understand that true growth comes from meeting and solving the problems of life in a way that is harmonizing to yourself and to others. If you can follow these simple old ways, you will be continually renewed.

Lao Tzu, Hua Hu Ching



Resources and references



WELCOME to the

Pediatric Integrative Medicine ECHO: Changing Health Care for Children

Session 10, December 21, 2023

Today's Program:

- Brief housekeeping
- Didactic: Sleep Disturbances – JT Craig
- Case Presentation:
- Case Discussion
- Summary
- Up Next

Notes:

- Enter name, organization into chat
- Raise virtual hand or enter comments in chat at any time. We will call on you when it works. Please mute otherwise.
- To protect individual privacy, please use non-identifying information when discussing cases.
- We will be recording the didactic part of these sessions. *Participating in these session is understood as consent to be recorded. Thank you!*
- Closed Captioning will be enabled during sessions
- [Submit cases](#)



Sleep Disturbances
JT Craig

Why Should You Care About Children's Sleep?



- Memory



- Ability to Regulate Emotions



- Ability to Learn and Retain New Information and New Patterns of Behavior



- Reason and Solve Problems Creatively



- Inhibit Impulses

INSUFFICIENT SLEEP FOR MOST

- Large studies find that 62-75% of teens get less than 8 hours of sleep per night
 - Older teens most sleep deprived
 - Girls and African-American teens with most sleep deprivation
- 20-40% of children and adolescents experience a diagnosable sleep disorder at some point; 1 of every 4 teens served in the hospital
- As of 2020 the incidence of sleep deprivation among youth is getting over time

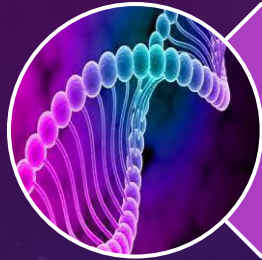
(Spuryt et al., 2011; Kansagra, 2020)

HIGH COMORBIDITY

- Anxiety Disorders
 - 88% with 1 significant sleep problem (most often insomnia, nightmares, refusal to sleep alone)
 - 50% reported 3 or more sleep disturbances ASD
 - 86% of children with ASD have a comorbid sleep problem
- Depressive Disorders
 - 74% reported significant insomnia
- ADHD
 - 25-50% have significant sleep problems
- Children's sleep problems negatively affect parents' mental health and quality of intimate relationships, impacting the family system as a whole.

(Chorney, Detweiler, Morris, & Kuhn, 2007; Maski & Kothare, 2013)

HOW DO SLEEP INTERVENTIONS WORK



Genetics and Chronotype



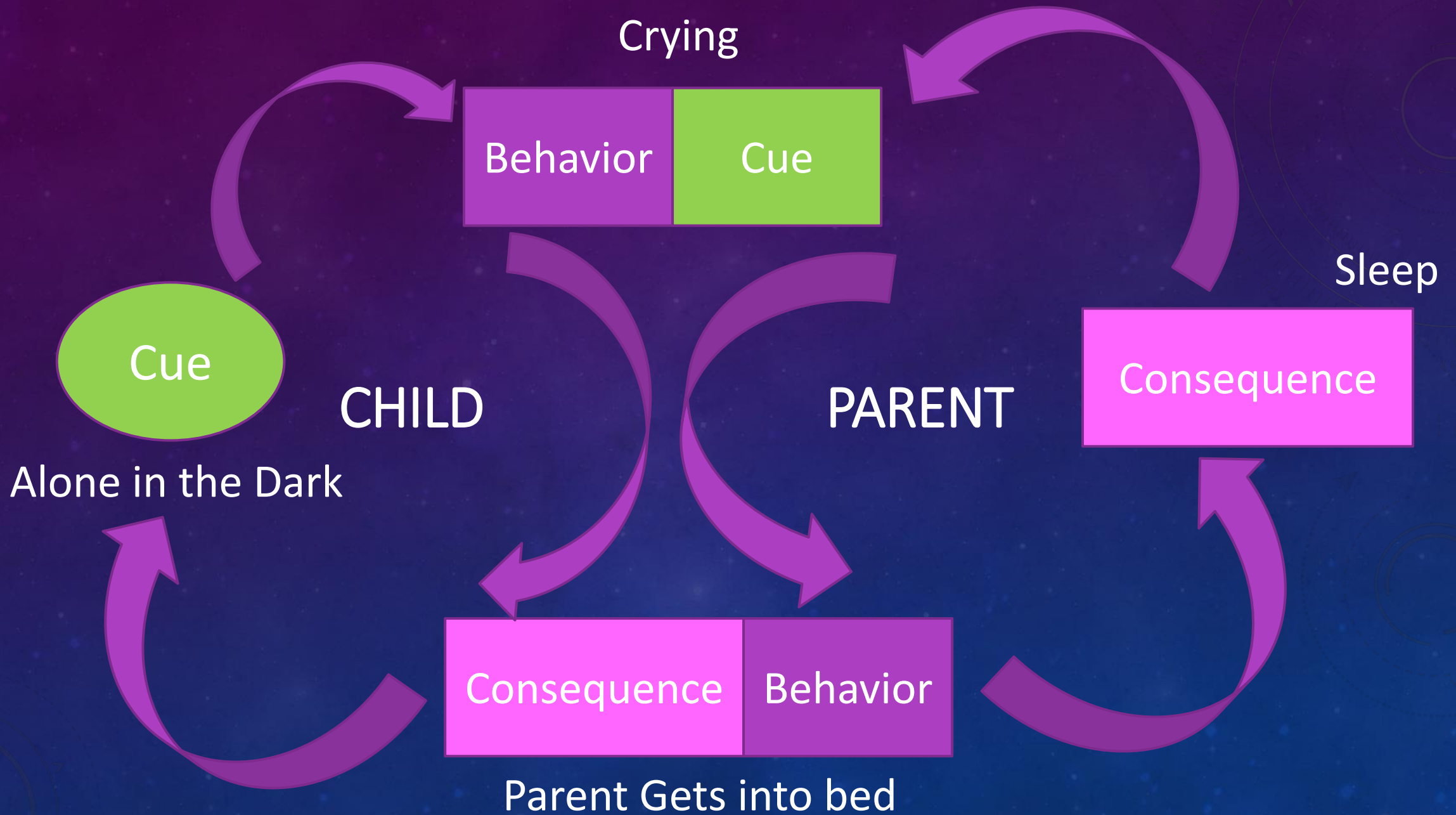
Inconsistent Homeostatic Sleep Drive
(Bad Schedules)



Bad learning (Anxiety, Stress, Excitement
and screens in Bed or at Bedtime)

FUNCTIONAL ASSESSMENT FOR BEHAVIORAL SLEEP PROBLEMS

- A-B-Cs of sleep and sleep refusal behaviors (Operant Conditioning)
- Sleep resistant behaviors are **positively reinforced** via attention or access to privileges (TV, drink of water, reading, pets for the dog, food)
- Inappropriate sleep behaviors are **negatively reinforced** via the escape or avoidance of an unpleasant stimuli or mood state (e.g., dark, being alone, feeling scared, boredom)
- Extinction bursts occur with sleep resistant behaviors just like any other behavior
- Parents are stuck too. They are part of the disorder.



CBT-I FOR ADOLESCENTS AND COMPONENTS OF CBT FOR YOUNGER CHILDREN

- CBT-I has decades of research supporting its use with adults
- Newer studies have looked at adaptations of CBT-I for adolescent
- Multiple randomized controlled trials now indicate effectiveness in adolescents 15 and up
- There is also promising research to suggest that CBT-I helps adolescents with Depression, but less so with Anxiety
- More research is needed to look at medication vs. CBT-I in children and adolescents

COMPONENTS OF CBT-I USED WITH ADOLESCENTS AND CHILDREN

- Sleep Restriction **
- Stimulus Control Therapy**
- Sleep Hygiene is necessary, but not sufficient to improve sleep for adolescents with insomnia
- Relaxation
- Cognitive Therapy
- Special behavioral treatments for young children
 - Excuse me drill
 - Bedtime Pass
 - Behavioral parent training

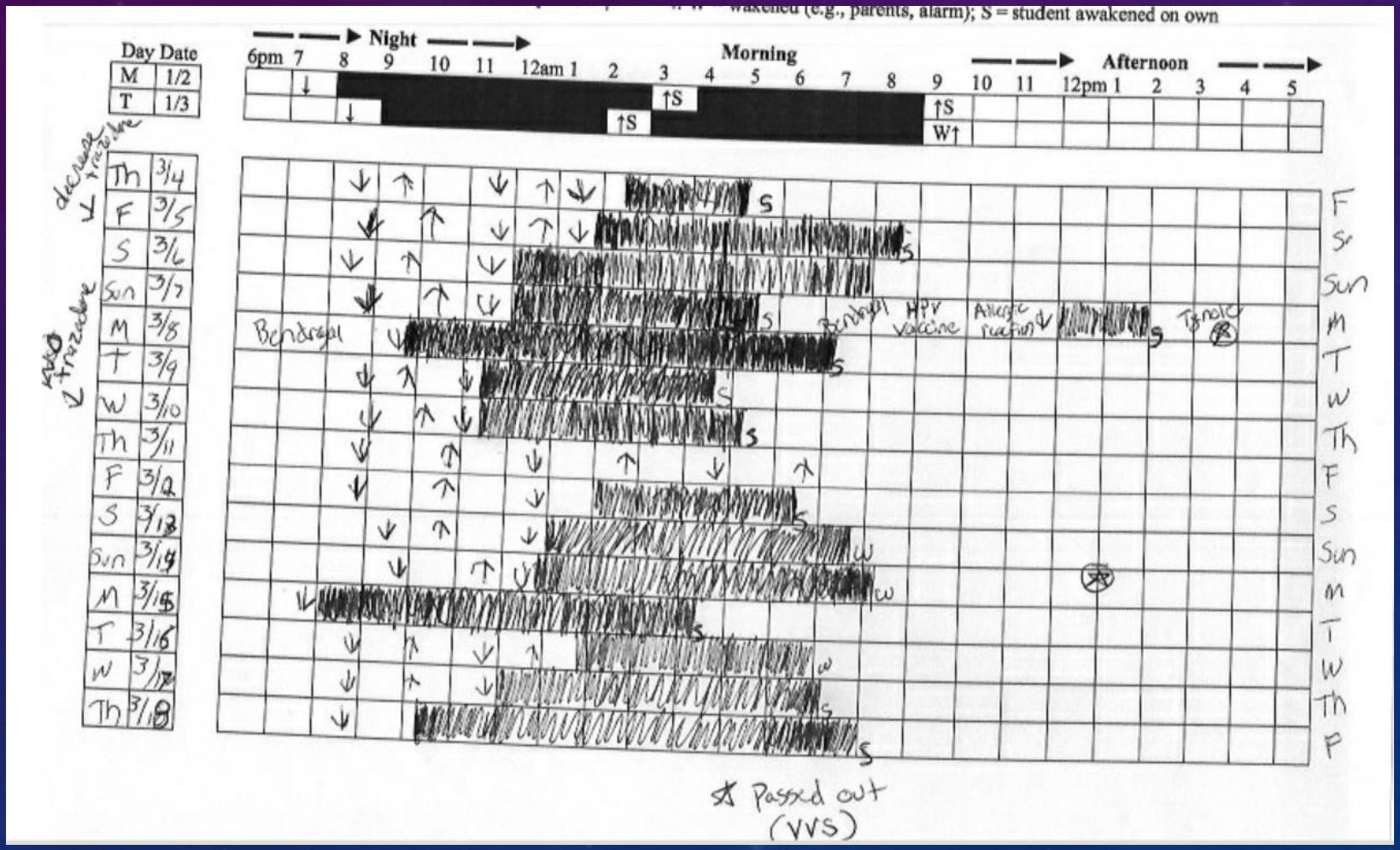
SLEEP RESTRICTION

- 1. Collect a sleep diary to see what time the person typically falls asleep and awakens
- 2. Calculate the sleep restriction to average total sleep time (TST) + 30 minutes
- 3. Set a regular wake time
- 4. Keep them out of bed until delayed time (No time in bed all day)

USING SLEEP RESTRICTION AS MONOTHERAPY

- 12 year old boy, White, rural New Hampshire
 - Adopted by grandmother
 - Diagnosed with anxiety and PTSD
 - Vasovagal syncope
 - School attendance has been very poor during the pandemic
 - Struggled with sleep for many years
 - Undergone therapy at community mental health for several years
 - Mild OSA

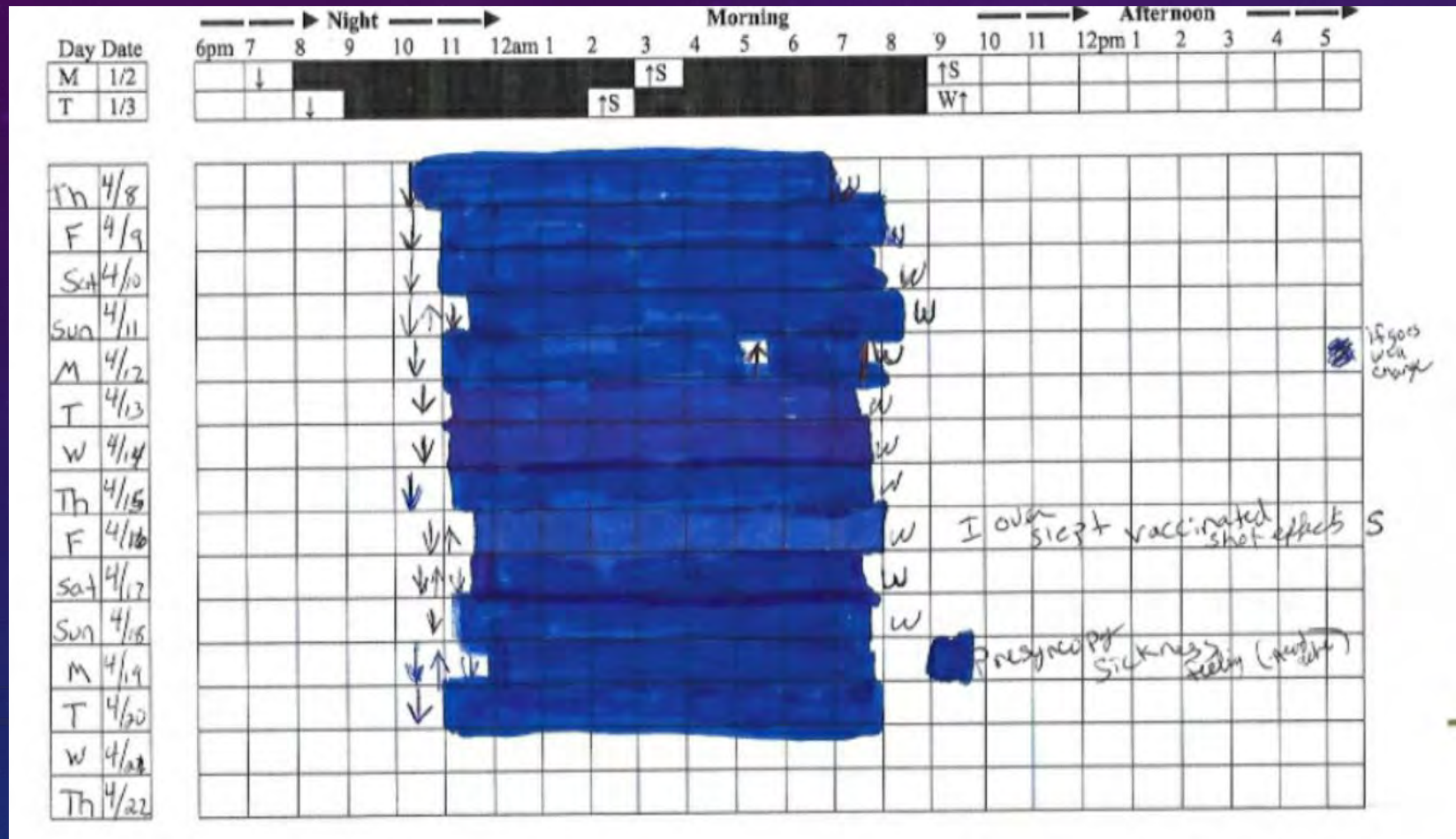
SLEEP RESTRICTION AND SCHEDULING



Averages

- TIB: 9.6 hrs
- TST: 6 hrs
- Latency: 3.4 hrs
- SE: 62%

1 MONTH LATER: INTERVENTION – GET INTO BED AT 10:30,
 WAKE UP EVERY DAY AT 8:00. AVOID BED COMPLETELY AT ALL
 OTHER TIMES.



Averages

TIB: 9.3 hrs
 TST: 8.7 hrs
 Latency: .57 hrs
 SE: 93%

Stimulus Control: 2-Bed Exercise

Bed 1

ODDS 1 IN 2

SLEEP

SEXUAL BEHAVIORS

Bed 2

ODDS 1 IN 15

Stress out about people at school

EAT

READ

TV

SEXUAL BEHAVIORS

SLEEP

LIE AWAKE

WORRY

HOMEWORK

PROBLEM SOLVE

Fortnight

Fortnight

Fortnight

Text

Insta/FB/Snapchat

THE EXCUSE ME DRILL



MORE CHALLENGING CASE: SLEEP RESTRICTION, STIMULUS CONTROL, AND EXCUSE ME DRILL

- 9 y.o. boy, White, Rural New Hampshire
- Level 1 Autism Spectrum Disorder
- ADHD
- Unable to participate in mainstream school except for 1-hour/day
- Sleeping in living room (family had moved both brother's beds into living room)
- Lots of interactions with parents around bedtime and television on
- Needs parental presence to fall asleep; afraid to sleep alone or even get into bed
- Mom has not been able to sleep more than 4 hours a night in years

SLEEP DIARY

		NIGHT										MORNING									
DAY	DATE	6pm	7	8	9	10	11	12am	1	2	3	4	5	6	7	8	9	10			
W	31-May			↓			↑ S			↓			↑ S		W ↑						
TH	1-Jun			↓				↑ S		↓				↑ S							
F	2-Jun				↓				↑ S			↓					↑ S				
S	3-Jun				↓						↑ S		↓				↑ S				
S	4-Jun			↓				↑ S				↑ S			W ↑						
M	5-Jun			↓					↑ S	↓		↑ S			W ↑						
T	6-Jun			↓				↑ S		↓			↑ S								
W	7-Jun			↓					↑ S	↓				↑ S							
TH	8-Jun			↓				↑ S		↓		↑ S	↓		W ↑						
F	9-Jun				↓				↑ S		↓				W ↑						
S	10-Jun				↓					↑ S		↓						↑ S			
S	11-Jun			↓				↑ S		↓		↑ S	↓		W ↑						
M	12-Jun			↓							↑ S	↓			W ↑						
T	13-Jun				↓					↑ S		↓						↑ S			

Averages

TIB: 10.6 hrs

TST: 5.8 hrs

Latency: 1.1 hrs

SE: 54%

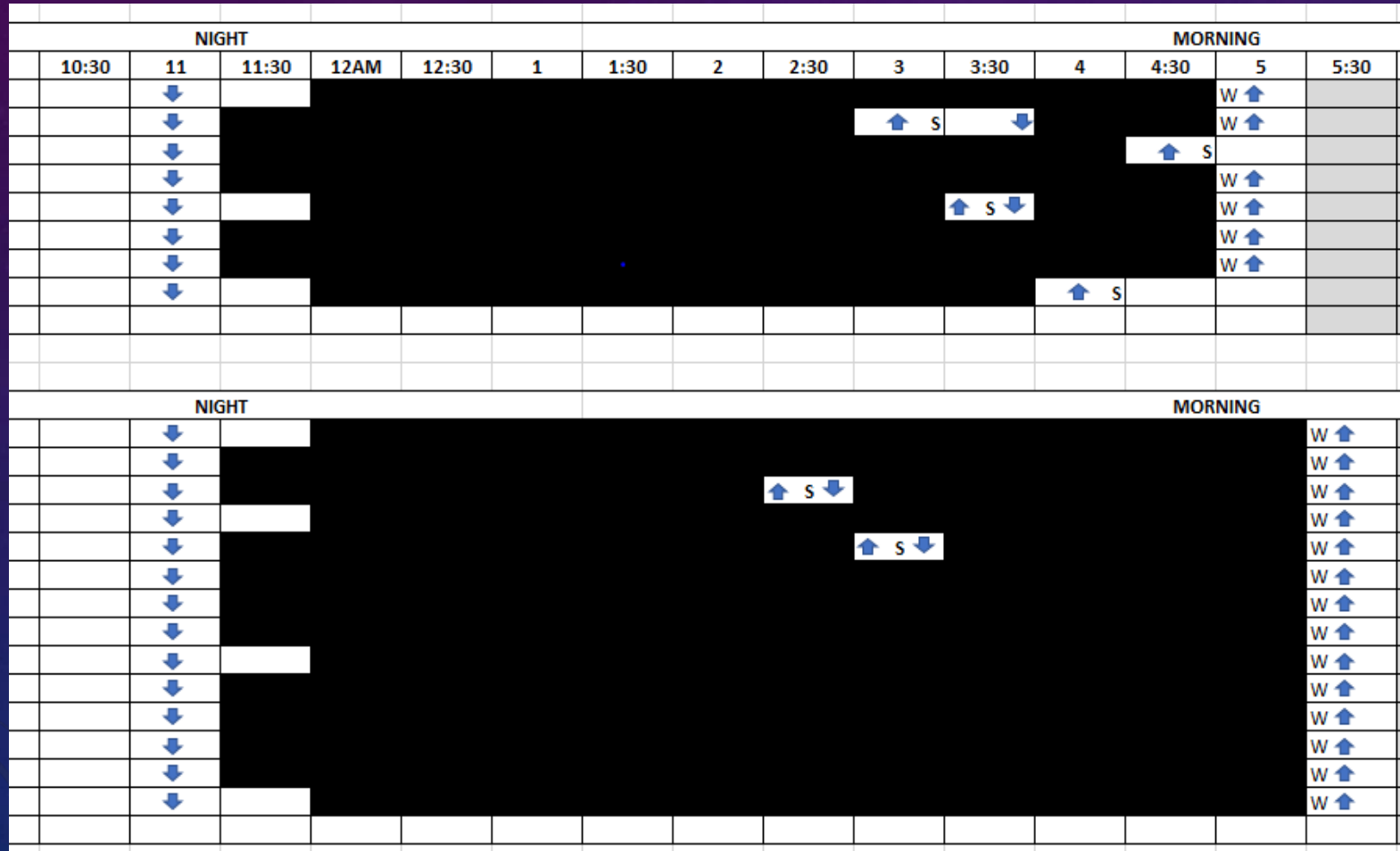
INTERVENTION

- Started a sleep restriction 10:30 PM to 5:00 AM and sleep looked exactly the same
- Moved sleep restriction to 11:00 to 5:00
- Introduced a safety bed (fully covered by insurance) and removed bed from living room
- Began gradual exposure to being alone using excuse me drill and walkie talkie

MIDDLE OF TREATMENT

Averages

TIB: 10.6 hrs
 TST: 5.75 hrs
 Latency: .64 hrs
 SE: 92%



CURRENTLY

- In own bed 9 hours a night
- Sleeping 7.5 – 8 hours a night
- Mother is sleeping again
- Attending 4-5 hours of school per day
- Overall, everyone is quite pleased

ADDITIONAL TREATMENT COMPONENTS: RELAXATION SKILLS AND COGNITIVE THERAPY

- Relaxation especially helpful with tension and waking up stressed
- Cognitive skills helpful with catastrophic thoughts about missing sleep

WELCOME to the

Pediatric Integrative Medicine ECHO: Changing Health Care for Children

Session 11, January 18, 2024

Today's Program:

- Brief housekeeping
- Didactic: Developmental Pediatrics – Sandy Newmark
- Case Presentation:
- Case Discussion
- Summary
- Up Next

Notes:

- Enter name, organization into chat
- Raise virtual hand or enter comments in chat at any time. We will call on you when it works. Please mute otherwise.
- To protect individual privacy, please use non-identifying information when discussing cases.
- We will be recording the didactic part of these sessions. *Participating in these session is understood as consent to be recorded. Thank you!*
- Closed Captioning will be enabled during sessions
- [Submit cases](#)

UCSF Osher Center for Integrative Medicine

**Do 3.3 Million Children Really
Need Ritalin? An Integrative
Approach to ADHD**

Sanford C. Newmark M.D.

**Pediatric Integrative
Neurodevelopmental Clinic**

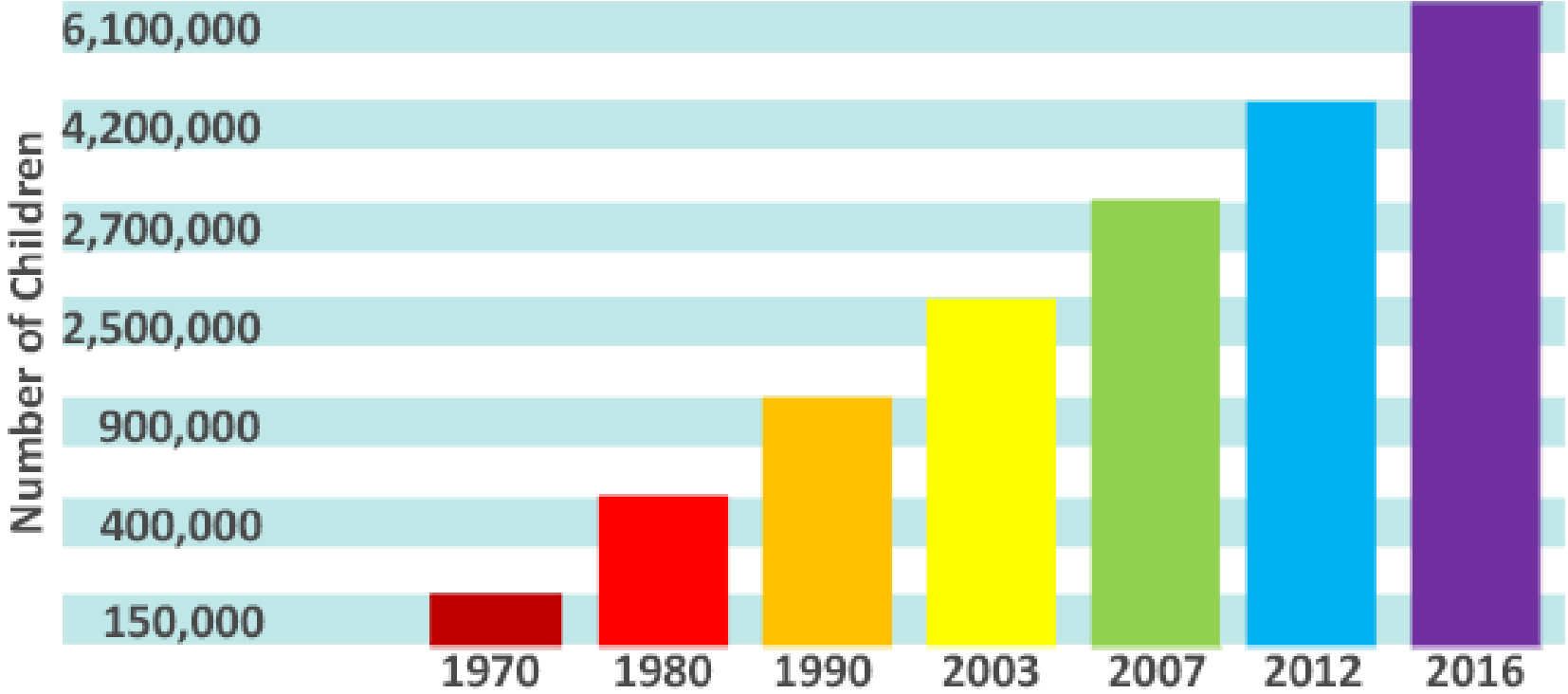


Your life, your health, your choice.

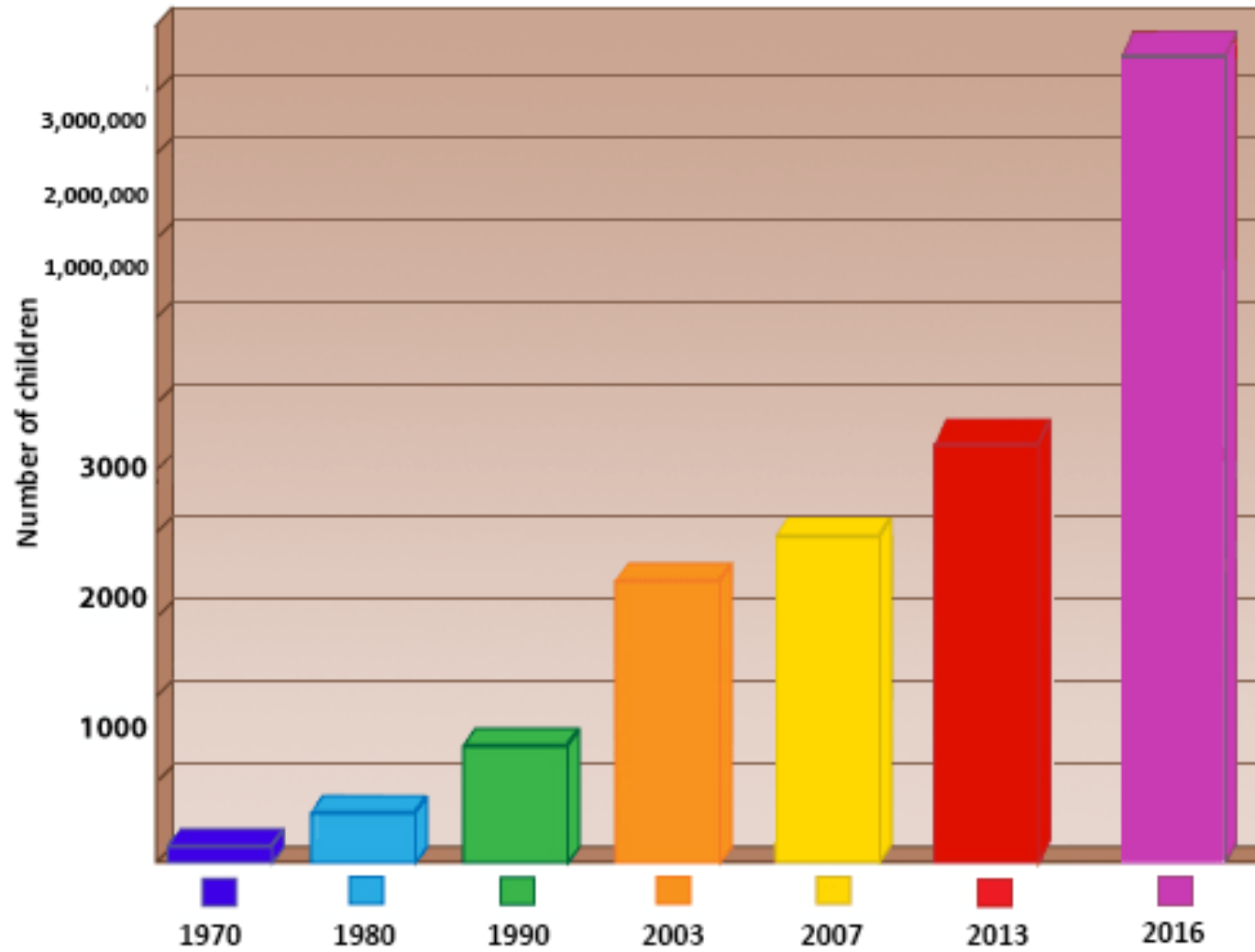
Disclosure

No one involved in the planning or presentation of this activity has any relevant financial relationships with a commercial interest to disclose.

Children Diagnosed with ADHD in U.S. (estimated)



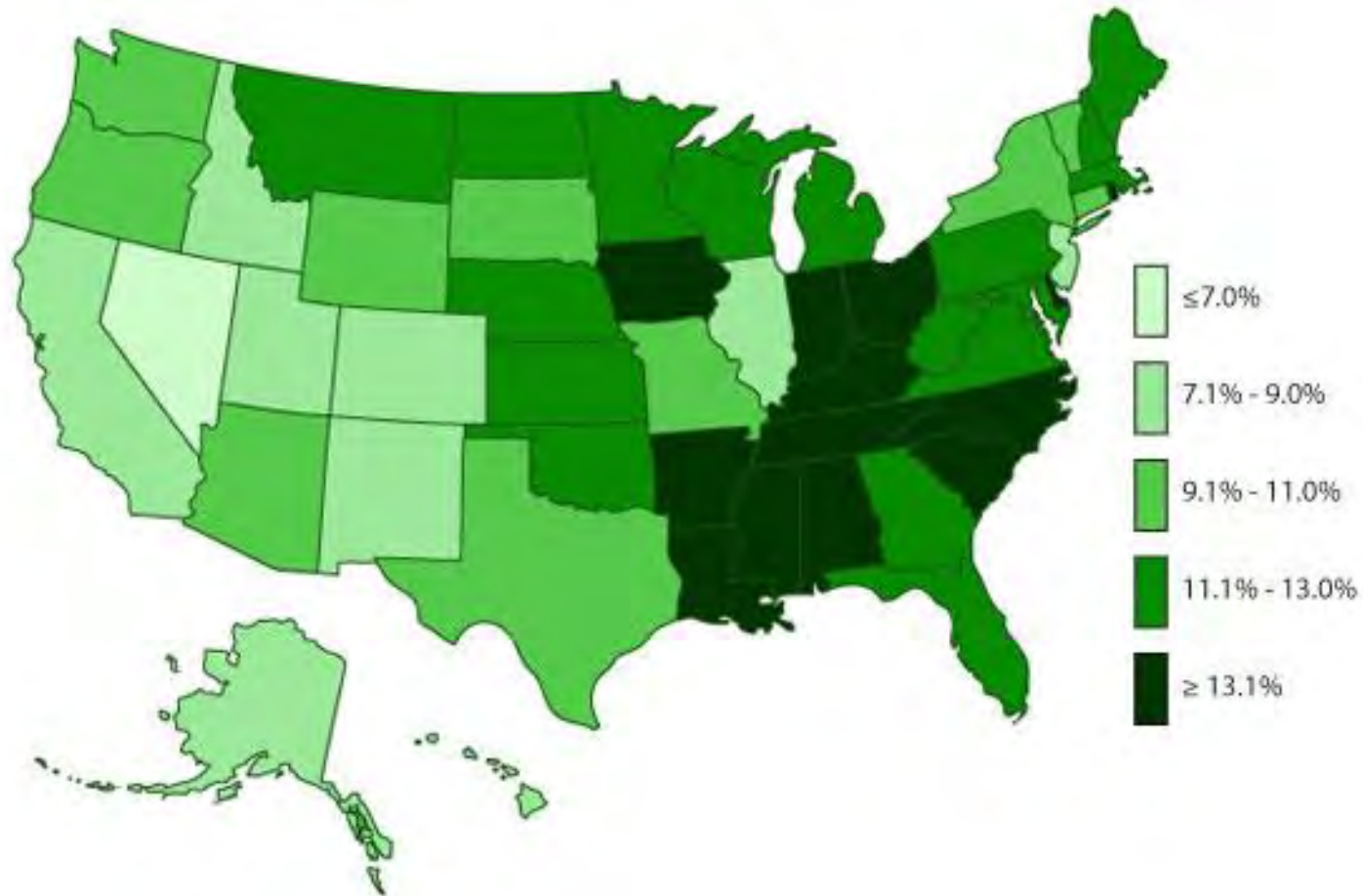
Psychostimulant Use in U.S. (estimated)



ADHD By State

Arkansas – 17.6%

Nevada 5.6%



What is ADHD

- ADHD is a neurodevelopmental syndrome involving some combination of difficulties with attention, impulsivity, and hyperactivity that cause a significant problem in a child's, or adult's, life.
- Note that "Inattention Type" ADHD can exist without the hyperactivity and impulsivity
- There is both a strong genetic component and environmental influences on the expression of these genetics
- According to DSM V criteria **these symptoms must be sufficiently severe to cause an impact in at least 2 areas of a child's life.**

ADHD as a Continuum

	"NORMAL"	RISK	ADHD
ACTIVITY:	Quiet		Active
ATTENTION:	Focused		Distractible
IMPULSIVE:	Careful		Impulsive

Born in the Wrong Month?

- **Diagnosed with ADHD** -**10%** of Kindergarteners born in August (youngest in class) **4.5%** born in September (oldest in class)
- **Treated with Psychostimulants** - **8.3%** of those born in August, as **3.5%** born in September

900,000 Incorrect Diagnoses

Journal of Health Economics 2010

Pesticides and ADHD

- **1139 children 8 to 15 years** “children with higher urinary levels of organophosphate metabolites were more likely to meet the diagnostic criteria for ADHD”
- For the most-commonly detected DMAP metabolite, dimethyl thiophosphate, **children with levels higher than the median of detectable concentrations had twice the odds of ADHD**

Pediatrics, June 2010

ADHD as a Continuum

	"NORMAL"	RISK	ADHD
ACTIVITY:	Quiet		Active
ATTENTION:	Focused		Distractible
IMPULSIVE:	Careful		Impulsive

Does Eating Organic Help?

- Children who ate organic fruits and vegetables had 1/5th the level of organophosphate pesticide metabolites in their urine
- Children can “reduce exposure levels from ‘uncertain’ to ‘negligible’ risk”



- **Environmental Health Perspectives 2003**

Canadian Healthy Infant Longitudinal Development (CHILD) study.

- Looked at 5 year olds and asked about previous screen use
- Mean screen-time was 1·4 hours/day at five-years and 1·5 hours/day at three-years.
- Compared to children with less than 30-minutes/day screen-time, **those watching more than two-hours/day were 5·9 times more likely to report clinically significant inattention problems** $p = 0·01$).
- Amana SK, et. Screen-time is associated with inattention problems in preschoolers: Results from the CHILD birth cohort study. PLoS One. 2019 Apr 17;14(4):

Do All Kids Who Have ADHD Need Psychostimulants?



Why not just use stimulants? They work, don't they?

- Short term- Stimulants effective 70% of time. Increase dopamine and noradrenalin levels frontal lobes.
- Can significantly improve school, home, and social success in some children.
- But they can have side-effects, and:
- **There are no long-term studies adequately addressing the effects of many years of these medications on the developing brain.**

Stimulant Medications and Side-Effects

- Decreased Appetite and Weight Loss
- Trouble Sleeping
- Abdominal Pain
- Headaches
- Tics
- Bizarre Behavior
- Hallucinations (at least 1:100)
- Increased Blood Pressure (may be bigger problem in adults)
- Decreased growth



More Subtle but “Worrisome” Effects

- “He’s just not himself”
- “She’s lost her spark, her joy”
- “He’s just not the same kid”
- “She’s teary, or sad a lot”
- “He’s not as enthusiastic or creative”



Do Stimulants Improve long term OUTCOME?

Evidence for long term positive effects of ADHD treatment is weak(or non-existent- depending on your perspective).

Studies that randomize treatment groups have failed to show positive effects on outcome

Long Term Efficacy Psychostimulants

- Debate: Are Stimulant Medications for Attention-Deficit/Hyperactivity Disorder Effective in the Long Term? (Against) James Swanson
- Debate: Are Stimulant Medications for Attention-Deficit/Hyperactivity Disorder Effective in the Long Term? (For) David Coghill
- Journal of the American Academy of Child & Adolescent Psychiatry Volume 58 Oct 2019

Do Psychostimulants Improve Learning?

- 3 week crossover trial academic instruction on social studies/science or vocabulary
 - Either psychostimulant or placebo
 - Behavior and finishing work improved in treated group.
 - Learning of material did not
-
- **Conclusions: Acute effects of OROS-MPH on daily academic seatwork productivity and classroom behavior did not translate into improved learning of new academic material taught via small-group, evidence-based instruction. Impact Statement**

An Integrative Approach to ADHD

- Nutrition - Basic principles
- Nutrition - Food Sensitivities and Elimination diets
- Nutritional Supplements
 - Omega-3 Fatty Acids
 - Zinc
 - Iron
 - Magnesium
 - Vitamin D

An Integrative Approach to ADHD

- Botanicals
- Sleep
- Parenting Skills/Behavioral Interventions
- School Interventions
- Exercise/meditation/martial arts
- Neurofeedback/digital therapeutics

Alternative or Complementary Therapies

- Homeopathy
- Craniosacral Therapy
- Traditional Chinese Medicine
- Other Energy Medicines

Elimination Diet for ADHD –Lancet - Feb 2011

- 100 children – 50 on restrictive diet – 50 controls 5 weeks
- Restricted diet (few foods) Rice, meat, vegetables, pears, water as basic diet
- **After 5 weeks 64% of children had 40% improvement on ADHD rating Scales**
- Assessor blinded, but parents and teachers not

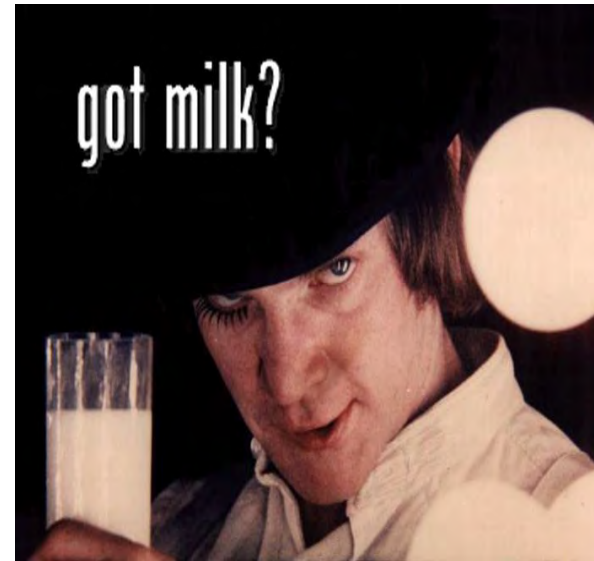
INCA Study – Phase 2

- **Double Blind Placebo Controlled Trial of those who responded to elimination diet in Phase I**
- Children were given challenge foods and relapse of ADHD sx occurred in 19 of 30 children.
- Evaluators, patients and family were blinded as to which foods were being challenged.

ADHD and Food Sensitivity - 2

- **76 children Oligoantigenic diet**
- 62 improved.
- 28 completed a DBPCFT
Symptoms worse on active foods than placebo.
- Wheat, dairy, artificial colors and preservatives commonest

Lancet 1985



ADHD and Food Sensitivity - 3

- 78 hyperactive children placed on few foods diet
- 59 improved
- Again double blind second phase positive
- **Archives of Disease in Childhood. 1993**
- **Metanalysis 2012 – 33% children likely to respond**



Artificial Colors, Flavors, and Preservatives

- 153 3 year olds & 144 8/9 year olds
- Given Sodium Benzoate and an artificial color and additive mixture or placebo
- **Artificial colours or a sodium benzoate preservative (or both) in the diet result in increased hyperactivity in 3-year-old and 8/9-year-old children in the general population.**

Lancet 2007



In Europe, Dyed Foods Get Warning Label

- Products with Yellow 5, Red 40, Other Dyes
“May Have an Adverse Effect on Activity and Attention in Children” July 20, 2010



Basic Nutrition - or - **When did “Pop Tarts” become a breakfast food?”**

- SAD American Diet –High in sugar, processed carbs, unhealthy fats, low in fiber
- Maintaining a normal blood sugar
 - Sugar
 - Processed Carbohydrates
 - Protein
- [The Glycemic Index](#)



“Healthful Diets & ADHD

- 12 week trial of DASH diet- significant improvement in ADHD symptoms, even among teachers blinded to treatment category.
- Children in Spain with lowest adherence to Mediterranean diet 3x risk of ADHD



Appleton Central High School

- Appleton Central Alternative Charter High School –kids “struggling in conventional settings”-“...disruptive in class, truant. have psychological and emotional problem, come from dysfunctional home environments.”
- A healthful meal program for breakfast and lunch
- Vending machines selling candy, soda, and chips removed.

Appleton Central -2

- **“...”I can say without hesitation that it's changed my job as a principal...”**
- "Since we've started this program, I have had zero weapons on campus, zero expulsions from the school, zero premature deaths or suicides, zero drugs or alcohol on campus. Those are major statistics.”



Omega-3's for ADHD-Meta-Analysis

“Omega-3’s, particularly with high doses EPA, were modestly effective in the treatment of ADHD”

- About 40% as effective as stimulants
- Very few and mild side-effects



- Journal of the American Academy of Child and Adolescent Psychiatry 2011
- Chang 2018

Fish Oil: Unanswered Questions

- Dosing: Based on Total EPA+DHA
- Children 6-10 – 1000mg (EPA 1.5-2x DHA)
- “ “ 10-12 – 1500mg
- “ “ 12 + - 2000 mg

- Are all brands the same?
- **How do you get your kids to take this stuff?**



ADHD and Iron Deficiency

- Fifty-three children with ADHD and 27 controls.

- **Serum Ferritin**

ADHD = **23**

Controls = **44**



- Serum iron, Hemoglobin, and hematocrit were normal.
- **Confirmed by Metanalysis of 11 studies 2017**

Arch Pediatr Adolesc Med. 2004 PLOS One 2017

Effects of iron supplementation on ADHD

- 23 children with ferritin <30, not anemic
- Treated for 12 weeks with iron or placebo
- **ADHD, as measured by standard measuring tools, improved in the iron taking group and not the placebo.**
- Mechanism – iron important cofactor in dopamine production
- **Dose – 30-40 mg/day if not anemic – use chelated**
- **Pediatric Neurology 2008 Clinical Psychopharm 2021**

Zinc for ADHD

- Arnold (2011) 15 or 30mg zinc in randomized trial with and without amphetamine.
- Zinc alone no results.
- With 30mg zinc - 37% reduction optimal amphetamine dose.
- **Overall- Zinc is an important nutritional factor in ADHD. Worth checking and treating in those who are deficient (or low normal?) Dose 20-30 mg/day**



- Journal of Child & Adolescent Psychopharmacology. 21(1):1-19, 2011 Feb.

Ginkgo & ADHD

- DBRPCT
- 66 children – all taking
- methylphenidate
- Ginkgo or placebo
- After 6 weeks –
- **statistically significant improvement in treatment group for inattention, not hyperactivity**
- **Dose – 30 mg 2x/day**
- Complementary Therapies in Clinical practice 2015



Bacopa and ADHD

- **Effects of Bacopa monnieri (CDRI 08[®]) in a population of males exhibiting inattention and hyperactivity aged 6 to 14 years: A randomized, double-blind, placebo-controlled trial**
- Improvements in cognitive flexibility ($p = .01$), executive functioning ($p = .04$), interpersonal problems ($p = .02$), and sleep routine ($p = .04$) were noted in those consuming CDRI 08[®] over placebo. CDRI 08[®] did not improve behavioural outcomes, but may have cognitive, mood and sleep benefits in children aged 6 to 14 years.

Saffron & ADHD

- **Crocus sativus L. Versus Methylphenidate in Treatment of Children with Attention-Deficit/Hyperactivity Disorder: A Randomized, Double-Blind Pilot Study**
- 54 children randomized to Methylphenidate or Saffron for 6 weeks
- Both groups improved – no difference between groups.
- Limitations – small size, , MPPH dose not optimized.
- Journal Child and Adol Psychopharmacology 2019

Life Choices and Mind Body

- **Decrease electronic media!**
- **Sleep**
- Yoga or meditation
- Mindfulness training
- Exercise
- Martial Arts
- Time in nature



Sleep – Often Major ADHD Issue

- Many of these Kids have hard time turning off their brain
- First – sleep hygiene (hiding electronics?)
- Melatonin -start at 0.5 mg.
- Sleep audios- Health Journeys and Others
- Various botanicals and supplements
 - 5 HTP, L-Theanine
 - Natures Way Vitality Sleep

Cognitive Behavioral Therapy

- Good studies have shown that **CBT is an effective treatment for ADHD in adolescents and adults**, with or without medication.
- 2012 study – groups randomized to CBT + dextroamphetamine or CBT +Placebo
- Both groups improved. Medication group did not improve more than placebo group.
- 6-12 sessions can be effective

Behavioral Management

- Many parents are **frustrated, confused, angry, helpless, guilty** about their lack of parenting success.
- Often end up in maladaptive patterns with high levels of criticism and negative emotions.
- **Helping parents with this is crucial. Can make a dramatic difference in behavior**
- Many approaches – Important to pick one and stick to it- Mental health consultation often necessary.

School Interventions

- **The right school and the right teacher can make all the difference**
- Sometimes 1st grade awful, 2nd grade fine, 3^d grade terrible, etc. etc.
- 504 plan –reasonable classroom modifications
 - Set of books for home
 - Modified homework
 - More time or quiet place for test taking
 - Direct communication of homework assignments
 - **IEP's and 504's tend to fall apart – need to follow**

Tolson School-the Nurtured Heart

- Tolson School, Tucson. “Failing School” 75% of children from low income families.
- **Entire school** began to apply the **Nurtured Heart** approach
- Behavioral management system based on highly increased positive feedback, clear rules, and well defined consequences, given without ‘energy”

Tolson School

- Discipline problems dropped sharply
- Special education dropped from 31 students to 7 students
- 2 of 519 students on medication for ADHD (0.3%)!
- “Performing Plus School”
 - increasing test scores.



How Do I Treat ADHD?

- **Make sure the diagnosis is correct!**
- **Clean Up the Diet**
- Elimination Diets
- Check serum Ferritin, Zinc,
- Omega-3's
- Behavioral Interventions
- School Modifications

How Do I Treat ADHD?

- Exercise- Martial Arts
- Mind-Body – Yoga-meditation
- Sometimes botanical and other CAM treatments
- EEG Neurofeedback
- Psychostimulants when necessary

Simple Steps for Treatment

- Decrease sugar and processed carbs
- Try simple elimination diet –only gluten or casein if necessary
- Check CBC, ferritin, zinc (Vitamin D) Treat where indicated
- Begin Fish Oil
- Address exercise
- Address sleep
- Address Screen Time
- Refer for parenting help where necessary
- Find professional to help with school interventions



Take Home Message

**Let's be Careful not to Over-Diagnose
ADHD**

**When we do diagnose ADHD, consider
beginning with safe, non-pharmaceutical
options before prescribing psychostimulants.**

UCSF Osher Center for Integrative Medicine

Sanford.Newmark@ucsf.edu

WELCOME to the

Pediatric Integrative Medicine ECHO: Changing Health Care for Children

Session 12, February 6, 2024

Today's Program:

- Brief housekeeping
- Didactic: Heme/Onc- Matt Hand
- Case Presentation: Matt Hand
- Case Discussion
- Summary
- Up Next

*Please note we are adding 2 make up sessions in May (*these will not have CME associated with them*)

Notes:

- Enter name, organization into chat
- Raise virtual hand or enter comments in chat at any time. We will call on you when it works. Please mute otherwise.
- To protect individual privacy, please use non-identifying information when discussing cases.
- We will be recording the didactic part of these sessions. *Participating in these session is understood as consent to be recorded. Thank you!*
- Closed Captioning will be enabled during sessions
- [Submit cases](#)



AN INTEGRATIVE APPROACH TO ONCOLOGY

Matthew Hand DO

Section Chief, Pediatric Nephrology and Integrative
Medicine

Children's Hospital at Dartmouth

Dartmouth Health, Children's



Disclosures

- Davinci/FoodScience/Little Davinci: Medical Advisor
- Note: As discussed in a previous session of our ECHO program, Supplements and Botanicals are not regulated by the FDA. The current presentation offers an overview of supplements/botanicals but cannot cover all the data/references related to individual therapies. It can also not cover all the side effects/benefits/drug-herb interactions related to the individual treatments.
- For more detailed look at these areas we refer you back to the ECHO session “Botanical Bootcamp” and the following independent reviewers:
 - Natural Medicine Comprehensive Database <https://naturalmedicines.therapeuticresearch.com/>
 - United States Pharmacopia, <https://www.usp.org/>
 - ConsumerLabs.com
 - NSF, <https://www.nsf.org/>

General nutritional rules

- Eat foods as whole foods, not processed foods
- Eat foods high in omega 3 fats
- As much of a plant based diet as possible including soy (even in breast cancer based on more recent info)
- Eat cruciferous vegetables as much as possible
- Add spices that have lots of anti-cancer/inflammatory effects: turmeric, garlic, onions, ginger
- Limit red meat
- Drink lots of green tea (and possibly coffee)
- If we can significantly decrease cancer with food better for patients even after diagnosis. Recent study in colon cancer should improved outcomes even after diagnosis.

Supplement/Herbs

- Somewhat controversial
- Common belief that more is better but some may increase cancer risks so general recommendation is to get it from food
- Also risk that it may interfere with Chemo/response.
- Three basic principles that I use
 - Decrease inflammation
 - Improve whole body/immune response (IE adaptogens)
 - Decrease toxicity of the chemo/therapies

My General Recommendations

- Omega 3s
- Vitamin D3
- Turmeric
- Astragalus
- Chinese mushrooms
- Milk thistle (liver and possible renal protective)
- CoQ10: for cardiomyopathy with chemo
- Melatonin
- Herbs/supplements to manage other symptoms IE sleep, neuropathy, esophagitis, oral ulcers, etc In particular glutamine
- Be Careful with vitamin E and High dose vitamin B's

My favorite supplement/botanical reference

Hematol Oncol Clin N Am 22 (2008) 581–617

HEMATOLOGY/ONCOLOGY CLINICS

OF NORTH AMERICA : Mary L. Hardy, MD

- Garlic extract with docetaxel: No change in pharmacokinetics
- Milk thistle with irinotecan: No change in pharmacokinetics
- St. John's wort with imatinib and irinotecan: Reduced serum levels
- Black cohosh extracts: No evidence estrogenic activity
- Beta-carotene and alpha tocopherol in head and neck patients during radiation: Increased rate local recurrence and high all cause mortality at 6.5 years
- Vitamin C, beta-carotene, alpha tocopherol in non-small cell lung cancer patients during chemotherapy: No change in response rate; no increase in toxicity
- Glutamine in bone marrow transplant: Did not increase relapse rate, progression of malignancy or incidence of graft versus host disease
- Glutamine in breast cancer patients: No adverse effect on tumor response
- Vitamin E in variety of solid tumors with cisplatin chemotherapy: No change in tumor response or survival

- Glutamine in variety of cancer patients undergoing chemotherapy and radiation: Decreased rates and severity of mucositis, neuropathy, and intestinal toxicity; decreased use of pain medication in stomatitis patients; improved nutrition in stomatitis patients; improved ADL in neuropathy patients
- Vitamin E topically in children undergoing bone marrow transplant; in adults undergoing chemotherapy or radiation to head and neck: area Improved stomatitis
- Zinc in head and neck patients during radiation therapy: Improved stomatitis
- Chamomile extract as mouthwash in chemotherapy and radiation: Improved stomatitis sometimes
- Proteolytic enzymes in head and neck patients with radiation: Improved stomatitis
- Vitamin E orally in variety of cancers during cisplatin chemotherapy; patients with cisplatin and paclitaxel chemotherapy: Decreased rate of neuropathy
- Ginger postoperatively in surgical cancer patients; with MOPP chemotherapy; with cisplatin chemotherapy: Decreased nausea
- Chamomile skin cream: Decreased dermatitis

- Vitamin C, E, and selenium in chemotherapy patients: Decreased rate nephron and ototoxicity
- Coenzyme Q10 with anthrocycline chemotherapy: Decrease cardiotoxicity
- Trametes versicolor extract in variety of solid malignancies: Increased percentage of 5-year disease-free survival; decreased relative risk of regional metastases; improvement in overall survival
- Basidiomycotina extract in variety of solid malignancies: Increased NK cell activity; improvement in activities of daily living (ADL); longer disease-free survival interval
- Grifola umbellatae in bladder cancer: More effective than mitomycin C in preventing recurrences after surgery
- Agaricus blazei extract in variety gynecologic cancers with chemotherapy: Increased NK cell activity and decreased general symptoms
- Fermented wheat germ extract in pediatric cancer patients: Decreased episodes of febrile neutropenia
- Fermented wheat germ extract in colorectal or melanoma cancer patients: Lower incidence of new disease, new metastases, or death; increased time to relapse

- Probiotics in biliary cancer patients undergoing surgery; colorectal cancer patients undergoing chemotherapy; patients receiving abdominal and pelvic radiation: Lower postoperative infection rates; decreased gastrointestinal toxicity (diarrhea) with less hospital care and less reduction in chemotherapy; decreased incidence of diarrhea
- Fish oil in patients with cancer induced cachexia: Increased dietary intake, maintenance of weight, decreased fatigue
- Selenium selenite in breast cancer and head and neck cancer patients: Decreased lymphedema
- Ginkgo in breast cancer patients: Decreased lymphedema
- Variety of high flavinoid extracts: Decreased lymphedema
- Carnitine in cancer patients following chemotherapy; benefit most pronounced in patients with carnitine deficiency: Decreases fatigue
- Black cohosh extracts in breast cancer patients with menopausal symptoms: Decreases vasomotor symptoms in some trials

- Green or black tea in leukoplakia: Improved abnormality
- Green tea extract in high-grade intraepithelial neoplasia of the prostate without conventional therapy: Decreased progression to frank prostate cancer
- Pomegranate juice in prostate cancer patients with rising PSA after radiation or surgery: Increased PSA-doubling time
- Soy in complex formula in prostate cancer patients with rising PSA after radiation or surgery: Increased PSA-doubling time
- Lycopene in hormone refractory prostate cancer; in hormone responsive patients following orchiectomy: Limited clinical response in some patients; Improved clinical response

Having said all that, Cautions on herbs and supplements: Very important

- There are two major concerns for oncology patients
 - Do they interact with drug metabolism (can inhibit or activate cytochrome systems) Classic was St Johns wort, Gingko and possibly high dose CBD
 - Anti-oxidants
 - Interesting issues since oxygen radicals important in inflammation.
 - Many chemo/therapies induce oxygen radicals as their impact.
 - One study in head and neck patients with high dose anti-oxidants with worse outcome.
 - More recent data does not show the same impact
 - In addition some chemo agents ex MESNA very potent anti-oxidants but used commonly in chemo regimens.
- One other theoretical concerns is using “immune stimulants” IE adaptogens in T Cell or lymphoproliferative conditions

Mind body therapies

- Can't predict outcomes no matter how hard we try
- Can predict with 100% certainty stress will be part of the therapies
- Recommend for everyone a stress reduction activity
 - Mindfulness
 - Self hypnosis
 - Biofeedback
 - Moving meditation: yoga, tai chi etc.
- “prepare you mind for surgery”: Using mind body therapies to improve outcomes with surgery.

Spirituality

- Never underestimate the power of ones sense of spirituality
- Don't be afraid to ask.
- Commonly either strengthens or hurts ones sense of self and faith
- Prayer
- Spirituality may be ones' sense of purpose or self. How do we improve this?

Acupuncture/TCM

- One of my favorite therapies in oncology
- Initially used for N/V
- Can be helpful in many issues
 - N/V
 - Pain
 - Neuropathy
 - Sleep
 - Lymphedema
 - And more



Key resources & references

- <https://www.mskcc.org/cancer-care/diagnosis-treatment/symptom-management/integrative-medicine>
- Hematol Oncol Clin N Am 22 (2008) 581–617, Hematology/Oncology Clinics of North America, Mary L. Hardy MD
- Natural Medicine Comprehensive Database
<https://naturalmedicines.therapeuticresearch.com/>
- United States Pharmacopia, <https://www.usp.org/>
- ConsumerLabs.com
- NSF, <https://www.nsf.org/>



Forty-Three

In ancient times, people lived holistic lives. They didn't overemphasize the intellect, but integrated mind, body, and spirit in all things. This allowed them to become masters of knowledge rather than victims of concepts. If a new invention appeared, they looked for the troubles it might cause as well as the shortcuts it offered. They valued old ways that had been proven effective, and they valued new ways if they could be proven effective. If you want to stop being confused, then emulate these ancient folk: join your body, mind, and spirit in all you do. Choose food, clothing, and shelter that accords with nature. Rely on your own body for transportation. Allow your work and your recreation to be one and the same. Do exercise that develops your whole being and not just your body. Listen to music that bridges the three spheres of your being. Choose leaders for their virtue rather than their wealth or power. Serve others and cultivate yourself simultaneously. Understand that true growth comes from meeting and solving the problems of life in a way that is harmonizing to yourself and to others. If you can follow these simple old ways, you will be continually renewed.

Lao Tzu, Hua Hu Ching

WELCOME to the

Pediatric Integrative Medicine ECHO: Changing Health Care for Children

Session 13, February 15, 2024

Today's Program:

- Brief housekeeping
- Didactic: Gastroenterology - Matt Hand and Rachel Rooke
- Case Presentation: Matt Hand
- Case Discussion
- Summary
- Up Next

*Please note we are adding 2 make up sessions in May (*these will not have CME associated with them*)

Notes:

- Enter name, organization into chat
- Raise virtual hand or enter comments in chat at any time. We will call on you when it works. Please mute otherwise.
- To protect individual privacy, please use non-identifying information when discussing cases.
- We will be recording the didactic part of these sessions. *Participating in these session is understood as consent to be recorded. Thank you!*
- Closed Captioning will be enabled during sessions
- [Submit cases](#)

HOLISTIC HEALING FOR LITTLE TUMMIES: INTEGRATIVE THERAPIES IN PEDIATRIC FUNCTIONAL GI DISORDERS

Rachel K. Rooke, MSN, PNP-AC
Dartmouth Health Children's
Department of Pediatric
Gastroenterology

Matthew Hand DO
Section Chief, Pediatric Nephrology
and Integrative Medicine



Disclosures

- Davinci/FoodScience/Little Davinci: Medical Advisor
- Note: As discussed in a previous session of our ECHO program, Supplements and Botanicals are not regulated but the FDA. The current presentation offers an overview of supplements/botanicals but cannot cover all the data/references related to individual therapies. It can also not cover all the side effects/benefits/drug-herb interactions related to the individual treatments.
- For more detailed look at these areas we refer you back to the ECHO session “Botanical Bootcamp” and the following independent reviewers:
 - Natural Medicine Comprehensive Database <https://naturalmedicines.therapeuticresearch.com/>
 - United States Pharmacopia, <https://www.usp.org/>
 - ConsumerLabs.com
 - NSF, <https://www.nsf.org/>

OBJECTIVES



Discuss basic pathophysiology of common pediatric GI disorders



Review the impact of these conditions on quality of life and common western medicine therapies



Discover integrative approaches to management of common functional GI conditions

Common Pediatric Functional GI Disorders

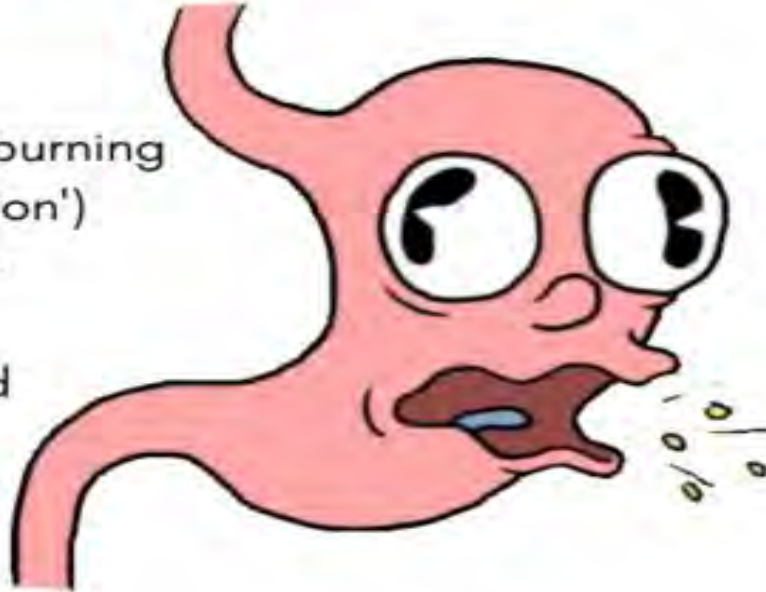
- Functional Dyspepsia
- Functional Abdominal Pain (FAP)
- Irritable Bowel Syndrome (IBS)
- Functional Constipation

*Understanding
Functional GI
Disorders in
Children*

FUNCTIONAL DYSPEPSIA...WHAT IS IT?

SYMPTOMS

- Upper gut pain or burning (feels like 'indigestion')
- Getting full quickly
- Excessive fullness
- Bloating, reflux and nausea



@andreahardyrd

Functional
Dyspepsia

Abdominal Pain

Functional Abdominal Pain

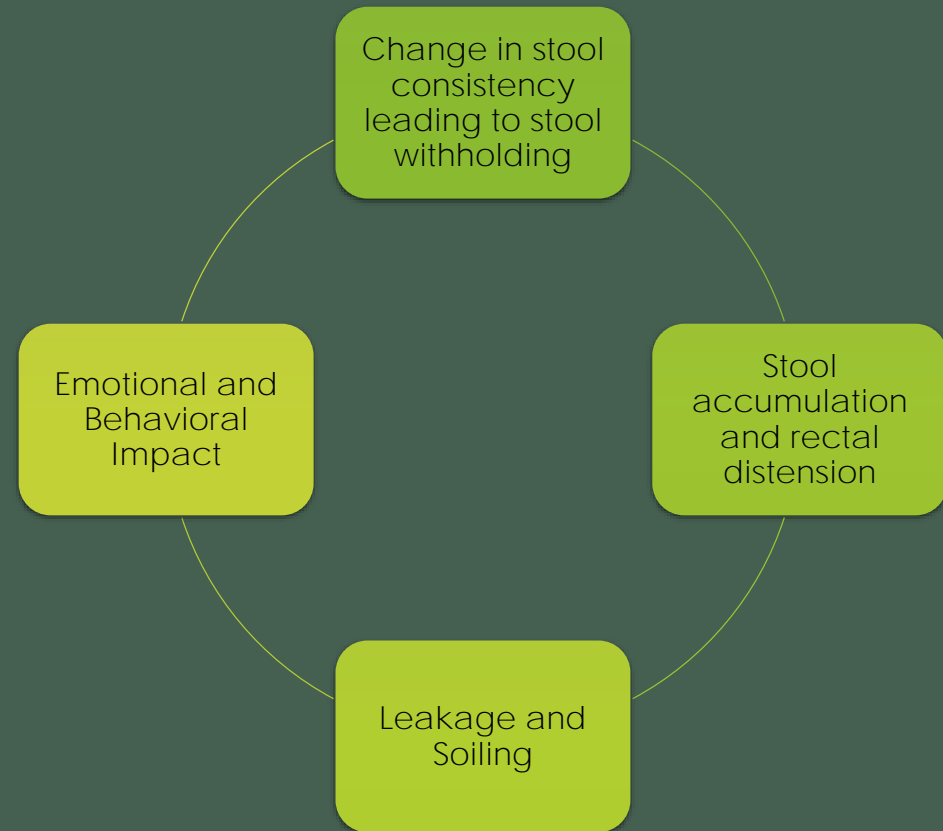
- Chronic abdominal pain without an identifiable “organic” cause
- Pain typically localized to the periumbilical region

Irritable Bowel Syndrome

- Recurrent abdominal pain associated with changes in bowel habits
- Absence of structural abnormalities



FUNCTIONAL CONSTIPATION and ENCOPRESIS



ROME Foundation

- Non-profit organization to help enhance:
 - Understanding
 - Diagnosis
 - Treatment
- Helps develop criteria for diagnosing DGBIs (disorders of the gut-brain interaction).

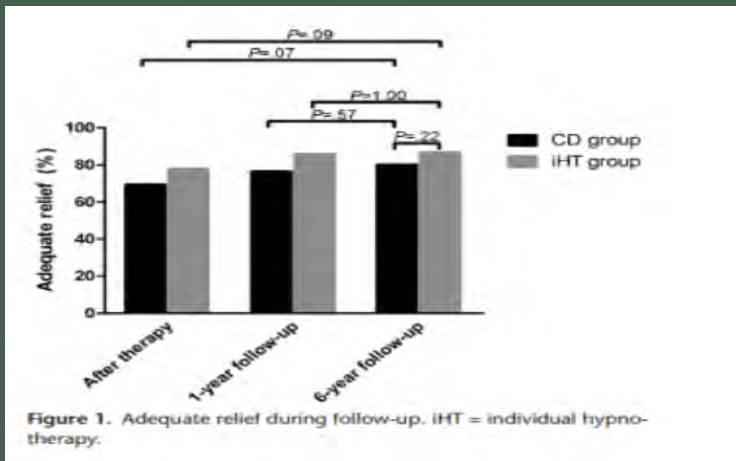
Common Therapies



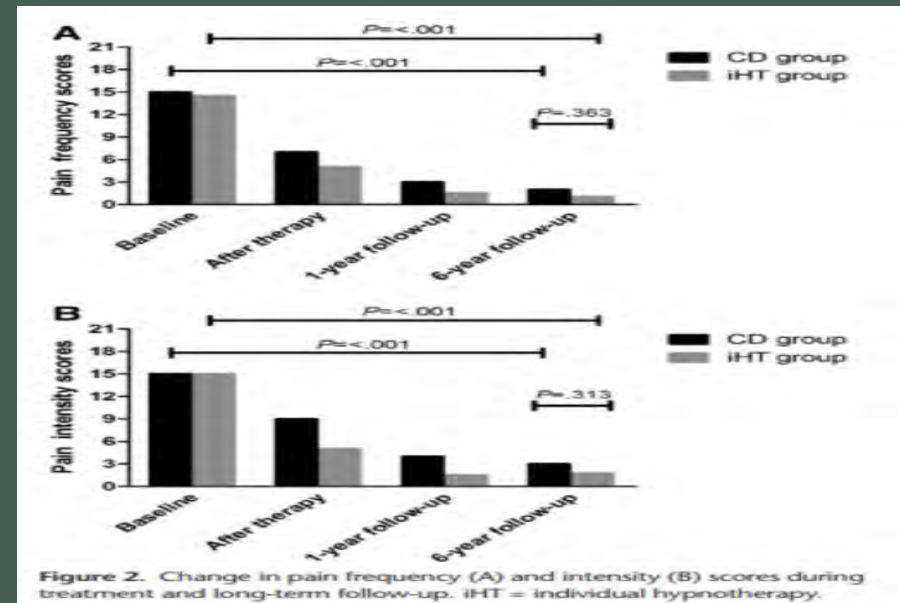
OPEN

Long-Term Follow-up of Individual Therapist Delivered and Standardized Hypnotherapy Recordings in Pediatric Irritable Bowel Syndrome or Functional Abdominal Pain

**Robyn Rexwinkel, MSc, *Jeske F.M. Bovendeert, MD, *Juliette M.T.M. Rutten, MD, PhD,
*Carla Frankenhuys, BSc, *Marc A. Benninga, MD, PhD, and †Arine M. Vlieger, MD, PhD*



- The proportion of children reporting AR at 6-year follow-up was 80.0% in the CD group and 86.6% in the iHT group



- **ADDRESS THE UNDERLYING CONSTIPATION**

- DIET

- prunes, pears, apricots, chia seed in smoothies, ground flaxseed

- FLUID, FLUID , and more FLUID!!!

- Improve physical movement

- **MEDICATIONS**

- Osmotic Laxatives
- Stimulant Laxatives
- Lubricants
- Rectal Treatments

- **BEHAVIORAL MODIFICATION**

- Regular Toileting Routine
 - Potty Box, rewards and incentives
- Addressing emotion factors



Breaking the
Cycle of
Stool
Withholding

**Early
recognition
and
intervention
are CRUCIAL**



POTPOURRI OF
BOWEL
MEDICATIONS

Stool softeners and osmotic laxatives:

These medicines pull water into the bowel, softening the stool to make them easier to pass.



Stimulants: These medications help stimulate the colon and increase the squeeze of the bowels.



Lubricants: help ease the passage of stool and lubricate the intestines. These are especially helpful for children that are withholding stool.



This medication is emulsified and needs to be mixed well. Can mix with milk/pudding or hot chocolate or can give with a spoonful of ice cream! Do not use unless instructed by a provider, as this medication should be AVOID in children under 2 or children with swallowing difficulties.

Suppositories/Enemas: These medications are helpful to stimulate bowel activity from below and helps empty the colon from below.



Nutrition

- IM dietitians: Focus on anti-inflammatory diet,
- Therefore, I recommend
 - Increase anti-inflammatory fats-IE use olive oil, fish twice a week and supplement with omega 3's (see further discussion)
 - Mindful eating
 - Cook foods down if needed, avoid clear triggers, watch skins and eat fruits/vegetables that are very colorful (phytonutrients).
- Elimination diet. I use less commonly. Select most common triggers: IE Gluten, dairy

EXERCISE

- Recommend non-competitive exercise with focus on wellness *even if competitive athlete*. Helps to “take back control”, focus on health, stress reduction, moving meditation.
- Other cultural systems place big emphasis on GI tract, wellness stems from health GI tract “not just eating and pooping”
- BENEFITS OF EXERCISE
 - Improve gut motility
 - Improve overall health
 - Decrease side effects of meds (fatigue, bone disease, weakness, hypertension, weight gain etc)
- Start off very slow (deconditioning effect) and pick something you like.
- Strongly recommend yoga, Tai Chi, Qi Gong, other martial arts or walking. Much of yoga and tai chi focus on improving GI function and recognizing wellness.
- Studies looking at benefits of exercise in patients with IBS
 - Taneja et al Appl Psychophys Biofeed, 2004 in IBS
 - Birdee et al Acad Pediatr 2009 Review of yoga in pediatrics
 - Evans et al Peds Gastro Nutrition: Yoga for IBS, adol and young women
 - Kuttner et al Pain Res Manag 2006 IBS

- Children and caregivers are taught:
 - -reframe perception of pain
 - -reward well behavior
 - -establish contingency plans for management of pain
 - -attempt to ignore pain behavior
 - -use of positive self-talk, relaxation and imagination
- -56% pain-free initial response with 75% pain-free at 6 months
 - Sanders et al: *J Consult Clin Psychol.* 1994;62:306-314.
- -Groups taught CBT: 72% pain-free post intervention
 - Humphreys et al: *J Pediatr Gastroenterol Nutr.* 2000;31:47-51.
- -25% decrease in pain scores and 30% decrease in absenteeism
 - Robins et al: *J Pediatr Psychol.* 2005;30:397-408.

CBT

Cognitive Behavioral Therapy

Biofeedback

- -Combines relaxation and mental imagery with visual or auditory
- feedback of somatic changes
- -ie: skin temperature, skin resistance, heart rate variability
- -Especially helpful in modulating autonomic reactivity
- Ex: Heartmath.com

Guided Imagery

- -A form of self regulation in which a state of deep relaxation is
- induced using progressive muscle relaxation (PMR)
- -The subject is then guided to actively create images to facilitate
- resolution of the problem
- - Differs from hypnosis in that the patient creates their own
- solution
- - Especially effective in children due to their ability
- to have active, creative imaginations

Common Herbal Medications

Peppermint oil

- Carminative- gas relieving
- Menthol- component which acts to relax smooth muscle by blocking calcium channels; most products have 44% menthol
- Also found to have mild topical anesthetic effect
- In children found to be both safe and effective.
- Dose: 0.2-0.4 ml per day
- Forms: enteric coated, peppermint oil soft gels, oil
- Randomized, double-blind, controlled 2-week trial:
- 50 children; dose- 1-2, 187mg peppermint oil 3X/day for 2 weeks
- 76% receiving enteric coated peppermint oil caps with decrease Sx
- 19% decrease in placebo group
- Kline et al. *J Pediatr* 2001;138:125-8.

Ginger (Zingiber officinale)

- Root of ginger plant chewed to alleviate nausea- ancient times
- India- proverb saying that all good is found in ginger
- Most often used in patients with nausea, dyspepsia, motion sickness
- Prokinetic action mediated by spasmolytic activity upon Ca⁺⁺ channels
- Proven effectiveness in reducing postoperative nausea and emesis
- Can cause mild abdominal pain in some patients
- Dosing: 250mg to 1.0 gram; max adult dose of 5 gm per day
- Ginger is available as a dried or fresh root, tea, powder form, liquid extract, tincture, tablets, capsules, and candied form

Additional Herbal Therapies

- Aloe Vera
- Ashwagandha-adaptogen, anxiolytic
- Boswellia(leukotriene inhibitor):
 - asthma/arthritis
- Chamomile: anxiolytic
- Licorice
- Marshmallow:
- Meadowsweet: arthritis
- Oregano: antimicrobial
- Slippery Elm
- Turmeric
- Wild Yam: previously know as “colic root”/antispasmodic

Omega 3 Fatty Acids

- Anti-inflammatory pathway
- May have both a local and systemic effect
- Review (2006) in IBD w/ possible better outcome from enteric coated.
- Numerous studies in mental health issues
- Long term risk of GI cancer: Decrease risk with fish intake. (Again the issue of plant based diet vs low residue)
- Dose: Start at ~2 gms/day and increase to 4-6 if tolerated. Freeze caps if “burpy”.
- CAN UPSET THE GI TRACT AND MAKE THINGS WORSE IF HAVING GERD

Probiotics

- Ecosystem of gut may differ at times of illness
- and health
- Anti-inflammatory effect of probiotics
- Barrier effect with alteration of mucus layer
- Treatment- **traveler's diarrhea and viral gastroenteritis**
- Lactobacillus and Bifidobacterium studied most often
- Forms- powder, yogurt, capsules, chewable tablets,
- freeze-dried powders, wafers and beverages.

Probiotics

- Lactobacillus rhamonosus GG (LGG)
- Randomized, double-blind,, placebo-controlled
- trial receiving either LGG or placebo for 8 weeks; 141 children
- Outcome: overall pain at end of intervention period

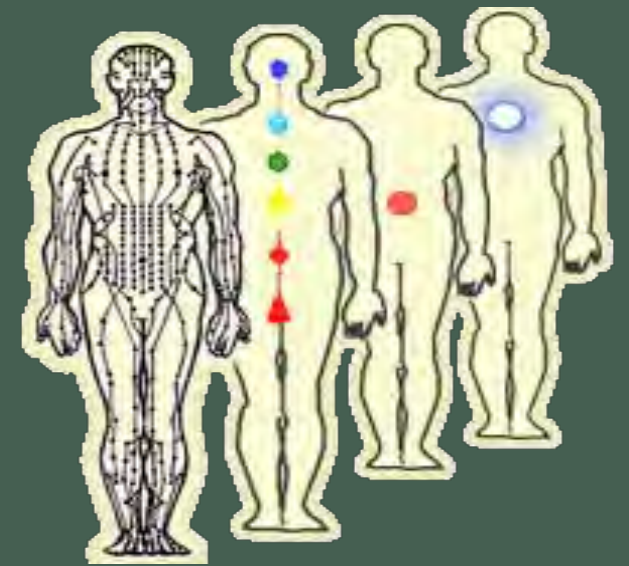
- LGG- significant reduction of frequency and severity of abd pain
- $p < .02$ and $.001$ respectively
- Week 12: treatment success: 48 children LGG vs. 37 placebo
- $p < .03$ Francavilla et al. *Pediatrics*. 2010;126:e1445-e1452.

Whole System

- Homeopathy- like cures like
 - Small doses of a compound that would give similar symptoms at higher doses is given (sometimes compared to vaccine)
 - No good data in IBD but minimal risk.
- TCM
 - Primarily acupuncture (and its components) and herbal regimens along with certain exercises (Tai Chi, Qi Gong). Improving the chi.
 - Increasing evidence of acupuncture helping with abd pain.
 - Intestines are a very major organ system in TCM that is viewed to interact closely with other systems
 - There are needle-less forms for children.
 - Careful of contaminants in herbal preps.
- Ayurvedic
 - Excellent system with a very holistic approach.

Energy Medicine

- Working with energy fields and chakras to help in overall wellness.
- Some spiritual healing falls in this category (IE shamanic healing)
- I have used more for acute pain/anxiety but can be used for long term wellness.
- Sometimes a difficult concept until one experiences it.
- Reiki, healing touch etc





MANUAL MEDICINE

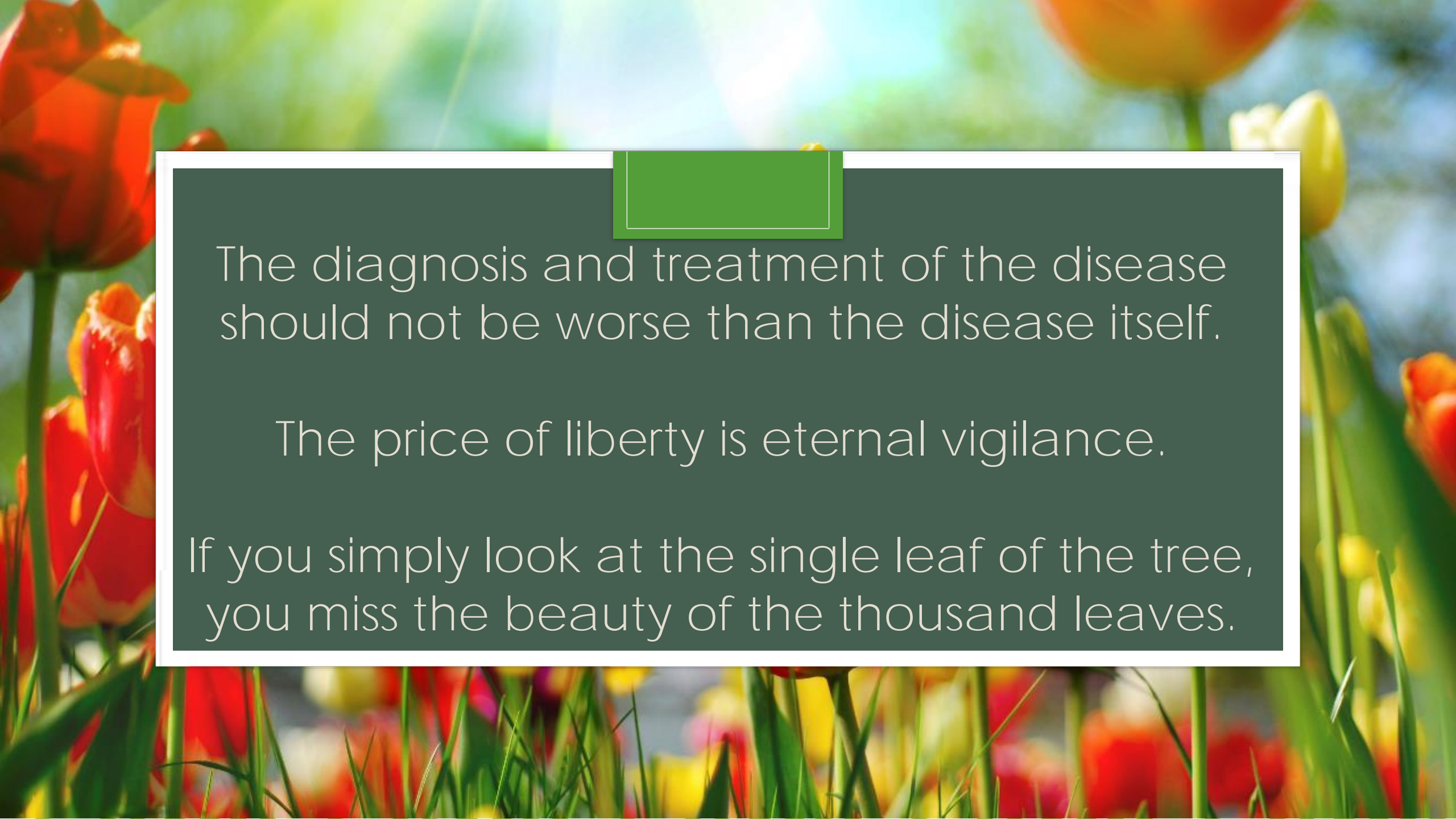
- Osteopathy
- Chiropractic
 - PT
- Massage
- Reflexology

Experience has shown us it can be effective in treating pain, and referred viscerosomatic responses.

- Treatment options are many
 - Breath work (Almost universal in all medical cultures but ours!)
 - Meditation
 - Yoga, Tai Chi, Qi Gong (moving meditation)
 - Exercise (not competition)
 - Counseling
 - Spirituality/Prayer
 - Energy Medicine
 - Biofeedback Ex: Heartmath.com

Stress Reduction

Life is stressful and exponentially for patients with a chronic illness. Should recognize and not ignore this component



The diagnosis and treatment of the disease
should not be worse than the disease itself.

The price of liberty is eternal vigilance.

If you simply look at the single leaf of the tree,
you miss the beauty of the thousand leaves.

WELCOME to the

Pediatric Integrative Medicine ECHO: Changing Health Care for Children

Session 14, March 5, 2024

Today's Program:

- Brief housekeeping
- Didactic: Cardiology, Jenifer Glatz
- Case Presentation: Matt Hand
- Case Discussion
- Summary
- Up Next

*Please note we are adding 2 make up sessions in May (*these will not have CME associated with them*)

Notes:

- Enter name, organization into chat
- Raise virtual hand or enter comments in chat at any time. We will call on you when it works. Please mute otherwise.
- To protect individual privacy, please use non-identifying information when discussing cases.
- We will be recording the didactic part of these sessions. *Participating in these session is understood as consent to be recorded. Thank you!*
- Closed Captioning will be enabled during sessions
- [Submit cases](#)



The Trauma In Our Treatment

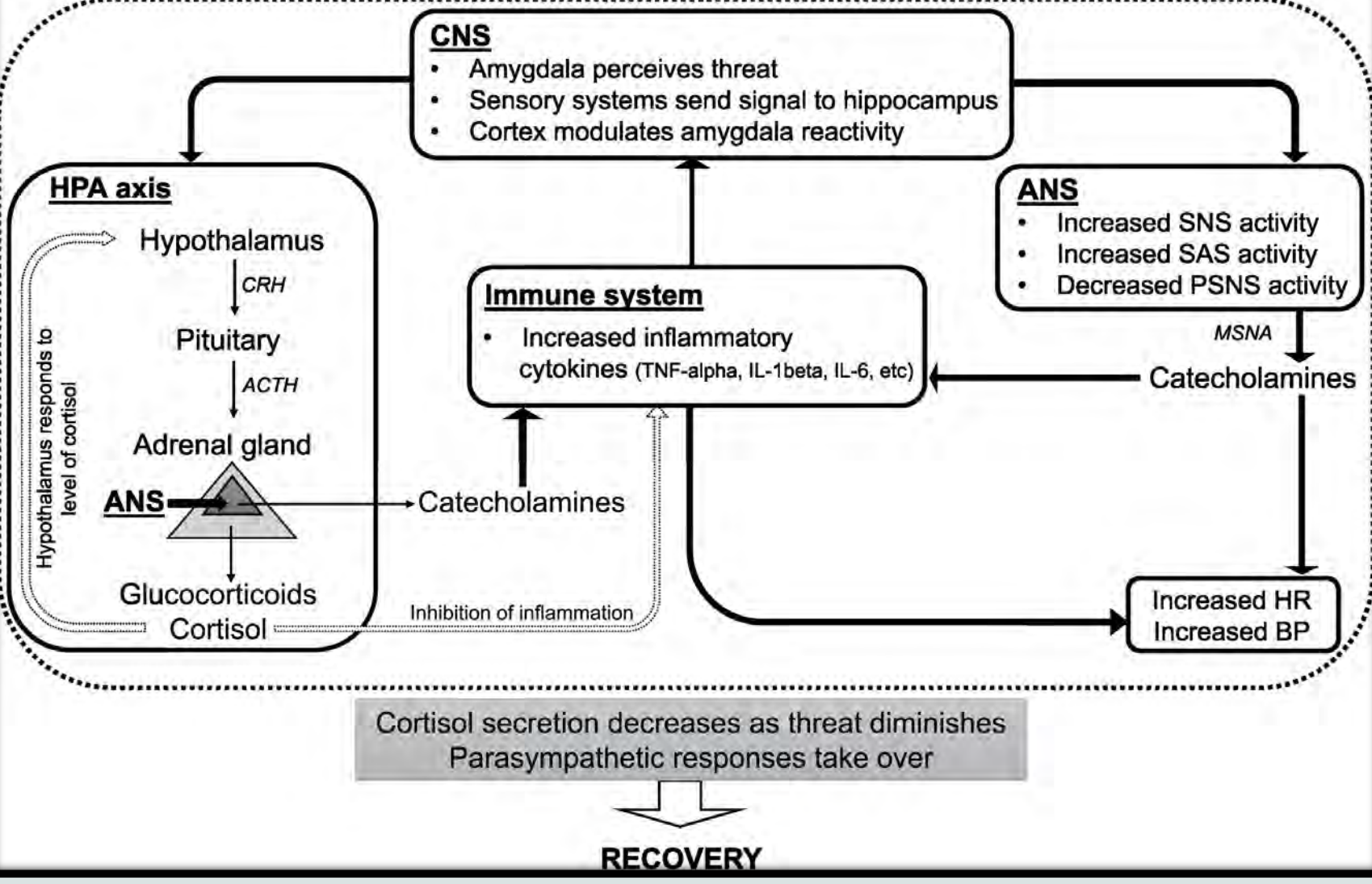
Jenifer Glatz, MD MPH

Integrative Medicine ECHO

3/5/2024

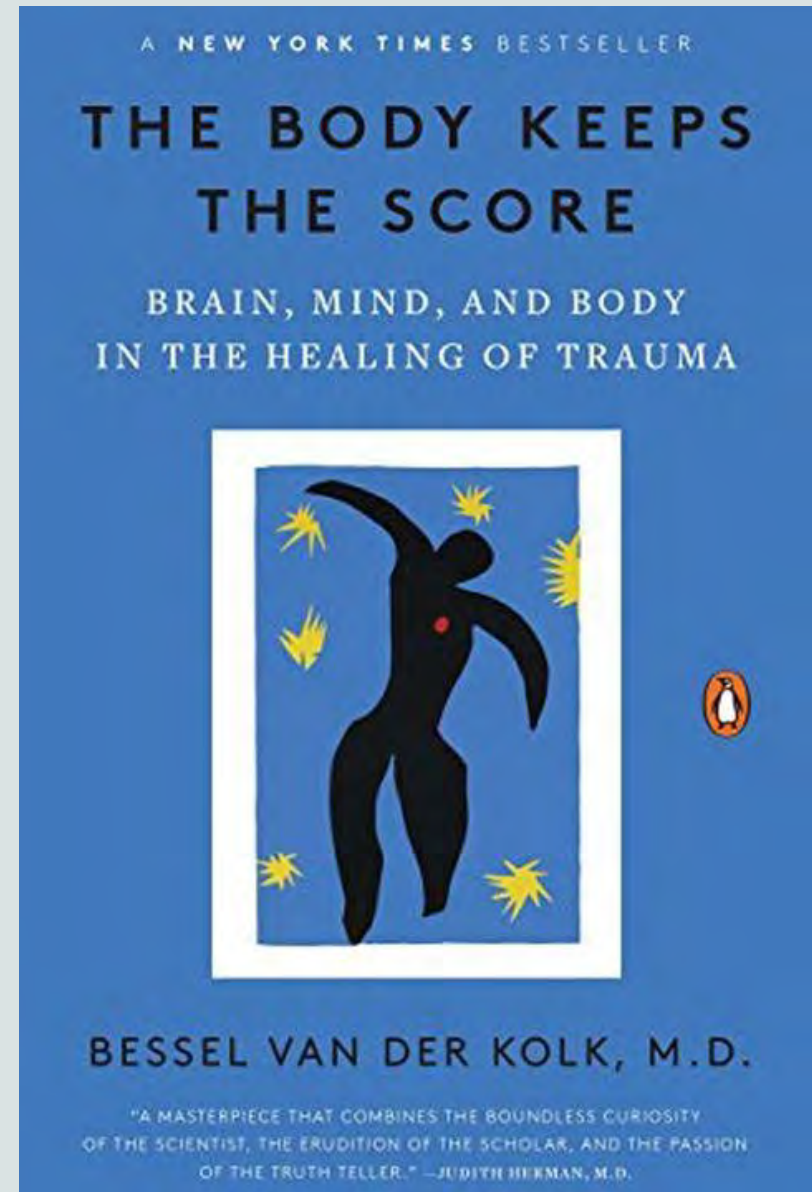


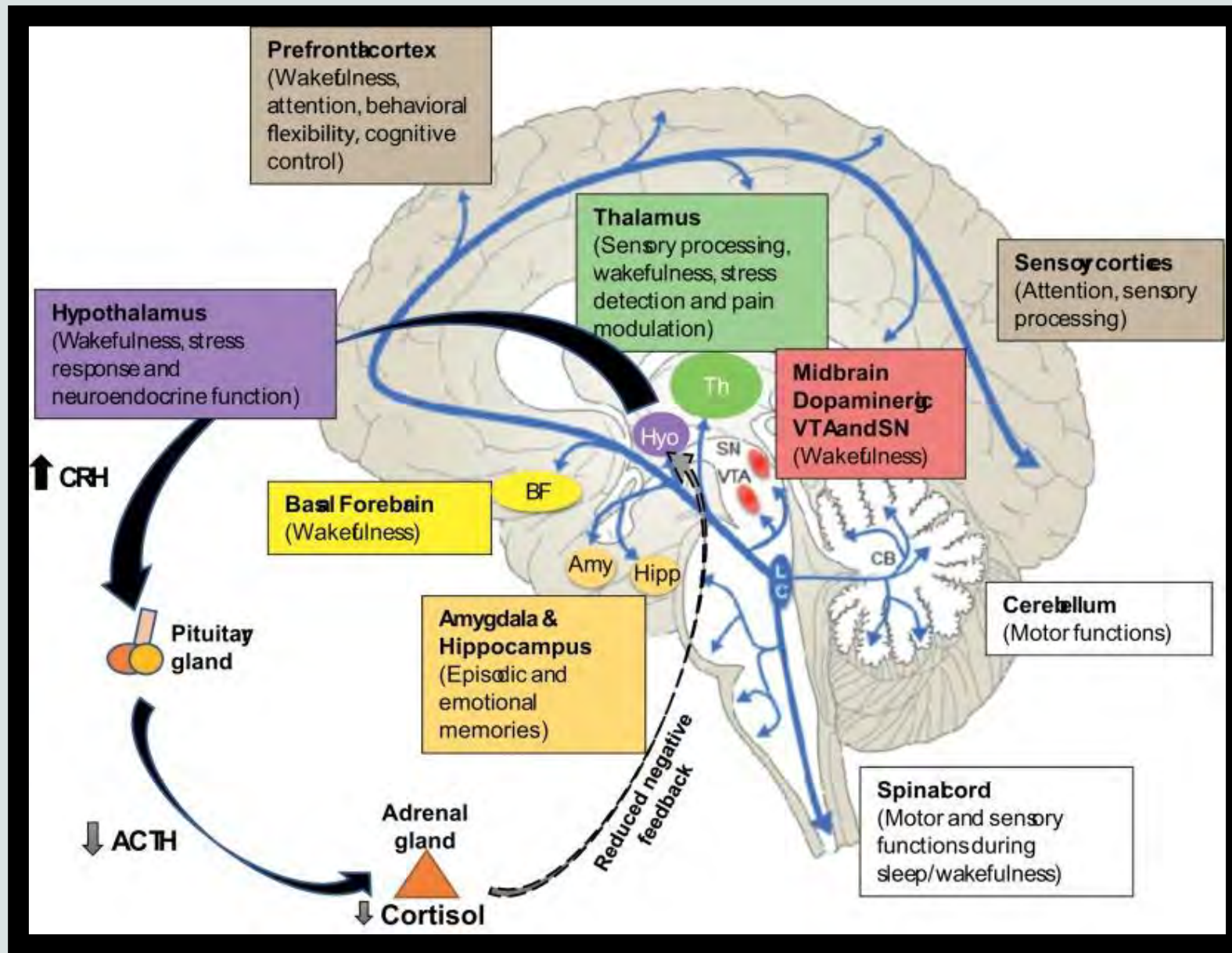
Acute Stress Response

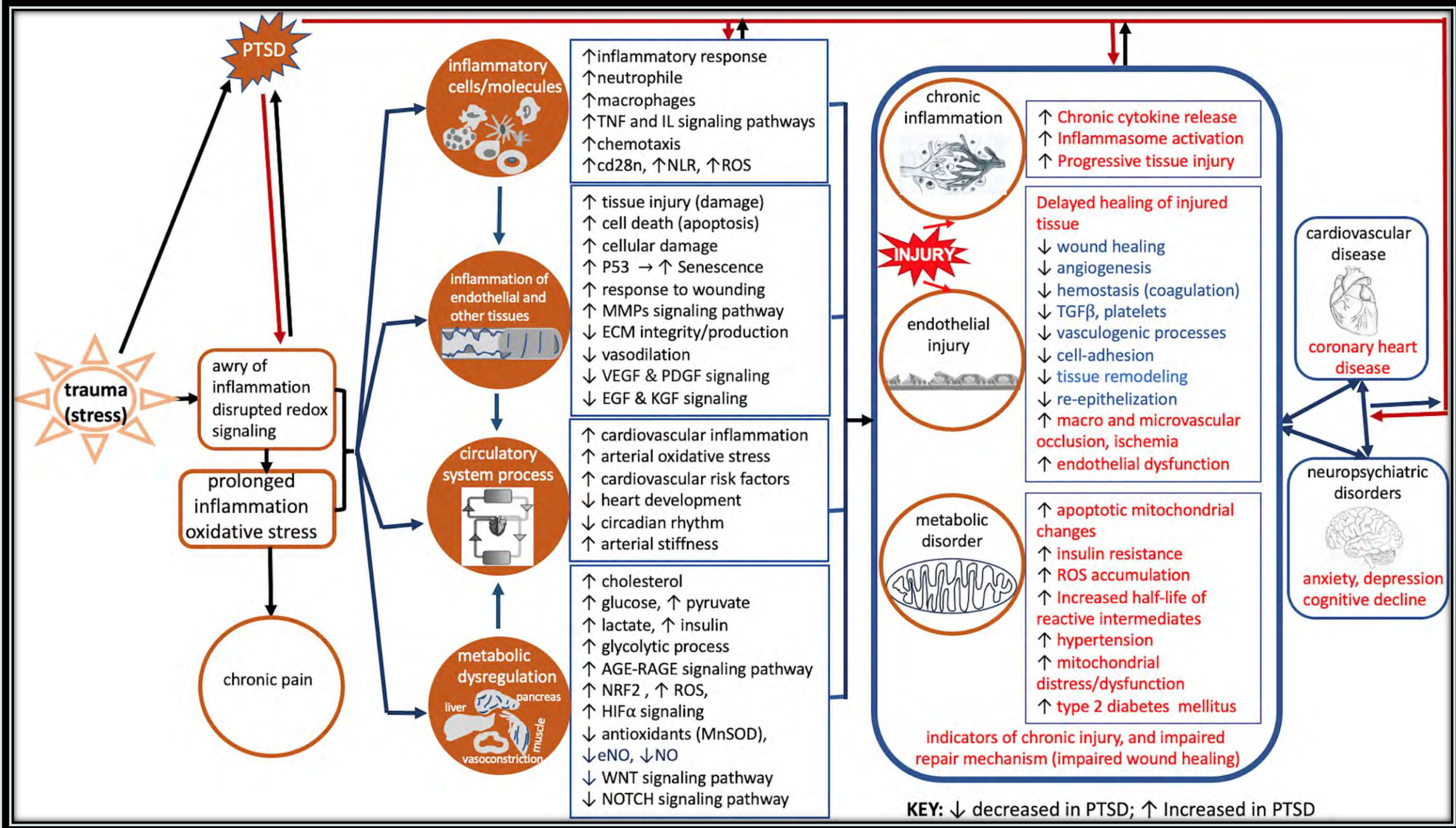


“Long after a traumatic experience is over, it may be reactivated at the slightest hint of danger and mobilize disturbed brain circuits and secrete massive amounts of stress hormones. This precipitates unpleasant emotions, intense physical sensations, and impulsive and aggressive actions. These post traumatic reactions feel incomprehensible and overwhelming.”

The Body Keeps the Score: Brain, Mind, and Body in the Healing of Trauma. Bessel van der Kolk







S. Muhie, et al. Molecular signatures of post-traumatic stress disorder in war-zone-exposed veteran and active-duty soldiers, Cell Reports Medicine, Volume 4, Issue 5, 2023.

Symptoms After Trauma Exposure

Behavioral

- Antisocial acts
- Change in activity
- Change in appetite
- Change in communication
- Change in sexual functioning
- Change in speech pattern
- Emotional outbursts
- Inability to rest
- Increased alcohol consumption
- Intensified startle reflex
- Pacing
- Social withdrawal
- Suspiciousness

Emotional

- Agitation
- Anxiety
- Apprehension
- Denial
- Depression
- Emotional shock
- Fear
- Feeling overwhelmed
- Grief
- Guilt
- Inappropriate emotional response
- Irritability
- Loss of emotional control

Cognitive

- Blaming
- Change in alertness
- Confusion
- Hypervigilance
- Increased or decreased awareness of surroundings
- Intrusive images
- Memory problems
- Nightmares
- Poor abstract thinking
- Poor attention
- Poor concentration
- Poor decision making
- Poor problem solving

Physical

- Chills
- Difficulty breathing
- Dizziness
- Elevated blood pressure
- Fainting
- Fatigue
- Grinding teeth
- Headaches
- Muscle tremors
- Nausea
- Pain
- Profuse sweating
- Rapid heart rate
- Twitching
- Weakness

Post Traumatic Stress



- Post traumatic stress is a normal adaptive response to a threatening situation or traumatic event
- Lifetime risk in adolescents is ~5%
- The physical and emotional reactions are known as post-traumatic stress symptoms and include flashbacks, bodily sensations (e.g., sweating, palpitations), avoidance of trauma-related aspects, emotional numbing, negative feelings, trouble with sleeping, anger, attention problems, hypervigilance, and others

Post Traumatic Stress Disorder

- Some develop persistent and debilitating symptoms (PTSD)
- DSM-V lists 20 symptoms and divides them into 4 clusters:
 - Intrusion (cluster B)
 - Avoidance (cluster C)
 - Negative alterations in cognition and mood (cluster D)
 - Alterations in arousal and reactivity (cluster E)
- Must have at least one cluster B, one cluster C, two cluster D, and two cluster E symptoms for more than a month.



Pediatric Medical Traumatic Stress

- Medical trauma is unique in that the threat is within the body and is ongoing
- Medical trauma stress has been shown to decrease physical functioning, decrease QOL, increase risk of mortality
- Factors that may contribute include uncertainty of symptom cause, lack of knowledge, unpredictability of future, and complexity of the health care system for young adults.
- Up to 80% of children experience some traumatic stress reactions a life threatening illness, injury, or painful medical procedure.
- 5-28% of children admitted to the PICU meet criteria for PTSD



Long Term Medical Complications of PTSD

- PTSD can lead to auto-immune diseases and cardiovascular disease in adults (coronary disease risk increases 60%)
- Patients with PTSD are less likely to attend college and have increased rates of depression, suicide, substance use and anxiety
- Reactivity in PTSD is not restricted to trauma-related events but could also be detected in response to a social stimulus such as listening to a crying infant



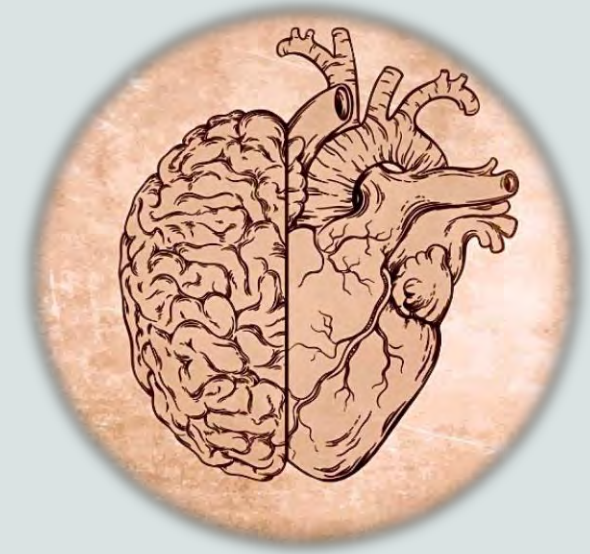
“Trauma is not what happens to you
but what happens inside you”

— Gabor Maté

The Myth of Normal: Trauma, Illness and Healing in a Toxic Culture

It is the subjective experience of a life threatening event, rather than objective factors (mechanism, type, and severity of the injury) that contribute to the development of PTSD

PTSD and Congenital Heart Disease



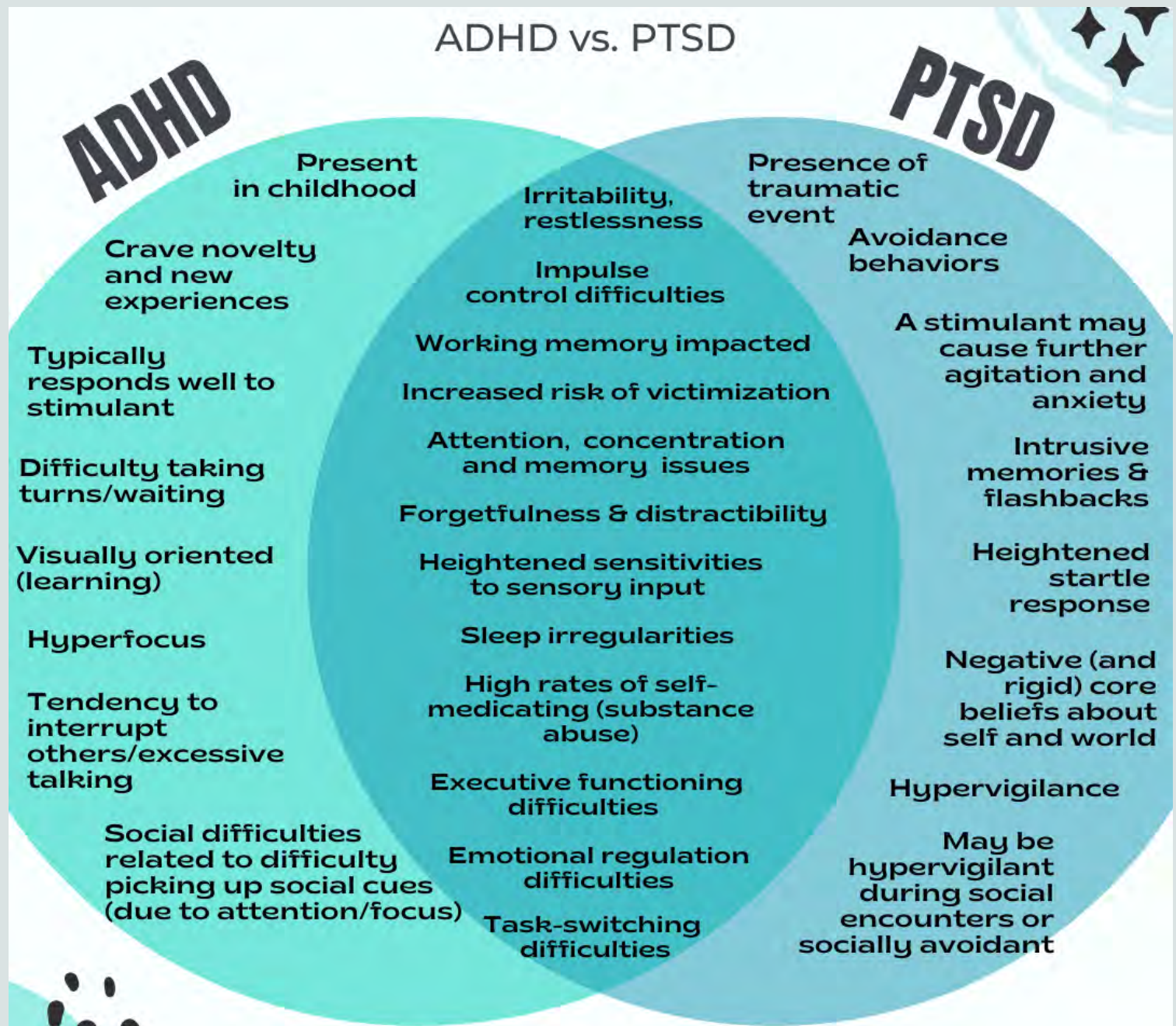
- Roughly 10-30% of children and 20% of adults with CHD have PTSS associated with their condition
- Ingles et al: 90 patients s/p ICD placement with at least 1 shock. Found ~30% met criteria for PTSD and 50% females met criteria for PTSS
- Studies are very limited in children
 - Connolly et al. : 43 children ages 5-12 years s/p cardiac surgery. At postoperative assessment 12% met diagnostic criteria for PTSD and another 12% had PTSS
 - Toren and Horesh studied PTSD in adolescents s/p cardiac surgery as newborn and 29% scored “full PTSD likely”

“Children who don’t feel safe in infancy have trouble regulating their moods and emotional responses as they grow older. By kindergarten, many disorganized infants are either aggressive or spaced out and disengaged, and they go on to develop a range of psychiatric problems. They also show more physiological stress, as expressed in heart rate, heart rate variability, stress hormone responses, and lowered immune factors. Does this kind of biological dysregulation automatically reset to normal as a child matures or is moved to a safe environment? So far as we know, it does not.”

The Body Keeps the Score: Brain, Mind, and Body in the Healing of Trauma.

Bessel van der Kolk

ADHD vs. PTSD



Predictors of Medical Traumatic Stress



- Illness onset (acute versus chronic)
- Medical complications and number of medications
- Frequency of medical visits
- Tube feeds
- Child characteristics: prior internalizing (e.g., anxiety and depression) and externalizing (e.g., aggressive behavior)
- Parental PTSS
- Trauma-related factors: elevated heart rate immediately after injury and perceived severity of the event
- Cognitive processes: dysfunctional cognitive strategies/ beliefs

Screening for Medical Trauma

- Resting heart rate and BP and HR/BP variability
- Child Stress Disorders Checklist
- Screening Tool for Early Predictors of PTSD (STEPP)
- Diagnostic Interview Schedule for Children (DISC)
- University of California at Los Angeles Post-Traumatic Stress Disorder Reaction Index (UCLA PTSD-RI)
- Impact of Event Scale-Revised (IES-R)
- Resources available through the National Child Traumatic Stress Network

Approach to Physical Symptoms of Trauma

- Reassurance/emotional support
- Education
- Avoid additional stressors and stimulants
- Early screening
- Trauma informed care
- Medication: +/- beta blocker
- No study has evaluated an evidence-based treatment for PTSD in children with congenital heart disease





“After trauma the world is experienced with a different nervous system. The survivor’s energy now becomes focused on suppressing inner chaos, at the expense of spontaneous involvement in their lives. These attempts to maintain control over unbearable physiological reactions can result in a whole range of physical symptoms. This explains why it is critical for trauma treatment to engage the entire organism, body, mind, and brain.”

The Body Keeps the Score: Brain, Mind, and Body in the Healing of Trauma. Bessel van der Kolk

Integrative Approaches for Medical Trauma

- Breathing/grounding techniques
- Trauma focused cognitive behavioral therapy
- Neurofeedback
- EMDR
- Acupuncture
- Yoga
- Theatre
- Fostering safe relationships
- Mindfulness
- Address parental symptoms of trauma



References

- Deng LX, Khan AM, Drajpuch D, Fuller S, Ludmir J, Mascio CE, Partington SL, Qadeer A, Tobin L, Kovacs AH, Kim YY. Prevalence and Correlates of Post-traumatic Stress Disorder in Adults With Congenital Heart Disease. *Am J Cardiol*. 2016 Mar 1;117(5):853-7. doi: 10.1016/j.amjcard.2015.11.065. Epub 2015 Dec 13. PMID: 26803381.
- Meentken MG, van Beynum IM, Legerstee JS, Helbing WA, Utens EM. Medically Related Post-traumatic Stress in Children and Adolescents with Congenital Heart Defects. *Front Pediatr*. 2017 Feb 13;5:20. doi: 10.3389/fped.2017.00020. PMID: 28243582; PMCID: PMC5303720.
- Warner CH, Warner CM, Appenzeller GN, Hoge CW. Identifying and managing posttraumatic stress disorder. *Am Fam Physician*. 2013 Dec 15;88(12):827-34. Erratum in: *Am Fam Physician*. 2014 Mar 15;89(6):424
- Fu Q. Autonomic dysfunction and cardiovascular risk in post-traumatic stress disorder. *Auton Neurosci*. 2022 Jan;237:102923. doi: 10.1016/j.autneu.2021.102923. Epub 2021 Nov 19. PMID: 34844132.
- S. Muhie, et al. Molecular signatures of post-traumatic stress disorder in war-zone-exposed veteran and active-duty soldiers. *Cell Reports Medicine*, Volume 4, Issue 5, 2023.

WELCOME to the

Pediatric Integrative Medicine ECHO: Changing Health Care for Children

Session 15, March 21, 2024

Today's Program:

- Brief housekeeping
- Didactic: Neurology, Gail Schuman
- Case Presentation: Erik
- Case Discussion **using Slido**
- Summary
- Up Next

*Please note we are adding 2 make up sessions in May (*these will not have CME associated with them*)

Notes:

- Enter name, organization into chat
- Raise virtual hand or enter comments in chat at any time. We will call on you when it works. Please mute otherwise.
- To protect individual privacy, please use non-identifying information when discussing cases.
- We will be recording the didactic part of these sessions. *Participating in these session is understood as consent to be recorded. Thank you!*
- Closed Captioning will be enabled during sessions
- [Submit cases](#)

Neurology

Gail Schuman, DO, MS

Session 15, March 21, 2024

Introduction - Types of Headaches

- ▶ Primary -
 - ▶ Migraine, Tension-Type, Cluster, Exertional headache
- ▶ Secondary
 - ▶ Trauma, vascular, substance abuse or withdrawal, infection, problems in cranial or facial structures, psychiatric, CNS tumor
- ▶ Neuralgias
 - ▶ Cranial/Facial/Trigeminal

Maria, p. 541

Introduction

▶ Common disorder of childhood

- ▶ up to 10 yrs: 5% Boys and Girls
- ▶ 10 - 15 yrs: 5% Boys and 7% Girls
- ▶ 15 - 20 yrs: 6% Boys and 10% Girls Szperka, p. 8

▶ Mean age of onset: 5 yrs for boys, 12 - 13 yrs for girls

▶ Boy:girl ratio changes in adolescence

▶ Nearly 60% of boys and 75% of girls age 12-17 report at least one headache in the last month

Hershey, Ed, p. 34

▶ Between 8 - 23% of children between 11 - 18 yo experience migraines

B. Catton, Pharmacy Times, Aug 19, 2016

Introduction - Clinical Differential

Episodic	Recent Onset, Persistent, Progressive	Chronic, Non- Worsening
Migraine AVM (rare) Cluster (rare)	Infectious Illness Postconcussion Cervical Sprain Brain Tumor with elevated ICP (less common)	Tension Type Medication Overuse Headache (MOH) Chronic Medical Illness (including sleep disturbances)

There is something
wrong!

Introduction - Features of Headaches

Migraine	Infectious	Tumor/ Pseudotumor	Sinusitis	Tension MOH
Nausea Vomiting Photophobia Transient neurological symptoms Phonophobia Worse with activity Severe <i>Osmophobia</i>	Fever Malaise Rash Fatigue	Persistent Focal Neurologic signs or papilledema	Nasal discharge Fever Hx of allergies, many upper airway infections	No additional symptoms usually, shoulder tightness, Milder

Introduction - What do kids get?

- ▶ Multiple headache types are common in children
 - ▶ Tension-type headache (10 - 24% of children & adolescents, but usually milder with little impairment)
 - ▶ Migraine and variants (8 - 23%) - recurrent, moderate to severe headaches
 - ▶ Due to medical condition (illness, infection)
 - ▶ Medication-overuse headaches
 - ▶ Concussion, neck sprain, post-concussive syndrome
 - ▶ Trigeminal Autonomic Cephalgias -cluster, paroxysmal hemicrania, short-lasting neuralgiform headache attacks (SUNHA) - rarely seen
 - ▶ Primary Stabbing Headaches - scary but occur with other primary headaches such as migraine

Important Questions to Ask

Other questions

- ▶ Where does it hurt on your head?
- ▶ What does it feel like - hammering, exploding or squeezing?
- ▶ Does the headache prevent you from participating in your activities?
- ▶ Are they missing school because of headaches?
- ▶ Does the headache wake you up from a sound sleep, or is present on awakening and improves during the day? (Increased ICP?)
- ▶ In young children, sometimes you need to infer symptoms from their behavior
- ▶ Worse with Valsalva maneuvers? (Increased ICP?)

Diagnosis - When is Location Helpful?

Other questions

- ▶ Where does it hurt on your head?
- ▶ What does it feel like - hammering, exploding or squeezing?
- ▶ Does the headache prevent you from participating in your activities?
- ▶ Are they missing school because of headaches?
- ▶ Does the headache wake you up from a sound sleep, or is present on awakening and improves during the day? (Increased ICP?)
- ▶ In young children, sometimes you need to infer symptoms from their behavior
- ▶ Worse with Valsalva maneuvers? (Increased ICP?)

Diagnostic Features of Migraine

- ▶ Common Migraine - No Aura
- ▶ Classical Migraine - With Aura
 - ▶ With or without headache (acephalalgic)
 - ▶ Basilar-type
 - ▶ Familial or Sporadic Hemiplegic Migraine
- ▶ Childhood Periodic Syndromes - Precursors to Migraine
 - ▶ Recurrent Abdominal Pain (RAP)
 - ▶ Benign Paroxysmal Vertigo or Torticollis
 - ▶ Cyclic Vomiting
 - ▶ Motion Sickness?

Features of Tension Type Headaches

- ▶ Pressure or tightness (often band-like)
- ▶ No neurological or autonomic symptoms
- ▶ Episodic or Chronic
 - ▶ Most common cause of chronic daily headache
 - ▶ Analgesic rebound (MOH) often contributes to problem
- ▶ Can be difficult to treat
 - ▶ Analgesic detoxification
 - ▶ Prophylaxis with TCAs, topiramate can be beneficial also
 - ▶ Muscle relaxants, esp tizanidine (Zanaflex) can help
 - ▶ Nonpharmacological approaches for muscle spasm - OMM, PT, cognitive-based therapy

Migraine - Acute Treatment Options

- ▶ Acetaminophen 10 - 15 mg/kg/dose
- ▶ Ibuprofen 10 mg/kg/dose
- ▶ Naproxen 2.5 - 5 mg/kg/dose
- ▶ Ergotamine 1 - 2 mg at onset (Migranal nasal spray - I do use in teens)
- ▶ Diclofenac (Cambia) 50 mg mixed with water - I do use in teens
- ▶ Triptans
 - ▶ Axert (almotriptan) down to 12 yrs old
 - ▶ Imitrex (sumatriptan) - tabs, nasal spray, injectable
 - ▶ Maxalt (rizatriptan) down to 6 yrs old - ODT, tabs
 - ▶ Zomig (zolmitriptan) - down to 12 yrs old, nasal spray, ODT
 - ▶ Treximet (suma + naproxen) - various strength combinations - down to 12 yrs old
- ▶ Frequency of use is limited for all of these

Abu-Arafeh, Ed., p. 110
Newman, p. 20, Szperka, p11

Triptan Approvals & Dosing Table

TABLE 3. ACUTE MIGRAINE TREATMENT GOALS				
Generic	Brand	Pediatric Dose	Age (yr)	Maximum Daily Dose (mg)
Sumatriptan ²⁰	Imitrex ²	Nasal: 5, 10, or 20 mg	12-17	40 mg
Rizatriptan ¹⁶	Maxalt, Maxalt MLT	5 mg (if <40 kg) or 10 mg (if ≥40 kg)	6-17	30 mg ^d
Zolmitriptan ²⁶	Zomig	Nasal: 2.5 or 5 mg	12-17	10 mg
Almotriptan ²⁷	Axert	6.25-12.5 mg	12-17	25 mg
Sumatriptan/ naproxen sodium ¹¹	Treximet	Oral: 10/60, 30/180, 85/500 mg	12-17	85/500 mg

^dTablets are not recommended in pediatric patients due to a lack of safety and efficacy data.

^eApproved only for adults; if patients take concurrent propranolol, the maximum daily dose is 5-mg oral disintegrating tablet.

Drug	Dose	Maximum Daily Dose
Propranolol	2-4 mg/kg/day, or 10-40 mg 3 times a day	4 mg/kg/day, or 120 mg
Cyproheptadine	0.25-1.5 mg/kg 3 times a day	24 mg
Valproic acid	20-40 mg/kg/day	1000 mg
Topiramate	1-10 mg/kg/day	200 mg
Amitriptyline	10-50 mg at bedtime	50 mg

Preventive Treatment of Migraines

- ▶ *Cyproheptadine 0.25 - 1.5 mg/day (prepubertal)*
- ▶ *Topiramate 1 - 10 mg/kg/day div BID (50mg BID)*
- ▶ Valproic Acid 20 - 40 mg/kg/day div BID - not in females
- ▶ Lamictal - 100 mg QHS or BID, particularly with aura
- ▶ Levetiracetam - 500 - 1000 mg per day
- ▶ Neurontin 10 - 40 mg/kg/day
- ▶ *Amitriptyline 10 - 25 mg QHS (teens, give at night, helps sleep)*
- ▶ *Nortriptyline 10 - 75 mg QHS*
- ▶ *Naproxen Sodium 250 - 500 mg BID (GI issues)*
- ▶ Verapamil 4 - 10 mg/kg/day div TID (FHM)
- ▶ *Propranolol 2 - 4 mg/kg/day (not in asthmatics)*
- ▶ Butterbur 50 - 75 mg BID (Class A evidence, liver toxicity, must be certified PA free) - lots of **OTC Combo products have this and can't tell if PA free** - Avoid combo products in general

Abu-Arafeh, Ed., p. 116-117
David, Ed. , p. 545

Pearls - This is where I start

- ▶ Take treatment medication early in the headache - even triptans
- ▶ Take the appropriate dose
- ▶ Wean all caffeine, save as treatment
- ▶ Plenty of fluids - minimum of 2 liters/day, no high sugar, no caffeine, no fake sugars
- ▶ Good sleep hygiene - regular bed-time, regular rising time, 8 - 10 hours, no TV, nightlights, cell phone or computer in bedroom (I hear you **laughing!**). **No screen time for one hour before bed (now you're rolling on the floor!)**
- ▶ MVI, Magnesium, Riboflavin, Co-Q-10, Migrelief (Magnesium, Riboflavin, feverfew), Be wary of combo products
- ▶ Regular meals - no skipping breakfast, protein source at breakfast (good luck in teenagers!)

Pearls - How to help us out

- ▶ Labs: Fasting - CBC, Fe, Ferritin, Thyroid, Magnesium, CMP
- ▶ Have the patient keep a headache diary before coming to see neurology
 - ▶ Date and Time of onset
 - ▶ Duration and any treatment used with dose
 - ▶ Type - pounding, squeezing
 - ▶ Location
 - ▶ Associated features - N/V, photophobia, phonophobia, vision changes, dizziness, etc.
 - ▶ Trigger info - how much sleep the night before, new food?, school stressors, other stressors

Red Flags in General

- ▶ Positional or Valsalva related
- ▶ Late-age onset headache (> 50 yrs old)
- ▶ Very young children with headaches (<6 yo)
- ▶ Maximum severity at onset of headache
- ▶ Fever with the headache
- ▶ Compromised immune system
- ▶ Scalp tenderness (not allodynia, ?trauma)
- ▶ Abnormal neurologic exam

Imaging is Necessary When...

- ▶ Subacute Headache with rapid progression in severity, Change in type of headache
- ▶ Atypical presentation - waking from sleep, intractable vomiting, vertigo, confusion, mental status changes
- ▶ New onset headache in immunosuppressed patient
- ▶ Child under 6 years of age
- ▶ First and/or worst headache - especially very young patients without typical features of migraine
- ▶ Any associated systemic features - fever, meningismus, etc.
- ▶ Headache with focal abnormalities on exam
- ▶ Occipital or Posterior Location
- ▶ No family history of migraine/primary headaches



References

- ▶ Pediatric Neurology - Essentials for General Practice - Heilbroner
- ▶ Pediatric Headache in Clinical Practice - Hershey, et al.
- ▶ Childhood Headache - Abu-Arafeh
- ▶ Comprehensive Review of Headache Medicine - Levin
- ▶ The Cleveland Clinic Manual of Headache Therapy - Tepper
- ▶ International Classification of Headache Disorders - 3 Beta
- ▶ Headache and Facial Pain - Newman
- ▶ Headache Simplified - Marcus
- ▶ Child and Adolescent Neurology - David
- ▶ Familial Occipitotemporal Lobe Epilepsy and Migraine With Aura. Neurology 2007;68(23):1995-2002. L. Deprez, et al.
- ▶ Pediatric Migraine: Abortive Management in the Emergency Department. Headache 2014;54;235-245. D. Sheridan, et al.
- ▶ Pediatric Neurology, Clinical Assessment & Management, Headache Chapter, W. Qubty & I. Patniyot, Ed: E. Steve Roach, Demos Medical, 2022
- ▶ CGRP Receptor, **Nat'l** Library of Medicine, July 17, 2021, A. Rashid & A. Manghi
- ▶ CGRP and Headache: A brief review, 2019, S. Tepper
- ▶ Headache in Children and Adolescents, Continuum. 2021 June 01; 27(3): 703-731. Szperka, C.
- ▶ Cannabis RCT shows Efficacy, AEs in Migraine, Neurology Reviews. 2023 July;31(7):1

WELCOME to the

Pediatric Integrative Medicine ECHO: Changing Health Care for Children

Session 16, April 2, 2024

Today's Program:

- Brief housekeeping
- Didactic: Rheumatology, Jill Ryan
- Case Presentation: Matt Hand
- Discussion
- Summary
- Up Next

Notes:

- Enter name, organization into chat
- Raise virtual hand or enter comments in chat at any time. We will call on you when it works. Please mute otherwise.
- To protect individual privacy, please use non-identifying information when discussing cases.
- We will be recording the didactic part of these sessions. *Participating in these session is understood as consent to be recorded. Thank you!*
- Closed Captioning will be enabled during sessions
- [Submit cases](#)

Pediatric Rheumatologic Disease

Jill Ryan PA-C

- Musculoskeletal complaints are second only to headache in school age children.
- Important for providers to understand when and how to pursue further evaluation of acute and chronic MSK complaints in pediatric patient.

Common Rheumatologic causes of musculoskeletal pain in children

- Juvenile Idiopathic Arthritis
- Fibromyalgia Syndrome
- Hypermobility Spectrum disorder and hypermobile Ehlers-Danlos
- SLE
- Dermatomyositis

Differential diagnosis of musculoskeletal complaints in children

Infection

Viral – Parvo, Rubella, Mumps

Bacterial – Septic Arthritis, Lyme Disease, Acute Rheumatic Fever

Reactive – Post-streptococcal, enteric infections

Connective Tissues Diseases

JIA SLE Sjogren's Syndrome Scleroderma

Dermatomyositis Systemic Vasculitis (Kawasaki, HSP)

Mechanical and Orthopedic

Slipped Femoral-Epiphysis Osgood-Schlatter's Disease

Benign Joint Hypermobility/EDS Legg-Calve Perthe's disease

Systemic Diseases

Hemophilia Endocrine Disorders Lipid Storage Diseases Malignancy

Consequences of Musculoskeletal Disease

1. Missed school, academic challenges
2. Decreased physical activity, limitations
3. Generalized growth delay
4. Localized Growth Abnormalities
(Limb length/size, Micrognathia, scoliosis)
5. Delayed puberty
6. Sleep cycle disruption

Juvenile Idiopathic (Rheumatoid) Arthritis “JIA/JRA”

- Most Common Connective Tissue/Autoimmune disease of childhood
- Incidence = 1 in 10,000 children annually. One of the most common chronic diseases of childhood.
- Prevalence = 1 in 1,000 children.
- Definition: A chronic arthritis persisting in one or more joint for > 6 weeks in patient under 16 years old
- Kids with JIA rarely have a specific chief complaint of joint pain.
- Other etiologies ruled out

Oligo (Pauci)-articular JIA

- Most common sub group of JIA
- F>M, Often presents age 2-5 y.o in girls and 11-16 y.o. boys
- 4 or less joints involved, most commonly knee, wrist or ankle.
- ANA + (low titer, younger age of onset)
- At risk for asymptomatic Uveitis.
- **50-60% will “outgrow” the arthritis. Small chance of relapse in adulthood. Remaining 40% transform to adult RA.**

Polyarticular JIA

- F>M
- Small and large joint with tenosynovitis
- Symmetric, 5 or more joints involved.
- RF+
- Erosive disease more common.
- Uveitis less common, screening still needed.

Systemic JIA

- F=M.
- Sick kids with fever and rash. Painful, stiff and swollen joints,
- Lymphadenopathy
- Hematologic findings including anemia, leukocytosis and thrombocytosis,
- Elevated inflammatory markers, elevated Ferritin
- RF + (suggests more aggressive pattern of disease)

Laboratory Values in JIA

- WBC: normal to 50K
- Hgb: 8-22gm
- Plt: normal to very elevated
- ESR: normal to elevated
- CRP: normal to elevated.
- ANA: 30-40% positive, in Oligo articular
- RF: 10-15% positive, Poly articular
- ASO, Parvo titers to rule out infectious etiology.
- Synovial joint fluid analysis - inflammatory cell count.

Treatment of JIA

1. NSAIDs (30% response in Oligo articular)
2. DMARDs -Hydroxychloroquine, Methotrexate, Sulfasalazine
3. Corticosteroids, oral and intraarticular
4. Biologics
5. Complementary therapies (acupuncture, OM, supplements, anti inflammatory diet)

Multidisciplinary approach: Rheumatologist, Pediatrician, Ophthalmologist.

Dietician, Physical Therapist, School support services

Hypermobility Spectrum Disorder

- Joint hypermobility seen in approx. 20% of general population.
- Of those with joint hypermobility < 10% symptomatic.
- Generalized, regional or localized joint hypermobility.
- Joint instability.
- Pain throughout day or later in day, morning stiffness is rare.
- Decreased muscle mass, decreased muscle strength, hyperalgesia
- Often seen in conjunction with POTS, IBS, Anxiety disorder, Fatigue.

hypermobile Ehlers-Danlos Syndrome (hEDS)

- Velvety skin, striae, increased skin laxity, easy bruising, blue sclera
- Family history of 1st degree relative with hEDS seen in pts with hEDS.

Hypermobility Spectrum Disorder/hypermobile Ehlers-Danlos Management

- Prognosis is good, joint laxity decreases with age.
- Noninflammatory, not progressive.
- This is a syndrome of daily pain that can be life altering. Supportive care is focus of therapy.
- Physical Therapy. Muldowney Protocol. Bracing and Taping.
- NSAIDs
- Nutritional supplements - Vitamin C, Vitamin D.

THE BEIGHTON SCORE

How to Assess Joint Hypermobility

A numerical mobility score of 0 to 9, one point allocated for the ability to perform each of the following tests:



Pull little finger back beyond 90°
(one point for each side)



Bend knee backwards beyond 10°
(one point for each side)



Pull thumb back to touch forearm
(one point for each side)



Lie hands flat on floor while keeping knees straight and bending forward at waist



Bend elbow backwards beyond 10°
(one point for each side)

A positive Beighton score for adults is 5 out of the 9 possible points; for children, a positive score is at least 6 out of 9 points.

Fibromyalgia Syndrome

- Most common in teenage females
- Diffuse MSK pain present at least 3 months
- Fatigue
- Disrupted sleep patterns
- Multiple tender points on exam.
- No inflammatory joint findings.
- Associated chronic headaches, abdominal pain, Depression & Anxiety.

Management of Fibromyalgia Syndrome

- Improve sleep cycle
- Exercise, physical therapy
- Management of pain with acetaminophen, NSAIDs. No indication for opioids.
- Depression and/or anxiety medication
- Acupuncture

What is Integrative Pediatrics?

“Integrative Medicine is the practice of medicine that reaffirms the importance of the relationship between practitioner and patient, focuses on the whole person, is informed by evidence, and makes use of all appropriate therapeutic approaches, healthcare professions and disciplines to achieve optimal health and healing”

Integrative Modalities for Rheumatologic and Musculoskeletal Pain

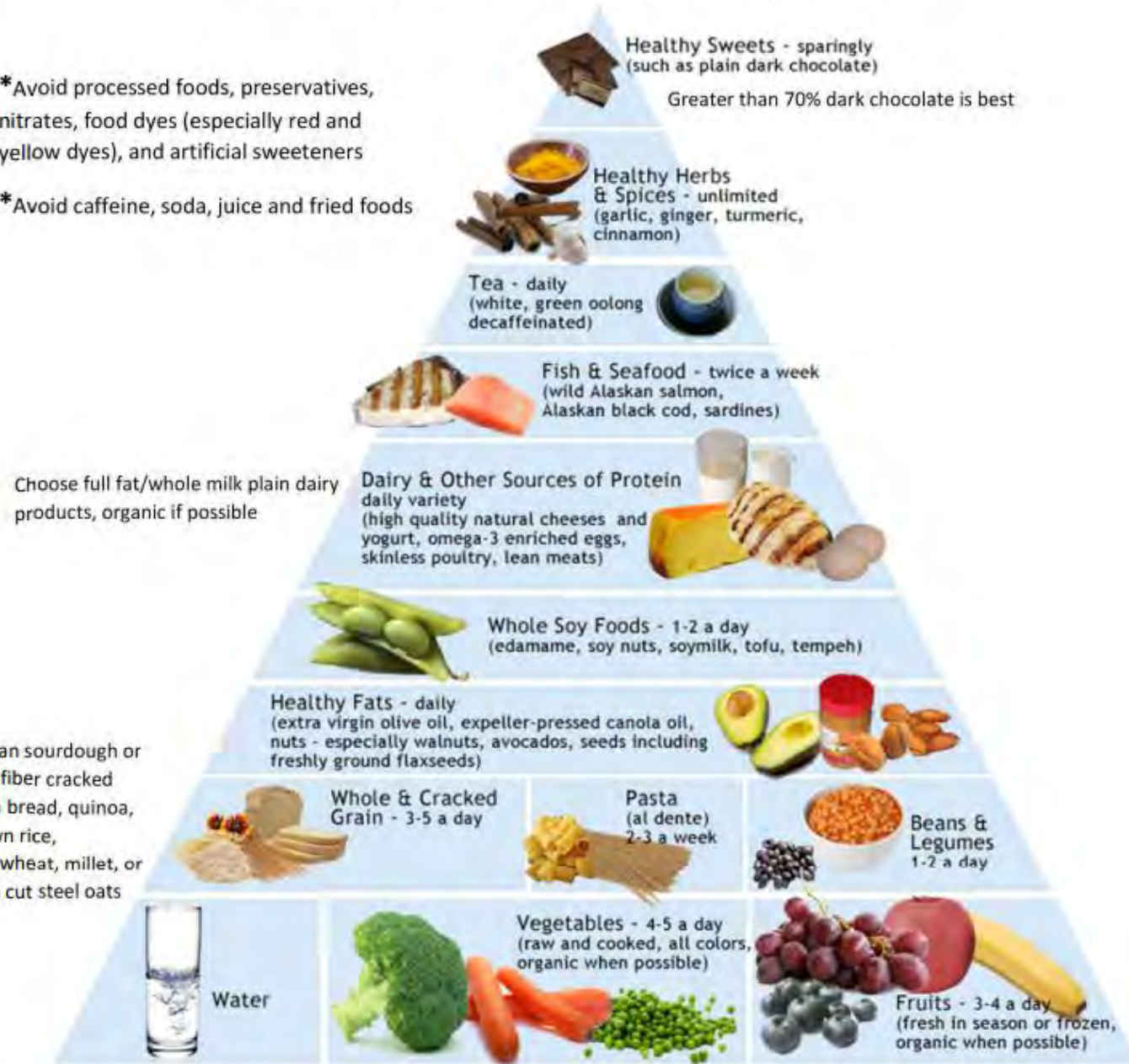
- Botanical Medicine/Supplements
- Mind Body Therapies - meditation, imagery, relaxation, biofeedback
- Osteopathic manipulation, chiropractic
- Acupuncture
- Diet/Nutrition
- Physical Therapy, Exercise
- Healing Touch, Reiki

Pediatric Anti-Inflammatory Food Pyramid

*Avoid processed foods, preservatives, nitrates, food dyes (especially red and yellow dyes), and artificial sweeteners

*Avoid caffeine, soda, juice and fried foods

Artisan sourdough or high fiber cracked grain bread, quinoa, brown rice, buckwheat, millet, or plain cut steel oats



Use of Integrative Modalities in Pediatric Rheumatology

- CAM use in young children in general pediatric clinics is estimated to be 11-21%, and 60 to 80% in children with chronic disease. In one study 2/3 of Pedi Rheum patients used 1 form of complementary medicine while ½ of the pts used 2 or more modalities.
- Integrative modalities allows patient and parent to feel back in control of at least **some aspect their child's chronic illness.**
- Provide an opportunity to improve quality of life in pediatric rheumatology patients.
- Avoid or minimize exposure to potential side effects (immunosuppression, malignancy).
- Management of pain from Rheumatologic disease
- Continued research in pediatric population is needed.

2022 American College of Rheumatology (ACR) Guideline for Exercise, Rehabilitation, Diet, and Additional Integrative Interventions for Rheumatoid Arthritis

Guideline Summary

Revised January 13, 2023

This American College of Rheumatology (ACR) guideline addresses the use of exercise, rehabilitation, diet, and additional integrative interventions in conjunction with disease-modifying anti-rheumatic drugs (DMARDs) as part of an integrative management approach for people with rheumatoid arthritis (RA).

References:

1. Klippel, John MD, Primer on the Rheumatic Diseases, 12th edition, 2001, pg 529-40.
2. Robbins, Laura DSW editor, Clinical Care in the Rheumatic Diseases, 2nd edition, 2001, pg 81-7.
3. www.Rheumatology.org
4. www.Uptodate.com -hypermobilityspectrumdisorder.
5. In the Clinic: Fibromyalgia, Annals of Internal Medicine, March 2020, Vol 172, No 5.
6. www.drweil.com
7. Consortium of Academic Health Centers for Integrative Medicine, May 2005
8. Sibinga EM, Ottolini MC, Duggan AK, Wilson, MH. Parent-pediatrician Communication about complementary and alternative medicine for children. *Clin Pediatr.* 2004;43(4):367-373
9. Hagen LEM, Schneider R, Stephens F, Modrussan D, Feldman BM. Use of complementary and alternative medicine by pediatric rheumatology patients. *Arthritis Rheum.* 2003; 49(1):3-6

WELCOME to the

Pediatric Integrative Medicine ECHO: Changing Health Care for Children

Session 17, Endocrine, April 18, 2024

Today's Program:

- Brief housekeeping
- Didactic: Endocrine, Matt Hand
- Case Presentation: Matt Hand
- Discussion
- Summary
- Up Next

Notes:

- Enter name, organization into chat
- Raise virtual hand or enter comments in chat at any time. We will call on you when it works. Please mute otherwise.
- To protect individual privacy, please use non-identifying information when discussing cases.
- We will be recording the didactic part of these sessions. *Participating in these session is understood as consent to be recorded. Thank you!*
- Closed Captioning will be enabled during sessions
- [Submit cases](#)

Pediatric Integrative Medicine ECHO: Endocrinology

Matthew Hand DO

Section Chief, Pediatric Nephrology and Integrative Medicine
Children's Hospital at Dartmouth/Dartmouth Hitchcock, Children's

Disclosures

Davinci/FoodScience/Little Davinci: Medical advisor

Note: As was discussed in a previous session of our ECHO program, Supplements and Botanicals are not regulated by the FDA. The current presentation offers an overview of supplements/botanicals but cannot cover all the data/references related to individual therapies. It can also not cover all the side effects/benefits/drug-herb interactions related to the individual treatments. For more detailed look at these areas we would refer you back **to the ECHO on “Botanical Bootcamp” and the following independent reviewers:**

Natural Medicine Comprehensive Database

United States Pharmacopia

ConsumerLabs.com

NSF

Concepts, Controversies and Conditions

- ▶ A number of things that we see/hear:
 - ▶ Thyroid
 - ▶ **“Adrenal Fatigue”**
 - ▶ Growth delay
 - ▶ Prediabetes
 - ▶ Diabetes
 - ▶ Type 1
 - ▶ Type 2
 - ▶ Obesity

- ▶ Endocrine thoughts of feedback loops, replacing or adjusting amounts to normalize the body. Profound impact of individual hormones/peptides on all aspects of the body. (IE insulin, thyroid, GH, PTH etc)
- ▶ Integrative aspects look at how all factors influence the endocrine system, food, exercise/movement, stress, environmental toxins, sleep, etc, and how variability in all these aspects interact with each other (ex blood sugar changes impacted by cortisol response)
- ▶ If you think about it, one of the most profound systems impacted by day to day changes.

So what happens with stress/anxiety

- ▶ Stress response:
 - ▶ Change in glucocorticoids, catecholamines, IL6
 - ▶ Impacts
 - ▶ Cognitive function, fear, anger, wake-sleep, thyroid axes GI, CV and immune response
 - ▶ Metabolic/Immune responses:
 - ▶ Corticotropin RH, stimulate gluconeogenesis, hepatic glucose secretion
 - ▶ Impact on TH-1 and th-2
 - ▶ "Stress and disorders of the stress system." Chrousos GP. *Nature reviews. Endocrinology* 5(7):374-81 Jul, 2009

Conditions associated with stress

"Stress and disorders of the stress system." Chrousos GP. *Nature reviews. Endocrinology* 5(7):374-81 Jul, 2009

Acute

- ▶ Allergic reactions
- ▶ Asthma
- ▶ Eczema
- ▶ Fear reactions
- ▶ Hypertension
- ▶ Indigestion (constipation, diarrhea)
- ▶ Migraine
- ▶ Pain
- ▶ Panic attacks
- ▶ Psychosis
- ▶ Urticarial

Chronic

- ▶ Anxiety
- ▶ Autoimmune disorders
- ▶ Behavioral maladjustment (poor planning and decision making)
- ▶ Cardiovascular disease
- ▶ Cognitive dysfunction
- ▶ Depression
- ▶ Growth delay
- ▶ Irritable bowel syndrome
- ▶ Loss of libido
- ▶ Metabolic disorders (obesity, metabolic syndrome, type-2 diabetes)
- ▶ Neurovascular degenerative disease
- ▶ Osteopenia
- ▶ Polycystic ovarian syndrome
- ▶ Reduced fertility
- ▶ Sleep disorders

- ▶ Has lead to Functional endocrinology and Naturopathic endocrinology
- ▶ Big emphasis on environmental factors on hormonal response
- ▶ In my opinion, also makes it harder study in a reduction theory system since it is a complexity theory model. Multiple factors impacting all aspects of the endocrine system.
- ▶ Integrative approach particularly important in the diabetes patients given the impact on multiple organ systems and long term end organ issues

Diabetes

- ▶ The majority of the work is done on Type 2 diabetes
- ▶ Big emphasis on pre-diabetes and prevention of diabetes from a lifestyle. Ultimately important for all patients with diabetes
- ▶ When I started Type 2 Diabetes in a child would have been a case to write up! Now seeing it routinely.
- ▶ Although research revolves around Type 2, concepts are the same.
- ▶ Recognizing the importance of conventional medicine and the improvements over the years.
- ▶ Interestingly, endocrinologists would point out we have better western therapies than before but in some cases worsening glucose control/HgbA1c. What are the factors competing against or improved treatments?



▶ Food

- ▶ Carb counting
- ▶ Anti-inflammatory/Mediterranean diet. Higher carb content but lowers inflammation
 - ▶ Multiple studies and a meta analysis with improve HgbA1C and glucose along with other cardiovascular risk factors
 - ▶ Recognizing glycemic index vs load, latter more important
- ▶ Combination of both

▶ Exercise

- ▶ Both physical movement and down regulation
- ▶ Helps with weight management and glucose uptake, JAMA 2011 Meta-analysis
 - ▶ Structured seems to be better
 - ▶ Both aerobic and resistance training
 - ▶ More total time seems to be better, intensity less important

▶ Stress Management

- ▶ Clear impact on counterregulatory hormones
- ▶ Associated with a multitude of systemic issues
- ▶ Likely greater impact more recently as we are seeing higher rates of anxiety and depression in the population and know to be worse with chronic illness
- ▶ Meditation
 - ▶ Has been shown to decrease counterregulatory hormones
 - ▶ Trials have shown improved HgbA1C and in type 2DM improved insulin levels, lower MAP, and improved insulin resistance
- ▶ Biofeedback
 - ▶ One RCT showed improve Blood sugar and HgA1C
- ▶ Yoga: variable findings. Some with improved HgbA1c, blood sugar, Bp. Others without the same findings. Lots of variability.

Supplements and Botanicals:

- ▶ Vitamin D
 - ▶ 2017 Meta-analysis: modest reduction in Hgba1c.
 - ▶ Also important for chronic inflammation
- ▶ Cinnamon
 - ▶ 2019 meta-analysis: significant decrease in blood sugar
- ▶ Chromium
 - ▶ Proposed mechanism improve insulin binding, insulin receptor number, increased insulin sensitivity at target tissues
 - ▶ Meta-analysis suggest improved blood sugar control and HgbA1c
 - ▶ ? Related to chromium deficiency or not.
- ▶ Gymnema
 - ▶ Active components: gymnemic acid and gymnemic saponins
 - ▶ Used in Ayurvedic medicine
 - ▶ One of the one with some studies in Type 1
 - ▶ Small trials but improved glucose control
 - ▶ **“Sugar destroyer” The plan reported decreases sugar cravings but may need to chew the leaf**

▶ Magnesium:

- ▶ Important in insulin secretion, insulin binding and insulin activity
- ▶ 2017 meta-analysis review with improved FBS, BP and lipid profile
- ▶ More risk of deficiency based on processed foods and current content of foods

▶ Alpha Lipoic acid

- ▶ Anti-oxidant
- ▶ Primary used type 2 diabetes and specifically for peripheral neuropathy
- ▶ 2019 meta-analysis showed improve FBS and HgbA1c.

▶ Zinc

- ▶ Increased urinary zinc excretion with glucosuria. May suggest zinc replacement

- ▶ Fiber
 - ▶ 2015 review, psyllium fiber with improve glycemic control (Type 2DM)
- ▶ Probiotics
 - ▶ 2017 meta-analysis with improved HgbA1c and FBS (Type 2 DM)
- ▶ Black seed/Nigella sativa
 - ▶ 2019 Meta-analysis with improved glycemic control
- ▶ **Omega 3's**
 - ▶ Commonly recommended for a variety of conditions. Known deficiency in the diet but no clear benefit for diabetes directly
- ▶ Apple cider vinegar
 - ▶ May lower blood sugar effect when taken with high glycemic/carb foods

WELCOME to the

Pediatric Integrative Medicine ECHO: Changing Health Care for Children

Session 18, Pulmonary, May 7, 2024

Today's Program:

- Brief housekeeping
- Didactic: Pulmonary, Matt Hand
- Case Presentation: Matt Hand
- Discussion
- Summary
- Up Next

Notes:

- Enter name, organization into chat
- Raise virtual hand or enter comments in chat at any time. We will call on you when it works. Please mute otherwise.
- To protect individual privacy, please use non-identifying information when discussing cases.
- We will be recording the didactic part of these sessions. *Participating in these session is understood as consent to be recorded. Thank you!*
- Closed Captioning will be enabled during sessions
- [Submit cases](#)

Pediatric Integrative Medicine ECHO: Pulmonary

Matthew Hand DO

Section Chief, Pediatric Nephrology and Integrative Medicine
Children's Hospital at Dartmouth/Dartmouth Hitchcock, Children's

Disclosures

Davinci/FoodScience/Little Davinci: Medical advisor

Note: As was discussed in a previous session of our ECHO program, Supplements and Botanicals are not regulated by the FDA. The current presentation offers an overview of supplements/botanicals but cannot cover all the data/references related to individual therapies. It can also not cover all the side effects/benefits/drug-herb interactions related to the individual treatments. For more detailed look at these areas we would refer you back **to the ECHO on “Botanical Bootcamp” and the following independent**

reviewers:

Natural Medicine Comprehensive Database

United States Pharmacopoeia

ConsumerLabs.com

NSF

Concepts, and Conditions

- ▶ 4 big things that come up from a pulmonary standpoint:
 - ▶ Asthma
 - ▶ VCD
 - ▶ Cystic Fibrosis
 - ▶ Recurrent respiratory infections
- ▶ Extensive use of integrative modalities in these conditions
 - ▶ For Asthma: 33-89% pediatric patients using CAM to some degree.
 - ▶ CF: Studies show > 70% using some form of CAM
 - ▶ Certain programs have put an emphasis on treatments (ex Upstate med had all CF patients learning self hypnosis as part of their care)
- ▶ About 50% families with asthma patient unhappy/concerned about only western therapies

Physiology

- ▶ Asthma is a chronic inflammatory disease
- ▶ Characterized by airway inflammation, obstruction and hyperresponsiveness
- ▶ Complex condition with multiple factors
 - ▶ Genetic
 - ▶ Environmental: early antibiotic exposure, early respiratory infections, low omega 3 intake , vitamin D deficiency, weather, stress
 - ▶ Changes in airways
 - ▶ Common triggers: respiratory illness, allergens, tobacco smoke,

Pathophysiology

- ▶ Allergic triggers are among the most predominant initiators
- ▶ Allergen exposure
- ▶ Mast cell degranulation
- ▶ Release of vasoactive amines, enzymes, and leukotrienes
- ▶ Smooth muscle bronchoconstriction
- ▶ Th2 cells: cytokines and chemokines increase cellular response
- ▶ Increase mucus production and inflammatory cascade.

Nutrition/Food

- ▶ Studies in chronic lung disease: positive effect in diet with high phytonutrients/anti-oxidants: fruits, vegetables, fish.
- ▶ Increased protein and calories important in certain forms of chronic lung disease.
- ▶ Improved lung function may be related to anti-inflammatory/anti-oxidant properties.
- ▶ Higher levels of omega 3 encouraged for anti-inflammatory properties.

Movement

- ▶ Initial concerns about making asthma worse.
- ▶ Some asthma triggered by exercise
- ▶ Yet some studies have shown
 - ▶ Sedentary lifestyle increased in the general population and even greater in Asthma patients
 - ▶ Studies using exercise have been mixed but have shown improved FEV1, FVC, QOL and more rapid improvement in asthma symptoms with treatment
 - ▶ Qi Gong/Tai chi: Older Small study with improved pulmonary testing, less antibiotic need and lower rates of hospital visit.
 - ▶ Lu, KD and Forno. E Curr Opin Pulm Med 2020
- ▶ Biggest question is what type of exercise and how much. I always start low and work up.

Mind Body

- ▶ Self hypnosis, breathwork, yoga and relaxation techniques: Decrease shortness of breath or dyspnea
- ▶ Mind body treatments also help decrease chronic symptoms such as cough and decrease the use of certain medications such as albuterol
- ▶ Also may help with lung expansion especially breathing used in Yoga and martial arts
- ▶ Numerous studies document the value of mind-body approaches in the treatment of asthma.
- ▶ Anxious and stressful experiences adversely affect expiratory flow rates in children with chronic asthma
- ▶ Emotionally-induced changes in expiratory flow rates were reversed with relaxation and self-hypnosis.
- ▶ External stress can trigger or worsen chronic asthma, and has similarly been shown that intrinsic stress can have the same effect.
 - ▶ Yeh,GY and Horwitz,R Med Clin North Am 2017

- ▶ One of the early studies that I found fascinating
 - ▶ Patients moderate to severe asthma: severe symptoms when exposed to saline mists that they believed were their asthma triggers. Also, quick resolution with saline inhaler that were thought to be their treatment (IE beta agonist).
- ▶ Mind-body therapies also studied in both adults and children include biofeedback, journaling (marked decrease in meds needs for up to 3 months), tai chi/qigong (particularly breath work related to it)

Herbals/Supplements

- ▶ Pycnogenol extract from French maritime pine:
 - ▶ mild to moderate asthma
 - ▶ 3 months,
 - ▶ Treatment group: improved pulm function, asthma scores and urinary leukotrienes
 - ▶ Also reduction or discontinue rescue inhalers more often as compared to placebo group J Asthma 2004;41:825-32
- ▶ Licorice
- ▶ Cromolyn: drug that active ingredient was extracted from the khella plant (Ammi visnaga), mast cell-stabilizing.
- ▶ **Omega 3's**

- ▶ Vitamin D
 - ▶ deficiency associated with increased asthma symptoms, exacerbations, increased medication use, and reduced lung function in both adults and children.
- ▶ Magnesium: Emergency treatment of acute asthma exacerbations intravenously
 - ▶ Mixed results on oral dosing.
 - ▶ Intracellular low mag levels associated with increased asthma exacerbation
 - ▶ One study in children suggested increased dietary intake in children with worse outcome.
 - ▶ Adult study showed improved asthma symptoms and outcomes on 340 mg Mag a day over 6 months

▶ Quercetin:

- ▶ Bioflavonoid found in foods, including apples, buckwheat, onions, and citrus fruits.
- ▶ In vitro: stabilizes mast cells and reduces the release of preformed histamine.
- ▶ Animal models: suppresses anaphylactic responses in sensitized rats, inhibits asthmatic inflammation in guinea pigs and rats.
- ▶ Multiple models using it as a anti-allergy therapy
- ▶ Still looking for human studies

Lifestyle

- ▶ Removing allergens
- ▶ Weight reduction
- ▶ Improved sleep

Prevention/Decreasing respiratory infections

- ▶ Zinc
- ▶ Adaptogens (TCM mushrooms, ashwagandha, astragalus)
- ▶ Blis K12 probiotics (Strep salivarius)
- ▶ Elderberry (has to be ripe or toxic)

▶ 4 good references

- ▶ Yeh,GY and Horwitz, Med Clin North Amer 2017
- ▶ Arteaga-Badillo et all Medicina June 2020
- ▶ Lu, KD and Forno Curr Opin Pulm Med 2020
- ▶ Mark,JD Ped Clinic North Amer 2007