

Toileting, Interoception & Nutrition: An Evidence-Based Approach for Promoting Toileting Success and Independence



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March 17, 2021

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#interoceptionresearch



Meet Kerri + Kelly

- Met in High School-coaching the Special Olympics Swim Team
- Occupational Therapists
- Teach at Elizabethtown College
- Co-Principal Investigators of multiple research studies focused on topics such as interoception, emotional regulation and toileting

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Potential Trigger Warning:

- You will be invited during this session to tune into your inner body signals.
- Please participate in these activities in a way that meets your comfort level.
- We will also discuss potentially triggering topics surrounding toileting challenges.
- Please be free to take a breath, a break or leave at anytime.

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### Successful Toileting: Support the 'Deep Whys'

- Successful bowel and bladder habits involve a complex interaction between many different internal and external factors.
- These factors include **nutrition** and **interoception**, but also many others such as:
  - ▣ Sensory Processing
  - ▣ Core/Postural Stability
  - ▣ Pelvic Floor Muscles (Function and Strength of bowel and bladder muscles)
  - ▣ Anxiety
  - ▣ Medical Conditions
- This course is not intended to oversimplify the process of toileting, but rather provide a closer look at 2 important, yet often overlooked factors

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### Successful Toileting: Support the 'Deep Whys'



- Given the complexity of factors needed for successful toileting, a surface behavioral approach fails to acknowledge and support the 'deep whys' involved in many toileting challenges
- External reinforcement like sticker charts, edibles, alarms, etc. will not support or build the underlying factors. For example, do they consider?
  - ▣ **Sensory Processing**-Is the child fearful of the sound of the toilet flushing?
  - ▣ **Core/Postural Stability**-Does sitting on a big toilet feel unsafe?
  - ▣ **Pelvic Floor Muscles**- Does the child struggle to relax the pelvic floor muscles in order to void?
  - ▣ **Anxiety**-Does the child need nurturing and/or comfort strategies to feel safe in the bathroom?
  - ▣ **Medical Conditions**-Does the child have an underlying medical need?
  - ▣ **Nutrition**-Does the child have a food sensitivity or limited nutrient intake?
  - ▣ **Interoception**-Does the child notice and understand internal pee and poop signals?

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### Successful Toileting: Support the 'Deep Whys'

**2 Important Notes:**

1. Medical Disclaimer
  - If your child/client has toileting issues, they should always be examined by a medical professional to rule out underlying medical conditions
  - This course should not take the place of a medical examination
2. Individualized Approach
  - This is a framework for considering the influence that interoception and nutrition have on successful toileting
  - No one-size-fits-all approach is effective for supporting toileting success

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Successful Toileting: A Note for the Caregivers

- This course a **JUDGEMENT FREE** zone
- As fellow caregivers it is important to acknowledge that we are all doing the very best we can
- There is no 'right approach' and 'wrong approach' when it comes to toileting, but we can always learn and grow and implement strategies that might make toileting a little easier
- We know this research and info inside and out, and yet we are not implementing it perfectly with our own children and with our own self (so be kind with your expectations of yourself!)

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Toileting & Interoception




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 The 8 Senses


The Outside Senses

  
 Ms. Visual


  
 Ms. Tactile


  
**Ms. Auditory**


  
 Mr. Gustatory


  
 Ms. Olfactory

The Inside Senses

  
 Mr. Proprioception

  
 Mr. Vestibular

  
 Mr. Interoception



Myles, Mahler, Robbins, 2014  
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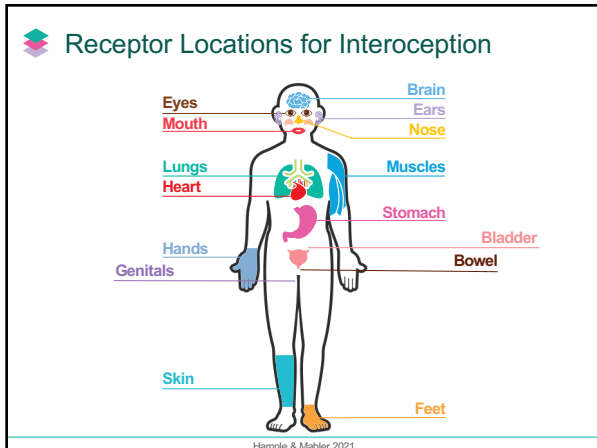
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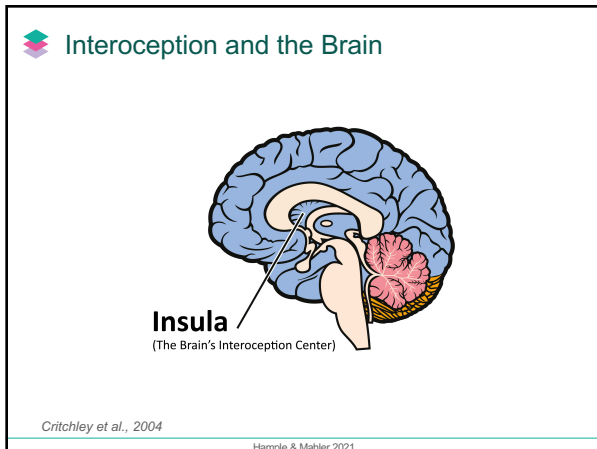
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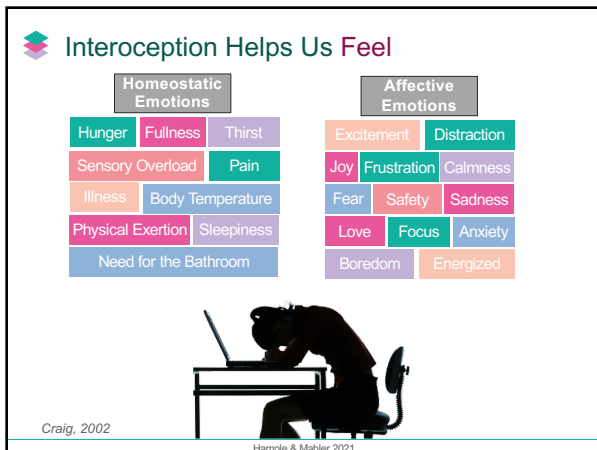
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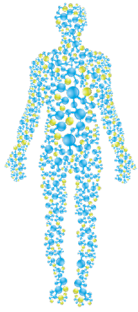
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**Interoception Defined**



The **Sensory System** that gives us information regarding our **BODY-EMOTION** connections.

Craig, 2002

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**Interoceptive Awareness (IA)**



The ability to:

- 1. NOTICE** body signals
- 2. CONNECT** body signals to the emotion

**Better Insula = Better Interoceptive Awareness (IA)**

Critchely et al., 2004

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**IA: A Variety of Extremes**

Body Signals	Sensory Processing Disorder	Characteristics
<b>too big</b>	SMD: Over-responsive	<ul style="list-style-type: none"> <li>• Strong</li> <li>• Overpowering</li> <li>• Too many body signals noticed all at once</li> </ul>
<b>too small</b>	SMD: Under-responsive	<ul style="list-style-type: none"> <li>• Muted</li> <li>• Don't notice body signals until they are intense OR</li> <li>• They go completely unnoticed</li> </ul>
<b>distorted</b>	Discrimination Disorder	<ul style="list-style-type: none"> <li>• Body signals are noticeable, but not clear enough to give specific detail about the exact <b>location</b> or <b>type</b> of feeling</li> </ul>

(Mahler, 2019; Miller, Anzalone, Lane, Cermak, Osten, 2007; Endow, 2010)

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**IA: a Sliding Scale**

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**IA: a Sliding Scale**

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**IA & Toileting Regulation**

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### When IA Breaks Down: Impact on Toileting

**Red icon:** "My son does not feel the need to poop until it is an extreme sensation. By then he is in tears, trying desperately not to have an accident and we are running for the nearest toilet. It is a very lucky day if we make it on time."

**Blue icon:** "My first-grade daughter goes to the bathroom a minimum of 10 times during the school day. She is so sensitive to the feeling of needing to pee. Her teacher keeps labeling her behavior as problematic as if she is purposefully doing it to be annoying or to avoid doing work."

**Purple icon:** "When I was in high school I was completely unaware of when I needed to pee. This was very distressing as I didn't want to have an accident in front of my friends. In order to solve the problem, I would go all day without drinking any liquids which was obviously not a healthy strategy."

**Orange icon:** "I do not feel when I need to pee. On a normal day, my rule is that I will go to the bathroom every 2 hours. If it is a coffee day, then I will go to the bathroom every hour until lunch time."

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### When IA Breaks Down: Impact on Toileting

**Body Signals are TOO BIG**

- The individual goes to the bathroom frequently, thinking they need to pee or poop, but very little comes out.
- Dislikes the feeling of peeing or pooping
- The child is fearful of the sensations involved when they pee or poop (stool withholding)

**Body Signals are too small**

- Unaware that bowel or bladder is full resulting in accidents
- Accident free during the day, but nighttime accidents
- Frequent "last minute emergency" trips to bathroom
- Needs reminded to go to the bathroom, even after long periods of time
- Unable to "push" or "relax" in order to eliminate (e.g., feeling tight vs loose)
- Unaware that they have had an accident or that their clothes are soiled.
- Doesn't wipe until fully clean (doesn't feel soiled)

**Body Signals are DISTOrTeD**

- Feels that they need to go, but not be able to discriminate whether they need to pee or poop.
- Goes to the bathroom frequently, but doesn't really need to 'go' (feeling is due to something else like hunger)

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### Evidence-Based Interoception Strategies

Adaptations for Reduced IA

IA Builders

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**Type 1: Adaptations for Reduced IA**

**Step 1:** Looking at a toileting concern through an interoception lens

*Could the toileting concern be due in part to a breakdown in IA?*

**Step 2:** If yes, put strategies in place that compensate for the inability to notice or connect body signals

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**Type 1: Adaptations for Reduced IA**

Example:

- Using the bathroom on a consistent schedule



Go to the bathroom at:  
 9:00  
 11:00  
 1:00  
 3:00

- N's Arrival Routine**
- Locker
  - Snack & Drink**
  - Preview Schedule
  - Deep Pressure Menu**
  - Go to the Bathroom**
  - Class

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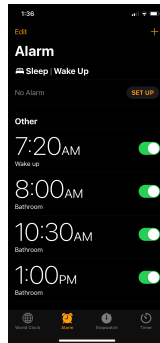
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**Type 1: Adaptations for Reduced IA**

Example:

- Setting a vibrating alarm or reminder on smart phone



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**Type 1: Adaptations for Reduced IA**

Example:

- Memorized Rules

The Potty Pass

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**Type 1: Adaptations for Reduced IA**

Example:

- Water bottles (marked or “smart”)



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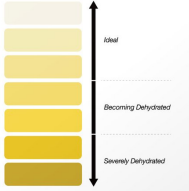
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**Type 1: Adaptations for Reduced IA**








Example:

- Bristol Stool Chart & Urine Color Chart

**Are You Drinking Enough Water?**



**Bristol Stool Chart**

Type 1		Separate hard lumps, like nuts (hard to pass)
Type 2		Sausage-shaped but lumpy
Type 3		Like a sausage but with cracks on its surface
Type 4		Like a sausage or snake, smooth and soft
Type 5		Soft blobs with clean-cut edges (passed easily)
Type 6		Fluffy pieces with ragged edges, a mushy stool
Type 7		Watery, no solid pieces. <b>Entirely Liquid</b>

[https://society6.com/product/pee-color-chart-urine-color-chart\\_print](https://society6.com/product/pee-color-chart-urine-color-chart_print)
<https://www.continence.org.au/bristol-stool-chart>

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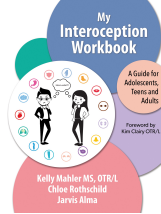
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### Type 1: Adaptations for Reduced IA

#### Why should I care?

Reasons to drink water on a regular schedule and not skip drinking

1. Water is essential to life. More than 50 percent of your body is made up of water, and water helps your body work well. When you drink enough water, this can be called being "hydrated." When you do *not* drink enough water, that can be called being "dehydrated."
2. Research shows that as little as 1 percent dehydration can decrease your mood, attention, memory, and motor coordination.



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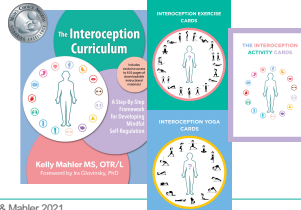
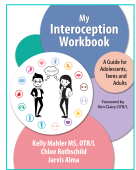
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### Evidence-Based Interoception Strategies

Adaptations for Reduced IA

IA Builders



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### IA Builders: Adapted Mindfulness



- Focus on 1 body part at a time
- Evoke a stronger sensation that draws attention
- Learning while 'doing'
- Provide Visual & Language Supports

**IA Builders**

Are a series of carefully designed strategies, rooted in concepts from mindfulness, used to develop IA in a sequential, playful and concrete manner

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**IA Builders**

- Always trauma-informed
- Take time to validate all inner experiences (no right or wrong)
- Co-Regulation First (must feel safe)



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**The Interoception Curriculum**  
www.kelly-mahler.com

**Section 1: Body**  
Lessons 1-16

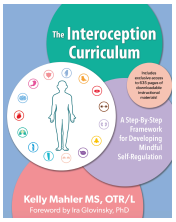
Build the learner's ability to **NOTICE** body signals in a concrete and slow method

**Section 2: Emotion**  
Lessons 17-20

Guide the learner to **CONNECT** body signals to emotion

**Section 3: Action**  
Lessons 21-25

Guide the learner to find a variety of feel-good actions that help the learner **REGULATE**



**BODY  
EMOTION  
ACTION**

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**Type 2: IA Builders**  
*Focus on one body part at a time*

 <p><b>Outside</b></p> <ol style="list-style-type: none"> <li>1. Hands &amp; Fingers</li> <li>2. Feet &amp; Toes</li> <li>3. Mouth</li> <li>4. Eyes</li> <li>5. Ears</li> <li>6. Nose</li> <li>7. Voice</li> <li>8. Cheeks</li> <li>9. Skin</li> </ol>	 <p><b>Inside</b></p> <ol style="list-style-type: none"> <li>10. Muscles</li> <li>11. Lung</li> <li>12. Heart</li> <li>13. Brain &amp; Head</li> <li>14. Stomach</li> <li>15. Bladder</li> </ol>
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## Type 2: IA Builders

Create a Visual and Language Support

**Descriptor Menus:**  
Consider what sensations do you want to target within each body part and create a menu:

**Skin:**  
Wet vs. Dry  
Messy vs. Clean  
Tight vs. Loose

**Muscles:**  
Fast vs. Slow  
Tight vs. Loose

Hot	Warm	Tight
Loose	Squeezing	Fast
Slow	Sweaty	Dry
Messy	Clean	Sore

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## Type 2: IA Builders

Evoke Stronger Sensations & Learning While Doing

**Focus Area Experiments:**

- Evoke a stronger sensation in body part of focus to help trigger attention to the body signal
- Gives concrete meaning to the interoception words from the menu

**Provided Experiments**

**Wet Hands:**  
Splashing in container of water  
Holding a wet cloth  
Holding a melting ice cube  
Holding a water bottle

**Naturally Occurring Experiments**

**Wet Hands:**  
Handwashing  
Water Play  
Washing Dishes  
Bath/Shower Time  
Moving Laundry

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## Type 2: IA Builders

More Focus Area Experiments

**INTEROCEPTION - DAILY ACTIVITY LIST**

**HANDS**

Going outside in hot/cold weather	Feeling finger numb	Playing with clay/playdough	Clapping	Playing in snow/can	Washing hands	Feeling an empty hand	Feeling an empty hand
Carrying a carton/bottle or handstand	Washing name on paper	Typing	Washing dishes	Feeling a worm/cold shoe	Catching a ball	Carrying a heavy load	Putting on handstand

**FEET**

In the bath/shower	Walking/rolling feet on carpet	Walking/rolling feet in grass	Walking on a balance beam	Standing on one foot	Feeling a ball	Jumping on a trampoline	Feeling an empty hand
Going outside in hot/cold weather	Relaxing on the couch or chair	Putting on socks/shoes	Taking off socks/shoes	During a foot tickle	While playing/active play	Carrying a heavy load	Putting socks on feet

**MOUTH**

Brushing teeth	Taking a sip of ice water	Taking a sip of warm tea	Eating a fruit	Feeling with mouthwash	Chewing gum	Blowing bubbles	Blowing up a balloon
Eating a crunchy snack	Eating soup	Eating a chewy snack	Feeling on Cheesecake	Eating a popsicle	Feeling a song	Feeling with fingers	Sucking on ice cube

Free: [www.kelly-mahler.com](http://www.kelly-mahler.com)

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**Type 2: IA Builders**  
*More Focus Area Experiments*


Interoception Exercise Cards



**WALL PUSH-UPS**

How do your hands feel during this exercise? Gently press each of your fingers into the wall one at a time. How do your hands feel while pressing your fingers into the wall?

Interoception Yoga Cards



**COW**

How do your hands feel while holding this pose? Gently press each of your fingers into the mat one at a time. How do your hands feel while you press your fingers into the mat?

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**Type 2: IA Builders**  
*IA on the Fly (Body Talk)*

**PRE-BEGINNER Level PROMPTS**  
 Statements that label the inner experience of the caregiver.  
 "My hand feels warm when you hold it."

**BEGINNER**  
 Statements that provide observations and prompt attention.  
 "I see your hands are wiggly. Look at your hands. Do you see them wiggling?"

**INTERMEDIATE**  
 Questions that call attention to a specific body part and provide choices for response.  
 "Are your hands tight or loose?"

**ADVANCED**  
 Questions that call attention to a specific body part and require students to provide a response without choice options.  
 "How do your hands feel right now?"

**PROFICIENT**  
 Questions that call attention to the entire body  
 "How does your body feel right now?"

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**IA Builder: IA on the Fly**

**PRE-BEGINNER Level PROMPTS**  
 Statements where the caregiver labels their inner body experience.

- "My hand feels warm when you hold it."
- "My eyes feel so heavy right now."
- "My skin feels wet when you splash me."
- "My stomach is growling. I'm so hungry"
- "My bladder feels full right now."

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 IA Builder: IA on The Fly

**Beginner Level Prompts:** Providing observations and prompting attention.

- I feel your muscles get really tight in your arms when I'm tickling you. Put your hand here, do you feel how tight that is?
- When I put my hand on your chest I can feel your heart pumping really fast. Put your hand here. Can you feel it beating against your hand?
- I see you have water on your arm. Your skin might feel wet. Can you see the water drops on your skin? Can you feel them?

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 IA Builder: IA on The Fly

**Intermediate Level Prompts:** Questions that call attention to a certain body part and provide choices for response

- Is your heart beating slow or fast right now?
- Does your breathing feel fast or slow?
- Does your skin feel cool or hot?
- How does your voice sound right now? Loud or soft?
- Do your eyes feel heavy or wide-open?
- Does your nose feel runny or dry?

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 IA Builder: IA on The Fly

**Advanced Level Prompts:** Questions that call attention to specific body parts and require response without choice options.

- How do your eyes feel right now?
- What does your voice sound like right now?
- How does your stomach feel right now?

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### IA Builder: IA on The Fly

**Proficient Level Prompts:** Questions that call attention to the entire body

- How does your body feel right now?
- What are 3 sensations (feelings in your body) you notice right now?

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### The Interoception Curriculum: Direct Evidence



**n=1;** 5-year-old female with SPD; home-based

**Pre-Intervention=**18 accidents per week

**Intervention=**3 weeks; 6 sessions of the Interoception Curriculum (Mouth, Throat, Nose, Stomach, Bladder, Muscles, Potty Parts)

**Post-Intervention=**0 accidents per week

**What we learned=** Interoception was a crucial part of toileting success for this participant



**Year 1:**

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### The Interoception Curriculum: Direct Evidence



**n=8;** toileting needs; outpatient setting

**Intervention=**Training outpatient OTs to deliver The Interoception Curriculum

**Post-Intervention=** Mixed results; some improvements but several study drop-outs, no significant toileting outcomes and therapists frustrated

**What we learned=**Something was missing; the participants with significant poop difficulty require more than just interoception



**Year 2:**

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**Toileting & Nutrition**

Why were the constipated kids having so much trouble?

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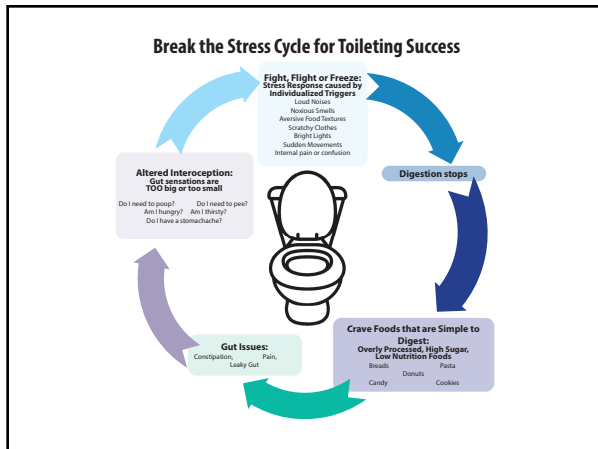
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**Nutrition: Examine your Intentions**

Ableist View of Nutrition	Toileting View of Nutrition
<ul style="list-style-type: none"> <li>• <b>Goal:</b> Eat a 'more typical' diet</li> <li>• Focus on external means of reinforcement to coerce a person into eating non-preferred foods for the sake of normalizing eating behaviors</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Goal:</b> To decrease pain or discomfort caused by current diet</li> <li>• Use of non-coercive, kind means to encourage a person to intake certain nutrition that will promote more comfort with toileting</li> </ul>

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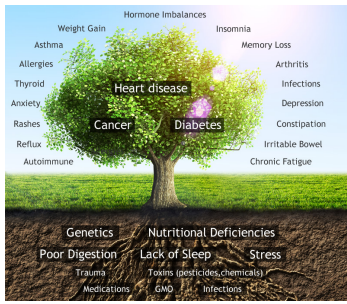
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### Traditional Medicine vs. Functional Medicine



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### The dirt when it comes to toileting

- Genetics – only 10% - we control the other 90%
- Poor digestion
- Limited fluid intake
- Nutrition deficiencies – Vitamins and minerals
- Lack of sleep
- GMO – corn, soy

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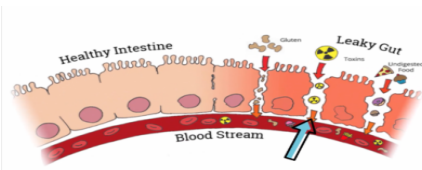
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### Poor Digestion

- Fight or Flight...
- Gut dysbiosis
- Decreased absorption



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**Limited Fluid Intake**

- Half our body weight in ounces, minimum – If high activity level more!
- Thirst signals
- Water vs. Drinks
  - Sugars
  - Artificial Flavors
  - Artificial Colors
  - Artificial Sweeteners

**A SIMPLE RULE ABOUT DRINKING WATER:**  
 Take your body weight and divide it in half.  
 That's how many ounces of water you should drink every day!



**To stay healthy, you must stay hydrated. Start today!**



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**GMOs and other toxins**

- What is a Genetically Modified Organism and why is it problematic?
- GMO = glyphosate (weed killer) injected into the seed.
- Glyphosate is a class 1 carcinogen and toxic
- It is in the seed, therefore it is in the food that we eat --- and the food that animals eat
- NON GMO food choice is critical

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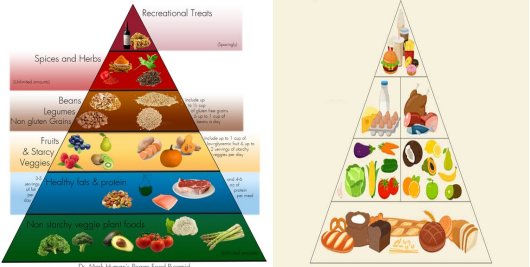
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**Rethinking the food pyramid**



Dr. Mark Hyman's Paleo Food Pyramid

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### Food and constipation

7 Foods That Can Cause Constipation  
Follow @health\_yliving

TOP FOODS + HERBS FOR CONSTIPATION

The infographic lists 7 foods that can cause constipation: Alcohol, Gluten, Processed Grains, Milk, Pried Foods, Unripe Banana, and Unripe Persimmons. It also lists top foods and herbs for constipation: Ginger, Coconut Oil, Flaxseeds, Wheat Grass, Tribhala, Licorice, L-Theanine, Aloe Vera, Water, Figs, Sauerkraut, and Apple Cider Vinegar.

Source: cookinglight.com

COOK + CURE  
your recipe for health

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### Food Sensitivities and Pain

- Shutting off interoception
- Inner feelings of safety
- Food and pain

Most Common Food Allergies and Food Intolerances in the United States

ALLERGIES				INTOLERANCES	
milk	egg	peanuts	tree nuts	dairy	grains/gluten
fish	shellfish	soy	wheat	beans	cabbage

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### Sensory Sensitivities and Pain

- Outer feelings of safety allows for resources to be able to attend within

MISERICORDIA UNIVERSITY

Table: ISQ-AASP Comparison  
\* = reached significance

AASP Quadrant	Independent-Samples Kruskal-Wallis Test Significance
Low Registration (passive)	0.001*
Sensory Seeking (active)	0.382
Avoiding (active)	0.167
Sensory Sensitivity (passive)	0.031*

(Mahler & McGlaughlin, forthcoming)

n=104 Adults

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Putting it all Together:  
Interception & Nutrition  
Supports for  
Toileting  
Success

A black silhouette of a toilet with the lid up, centered within a white circle. The circle is set against an orange background.

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Challenge 1: Urinary Issues

Interception Intervention

A stylized diagram of the urinary system, showing the bladder, ureters, and kidneys in grey, with a black vertical bar representing the ureter.

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Challenge 2: Stool Withholding, Constipation and Other Poop Issues

A stylized diagram of the urinary system, showing the bladder, ureters, and kidneys in grey, with a black vertical bar representing the ureter.

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Challenge 3:  
Combination  
of Pee and  
Poop Issues




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 The Interoception Curriculum: **Direct Evidence**

**Year 3:** n= 5

**In progress:**  
Group 1: Pelvic floor, interoception and nutrition  
Group 2: interoception and nutrition  
Group 3: Interoception

Hypothesis: Need to work on all three for many kids.

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 **Build a Team**

- Interoception and Sensory Processing
- Nutrition
- Bowel/Bladder Therapist (Pelvic Health)
  - For Professionals
    - Pediatric Pelvic Physiotherapy FB
  - For Caregivers
    - <https://kidsbowelbladder.com> (Dawn Sandalcidi, PT)
    - The Academy of Pelvic Health
    - <https://aptlapelvichealth.org/pllocator/> (search for a pediatric specialist)



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 **THANK YOU!!**  
*FOR MORE INFORMATION*

**Our websites:**  
[www.kerrihample.com](http://www.kerrihample.com)  
[www.kelly-mahler.com](http://www.kelly-mahler.com)

**Our FBs:**

- Interoception: The Eighth Sensory System (Kelly)
- Leaky Gut & Interoception (Kerri)



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