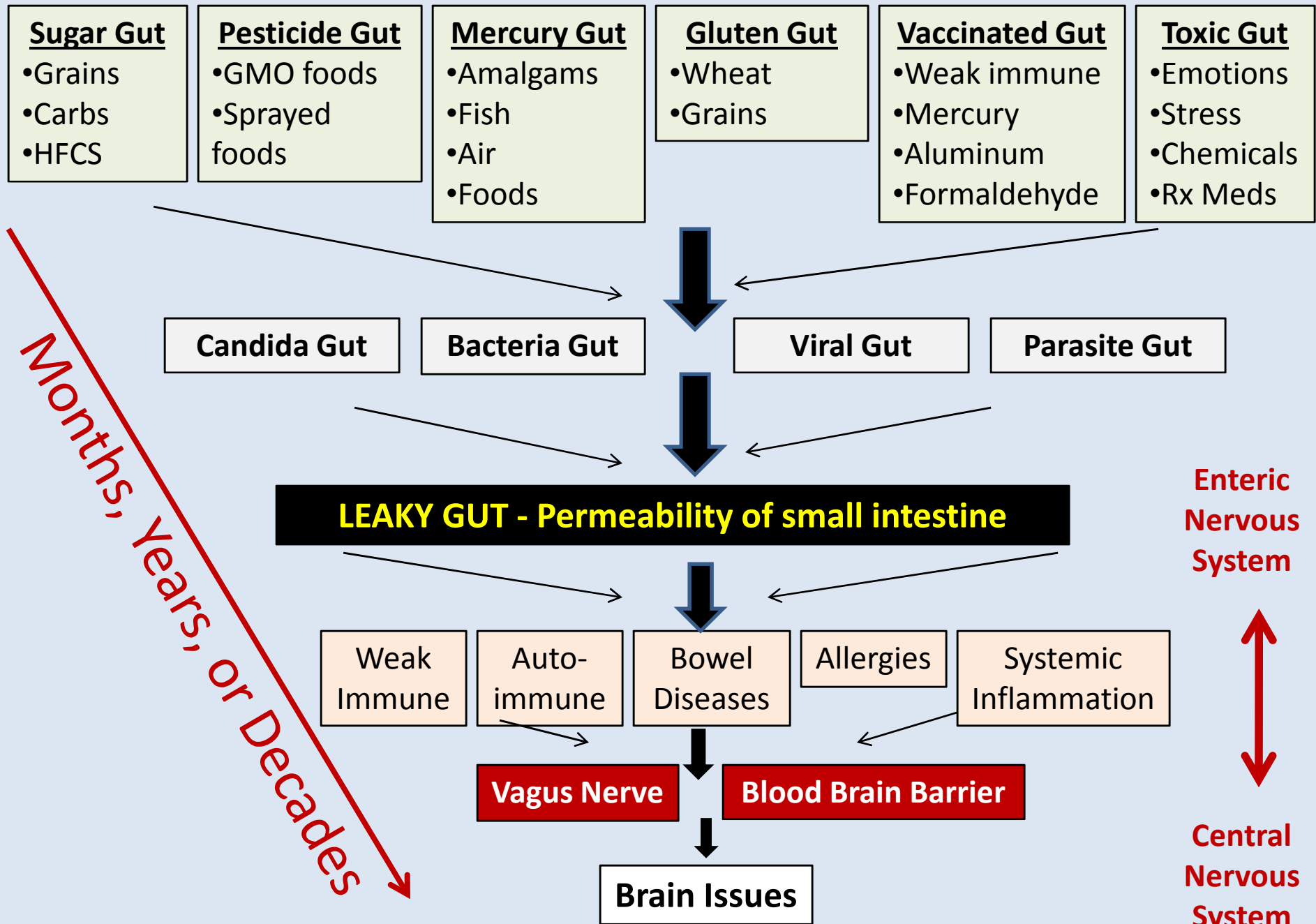


Gut-Brain Axis or The Two Connected Brains

March 2019

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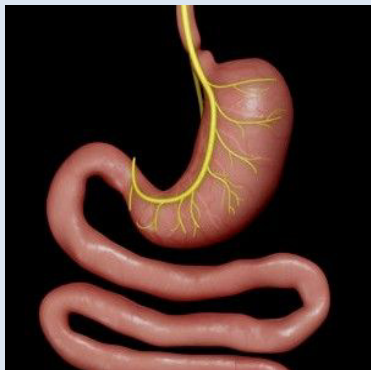
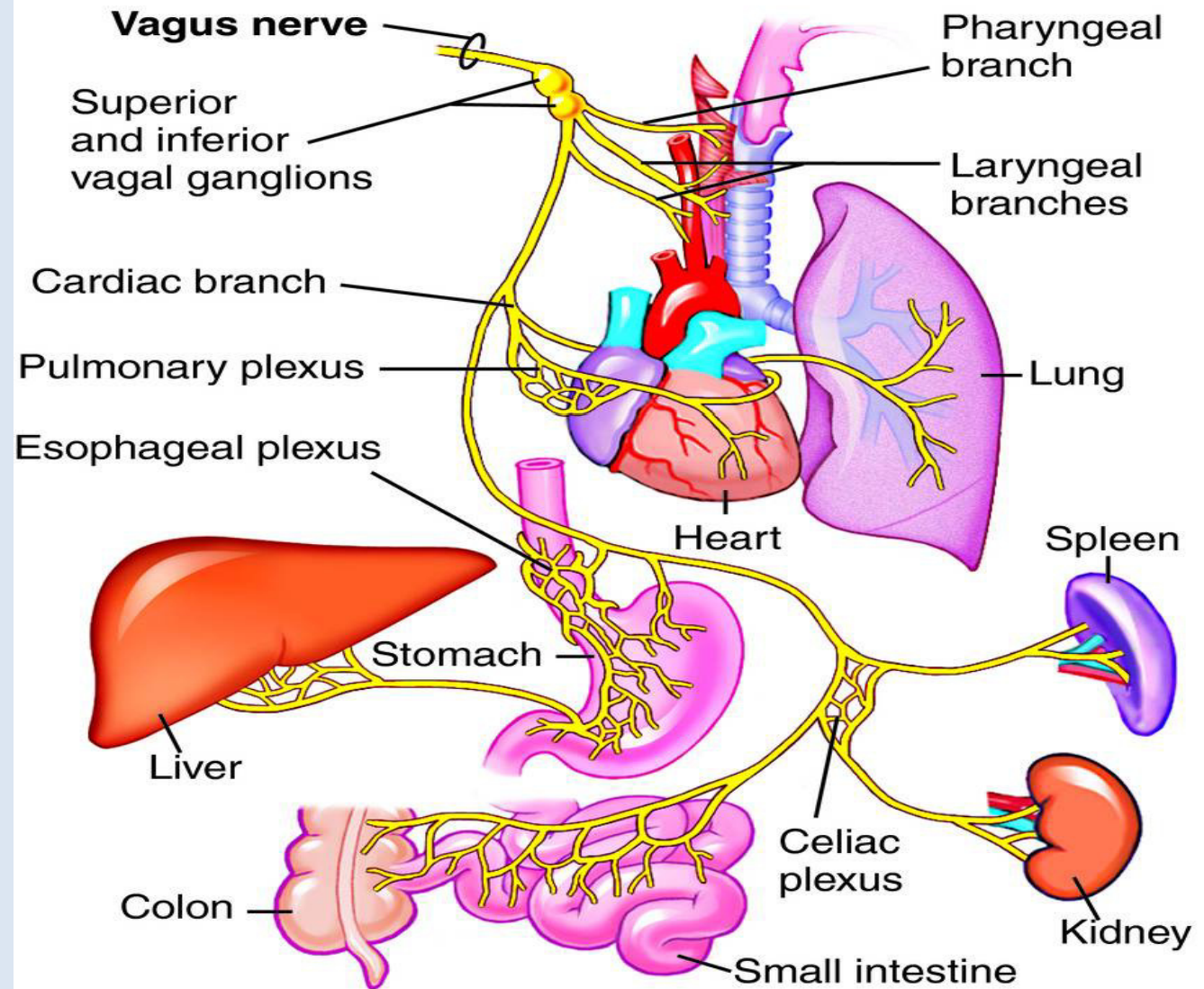


- Called Food
- More nutritious
- Be careful of hormones
- Be careful of pesticides
- Be careful of mercury

- Make-believe food
- Nutrient deficient
- Acidic
- Inflammatory
- Blood sugar spikes
- Chemicals
- Mercury found in HFCS

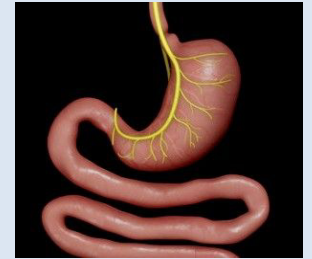


Gut-Brain Connection – Vagus Nerve

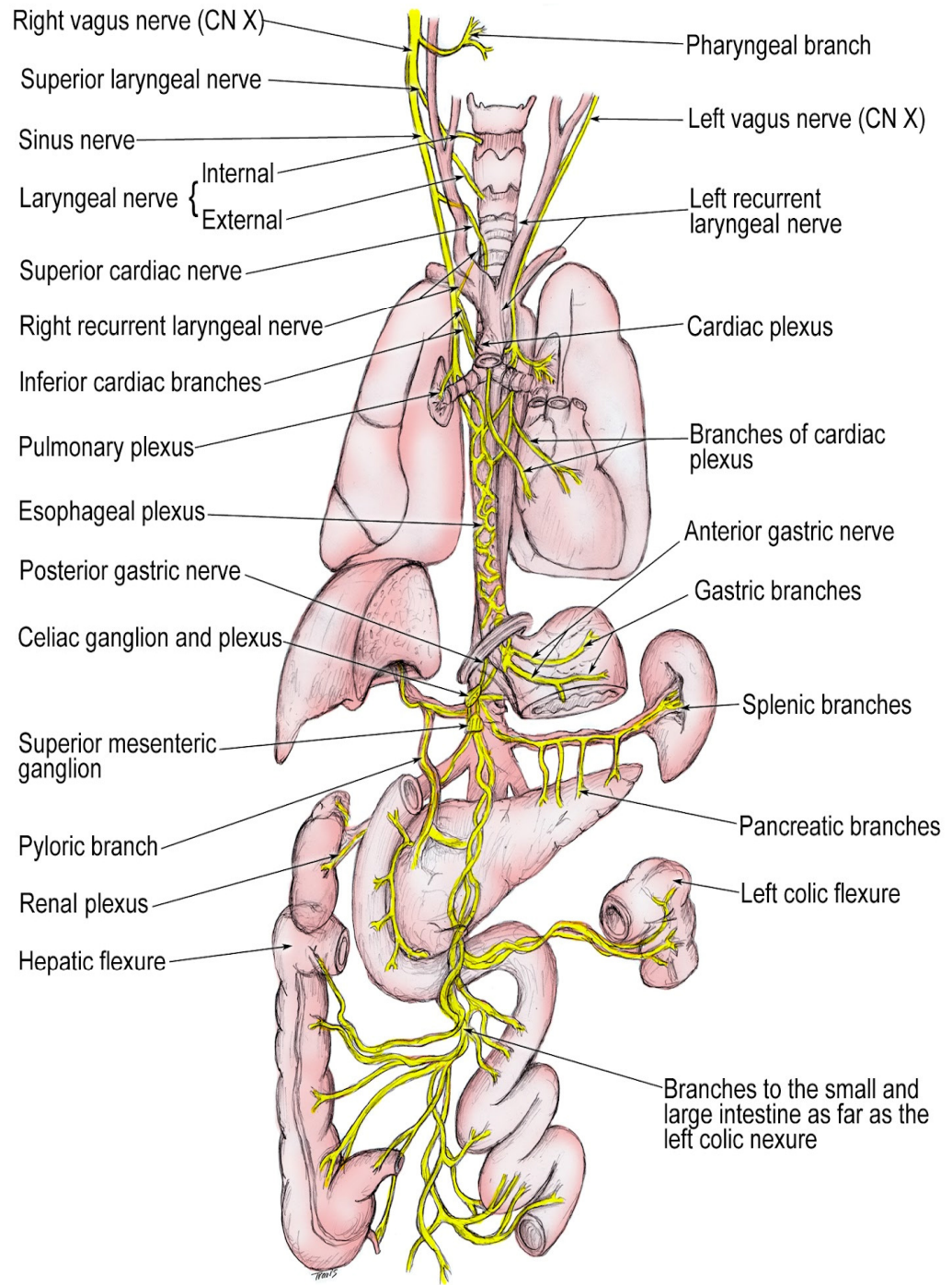
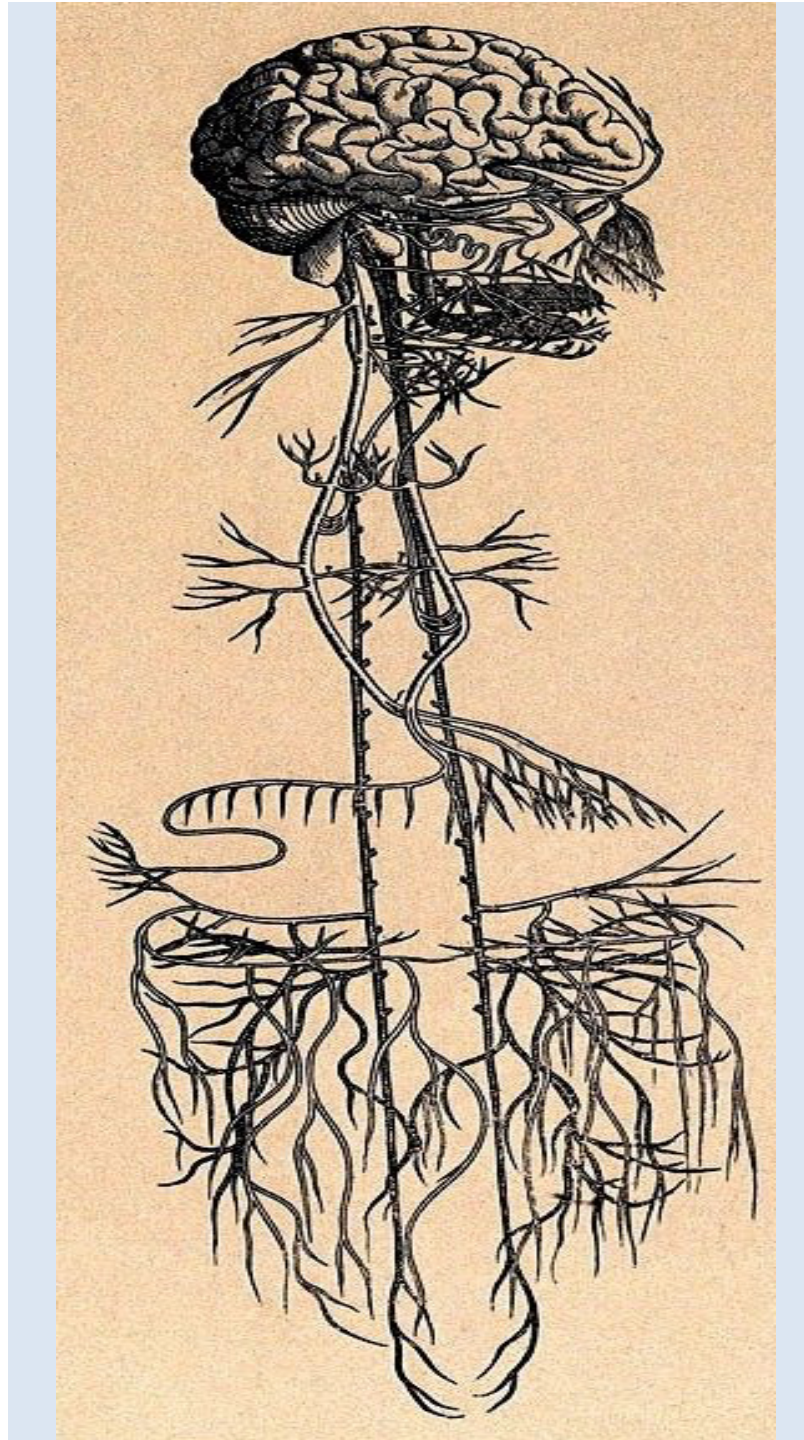




Vagus Nerve

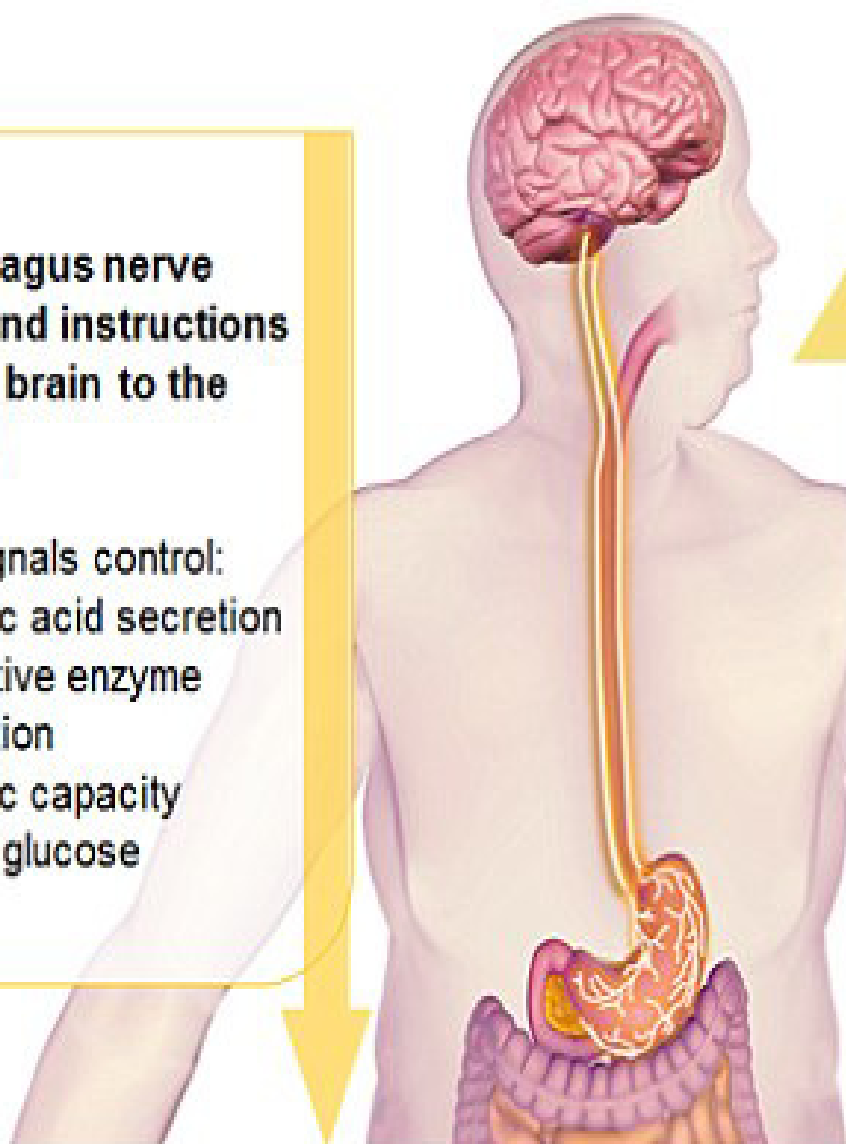


- The vagus nerve is a very important cranial (parasympathetic) nerve through which is the primary control of heart rate.
- When it is stimulated, it causes an inhibitory effect with slowing of the heart rate and lowering of blood pressure.
- The vagus nerve comes from the medulla and goes to the heart, esophagus, lungs, stomach, small intestines, liver, gall bladder, pancreas and colon. It also has links to the kidney, bladder, and external genitalia.
- The irritation on the vagus nerve can cause reflex irritations throughout the body.



The Vagus Nerve

- The central nervous system (CNS) is composed of your brain and spinal cord.
- The enteric nervous system (ENS) is two thin layers of nerve cells embedded in the lining of the gastrointestinal system, beginning from the esophagus to rectum.
- Both are created from identical tissue during fetal development.
- These two systems are connected via the vagus nerve, that runs from your brain stem down to your abdomen.
- The vagus nerve is the primary route that your gut bacteria use to transmit information to your brain.



20% of vagus nerve fibers send instructions from the brain to the stomach

These signals control:

- Gastric acid secretion
- Digestive enzyme secretion
- Gastric capacity
- Blood glucose

80% of vagus nerve fibers send instructions from the stomach to the brain

These signals control:

- Satiety (Hunger)
- Satiety (Fullness)
- Energy Metabolism

The Vagus Nerve and E.O.s

- The vagus nerve travels down both sides of the neck and is most accessible behind the ear lobe on the mastoid bone.
- Essential oils can activate the vagus nerve to trigger the parasympathetic nervous system to promote the rest and digest state of the autonomic nervous system.

The Vagus Nerve and BBB

- One of the main reasons essential oils are so effective in their ability to access the brain is the fact that the volatile compounds of essential oils are extraordinarily small allowing them to cross the blood brain barrier.
- This is one of the reasons that essential fatty acids like omega-3 supplements work so well to support brain health.
- In fact, researchers in Sweden have found that omega-3 supplements can cross the blood brain barrier and assimilate into the brain which helps them calm inflammation.

The Endocrine Glands and BBB

- The posterior pituitary and pineal gland are not covered by the BBB because they secrete hormones into circulation.
- The median eminence of the hypothalamus is not covered by the BBB; because the pituitary secretions collect in this area before release into circulation.

The Two Connected Brains

- The gut sends about 90% more information to the brain than your brain sends to your gut.
- Irritation in the GI system (ENS) sends signals to the central nervous system (CNS) that triggers mood changes.
- The secret to improving your mood and brain health is mostly in your gut.
- Unhealthy gut flora can affect issues like anxiety, depression, autism, etc.

Bowel Flora

- A study found that women who regularly ate yogurt containing beneficial bacteria had altered brain function compared to those who did not consume probiotics.

UCLA May 28, 2013

- The women who consumed probiotic yogurt had **decreased** activity in brain regions that control processing of **emotions** and sensation.

Parkinson's May Spread From Gut to Brain via Vagus Nerve

[Medscape Medical News](#) > [Neurology](#)

Megan Brooks - August 06, 2015.

Researchers found that patients who have had the entire vagus nerve severed were less apt to develop PD.

"Their risk was halved after 20 years," Elisabeth Svensson, PhD, from the Department of Clinical Epidemiology, Aarhus University in Denmark, said in a statement.

"However, patients who had only had a small part of the vagus nerve severed were not protected. This also fits the hypothesis that the disease process is strongly dependent on a fully or partially intact vagus nerve to be able to reach and affect the brain," Dr Svensson noted.

Alzheimer's patients

Vagus nerve stimulation in patients with Alzheimer's disease – 12 of 17 improved or did not decline from baseline after 1 year.

[J Clin Psychiatry](#). 2006 Aug;67(8):1171-8.

<http://www.ncbi.nlm.nih.gov/pubmed/16965193>

Bowel Flora

Gene expression

- Researchers have discovered that the absence or presence of gut microorganisms during infancy permanently alters gene expression.
- Through gene profiling, they were able to discern that absence of gut bacteria altered genes and signaling pathways involved in learning, memory, and motor control.

Bowel Flora

Diabetes

- Bacterial populations in the gut of diabetics differ from non-diabetics, according to a study from Denmark.
- The researchers concluded: *"The results of this study indicate that type 2 diabetes in humans is associated with compositional changes in intestinal microbiota."*

Bowel Flora

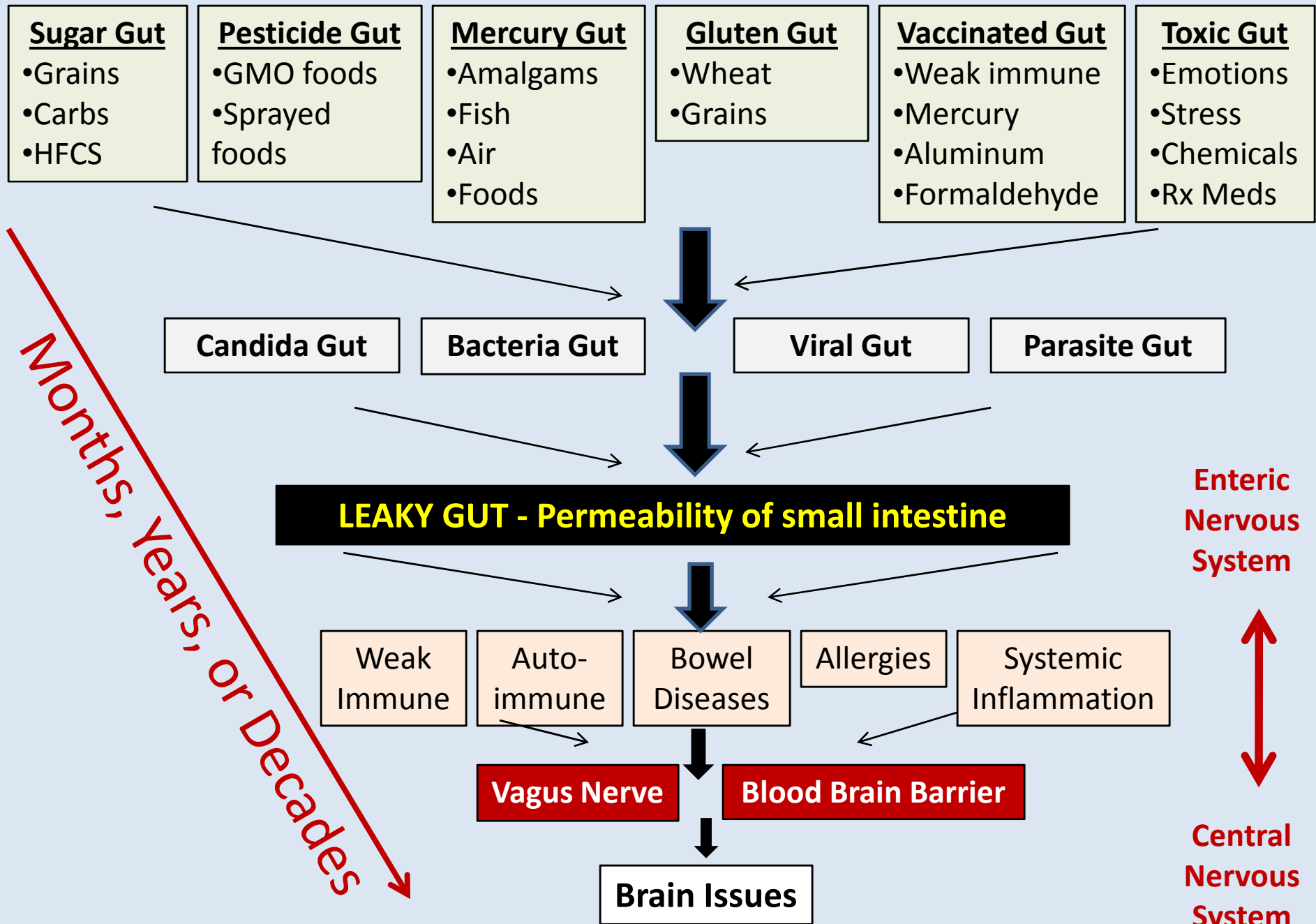
Autism

- Establishment of normal gut flora in the first 20 days or so of life plays a crucial role in appropriate maturation of your baby's immune system.
- Babies who develop abnormal gut flora are left with compromised immune systems and are particularly at risk for developing such disorders as ADHD, learning disabilities and autism, particularly if they are vaccinated *before* restoring balance to their gut flora.

Brain-Gut Barrier

What compromises blood brain barrier?

The same things that compromise intestinal permeability, which is called leaky gut.



Gut Types

Undigested Food

Lack of proper digestion creates more undigested food particles for an already compromised gut barrier.

1. Not chewing food well
2. Low stomach acid
3. Lack of digestive enzymes (more raw foods)
4. Eating conflicting foods at same meal (meats with fruit)
5. Eating too much
6. Eating late evening meals

The Sugar Gut

Sugar / Grains / Carbs / H.F.C.S.

- **Too much sugar** damages the digestive system, weakens the immune system, and promotes autoimmune responses.
- **Sugar feeds candida** and promotes the excessive growth of “**bad**” bacteria in the gut.
- **Splenda** has been shown that it can decrease good bacteria levels in the gut.
- **Other studies** suggest all artificial sweeteners do negatively effect the gut microbiome.

The Pesticide Gut

GM crops / Unwashed produce

- **The Bt-toxin** produced by genetically modified corn kills insects by punching holes in their digestive tracts, and a 2012 study confirmed that it punctures holes in human cells as well.
- **Glyphosate in GM crops** disturbs intestinal microflora and promotes the growth of harmful bacterial.
- **Bt-toxin** is present in every kernel of Bt corn. It survives human digestion, and has been detected in the blood of 93% of pregnant women tested and 80% of their unborn fetuses.

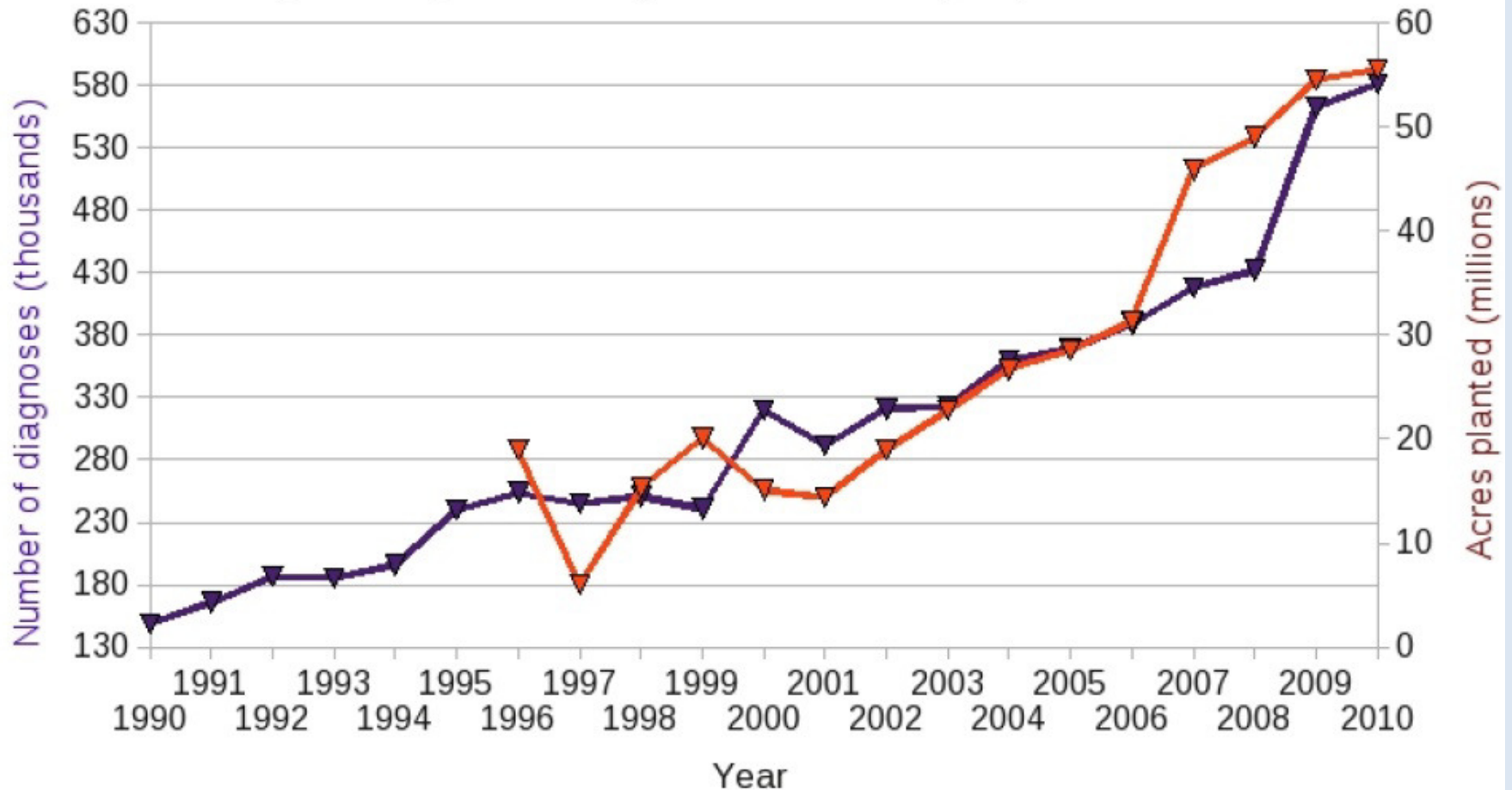
<http://responsibletechnology.org/glutenintroduction/>

Hospital discharge diagnoses (any) of
Inflammatory Bowel disease
(Crohn's and Ulcerative Colitis)

W/ 2 yr delay
 $R = 0.9545$,
 $p \leq 2.755e-05$

- ▲ Inflammatory Bowel Disease (thousands)
- ▼ Acres planted in Bt corn for ECB (million)

plotted against acres planted of Bt corn (ECB)

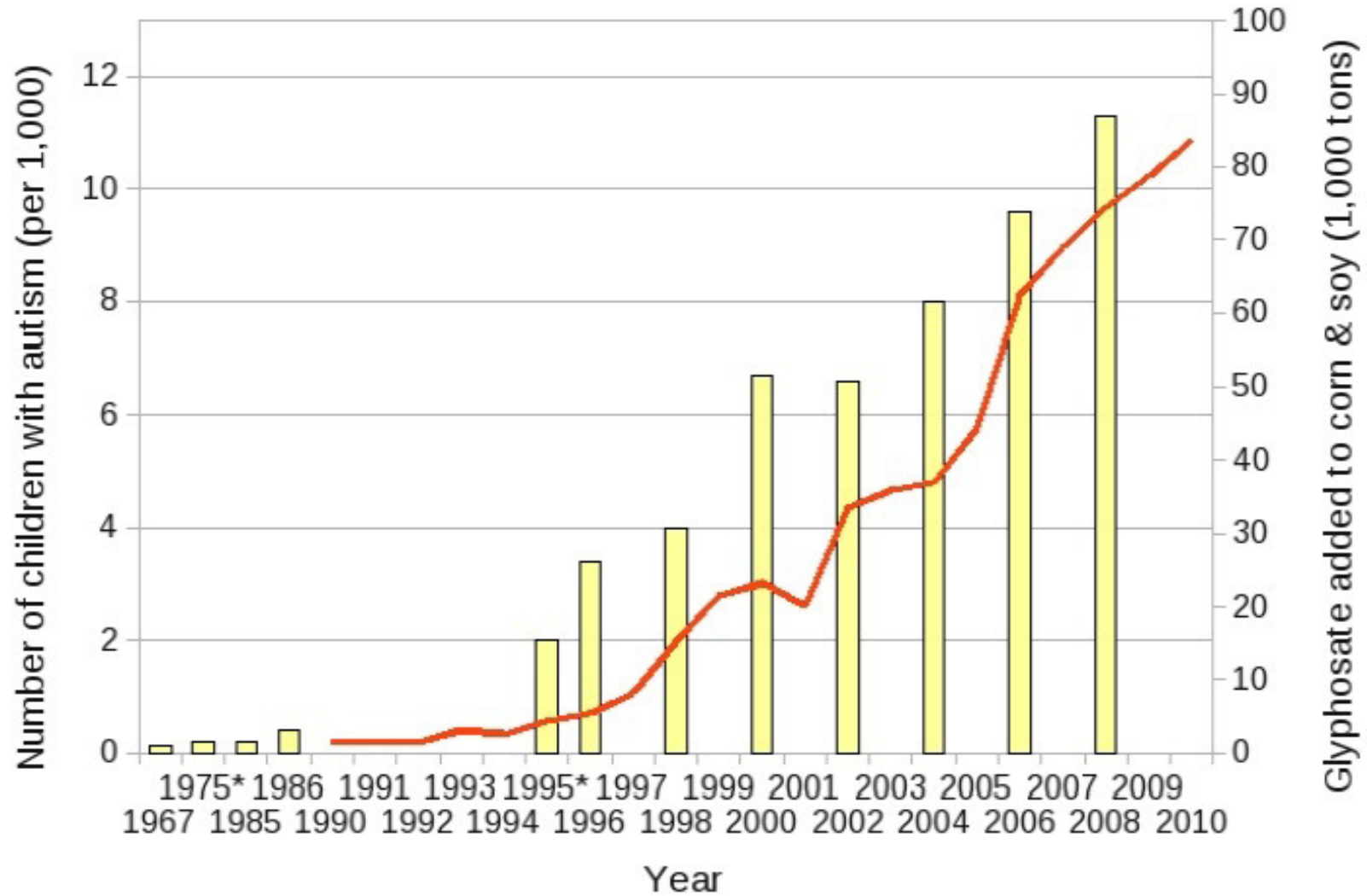


Inflammatory Bowel Disease and Bt corn

Autism prevalence (per 1,000)

plotted against glyphosate applied to corn & soy

■ Prevalence (per 1,000)
— Glyphosate applied to Corn & Soy



Autism and Glyphohsate Applied to Corn and Soy

The Mercury Gut

Amalgams / Fish / Air / Foods

The results of the study demonstrated that mercury (methylmercury and thimerosal) caused intestinal epithelial cell damage and macromolecule leak (leaky gut)

- Aarti Vala -June 2012 - College of Medicine -The Ohio State University
- https://kb.osu.edu/dspace/bitstream/handle/1811/52055/1/Aarti_Vala_Honors_Thesis_May2012_final.pdf

Gluten Gut

Wheat / Grains

- **Gluten** has a protein that increases the enzyme zonulin in our system.
- **Zonulin** opens up the spaces between the cells of the intestinal lining thus increasing permeability. Excess zonulin = too wide spaces.
- **The two most powerful triggers** to open the zonulin door are gluten and gut bacteria in the small intestine.

The Vaccinated Gut

**Weakened immune / Mercury / Aluminum / Formaldehyde /
Disruption of gut GABA and serotonin levels / Polysorbate 80**

First the Gut, Then the Brain

“When we think about vaccine injuries such as autism and epilepsy, we generally consider a direct assault on the brain. But the reality may be far different where injury begins in the gut, leading to brain damage.”

<http://www.greenmedinfo.com/blog/vaccine-injury-first-gut-then-brain?page=2>

Posted on: Wednesday, February 25th 2015 at 12:45 pm

Written By: [Keith Bell](#)

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The Stressed and Medicated Gut

Emotional Trauma / Stress / Chemicals / Rx Meds

- **Emotional trauma and chronic stress** compromises intestinal tissue
- **Environmental chemicals** assault gut flora and gut tissue
- **Antibiotics** destroy good gut bacteria and cause dysbiosis
- **Medications** (Corticosteroids, ibuprophen, and aspirin compromise gut tissue)
- **Chemotherapy** drugs cause dysbiosis and assault gut tissue

Candida Gut / Systemic

Symptoms

- Exhaustion
- Cravings for sweets
- Bad breath
- White coat on tongue
- Brain fog
- Hormone imbalance
- Joint pain
- Loss of sex drive
- Chronic sinus & allergies
- Any or all digestive problems
- Weak immune system
- UTI

Causes

- High sugar diet
- Diet high in refined carbohydrates
- Excessive alcohol
- Antibiotics
- Birth control pills
- Oral Corticosteroids
- Chemotherapy and radiation Treatments

Results of Candida

Overgrowth

- Chronic Fatigue
- Mood Disorders
- Recurring Vaginal and Urinary Tract Infections
- Oral Thrush
- Sinus Infections
- Intestinal Distress
- Brain Fog
- Skin and Nail Fungal Infections
- Hormonal Imbalance
- When systemic – can produce almost any type of health problem

The Poop Test

1. **Once a day** - You should be having a bowel movement daily.
2. **No stinkers** - You should not have smelly poop, because that means putrefaction (rotting) of food in the gut.
3. **Must have floaters** - Your poop needs to float, which means you have sufficient fats in the diet to make it all the way to elimination.
4. **No mess** - You need to look at the toilet paper and it shouldn't be messy. Healthy animals don't mess on themselves and we shouldn't either.

If you can't consistently pass the poop test the chances are good that you have a gut digestion issue.

SIBO

SIBO is an overgrowth of bacteria in the small intestine that is normally found in the colon.

Most of our bacteria is meant to proliferate in the colon, not the small intestine.

- 50% of people with SIBO have **leaky gut**.
- 25% of people with SIBO have **candida issues**.
- 50% of people with **IBS** also have SIBO.

- **SIBO** can also be an overgrowth of normal bacteria.
- **Candida, SIBO** (small intestinal bacteria overgrowth) **or H. pylori** may occur alone, but frequently exist in conjunction with one another.
- One leads to the other at some point.
- **Candida, SIBO or H. pylori** can cause inflammation and degradation of the gut lining and compromise the immune system.

- **SIBO** produces hydrogen, which is used as a source of energy by **H. pylori**.
- **The hydrogen** feeds another type of bacteria that produce methane.
- **Methane dominate SIBO** promotes constipation.
- **Hydrogen dominate SIBO** promotes diarrhea.
- **SIBO** also causes elevated levels of ammonia that increase the gut pH, which promotes overgrowth of **Candida**.

- If **H pylori** colonizes the stomach, it will reduce stomach hydrochloric acid levels, which fosters the overgrowth of other **bacteria and Candida**.
- **Candida** can impair the ileocecal valve, which encourages **SIBO**.
- **The ileocecal valve** connects the large intestine to the small intestine, but creates a barrier that allows each environment to have different temperatures, pH levels, and different microflora.
- **The ileocecal valve** prevents the backflow of harmful toxins and microbial overgrowth into the small intestine.
- It also prevents food from entering the large intestine before it is effectively digested.

- When the ileocecal valve is **stuck open or doesn't close tightly**, it allows bacteria to migrate and proliferate in the small intestine.
- A malfunctioning ileocecal valve is highly related to SIBO.
- A malfunctioning ileocecal valve is a “prominent player in intestinal disorders” and should be considered in patients struggling with gastrointestinal complaints ([1](#)).

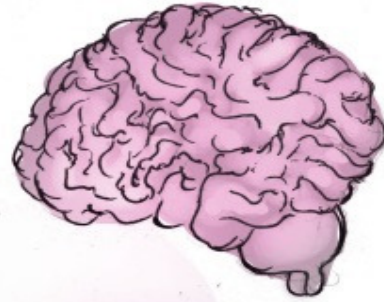
What Else Can Cause Ileocecal Malfunction?

1. Toxins
2. Dehydration
3. Any type of stress (esp. emotional)
4. Eating too frequently
5. Eating too quickly
6. Food sensitivities
7. Under-chewing your food
8. Caffeine
9. Carbonated drinks
10. Alcohol
11. Chocolate
12. Hot spicy food ([4](#))
13. Appendix removal ([5](#))
14. Pregnancy

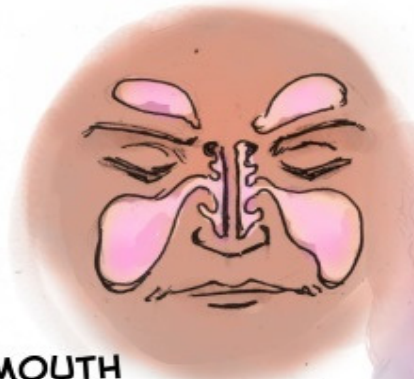
Leaky Gut

1. **Leaky Gut** develops when the mucous lining of the small intestine becomes too porous, allowing entry of toxins, microorganisms, and food particles into the bloodstream.
2. Once inside, these foreign particles invoke an immune response promoting inflammation.
3. It raises your cortisol levels, challenges the liver, the lymphatic system, and the endocrine system.
4. Leaky gut is not found with normal tests including endoscopy or colonoscopy.
5. Leaky gut syndrome is the cause of most all **autoimmune issues** and is probably the main contributor or origination of **neurological conditions**.

BRAIN
DEPRESSION
ANXIETY
ADHD



THYROID
HASHIMOTOS
HYPOTHYROIDISM
GRAVES



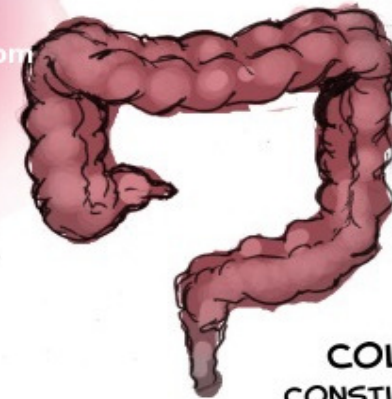
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www.holistic-healing-information.com



JOINTS
RHEUMATOID ARTHRITIS
FIBROMYALGIA
HEADACHES



COLON
CONSTIPATION
DIARRHEA
IBD



ADRENALS
FATIGUE

Leaky Gut

- **35% of the people** with leaky gut have NO digestive symptoms.
- The most important organ in the production of immune agents seems to be the **adrenal gland**, and Leaky Gut Syndrome slowly diminishes adrenal function.
- The **primary assault** upon the immune system is in the gastrointestinal barrier to your blood.
- **Eighty %** of immune response is in the gut.

How do you know if you have a leaky gut?

Any one of these could mean that you have leaky gut issues, but having at least 2 of these probably means you DO have leaky gut issues.

1. Food sensitivities or food allergies
2. Over use or extended use of antacids, or anti-inflammatory drugs (NSAIDS, Aleve, Advil, or Motrin), and/or antibiotics
3. Over or under weight, as well with high or low cholesterol, and blood sugar issues
4. Any type of digestive issue such as gas or bloating or cramping (esp. after a meal) or alternating bowel habits
5. Inflammatory bowel disease (Irritable Bowel Syndrome, Crohn's disease, or Colitis)
6. Any autoimmune issue or disease
7. High levels of systemic inflammation
8. Thyroid or adrenal issues
9. Chronic fatigue or fibromyalgia
10. Joint pain or Rheumatoid Arthritis
11. Any type of mal-absorption issues
12. Small intestinal bacterial overgrowth (SIBO)
13. Any neurological issue (Alzheimer's, Parkinson's, Autism, Restless Leg Syndrome)
14. Skin issues (acne, rosacea, psoriasis, eczema, etc)
15. Mood issues (anxiety, depression, ADD, ADHD, bipolar)
16. Over-stressed gut (pesticides, heavy metals, chronic emotional stress, and consume excessive gluten)

How do you know if you have a leaky gut?

Symptoms	Possible Conditions	Possible Conditions (cont.)
<ul style="list-style-type: none"> • Abdominal pain or cramps • Acne • Anxiety/nervousness • Brain fog • Chronic fatigue • Chronic sinusitis • Constipation • Depression • Diarrhea soon after eating • Food allergies • Food and chemical sensitivities • Gas and bloating • Headaches • Indigestion • Iron deficiency • Joint pain and stiffness • Malnutrition • Muscle aches and pains • Over or under weight • Poor immunity • Poor memory • Systemic inflammation 	<ul style="list-style-type: none"> • ADD/ADHD • Alopecia Areata • Alzheimer's • Anemia (Iron or B12) • Asthma • Autoimmune Disease • Autism • Celiac Disease • Chronic Fatigue Syndrome • Crohn's Disease • Cystic Fibrosis • Diabetes Type 1 or Type 2 • Eczema • Fibromyalgia • Heart Disease 	<ul style="list-style-type: none"> • Irritable Bowel Syndrome • Liver dysfunction • Lupus • Multiple Sclerosis • Multiple Sclerosis Rheumatic • Neurological issues • Polymyalgia • Psoriasis • Raynaud's Syndrome • Restless Leg Syndrome • Rheumatoid Arthritis • Thyroiditis • Ulcerative Colitis • Urticaria (Hives) • Vasculitis • Vitiligo

Broad Overview of Gut Recovery

- 1. Deal with any associated trauma/stress**
- 2. Digestive aids**
(Betaine HCl with pepsin, digestive enzymes with Ox bile)
- 3. Determine and eliminate food allergens / sensitivities**
- 4. Diet changes as needed**
(Anti-candida, Paleo, SCD, GAPS, or Low FODMAP Diet)
- 5. If needed remove mercury and chemicals from gut**
(chlorella, zeolites, EDTA)
- 6. Support other systems as needed**
(liver, adrenals, nerves, kidneys, etc)
- 7. Deal with the pathogens**
(candida, virus, bacteria, parasites)
- 8. Add fermented foods in moderation (may worsen SIBO)**
- 9. Restore flora with prebiotics and potent probiotics**
- 10. Heal the tissue as needed with supplement support**
(bone broth, glutamine, zinc, Aloe Vera, DGL, Fish oil, Slippery Elm)



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