

Digestive Health and Medical Diets Demystified

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Outline

- ▶ GUT basics
 - ▶ Mouth
 - ▶ Esophagus
 - ▶ Stomach
 - ▶ Small intestine
 - ▶ Large intestine
- ▶ Signs of dysfunction
 - ▶ Functional bowel disorder
 - ▶ Inflammatory bowel disease
 - ▶ Intestinal permeability
 - ▶ Aka: leaky gut syndrome
- ▶ The GUT Brain
- ▶ The Role of Probiotics
- ▶ Medical diets
 - ▶ Elimination diet
 - ▶ Paleolithic diet
 - ▶ Ketogenic diet
 - ▶ Specific carbohydrate diet (SCD)
 - ▶ Gut and psychology syndrome (GAPS) diet
- ▶ Weston A. Price Foundation

GUT Basics

- ▶ Mouth
 - ▶ Chewing increases the surface area of food
 - ▶ Teeth
 - ▶ Tongue
 - ▶ Saliva glands
 - ▶ An enzyme (called salivary amylase) begins the process of carbohydrate and fat digestion.
 - ▶ You'll notice that the longer you chew, grains will become sweeter
- ▶ Esophagus
 - ▶ The conduit through which food passes to reach the stomach.
 - ▶ Most common problem:
 - ▶ Heartburn (Gastroesophageal Reflux disorder or GERD for short)
 - ▶ Which can progress to 'Barrett's Esophagus' the stage before cancer of the esophagus develops.

GUT Basics

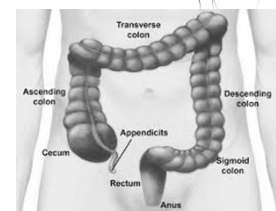
- ▶ Stomach
 - ▶ Food gets progressively smaller with the muscular contractions or 'churning' of the stomach.
 - ▶ The goal remains to increase the surface area of food
 - ▶ Stomach acid begins the process of protein digestion
 - ▶ Protective against bacteria and fungi
 - ▶ Decreased supply with aging, adrenal insufficiency, alcohol consumption, and medications
- ▶ Most common problems:
 - ▶ GERD. Why? Usually because of insufficient stomach acid.
 - ▶ Ulcers. Why? H. Pylori infection. 90% duodenal ulcers and 70% gastric ulcers
 - ▶ How can I tell? Burping, gnawing feeling under the ribcage, burning behind the sternum, repeating food, nausea, bloating and rosacea

GUT Basics

- ▶ Small Intestine
 - ▶ This is where the majority of digestion and absorption take place.
 - ▶ Gut wall lined with protrusions called 'villi'.
 - ▶ Coated with 'enterocytes'
 - ▶ Complete process of digestion
 - ▶ "brush border" of enzymes
 - ▶ Vulnerable to damage
 - ▶ Also the site of roughly 80% of our immunity
 - ▶ Gut Associated Lymphoid Tissue.
 - ▶ Secretory IgA
 - ▶ First line defence against pathogenic material
 - ▶ Damage to small intestine caused by:
 - ▶ Gluten and other food intolerances
 - ▶ Antibiotics
 - ▶ Dysbiosis
 - ▶ Acute/Chronic stress
 - ▶ Birth control pill
 - ▶ Birth*
 - ▶ Site of "intestinal permeability"....

GUT Basics

- ▶ The large intestine
 - ▶ Largely tasked with absorbing remaining water from digestive material.
 - ▶ Vitamins K1 and K2 are produced here
 - ▶ Involved in blood clotting and bone health
 - ▶ Biotin and other Bs are produced here as well
 - ▶ Via bacterial flora
 - ▶ Most common problems:
 - ▶ IBS, diverticulosis, Crohn's, Ulcerative Colitis and Colorectal cancer
 - ▶ How can I tell? Constipation, diarrhea, bleeding and mucus in the stool.
 - ▶ Why? Food sensitivities, antibiotics, chronic constipation and autoimmune dysfunction



Functional GUT disorders

- ▶ Lasting a total of 12 weeks over the last 12 months
- ▶ Absence of structural or biochemical abnormality
 - ▶ Bloodwork, endoscopy, colonoscopy, ultrasound
 - ▶ All normal
- ▶ Conventional treatment aimed at alleviating symptoms while leaving the cause unaddressed
- ▶ Symptoms range
 - ▶ Burping
 - ▶ Reflux
 - ▶ Abdominal pain
 - ▶ Gas/bloating
 - ▶ Constipation/obstipation
 - ▶ Loose stool/diarrhea

Small Intestine Bacterial Overgrowth (SIBO)

- ▶ Mild to moderate cases
 - ▶ Bloating, gas, abdominal discomfort/pain, diarrhea, and constipation
- ▶ Severe cases
 - ▶ Signs of malabsorption
 - ▶ Unexplained weight loss
 - ▶ Malnutrition
 - ▶ Fat in the stool
 - ▶ Liver lesions (changes to tissue)
 - ▶ Skin lesions
 - ▶ Joint pain
 - ▶ Autoimmunity
- ▶ Testing:
 - ▶ Hydrogen breath test most common
 - ▶ Gold standard of aspirating contents of jejunum and subsequent culture
 - ▶ Invasive
 - ▶ False positives
 - ▶ Is usually not done leaving patients with ineffective medications as 'treatment' while the cause goes unaddressed
 - ▶ Rifaximin and Neomycin are treatments of choice
 - ▶ Not systemically absorbed

Inflammatory Bowel Disease (IBD)

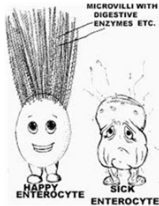
- ▶ Crohn's disease
 - ▶ Stool: porridge-like with presence of fat (steatorrhea)
 - ▶ Fever is a common feature
 - ▶ Can develop 'fistulae' or communicate with other compartments of anatomy
 - ▶ E.g bladder
 - ▶ Weight loss is common
- ▶ Ulcerative colitis
 - ▶ Stool: mucus-like with blood
 - ▶ Urgent need to visit toilet
 - ▶ Severe disease indicated by fever
- ▶ Conventional treatment
 - ▶ Steroids
 - ▶ Immunosuppressant drugs
- ▶ Can occur anywhere along digestive tract
 - ▶ Small and large intestine most common
- ▶ Common feature of both
 - ▶ GUT flora is *completely* altered
 - ▶ Perform entirely different functions
 - ▶ Perpetuate inflammation

Intestinal Permeability: Leaky Gut Syndrome

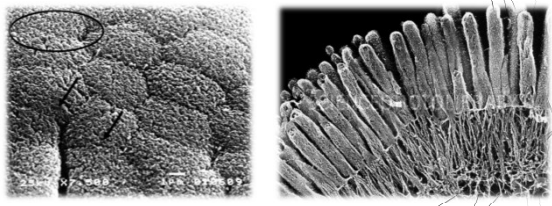
- ▶ Dysfunction at the level of the enterocyte (cells along the small intestine wall)
 - ▶ Tight junctions allow foreign material across the gut wall
 - ▶ Picked up by regional lymphatics and bloodstream as 'foreign'
 - ▶ Subsequent antibody development
 - ▶ Creates confusion in immune system
 - ▶ Over react: Atopic conditions (eczema, allergies, asthma)
 - ▶ Attack self: autoimmunity (celiac, rheumatoid arthritis, multiple sclerosis)

Intestinal Permeability: Leaky GUT Syndrome

- ▶ Often, but not always, associated with gastrointestinal symptoms
 - ▶ Gas, bloating, reflux, pain, constipation, diarrhea (functional changes)
- ▶ Chronic irritation to gut wall allows for more food particles and waste material to enter
- ▶ Immune system becomes increasingly reactive
 - ▶ Continued antibody formation and inflammation. Recall:
 - ▶ Atopy: eczema, asthma, allergies
 - ▶ Autoimmune disorders
 - ▶ Mood/behavioral disorders
- ▶ Over time gut architecture becomes compromised
 - ▶ Lose ability for optimal absorption and assimilation of food
 - ▶ Nutritional compromise
- ▶ Susceptibility to infection
 - ▶ H. pylori
 - ▶ Fungal infection
 - ▶ Parasites



Small Intestine: A Comparison



The GUT Brain

- ▶ **Leaky Gut associated with**
 - ▶ Migraines
 - ▶ Depression/Anxiety
 - ▶ ADD/ADHD
 - ▶ ASD
 - ▶ Obesity
- ▶ **How?**
 - ▶ **Via vagus nerve**
 - ▶ 80% of fibers send info TO the brain
 - ▶ Affected by gut microflora
 - ▶ Metabolites are neuroactive
 - ▶ GABA, noradrenaline, serotonin, dopamine
 - ▶ Negative emotions suppress activation
 - ▶ Decreased stomach acid
 - ▶ Reduces secretion of pancreatic enzymes
 - ▶ Decreased blood flow to digestive tract
 - ▶ Suppresses Iga
 - ▶ **Chronic inflammation**
 - ▶ Chemical messengers travel to brain and activate immune cells in the brain
 - ▶ Result is SLOWER nerve conduction



Antibiotics: Friend or Foe?

- ▶ Prior to 1940, infectious disease most common cause of death
 - ▶ Presently, cardiovascular disease, cancer and diabetes are most common causes
- ▶ ADD/ADHD, ASD, Atopy and autoimmunity are all on the rise
 - ▶ While wiping out presenting infection, ABCs also wipe out protective bacteria
 - ▶ ABC misuse leads to drug resistant bacteria
 - ▶ Refractory to treatment
- ▶ Side effects of ABCs
 - ▶ Nausea/Vomiting
 - ▶ Rashes
 - ▶ Diarrhea
 - ▶ Abdominal pain
 - ▶ Increase risk of:
 - ▶ Pseudomembranous colitis
 - ▶ C. difficile
 - ▶ Lowered immunity
 - ▶ Lacking protective effect of beneficial bacteria
 - ▶ Intestinal hyper permeability
 - ▶ Hygiene hypothesis said to be linked to increases in autoimmunity and Atopy



Probiotics: What's the big deal?

- ▶ **Immune benefits**
 - ▶ Crowd out harmful bacteria
 - ▶ Induce immune tolerance
 - ▶ Help cope with environmental pathogens
 - ▶ Protect against autoimmunity
 - ▶ Protect against mood disorders
 - ▶ Initiates immune development in infants
 - ▶ Entero-mammary pathway
 - ▶ Reduces risk of atopy
- ▶ **Digestive benefits**
 - ▶ Reduces putrefaction of foods
 - ▶ Reduces bloating and gas
 - ▶ Aids elimination
 - ▶ Stimulates bile release
 - ▶ Manufactures nutrients
 - ▶ Vitamin K2, folate
 - ▶ Converts fiber into short chain fatty acids
 - ▶ Feed the gut wall
 - ▶ Protective against excessive weight gain
 - ▶ All cultures have some source of fermented food



Medical Diets: The Elimination Diet

- ▶ First line therapy when addressing functional GUT disorders in addition to:
 - ▶ Joint pain
 - ▶ Fatigue
 - ▶ Hormonal dysregulation
 - ▶ Brain fog
 - ▶ Skin lesions
- ▶ Eliminates most common sources of food intolerances for 4-6 weeks

Gluten	Eggs (AIP)
Dairy (AIP)	Corn (AIP)
Soy (AIP)	Nightshades (AIP)
Sugar (AIP)	Peanuts (AIP)
Shellfish	Beef and Pork

Medical Diets: The Paleolithic Diet

- ▶ Helpful when results are limited with elimination diet
 - ▶ Indicative of increased damage to GUT wall
- ▶ Removes further obstacles to digestion
 - ▶ Grains and pseudo-grains
 - ▶ Legumes
 - ▶ Tree nuts (AIP)
 - ▶ Dairy
 - ▶ Refined sugar
- ▶ **Lectins**
 - ▶ Resist digestion, inhibit enzymatic activity and stimulate the immune system
- ▶ **Phytic Acid**
 - ▶ Suppress activity of digestive enzymes
 - ▶ Act as 'anti-nutrient' to mineral absorption
- ▶ **Saponins**
 - ▶ Acts as a 'detergent' and degrades cell membranes of enterocytes
 - ▶ Nightshade vegetables

Medical Diets: Specific Carbohydrate Diet

- ▶ Was invented in the 1950s by renowned pediatrician, Dr. Sidney Valentine Haas
 - ▶ Patients did very well with animal fats and proteins but intolerant to complex carbohydrates and their various sources (grains and starchy vegetables)
 - ▶ Useful for all digestive disorders of the time
 - ▶ Crohn's, ulcerative colitis, celiac
 - ▶ Popularized by Elaine Gottschall, author of "Breaking the Vicious Cycle"
 - ▶ Daughter cured of Ulcerative colitis and neurological issues after 2 years on SCD
- ▶ Monosaccharides are the only permissible starch
 - ▶ Glucose, fructose and galactose
 - ▶ Must omit di and poly - saccharides
 - ▶ Difficult to digest. Left to ferment
 - ▶ Feed harmful bacteria - source of inflammation in the bowel
 - ▶ Grains and legumes have only been consumed for 10,000 years vs 2 million years of human existence.
 - ▶ The exceptions are lentils, split peas and dried beans only after 12 hours of soaking.
 - ▶ Goal is to starve harmful bacteria and restore function to GUT wall

Medical Diets: The Ketogenic Diet

- ▶ Forces the body to burn fat and not starch
 - ▶ 'Carb' adapted vs 'keto' adapted
 - ▶ Used in the 1920s to treat epilepsy in children
 - ▶ Fell out of favor with the introduction of anti-convulsant drugs
 - ▶ Revival with the popularity of the 'Atkin's Diet' in the 1990s
 - ▶ Well constructed plan limits the development of troublesome side effects
 - ▶ Used to treat: Alzheimer's, diabetes, PCOS, Autism, MS etc...
- ▶ **Goals**
 - ▶ Protein based on amount needed to maintain lean muscle mass of 'reference weight' (-25%)
 - ▶ Carbohydrates are set to 60 gms or less (10-15%)
 - ▶ Remaining calories are to come from fat (70-75%)
 - ▶ MCT oil/coconut oil
 - ▶ Rendered animal fats
 - ▶ Heavy creams
 - ▶ Avocados
 - ▶ Requires: 2 cups of dark greens, LOTS of water, salt your food
 - ▶ Be aware of side effects of transition and have a plan in place to treat

Medical Diets: The GAPS diet

- ▶ Based on Elaine Gotschall's work (recall SCD)
- ▶ Intro diet divided into 6, 5 day stages to initiate and expedite gut repair
 - ▶ Heal and seal the GUT
- ▶ Adds the element of meat stocks and bone broths to provide the material for repair
 - ▶ Source of minerals: calcium, phosphorus, magnesium, and potassium
 - ▶ Source of amino acids: glycine and proline (not in muscle meat)
 - ▶ Source of chondroitin sulfate and glucosamine
 - ▶ Source of collagen - needed for tissue repair
- ▶ Avoids irritating fibers from vegetables that could exacerbate ulcerations in the GUT lining
- ▶ Emphasizes repopulating the GUT with healing, beneficial bacteria - since these microbes orchestrate enterocyte repair
- ▶ The end result is the 'Full GAPS diet' - requires 6-24 months

Weston A. Price Foundation: A Diet for All

- ▶ Not all diets mentioned here are appropriate for all