Digestive Wellness
Ayurveda & Functional Medicine

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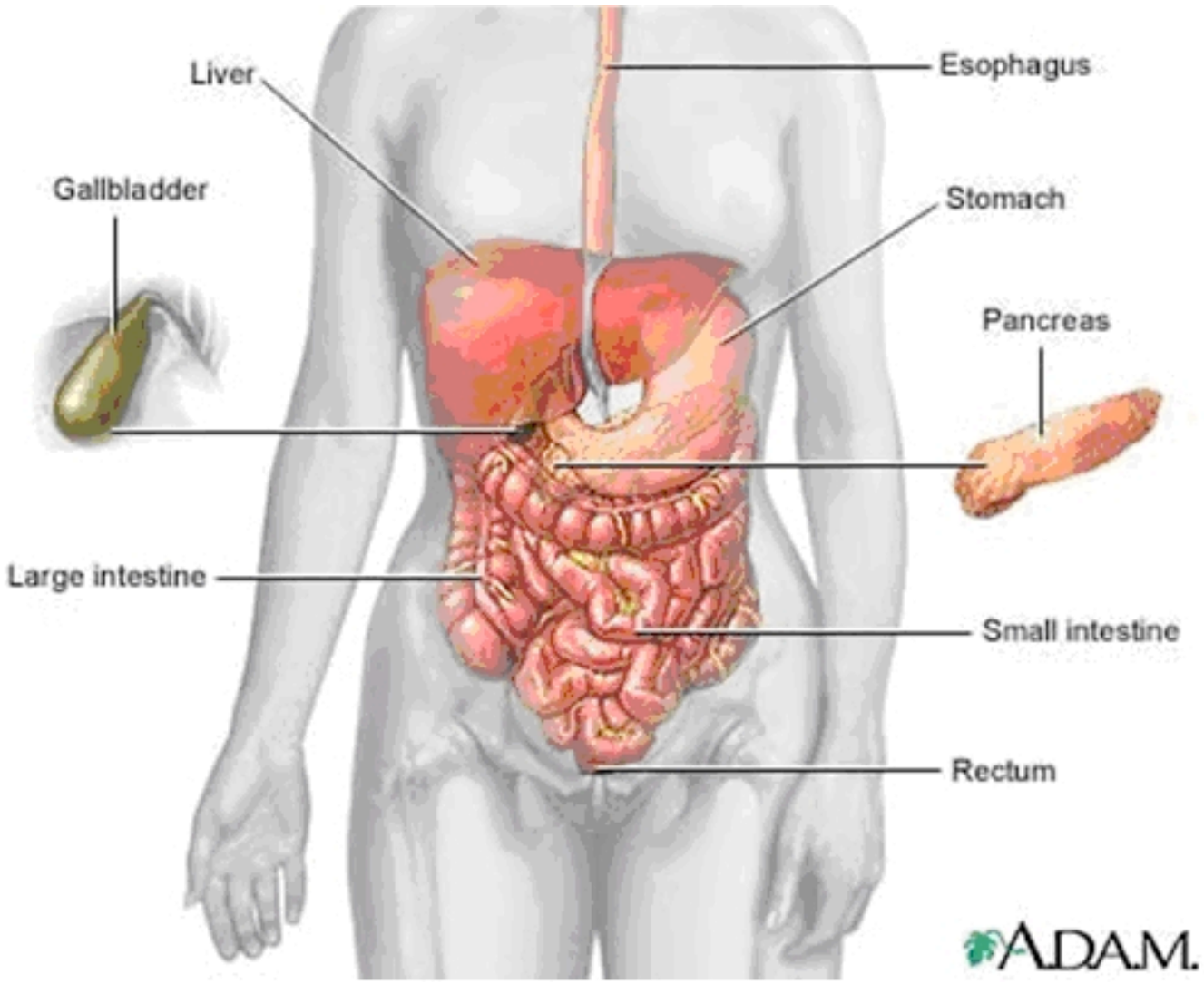
UnityMedicine
Integrative Medicine & Ayurveda

The Gastrointestinal Tract



10 Facts About Your Gut

- The gut includes the entire passage from the mouth to the anus
- Bacteria like acidophilus is passed on from generation to generation at the time of birth
- IBS (Irritable Bowel Syndrome) affects 3 to 20% of the population with 5-7% diagnosed
- Approximately 100 trillion bacteria live in your gut weighing 1.5kg
- Travelers diarrhea affects 50% of travelers in tropical climates
- There are more neurons in your gut than the nervous system
- 66% of immune cells live in the gut
- 62 million people in the US are diagnosed with a digestive condition or disease
- The digestive tract is 9 meters in length
- 95% of your serotonin is located in the gut[1]

The Gastrointestinal Health from an Ayurvedic Perspective

Maha srotas is the gastrointestinal tract in Ayurveda

-Includes Annavaha srota, Raktavaha srota, Purisavaha srota

13 Agni or Enzymes

- Jatharagni,
- 7 Dhatu Agni (rasa, rakta, mamsa, medas, asthi, majja, sukra/artava)
- 5 bhutagni (Parthiva, apya, agneya, vayavya, akasiya)

Factors helping digestion

- Jatharagni and pachaka pitta (gastric juice)
- Gut motility (apana vayu)
- Absorption of nutrients (samana vata)
- Water
- Mucous (Kledaka Kapha)
- Time (when you eat, season)
- Proper combination of above

State of Agni

Determines the state of overall health and digestive wellness

- Balanced / sama
- Abnormal / vishamagni
- Increased / tiksnagni
- Decreased / mandagni

Etiologic factors contribute to imbalanced agni and a pathological state called agnimandya.

Creates metabolic disorders from:

- Taking too much water
- Irregular eating habits
- Food allergies
- Improper application of panchakarma
- Suppression of natural urges (hunger, flatulence, elimination, etc.)
- Sleep disturbances
- Emotional disturbances
- Seasonal changes
- Debilitating chronic illnesses

Ajirna (Dyspepsia)

Symptoms

- nausea, vomiting, upper abd pain, early satiety, bloating
- Vishamagni - vitiated vata. Variable digestion
- Tiksnagni - vitiated pitta. Strong appetite, but poor digestion, absorption, assimilation
- Mandagni - vitiated kapha. Difficult to digest even simple meal. Indigestion, heaviness, maybe even vomiting.

3 pathologic types of indigestion:

- endotoxic indigestion (ama ajirna) - abdominal heaviness, hyper-salivation, puffiness of face, belching of undigested food

-acid indigestion (vidagdha ajirna) - dizziness, intense thirst, acid reflux, increased sweating, burning all over the body

-static indigestion (vishtabdha ajirna) - abdominal pain, distention, obstruction, myalgia

Treatment:

- Lifestyle changes. Regulate samana vayu.
  not just the what, but when, where, how, why of eating
- Digestives (ginger, fennel, cumin, coriander), carminitives (nutmeg, cumin, coriander, fennel), deepan (chitrak, clove, asafetida, trikatu, cayenne), pachan

Vibandha (Constipation)

Causes: Mostly due to vata aggravation (apana vayu), sometimes pitta and kapha involved

- wrong bowel habits (resisting urge)
- improper eating habits
- difficult to digest food
- too much astringent food
- too little fiber intake
- frequent fasting
- poor sleep
- negative emotions

Treatment:

- change diet
- exercise
- abhyanga (if no contraindication), svedana, medicated fats (snehapana), purgation (virecana), enema (basti), suppositories
- milk with 1tsp ghee
- triphala with warm water and ghee
- psyllium, senna, rhubarb, aloe
- castor oil

Amlapitta (Hyperacidity)

Causes (Charaka):

- Fasting
- Overeating while having indigestion
- Irregular eating habits
- Consuming unsuitable foods
- Eating in an unsupportive atmosphere or at the wrong time
- Eating foods that have been improperly prepared
- Factors which elevate pitta

Treatment:

-PK therapies (vamana, virechana)

-Ahara Chikitsa (lifestyle changes)

-Multiple herbal preparations (amla, aloe, licorice, shatavari, avipattikara churna 1tsp tid ac with lemon juice, bitters eg dandelion, gentian, kutki)

Grahani (Irritable Bowel)

Grahani is seat of agni/enzymes (mostly small intestine). Holds the food until digested, then releases it.

General principles:
- see treatment of ajirna
- if sama (endotoxins), fasting and administration of digestives and carminatives
- use of takra (buttermilk); add asofetida, cumin, and rock-salt powder to control bowel movements
- identify and remove food intolerances

Constipation predominant:
- digestives (ginger, clove, fennel, cumin, cardamom, cinnamon)
- Haritaki (terminalia chebula), triphala, shatavari, ashwagandha, sesame oil for calming vata
- sweet, sour, salty foods

Diarrhea predominant:
- amla, coriander, sandalwood, aloe, guduchi, shatavari
- sweet, bitter, astringent foods)

Dysentery predominant:
- ginger, lime juice, honey for controlling kapha
- trikatu for deepan and pachan
- digestives
- hingvastak
- pungent, bitter, astringent foods

Functional Medicine

-Addresses the underlying causes of disease, using a systems-oriented approach and engaging both patient and practitioner in a therapeutic partnership.

-Is a new paradigm of medicine where physicians and other practitioners are assessing and treating the underlying cause of illness through individually tailored therapies to improve function, restore health, and heal chronic disease.

-Is patient-centered, individualized, and treats the whole person.

Practicing Functional Medicine: Essential Tools

1. The patient's complete story emerges during the health history and facilitates the therapeutic partnership.

2. The physician and the patient together identify and address the challenges of the patient's modifiable lifestyle factors.

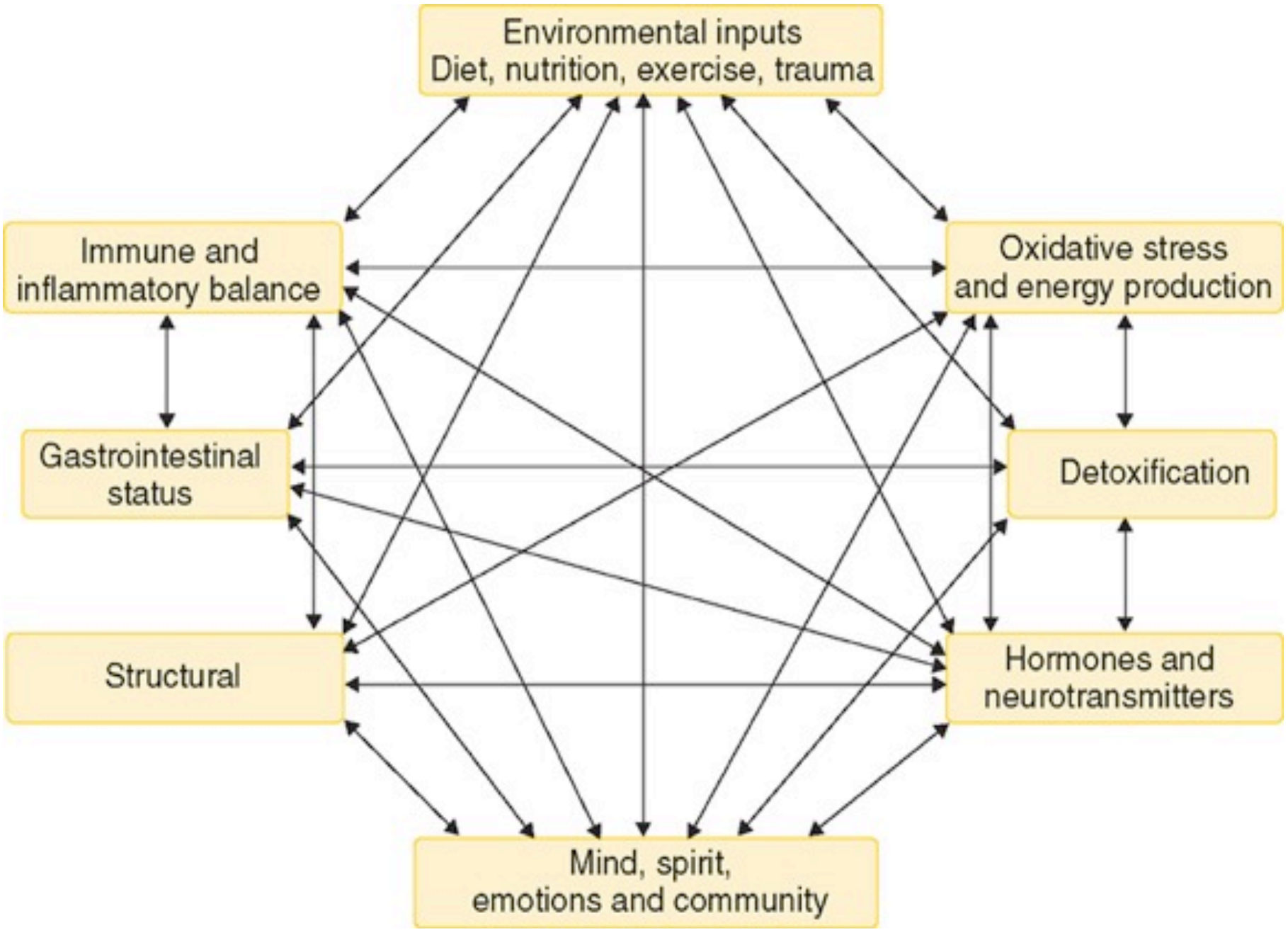
3. The physician identifies the patient's clinical imbalances by underlying causes of disease in a systems biology matrix framework.

3 Key Interacting Systems

Nervous System: neurotransmitters- norepinephrine, serotonin, dopamine, glutamate, and more made in neurons many in brain and gut

Endocrine System: (hormones released by endocrine glands) Response via HPA axis epinephrine, and cortisol.

Immune System: (Cytokines): Up-regulated via NfkB, which is affected by norepinephrine.


Environmental inputs
Diet, nutrition, exercise, trauma
Immune and
inflammatory balance
Oxidative stress
and energy production
Gastrointestinal
status
Detoxification
Structural
Hormones and
neurotransmitters
Mind, spirit,
emotions and community

The Brain in Your Gut

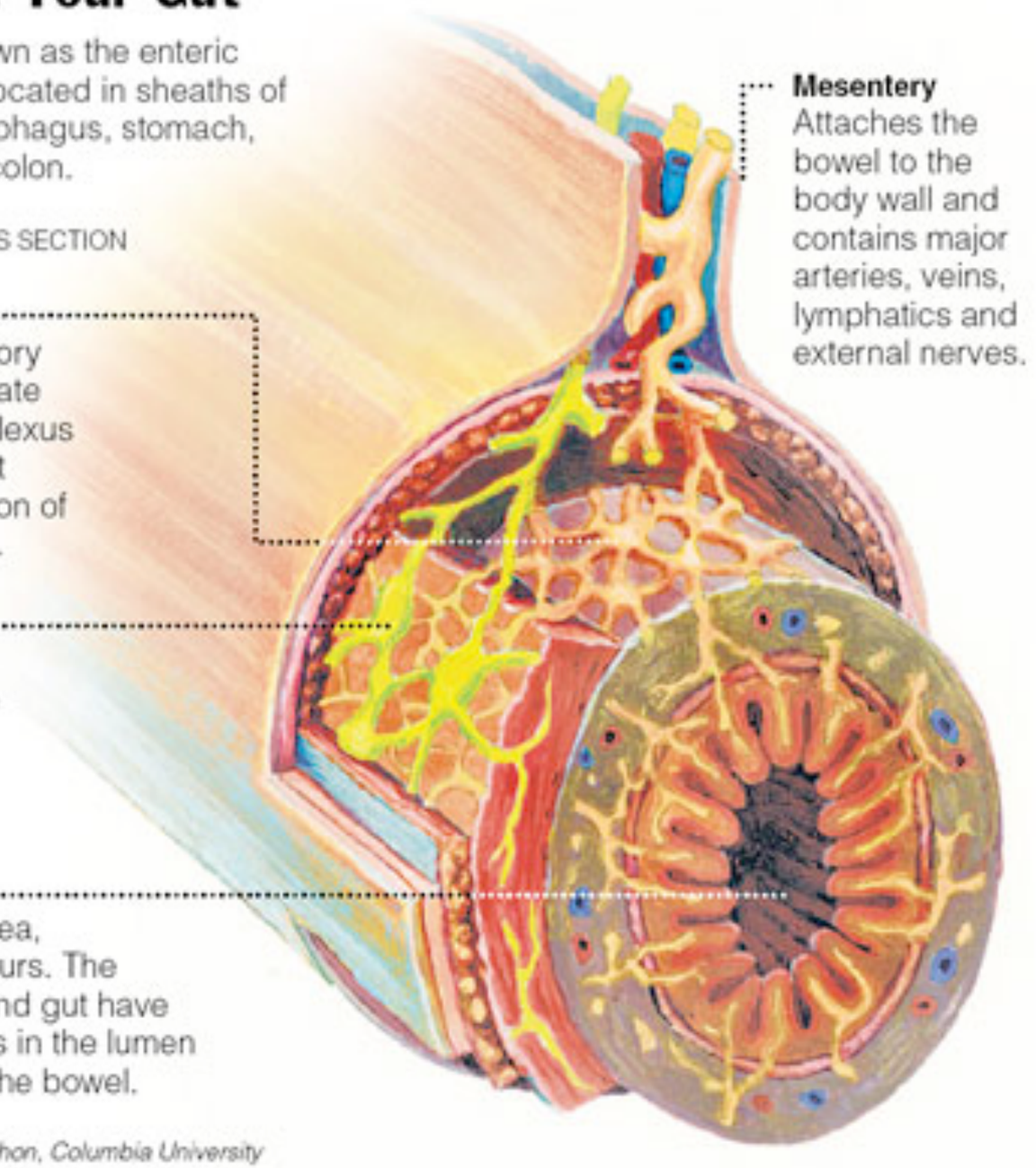
The gut's brain, known as the enteric nervous system, is located in sheaths of tissue lining the esophagus, stomach, small intestine and colon.

SMALL INTESTINE CROSS SECTION

Submucosal plexus Layer contains sensory cells that communicate with the myenteric plexus and motor fibers that stimulate the secretion of fluids into the lumen.

Myenteric plexus Layer contains the neurons responsible for regulating the enzyme output of adjacent organs.

Lumen No nerves actually enter this area, where digestion occurs. The brains in the head and gut have to monitor conditions in the lumen across the lining of the bowel.



Mesentery Attaches the bowel to the body wall and contains major arteries, veins, lymphatics and external nerves.

Source: Dr. Michael D. Gershon, Columbia University

Seven Organizing Systems where Clinical Imbalances Develop:

1. Assimilation
2. Defense and Repair
3. Energy
4. Biotransformation and Elimination
5. Transport
6. Communication
7. Structural Integrity

Parallel Concepts

The gut as central to health.

- 70-90% of immune system (GALT).
- 70% or more of neurotransmitters (enteric nervous system).
- Only 10% human.
- Biofilms/colonies
- Individual microbiome
- Increased intestinal permeability → correlates to entry of dosha into the dhatu
- Ayurveda approach: Pancha Karma/Functional Medicine: 5Rs (Remove, Replace, Reinoculate, Repair, Rebalance)
- Ama=endotoxin=antigen/antibody complex

Movement of disease/pathways of disease = gati/vyaadhi maarga

-Gati is up/down, inward/outward, linear, circular.
-Maarga is abhyantara maarga = internal pathway (GI tract),
-baahya maarga = external pathway (rasa/rakta vaha srotas),
-madhyama maarga = deep vital organs, deep tissues.
-*Example*: Gluten intolerance leads to inflammation of the villi and eventually celiac disease, which moves from GI tract to veins and lymphatics and eventually becomes systemic, affecting liver, bones (osteoporosis), hematopoetic system (anemia).

Parallel Concepts con't

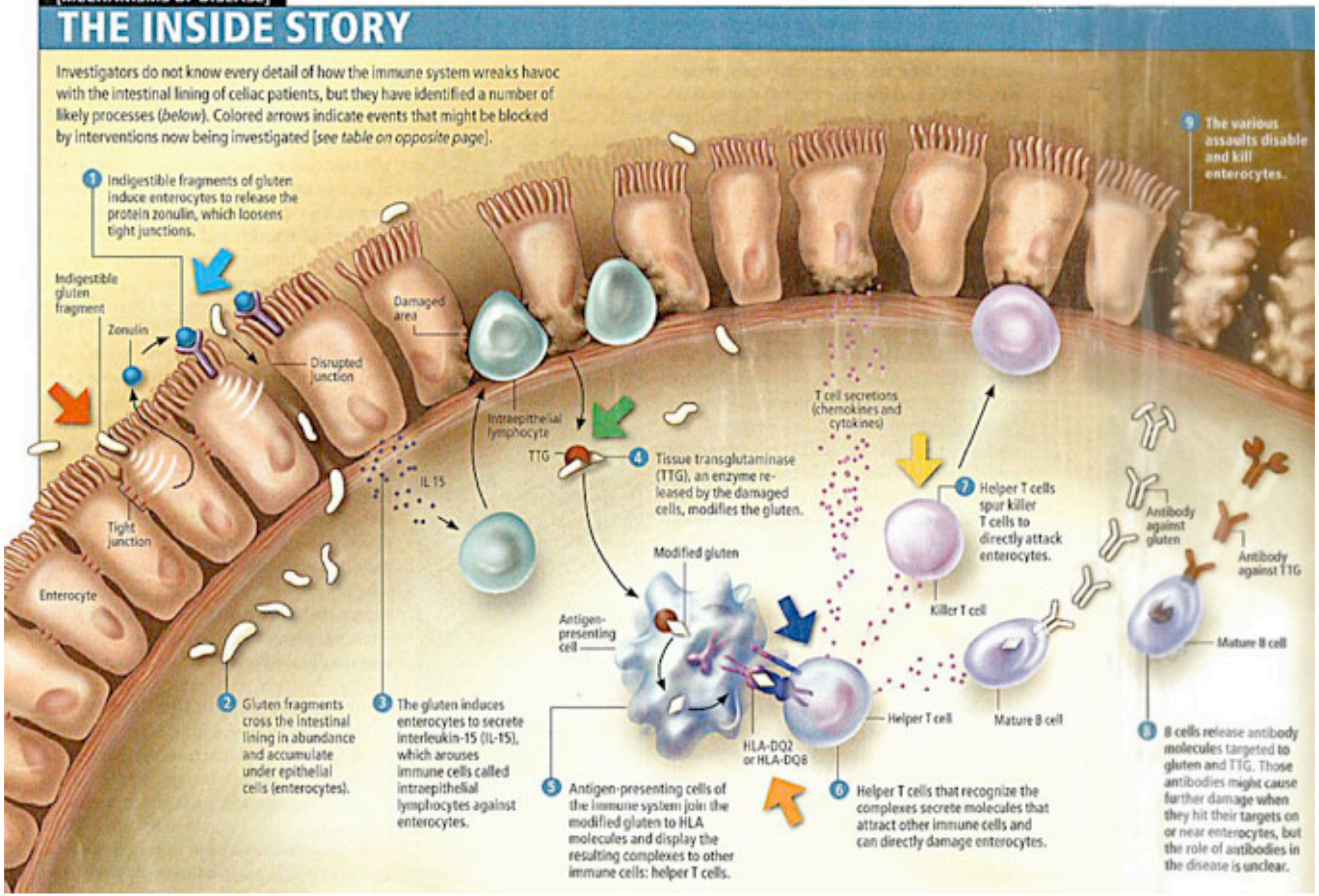
Dhatu dhara kala is a biological membrane that holds dhatu
(***Dhara*** means holding, ***kala*** means membranous structure.)
Kala

- separates two tissues from one another to give them form and make them distinct
- mother of the dhatu because it holds and nourishes the dhatu
- dhatu agnis are present within the kala and transform raw, unprocessed dhatu into processed, formed dhatu.
- Concept of dhatu agni being held in the kala correlates to the cell messaging system embedded in the cell membrane.
- Secondary messenger proteins affecting genetic transcription in the nucleus.
- Areas of body which are less human dna, others are more.

Disease occurs when non-human organisms breach these kalas or cross srotamsi
-Blood, urine, lymphatic, CSF infections.
-Edema, peritonitis, diverticulitis, etc.
-Colonization of GI tract leads to chronic disease.
-Chlamydia's role in heart disease.
-Entry of oral pathogens into blood stream correlating to endocarditis, heart disease, preterm labor, Alzheimers, etc.

THE INSIDE STORY

Investigators do not know every detail of how the immune system wreaks havoc with the intestinal lining of celiac patients, but they have identified a number of likely processes (*below*). Colored arrows indicate events that might be blocked by interventions now being investigated [*see table on opposite page*].



5 Rs

Remove:
- Pathogenic microflora (e.g., bacteria, fungi, parasites)
-Food allergens
-Environmental stressors
-Medications
-Stress

Replace:
-Digestive enzymes
-Gut healing compounds

Reinoculate:
-Reintroduction of desirable GI microflora to obtain balance in GI intestinal milieu

Repair:
-Proper nutrition to heal the gut
-Provide nutritional support for healing and regeneration of GI mucosa
-*Examples*: L-Glutamine, B Vitamins, DGL, antioxidants

Rebalance:
-Providing support for restorative processes in patient's life
-Scheduling, relaxation, meditation
-Better choices

Case Study

Patient: 62 Year Old Female
Chief complaints:
1. Digestive issues "I don't feel well after eating."
2. Insomnia
Past Medical History:
1. Ovarian Cancer (s/p hysterectomy and bilateral salpingoophorectomy and chemotherapy)
2. Hypothyroidism (mildly elevated TPO and TG antibodies)
3. Osteoporosis
4. Hyperlipidemia
5. Herpes labialis
Social History:
Self-employed
No tobacco, 3 alcoholic drinks per week
Dinacharya:
7a: wakes
7-8a: walks dog
8a: breakfast: warm grains
8-11a: computer work
noon: lunch: avocado, cottage cheese, almond butter, crackers, hummus, carrots
afternoon: appointments, more computer work, gardening
5p: "tired"
7p: dinner with partner: omnivorous
9-9:30: bed
Snacks: almonds
Avoids: hot/spicy foods, too much red meat, peanut butter

Agni: manda
Purisha: one spontaneous BM per day, unremarkable
Mutra: 4-6 times/day, nocturia x 1
Akruti: 5'7" 128lbs
Jihva: thin, mild foam laterally, pink
Khavaigunas: arthava
Prakruti: V3P2K1
Vikruti: V3.5P2K1
Samprapti:
1. vata kaya
2. oja kshaya
3. anna v.s. dusthi

GI fx GI Effects Stool Profiles
U.S. patent pending 2008

2200 GI Effects Comprehensive Profile

Methodology: DNA Analysis, GC/MS, Microscopic, Colorimetric, Automated Chemistry, EIA

Results	Quintile Ranking (1st / 2nd / 3rd / 4th / 5th)	95% Reference Range

Consistency = Formed/Normal

Predominant Bacteria

E+007

Obligate Anaerobes

	Results	Quintile Ranking	95% Reference Range
Bacteroides spp.	10.9	1.6 – 6.7	>= 1.3
Clostridia spp.	4.2	1.5 – 6.2	>= 1.0
Prevotella spp.	1.6	1.6 – 6.2	>= 1.1
Fusobacteria spp.	7.0	1.6 – 7.4	>= 1.1
Streptomyces spp.	2.7	1.6 – 5.8	>= 1.0
Mycoplasma spp.	2.1	1.7 – 6.2	>= 1.2

Facultative Anaerobes

	Results	Quintile Ranking	95% Reference Range
Lactobacillus spp.	2.9	1.8 – 7.8	>= 1.2
Bifidobacter spp.	8.5	2.3 – 7.6	>= 1.8
Escherichia coli (E. coli)	4.2	1.7 – 7.7	>= 1.1

Predominant Bacteria play major roles in health. They provide colonization resistance against potentially pathogenic organisms, aid in digestion and absorption, produce vitamins and SCFA's, and stimulate the GI immune system. DNA probes allow detection of multiple species (spp.) within a genus, so the genera that are reported cover many species.

Organisms are detected by DNA analysis. One colony forming unit (CFU) is equivalent to one bacterium. Each genome detected represents one cell, or one CFU. Results are expressed in scientific notation, so an organism reported as 2.5 E+007 CFU/gram is read as 25 million colony forming units per gram of feces.

Opportunistic Bacteria

	Results	Expected Value
Morganella morganii	Positive	Negative

Opportunistic Bacteria may cause symptoms and be associated with disease. They can affect digestion and absorption, nutrient production, pH and immune state. Antibiotic sensitivity tests will be performed on all opportunistic bacteria found, although clinical history is usually considered to determine treatment since the organisms are not generally considered to be pathogens.

Yeast/Fungi

		Expected Value
Yeast/Fungi; taxonomy unavailable	+4 => 100000 pg DNA/g specimen	Negative

Yeast/Fungi
Yeast overgrowth has been linked to many chronic conditions, in part because of antigenic responses in some patients to even low rates of yeast growth. Potential symptoms include diarrhea, headache, bloating, atopic dermatitis and fatigue. Positives are reported as +1, +2, +3 or +4 indicating >100, >1000, >10000 or >100000 pg DNA/g.

Parasitology

Microscopic Exam Results:*

Blastocystis hominis: Many

Parasitology
Parasite Recovery: Literature suggests that >90% of enteric parasitic infections are detected in a sample from a single stool collection. Increased sensitivity results from the collection of additional specimens on separate days. Parasites have been detected in 20-24% of U.S. patients with mild to moderate GI symptoms.

Parasitology EIA Tests:

	In Range	Out of Range
Cryptosporidium	Negative	
Giardia lamblia	Negative	
E. histolytica/dispar	Negative	

2150 GI Effects® Sensitivity Bacteria Profile - Stool

Methodology: DNA Analysis, ELISA

Pharmaceuticals	Sensitive	Resistant
1. Amoxicillin		R
2. Ampicillin		R
3. Cefuroxime	S	
4. Ciprofloxacin	S	
5. Clindamycin	S	
6. Erythromycin	S	
7. Levofloxacin	S	
8. Potassium Clavula		R
9. Rifaximin		R
10. Sulfamethoxazole	S	
11. Tetracyclin	S	
12. Trimethoprim-Sulfa	S	

Botanicals	Sensitive	Resistant
13. 5-Hydroxy-1,4-naphthoquinone Black Walnut	S	
14. Alliin Garlic	S	
15. Arbutin Uva Ursi		R
16. Artemisinin Wormwood	S	
17. Berberine Goldenseal	S	
18. Caprylic acid Octanoic acid	S	
19. Carvacrol Oregano	S	
20. Oleuropein Olive Leaf	S	
21. Quinic Acid Cats Claw	S	
22. Thymol Oil of Thyme	S	
23. Undecylenic acid Undecylenic acid	S	

Bacterial growth suppression is measured in a liquid growth medium where fungal growth is suppressed and specific antibacterial agents are introduced before incubation. In contrast to the older isolation and culture techniques, such universal culturing more closely approximates the actions of antibacterials in the complex milieu of the colon.

Agents marked as **"Sensitive"** cause effective bacterial growth suppression. Those antibacterial agents are candidates for suppressing the growth of bacteria in the patient's colon. The results apply to all organisms reported under **"Opportunistic**

Agents indicated as **"Resistant"** have low effectiveness. If all tested agents are resistant, synergistic mixtures of antibacterial agents may be effective.

For Botanical sensitivity testing the active ingredients are tested and an example of the available source is shown.

Sensitivities are not performed on **"Pathogens"** or **"Parasites"** because they do not grow in culture under normal laboratory conditions. Standard protocols are generally used for treatment of pathogens and parasites.

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We invite you to become a member of NAMA today!

If you would like more information, visit drgrasser.com or email elizabeth@drgrasser.com.

Thank you!