



# Digestive Support in CKD

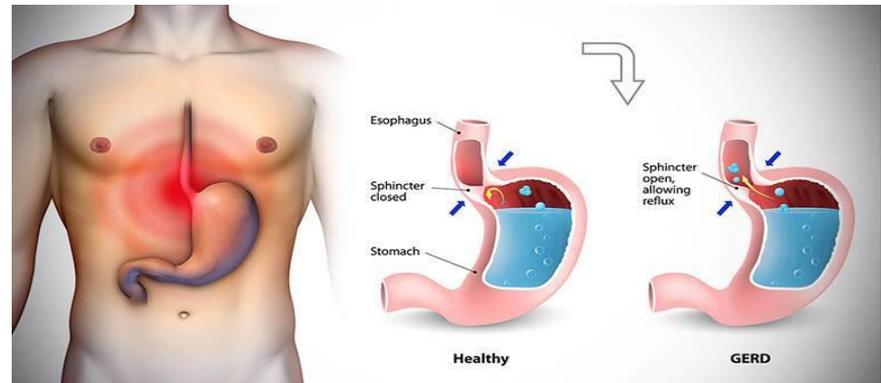


Is there a Need for Herbs, Supplements  
and Functional Nutrition?

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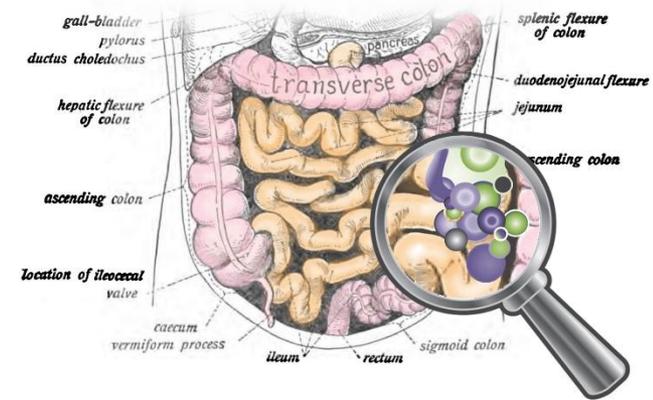
# Common GI issues in CKD

- Indigestion / Heartburn / GERD
- Nausea / Vomiting
- Constipation
- Diarrhea
- Gas
- Malabsorption / Dysbiosis



# Uremic Syndrome

- Dysmotility
- Endotoxemia
  - Duranton, *et al* 2012 found 32 previously known toxins
  - And found 56 newly reported solutes.
- Most frequently reported concentrations
  - B2-microglobulin
  - Indoxyl sulfate
  - Homocysteine
  - Uric acid
  - Parathyroid hormone





# Reduced Molecules in CKD

Uremia reduces the following:

- Bilirubin
- Reduced glutathione
- A1-antitrypsin
- Arginine
- Homoarginine



DETOX



All are associated with antioxidant, anti-inflammatory and vasodilating properties.

# Digestion / Indigestion

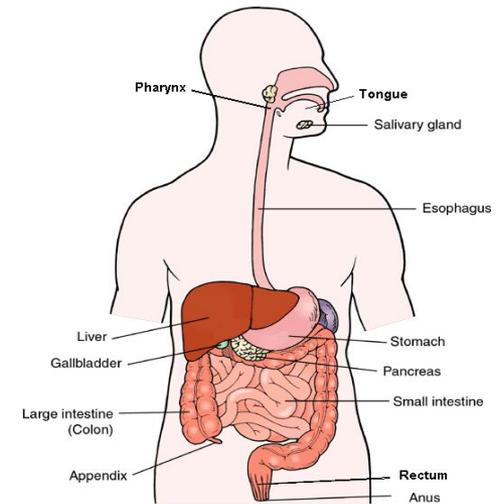
## Physiology of digestion & absorption

- Acid base balance / pH
- Adequate smooth muscle tone
- Acid secretion in the stomach
- Pancreatic enzymes in the intestine
- Bile
- Integrity of the GI mucosa for protection and absorption

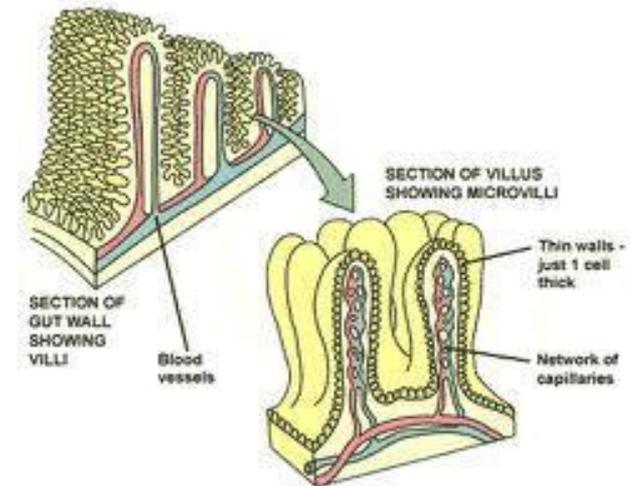
## Features adversely affecting Digestion:

- Inadequate Chewing
- Hypochlorhydria (low stomach acid)
- Chronic inflammation
- Chronic hyposecretion of pancreatic enzymes
- Inadequate Bile
- Permeability of the intestine
- Lack of adequate community of beneficial microbes (microbiota)

Digestive System



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Brush Border

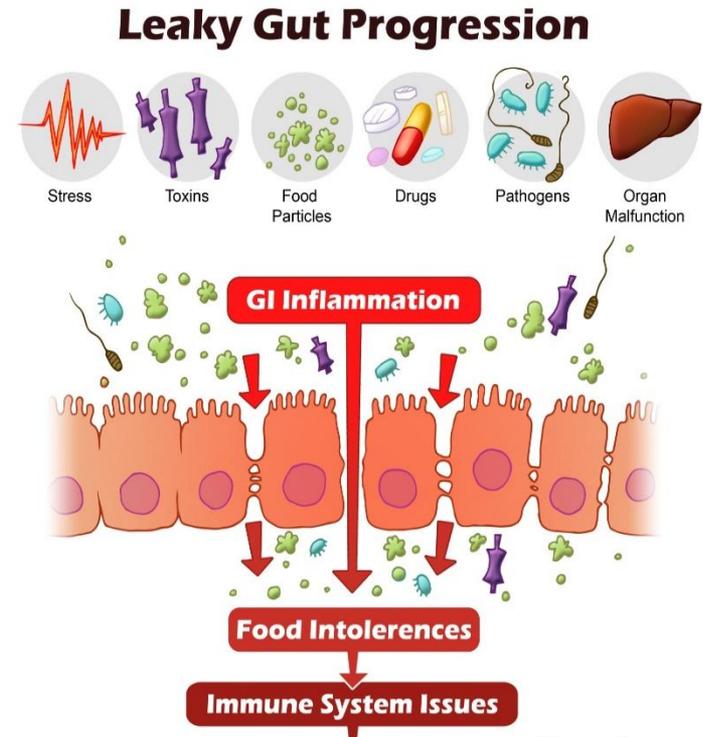
# Permeability

## The Gut and Inflammation in CKD

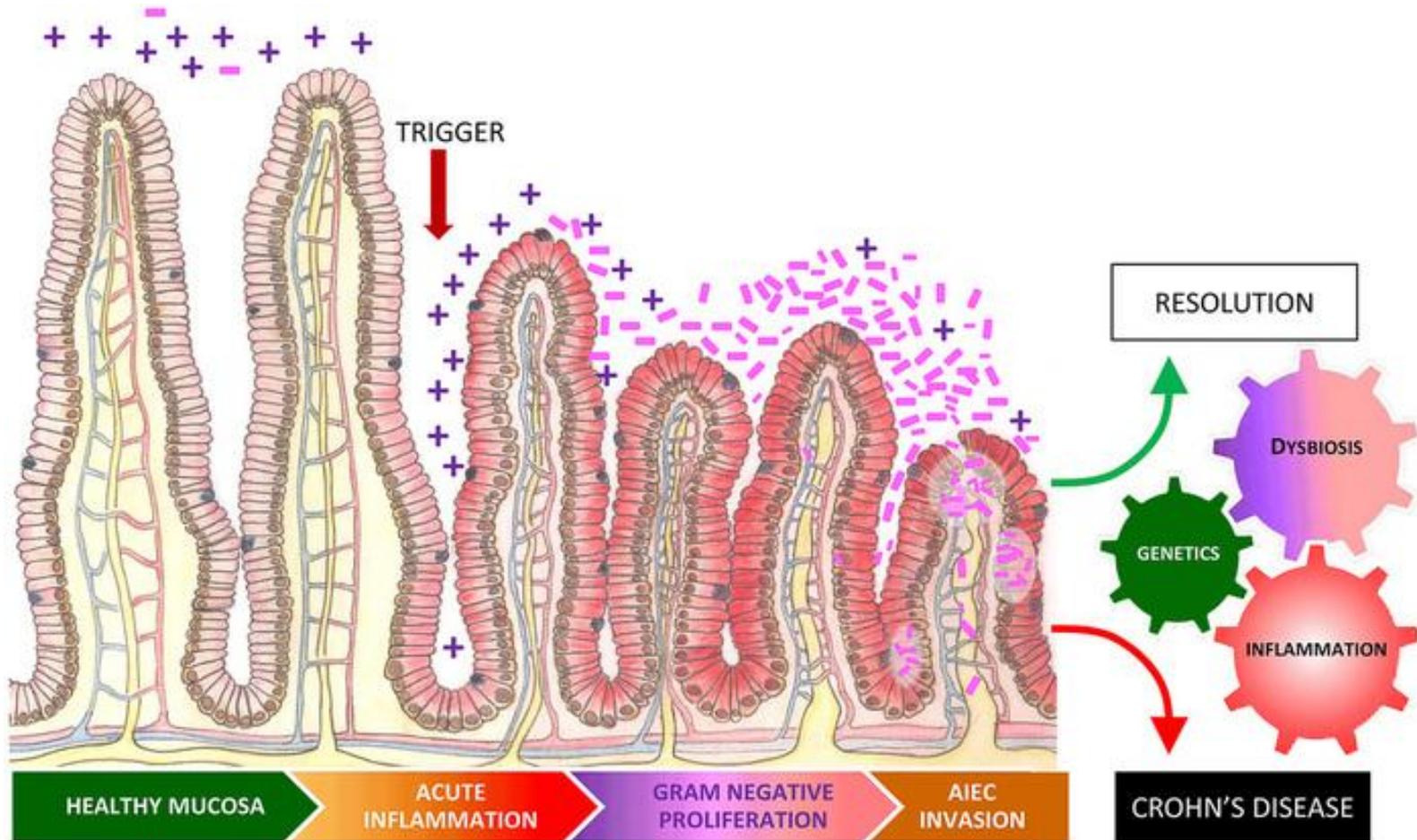
Gastrointestinal tract is a major instigator of systemic inflammation in CKD:

- Colon wall inflammation
  - is associated with epithelial tight junction barrier breakdown
  - and translocation of bacterial DNA and endotoxin into the bloodstream
- CKD diet is the culprit
  - low fiber and low symbiotic organisms
  - alters the normal gut microbiome
  - leads to overgrowth of bacteria

*Lau et al 2015*



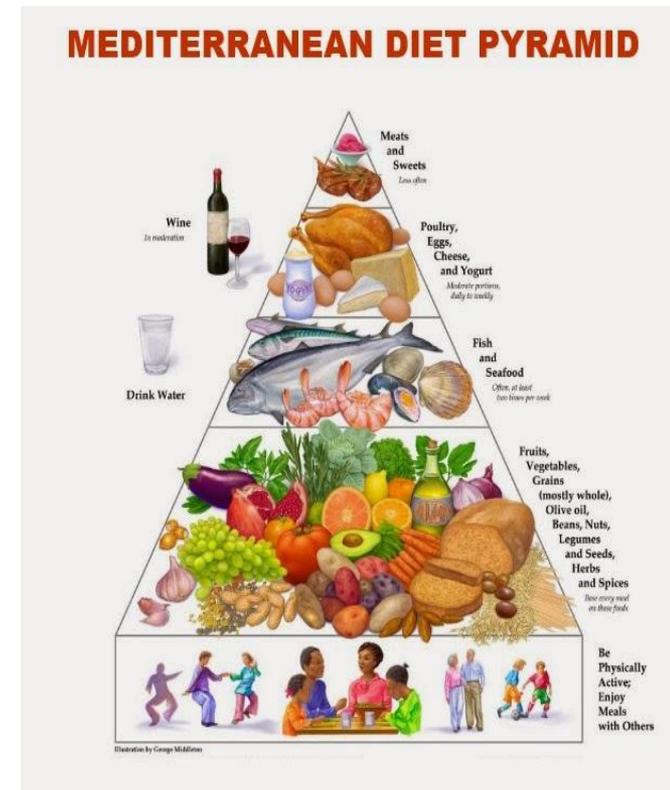
# Dysbiosis and Intestinal Mucosa



# Microbiota: The missing link?

- The microbial community found in the large intestine.
- Supplementary organ or symbiotic
- Aids digestion through Catabolic pathways:
  - ❖ Saccharolytic (fermentation)
    - ✓ Mediterranean Diet
    - ✓ high fiber, antioxidants
  - ❖ Proteolytic (putrefaction /dysbiosis)
    - ✓ Western Diet
    - ✓ Uremic toxins
- Influences immunity
- Metabolism
- Health Status
- Data indicates that the progression of CKD is strictly related to the composition of microbiota *Felizardo et al 2012*

vicious cycles



# Restoring Microbiota: Nutritional Approaches

- Probiotic Biologicals

- Lactobacillus acidophilus
- Bifidobacterium

- Prebiotics

- Inulin
- Galactooligosaccharides

- Other

- Lubiprostone
- Activated carbon adsorbents



## Foods High in Inulin



Wheat



Shallots  
and red onions



Jerusalem  
artichokes



Chicory root



Rye



Leeks  
(the bulb)

## Benefits:

- improving dysfunction of CKD patients with their gut microbiota dysbiosis
- reducing uremic toxins
- inhibiting systemic micro-inflammation
- Delaying CKD progression

## Future Study

- Interventional studies targeting the gut microbiota-related pathological factors
- tight junction proteins,
- helper T cells and regulatory T cells in the intestinal tract of the advanced CKD patients will become one of the key development directions in the future.



# Herbs and Good Diet

Uses of herbs for digestion

- Anti-inflammatory
- Anti-microbial
- Astringents
- Demulcent
- Bitters
- Tonify and Restore with Bitters
- Nervines / Hypnotics
- Carminative



# Other Ways of Shoring up the Gut

- Glutamine
  - important fuel for intestinal mucosal cells and aids in their repair
  - preventing the translocation of microbes and endotoxins into the body
  - Sources : Bone Broth, Cabbage, Eggs, Wheat, Soybeans, Fermented foods (miso, yogurt)



- Butyric Acid
  - Fuel of choice for the large intestine

- Fermented Foods
  - Kimchi
  - Kombucha
  - Sauerkraut



- Colostrum
  - Improves gut permeability ; prevents permeability of the gut

# Common Culinary Herbs to Eat Daily

- Common Kitchen herbs to encourage daily

- Garlic, Turmeric, Cinnamon, Ginger

- Cumin, Clove, Rosemary, Sage, Thyme

- Antimicrobial Herbs Specifically

- *Allium sativum* (Garlic)

- *Thymus vulgaris* (Thyme)

- *Commiphora molmol* (Myrrh)

- *Salvia officinalis* (Sage )



Both are Sage

# Simple Solution *That Njeri Proposes*

## Put it into Action:

- a fresh raw lettuce or cabbage salad daily
- made with homemade salad dressing (using good quality olive oil, fermented vinegar ) and with fresh sage, thyme, ginger, garlic daily
- A 4oz cup of ginger, cinnamon, clove tea 2-3 times daily
- 1-3 oz of Kombucha with meals or ½ teaspoon sauerkraut or kimchi with meals either / or.



# Herbs for Heartburn /GERD



Marshmallow

- *Althea officinalis* (Marshmallow)
  - demulcent
- *Calendula officinalis* (Calendula)
  - demulcent , vulnerary, Astringent and anti-inflammatory
- *Matricaria recutita* (German Chamomile)
  - anti-inflammatory & Carminative



Calendula

**Formula** – 2 parts Marshmallow and 1 part Calendula and Chamomile; pour 8 oz boiling water over 1-2 tsp cover and let steep for 10 minutes.

# Herbs for Indigestion

- *Matricaria recutita* (German Chamomile)
  - anti-inflammatory, Carminative, bitter, nervine)
- *Mentha piperita* (Peppermint) or *Melissa officinalis* (Lemon balm)
  - anti-inflammatory
- *Gentiana lutea* (Gentian)
  - bitter
- *Valeriana officinalis* (nervine)



Chamomile



Gentian

**Formula** – 1 part of each; pour 1 cup of boiling water over 1 – 2 teaspoons, let steep covered for 10 minutes



Peppermint



Valerian

# Nausea / Vomiting



- *Zingiber officinale* (Ginger)



- *Foeniculum vulgare* (Fennel)



# Restorative Effects of Antioxidants

- N-acetyl cysteine  
NAC,
- Vitamin C,
- Vitamin E
- Magnesium

## MAGNESIUM RICH FOODS



VitaminsHub.com



# Other Beneficial Supplements in CKD

- Omega 3 Fatty Acids (alpha-linolenic acid / ALA)
  - Essential fatty acid deficiency and Pruritus (itching)
  - Improves cardiovascular function
  - Fish oil (ALA ) vs non fish (ALA )
  - Encourage daily intake of deep sea cold water fish (cod, salmon, herring, halibut, trout, sardines, mackerel)
  - Encourage grass fed pasture raised beef as resources permit.
  - Dosage : 1 – 10 g /day
- B Vitamins
- Vitamin E





# Herbs for Cardiovascular Health



## Culinary Herbs to include in Daily Meals

- ***Allium Sativum*** (Garlic)
  - 1 fresh clove should be added to the daily diet
  - Consider adding garlic and onions to cooked and raw dishes
  - A homemade salad dressing is an excellent way to incorporate onions and raw garlic with heart health olive oil
- ***Capsicum annum*** (Cayenne pepper)
  - Circulatory and digestive stimulant
  - Can block pain and itch topically



## Consider These as Teas at least once daily

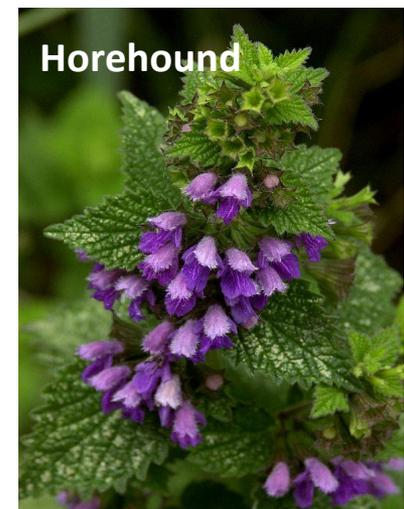
*(with Caution and with Considerable Involvement with the Physician monitoring).*

- ***Crataegus spp*** (Hawthorn)
  - Hypertension in general or with headache and/ or palpitation
- ***Tilia platyphyllos*** (Linden)
  - Hypertension in general with palpitations
- ***Viburnum opulus*** (Cramp bark)
  - Hypertension with indigestion and / or bronchitis or debility
- ***Valerian officinalis*** (Valerian)
  - Hypertension with indigestion and / or stress, menstrual cramps
- ***Scutellaria lateriflora L*** (Skullcap)



# Cough & Upper Respiratory

- ***Hyssopus officinalis* (Hyssop)**
  - Use for general cough and common cold
  - Antispasmodic & expectorant
  - Diaphoretic & anti-inflammatory
  - Nervine & carminative
- ***Verbascum thapsus* (Mullein)**
  - acute hard dry cough & Expectorant
  - Demulcent & vulnerary (soothes sore throats)
  - Anti-inflammatory & Antispasmodic
- ***Thymus vulgaris* (Thyme)**
  - Anti microbial (against E. coli, Listeria, Streptococcus, Salmonella)
  - Antiviral, anti-oxidant, astringent, anti-inflammatory
- ***Marrubium vulgare* (Horehound)**
  - Use for unproductive cough and bronchitis
  - Expectorant, antispasmodic, bitter, vulnerary, emmenagogue
  - Asthma, hoarseness, some dyspepsia



Questions?



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