# Nutritional issues in inflammatory bowel disease

Brian Behm MD MS
Associate Professor of Medicine
Division of Gastroenterology
University of Virginia
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# Objectives

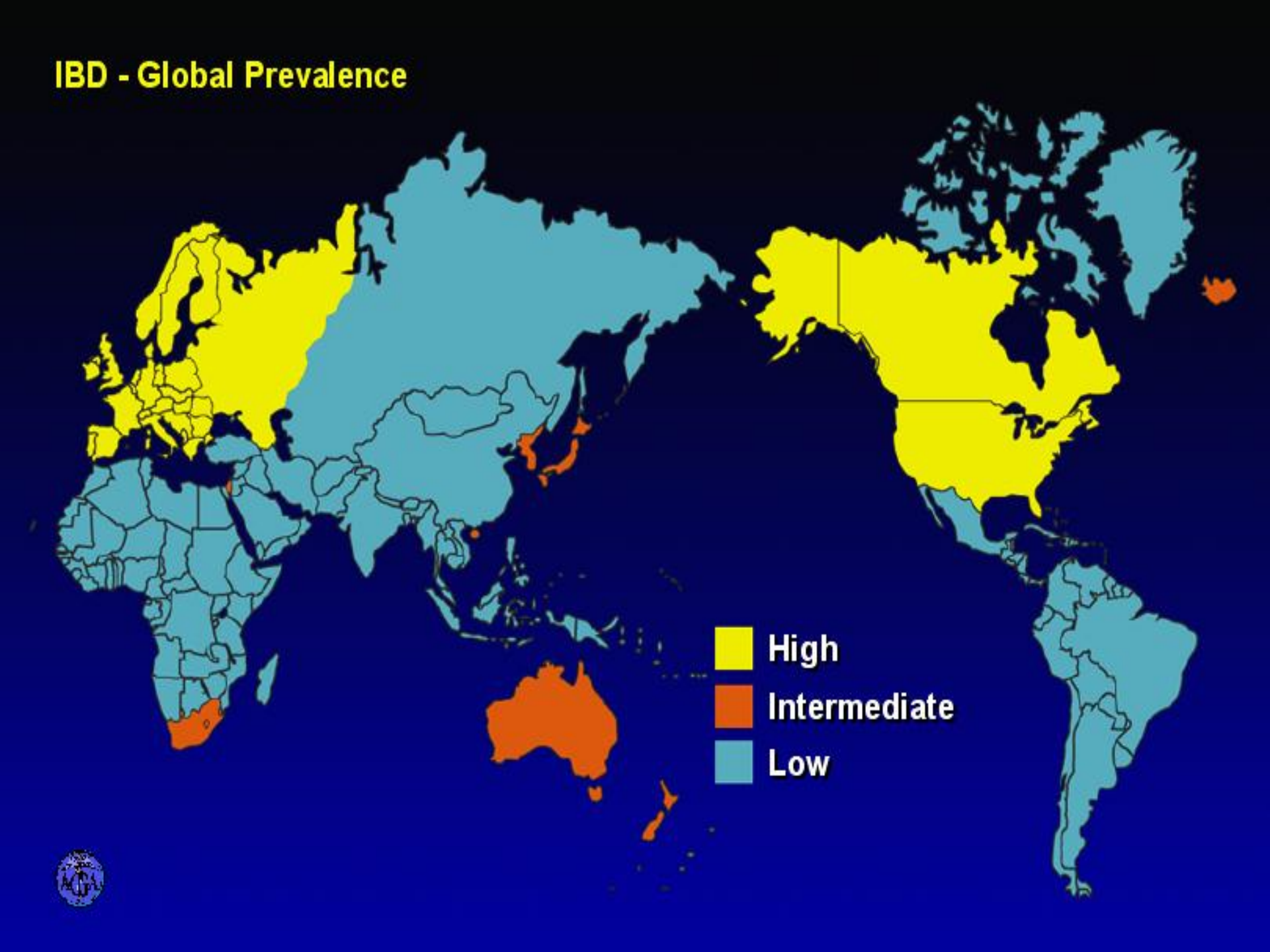
- Identify disease factors that impact the nutritional status of patients with inflammatory bowel disease (IBD)
- Review pathophysiology and potential treatment options for IBD
- Discuss the impact of diet, probiotics, prebiotics on IBD activity

# Inflammatory bowel disease: overview

- Epidemiology
  - Prevalence:  1-1.5 million in U.S.
  - Peak incidence:  15-30 years
  - Annually: 6 million outpatient visits, 170K hospitalizations
  - > $6 billion direct costs annually

The cause of IBD remains unknown
There is no cure for IBD, only “remission”

# IBD - Global Prevalence



# Changes in IBD Incidence

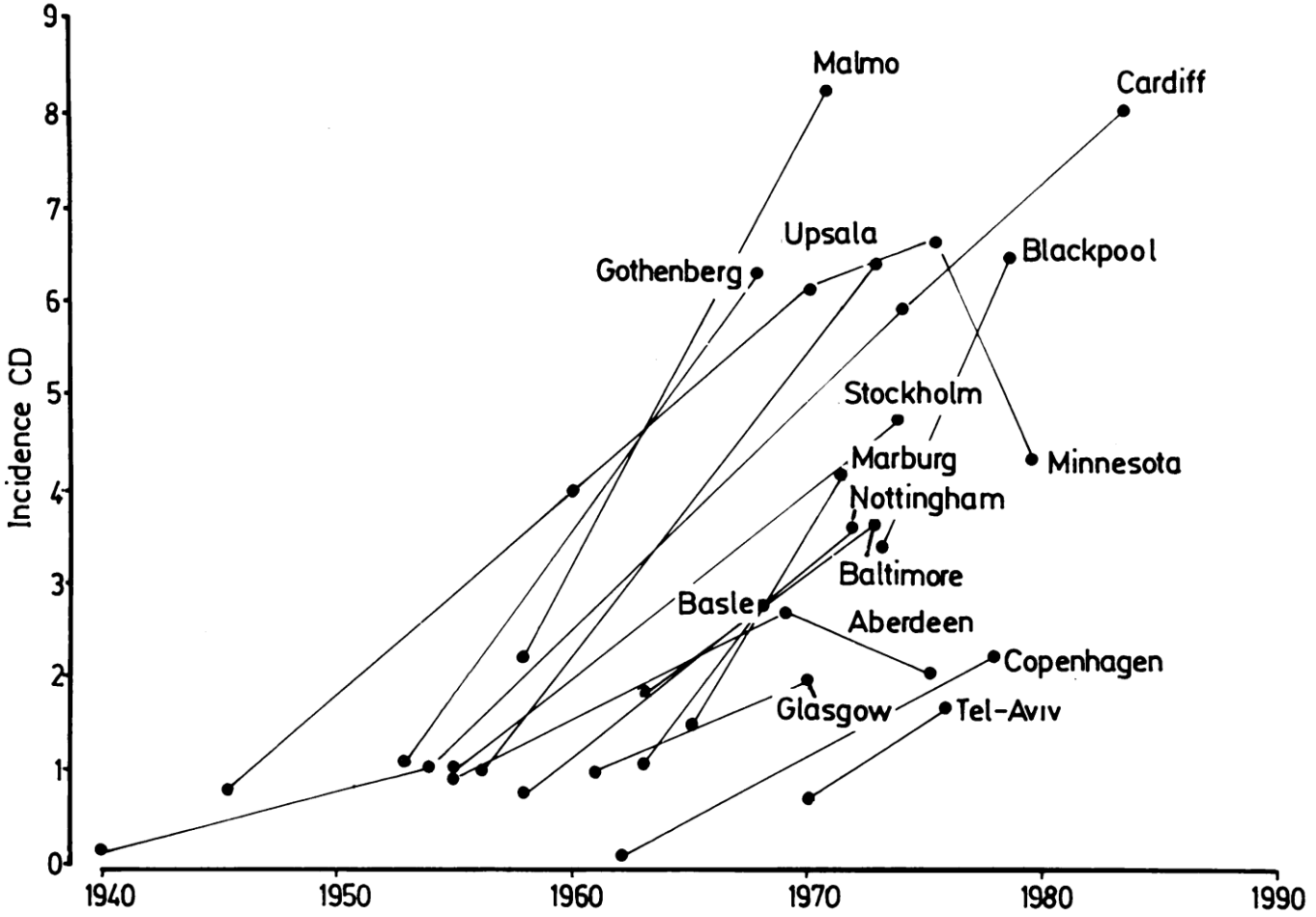



Fig. 5 *Changes in the incidence of Crohn's disease in recent decades in various geographical areas. Initial and most recent figures are given with occasional intermediate figures.*


- Diffuse mucosal inflammation limited to colon
- Affects rectum
- May involve all or part of rest of colon

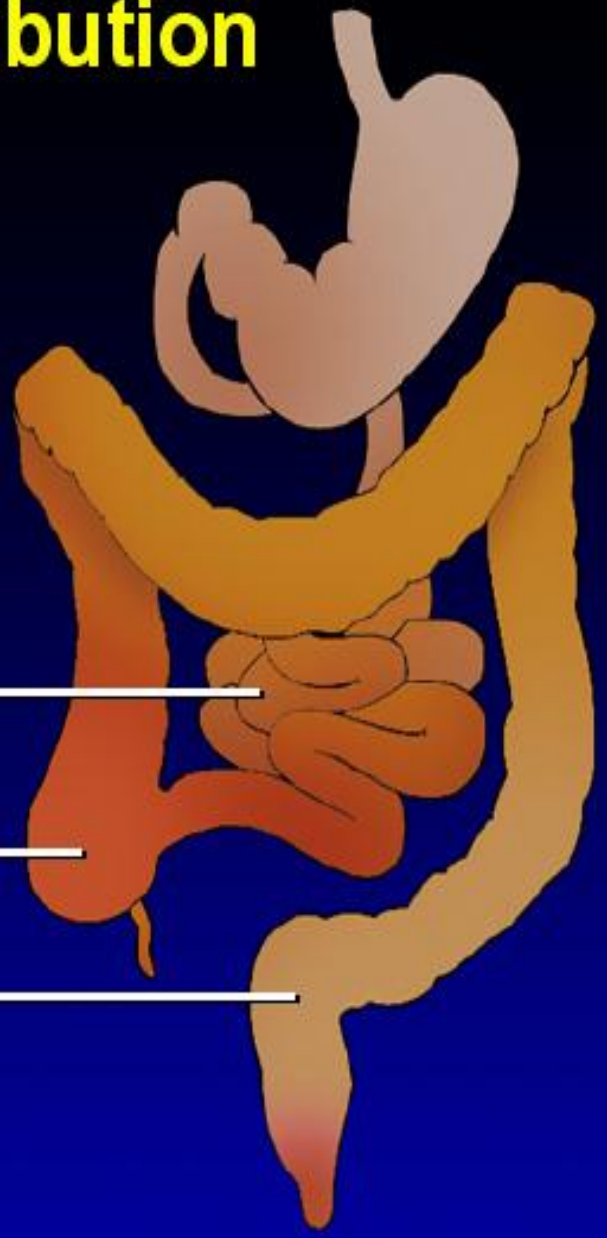

- Patchy transmural inflammation
- May affect any part of GI tract

CD

# Anatomic Distribution

Freq. of involvement

most — least

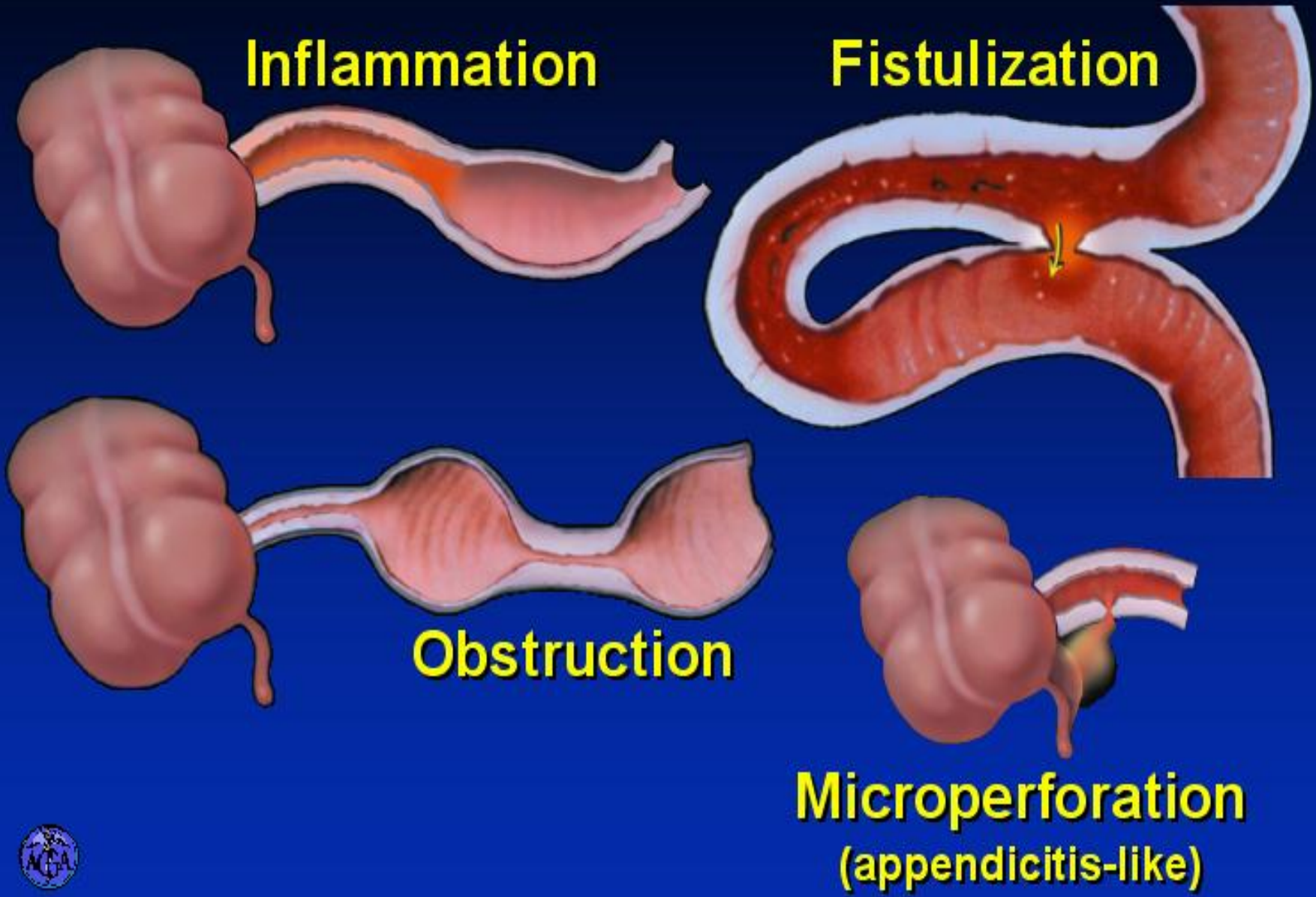


Small bowel alone 33%

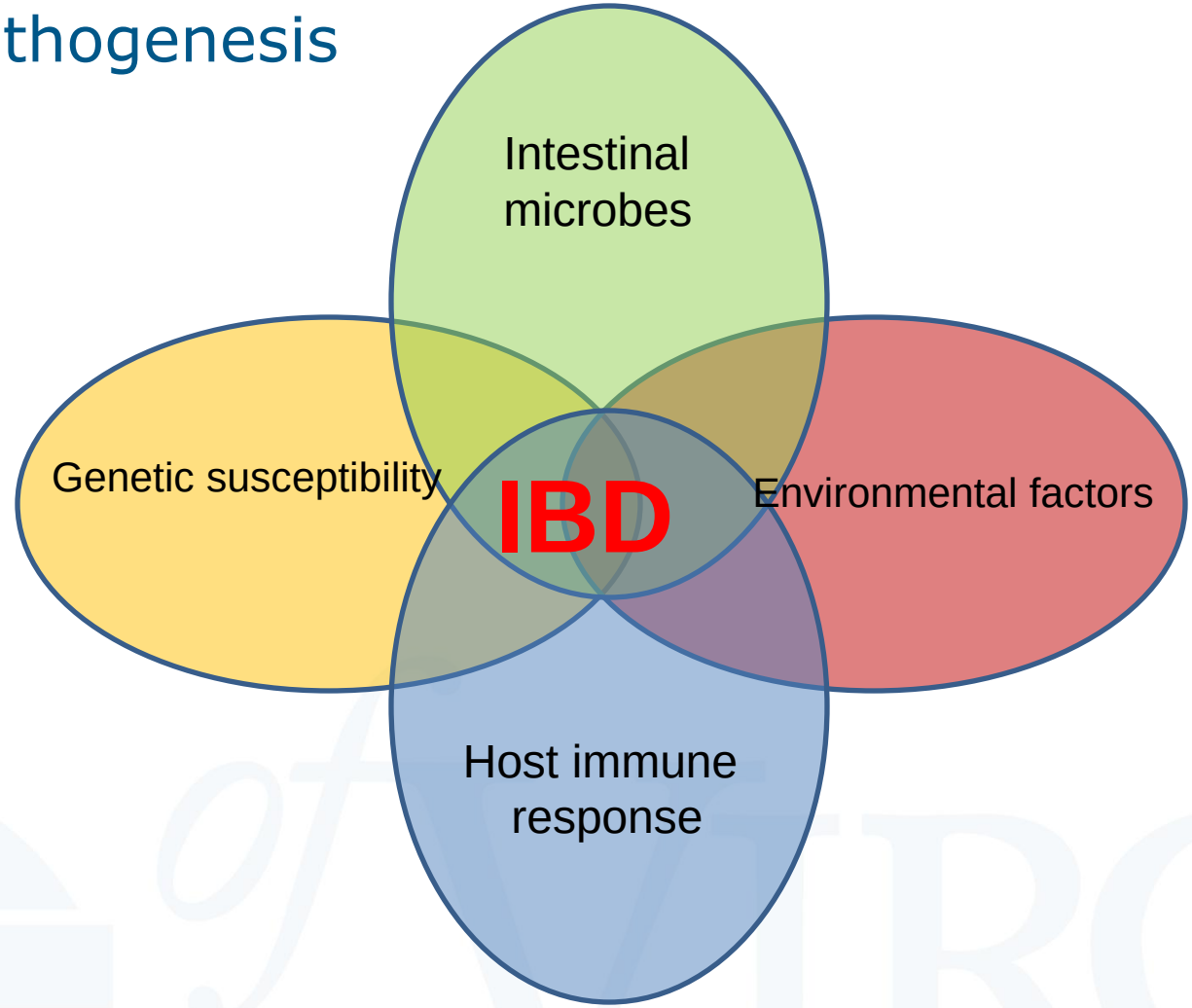
Ileocolic 45%

Colon alone 20%

## CD - Clinical Patterns



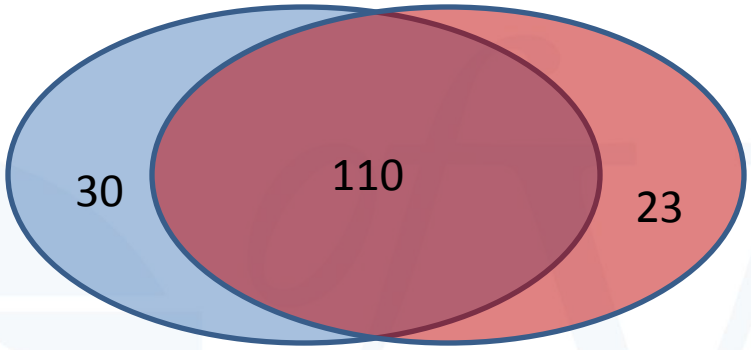
# IBD pathogenesis




Sartour Mucosal Imm 2011

# IBD Genetics

- 163 IBD-associated loci
  - More than any other chronic disease
- Crohn's – stronger genetic component than UC (twin studies- 50 v 19%)




Halfvarson Gastroenterology 2003;124:1767
Jostins et al. Nature 2012;490:119

# The human microbiome

>1000 species in gut microbiome.

Stomach-nearly sterile in presence of gastric acid

Small intestine
$10^4$ - $10^7$ microbes

Colon
>$10^{14}$ total microbes

10x number of cells in the body
150x number of genes

Bajzer M.& Seeley, RJ (2006) *Nature* **444**, 1009

# Diseases associated with “dysbiosis” of gut microbiota

- **Inflammatory bowel disease**
- **Irritable bowel syndrome**
- **NAFLD**
- **Obesity/metabolic syndrome**
- **Type 1 Diabetes**
- **Coronary artery disease**

Nature 2011;472:40

# Host immune response- double-edged sword

Inflammatory response is required for pathogen defense, but causes tissue damage

Crohn's disease: Too little innate immunity

Ulcerative colitis: Too much innate immunity

# Factors altering nutritional status in IBD

- Decreased intake/anorexia
- Nausea, vomiting, diarrhea
- Restrictive diets
- Medication side effects
- GI blood loss
- Protein loss from intestinal inflammation
- Malabsorption
- Surgical resections
- Increased vitamin and mineral needs
- Bacterial overgrowth

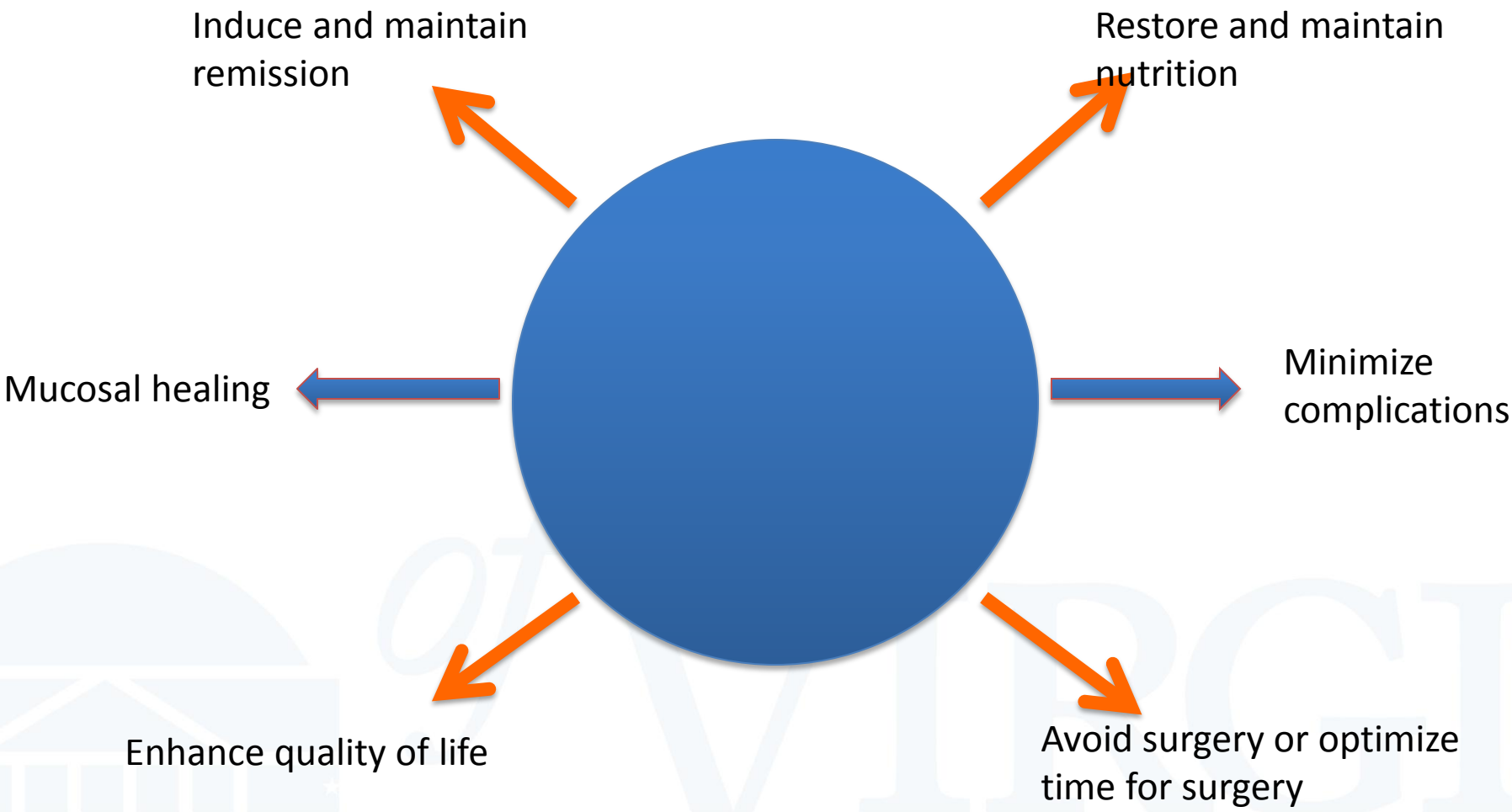
Adapted from: Eiden KA. Practical Gastro 2003

# IBD flares

- 85% hospitalized IBD patients have protein-energy malnutrition

Graham TO Gastroenterol Clin N Am 2002;31:203

# Goals of Therapy for IBD



# Ulcerative Colitis

- Induction
  - 5-Aminosalicylates
  - Corticosteroids
  - Cyclosporine
  - Anti-TNF
    - Infliximab
    - Adalimumab
    - Golimumab
    - Vedolizumab

Maintenace

- 5-Aminosalicylates
- Azathioprine/6MP
- Anti-TNF
  - Infliximab
  - Adalim
  - Golim
  - Vedol

# Crohn's disease

- Induction
  - 5-ASA
  - Corticosteroids
  - Biologics
    - Infliximab
    - Adalimumab
    - Certolizumab pegol
    - Natalizumab
    - Vedolizumab

Maintenance

- Azathioprine/6-MP
- Methotrexate
- Biologics
  - Infliximab
  - Adalimumab
  - Certolizumab pegol
  - Natalizumab
  - Vedolizumab

# IBD diet

- General recommendation- follow a normal healthy diet as tolerated
- lactose intolerance 10-20% of IBD patients
- Enteral nutrition may induce remission in Crohn's
- Elemental, semi-elemental, polymeric formulas

Bernstein Am J Gastroenterol 1994;89:872

# Probiotics in IBD

- Crohn's disease- no evidence
- Ulcerative colitis – possibly (E coli Nissle 1917, VSL#3 for maintenance of remission)

Cochrane Database Syst Rev 2006;CD004826, 2008;CD006634

# Diet modification

- Conflicting data on benefits of low carbohydrate diets, fiber, omega-3, antioxidants.

# Total parenteral nutrition

- AGA position statement- no benefit in the routine treatment of IBD
- Increased risk

Gastroenterology 2001;121:970