Inflammatory Bowel Disease

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Overview of Talk

- Background
- Crohn’s Disease vs Ulcerative Colitis
- Epidemiology and Pathophysiology
- Goals of IBD Therapy
- Diet and IBD

If time: Diagnostic Testing in IBD, Routine Health Care

No financial disclosures or potential conflicts of interest
Slides courtesy of the American Gastroenterological Association and Takeda IBD Insights

Educational Awareness

Inflammatory bowel disease (IBD) – Crohn’s disease (CD) and ulcerative colitis (UC)
Characterized by chronic inflammation of the gut
- ~1.5 million Americans, over 2 million Europeans, increasing in developing countries
  - Prevalence ~200-250 per 100,000 adults
  - Incidence rates: 5-15 cases per 100,000 p-y
- Annual costs in the US healthcare system
  - Direct costs $6.3 billion
  - Indirect costs an additional $3.6 billion

Background


Clinical Presentation

- Chronic inflammation impairs GI tract function…
- Symptoms:
  - Diarrhea, abdominal cramps/pain, rectal bleeding
  - Urgency, nocturnal bowel movements
  - Weight loss, fatigue, night sweats
  - Signs of malnutrition or vitamin malabsorption
  - Constipation, obstruction
  - Fistulas, abscesses
  - Asymptomatic!

If Only We Got Paid for Bowel Movements…

Crohn’s Disease vs. Ulcerative Colitis

<table>
<thead>
<tr>
<th>Crohn’s Disease</th>
<th>Ulcerative Colitis</th>
</tr>
</thead>
<tbody>
<tr>
<td>GI tract involvement</td>
<td>Any portion of the GI tract (*ileum and colon most common)</td>
</tr>
<tr>
<td>Tissue layers</td>
<td>Full-thickness (transmural)</td>
</tr>
<tr>
<td>Tissue layers</td>
<td>Mucosal layer</td>
</tr>
</tbody>
</table>
Ulcerative Colitis

- Begins in rectum or left colon, but can spread to involve entire colon
- Continuous

~50% with proctitis develop more extensive disease over time
Complications of UC:
- Toxic megacolon
- Bowel perforation

Crohn’s Disease

- Granuloma
- Focal lesions
- Asymmetric involvement
- Skip lesions
- Small bowel involvement
- Fistulization
- 20-30% without gross bleeding
- Rectal sparing
- Perianal disease

Crohn’s Disease

- Increased risk: factors include disease duration, extent, severity; family history, primary sclerosing cholangitis (PSC)
- Screen every 1-3 years after 8 years of disease
- PSC: start immediately, screen every year

Colorectal Cancer
Colorectal Cancer

- Increased risk: factors include disease duration, extent, severity; family history, primary sclerosing cholangitis (PSC)
- Screen every 1-3 years after 8 years of disease
- PSC: start immediately, screen every year
- Colonoscopy (Chromoendoscopy preferred)
  - Methylene blue or Indigo carmine

Eye Manifestations

- Occur in up to 10% of patients with IBD
- Types: anterior uveitis (iritis), scleritis, episcleritis
- Can be associated with IBD activity (especially scleritis or episcleritis)
- If you have eye pain, redness, blurry vision, burning, itching → let your Doc know!
- Evaluation: Ophthalmology

Bone and Joint Manifestations

- Occurs in up to 30% of IBD patients
- Several different types!
  - Axial: sacroiliitis, ankylosing spondylitis
    - Low back pain/stiffness
    - Limited ROM
    - Worse in the morning, w/ rest
    - Better with exercise
    - Not associated with IBD activity
  - Peripheral
    - Asymmetric, large joints
    - Joint pain, swelling, limited ROM
    - Associated with IBD activity
- Consider imaging, referral to Rheumatology

Erythema Nodosum

- Inflammation of subcutaneous tissue
- Painful, tender, red subcutaneous nodules, usually on legs
- 15% of CD patients, 5% of UC patients
- More common in young women
- Correlates with IBD activity
- Generally responds to treatment of IBD
**Pyoderma Gangrenosum**

- Ulcerative inflammatory skin disease in up to 12% of IBD patients
- Starts out like a pimple/pus-filled lesion, progresses to an ulcer
- Course is NOT associated with IBD
- Treatment: usually steroids and immunosuppressants

**Hepatobiliary Manifestations**

- Bile Ducts
  - Primary sclerosing cholangitis
  - Gallstones
- Liver
  - Autoimmune hepatitis
  - Drug-related liver injury

**Epidemiology of IBD**

- Age: Peak onset 15-30 years old, second peak in 60s
- Ethnicity: More common in Caucasian and Ashkenazi Jews
- Family History: 3-20x increased risk 1st degree relative
  - "Genetic anticipation"
- Geography: More common in developed countries, increasing in developing countries (urbanization, hygiene hypothesis, "westernization" of diets)
  - North-to-south variation
- Tobacco Use: UC — more common in nonsmokers or former smokers
  - CD — more common in smokers

**Understanding the Causes of IBD**

- Genetics
  - Over 200 potential susceptibility genes identified
  - Genes involved in intestinal function, mucosal barrier function
- Environment
  - Environmental antigens (e.g., tobacco, vitamin D, NSAIDs, stress, diet, infection) may be the direct cause of inflammation or affect immune function
- Immune System
  - Alterations in gut bacteria (microbiome) may stimulate immune system to produce inflammation
  - Once inflammation is triggered, the IBD patient's immune system has difficulty "turning off" the immune response

**Summary on Risk Factors for IBD (NHS studies)**

<table>
<thead>
<tr>
<th>Risk factors</th>
<th>Method of Assessment</th>
<th>Disease</th>
<th>Effect Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vitamin E</td>
<td>Prediction score</td>
<td>Crohn's disease</td>
<td>OR 0.59 (0.39 - 0.89) (Q4 vs. Q1)</td>
</tr>
<tr>
<td>NSAID use</td>
<td>Q4 score</td>
<td>Crohn's disease</td>
<td>OR 1.59 (0.99 - 2.56) (vs. non-users)</td>
</tr>
<tr>
<td>NSAID use</td>
<td>Q4 score</td>
<td>Ulcerative colitis</td>
<td>OR 1.87 (1.06 - 3.39) (vs. non-users)</td>
</tr>
<tr>
<td>Depression</td>
<td>MMH-5 Questionnaire</td>
<td>Crohn's disease</td>
<td>OR 2.06 (1.40 - 3.08) (vs. MMH-5.58-100)</td>
</tr>
<tr>
<td>Dietary fiber</td>
<td>Semi-quantitative food frequency questionnaire</td>
<td>Crohn's disease</td>
<td>OR 0.62 (0.40 - 0.95) (Q5 vs. Q1)</td>
</tr>
<tr>
<td>One Contraceptive use</td>
<td>Questionnaire</td>
<td>Ulcerative colitis</td>
<td>OR 2.64 (1.32 - 5.34) (current vs. non-users)</td>
</tr>
<tr>
<td>Postmenopausal Hormone use</td>
<td>Questionnaire</td>
<td>Ulcerative colitis</td>
<td>OR 1.74 (1.09 - 2.77) (current vs. non-users)</td>
</tr>
</tbody>
</table>
Summary on Risk Factors for IBD (NHS studies)

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<th>Risk factors</th>
<th>Method of Assessment</th>
<th>Disease</th>
<th>Effect Size</th>
</tr>
</thead>
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<tr>
<td>Vitamin D</td>
<td>Predominantly score</td>
<td>Crohn's disease</td>
<td>OR 0.55 (0.33 – 0.90) (OR vs. ON)</td>
</tr>
<tr>
<td>NSAD use ≥ 15 months</td>
<td>Questionnaire</td>
<td>Crohn's disease</td>
<td>OR 1.53 (0.99 – 2.55) (OR vs. non-users)</td>
</tr>
<tr>
<td>NSAD use &lt; 15 months</td>
<td>Questionnaire</td>
<td>Ulcerative colitis</td>
<td>OR 1.87 (1.16 – 3.00) (OR vs. non-users)</td>
</tr>
<tr>
<td>Depression symptoms</td>
<td>MS-15 questionnaire</td>
<td>Crohn's disease</td>
<td>OR 2.36 (1.42 – 3.90) (OR vs. MS-15)</td>
</tr>
<tr>
<td>Dietary fiber</td>
<td>Semi-quantitative food frequency questionnaire</td>
<td>Crohn's disease</td>
<td>OR 0.82 (0.43 – 1.60) (CD vs. ON)</td>
</tr>
<tr>
<td>Alcohol consumption</td>
<td>Questionnaire</td>
<td>Ulcerative colitis</td>
<td>OR 2.44 (1.50 – 4.04) (current vs. non-users)</td>
</tr>
<tr>
<td>Past transfusion</td>
<td>Questionnaire</td>
<td>Ulcerative colitis</td>
<td>OR 1.74 (1.03 – 2.97) (current vs. non-users)</td>
</tr>
</tbody>
</table>

Normal Host Defenses in the Gut

IBD: Aberrant and Persistent Immune Response Results in Chronic Inflammation
Persistent Infiltrating Lymphocytes is a Hallmark of IBD

Inappropriate and sustained recruitment of inflammatory T cells

Chronic Inflammation Can Lead to Structural Damage Over Time in IBD

Abnormal immune response — Clinical manifestations — Complications — Surgery

Time

Subclinical inflammation — Clinical inflammation — Late clinical phase

Inflammation of bowel structure and function

Symptoms don’t always correlate with inflammation!

Surgery and IBD

- If IBD is not controlled it usually leads to surgery
  - Chance of requiring surgery for Crohn’s disease
    - Within 1 year of diagnosis = 40%
    - Within 5 years of diagnosis = 50%
    - Within 20 years of diagnosis = 80%
  - Chance of requiring surgery (colectomy) for ulcerative colitis
    - With 20 years of diagnosis = 20%

Goals of IBD therapy

- To get our patients feeling well
- To keep our patients feeling well
- To get our patients OFF of prednisone

Therapeutic Goals in IBD

Short Term

| Clinical Remission | Endoscopic Remission | Normalize Quality of Life |

Therapeutic Goals in IBD

**Short Term**
- Clinical Remission
- Endoscopic Remission
- Normalize Quality of Life

\[ \Rightarrow \text{Deep Remission} \]

**Long Term**
- Decrease Flares
- Decrease Hospitalizations
- Prevent Complications
- Maintain Healing

Overview of the Drugs for IBD

**Traditional IBD management:**
- "Step-up" approach
- Step-wise progression based on disease severity or failure at a prior step
- Conservative use of immunomodulators and biologics

For moderate-to-severe IBD:
- "Top-down" approach
- Choice based on RISK
- Goal: modify the progressive and destructive course of disease

Decision is complex! Think about disease-appropriate therapy

Defining Disease Severity in Inflammatory Bowel Diseases: Current and Future Directions

Sousa Guerreiro, Am J Gastro, 2007

**Table 1. Proposed Potential Criteria to Classify Disease Severity in Inflammatory Bowel Diseases**

- Impact of disease on patient
- Clinical symptoms
- Quality of life
- Disability
- Inflammatory burden
- Comorbid conditions
- Mental balance
- Upper gastrointestinal involvement
- Disease extent
- Disease course
- Structural damage
- History of intestinal resection
- Familial disease
- Number of flares
- Extraintestinal manifestations

Diet and IBD

- Confusing!
- We are still learning...
- Important for docs to assess eating habits and nutritional status → modification/repletion can improve well-being and symptoms
- How does diet influence IBD? Still lots of questions...
  - Diet can impact symptoms, effects of complications (strictures, fistulas, short gut), and potentially disease activity
  - Data is limited, options are varied, and we cannot predict how any individual patient will respond
- We need skilled dieticians for patients with IBD
How are Diet and IBD Associated?

- Incidence of IBD is increasing, especially among Asians and Hispanics, and in developing countries

How Does Diet Impact IBD?

- Early life exposure to bacteria that survive in refrigeration (Crohn’s disease)
- Bacterial penetration to and across epithelial barrier due to epithelial injury and/or dysfunction
  - Emulsifiers (Crohn’s disease)
  - Explosive FODMAP fermentation (Crohn’s disease)
  - NO-sulphide exposure (ulcerative colitis)
- Altered immune responsiveness due to indigestible particles (Crohn’s disease)
- Alterations in lipid exposure (Crohn’s disease)

Nutritional Deficits in IBD

- Decreased intake
  - Lack of desire to eat
  - Inability to tolerate foods
- Decreased absorption of nutrients
  - Nutrient absorption occurs in small intestine
  - Inflammation, surgery
- Active disease
  - Impaired fluid absorption
  - Dysbiosis
  - Protein and blood loss
  - Drug loss!
- All of these can result in weight loss

Nutritional Deficiencies

<table>
<thead>
<tr>
<th>Micronutrient</th>
<th>Ulcerative colitis (%)</th>
<th>Crohn’s disease (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Iron</td>
<td>81</td>
<td>39</td>
</tr>
<tr>
<td>B12</td>
<td>5</td>
<td>48</td>
</tr>
<tr>
<td>Folic acid</td>
<td>35</td>
<td>54-67</td>
</tr>
<tr>
<td>Potassium</td>
<td>6-20</td>
<td></td>
</tr>
<tr>
<td>Magnesium</td>
<td>14-33</td>
<td></td>
</tr>
<tr>
<td>Vitamin A</td>
<td>26 – 93</td>
<td>11 – 50</td>
</tr>
<tr>
<td>Vitamin D</td>
<td>35</td>
<td>75</td>
</tr>
<tr>
<td>Zinc</td>
<td>40-50</td>
<td></td>
</tr>
</tbody>
</table>
Table 3 | Key micronutrients commonly at risk of deficiency in patients with IBD

<table>
<thead>
<tr>
<th>Micronutrient</th>
<th>At-risk individuals</th>
<th>Method of detection</th>
<th>Food sources</th>
<th>Common consequences of deficiency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Iron**</td>
<td>Those with active disease, vegetarians, and vegans; pre-menopausal women</td>
<td>Serum ferritin levels, transferrin saturation, transferrin receptor levels</td>
<td>Red meat, offal</td>
<td>Anemia, fatigue, weakness, brittle nails</td>
</tr>
<tr>
<td><strong>Vitamin D</strong></td>
<td>Those with active disease, vegetarians, and vegans; pre-menopausal women</td>
<td>Serum concentrations of 25(OH) vitamin D</td>
<td>Limited amount in fortified foods (e.g., margarine, milk)</td>
<td>Disturbed calcium homeostasis and bone health, possible enhancement of inflammatory activity</td>
</tr>
<tr>
<td><strong>Vitamin B12</strong></td>
<td>Vegetarians and vegans; leafy vegetables or refection</td>
<td>Serum concentrations of vitamin B12, homocystein, methylmalonic acid levels when uncertainty</td>
<td>Animal-based foods</td>
<td>Anemia, fatigue, neurological effects</td>
</tr>
<tr>
<td><strong>Zinc</strong></td>
<td>Vegetarians and vegans; chronic diarrhea</td>
<td>Plasma concentration (invasive indicator of decreased zinc stores)</td>
<td>Meat, fortified cereals</td>
<td>Impaired healing, disturbed wound healing, delayed growth in children</td>
</tr>
<tr>
<td><strong>Folate</strong></td>
<td>Those on restricted or elimination diets, medications therapy</td>
<td>Serum folate levels</td>
<td>Whole grains, leafy green vegetables, fortified cereals</td>
<td>Anemia, fatigue</td>
</tr>
<tr>
<td><strong>Calcium</strong></td>
<td>Restriction of dairy</td>
<td>Serum calcium levels</td>
<td>Dairy, calcium fortified dairy alternatives</td>
<td>Decreased bone density</td>
</tr>
<tr>
<td><strong>Magnesium</strong></td>
<td>Chronic or severe acute diarrhea</td>
<td>Serum magnesium levels</td>
<td>Leafy green vegetables, soybean</td>
<td>Disturbed bone health, muscular cramps, fatigue</td>
</tr>
</tbody>
</table>
Do IBD medications have Nutritional Side Effects?

- **Prednisone**
  - ↓ absorption of calcium and phosphorus from the small intestine
  - ↑ losses of calcium, zinc, potassium and vitamin C
  - Can ↑ protein breakdown
  - With long term use → increased risk of bone loss, cataracts, elevated blood sugars

- **Cholestyramine**
  - ↓ absorption of fat-soluble vitamins (A,D, E and K), as well as folate, vitamin B-12, calcium and iron

- **Sulfasalazine and Methotrexate** interfere with folate absorption
  - 1 milligram folate supplement daily

What Should I Eat?

Nutritional Needs in IBD

- **Protein**
  - Typically about 1 gram per kilogram
  - For weight gain, to restore losses after acute flare, needs may ↑ 50%

- **Fluids and Electrolytes**
  - Requirements increase with diarrhea and with exercise
  - Aim for 64 oz water daily
  - Get electrolytes checked and replenished if needed. Sodium, chloride and potassium can be replenished by drinking sports drinks (eg, Pedialyte, Gatorade)

- **Vitamins and Minerals**
  - Take a multivitamin with minerals each day
  - Vitamin/mineral deficiencies should be assessed and treated

Dietary Goals in IBD

- Adequate fluids and nutrients
- Avoid triggers, keep a food diary
- Carbohydrates with more soluble fiber (rice, oat bran, legumes and barley are best tolerated)
- Proteins like lean meats, fish, eggs, nuts, poultry and soy
- Healthy fats like omega-3 fatty acids, medium chain triglycerides (eg, avocado, coconut)
- Deeply colored fruits and vegetables – consider peels, seeds, and whether to cook
- Dairy/calcium (dairy substitute if you’re lactose intolerant)

Should I Try Any Particular Diet?

- Diet can significantly impact symptoms, potentially modulate disease activity
- **How?**
  - Remove environmental triggers
  - Alter bacterial flora
  - Alter intestinal fluid transport, gas production
- **Elemental diets work, but difficult long term**
- **Defined diets**
  - Specific carbohydrate diet
  - Malaler’s diet
  - Autoimmune protocol diet
  - GAPS
  - Gluten free diet

What Should I Eat? Principles

- Approach during flares
- Approach during remission
- Keep a diary to identify possible trigger foods
- Don’t overly restrict foods → adequate nutrition is important
General Advice for Flares

- Minimize caffeine and alcohol
- Decrease concentrated sweets in your diet, such as juices, candy and soda, to help decrease amounts of water pulled into your intestine, which may contribute to watery stools.
- Low residue diet
  - What is it? Low fiber, easy to digest foods
  - Avoid fresh fruits and vegetables
  - Can help to relieve abdominal pain and diarrhea
- Smaller, more frequent meals are better tolerated

Diet Tips for Crohn’s Flares

- If you have strictures
  - Avoid nuts, seeds, beans and kernels
- If you have lactose intolerance, try a lactose-free diet
- If you have oily and foul-smelling stools, you may have fat malabsorption. Try a low-fat diet.
  - MCTs (medium chain triglycerides) don’t require bile for absorption → oil to incorporate coconut, avocado, etc.

What Do I Do If I Can’t Eat?

- Notify your doctor
- Consider taking nutritional supplements
- Meet with a nutritionist!

Ulcerative colitis

- **Modulen IBD** — A mild formulation, which may help control diarrhea. It also contains a growth factor which may decrease inflammation. It contains MCT oil for better absorption of fat. An 8 ounce serving made from powder provides 240 calories, 9 grams protein; made by Nestle.
- **EnLive!** — Useful for nutrition before surgery, fat malabsorption, lactose intolerance and gluten sensitivity. This is a clear liquid supplement that is a good source of protein and calories. An 8 ounce ready-to-drink box provides 300 calories, 10 grams protein; made by Ross.

Other Dietary Supplement Options

- **Modulen IBD** or Enlive!
- **Peptamen or Peptamen Junior for kids** — Partially digested protein, easier to absorb. Useful if inflammation or portions of digestive tract have been removed. Contains MCT oils that are absorbed more easily, decreasing the undesirable effects of fat malabsorption (diarrhea, gas and bloating). This formula is not highly concentrated, which also may help decrease diarrhea. An 8 ounce ready-to-drink can provides 240 calories, 10 grams protein; made by Nestle. Recommend adding flavor packets to improve palatability.
- **Peptamen 1.5** — Same composition as Peptamen but offers more calories per can. An 8 ounce ready-to-drink can provides 360 calories, 16 grams protein; Nestle.
- **Lipisorb** — High in MCT oil, which is an easily absorbed form of fat — useful for fat malabsorption. An 8 ounce ready-to-drink can provides 325 calories, 14 grams protein; made by Mead Johnson.
- **Subdue** — Partially broken down protein plus MCT oil for better absorption of fat. An 8 ounce ready-to-drink can provides 240 calories, 12 grams protein; made by Mead Johnson.
- **Vivonex** — May be indicated for severe problems with absorption. This formula is very low in fat and is “elemental” or contains completely broken down protein, so the intestines can absorb nutrients easily. An 8 ounce ready-to-drink can provides 240 calories, 11 grams protein; made by Novartis.
- **Optimental** — This product is also elemental (completely broken down proteins) and contains MCT oils for easier absorption. It is lactose free and contains high levels of antioxidants. An 8 ounce ready-to-drink can provides 237 calories, 12 grams protein; made by Ross.

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What To Eat After A Flare

- Continue a low residue diet and slowly add back a variety of foods
- Introduce 1-2 items every few days and avoid foods that cause symptoms
  - Diluted juice
  - Applesauce, canned fruit, oatmeal
  - Plain turkey, chicken, fish
  - Mashed potatoes, rice, noodles
- Add fiber to diet as tolerated
  - Start with soluble fibers (eg, tender cooked vegetables, canned or cooked fruits, and starches like cooked cereals and whole wheat noodles and tortillas)
• IBD, including Crohn’s disease and ulcerative colitis, is characterized by chronic GI tract inflammation
• They have a significant impact on the lives of our patients
• The etiology of IBD likely involves a complex interplay of genes, environmental factors, and immune-mediated reactions that culminate in chronic inflammation
• The goals of IBD: clinical AND endoscopic remission, to prevent flares and long-term complications of the disease

Summary

• We use a variety of tests (blood, stool, imaging, endoscopy, pathology) to look for inflammation, complications of disease, and monitor on therapy
• Important to assess general health and well-being: vaccinations, routine labs, nutrient deficiencies, and cancer screening
• Diet plays an important role in the cause and management of IBD, still learning more!
• Targeted therapies emerged in the 1990s, and continue to be developed with the ultimate goal of not just disease control, but also cure

Summary

Diagnostic Testing in Inflammatory Bowel Disease

Why So Many Tests?

Doc, I’m doing fine now. Why do I need more testing?
• Subjective vs. Objective
• LOOK FOR:
  • Signs of active inflammation
  • Complications of IBD or medical therapy
  • Blood tests, stool tests, imaging, and endoscopy
• Together, these provide a snapshot of your status

Routine Labs

• Complete blood count (CBC)
• Liver enzymes (LFTs, or part of CMP)
• Electrolytes (BMP, or part of CMP)
• Stool cultures: look for infections due to bacteria or parasites
• Antibody tests: “IBD serology”
  • Antibodies against environmental or self-antigens
  • Uses: Is this IBD? What type of IBD?
  • Sensitivity: 40-80% (Not everyone with IBD has +serology)
**Biomarkers**

- Inflammatory markers ("Biomarkers")
  - Blood: C-reactive protein (CRP), erythrocyte sedimentation rate (ESR)
  - Stool: fecal calprotectin, lactoferrin

- Uses: Diagnosis of IBD, monitoring in IBD (response and relapse), predicting recurrence postoperatively

**Endoscopy and Biopsy**

- Gold standard for diagnosis and monitoring
- Assess: location, severity, take biopsies
- Types of endoscopy:
  - Colonoscopy
  - Sigmoidoscopy ("flex sig")
  - Upper endoscopy (EGD)
- Overall very safe and well tolerated

**Video Capsule Endoscopy**

- Most useful for
  - Small bowel lesions in Crohn’s disease
  - Unexplained GI bleeding or iron deficiency anemia
  - After bowel resection for postoperative surveillance (if we can’t reach that segment by endoscopy)

- The "how":
  - Capsule or "pill"
  - Contains a light source and camera surrounded by a protective outer shell
  - Transmits images wirelessly to a recorder (hip pack)

**Video Capsule Endoscopy**

- Disadvantages
  - Can’t take biopsies
  - Not recommended if history of strictures or bowel obstructions
  - Risk of capsule retention: 13% in patients with known Crohn’s disease
    - Consider patency capsule first

**Radiology: Imaging**

- Why use radiology when we have scopes?
  - EGD and colonoscopy can’t see most of the small intestine
  - Supplements capsule endoscopy
  - Monitor disease activity
  - Examine the abdomen outside the GI tract
  - Evaluate for complications
    - Obstruction
    - Perforation
    - Fistula
    - Abscess

**Radiology: Imaging**

- Examples:
  - Barium Enema
  - CT scan, CT enterography (CTE)
  - MRI and MR enterography (MRE)
  - MRCP (bile ducts, PSC)
  - Small bowel follow through
  - Ultrasound
  - Xrays
Radiation is a risk factor for cancer
- Use MRI and ultrasound, where possible
- CT scan, though, is sometimes the best test
- Discuss risks and benefits with your MD
- Absolute risk of radiation << Poorly controlled IBD
- Let us know if you are pregnant!
  - Will influence tests that are performed (and medications!)

Questions for your Doctor and Nurse
- What is the purpose of the test?
- What will happen if we get a positive result?
- How do I prepare for the test? Do I need to fast?
- How long will it take?
- Can I go alone or do I need a companion?
- When will I get the results?
- Who will be giving me the results?

Radiation Risks

Routine Health Care

Questions for your Doctor and Nurse

Vaccinations
- Goal is to prevent infections!
- Patients with IBD at at increased risk of infections
  - Underlying IBD itself
  - Immunosuppressant medications
- Most patients with IBD are under-vaccinated
  - Most common reason is lack of awareness

Aim: Vaccinate early, consider whether patient is immunosuppressed

What is “Immunosuppressed”?
- Active treatment with or within 3 months of stopping the following:
  - Steroids: Prednisone 20 mg/d or equivalent for ≥ 2 weeks
  - 6-MP/azathioprine
  - Methotrexate
  - TNF therapy (infliximab, adalimumab, certolizumab, golimumab)
  - ?Vedolizumab
  - ?Newer agents
- Significant protein-calorie malnutrition

Live Virus Vaccines
- Contains a “living” virus that is able to confer immunity, usually without causing illness
  - Immunocompromised

Examples:
- Influenza – intranasal is LIVE (intramuscular is NOT LIVE)
- Measles, Mumps, Rubella (MMR)
- Varicella/Zoster
- Bacille Calmette-Guérin (not in USA)
- Typhoid (oral)
- Vaccinia (smallpox)
- Yellow Fever
Adults with IBD: Vaccines

• All patients:
  – Td booster every 10 years (one-time Tdap)
  – HPV in females 9-26
  – Pneumococcal: 1-2 doses before age 50, 1 dose after 65
  – Hepatitis A and B (if serologies negative)

• If not immunosuppressed:
  – Varicella: 2 doses as adult
  – Zoster: 1 dose after 60
  – MMR: 1-2 doses before age 50, 1 dose after 50

• If risk factors: meningococcal vaccine

Summary: Vaccines

• Goal is to get vaccinated early, ideally before immunosuppressants are started
• Please bring vaccination records to visit
• Blood tests: Hep A/B, varicella
  – Look for immunity
• Vaccinate according to recommendations and risk factors

Osteoporosis

• IBD patients are at increased risk for osteoporosis
  – Underlying disease, diet, medications
• Dual energy x-ray absorptiometry scanning (DEXA)
  – IBD over age 50
  – IBD: Prolonged (>3 months) steroid use
• Supplementation (steroids, osteopenia, osteoporosis)
  – Calcium 1200 mg daily
  – Vitamin D 800 IU daily (or based on 25OHD level)

Cancer Screening

• Colon Cancer (discussed earlier in talk)
• Cervical Cancer
  – Increased rate of abnormal Pap smears and cervical dysplasia among women on immunosuppressants
  – Routine age-appropriate Pap smears
  – *Reason for HPV vaccine recommendation as well
• Skin Cancer
  – Nonmelanoma increased with thiopurines (2x increase)
  – Nonmelanoma and melanoma slightly increased with TNFs (1.4-1.5x), more recent data suggests nonsignificant association
  – Skin protection: sunscreen, hats/long sleeves, annual skin surveys

Cancer Screening

• Breast Cancer
  – Same as the general population
  – Breast exam every 3 years, mammography based on risk factors or starting at age 40
• Prostate Cancer
  – 1 in 6 men in the US have prostate cancer
  – PSA when appropriate (consult with your primary care doc and urologist)

Summary

• IBD, including Crohn’s disease and ulcerative colitis, is characterized by chronic GI tract inflammation
• They have a significant impact on the lives of our patients
• The etiology of IBD likely involves a complex interplay of genes, environmental factors, and immune-mediated reactions that culminate in chronic inflammation
• The goals of IBD: clinical AND endoscopic remission, to prevent flares and long-term complications of the disease
We use a variety of tests (blood, stool, imaging, endoscopy, pathology) to look for inflammation, complications of disease, and monitor on therapy.

- Important to assess general health and well-being: vaccinations, routine labs, nutrient deficiencies, and cancer screening.
- Diet plays an important role in the cause and management of IBD, still learning more!
- Targeted therapies emerged in the 1990s, and continue to be developed with the ultimate goal of not just disease control, but also cure.