GI Issues In The Primary Care Setting

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No Conflict of Interest

Digestive Diseases Statistics for the United States

Prevalence: 60 to 70 million people affected by all digestive diseases
Ambulatory care visits: 48.3 million
Primary diagnosis at office visits: 36.6 million
Primary diagnosis at emergency department visits: 15.7 million
Hospitalizations: 21.7 million ($31 billion)
New GI cancer: 266,000
Mortality: 245,921 deaths
Diagnostic and therapeutic inpatient procedures: 5.4 million—12 percent of all inpatient procedures
Ambulatory surgical procedures: 20.4 million—30 percent of all “write-in” surgical procedures

Costs:
$141.8 billion (more than heart disease $113, trauma $103 or mental health $99)
$97.8 billion, direct medical costs
$44 billion, indirect costs—for example, disability and mortality

Burden of Digestive Diseases in the U.S.

Fourth most common cause of visit to the primary care office.
For every 100 U.S. residents, there were 35 ambulatory care visits at which a digestive disease diagnosis was noted.
Generate 15-20% of all consultations.
Abdominal pain (28 million), N/V (7 million), Diarrhea/Gastroenteritis (4 million).
Associated with billions of dollars in Rx costs.
Billions in economic cost from lost or reduced productivity.

Case Study

36 years old female presents for evaluation of abdominal complaints that is bothering her.
- Pain and bloating that bothers her daily.
- Urgency with cramps after meals.
- Nausea and dyspepsia with foods.
- Noticed irregular bowel habits (fluffy stools), mucus.
- Thinks it may be related to situational stress.
- Ongoing for years but wants to make sure.
- Weight is going up despite “diet”.
- Did not notice blood in stools.
- Concerned because best friend’s father just got diagnosed with something serious.
Social & Medical History

Non Smoker
Drinks alcohol socially, likes wine with dinner.

Had appendix out when young.
C-section x 1

Takes allergy pills, lipitor and occasional Aleve

Mother had GB out for similar symptoms about three years ago

Examination

Healthy appearing 36 y.o.f in NAD
Vitals normal. BMI-32.
Cardiopulmonary-normal.
Musculoskeletal-normal.

Abdominal-Active bowel sounds, mild bloating, tenderness to touch “all over” but more so in the periumbilical region with some radiation to the LLQ.
Rectal- “Deferred”.

Differentials

Peptic ulcer disease
Pancreatitis
Diverticulitis
Gallbladder Disease
Hiatl hernia attacks
Colitis or cancer
Appendicitis appendixedce
Celiac disease
Irritable bowel syndrome

Diagnostic Evaluations

CBC
Chemistry Panel
Special labs
Stool tests
Ultrasound
CT scan
Upper endoscopy
Colonoscopy
Consultations

Definition

Irritable bowel syndrome (IBS) is a chronic, potentially disabling disorder of the gastrointestinal (GI) tract with a relapsing/remitting course in which abdominal pain is associated with defecation or changes in stool form or frequency.

Rome IV Diagnostic Criteria for Irritable Bowel Syndrome

Recurrent abdominal pain on average at least 1 day per week in the last 3 months, associated with 2 or more of the following criteria:
1. Related to defecation
2. Associated with a change in frequency of stool
3. Associated with a change in form (appearance) of stool
* Criteria fulfilled for the last 3 months with symptom onset at least 6 months prior to diagnosis.
The diagnosis of IBS can generally be made after performing a careful history and physical examination (to exclude warning signs and alternative diagnoses) and using the Rome IV criteria.

Signs or symptoms that might suggest another, more serious, condition:
- Onset of signs and symptoms after age 50
- Weight loss
- Rectal bleeding
- Fever
- Nausea or recurrent vomiting
- Abdominal pain, especially if it's not completely relieved by a bowel movement, or occurs at night
- Diarrhea that is persistent or awakens you from sleep
- Anemia related to low iron
- If patient have these signs or symptoms, or if an initial treatment for IBS doesn't work, you'll likely need additional tests.

Epidemiology

- IBS at a Glance
  - 35-45 million Americans (3 out of every 20 individuals) may experience the disease
  - IBS can be either a chronic or episodic condition and is commonly associated with abdominal pain or abdominal discomfort and altered bowel function
  - Urgency, abdominal pain, and diarrhea are ranked as the most bothersome symptoms by IBS-D patients

- The exact cause of IBS is unknown—symptoms may result from a disturbance in the way the brain, GI tract, and nervous system interact
- Females are 1.5 times more likely than males to have IBS
- Anyone can have IBS, and the age distribution is great; however, 40% of patients are between the ages of 35 and 50 years
- Symptoms tend to first appear before the age of 35 years in 50% of patients with a history of IBS
- Patients with IBS consume over 50% more healthcare resources than matched controls without IBS

IBS Is Prevalent and Underdiagnosed

- Affects an estimated 10% to 15% of the US population
- Prevalence rates vary because IBS remains undiagnosed in a majority of patients
  - Up to 70% of individuals with IBS do not seek medical care

Patient Presentation

- 85% → PCP Office
- 10% → GE Office
- <5% → Hospital/ER
IBS Is Classified Into Subtypes Based on Bowel Habits

- >60% of patients have a diarrheal component to IBS
d- IBS-D is defined as diarrhea-predominant IBS
- 40% of patients
- IBS-M is defined as constipation-predominant IBS
- 23% of patients
- IBS-C is defined as mixed IBS (constipation and diarrhea)
- 35% of patients

IBS-D Significantly Impacts Daily Life

- Patients with IBS-D report significantly greater overall work productivity loss and impairments in daily activities than individuals without IBS-D
- Patients with IBS-D report significantly greater overall work productivity loss and impairments in daily activities than individuals without IBS-D

IBS Is Associated With Significant Healthcare Costs and Increased Use of Medical Services

- Significantly higher annual all-cause healthcare costs due to increased healthcare utilization among patients with IBS compared with healthy controls
- Greater number of physician visits, outpatient visits, and prescription medications

Microbial Imbalance Has Been Linked to Symptoms of IBS

- IBS is thought to be a multifactorial disease, with different combinations of causative factors appearing in each patient.
- A variety of evidence suggests that alterations in gut microbiota are associated with IBS in some patients.

Potential Factors That May Contribute to the Pathophysiology of IBS:

- Psychological distress
- Intake of probiotics
- Disturbances in the gut-microbiota
- Increased gastrointestinal permeability
- Hypersensitivity
- Somatic symptoms

IBS-D (n=1102)

Absence

Overall Work Productivity

Absenteeism:

Presenteeism:

Controls (n=65,389)

Somatic symptoms

Psychosocial stressors

IBS-C (n=1102)

IBS-M (n=1102)

IBS-D (n=1102)

Use of effective therapies that provide adequate and sustained relief of multiple IBS symptoms could potentially reduce healthcare resource utilization and costs.

IBS-C

IBS-M

IBS-D

Matched Controls (n=19,653)

IBS-D

IBS-M

IBS-C

Retention of effective therapies is critical to reduce healthcare resource utilization and costs.
Patients need to know 2 things: Symptoms tend to be chronic and exacerbate from time to time, and individuals need to avoid stressors and triggers.

Patients with IBS need 3 types of support.
1. Support to address the common psychological comorbidities.
2. Advice about dietary measures that can ameliorate or prevent symptoms.
3. Staying adequately hydrated, limiting fermentable oligo-, di-, and monosaccharides and polyols, and supplementing calcium for patients who avoid lactose entirely.

Nonpharmacologic Interventions for IBS

<table>
<thead>
<tr>
<th>Therapy</th>
<th>Quality of Evidence</th>
<th>Adverse Effects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Soluble fiber</td>
<td>Moderate</td>
<td>Diarrhea, constipation, bloating, flatulence</td>
</tr>
<tr>
<td>Peppermint oil</td>
<td>Moderate</td>
<td>Heartburn, dyspepsia, headache, dry mouth</td>
</tr>
<tr>
<td>Probiotics</td>
<td>Low</td>
<td>Adverse effects poorly controlled in trials</td>
</tr>
<tr>
<td>Psychological therapies</td>
<td>Very Low</td>
<td>Adverse effects poorly controlled in trials</td>
</tr>
<tr>
<td>Low FODMAP diet</td>
<td>Very Low</td>
<td>May affect colonic microbiome; long-term effects unknown</td>
</tr>
<tr>
<td>Gluten-free diet</td>
<td></td>
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</table>

Over-the-Counter Options

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Special Diets

High FODMAP Foods to Avoid

<table>
<thead>
<tr>
<th>Foods</th>
<th>Vegetables</th>
<th>Dairy</th>
<th>Legumes</th>
<th>Sweeteners</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fruits</td>
<td>Apples</td>
<td>Cottage Cheese</td>
<td>Black Beans</td>
<td>High Fructose Corn Syrup</td>
</tr>
<tr>
<td>Fruits</td>
<td>Bananas</td>
<td>Cream Cheese</td>
<td>Chickpeas</td>
<td>Hydrogenated Oils</td>
</tr>
<tr>
<td>Fruits</td>
<td>Oranges</td>
<td>Goat Cheese</td>
<td>Soybeans</td>
<td>Sucrose</td>
</tr>
<tr>
<td>Berries</td>
<td></td>
<td>Blue Cheese</td>
<td></td>
<td>Tagatose</td>
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<td></td>
<td></td>
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<td></td>
<td>Xylitol</td>
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<tr>
<td>Alcohol</td>
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<td>Alcohol</td>
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<td></td>
<td></td>
<td>Stevia</td>
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<td></td>
<td>Maltitol</td>
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<td>Sorbitol</td>
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<td></td>
<td>Xylitol</td>
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<td></td>
<td>Fructose</td>
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<td></td>
<td>Polyols</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Natural</td>
</tr>
</tbody>
</table>

FERMENTABLE OLIGOMONOSACCHARIDES AND POLYOLS
Case Study Continued

No better. “Tried” to follow diet.

Treatments for IBS-C

- dietary fiber, bulking agents, and laxatives or stool softeners may be used.
- FDA approved agents:
  - Amitiza (lubiprostone)
    - type-2 chloride channel activator
  - Linzess (linaclotide)
    - structurally related to human uroguanylin and guanylin. It functions as a guanylate cyclase-C (GC-C) receptor agonist.
  - Trulance (plecanatide)
    - structural analog of human uroguanylin and a (GC-C) receptor agonist.

Treatments for IBS-D

- OTC measures, loperamide
- Smooth muscle Antispasmodics
  - dicyclomine, hyoscyamine, librax
- Antidepressants
  - SSRIs & TCAs
- FDA approved agents:
  - Alosetron
    - 5-HT3 receptor antagonist
  - Eluxadoline
    - Mu-opioid receptor agonist
  - Rifaximin
    - Semisynthetic nontoxic antibiotic

Options for IBS-M

- Dietary and OTC measures
- Smooth muscle Antispasmodics
  - Dicyclomine, hyoscyamine, librax
- Antidepressants
  - SSRIs, SNRIs and TCAs
- No FDA approved agents
Case Study Part 2

• Returns after couple of months.
• Not quite satisfied with results.
• Weight is stable with no new alarm symptoms.
• Not compliant with medication because she is
• Uncomfortable with using “crazy” medications.
• Now is concerned that she has celiac disease.
• Tried gluten-free diet for a while and felt better.

What is Celiac Disease?

Celiac disease is a serious autoimmune disorder that can occur in genetically predisposed people where the ingestion of gluten leads to damage in the small intestine. It is estimated to affect 1 in 100 people worldwide. Two and one-half million Americans are undiagnosed and are at risk for long-term health complications.

To Develop Celiac Disease

• Must inherit the genetic predisposition.
• Be actively consuming gluten
• Have the disease activated
• Activation triggers:
  • Stress
  • Trauma (surgeries, injuries, etc.)
  • Viral infections

The reaction to gluten causes villous atrophy or flattening of the cells lining the small intestine, which can lead to malabsorption of nutrients and related health issues.

Autoimmune and Other Conditions Associated with Celiac Disease

<table>
<thead>
<tr>
<th>Autoimmune Condition</th>
<th>Prevalence in CD Populations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anemia</td>
<td>12-48%</td>
</tr>
<tr>
<td>Autoimmune Hepatitis</td>
<td>2%</td>
</tr>
<tr>
<td>Autoimmune Thyroid Disease</td>
<td>26%</td>
</tr>
<tr>
<td>Chronic Fatigue Syndrome</td>
<td>2%</td>
</tr>
<tr>
<td>Dermatitis Herpetiformis</td>
<td>23%</td>
</tr>
<tr>
<td>Diarrhea's Syndrome</td>
<td>12%</td>
</tr>
<tr>
<td>Gluten Intolerance</td>
<td>10-15%</td>
</tr>
<tr>
<td>Idiopathic Disease/Candidiasis</td>
<td>1.7%</td>
</tr>
<tr>
<td>Juvenile Idiopathic Arthritis</td>
<td>1.5-4.6%</td>
</tr>
<tr>
<td>Liver Disease</td>
<td>29%</td>
</tr>
<tr>
<td>Sjogren’s Syndrome</td>
<td>15-27%</td>
</tr>
<tr>
<td>Microscopic Collitis</td>
<td>4%</td>
</tr>
<tr>
<td>Peripheral Neuropathy</td>
<td>10-12%</td>
</tr>
<tr>
<td>Primary Sjogren’s Syndrome</td>
<td>3%</td>
</tr>
<tr>
<td>Sjogren’s Syndrome</td>
<td>3%</td>
</tr>
<tr>
<td>Type 1 Diabetes</td>
<td>8-10%</td>
</tr>
<tr>
<td>Unexplained infertility</td>
<td>15%</td>
</tr>
</tbody>
</table>
Prevalence of Celiac Disease

Things to Know

- Requires the presence of HLA-DQ2 or HLA-DQ8.
- 25% to 40% of the United States population has either DQ2 or DQ8.
- The presence of either heterodimer is not diagnostic of CD.
- The primary use of HLA-DQ typing is to rule out CD and genetic susceptibility for CD.

Individuals Suitable for Testing

- Individuals at increased risk of CD
- Symptomatic individuals in whom the diagnosis of CD is uncertain

What needs to happen

Environmental triggers
- Cereals containing toxic proteins for patients (gladins, secalains, hordenin)

Celiac disease

Genetic predisposition
- DQ2 and/or DQ8 positive HLA haplotype

Immune system
- Autoimmunity due to the loss of the mucosal barrier function

[Table]

<table>
<thead>
<tr>
<th>Analyte Value Ref. Range</th>
<th>Units</th>
<th>Abn. Flag</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gliadin Ab IgA</td>
<td>&gt;100</td>
<td>final CB</td>
</tr>
<tr>
<td>Gliadin Ab IgG</td>
<td>70</td>
<td>final CB</td>
</tr>
</tbody>
</table>

TEST PERFORMED AT:
QUEST DIAGNOSTICS WOOD DALE
1355 MITTEL BOULEVARD WOOD DALE, IL 60191-1024

Value Interpretation

- <20 Antibody not detected
- ≥20 Antibody detected

TEST PERFORMED AT:
QUEST DIAGNOSTICS WOOD DALE
1355 MITTEL BOULEVARD WOOD DALE, IL 60191-1024

Value Interpretation

- <4 No Antibody Detected
- ≥4 Antibody Detected
**Foods That May Contain Gluten**

These foods must be verified by reading the label or checking with the manufacturer.

- Energy bars/granola bars
- French fries
- Potato chips
- Processed lunch meats
- Candy and candy bars
- Soup – pay special attention to cream-based soups, which have flour as a thickener.
- Multi-grain or "artisan" tortilla chips or tortillas that are not entirely corn-based may contain a wheat-based ingredient.
- Salad dressings and marinades – may contain malt vinegar or wheat starch.
- Starch or dextrin if found on a meat or poultry product could be from any grain, including wheat.
- Brown rice syrup – may be made with barley enzymes.
- Meat substitutes made with seitan (wheat gluten) such as vegetarian burgers, vegetarian sausage, imitation bacon, imitation seafood.
- Soy sauce (though tamari made without wheat is gluten-free).
- Self-basting poultry.
- Pre-seasoned meats.
- Cheesecake filling – some recipes include wheat flour.
- Eggs served at restaurants – some restaurants and pantries batter their eggs in seasonings, apps, and entrees, but on their own, eggs are naturally gluten-free.

“**If In Doubt, Go Without!”** - Celiac Disease Foundation

**Recommended Diagnostic Tests**

- CBC
- CRP or fecal calprotectin
- Serum TTG antibody

**Clostridium difficile**

Infection-Impact-Intervention

> Clostridium difficile:
> - Spindle shaped
> - Name given because it was difficult to isolate and culture this organism
> - A gram positive anaerobic spore forming rod found EVERYWHERE
> - Most common cause of Nosocomial diarrheaa
> - History dates back to 1895 when first case of pseudomembranous colitis was identified
> - C. diff bacteria described in 1935
> - 1979 - Therapy with Metron or Vancomycin started
Background – C. Difficile

- Clostridium Difficile
- Gram-positive, anaerobic, spore-forming bacillus
- Infection is a result of a disturbance of the normal flora of the colon
- Responsible for development of antibiotic-associated diarrhea and colitis
- Incidence and severity of infection is increasing
  - Emergence of a hypervirulent strain
  - Reduced clinical response, increased recurrence

Risk factors for C. difficile infection

- Exposure to antimicrobial agents  Most Important
- Advanced age  ≥ 65 years
- Duration of hospitalization  Effect of neutropenia
- Cancer chemotherapy  Surgery – Tube feeding
- Human immunodeficiency virus  PPIs – H$_2$RA
- Manipulation of GIT
- Gastric acid suppression

Clinical practice guidelines for Clostridium difficile infection in adults.

Pathogenesis of C. difficile diarrhea

Antibiotic therapy
Reduces protective colonic flora
C. difficile spores ingested
Toxins released in lumen
Diarrhea & colitis

Common complications of C. diff
- dehydration
- colitis
- severe diarrhea

Rare complications of C. diff
- serious intestinal conditions
- sepsis
- death
Antibiotics and *C. difficile*

- The overuse of antibiotics
  - penicillin (ampicillin)
  - Clindamycin
  - Cephalosporins
  - Fluoroquinolones
  alters the normal intestinal flora
  and increases the risk of developing
  *C. difficile* diarrhea.

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**C. difficile** Manifestations

- Carrier state
- *C. difficile* - associated diarrhea (CDAD)
- *C. difficile* colitis
- Pseudomembranous colitis
- Fulminant Colitis / Toxic megacolon
- Atypical (e.g., sepsis, ascites)
- Recurrent disease

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**Treatment-IDSA guideline update 2018**

<table>
<thead>
<tr>
<th>Clinical Episode</th>
<th>Superfecund Clinical Data</th>
<th>Recommended Treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Initial episode, severe</td>
<td>Lactobacillus with a white blood cell count of 15,000/µL, and a serum creatinine level ≤ 1.5 mg/dL</td>
<td>Vancomycin 125 mg q 6 h for 10 days, or</td>
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Why Fecal Transplants for c diff

- Highly effective for patients with Clostridium Difficile with success rates of 90-100% depending on the study.
- Symptoms improve almost immediately often with just one treatment using a colonoscope or less than a week of self-administered enemas.
- Fights bad bacteria with a mix of stronger, more dominant, good bacteria.
- Safe, with a healthy donor, there are no published cases of a person contracting an incurable disease.
- Keeps the infection from coming back as it often does with antibiotics, by restoring a healthy balance of bacteria.
Liver failure occurs when large parts of the liver become damaged beyond repair and the liver is no longer able to function. Liver failure is a life-threatening condition that demands urgent medical care. Most often, liver failure occurs gradually and over many years. Acute liver failure occurs rapidly (in as little as 48 hours).

Acute Causes
- Acetaminophen (Tylenol) overdose
- Viruses including hepatitis A, B, and C (especially in children)
- Reactions to certain prescription and herbal medications
- Ingestion of poisonous wild mushrooms

Chronic Causes
- Infectious causes.
- Malnutrition.
- Long-term alcohol consumption.
- Inherited disorder.
- Cirrhosis
- Fatty liver disease.

Differential Diagnosis
- Infectious hepatitis
- Alcohol
- Medications
- Natural herbal Supplements
- Vitamins
- Wilsons disease
- Alpha-1-antitrypsin disease
- Hemochromatosis
- Autoimmune hepatitis
- Primary biliary cirrhosis
- Gall bladder disease
- Fatty liver disease.

New day, new job, new patient
- 45 y.o.m. here for check up.
- No complaints other than back pain.
- Does not smoke but drinks “socially.”
- Tries to stay healthy with occasional vitamins and supplements.
- Burgers & fries type of guy.
- Doesn’t exercise because of back pain
- Exam negative. BMI-41.
- Bili-0.8, AST-68, ALT-56.
Nonalcoholic Steatohepatitis (NASH)

- Ludwig et al. (1980-Mayo Clinic) – coined the term NASH
- 20 patients evaluated over a 10-year period.
- Found histologic evidence of alcoholic hepatitis but no history of alcohol abuse or other causes of liver disease.
- 15% had cirrhosis
- 60% F (54 yrs), 90% obese, 25% with dyslipidemia +/- Diabetes
- Majority are asymptomatic
- 90% with abnormal LFTs, 75% hepatomegaly, 25% splenomegaly, 5% with ascites

Fatty Liver Disease (NAFLD)

- Affect up to 46% of people in the US.
- It is the most common cause of liver disease in western countries.
- 1 out of 10 children have fatty liver disease.
- 12% can progress in to steatohepatitis (NASH).
- Around 75% of patients will have swelling of the liver.
- 10-25% of people with NASH will develop cirrhosis.
- Cirrhosis related complications (ascites, liver failure, liver cancer).
Non-alcoholic fatty liver disease

- Fatty liver caused other than excessive use of alcohol
- Can caused by medication like Corticosteroids, Methotrexate, Tamoxifen, Tetracycline etc
- Due to soft drinks having high concentration of fructose
- Obesity and insulin resistance (Diabetes Type 2) leads to excessive accumulation of fatty acid in liver
- Protein malnutrition, coronary artery disease, and treatment with corticosteroid medications can also lead to NAFLD
- Genetic Predispositions: NAFLD is also linked with single-nucleotide polymorphisms (SNPs) T455C and C482T in APOC3

Progression of fatty liver disease
Liver can be scarred within 10 to 15 years.

Healthy
- Liver enlarges with fat deposits; scar tissue forms.
- Cleans blood of bacteria, toxins and other foreign particles.

Cirrhosis
- Cells are injured, organ hardens and reduces in size.
- Liver failure or liver cancer can follow.
- Some may need a new liver by their 30s or 40s.

Fatty Liver Treatment Focus Points
- Lose weight
- Exercise regularly
- Eat healthy food
- Avoid eating fried and high fat food
- Consider nutritional supplements

Drink green tea for fatty liver
Drink ginger tea for fatty liver
Dandelion Tea For Fatty Liver
Treatment of Fatty Liver Disease:

- Treatment mainly aims at remediying the underlying cause. In case of simple alcoholic fatty liver, alcohol consumption has to be stopped. For those with non-alcoholic fatty liver disease, correct diagnosis is very much important.
- This is because of the myriad health problems than can cause the condition. For obese people, weight loss is suggested as a remedy. The condition can be reversed, if detected at an early stage.
- There is no specific treatment for severe fatty liver disease, but health experts recommend reduction in alcohol consumption and treatment of underlying causes. A change in diet and weight loss is considered most effective against this disease.
**Figure 1:** Geographic Distribution of Outbreak-Associated Cases by County

**Figure 2:** Incidence of Outbreak-Associated Cases by County

The KY incidence rate is 77.5 per 100,000.

**Figure 3:** Epidemic-curve (Epi-Curve) of Outbreak-Associated Cases

KY17-089 Epi-Curve of Outbreak-Associated Cases by MMWR Week, August 1, 2017 - December 29, 2018

**Figure 4:** Outbreak-Associated Cases by Age

KY17-089 Outbreak-Associated Cases of Acute Hepatitis A in Kentucky, by Age, August 1, 2017 - December 29, 2018

The mean age of cases is 37.5 years, and the median age is 36.0 years.

**Figure 5:** Frequent Risk Factors of Outbreak-associated Cases

**Table 3:** Frequent Risk Factors of Outbreak-Associated Acute Hepatitis A Cases, August 1, 2017 - December 29, 2018

<table>
<thead>
<tr>
<th>Risk Factor</th>
<th>Number of Cases (n=2824)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Homelessness + No/Unk Illicit Drug Use</td>
<td>48 (1.7%)</td>
</tr>
<tr>
<td>Illicit Drug Use + No/Unk Homelessness</td>
<td>1973 (70%)</td>
</tr>
<tr>
<td>Homelessness + Illicit drug use</td>
<td>260 (9.2%)</td>
</tr>
<tr>
<td>No Outbreak-Related Risk Factors</td>
<td>543 (19%)</td>
</tr>
</tbody>
</table>

*MMWR weeks are based on date of specimen collection.
Treatment – Conservative
Prevention - Vaccination

Hepatitis B virus
DNA
Core
Hepatitis B surface antigen (HBsAg)
Outer lipid envelope

HEPATITIS B FACTS

1. A life-threatening liver disease which spreads through exposure to infected body fluids.
2. Can be life-threatening.
3. Preventions: Hepatitis B vaccination as soon as possible after birth.

SYMPTOMS INCLUDE

SPREAD BY

Mouth to mouth contact
Medical or dental needles
Intravenous drug use
Sealed objects handled by infected person.
Hepatitis B Vaccination

- Effective in preventing hepatitis B
- 95% develop immunity
- 3-dose vaccination series (0, 1, 6 months)
- May be given to pregnant patients
- Test for antibodies HbsAb 1-2 months after completion
- Re-vaccinate those who do not develop adequate antibody response
- HBIG+vaccine for blood exposure to pt with acute hep B.

Recommended Hepatitis B Virus Vaccine Dosages and Schedules for Adults

<table>
<thead>
<tr>
<th>Vaccine</th>
<th>Dosage</th>
<th>Dosing and Route</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hepatitis B Vaccines</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Engerix-B</td>
<td>20 mcg</td>
<td>3-Dose Schedule: 1 mL given IM at 0, 1, and 6-12 months</td>
</tr>
<tr>
<td>Recombivax HB</td>
<td>10 mcg</td>
<td>3-Dose Schedule: 1 mL given IM at 0, 1, and 6-12 months</td>
</tr>
<tr>
<td>Hepavac</td>
<td>20 mcg</td>
<td>2-Dose Schedule: 1 mL given IM at 0 and 1 month</td>
</tr>
<tr>
<td>Combined Hepatitis A and B Vaccines</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Twinrix</td>
<td>HAIV: 720 ELU plus HBsAg 20 mcg</td>
<td>Standard 3-Dose Schedule: 1 mL given IM at 0, 1, and 6 months or Accelerated 4-Dose Schedule: 1 mL given IM on days 0, 7, and 21-30, followed by a booster dose at month 12</td>
</tr>
</tbody>
</table>
Hepatitis C Facts

Symptoms Include:
- Abdominal pain
- Vomiting
- Yellowing of skin & eyes

Spread by:
- Transfusion of Unscreened Blood
- Inadequate sterilization of needles
- Sexual transmission
- Transfer of infected blood from one person to another

Symptoms of Hepatitis C
- Jaundice
- Nausea
- Lack of appetite
- Arthritis
- Intoxication
- Joint pain

130-150 Million people worldwide have chronic Hep C.
16,000 cases of acute Hep C were reported in the U.S in 2009.

Central & East Asia and North Africa have the highest Hep C rates.

There is no vaccination for Hep C.

Hep C can be successfully treated with antiviral medications, but chronic Hep C can severely damage the liver over time.

70-80% of people with Hep C don’t show any symptoms.

50-90% of people using antiviral treatment get better.

15-45% of people with Hep C get better in 6 months without treatment.

350,000-500,000 people die from Hep C-related complications every year.
Latest Treatment Recommendation

Summary

- Abdominal symptoms – Think IBS unless >50
- Million dollar work up not necessary
- Celiac disease – 1% with true condition
- Having the genes does not always mean disease
- C.diff – Epidemic level due to antibiotic misuse
- Potentially fatal for both patient and your career
<table>
<thead>
<tr>
<th>Summary continued</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Toxic liver - Often related to medications/supplements</td>
</tr>
<tr>
<td>• Associated with significant morbidity &amp; mortality</td>
</tr>
<tr>
<td>• Elevated LFTs - Think fatty liver and US exam</td>
</tr>
<tr>
<td>• No current cure other than diet and exercise</td>
</tr>
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</table>

<table>
<thead>
<tr>
<th>Summary continued</th>
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</thead>
<tbody>
<tr>
<td>• Infectious hepatitis - On the rise associated with the drug epidemic</td>
</tr>
<tr>
<td>• Hepatitis A - Vaccinate</td>
</tr>
<tr>
<td>• Hepatitis B - Vaccinate</td>
</tr>
<tr>
<td>• Hepatitis C - Cure is available</td>
</tr>
</tbody>
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