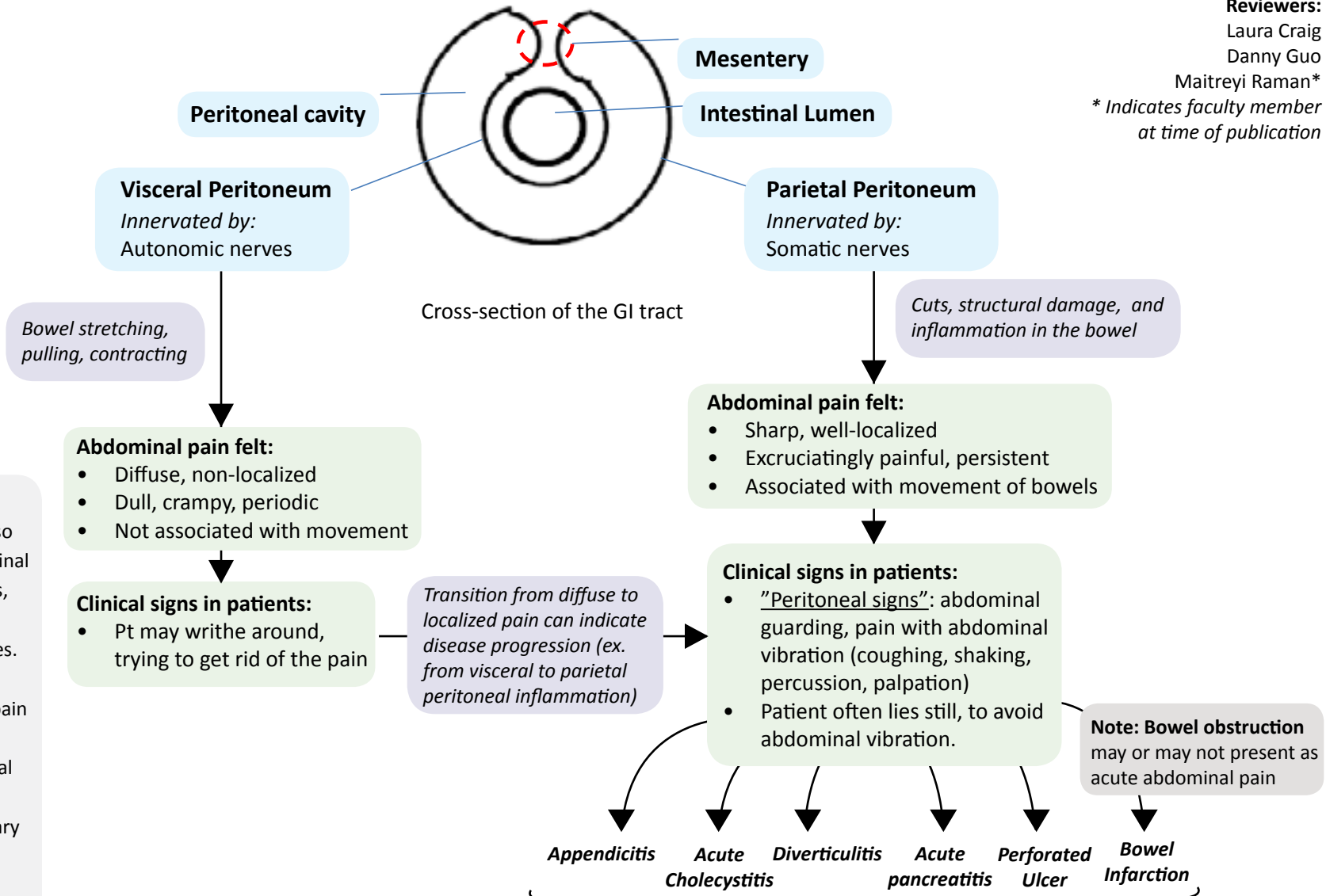


Acute GI-related Abdominal Pain: Pathogenesis and Characteristics

Authors:
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Reviewers:
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Maitreyi Raman*

* Indicates faculty member at time of publication



Important Notes:

- Acute abdominal pain can also result from non-gastro-intestinal causes, such as kidney stones, female reproductive tract issues, and urinary tract issues. For simplicity's sake, only the GI-related acute abdominal pain disorders are listed here.
- The DDx of Visceral abdominal pain is broad, please consult relevant sections of the Calgary Black Book for the DDx.
- Keep in mind that visceral abdominal pain can also be caused by the "acute abdomen" diseases (if the diseases are presenting in their initial phases).

DDx of an "acute abdomen":
a sudden, non-traumatic disorder of the abdomen that needs urgent diagnosis and treatment. Each topic will be further explored in subsequent slides

Appendicitis: Pathogenesis and Clinical Findings

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Epidemiology

Dx of healthy adults:

- Men > women
- Commonly 10-30 yrs old, can present at any age
- Most common cause of acute abdomen (5% prevalence in all ethnicities)

The appendix is anatomically located in the RLQ; appendicitis may be confused with disorders of surrounding structures:

Gynecological Diseases

- Rule out pregnancy with HCG pregnancy test
- Ruptured ovarian cyst
- Ectopic pregnancy
- Mittelschmerz (mid-cycle pain)

Gastro-intestinal diseases

- Meckel's diverticulum (presents identically to appendicitis; surgically located 2 feet from ileocecal valve; mostly seen in children)
- Diverticulitis (presents as a left-sided appendicitis)

Non-GI abdominal issues

- Mesenteric adenitis in kids <15: swollen mesenteric lymph nodes, 10x more common than appendicitis in this age group!
- Renal colic

Pathogenesis

Obstruction of appendiceal lumen (by fecalith, fibrosis, neoplasia, foreign bodies, or lymph nodes in kids)

Appendix distension and spasms

↑ Lumen pressure, ↓ blood flow to appendix

Ischemia, tissue necrosis, loss of appendix structural integrity

Bacterial invasion of the appendix wall, causing transmural inflammation and necrosis

(if not surgically removed)

Perforation of colon wall, causing peritonitis, abscesses, or death

Stretches visceral peritoneum, stimulates Autonomic nerves (T9-10)

Irritation of parietal peritoneum, stimulates Somatic nerves

Clinical Findings

Symptoms hugely variable and inconsistent, only 30% present with classic history:

Dull, crampy, diffuse peri-umbilical pain

Progression of inflammation over several days (variable length of time).

Pt may develop fever, diarrhea, constipation, or vomiting as inflammation worsens.

Focal, intense, persistent RLQ pain, abdominal guarding and peritoneal signs (i.e. percussion and rebound tenderness)

Further investigations:

CBC: leukocytosis, esp neutrophilia (due to inflammatory response **to infection**)

CT: Gold Standard Diagnostic test; shows thickened visceral membrane around appendix (due to inflammation) with enhancing (white) rim (due to ↑ blood flow to appendix)

Note: Diagnosis is usually clinical, minimal investigations are needed: would rather operate than miss a potentially life-threatening disease

Acute Diverticulitis: Pathogenesis and Clinical Findings

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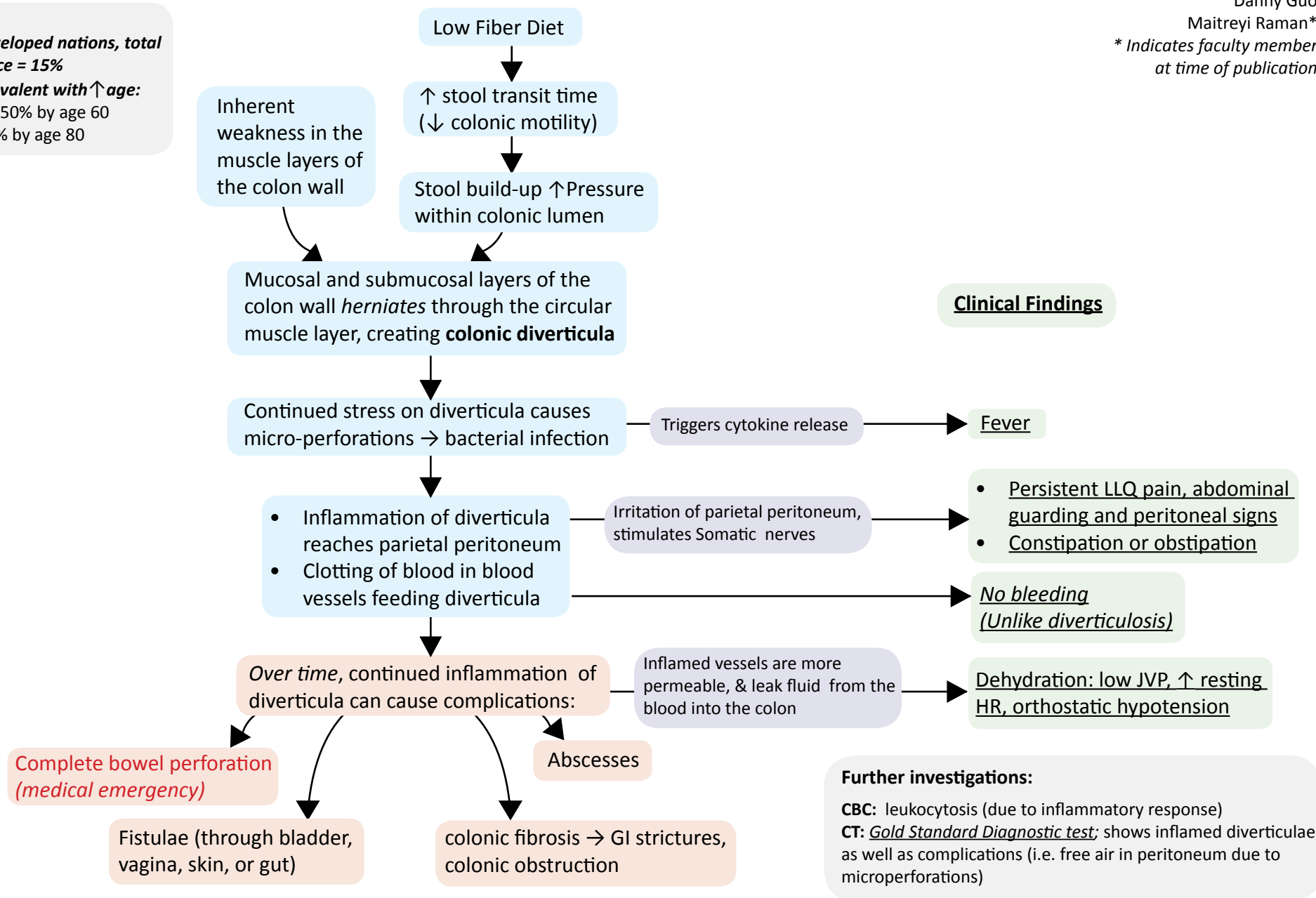
Maitreyi Raman*

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Epidemiology

- **Dx of developed nations, total prevalence = 15%**
- **More prevalent with ↑ age:**
 - 30-50% by age 60
 - 70% by age 80

Pathogenesis



Clinical Findings

Further investigations:

CBC: leukocytosis (due to inflammatory response)
CT: *Gold Standard Diagnostic test*; shows inflamed diverticulae as well as complications (i.e. free air in peritoneum due to microperforations)



Acute Cholecystitis: Pathogenesis and Clinical Findings

Author:

Yan Yu

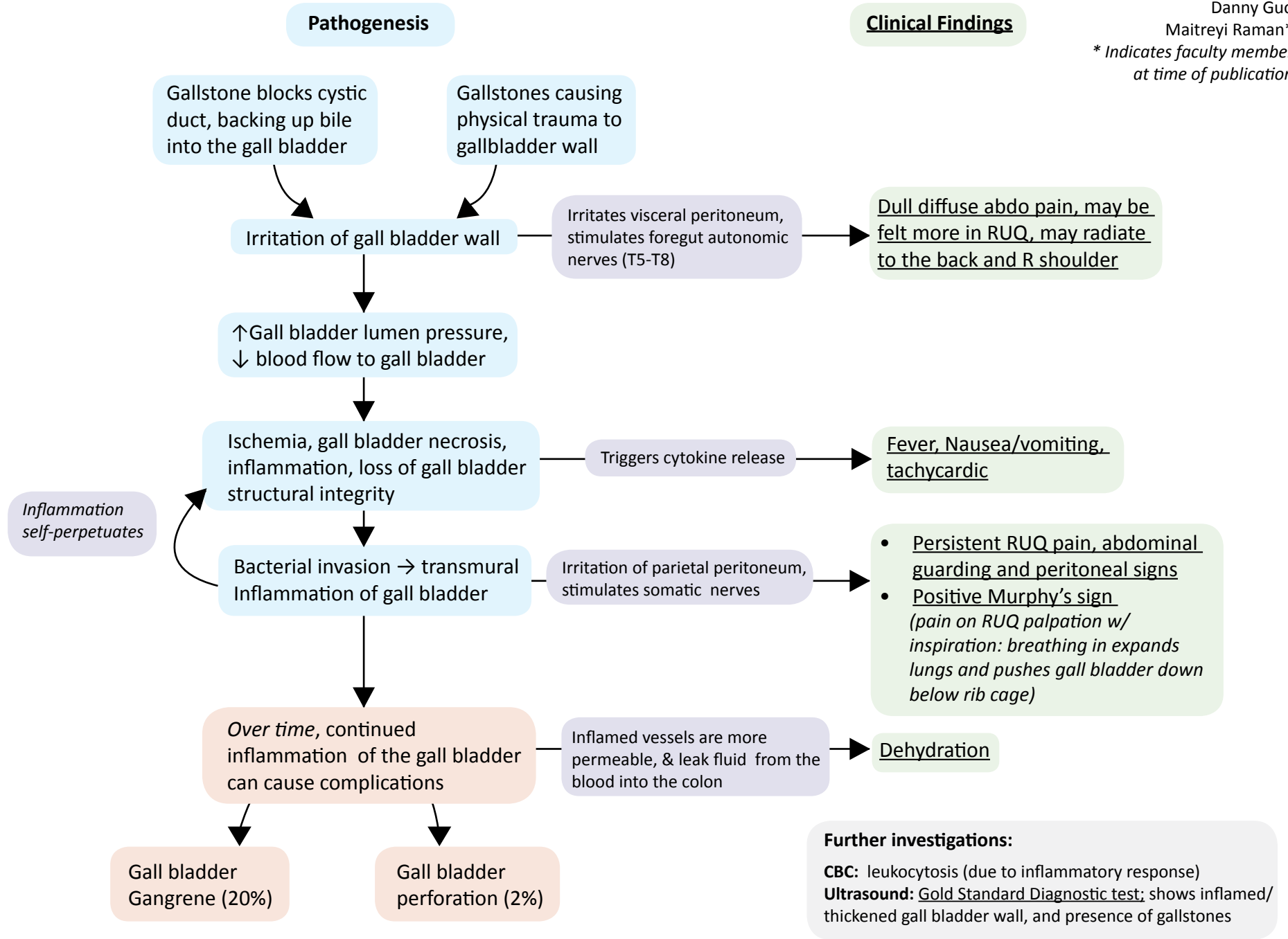
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Acute Pancreatitis: Pathogenesis and Clinical Findings

Author:

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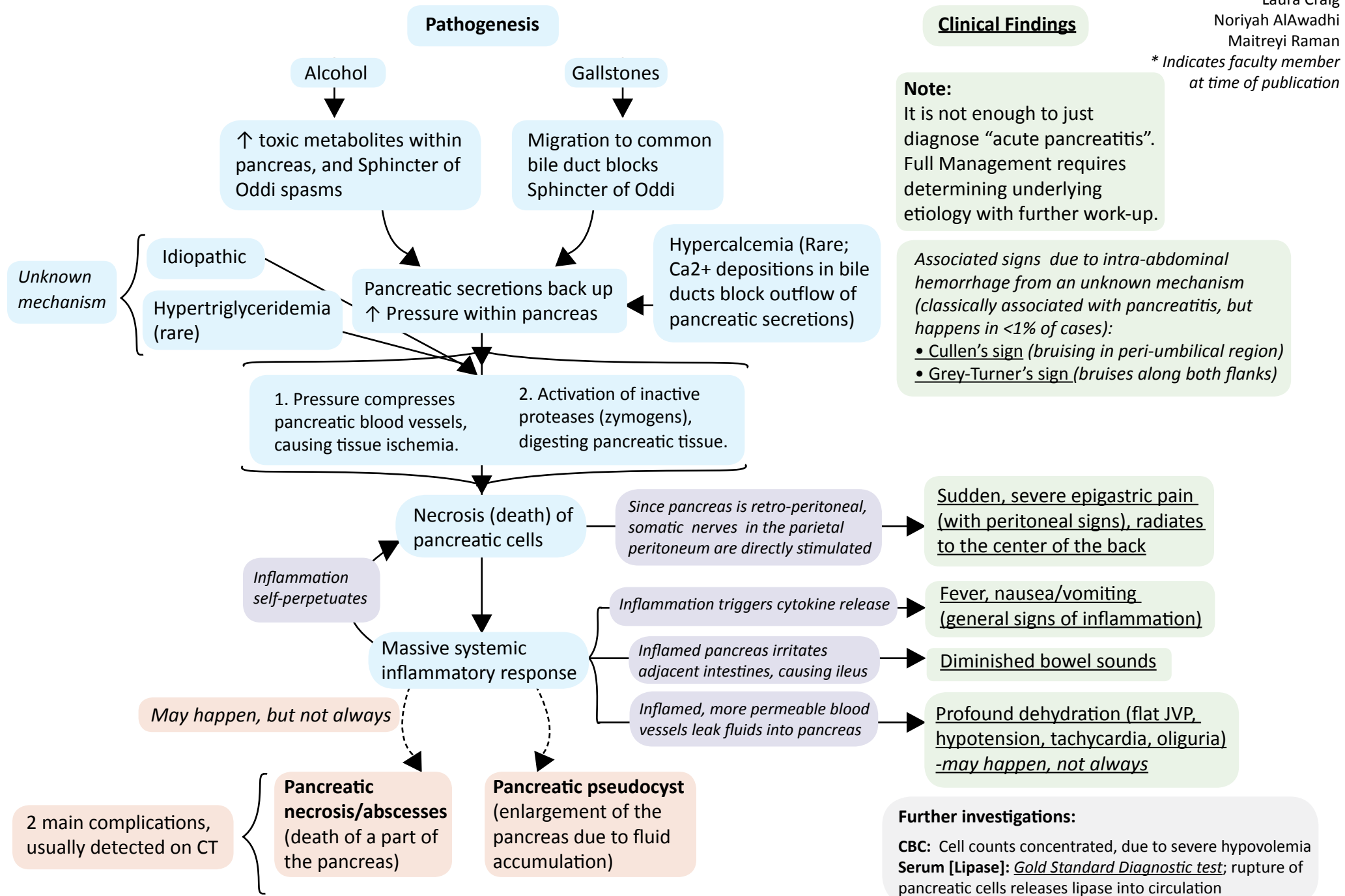
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Mechanical Bowel Obstruction and Ileus: Pathogenesis and Clinical Findings

Author:

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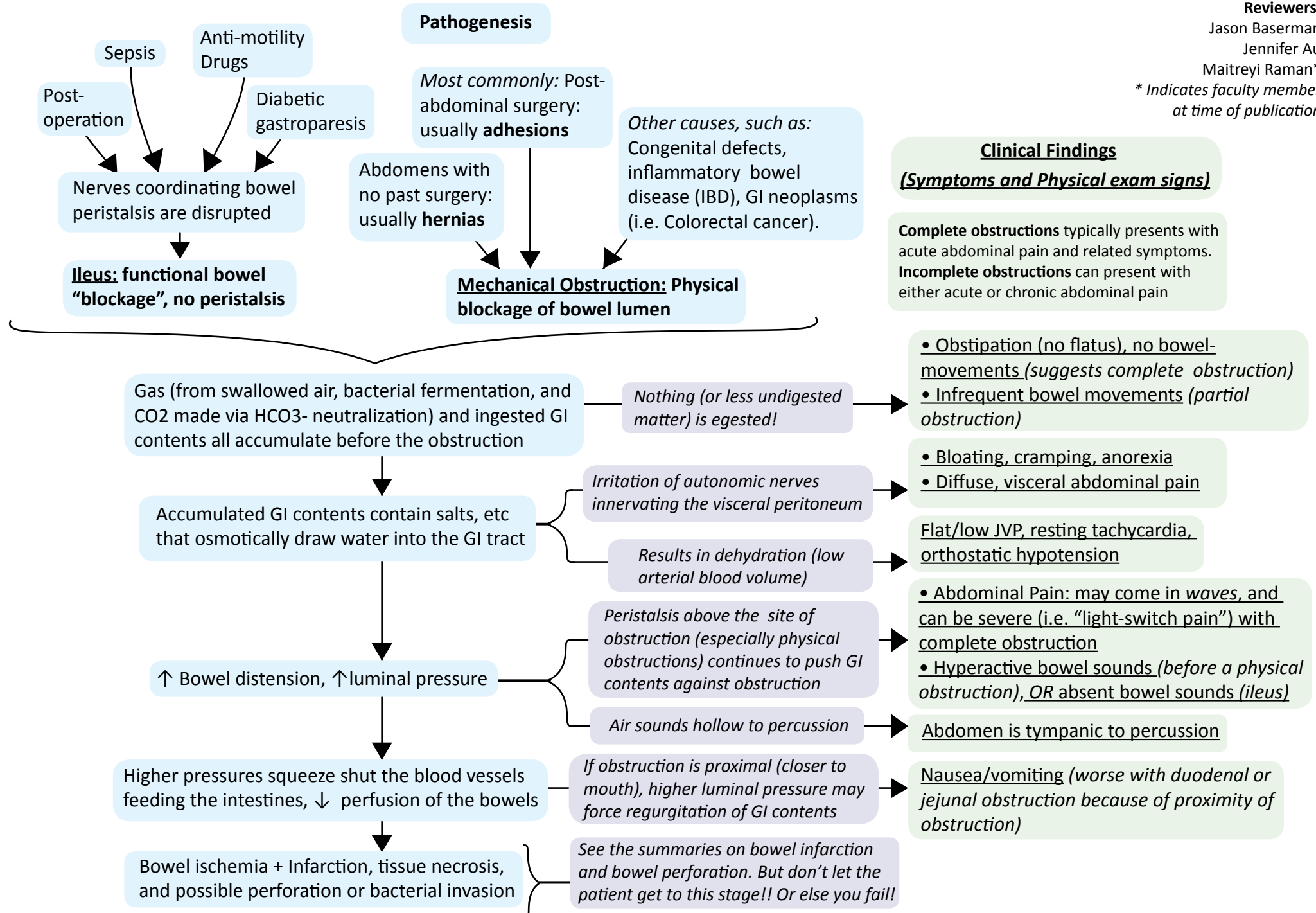
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Clinical Findings (Symptoms and Physical exam signs)

Complete obstructions typically presents with acute abdominal pain and related symptoms. **Incomplete obstructions** can present with either acute or chronic abdominal pain

• Obstipation (no flatus), no bowel-movements (suggests complete obstruction)
• Infrequent bowel movements (partial obstruction)

• Bloating, cramping, anorexia
• Diffuse, visceral abdominal pain

Flat/low JVP, resting tachycardia, orthostatic hypotension

• Abdominal Pain: may come in waves, and can be severe (i.e. "light-switch pain") with complete obstruction
• Hyperactive bowel sounds (before a physical obstruction), OR absent bowel sounds (ileus)

Abdomen is tympanic to percussion

• Nausea/vomiting (worse with duodenal or jejunal obstruction because of proximity of obstruction)



Perforated "Viscous" (aka. GI tract; bowels): Pathogenesis and Clinical Findings

Author:

Yan Yu

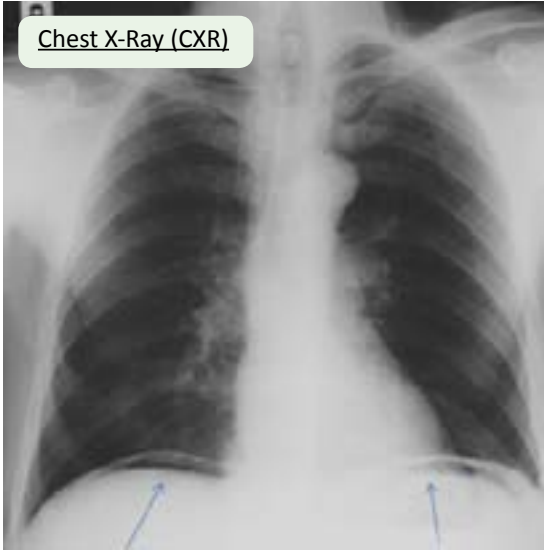
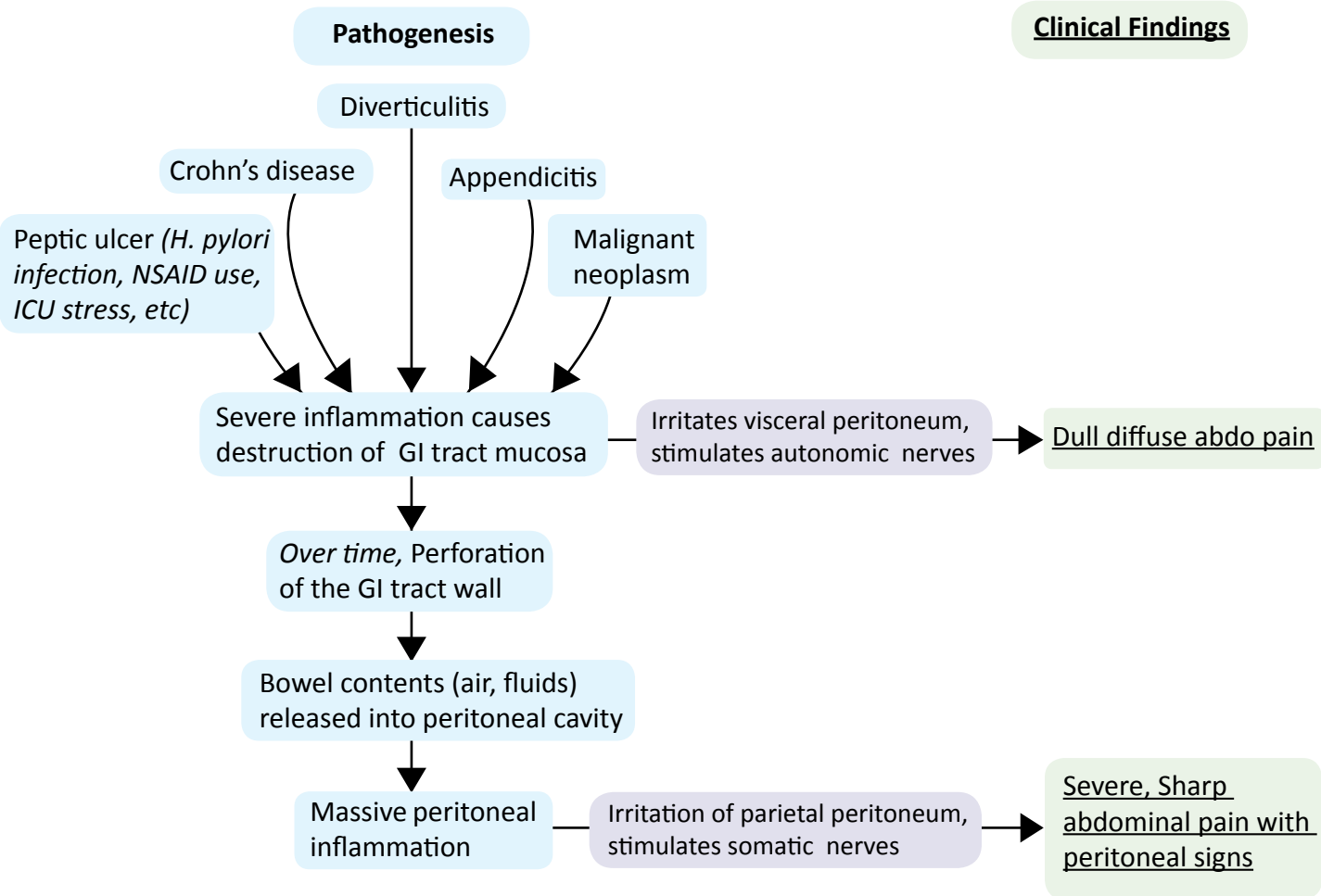
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Images courtesy of Alberta Health Services Repository

Diagnostic investigations if a GI perforation is suspected

- **Abdominal X-ray**
 - Intra-peritoneal air will coat the GI tract surfaces, giving them a faint white outline under X-ray
- **Chest X-ray of upright patient (Diagnostic)**
 - Intra-peritoneal air will rise above the peritoneal fluid when pt is upright, accumulating under the right hemi-diaphragm.
 - Note: air under left hemi-diaphragm = normal gastric bubble
- **CT?** Most patients with suspected GI perforation will get a CT scan, but this is not the diagnostic gold standard (and access to CT can be limited, especially in rural settings)

Small Bowel Infarction: Pathogenesis and Clinical Findings

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Important Notes:

Thankfully, bowel infarction in general is the rarest cause of acute abdominal pain.

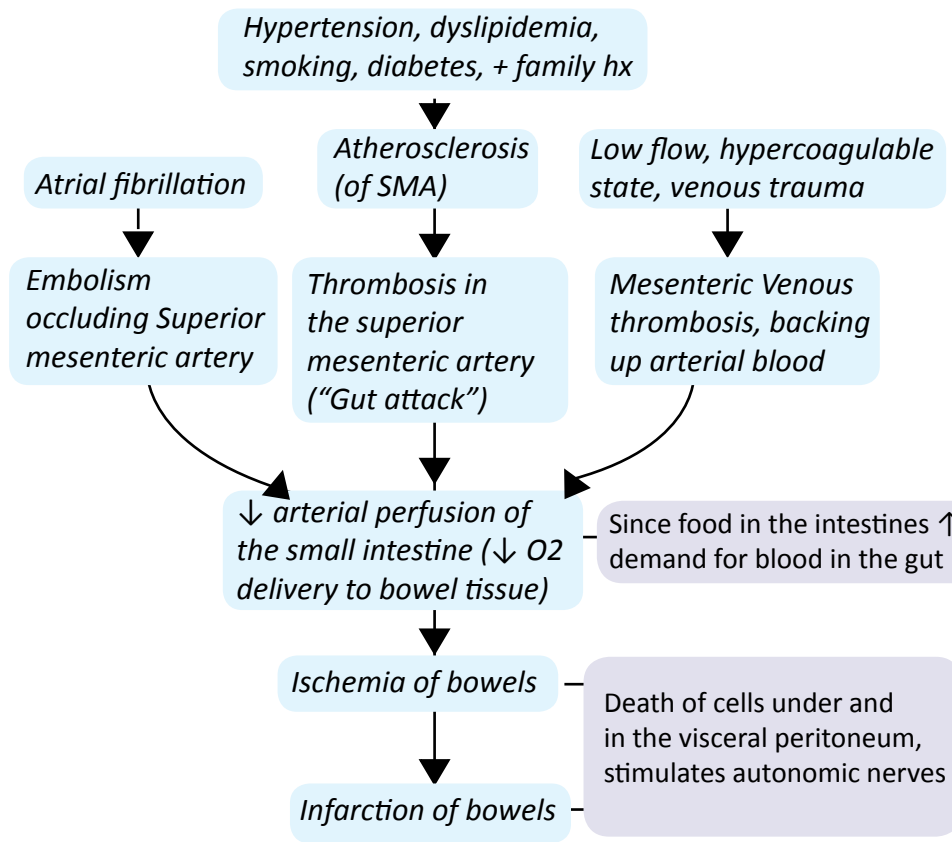
Bowel infarction most commonly occurs in the small intestine, due to reduced blood perfusion provided by the superior mesenteric artery (SMA).

Because of the colon's dual blood supply from the Superior and Inferior mesenteric arteries, reduced perfusion to the colon happens much less commonly than to the small bowel.

If perfusion to the colon is reduced, colonic tissue tends to suffer from ischemia rather than more serious infarction.

Colonic ischemia presents with different symptoms than small bowel infarction: usually pain, diarrhea, and rectal bleeding.

Pathogenesis



Clinical Findings

Pain is progressive, and out of proportion with the patient's physical exam findings – classic of small bowel infarction due to SMA occlusion