



## **SURGICAL COMPLICATIONS**

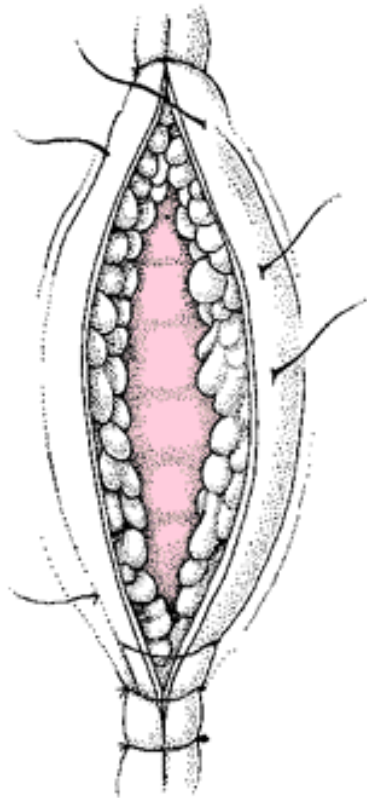
## COMPLICATIONS

- What operation did the patient have?
- What are the most common complications of this operation?
- What is most life-threatening?
- What comorbidities does that particular patient have?

## CLASSIFICATION

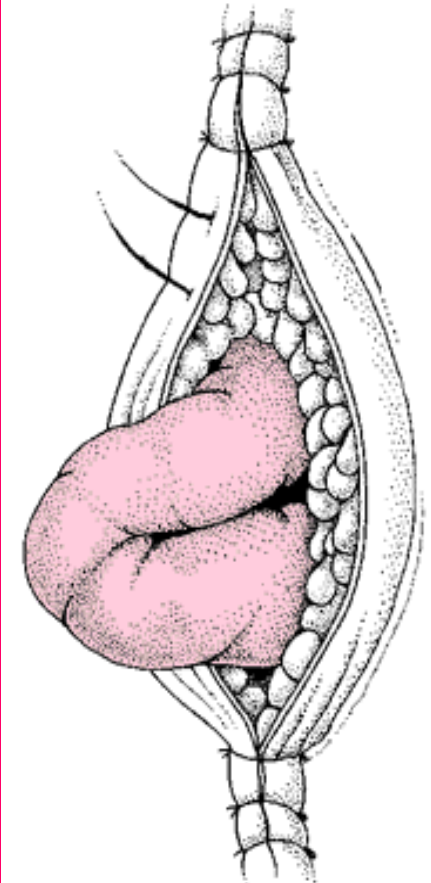
- Wound
- Thermal regulation
- Postoperative fever
- Pulmonary
- Cardiac
- Gastrointestinal
- Metabolic
- Neurological

## WOUND COMPLICATIONS



Dehiscence

Dehiscence  
Evisceration  
Seroma  
Hematoma  
Infection  
Incisional Hernia



Evisceration

**WHAT DO YOU DO?**



## SEROMA



Collection of liquefied fat, serum and lymphatic fluid under the incision

Benign

No erythema or tenderness

**Associated procedures:** mastectomy, axillary and groin dissection

**Treatment:** evacuation, pack, suction drains

## SCENARIO

You are called by the nurse about a patient who has just undergone a **thyroidectomy** with report of the patient having **difficulty breathing and desaturations?**

**What do you do?**

**What are you concerned about?**

## HEMATOMA

Abnormal collection of blood

**Presentation:** discoloration of the wound edges (purple/blue), blood leaking through sutures

**Etiology:** imperfect hemostasis

**What is the biggest concern with retained hematoma in the wound?**

Potential for infection



# WOUND INFECTION

## Superficial Site Infection (SSI)

Superficial

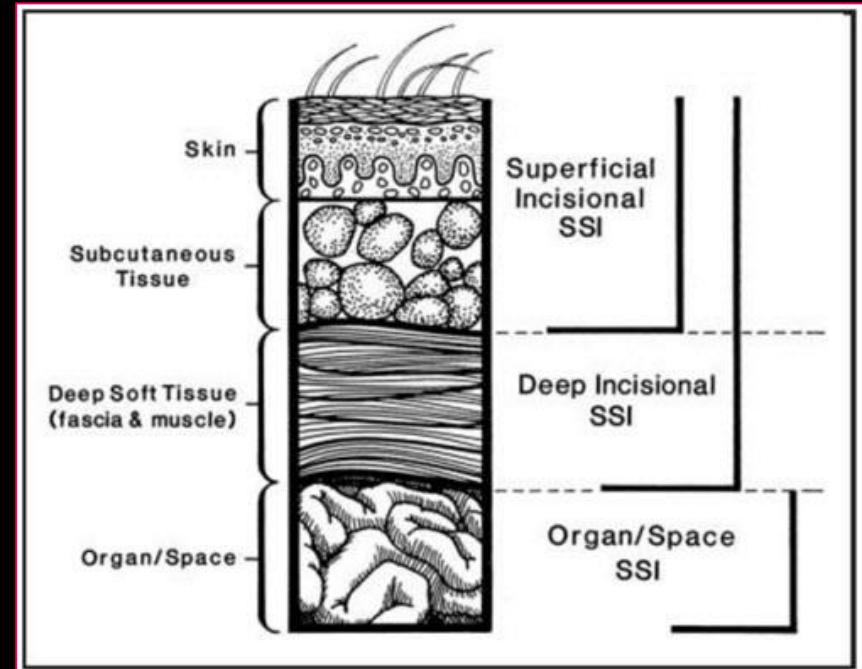
Deep (involving the fascia/muscle)

Presentation: erythema, tenderness,  
drainage

## Organ Space

Occurring 4-6 days postop

Presentation: SIRS symptoms



## WOUND INFECTION

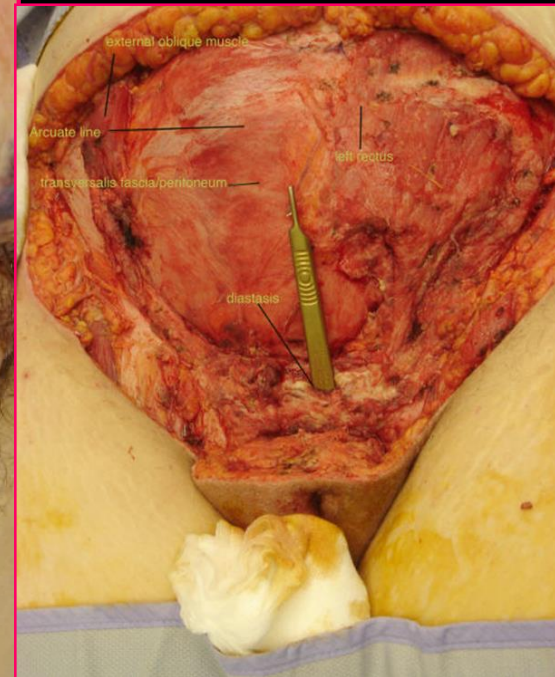
1. **Group A  $\beta$ -hemolytic streptococcal gangrene** – following penetrating wounds
2. **Clostridial myonecrosis** – postoperative abdominal wound  
**Presentation:** sudden onset of pain at the surgical site following abdominal surgery, crepitus → edema, tense skin, bullae = EMERGENCY
3. **Necrotizing fasciitis** – associated with strep, **Polymicrobial**, *associated with DM and PVD*

**Management:** aggressive early debridement, IV antibiotics

# NECROTIZING FASCIITIS



These large, dark, boil-like blisters are a diagnostic sign of necrotizing fasciitis (also known as flesh-eating disease).  
(Source: EMBS 1996 <http://mdchoice.com/>)



## COMPLICATIONS OF THERMAL REGULATION

Hypothermia

Malignant hyperthermia

## COMPLICATIONS OF THERMAL REGULATION

### Hypothermia

Drop in temp by 2° C

Temp below 35 ° C → coagulopathy, platelet dysfunction

**Risks:** (1) 3x risk increase of cardiac events, (2) 3x risk increase of SSI, (3) increase risk of blood loss and transfusion requirement

### Malignant hyperthermia

Autosomal dominant, rare

**Presentation:** fever, tachycardia, rigidity, cyanosis

**Treatment:** Dantrolene 1 to 2 mg/kg → 10 mg/kg total until symptoms subside

## POSTOPERATIVE FEVER

**What is the number #1 culprit of fever POD #1?**

### **Atelectasis**

**Management:** IS (incentive spirometry), early ambulation

### Work-up > 48h:

Blood cultures

UA/urine culture

CXR

Sputum culture

...then Treat the Fever

### The 6 W's

WIND– pneumonia, atelectasis

WOUND – infection

WATER – UTI

WALKING – DVT, possible PE

WASTE – Abscess

**What day do we expect abscesses?**

WONDER – medications

## PULMONARY COMPLICATIONS

**Atelectasis** – peripheral alveolar collapse due to shallow tidal breaths, MC cause of fever within 48h

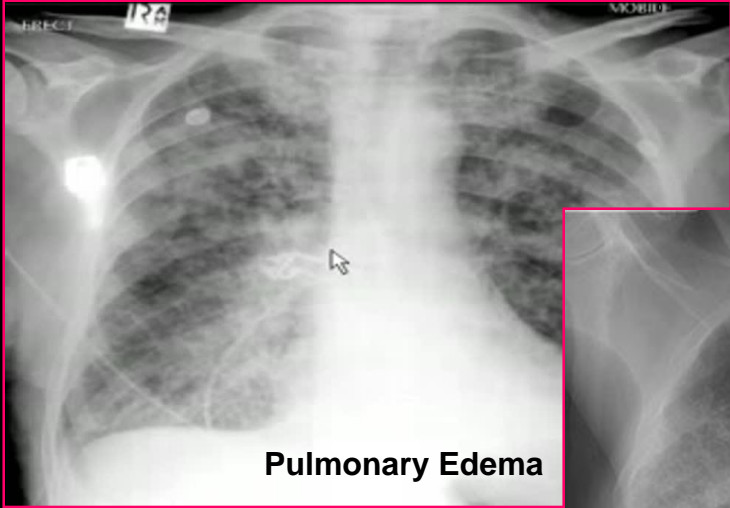
**Aspiration pneumonitis** – only requires 0.3 ml per kilogram of body weight (20 to 25 ml in adults)

**Nosocomial pneumonia**

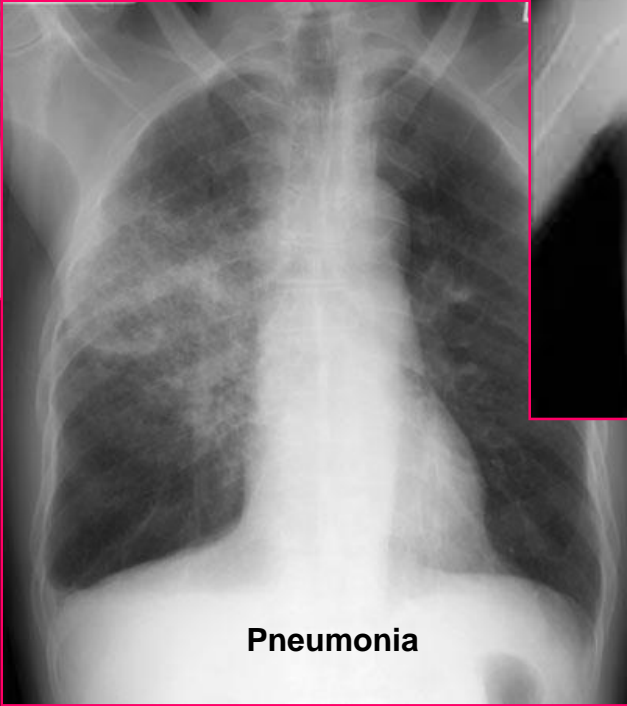
**Pulmonary edema** – CHF, ARDS

**Pulmonary embolus** – 1/5 are fatal, greatest management = prevention

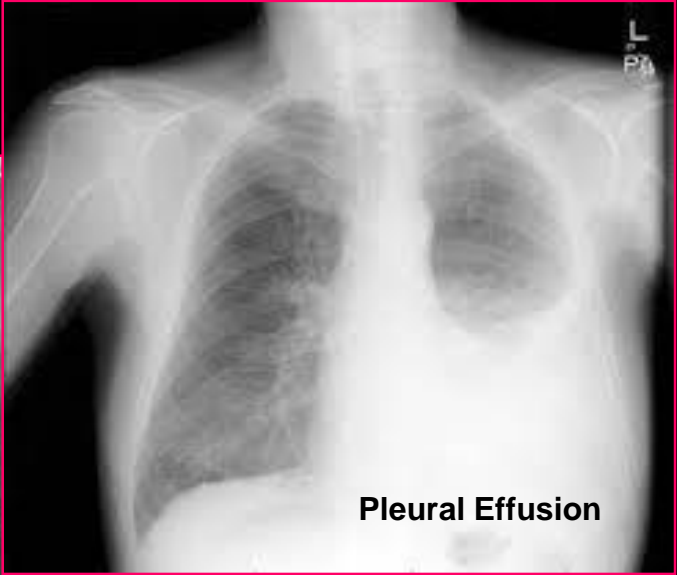
# CHEST X-RAY



**Pulmonary Edema**



**Pneumonia**



**Pleural Effusion**



# CARDIAC COMPLICATIONS

## Hypertension

### Ischemia/Infarction

- Leading cause of death in any surgical patient
  - Key to treatment = prevention
    - First steps: MONA

## Arrhythmias

- 30 seconds of abnormal cardiac activity
- Key to treatment = correct underlying medical condition, electrolyte replacement (Mg > 2, K > 4)

## RENAL COMPLICATIONS

### Urinary retention

Inability to evacuate urine-filled bladder after 6 hours

- 250-300 mL urine → catheterization
- >500 mL trigger foley replacement

### Acute renal failure

Oliguria  $< 0.5$  cc/kg/hr

Pre-renal (FeNa  $< 1$ )

Intrinsic (FeNa  $> 1$ )

Post-renal (FeNa  $> 1$ )

## GASTROINTESTINAL COMPLICATIONS

Postoperative ileus

GI bleeding

Pseudomembranous colitis

Ischemic colitis

Anastomotic leak

**Enterocutaneous fistula**

## POSTOPERATIVE ILEUS



Lack of function without evidence of obstruction

Prolonged by extensive operation/manipulation, SB injury, narcotic use, abscess and pancreatitis

Must be distinguished from SBO

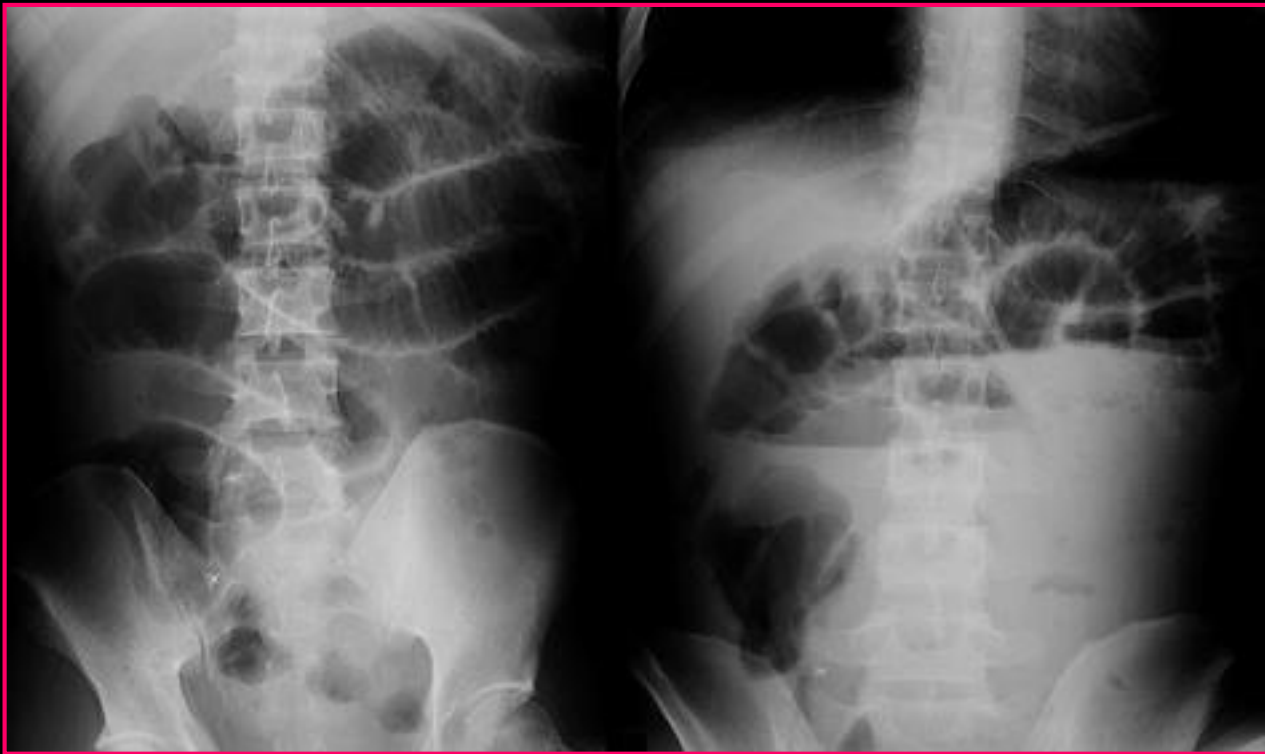
**Imaging:** KUB flat/upright

**Diagnosis:** dilation throughout with air in colon and rectum

**vs.**

SBO – air fluid levels, no colonic or rectal air

## SMALL BOWEL OBSTRUCTION



## GASTROINTESTINAL COMPLICATIONS

### GI Bleeding

From any source → get detailed history, place NG tube

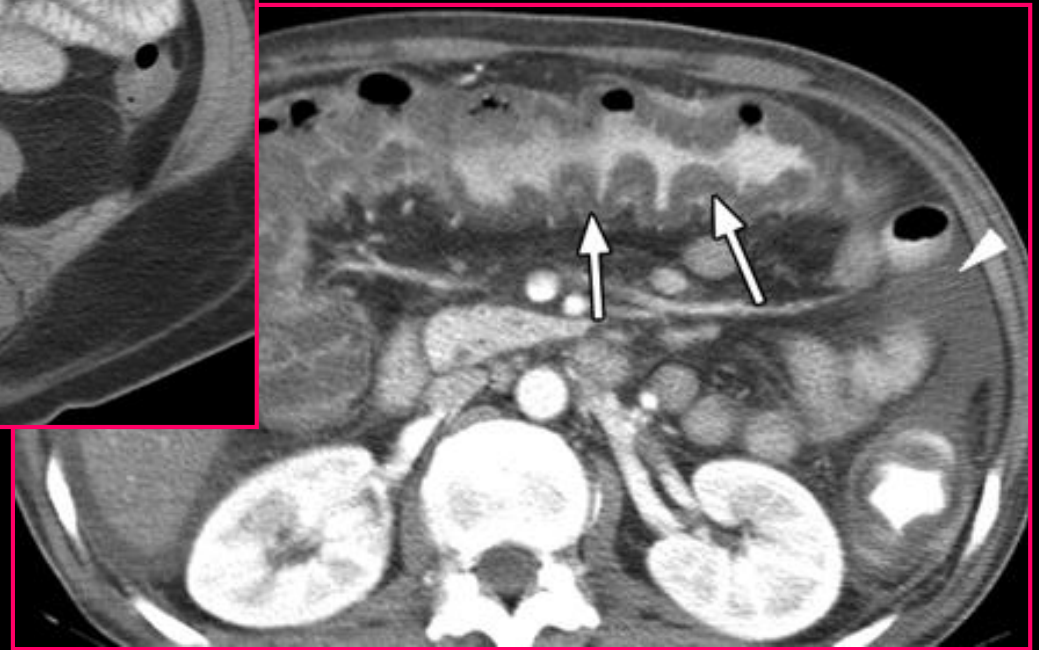
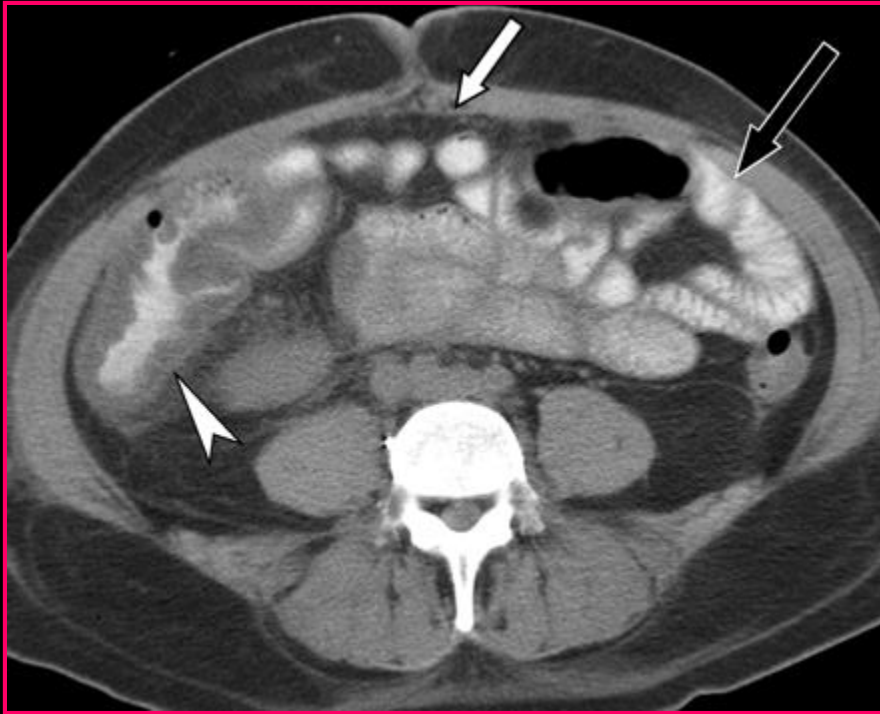
Etiology: Cushing's ulcer (less common with PPI use)

### Pseudomembranous colitis

Superinfection with *C difficile* due to alteration in normal flora

Toxic colitis is a surgical EMERGENCY (mortality 20-30%)

## C DIFF COLITIS



## GASTROINTESTINAL COMPLICATIONS

### Ischemic colitis

Bowel affected helps determine cause

Surgical devascularization, hypercoagulable states, hypovolemia, emboli

### Anastomotic leak

POD# ?

### Enterocutaneous fistula

The most complex and challenging complication



## METABOLIC COMPLICATIONS

### Adrenal insufficiency

Uncommon but potentially lethal

Sudden cardiovascular collapse

Presentation: hypotension, fever, confusion, abdominal pain

Work-up: Stim test with administration of hydrocortisone (baseline cortisol at 30 minutes and 60 minutes)

### Hyper/Hypothyroidism

#### SIADH

Continue ADH secretion despite hyponatremia

Neurosurgical procedures, trauma stroke, drugs (ACEI, NSAIDs)

## NEUROLOGIC COMPLICATIONS

Beware the drugs that you will be subscribing

Delirium, dementia, psychosis

Seizure disorders

Stroke and TIA