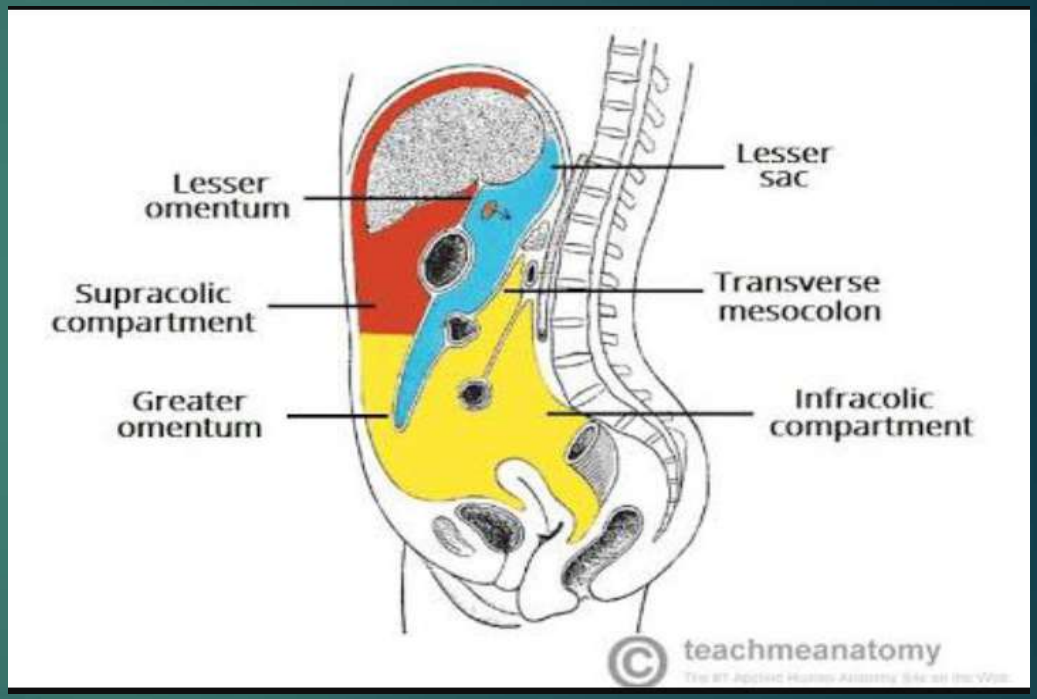
Peritonitis

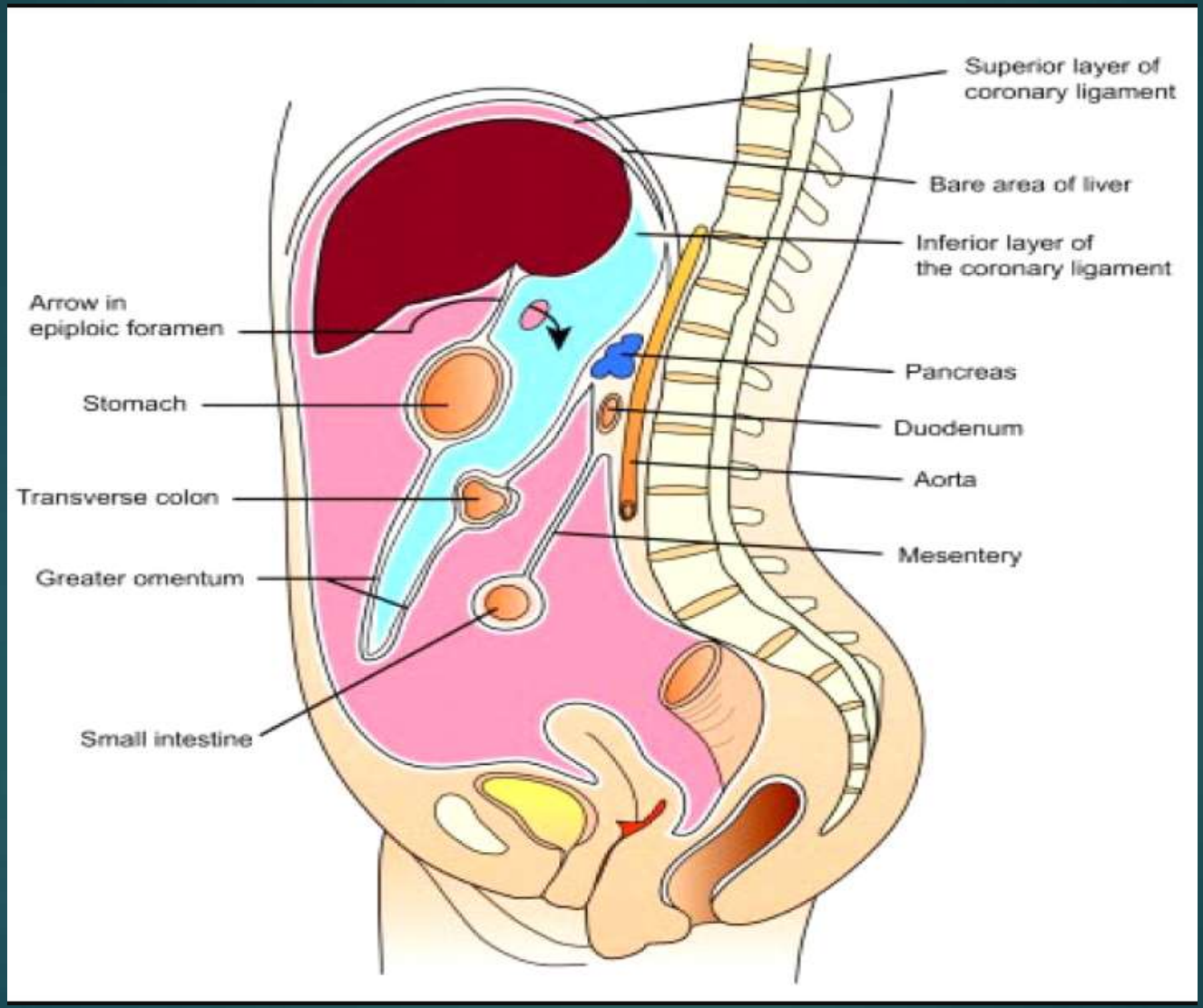


- Prof. Dr. / Alaa El-suity

Peritonitis

Definition:

Peritonitis is an inflamation of the peritoneum, the serous memberane that lines part of the abdominal cavity. Peritonitis may be localized or generalized, and may result from infection and from a non-infectious process.


Superior layer of coronary ligament
Bare area of liver
Inferior layer of the coronary ligament
Arrow in epiploic foramen
Pancreas
Stomach
Duodenum
Transverse colon
Aorta
Mesentery
Greater omentum
Small intestine

Types of peritonitis
Or
Classification

1 -Infected peritonitis (localized or generalized infected peritonitis) or none infected peritonitis .

2 -Primary or secondary peritonitis .

- **Primary peritonitis is caused by the spread of an infection from the blood and lymph nodes to the peritoneum.**
- **Secondary peritonitis is the more common type of peritonitis, happens when the infection comes into the peritoneum from the gastrointestinal or billiary tract .**

Risk Factors

- Liver disease (cirrhosis)
- Fluid in the abdomen
- Weakened immune system
- Pelvic inflammatory disease
- ***Risk factors for secondary peritonitis include:***
- Appendicitis (inflammation of the appendix)
- Stomach ulcers, Twisted intestine, Pancreatitis
- Inflammatory bowel disease, Injury caused by an operation.
- Peritoneal dialysis, Trauma.

Causative organisms

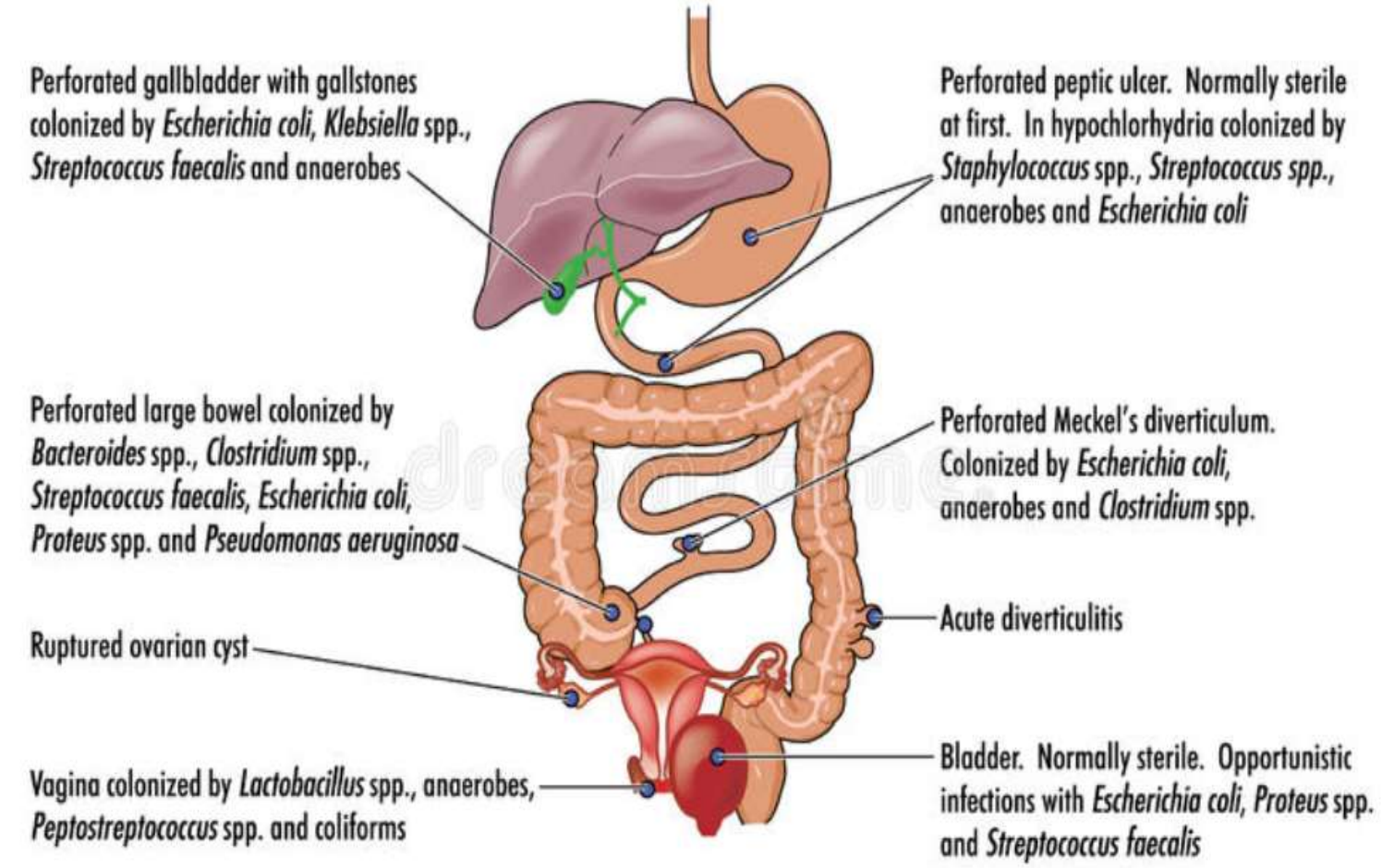
- pyogenic bacteria .
- E-coli .
- Aerobic and anaerobic .

Causes

I- Infected peritonitis:

1) Generalized Infected peritonitis:

A- Perforation of part of the gastrointestinal tract is the most common cause of peritonitis. This includes:


Perforated gallbladder with gallstones colonized by *Escherichia coli, Klebsiella* spp., *Streptococcus faecalis* and anaerobes
Perforated peptic ulcer. Normally sterile at first. In hypochlorhydria colonized by *Staphylococcus* spp., *Streptococcus spp.*, anaerobes and *Escherichia coli*
Perforated large bowel colonized by *Bacteroides* spp., *Clostridium* spp., *Streptococcus faecalis, Escherichia coli, Proteus* spp. and *Pseudomonas aeruginosa*
Perforated Meckel's diverticulum. Colonized by *Escherichia coli*, anaerobes and *Clostridium* spp.
Acute diverticulitis
Ruptured ovarian cyst
Vagina colonized by *Lactobacillus* spp., anaerobes, *Peptostreptococcus* spp. and coliforms
Bladder. Normally sterile. Opportunistic infections with *Escherichia coli, Proteus* spp. and *Streptococcus faecalis*

- perforation of the stomach as peptic ulcer, gastric carcenoma
- perforation of the duodenum (peptic ulcer)
- perforation of the remaining inttestine (e.g., appendicitis, inflamatory bowel disease, intestinal infarction, intestinal strangulation, colorectal carcinoma.).

2 - Disruption of the peritoneum, even in the absence of perforation of a hollow viscus, may also cause infection by letting micro-organism into the peritoneal cavity. *Examples include* yrotalubma suounitnoc ,dnuow lacigrus ,amuart .yparehtomehc laenotirep-artni dna ,sisylaid laenotirep

3 - Direct entry through an operative or traumatic wound.

4 - Intra-peritoneal dialysis **predisposes** laenotirep ot noitcefni

5 -Though blood spread in cases of septicemia and pyaemia but is rare.

6- TB peritonitis one of chronic specific peritonitis

Pathology :

- 1) the inflamed area become opaque and adherent together because of fibrin deposition .
- 2)excess purulent exudate accumulates .
- 3)paralytic ileus occurs at first as a reflex to minimize spread and then by the toxic effect of pus .finally mechanical intestinal obstruction from fibrinous adhesions may complicate the picture.

Fate

1) Resolution

2) Septicemia and death

3) Localization & abscess formation either around the 1ry viscus.

Factors facilitate localization of infection :

- **Anatomical**
- **Peristalsis**
- **Greater omentum**
- **Peritoneal fluid**

4) flaring up to diffuse peritonitis and its factors

1. Rapid Rate of infection: . e.g. perforated viscus no time for localization.

2. Centrallv Situated Organs . e.g. Mickle's diverticulum (with failure of localization).

3. Defect in Omentum: . Pregnancy elevated omentum. . Children small omentum.

4. Enema & purgatives increase peristalsis spread of infection.

5. High Virulence of Organism.

6. Low Patient Resistance.

Diffuse bacterial peritonitis

c/p :

The patient come the clinical picture of the cause then

Symptoms

1- pain: persistent, dull aching, increases by movement or coughing . The site of maximum pain is at the site of the original lesion.

2- Abdominal Distension.

3- Vomitinq: . At first gastric contents are vomited then it becomes bilious. . ln long standing cases, the vomitus becomes feculent.

4- Absolute Constipation: . lf there is pelvic collection, patient may have tenesmus or diarrhea

Signs :

1- General:

The patient looks distressed, toxic, lies still in bed and avoids any movement. There is fever & tachycardia.

2- Local: .

a. lnspection: - Limited abdominal movements with respiration all over the abdomen - Abdominaldistension.

b. Superficial palpation: Guarding all over the abdomen and tenderness.

c. Deep palpation: Rebound tenderness all over the abdomen.

d. Percussion:

- Shifting dullness.

- Tympanitic resonance (if intestinal obstruction)

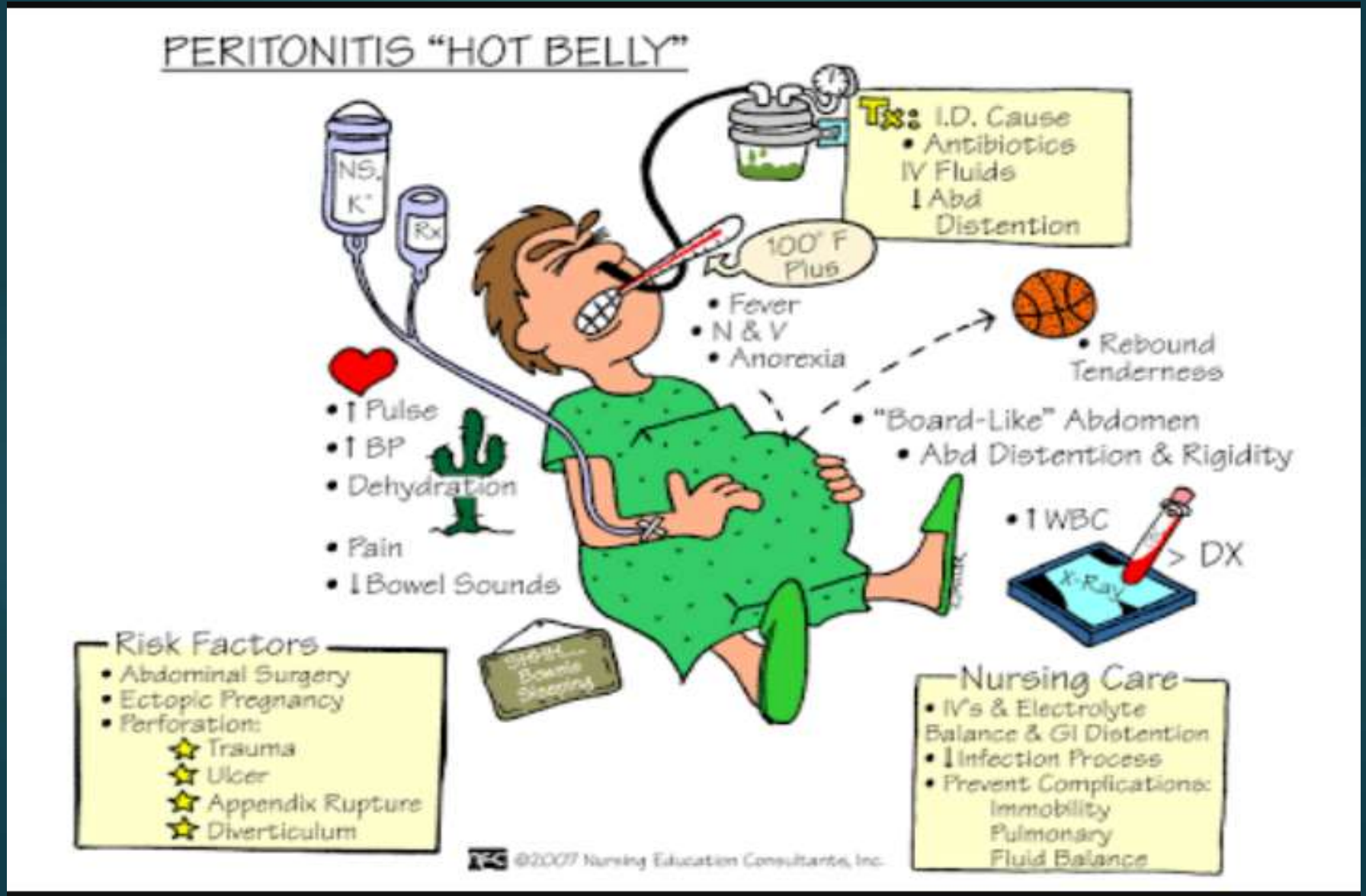
e. Auscultation:

- Absent or diminished intestinal sounds (dead silent abdomen).

f. PR/PV:

- Tenderness & fullness in Douglas pouch in females

- Fullness in the rectovesical pouch in males


PERITONITIS "HOT BELLY"
NS
K+
Rx
Tx: I.D. Cause
• Antibiotics
IV Fluids
↓ Abd Distention
100° F Plus
• Fever
• N & V
• Anorexia
• Rebound Tenderness
• ↑ Pulse
• ↑ BP
• Dehydration
• "Board-Like" Abdomen
• Abd Distention & Rigidity
• Pain
• ↓ Bowel Sounds
• ↑ WBC
X-Ray
> DX
Risk Factors
• Abdominal Surgery
• Ectopic Pregnancy
• Perforation:
Trauma
Ulcer
Appendix Rupture
Diverticulum
Nursing Care
• IV's & Electrolyte Balance & GI Distention
• ↓ Infection Process
• Prevent Complications:
Immobility
Pulmonary
Fluid Balance
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Causes of death & complication of generalized peritonitis :

1) Toxemia, septicemia, pyemia, bacteremia.

2) Multiple organ failure.

3) Paralytic ileus.

4) H2O and electrolyte imbalance.

5) Wound infection.

6) lncisional hernia and adhesive intestinal obstruction.

7) Residual abscess

Investigations :

for diagnosis :

- **U/S :intra-abdominal collection**

- Peritoneal diagnostic aspiration: May be helpful in determining the nature of the fluid e.g.:

- Bilious perforated DU.

-Pus bacterial peritonitis.

-Serosanguinous pancreatitis.

-CBC: Reveals leucocytosis.

For the cause :

. Plain X- Rav abdomen: . May indicate the cause (e.9. air under diaphragm in perforated viscus). . May demonstrate paralytic ileus with the distension of small and large bowel. , Multiple fluid levels in intestinal obstruction.

For complications :

. KFTs: Pre-renal uremia.

Localized 2ry Bacterial Peritonitis :

1- Subphrenic abscess.

2- IIiac abscess.

3- Pelvic abscess

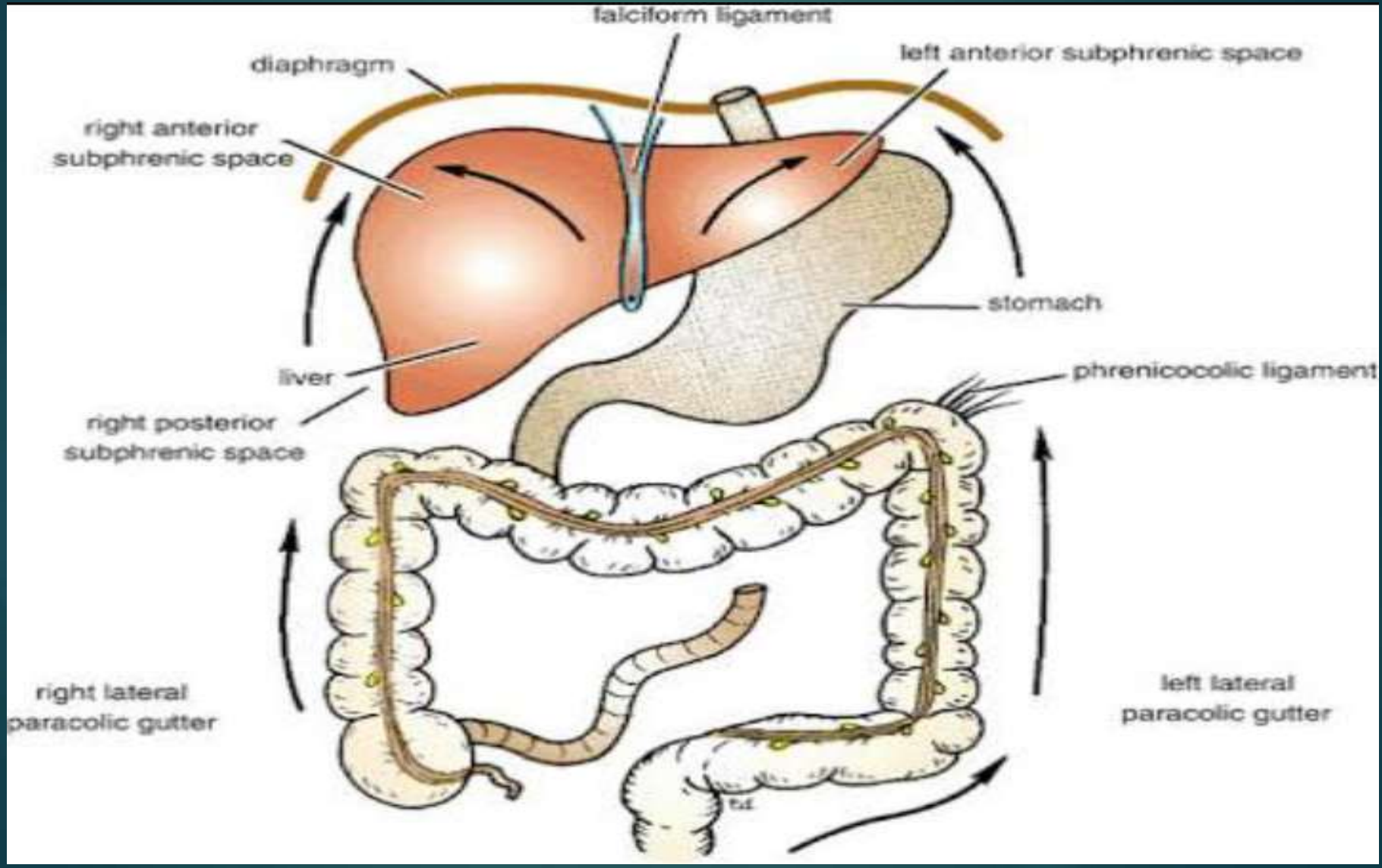
Subphrenic abscess

Anatomy

-The subphrenic region is considered as the portion of the abdominal cavity which extends from the diaghraom above to the transverse colon and mesocolon below .

-The region is divided by the liver into suprahepatic and infrahepatic compartments . The falciform ligament divides suprahepatic compartment into Rt. and Lt. portions.

-The subphrenic spaces, therefore, include the following:


falciform ligament
diaphragm
left anterior subphrenic space
right anterior subphrenic space
stomach
liver
phrenicocolic ligament
right posterior subphrenic space
right lateral paracolic gutter
left lateral paracolic gutter

intra-peritoneal spaces :

1- Riqht Anterior Subphrenic Space.

2- Left Anterior Subphrenic Space.

3- Riqht Posterior Subphrenic space: (Hepatorenal pouch of Morrisons).

4- Left Posterior Subphrenic Space .

Extra-peritoneal spaces :

1- rt & lt extra-peritoneal spaces

2- two perinepheric spaces

Etiology

Causative Organism: **E coli, Staph. or Strept.**

Route of Infection:

1. **Residual pus collection following generalized peritonitis.**
2. **Inflamed or perforated viscera e.g. appendix, GB.**
3. **Postoperative collection after appendectomy or cholecystectomy**
4. **Lymphatic spread from chest infection**

c/p :

Symptoms

General :

FAHM.

Local :

1- Persistent hiccoughs.

2- Pain is slight or absent

- Site: in the epigastrium or in the Rt. Hypochondrium.

- Referred to: the shoulder.

- lncreases bv: inspiration.

Signs

General :

fever, tachycardia, rapid deterioration of the general condition of the patient, may be pleural effusion.

Local :

1. Inspection: . lmpaired movement. . Rarely, there is bulging of the lower ribs or upper abdomen .

2.Palpation:

-Tenderness may be present in the lower ribs and just below the costal margin. Ihere may be swelling and rigidity of the upper abdomen.

- Downward displacement of liver with upward displacement of the apex of the heart.

3.Percussion:

lf the abscess contains gas, 4 percussion zones may be elicited:

a. Resonance of the lung.

b. Dullness of the pleural effusion.

c. Resonance of the gas in the abscess.

d. Dullness of the liver or pus in the abscess.

4.Auscultation:

Decrease air entry and crepitations over the lung base of the affected side.

Investigation :

the best is U/S & CT .

. Chest X- Rav:

- Thickened elevated and fixed copula of the diaphragm (Tented Diaphragm)

- Diminished movement of the copula by screen. . Homogenous opacity obliterating the corresponding costophrenic angle risingto the axilla (pleural effusion).

- Air under diaphragm .

Pelvic abscess

Collection of pus in douglas pouch or retrovesical pouch

causes :

a) Acute pelvic appendicitis.

b) Pelvic inflammatory disease (PlD) in females.

c) Localization of diffuse peritonitis.

Symptom

a) Dysuria and frequency due to bladder irritation

b) Tenesmus and diarrhea due to rectal irritation

c) Pain (pelvic, perineal & suprapubic).local

Signs (PR) or (PV)

- Tense, cystic and tender mass (tender boggy).

If large felt in the suprapubic region.

Treatment :

- Drainage

. Colpotomy (vagina).

. Proctostomy (rectum).

Illiac abscess

Causes :

a) Rt. lliac fossa from acute appendicitis and perforated DU.

b) Lt. iliac fossa from diverticulitis or ulcerative colitis.

c) On both sides: tubo-ovarian abscess, localization of diffuse peritonitis.

C / P :

Symptoms

1. General: FAHM.

2. Local:

. Pain in the iliac fossa.

. Vomiting and constipation.

Signs

. Swellinq in the iliac fossa.

' Tenderness in the iliac fossa

TTT :

Percutaneous U/S or CT guided aspiration.

II-Non-infected peritonitis

1) Billiary peritonitis eg

1. After cholecystectomy (cholecystohepatic ducts).

2. Leakage around a T-tube

2) Meconum peritonitis

Gut perforation (neonatal- late intrauterine)) aseptic peritonitis

Pathophysiology

- In normal conditions, the peritoneum appears greyish and glistening. It becomes dull 4 –2hours after the onset of peritonitis, initially with serous or slightly turbid fluid.
- Peritonitis is caused by leakage of contents from abdominal organs into the abdominal cavity, usually as a result of inflammation, infection, ischemia, trauma, or tumor perforation.

- **Bacterial proliferation occurs .**
- **Edema of the tissues results and exudation of fluid develops in a short time .**
- **Fluid in the peritoneal cavity becomes turbid with increasing amounts of protein, white blood cells, cellular debris, and blood. The immediate response of the intestinal tract is hypermotility, followed by paralytic ileuse with an accumulation of air and fluid in the bowel.**
- **Later on, the exudate becomes creamy and suppurative. It may be spread to the whole peritoneum**

Nursing process:

A-Assessment through:

- Signs and symptoms - Diagnostic parameters

Signs and symptoms of peritonitis:

- Symptoms depend on the location and extent of the inflammation.
- Abdominal pain and tenderness. At first, a diffuse type of pain is felt. The pain tends to become constant, localized, and more intense near the site of the inflammation.

- **Diffuse abdominal rigidity, Swelling and tenderness in the abdomen with pain ranging from dull aches to severe, sharp pain is often present, especially in generalized peritonitis**
- **Fever and chills, loss of appetite, thirst, nausea and vomiting.**

- Reduced urine output
- Not being able to pass gas or stool
- Sinus tachycardia
- Development of paralytic ileus (i.e., intestinal paralysis), which also causes nausea, vomiting and.
- Abdominal distension
- Auscultation reveals absent of bowel sound due to paralytic ileus
- In neglected cases the patient will present by sunken eyes

Diagnostic parameters:

- **A diagnosis of peritonitis is based on the clinical manifestations .**
- **Blood picture for leukocytosis.**
- **hypokalemia, hypernatremia, and acidosis may be present, but they are not specific findings.**
- **Abdominal X-rays may reveal dilated, edematous intestines,**

- **Computed tomography (CT or CAT scanning) may be useful in differentiating causes of abdominal pain .**
- **In patients with ascites, a diagnosis of peritonitis is made via paracentesis .**
- **Culture of the peritoneal fluid can determine the microorganism responsible and determine their sensibility to antimicrobial agents.**

Medical Treatment of peritonitis:

1) General supportive measures such as intravenous rehydration and correction of electrolyte disturbances.

2) Antibiotics are usually administered intravenously, but they may also be infused directly into the peritoneum .

Surgical treatment:

-laparotomy is needed to perform a full exploration and lavage of the peritoneum.

Preoperative preparation:

- **A nasogastric tube is inserted to deflate the stomach and bowels and to prevent vomiting during induction of anesthesia.**
- **Intravenous fluids as saline or ringer solution are administered to correct the hypovolemia.**
- **Antibiotics: a combination of ampicillin, an aminoglycoside and metroniazol can cover all aerobic and anaerobic organisms.**
- **Analgesics are given for pain relieve.**
- **Foley catheter is inserted to check the urine output and the adequacy of fluid replacement.**

Exploratory laparotomy :

1- lncision:

Midline incision in doubtful cases or paramedian

2- Peritoneal toilet:

(Saline + betadine or antibiotic) then the pus & foreign materials are removed.

3- ldentification of the cause:

It should be dealt with e.g. acute appendicitis) Appendicectomy.

4- Drainaqe

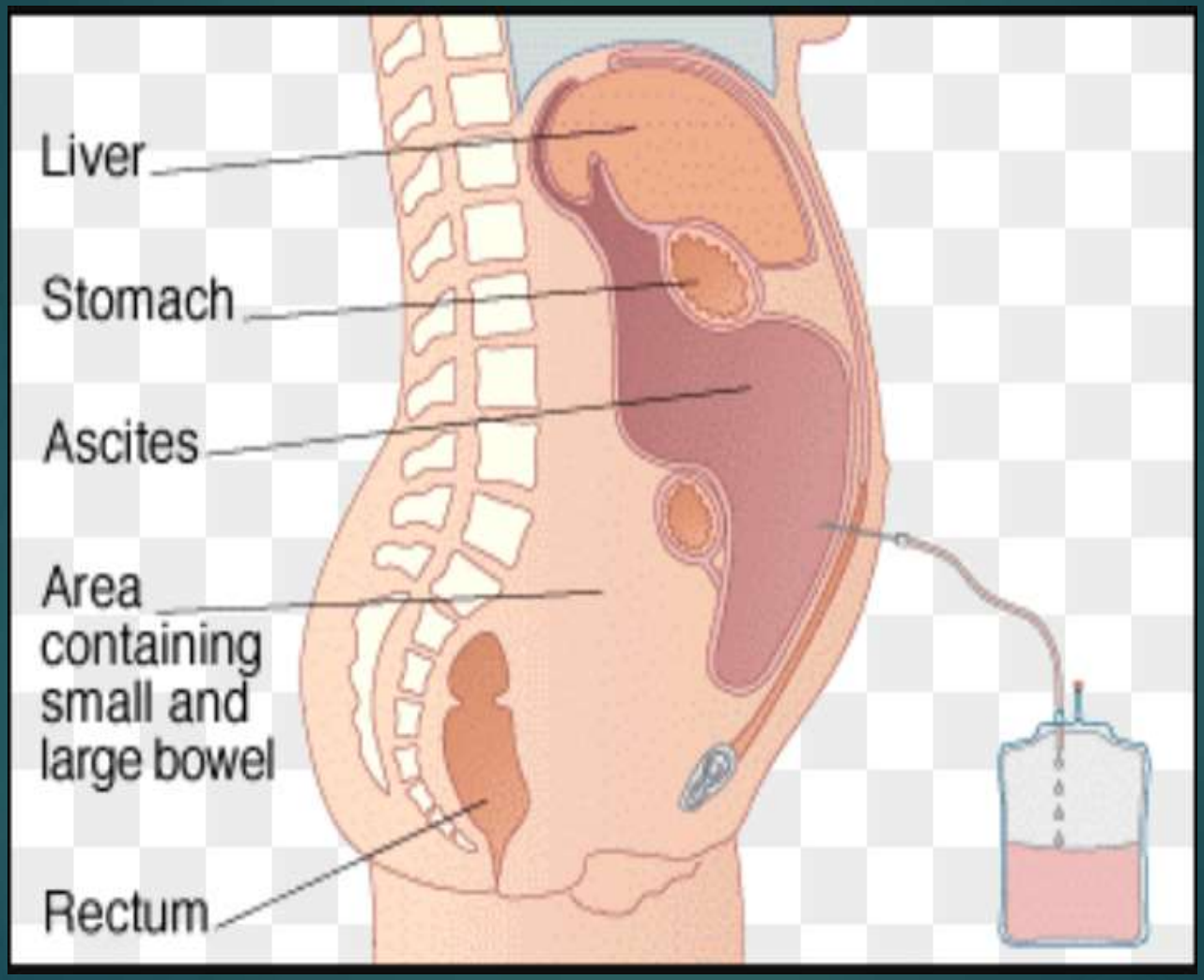
- Hepatorenal drain: most dependent area while lying down.

- Pelvic drain: most dependent area during standing.

- Drain beside the cause.

Subcutaneous drain

5- The abdomen is closed


Liver
Stomach
Ascites
Area containing small and large bowel
Rectum

In case of subphrenic abscess

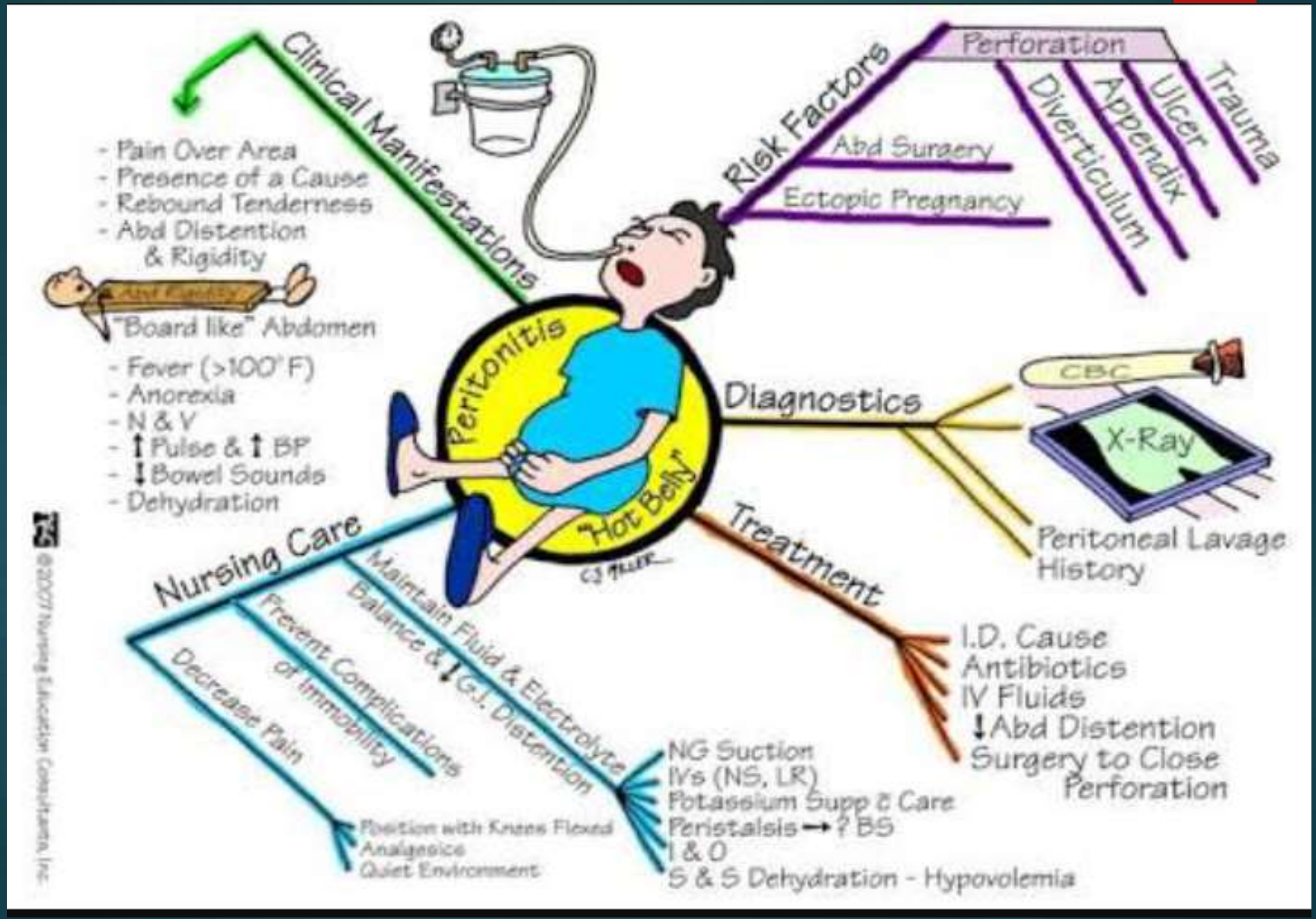
1) Percutaneous drainage under the guidenss of U/S or CT

2) Open drainge

Post operative care:

- **Continuous antibiotic treatment.**
- **Drains are inserted during the surgical procedure, and the nurse must observe and record the character of the drainage postoperatively.**
- **Care must be taken when moving and turning the patient to prevent the drains from being dislodged.**
- **Prepare the patient and family for discharge by teaching him to care for the incision and drains if he will be sent home with the drains.**

Summery


Peritonitis
"Hot Belly"
Clinical Manifestations
- Pain Over Area
- Presence of a Cause
- Rebound Tenderness
- Abd Distention & Rigidity
"Board like" Abdomen
- Fever (>100° F)
- Anorexia
- N & V
- ↑ Pulse & ↑ BP
- ↓ Bowel Sounds
- Dehydration
Risk Factors
Perforation
Trauma
Ulcer
Appendix
Diverticulum
Abd Surgery
Ectopic Pregnancy
Diagnostics
CBC
X-Ray
Peritoneal Lavage
History
Treatment
I.D. Cause
Antibiotics
IV Fluids
↓Abd Distention
Surgery to Close Perforation
Nursing Care
Maintain Fluid & Electrolyte Balance & ↓ G.I. Distention
NG Suction
IVs (NS, LR)
Potassium Supp & Care
Peristalsis → ? BS
I & O
S & S Dehydration - Hypovolemia
Prevent Complications of Immobility
Position with Knees Flexed
Decrease Pain
Analgesics
Quiet Environment