# PLABABLE

## GEMS

**VERSION 5.2**

# GENERAL SURGERY

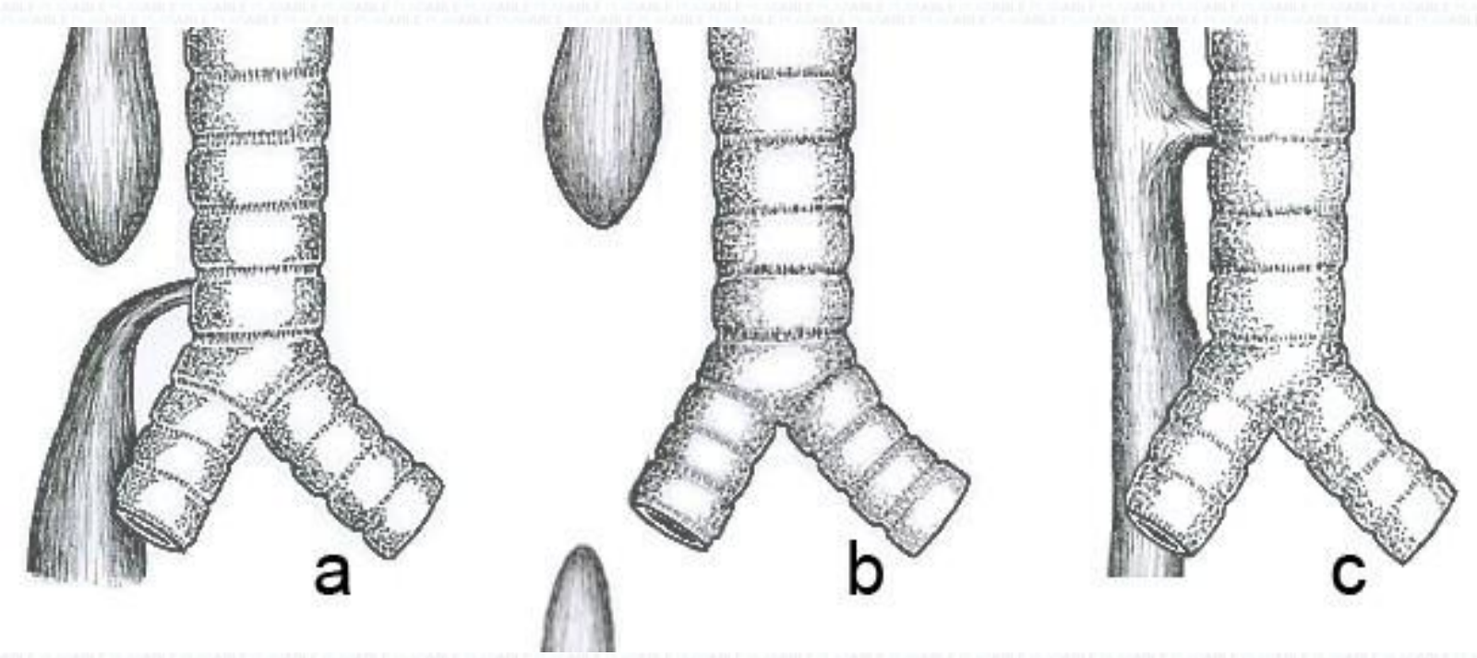
# Oesophageal Atresia

## Presentation

- Polyhydramnios
- Absent gastric bubble on antenatal USG scan
- Diagnosed after 26 weeks of gestation
- Associated with VACTERL defect

## Complications

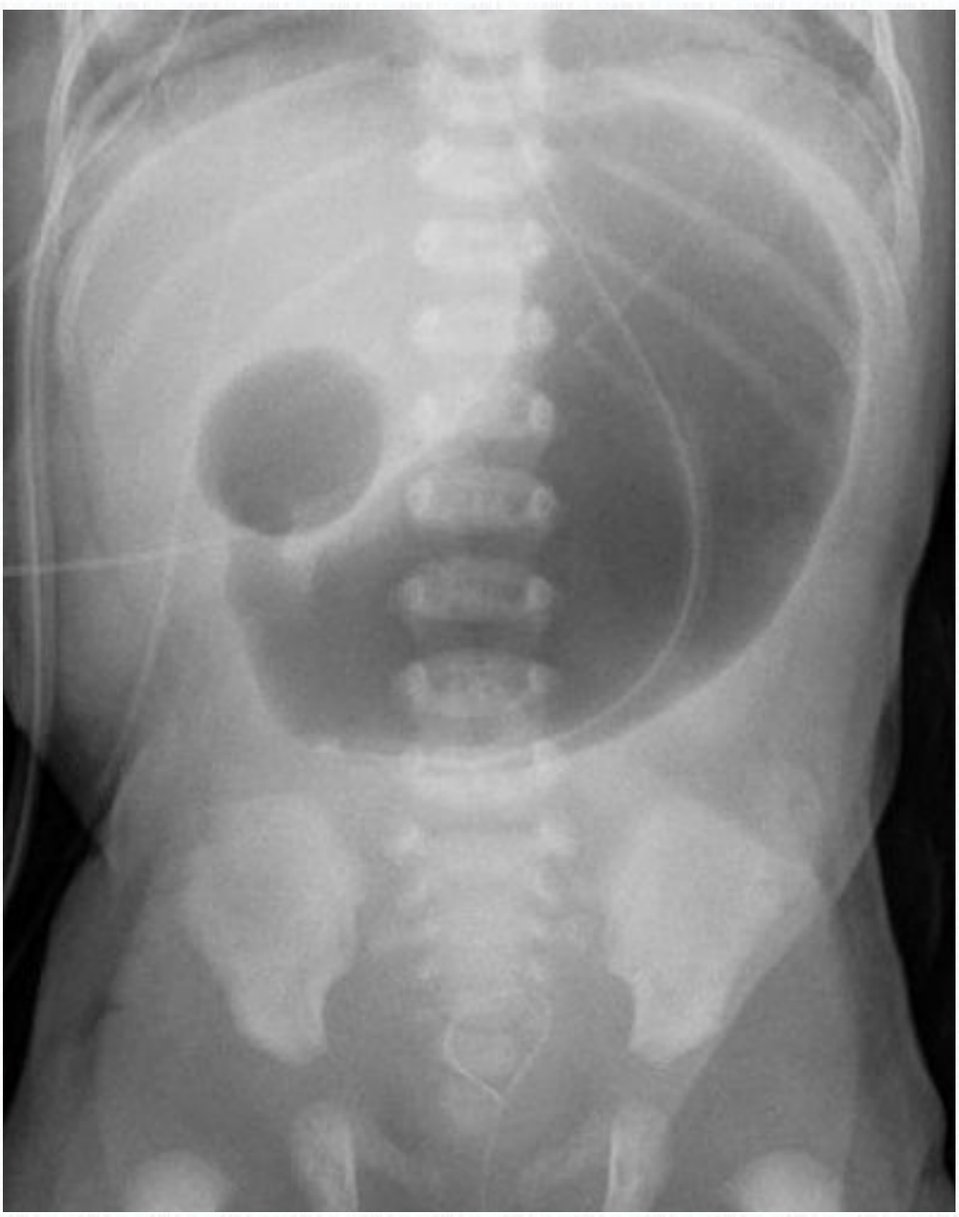
- Aspiration pneumonia
- Gastric distension at birth




a) Oesophageal atresia with distal tracheoesophageal fistula
b) Isolated esophageal atresia without tracheoesophageal fistula
c) H-type tracheoesophageal fistula

# Atresia Comparisons

| | |
|---|---|
| No Bubble | Oesophageal atresia |
| Single Bubble | Gastric atresia |
| Double Bubble | Duodenal atresia |
| Triple Bubble | Jejunal atresia |



**Double bubble**

# Pharyngeal Pouch (Zenker's Diverticulum)

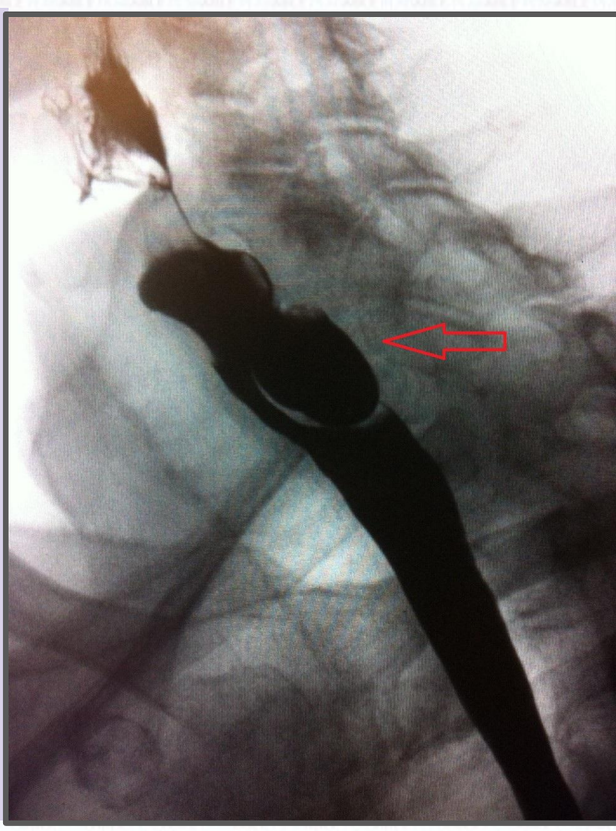
Herniation between thyropharyngeus and cricopharyngeus muscles

**Presentation**

- Dysphagia
- Regurgitation of **old eaten food**
- Halitosis
- Chronic cough
- Progressive weight loss

**Investigation**

- Avoid endoscopy (fear of rupture)
- Barium swallow may show residual pool of contrast within the pouch



**Management**

Surgical (minimal invasive surgery)

# Oesophageal Carcinoma

**Risk factors**

- Smoking → Higher risk of **SCC** as compared to adenocarcinoma
- Alcohol
- GORD
- Barrett's oesophagus → **Adenocarcinoma**
- Achalasia → **Squamous cell carcinoma**

The commonest type → **Adenocarcinoma** (caucasians)

**Presentation**

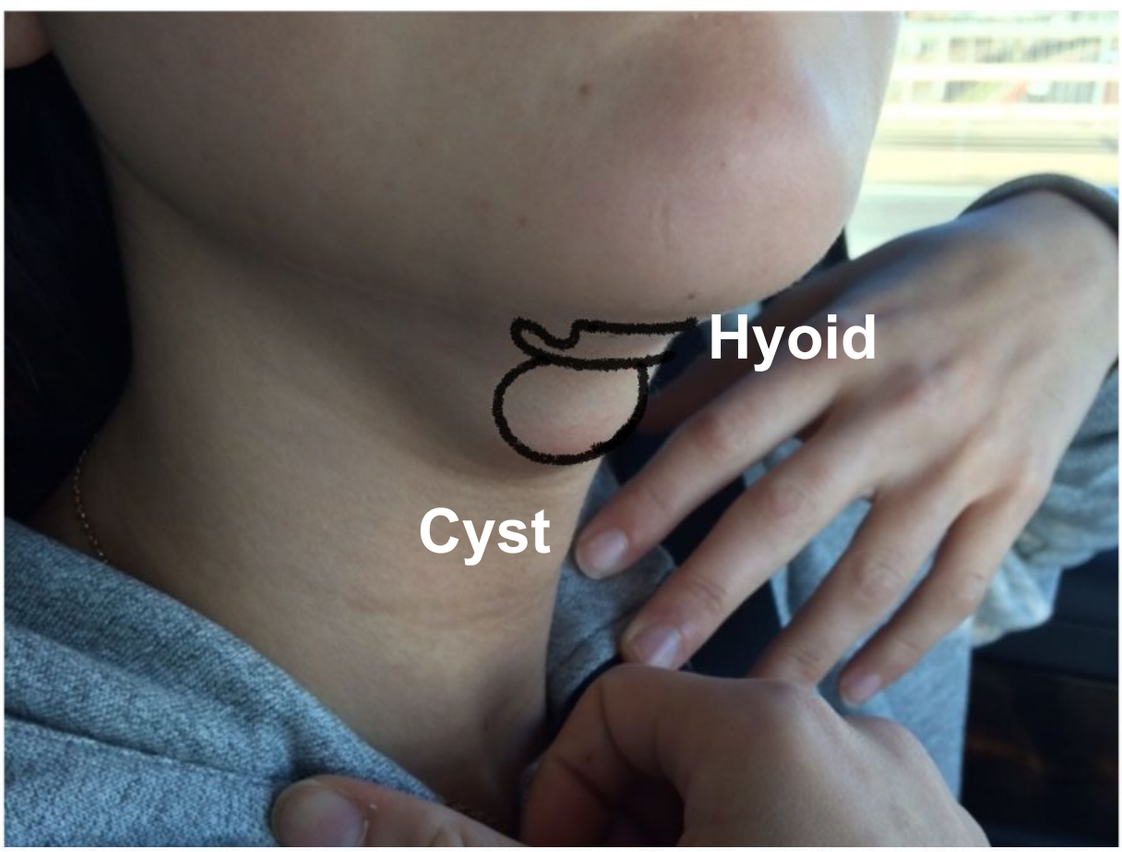
- Old age
- Gradually worsening dysphagia
- Upper abdominal pain
- Long standing gastric reflux
- Weight loss

**Investigations**

- Upper GI endoscopy with biopsy (**1st line test**)
- Barium swallow → Irregular narrowing + proximally dilated segment

# Thyroglossal Cyst

- Formed from **persistent thyroglossal duct**
- Midline neck swelling which **moves with tongue protrusion**
- Accounts for 75% of midline neck swellings in children
- Asymptomatic, benign
- Fluid filled



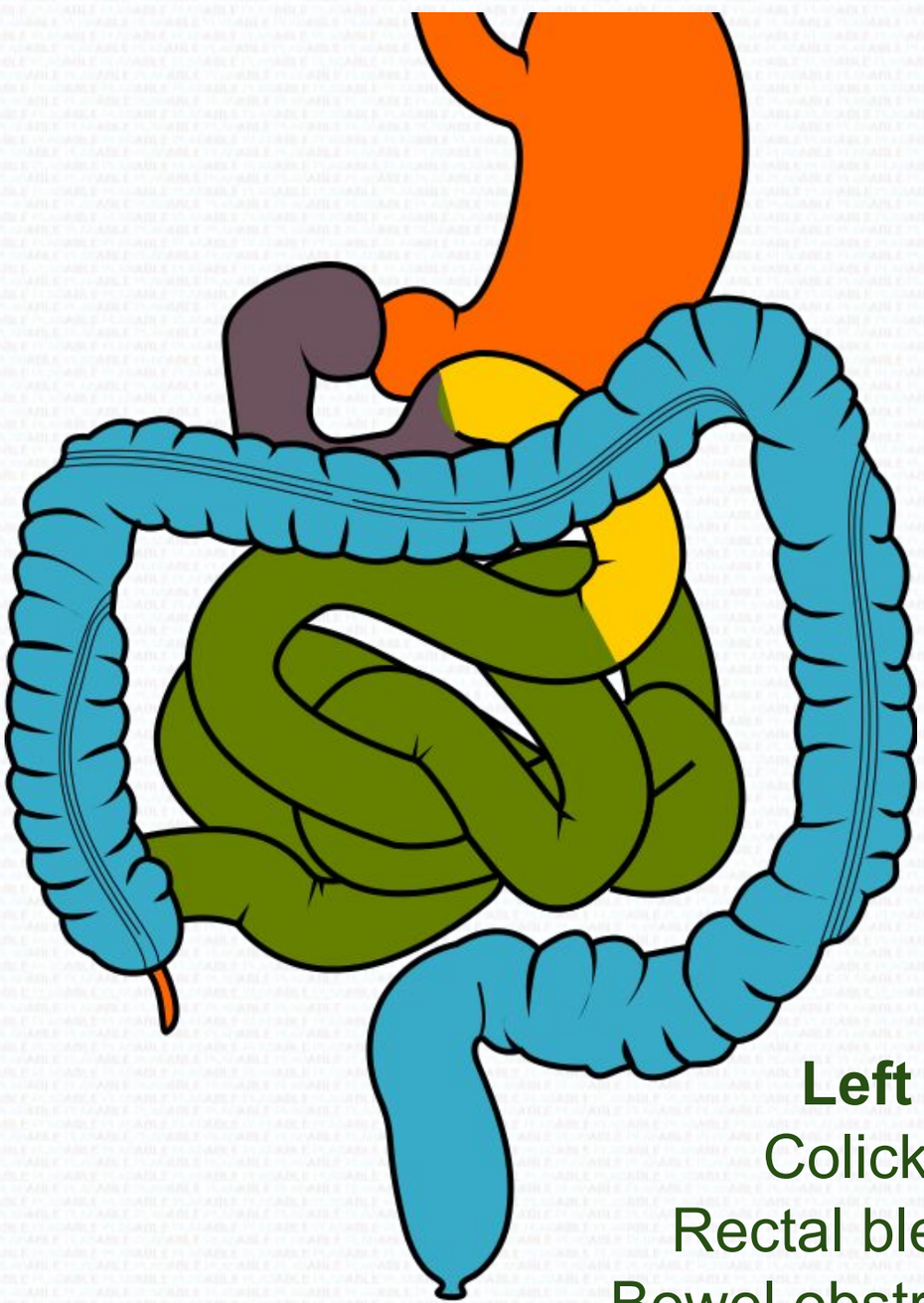

## Diagnosis

- USG (first-line & investigation of choice)
- Rarely requires MRI or CT scan
- To rule out ectopic thyroid tissue in wall→Tc-99m scan

# Colorectal Cancer

**Risk factors**

- Age
- Family history
- Inflammatory bowel disease
- Polyposis syndrome
- Meat rich diet, sedentary lifestyle

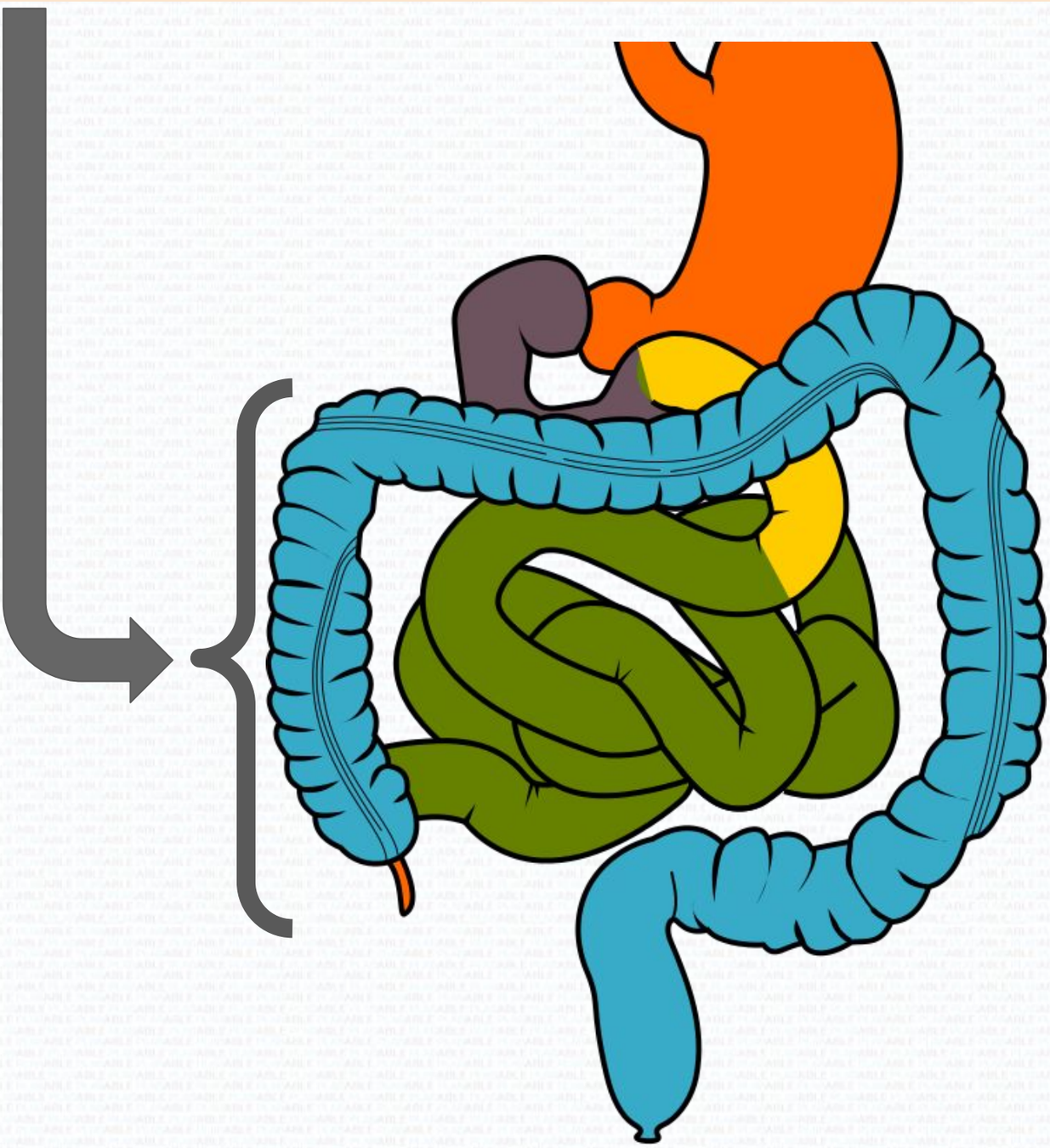


**Right colon**
Weight loss
Blood loss
Mass in RIF

**Left colon**
Colicky pain
Rectal bleeding
Bowel obstruction
Change in bowel habits
(Tenesmus)

# Colorectal Cancer

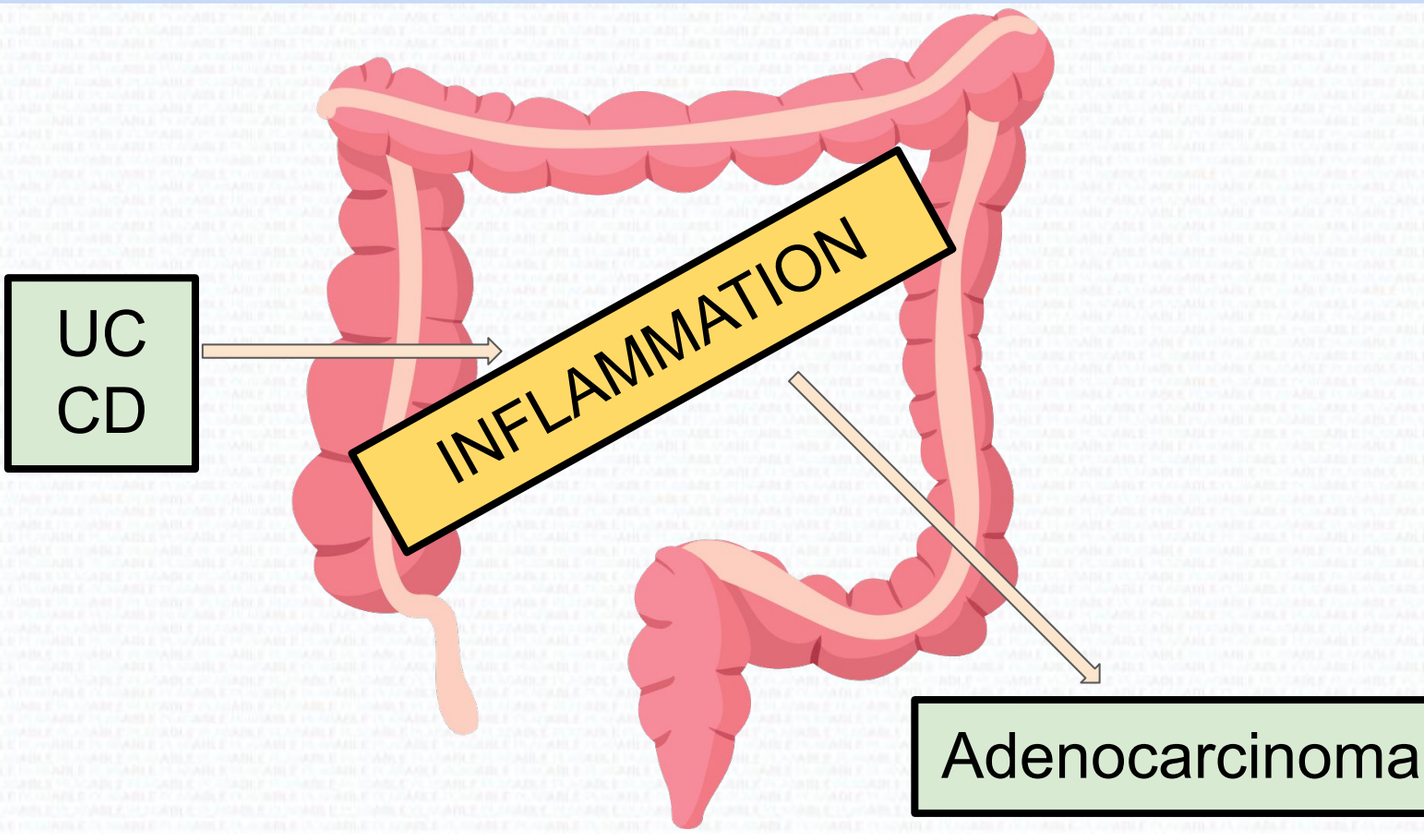
**Example:**
Iron deficiency anaemia in a patient 60 years and above who is otherwise asymptomatic = Think right-sided colon cancer



# Colorectal Cancer

**Why do patients with inflammatory bowel disease (ulcerative colitis and Crohn's disease) have a higher risk of colorectal cancer?**

This is due to continuous turnover of cells in the intestinal tract which increases the chance of a mutation leading to cancer.




Most common type of colorectal cancer → **Adenocarcinoma**

# Colorectal Carcinoma

## Presentation

- Weight loss
- Rectal bleeding
- Anaemia
- Old age
- Bowel obstruction

## Risk factors

- Familial adenomatous polyposis
- Diet rich in meat and poor in fibre
- Smoking
- Inflammatory bowel disease

## Investigation

- Colonoscopy and biopsy (**gold standard**)
- CT scan
- Barium enema

**Management** - Surgery or palliative care

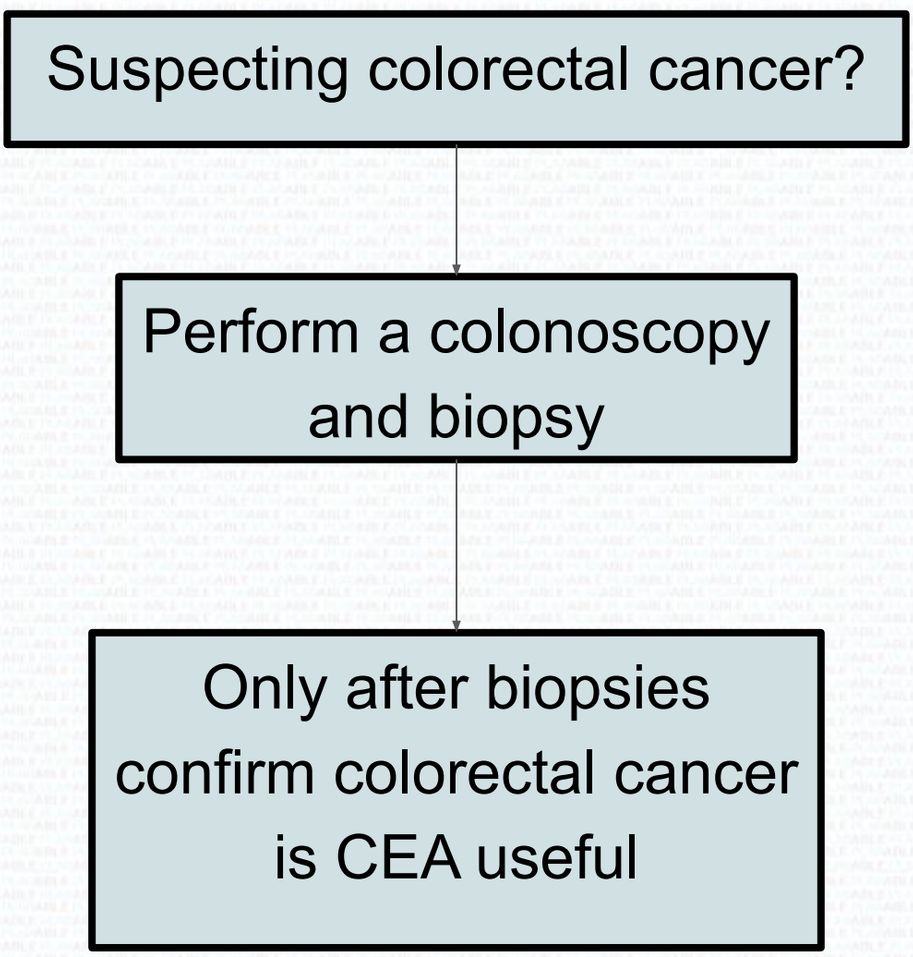
## Screening

Every 2 years to all aged 60 to 74

# CEA

Carcinoembryonic antigen (CEA) is used to monitor the treatment of colorectal cancer.

A CEA should only be requested once malignancy has been confirmed and not used to screen for it.



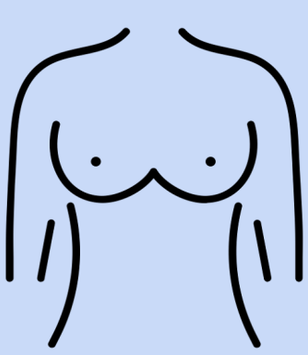

*Our PLABABLE phrase to help you remember:*

***CEA is for prognosis NOT diagnosis***

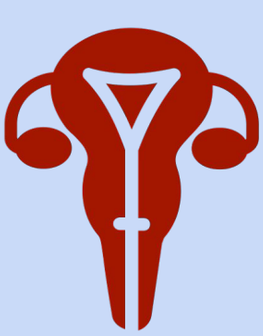
# Tumour Markers

| Tumour marker | Associated cancer |
|---|---|
| CA 125 | Ovary |
| CA 19-9 | Pancreas |
| CA 15-3 | Breast |
| Prostate specific antigen (PSA) | Prostate |
| Carcinoembryonic antigen (CEA) | Colon, Rectum |
| Alpha-fetoprotein (AFP) | Liver, Teratoma |
| Lactate dehydrogenase (LDH) | Testis (Seminoma) |

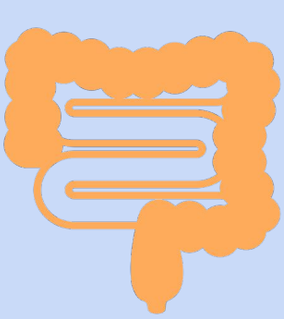
**Screening** is available in UK for everyone:



Breast cancer



Cervical cancer



Colon cancer

# Mesenteric Ischaemia Vs Ischemic Colitis

| | Mesenteric ischaemia | Ischemic colitis |
|---|---|---|
| **Onset** | Acute | Gradual |
| **Aetiology** | **Embolic** (look for AF) → Sudden total loss of blood supply (to a segment of bowel) | **Multifactorial** → Transient loss of blood supply |
| **Clinical Features** | Abdominal pain is disproportionate to clinical findings | • Pain → Starts in the left iliac fossa<br>• Moderate colicky abdominal pain and bloody diarrhoea |
| **Treatment** | **Urgent** surgery needed to restore blood supply and to remove necrotic tissue | **Conservative**: Medications Or Surgical |

# Acute Mesenteric Ischaemia

**Brain trainer:**

A man presents with acute onset of severe, persistent abdominal pain. His abdomen is distended and silent on auscultation. He has atrial fibrillation. What is the most likely cause?

➔ **Acute mesenteric ischaemia**

# Perianal Abscess

**Presentation**

- Lump near anal opening
- Throbbing pain (on sitting)
- Constipation
- Fever, local rise of temperature
- Erythema around swelling

**Common with**

- Diabetes
- Immunocompromised status
- With Crohn’s disease

**Treatment**

- Incision and drainage (definitive)
- Antibiotics

# Perianal Abscess


Perianal **haematoma** can get infected and become abscess. Haematoma can be treated **conservatively** with analgesics.

# Anal Fistula

Abnormal communication between the anal canal and perianal skin

**Symptoms**

- Pain
- Pus, Serous discharge
- Itching

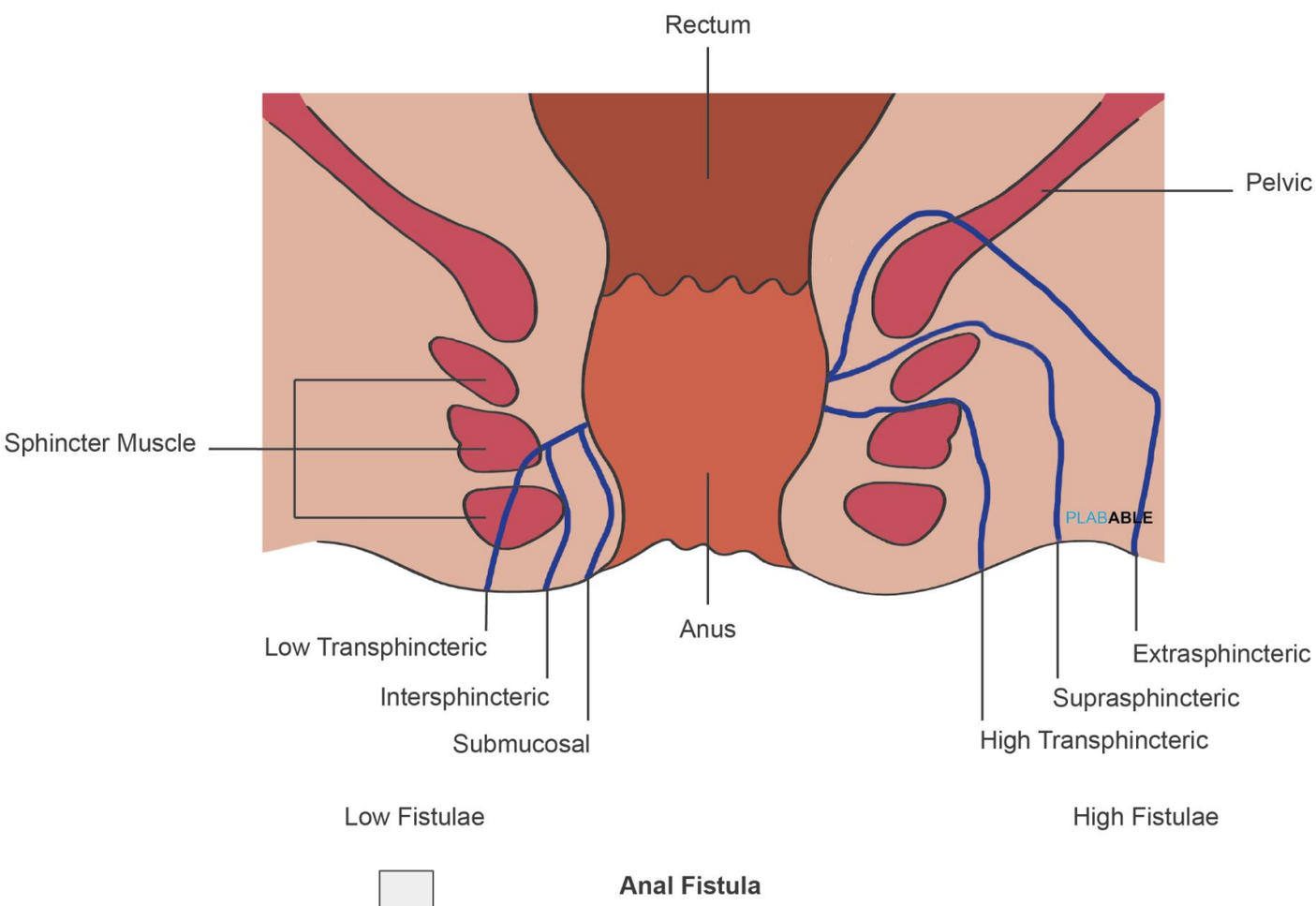
**Predisposing factors**

- Previous history of fistula
- Inflammatory bowel disease
- Diverticulitis

**Treatment**

- **High/complex fistula**: Seton suture, ligation
- **Low/simple fistula**: Lay open

# Anal Fistula




Keywords that may be used for describing a **low fistulae**

Does not cross the sphincter muscles

Management:
**Lay open**

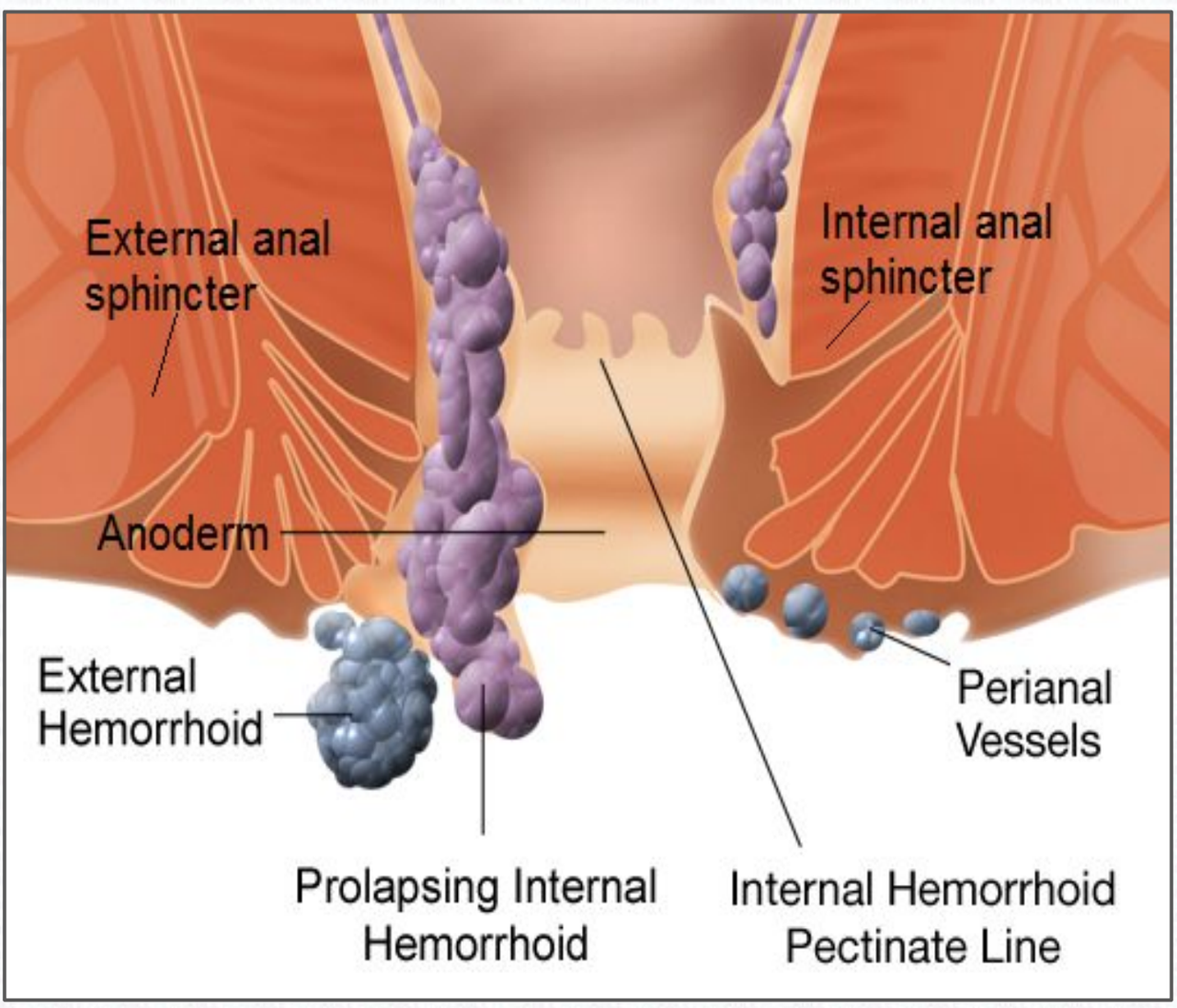
**Avoiding injury to anal sphincters is important.** Otherwise it can lead to faecal incontinence

# Haemorrhoids (Piles)

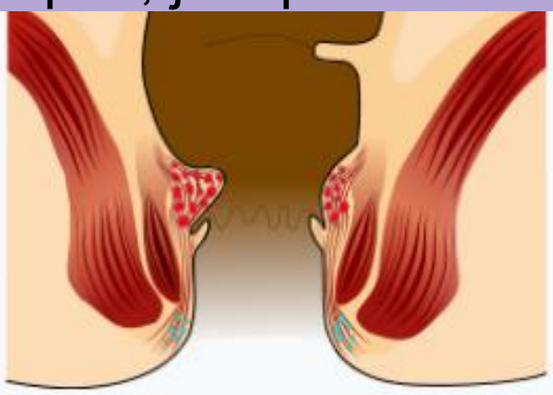
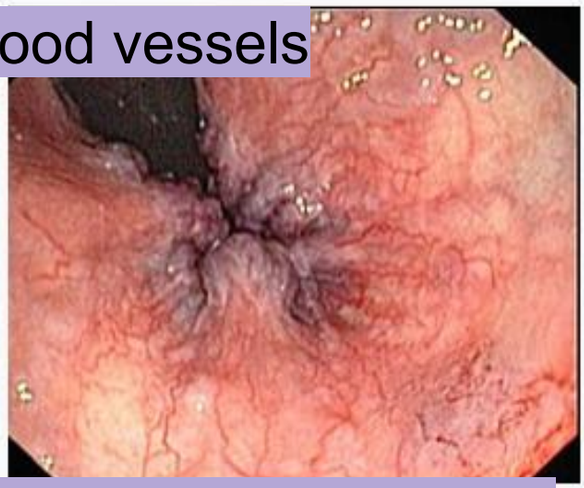
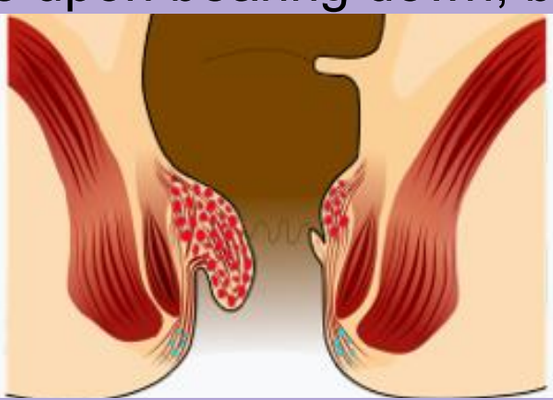
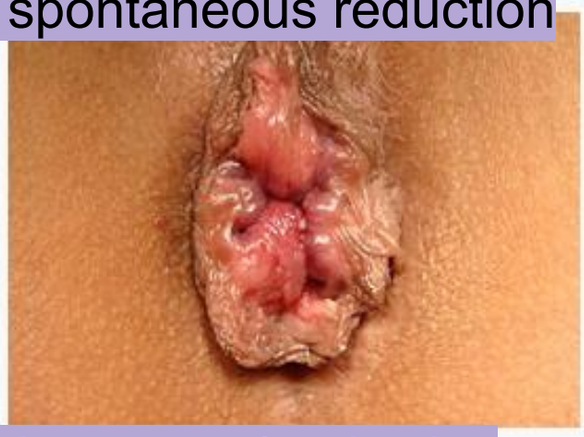
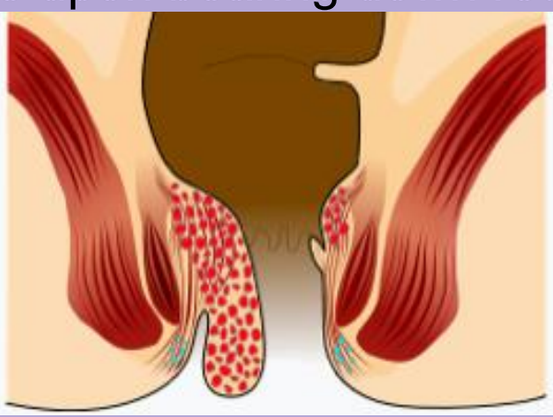
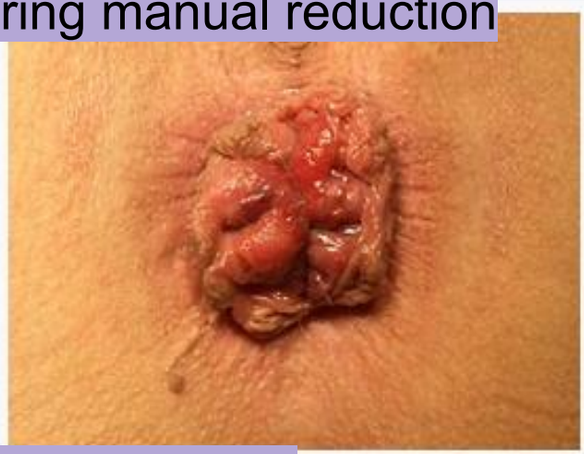
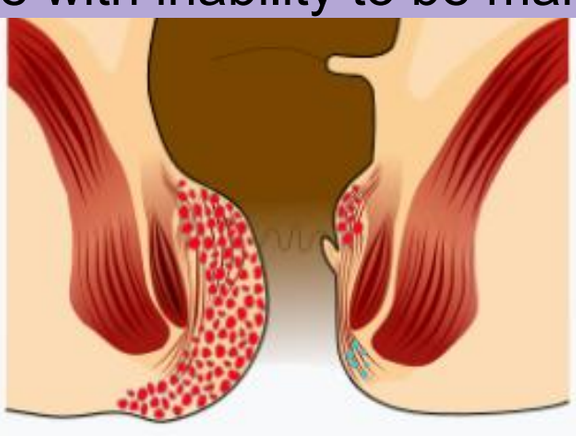
- It is **excess of perianal tissue** which consists of normal vascular mucosal cushions
- Excess tissue contains mucosa + submucosa + blood vessel pedicles

- Internal haemorrhoids → Upper anal canal
- External haemorrhoids → Lower anal canal

Anal canal is marked by a pectinate line



# Internal Haemorrhoids

| Grade | Diagram | Picture |
| --- | --- | --- |
| 1 |  |  |
| No prolapse, just prominent blood vessels | | |
| 2 |  |  |
| Prolapse upon bearing down, but spontaneous reduction | | |
| 3 |  |  |
| Prolapse upon bearing down requiring manual reduction | | |
| 4 |  |  |
| Prolapse with inability to be manually reduced | | |

# Haemorrhoids (Piles)

**Presentation**:

- Young age
- Post defaecation bleed
- Bright red, splash like, streaks on toilet paper
- Constipation associated
- Pain→ only with external haemorrhoids

**Internal haemorrhoids** covered by columnar epithelium.
Not painful unless strangulated or infected

**External haemorrhoids** are covered proximally with anoderm and distally by skin.
Therefore they are painful

**Investigation**:

- Proctoscopy
- Rigid sigmoidoscopy
- If suspicion of cancer, flexible sigmoidoscopy/ colonoscopy

# Haemorrhoids (Piles)

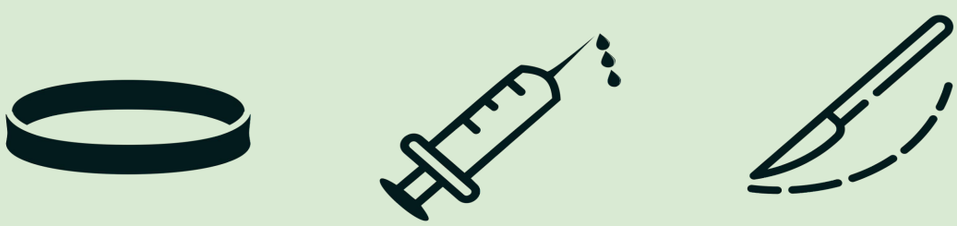
**Treatment**:

**Conservative**

- Laxatives, bulking agents to avoid constipation
- Local anaesthetic creams for pain
- Digital replacement of prolapsed haemorrhoids

**Surgical**

- Sclerotherapy
- Banding
- Stapling
- Haemorrhoidectomy



# Oesophageal Cancer

**Symptoms**

- Worsening dysphagia (Solid first, liquids later)
- Weight loss
- Heartburn

**Associated with**

- Smoking
- GORD
- Alcohol
- Iron deficiency anaemia

**Investigations**

- Upper GI endoscopy
- Barium swallow → Irregular narrowing + Proximally dilated segment
- Biopsy

# Gastric Cancer

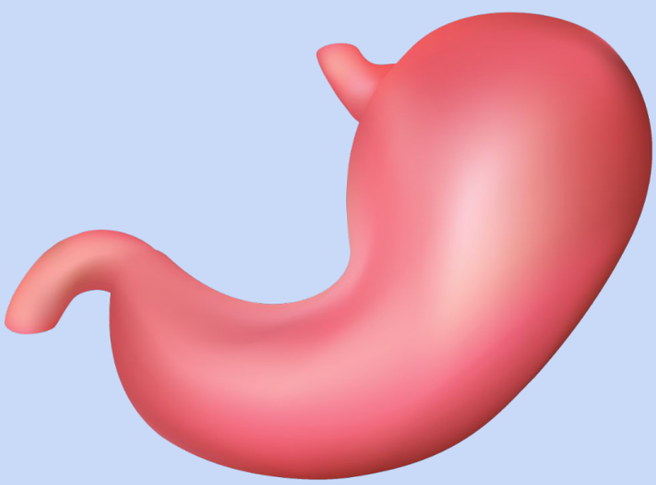
**Symptoms**

- Dyspepsia
- Weight loss, dysphagia
- Anaemia
- Epigastric mass

**Troisier's sign** → Lump in **left supraclavicular region (Virchow's node)**
indicative of gastric cancer

**Associated with**

- Hepatomegaly
- Ascites



**Risk factors**

- H. pylori infection
- Smoking
- Familial risk
- Blood group A

**Management**:

- Screen for nutritional deficiency
- Partial or total gastrectomy

# Carcinoma

**Brain trainer:**

A 60 year old man presents with a lump in the left supraclavicular region. He complains of reduced appetite and he has lost 7 kg in the last two months. What is the most probable diagnosis?

➔ **Gastric carcinoma**

# Paralytic Ileus

It is cessation of gastrointestinal tract motility.

**Seen after:**

- Prolonged abdominal surgery
- Electrolytic disturbances
- Anticholinergic or opiate use
- Immobilisation

**Features**:

- Nausea, vomiting
- Constipation
- Abdominal distension
- **Absent bowel sounds**

**Conservative management**

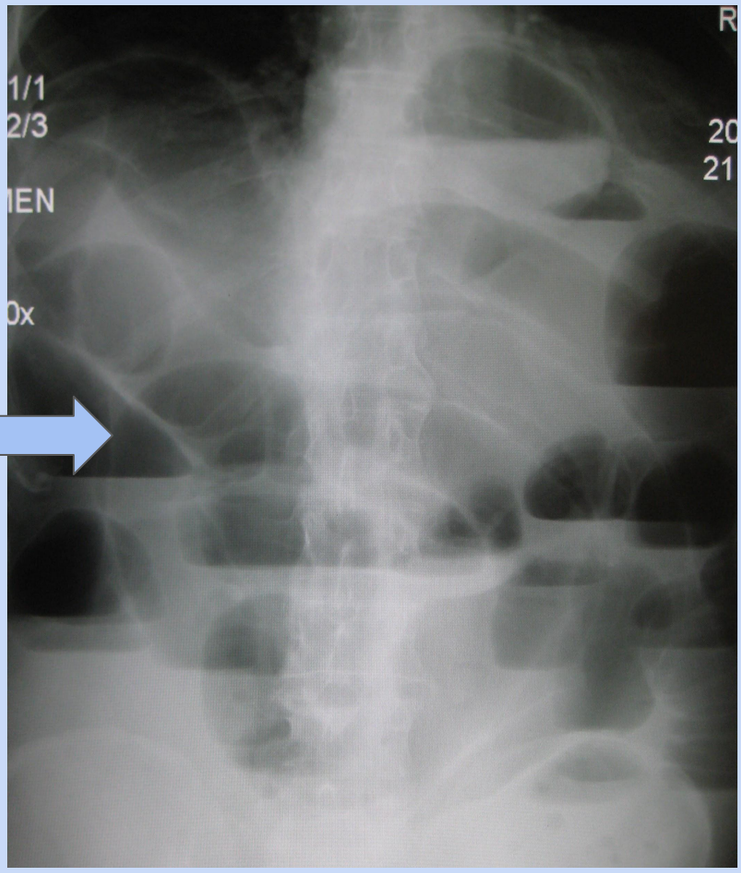
- **Drip and Suck** method
- Drip→ Intravenous fluid
- Suck→ Empty stomach with NG tube from fluid and gas
- Correct electrolyte imbalance

**Imaging**

Abdominal X-ray= air/fluid filled loops of small and/or large bowel

# Paralytic Ileus

Multiple air-fluid level




Generalised distension of bowel

**Intestinal obstruction** :

- Similar features as paralytic ileus. Here, **bowel sounds are present (high pitched)**
- Urgent surgical referral is required

**Intestinal obstruction is noisy ileus is not!**

# Paralytic Ileus

What is the MOST common electrolyte imbalance that causes paralytic ileus?

**Hypokalaemia and hypercalcaemia**

**Memory tool**:

**<u>Hyper</u>calcaemia depresses!**

So would cause depression and decrease bowel activity

Causes paralytic ileus

**<u>Hypo</u>calcaemia excites!**

So causes spasms and increases the smooth muscle tone

Does not causes paralytic ileus

# Pancreatic Cancer

**Risk factors**

- Smoking/ alcohol
- Obesity
- Family history
- Diabetes mellitus
- Chronic pancreatitis

**Symptoms**

- Abdominal distension
- Obstructive jaundice → Pale stools, dark urine
- Abnormal LFT
- Tenderness
- Weight loss, loss of appetite
- Epigastric pain → Radiates to back, relieved on sitting forward

**Investigations**

- CA 19-9
- High resolution CT

The CT scan is the most initial and appropriate test if suspecting pancreatic cancer

**Management**:

- Without metastasis → Whipple's resection
- With metastasis → Palliative ERCP with stent

# Hernia

**Incisional hernia**: Hernia through surgical site

**Umbilical hernia**: Hernia of fatty tissue or part of bowel through umbilicus.
Most commonly congenital

**Hiatus hernia**: Hernia of part of the stomach in chest cavity through diaphragmatic opening

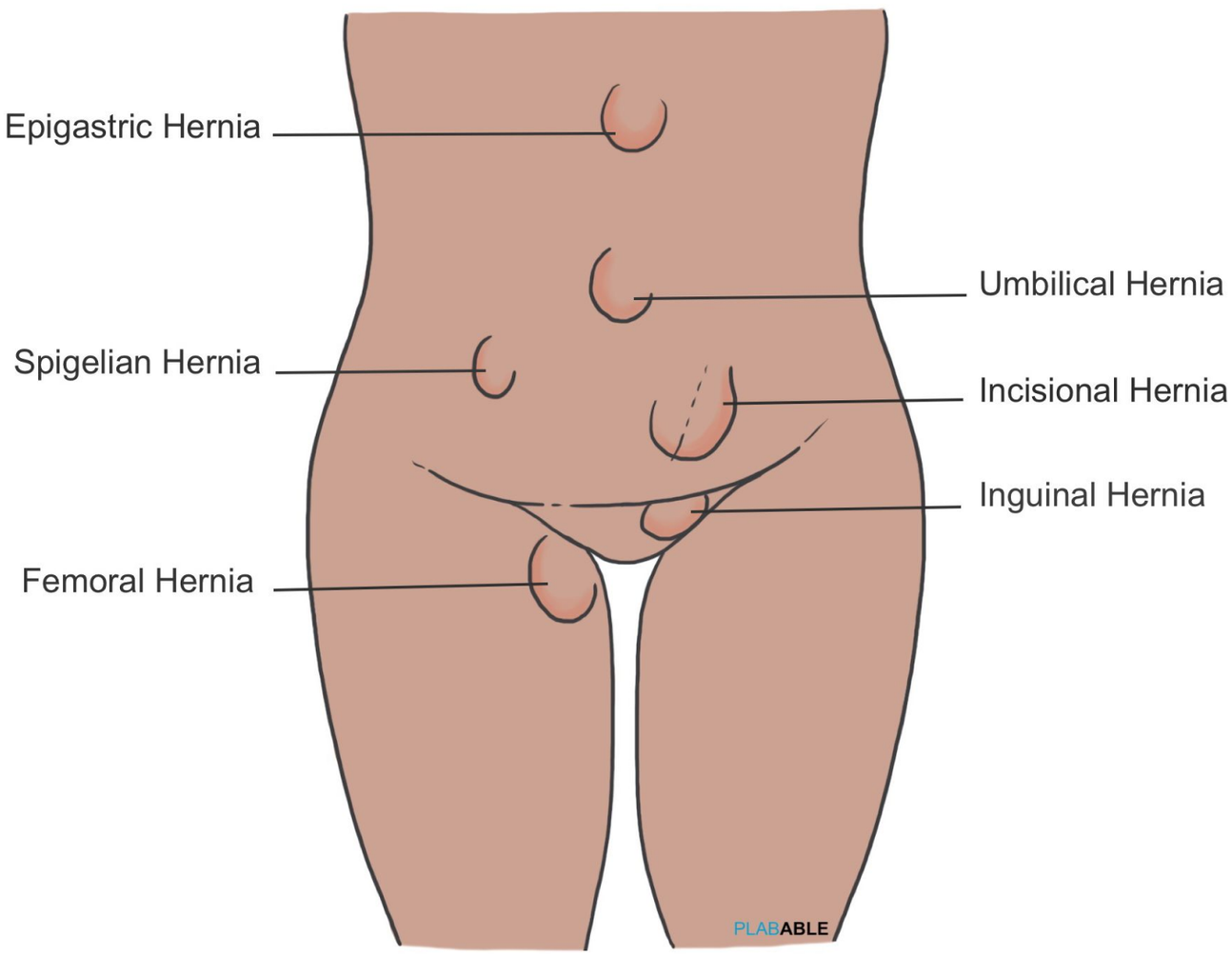
**Diaphragmatic hernia**: abdominal organs protrude through diaphragm (not necessarily through opening)

**Spigelian hernia**: When part of the bowel protrudes through lateral  abdominal muscles below umbilicus

**Inguinal hernia**: most common in men, indirect hernia can protrude till scrotum

**Femoral hernia**: Part of bowel protrudes in femoral canal, more common in females

# Hernia

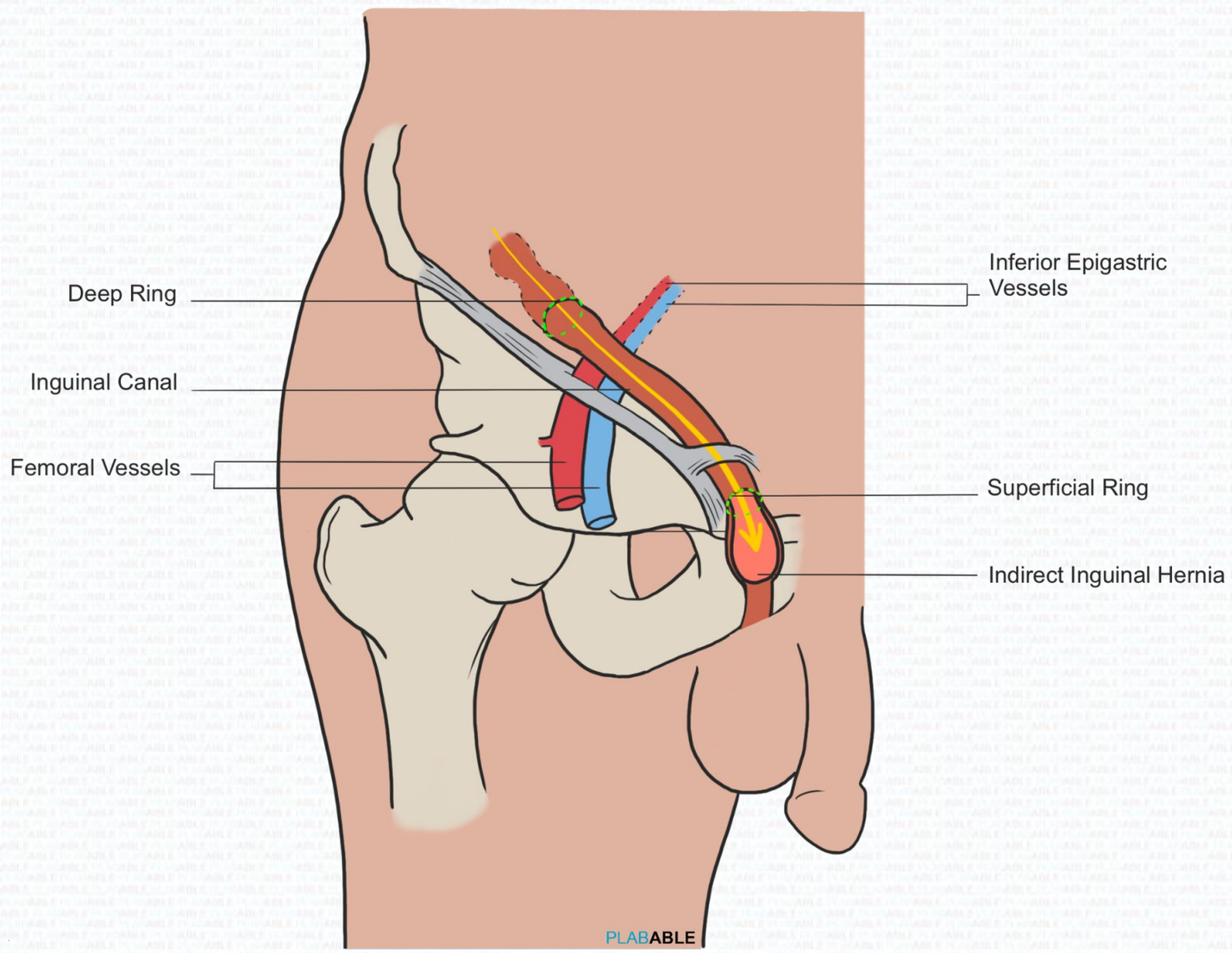



**Hernia**

# Indirect Inguinal Hernia

**Indirect inguinal hernia:**

- Passes through the deep inguinal ring and exits via superficial inguinal ring
- Can continue to descend to scrotum

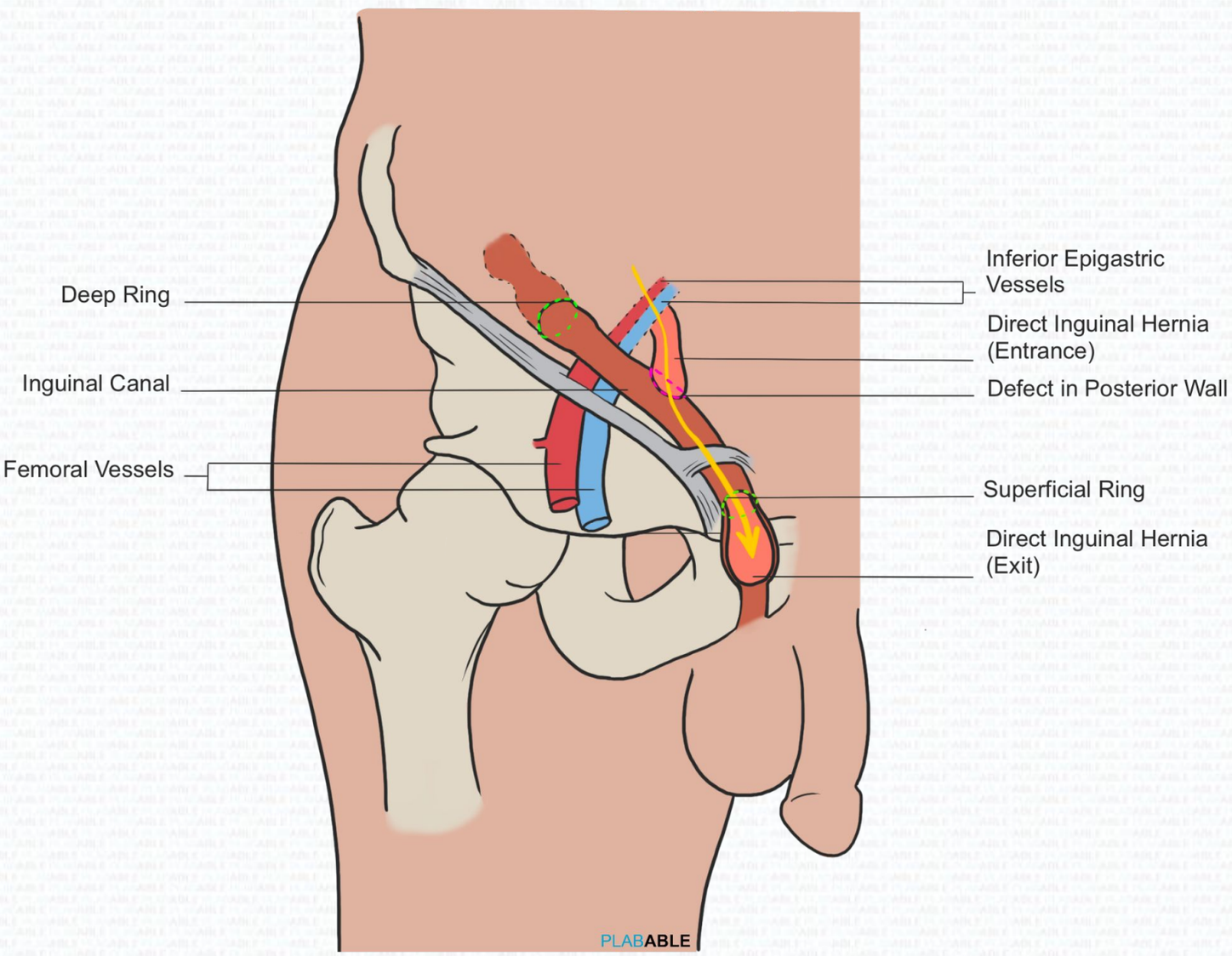



Indirect Inguinal Hernia

# Direct Inguinal Hernia

## Direct inguinal hernia

- Passes through the posterior wall of inguinal canal and exits via superficial ring

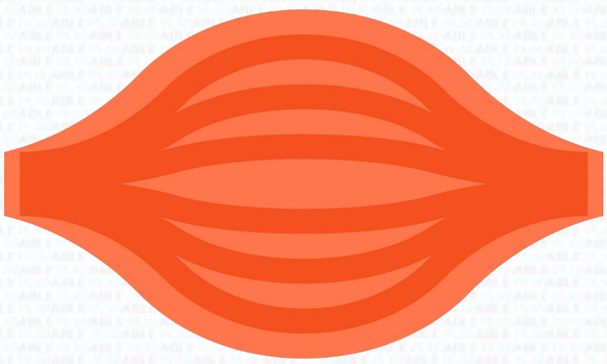



Direct Inguinal Hernia

# Inguinal Hernia

## The DIFFERENCE

Indirect inguinal hernias more commonly descend to scrotum compared to direct because indirect inguinal hernias enters the deep inguinal ring instead of a muscle defect (posterior wall) which has more resistance



More resistance

Less resistance

Muscle *(posterior wall)* has more resistance than anatomical rings *(deep ring)*

# Inguinal Hernia

Knowing if the inguinal hernia is indirect or direct does not matter clinically as the management is the same

**Management**

- Asymptomatic and reducible: No surgery
- Symptomatic: Surgical repair with prosthetic mesh
- Symptomatic and irreducible: Surgical emergency to avoid strangulation

# Asymptomatic Inguinal Hernia

**Patient planned for a surgery +**
**Asymptomatic inguinal hernia discovered on pre-op assessment**

Next step?

**Leave it alone!**

Asymptomatic inguinal hernias do not need to be operated

# Inguinal Hernia In Scrotum or Varicocele

**Scrotal mass → How to differentiate between a inguinal hernia and varicocele?**

| Inguinal Hernia | Varicocele |
| --- | --- |
| Positive cough impulse (unless incarcerated) | May or may not have positive cough impulse |
| Swelling decreases when lying down | Swelling decreases when lying down |
| Examiner's hand cannot "get above" the mass (i.e. cannot palpate the superior surface of the mass) | This is the main examining feature that will lean you towards inguinal hernia as opposed to varicocele |

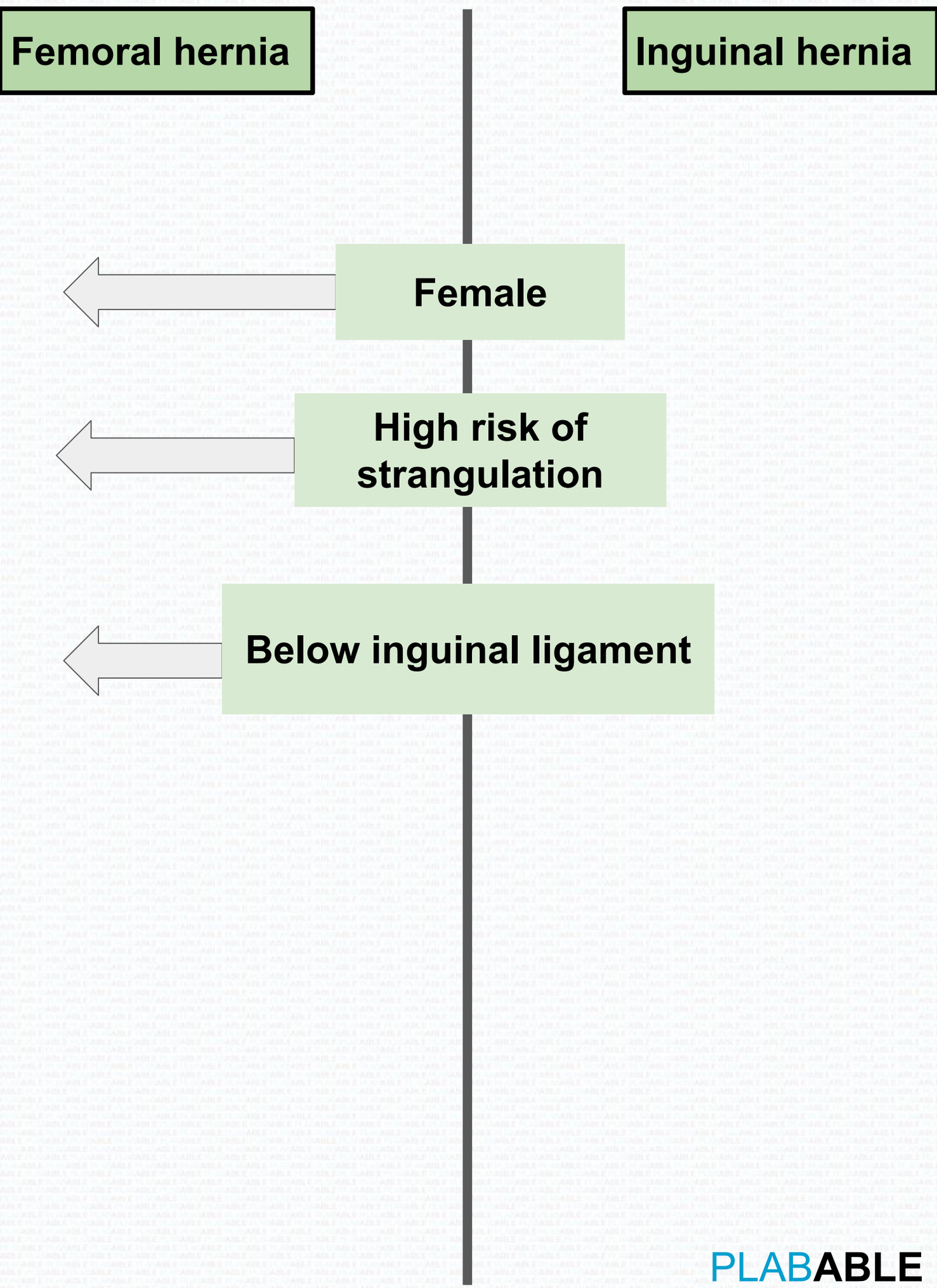
# Femoral Hernia

**F→ Femoral, Female**

**High risk of strangulation**

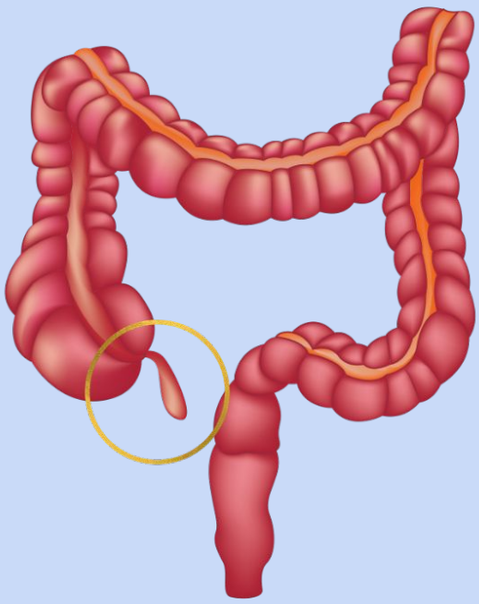
**Femoral hernia always** needs to be repaired

# Femoral vs Inguinal Hernia



# Appendicitis

## Risk factors



- 10- 20 years old
- Male
- Frequent use of antibiotics
- Smoking

## Complications

- Appendix perforation
- Generalised peritonitis
- Appendix mass or abscess or adhesions
- Sepsis

## Symptoms

Remember the "**Murphy's triad**"

- Right lower quadrant pain
- Nausea, vomiting
- Fever

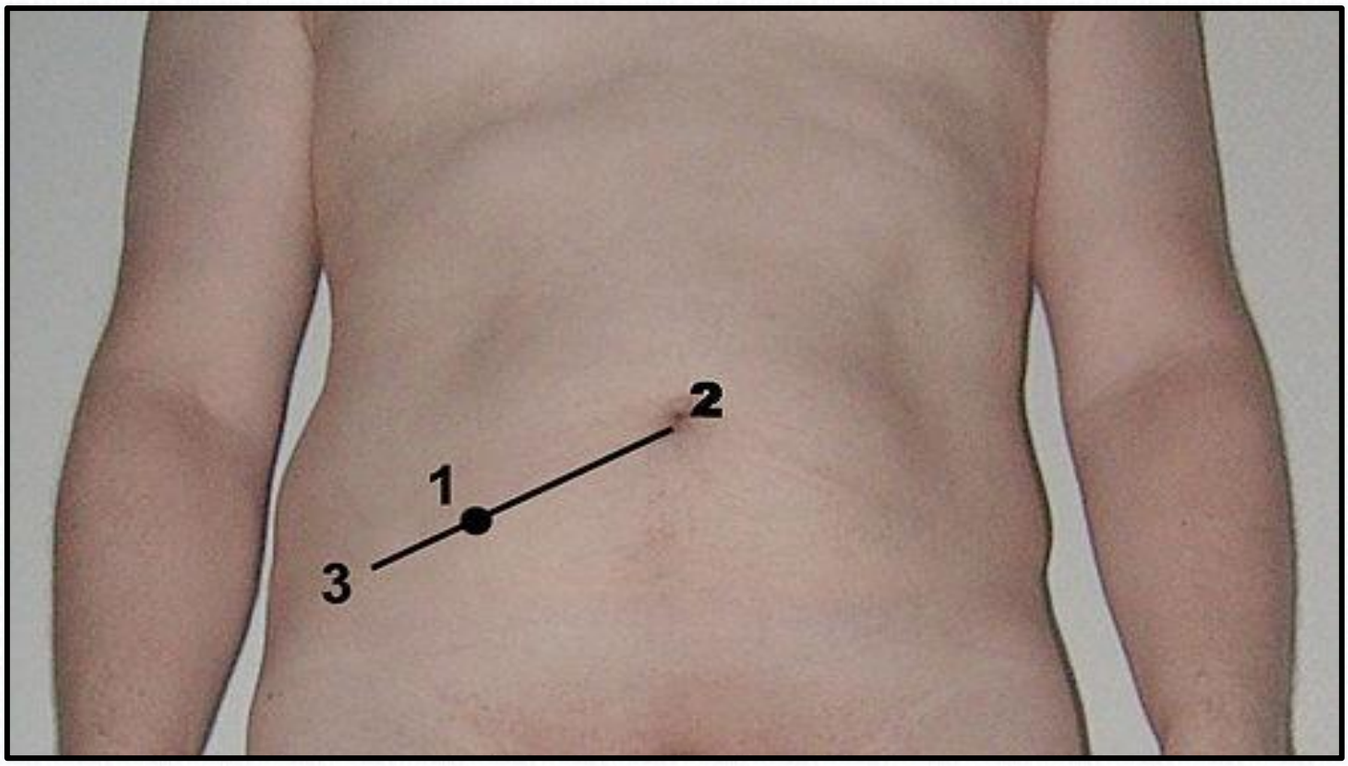
## **Investigations**:

- Full blood count, CRP, r/o UTI
- CT scan is more sensitive test than USG

## **Management**:

- Urgent admission
- Surgery

# Appendicitis



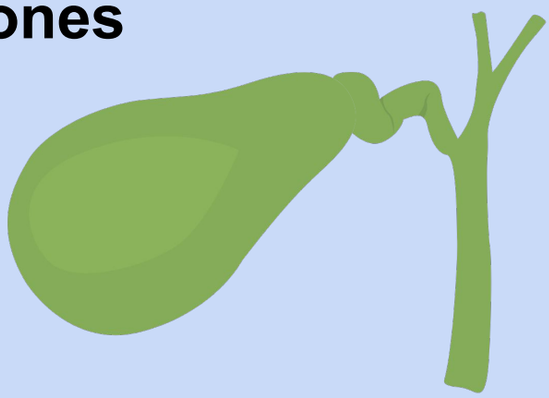

Location of McBurney's point (1), located two thirds the distance from the umbilicus (2) to the right anterior superior iliac spine (3)

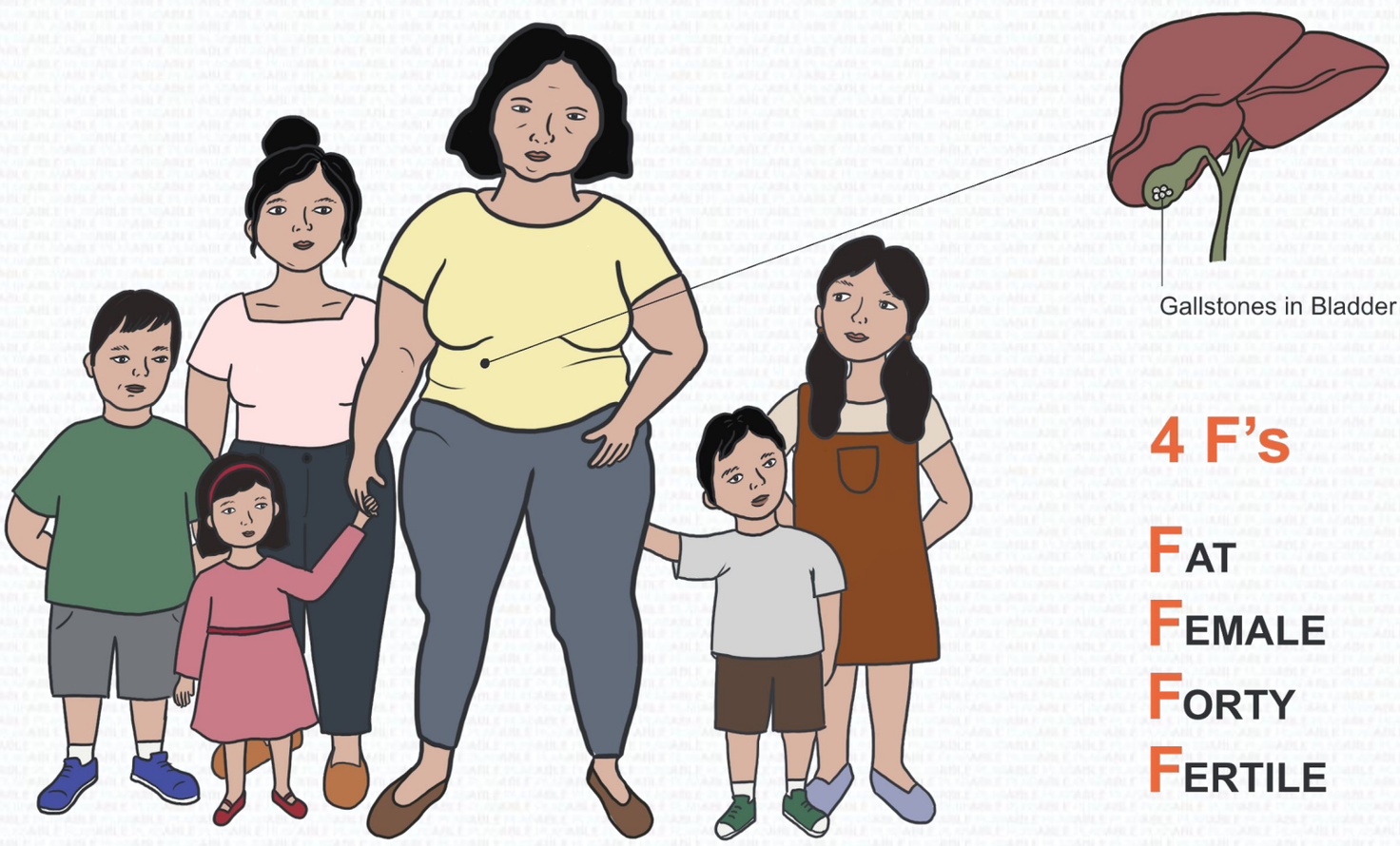
# Cholecystitis

Inflammation of gallbladder. Most common cause is gallstones (cholelithiasis)

**Predisposing factors of gallstones**

- Obesity
- Women
- Being age 40 or older
- One or more children
- Diabetes mellitus






Predisposing Factors

# Cholecystitis

**Presentation**

- Right upper quadrant pain
- Anorexia, nausea/ vomiting
- Fever
- Jaundice
- **Murphy's sign**= Inspiration is difficult due to pain when examiner is palpating abdomen near right costal margin
- Referred pain to shoulder or interscapular region

**Management**

- Urgent admission
- Ultrasound, WBC, CRP, Serum amylase
- Antibiotics +/- surgery

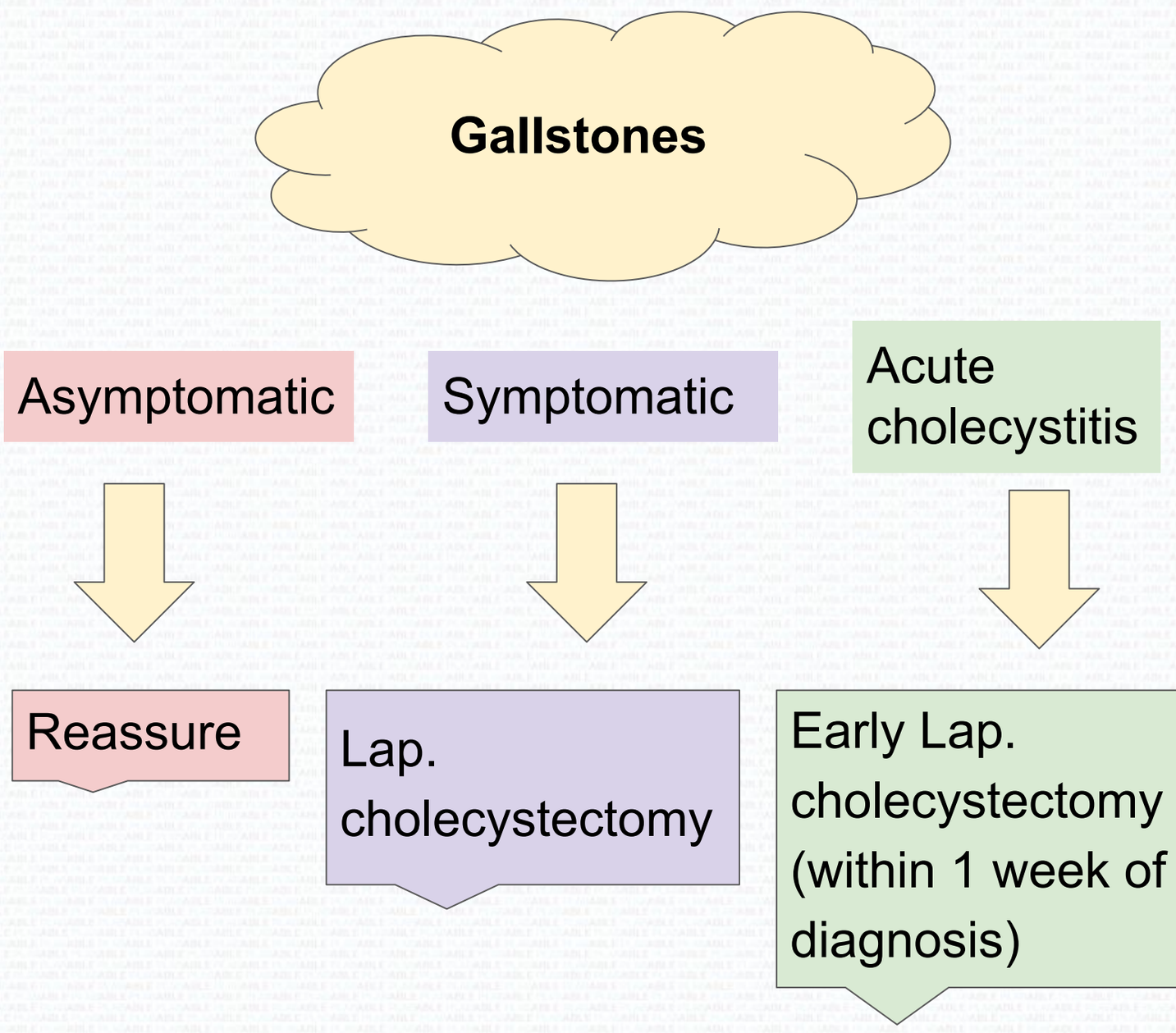
# Gallstones Management

**Investigations**

- **Initial** and **appropriate** investigations → **LFT, ultrasound**

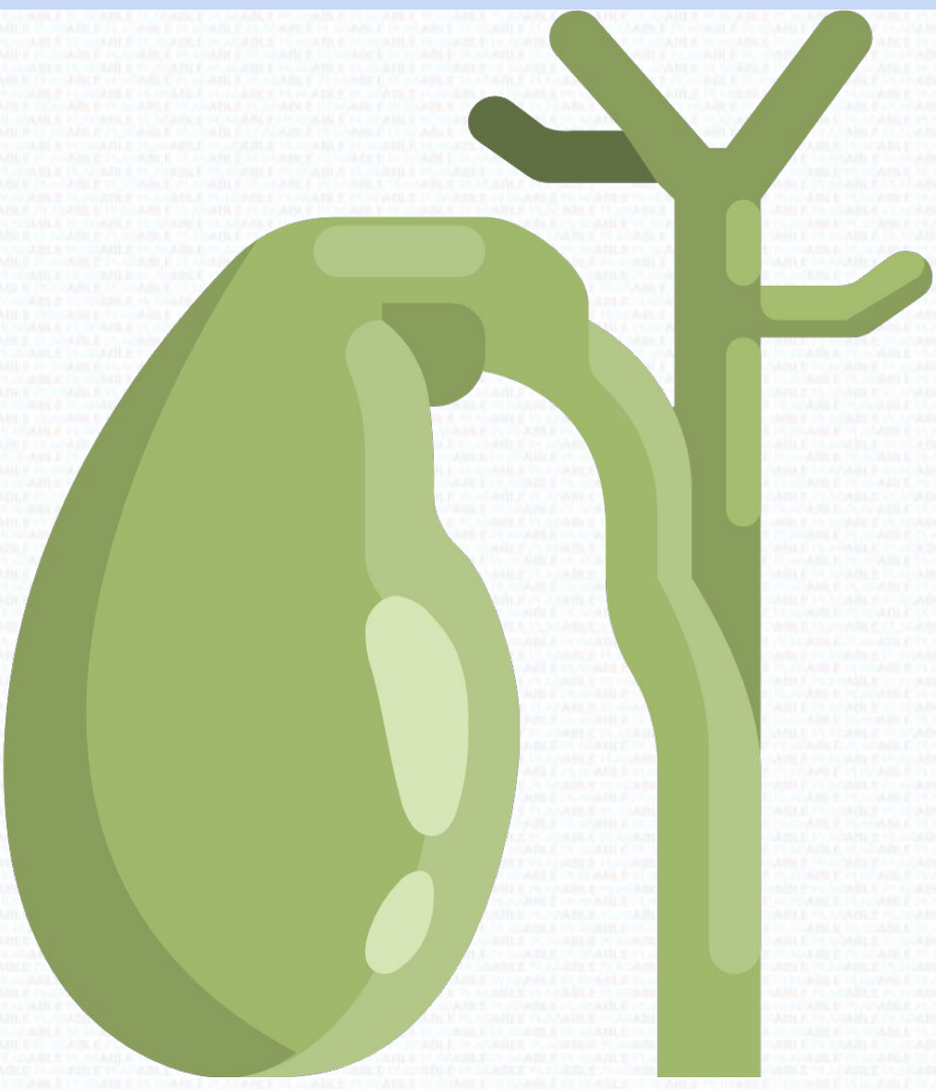
**Consider MRCP** for common bile duct stones if →

- Bile duct is dilated and/or
- Liver function tests are abnormal



# Biliary Colic

- Sudden pain due to gallstones blocking the cystic duct temporarily
- Usually after heavy fatty meal
- At right upper quadrant of the abdomen
- Repeated attacks are common



# Biliary Colic Vs Acute Cholecystitis

| | Biliary Colic | Acute Cholecystitis |
|---|---|---|
| **Local peritonism** | Absent | Present (Murphy's sign) |
| **Fever** | Absent | Present |
| **WBC count** | Normal | Elevated |
| **Treatment** | • Analgesia<br>• Nil by mouth<br>• Rehydration<br>• Elective lap. cholecystectomy | Antibiotics + Early laparoscopic Cholecystectomy (within 1 week of diagnosis) |

# Ascending Cholangitis

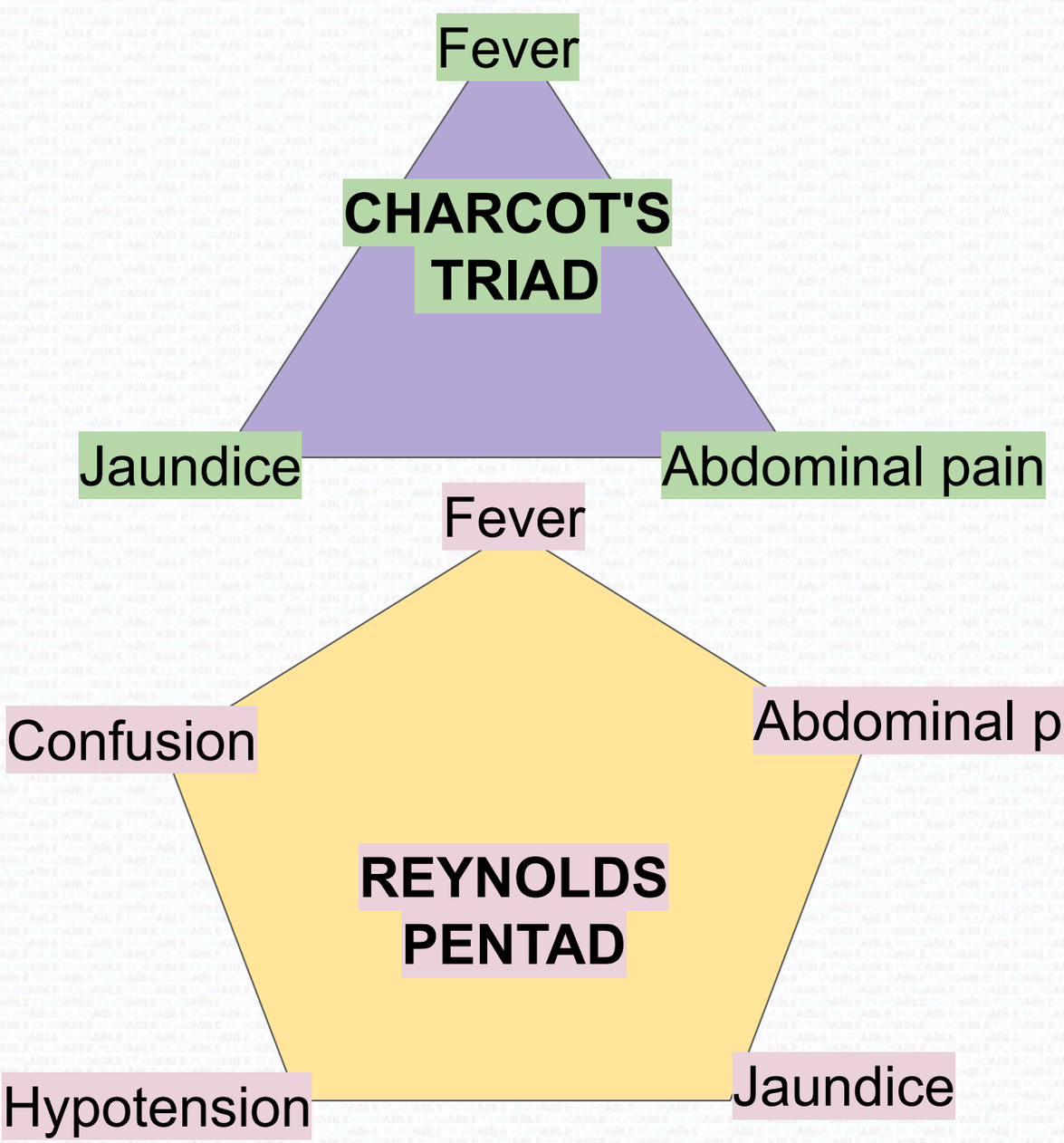
Infection due to obstruction biliary system

**Investigations:**

- **Initial and appropriate → Ultrasound**
- If diagnosis of choledocholithiasis remains unclear after ultrasound → MRCP

**Management:**

- Antibiotics
- ERCP (remove obstruction)

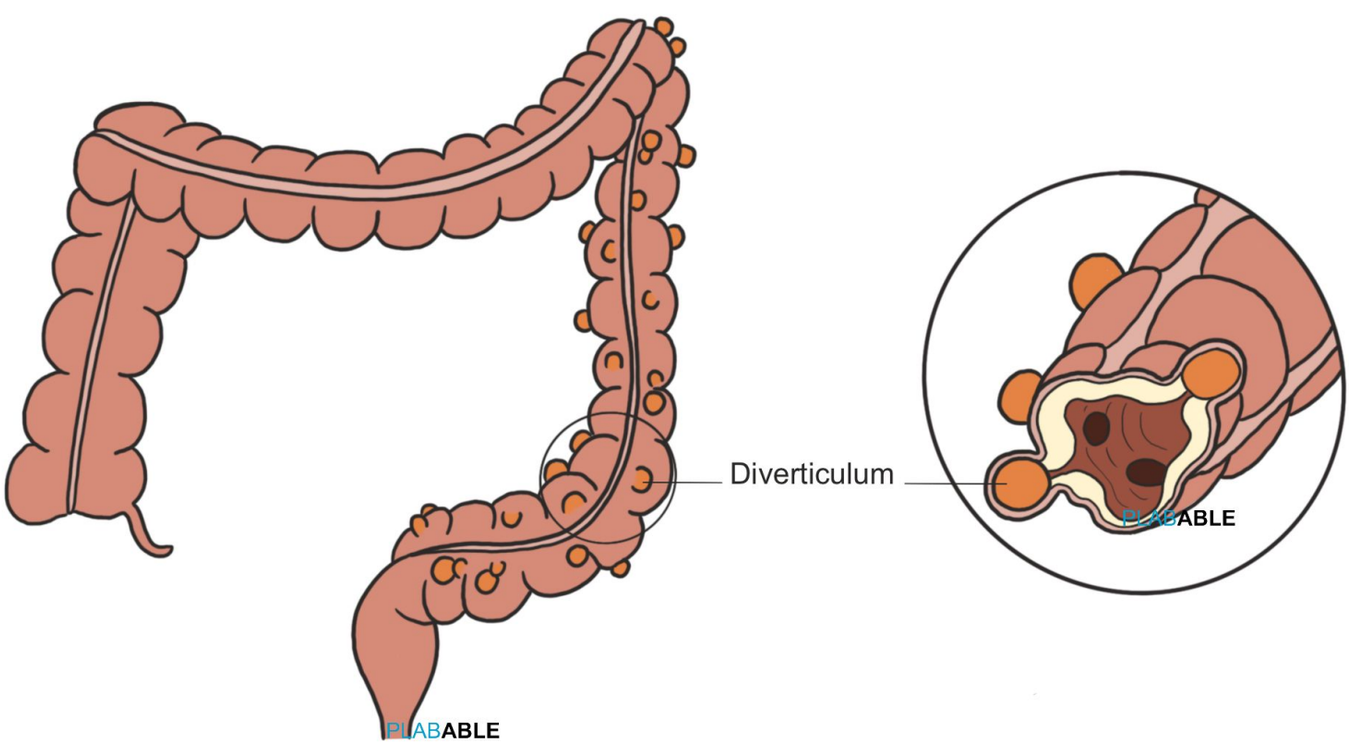


# Diverticulosis

- Multiple pouches (diverticula) in the colon that are not inflamed
- Sigmoid colon is most commonly affected
- Asymptomatic
- If infected, called as diverticulitis which can cause fever, abdominal pain, bleeding or rupture in severe cases

## Risk factors

- Old age
- Low fibre intake
- Genetic




Diverticula

# Diverticulitis

Diverticula becomes inflamed and infected

**Presentation**

- Severe lower abdominal pain
- Fever
- General malaise
- Occasionally rectal bleeding
- **Uncomplicated** diverticulitis: **Localized** diverticular inflammation that does not extend to the peritoneum
- **Complicated** diverticulitis: Diverticulitis associated with **complications** like abscess, peritonitis, fistula, obstruction, or perforation

**Investigations**

- USG abdomen, pelvis (initial)
- CT to confirm diagnosis and severity
- Urgent colonoscopy **only** if there is bleeding

**Management**

- Antibiotics
- Analgesia
- Surgical exploration according to severity

# Diabetes Before Surgery

**Patients on insulin for elective major surgery**

**Day before surgery**: Give rate controlled infusion of 80% of total once daily long-acting insulin analogue + other insulin as usual

**During intraop period**: Give rate controlled infusion 80% of total once daily long-acting insulin analogue, **stop** other insulin

Alongside **start** on iv infusion of KCl + glucose + NaCl to avoid hypoglycemia

Continue until patient starts taking orally.

- Aim to achieve and maintain glucose concentration within the usual target range (6–10 mmol/litre; up to 12 mmol/litre is acceptable)
- Infusing a constant rate of glucose-containing fluid as a substrate, while also infusing insulin at a variable rate.

# Diabetes Before Surgery

**Patients on oral hypoglycaemic**

For surgery requiring missing one meal: Continue same medications

For longer surgeries or with uncontrolled DM: Need to shift on insulin and monitor sugar levels

**Emergency surgery**

**For all patients**:

Check blood-glucose, blood or urinary ketone concentration, serum electrolytes and serum bicarbonate before surgery

R/O ketoacidosis

# Haemoglobin Before Surgery

**Elective surgery**:
<100 → Postpone the surgery + investigate for anaemia
<80 → Blood transfusion + postpone the surgery

**Emergency surgery**:
<100 → Go ahead with the surgery
<80 → Blood transfusion + surgery

**History of MI** → No elective surgeries for at least 6 months after an episode of MI

# Postpone Surgery

**Brain trainer:**

A patient is admitted for elective herniorrhaphy. What is a reason to delay this operation?

➔ **Myocardial infarction within last 6 months**

# Postpone Surgery

**Brain trainer:**

A man is about to undergo an elective inguinal hernia surgery. HIs haemoglobin is 82 g/L. What is the most appropriate action?

➔ **Investigate and postpone the surgery**

For elective surgery if haemoglobin is below 100 g/L you must postpone surgery and investigation.

# Surgical Haemorrhage

**Primary haemorrhage**: Intraoperative, on table

**Reactive haemorrhage**: Within 24 hours of operation

**Secondary haemorrhage**: Within 7-10 days


**Post tonsillectomy bleed:**

Within 24 hours: Due to inadequate haemostasis, displacement of suture: Return to theatre may be required

After 24 hours within 10 days: Due to vessel erosion secondary to infection: Admit for iv antibiotics

# Reactive Haemorrhage

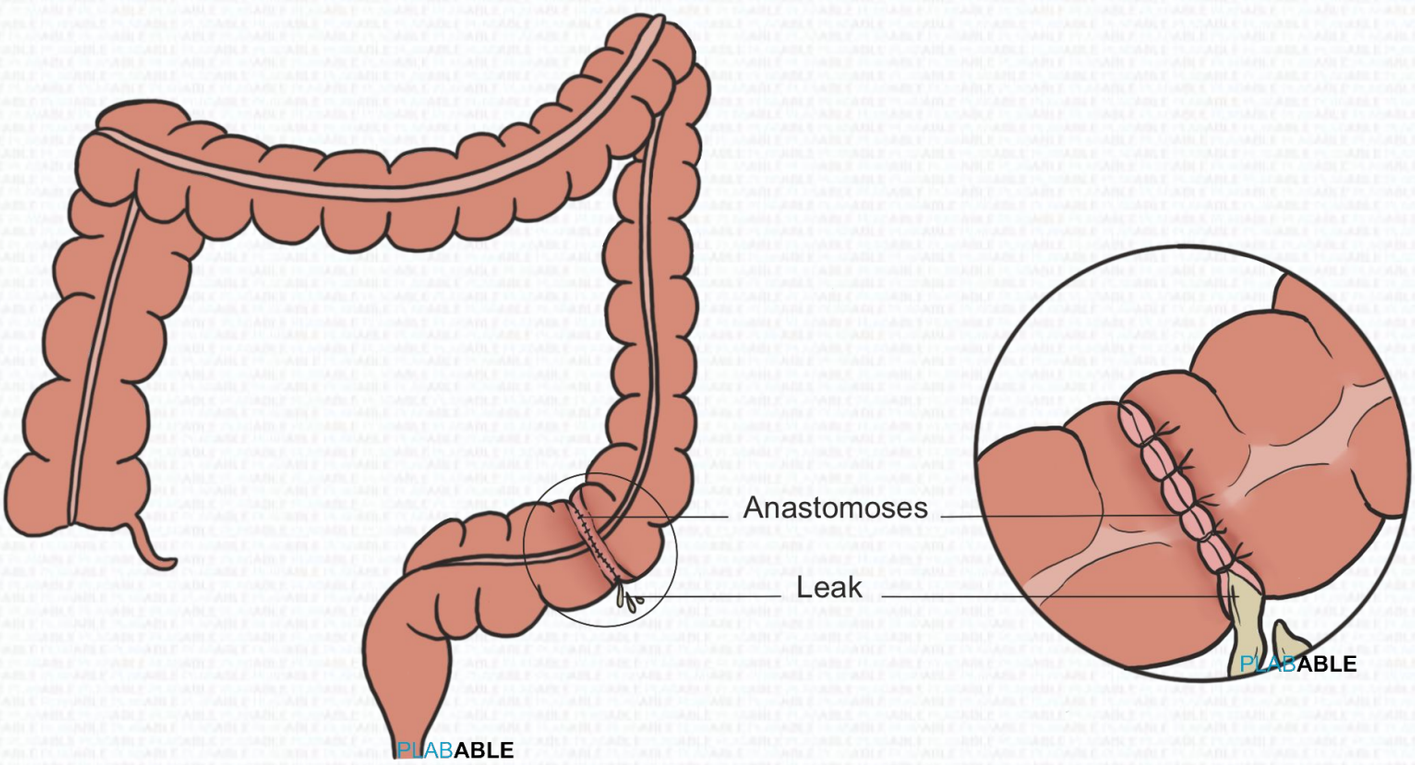
**Brain trainer:**

After thyroidectomy a patient is found hypotensive with blood dripping from the drain. What type of haemorrhage?

➔ **Reactive haemorrhage**

# Anastomotic Leak

- Feared complication after hemicolectomy or anterior repair
- Usually occurs 5 to 7 days (sometimes 10 days) after surgery
- Severe abdominal pain and tenderness at site of anastomosis
- Fever
- Reduced bowel sounds




Anastomic Leak

# Anastomotic Leak

Any patient with **systemic sepsis** or is **not improving** as expected after a GI resection should be considered to be an → **Anastomotic leak** until proven otherwise

**Investigation of choice**

- CT abdomen and pelvis with PO and IV contrast

**Management**

- Small leaks → Broad spectrum antibiotics may suffice
- Large leaks → Percutaneous drainage
- Large leaks + sepsis OR peritonitis → Open surgery to drain

# Stoma Complications

If there is a development of painful **swelling** at stoma site + **fever**, consider the formation of an abscess

→ Local exploration may be required

# Nerve Injuries in Thyroidectomy

**Unilateral injury to recurrent laryngeal nerve**

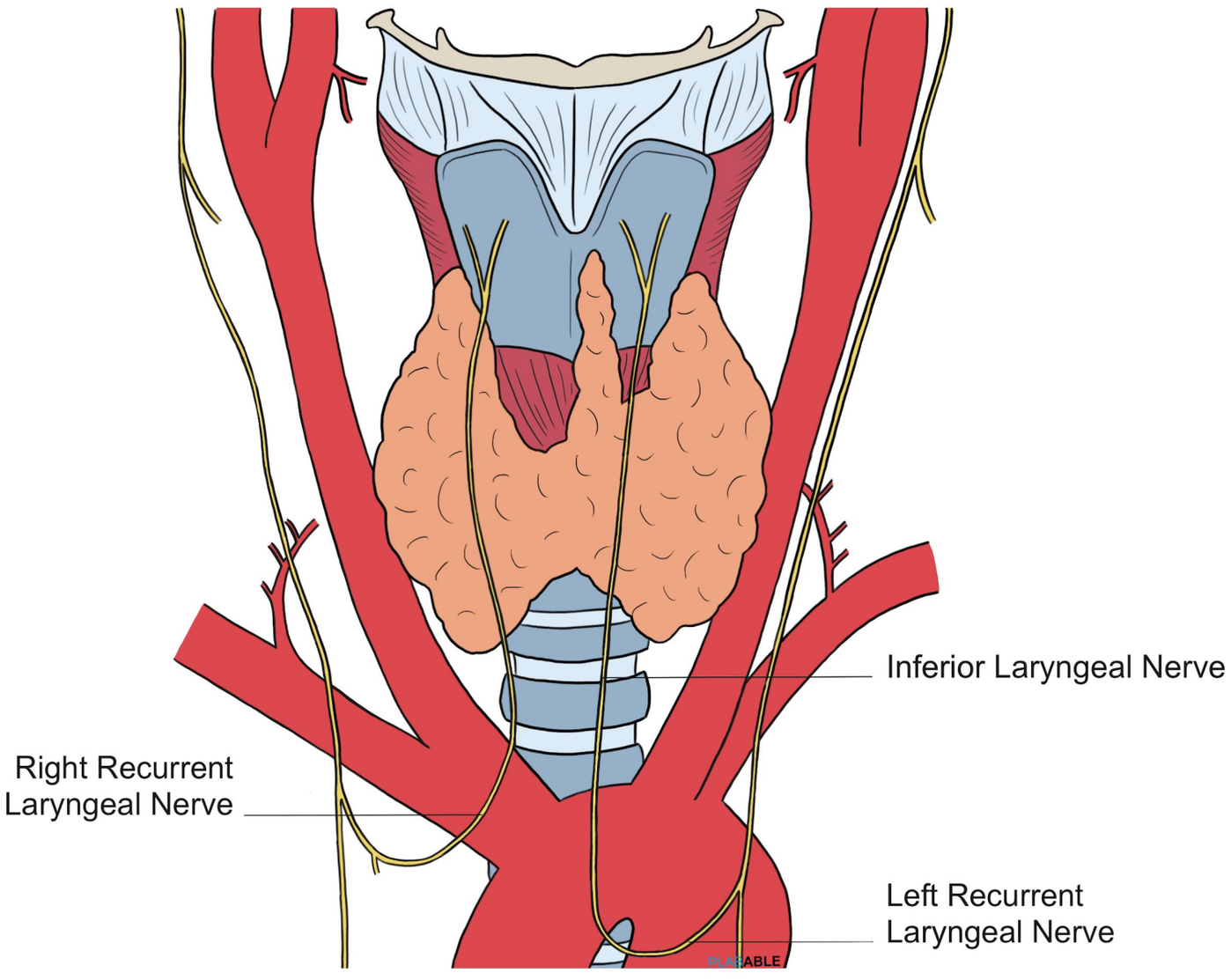
- Hoarseness of voice

**Bilateral injury to recurrent laryngeal nerve**

- Aphonia
- Airway obstruction

**Superior laryngeal nerve**

- Loss of ability to create high-pitch sounds (monotone voice)




Recurrent Laryngeal Nerve

# Perianal Fistula Management

**Superficial, simple, low fistula**

- Lay open (fistulotomy)

**Deep, complex, high fistula**

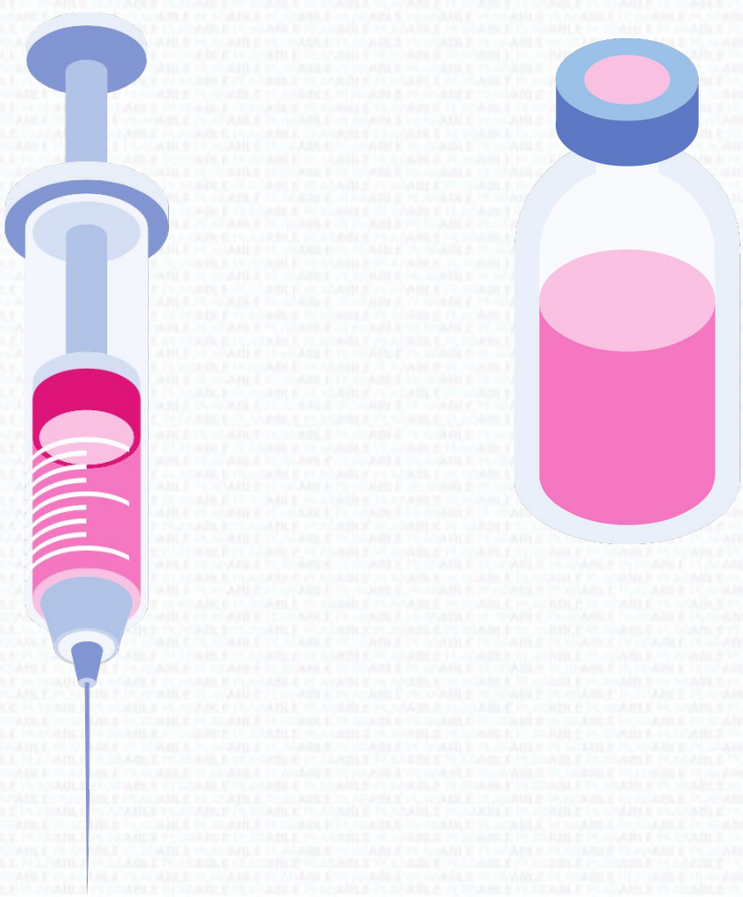
- Ligation of intersphincteric fistula tract

# Surgical Prophylaxis Antibiotics

**Brain trainer:**

A patient is about to undergo a low anterior resection as the management of his stage 1 rectal cancer. What is the best time to administer prophylactic antibiotics?

➔ **At the time of the induction of anaesthesia**



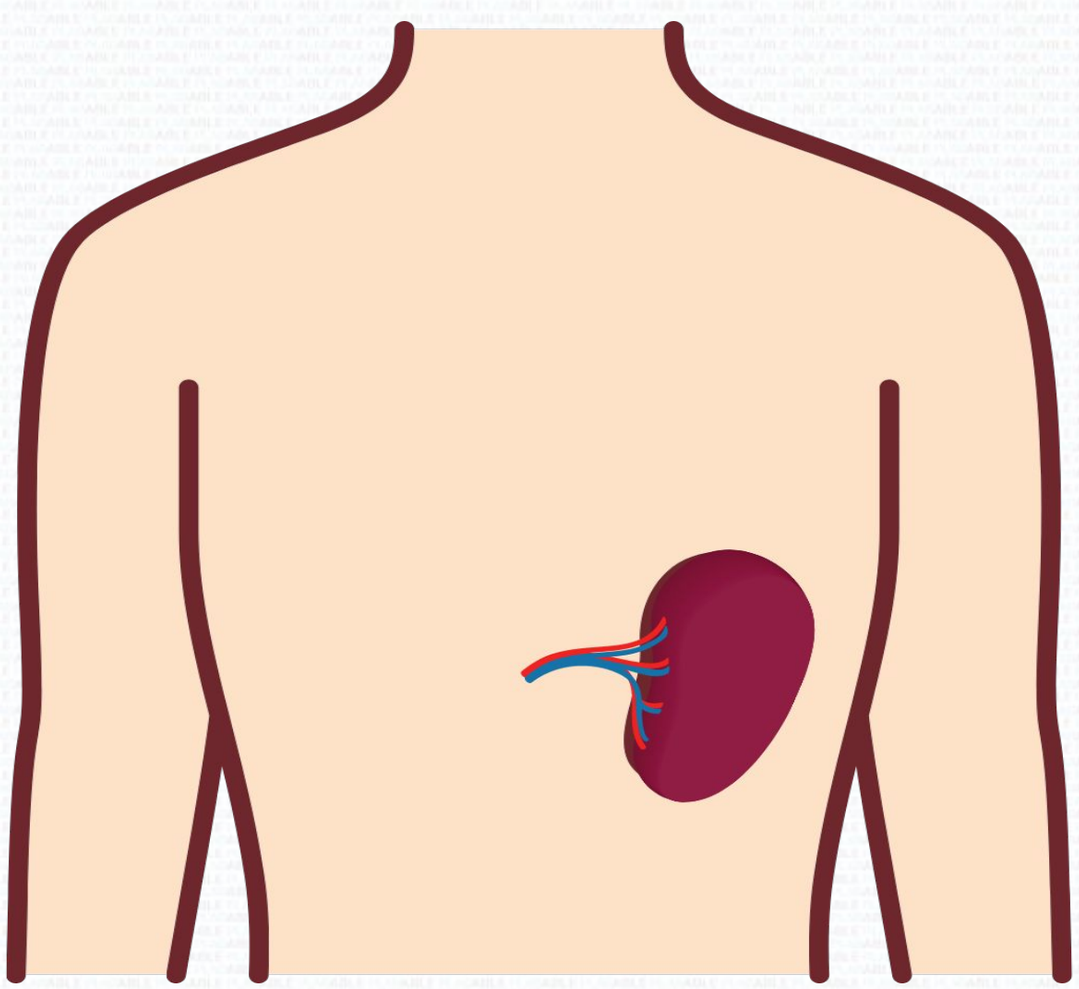
# Splenic Injury

Subcapsular splenic haematoma is common with trauma and the management is based on the patient's vitals.

**If haemodynamically stable → Admit and observe**

**If haemodynamically unstable → FAST scan → Laparotomy**

The most **appropriate step** in a haemodynamically unstable patient is **laparotomy**



# Opioid Overdose or Something Else?

Postoperative patient suddenly becomes short of breath

Respiratory rate low, pupils constricted

Respiratory rate high, no comment on pupils or pupils dilated

Opioid overdose

Something else

Pick one of the following as it will be in the options:

- Stop morphine
- Start intravenous naloxone

Pick:

- Start oxygen by face mask immediately

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