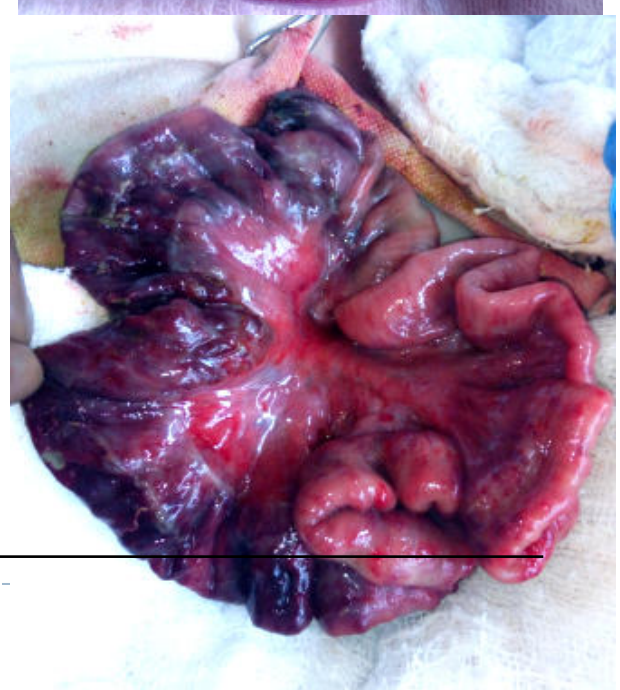
SHORT GUT AND INTESTINAL FAILURE IN PEDIATRIC SURGERY

SHORT BOWEL SYNDROME

- The decreased absorptive ability of intestines- either **due to short length** or functional reduction due to diseases- jeopardizing survival.

- Due to:

1. Congenital gut defects
2. Malabsorptive diseases
3. Surgical removal of long segments of intestines



Normal bowel length

- Neonatal: 200-300 cm
- Children:

0-6 mo	239.2
7-12 mo	283.9
13-18 mo	271.8
19-24 mo	345.5
25-36 mo	339.6
37-48 mo	366.7
49-60 mo	423.9

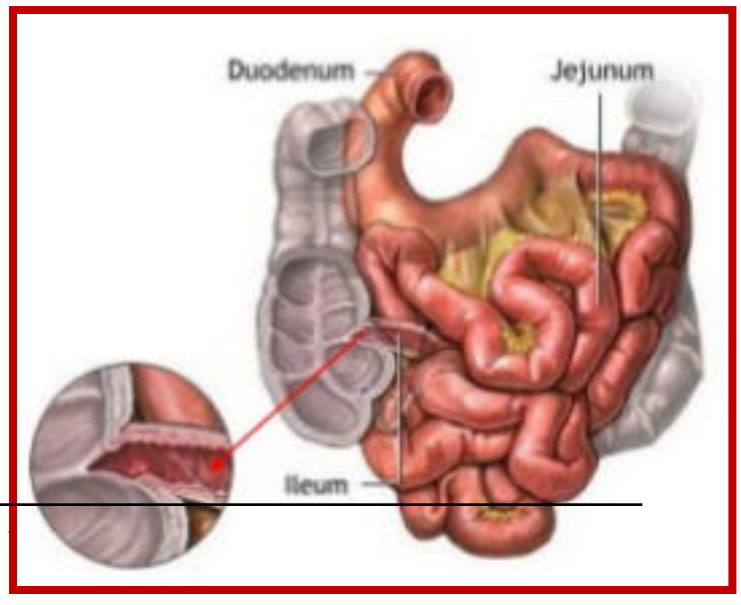
- Adult : 700-800 cm

SHORT BOWEL SYNDROME

- Various definitions:

1. **50% or more** of the small bowel resected.
2. When Ileocaecal valve is present: **25-30 cm**
   When ileocaecal valve is absent: **40cm**

- If Ileocaecal valve is lost, transit time is faster and loss of fluid and nutrients is greater.

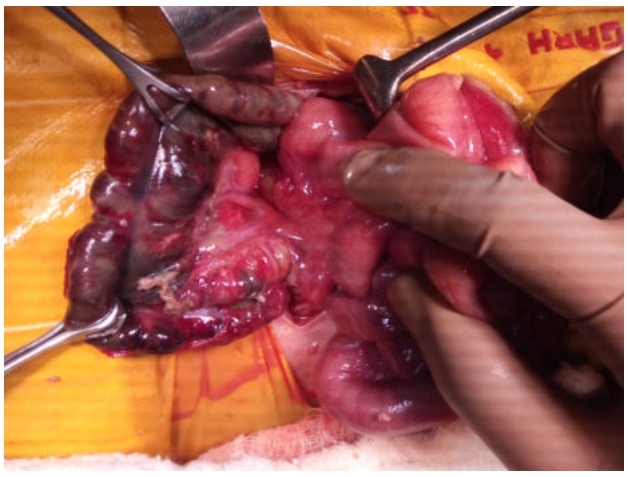


ETIOLOGY

- **Necrotising enterocolitis (35%)**
- Intestinal atresias (**25%**)
- Gastroschisis (**18%**)
- Malrotation with midgut volvulus (**14%**)
- Long segment Hirschsprung's(**2%**)
- Others (6%)

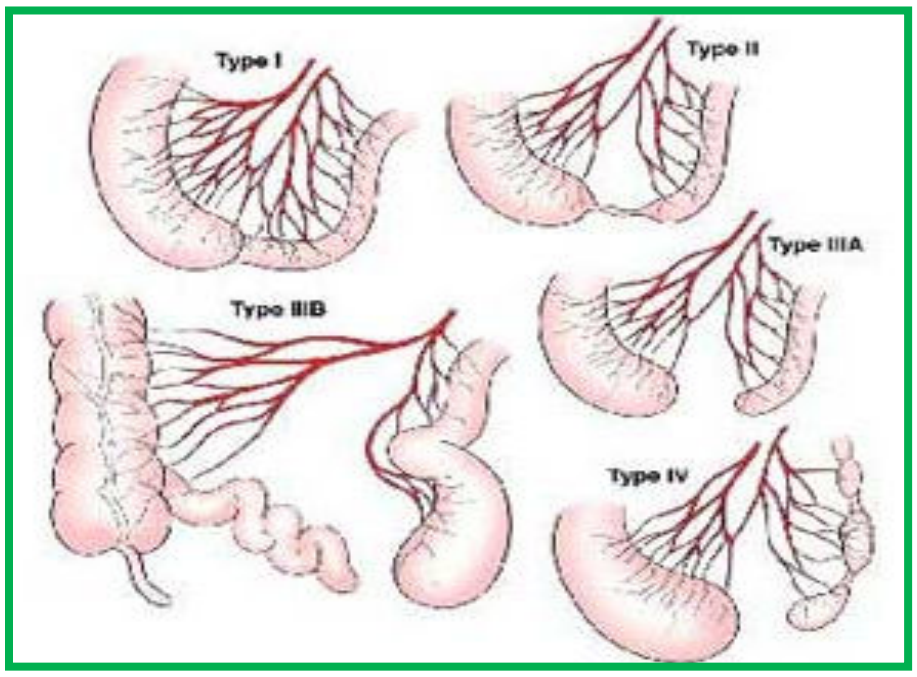
NECROTISING ENTEROCOLITIS (35%)

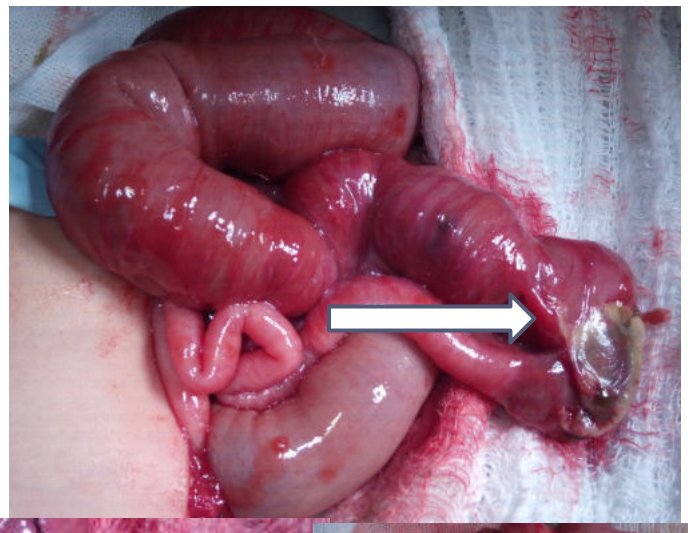
- One of the most common gastrointestinal emergencies in the newborn infant.
- Premature neonates that results in inflammation and bacterial invasion of the bowel wall.

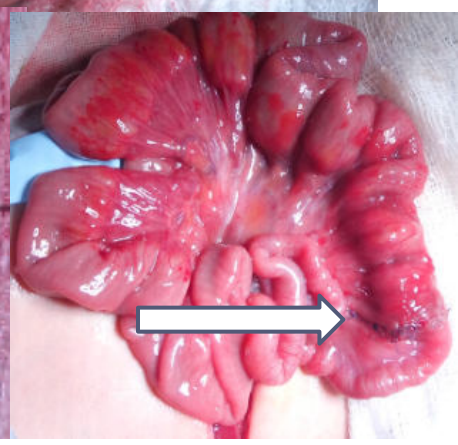


INTESTINAL ATRESIAS (25%)

- Congenital complete blockage or obstruction anywhere in the intestine.
- Duodenal, jejunal, ileal- usually treated by **resection and end to end anastomosis.**





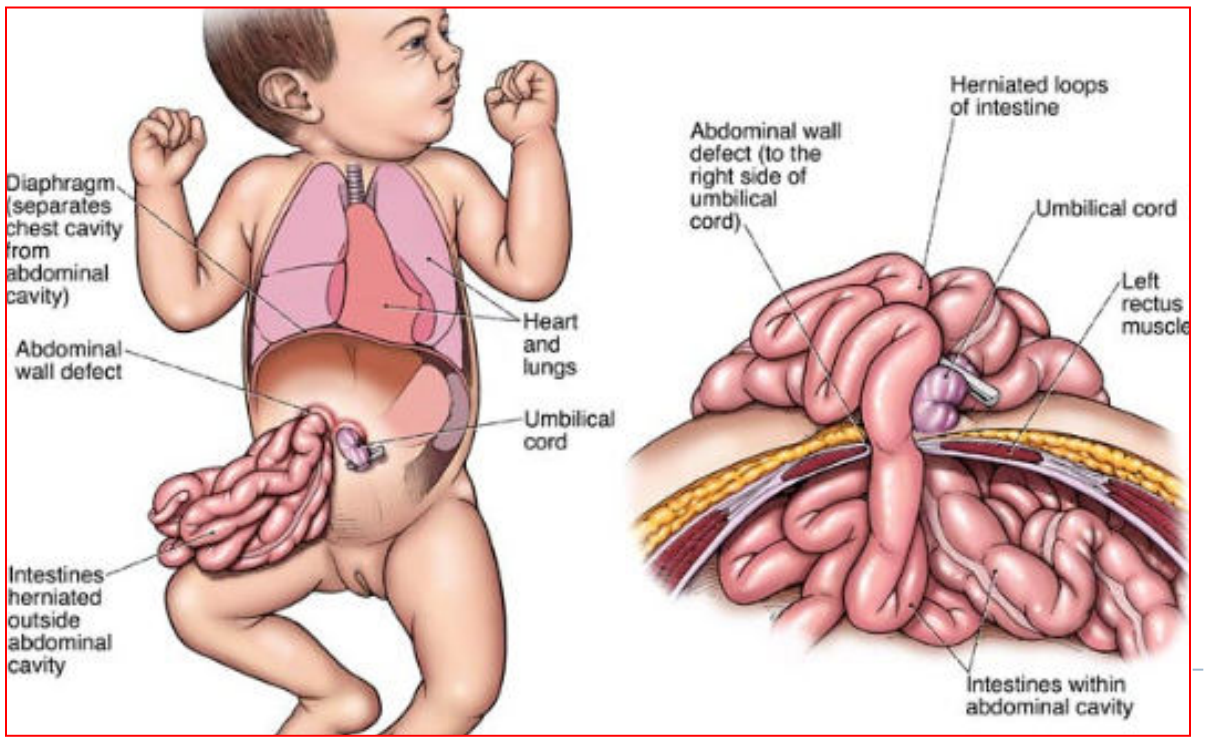


- Some develop severe disruption- **large part atretic**.

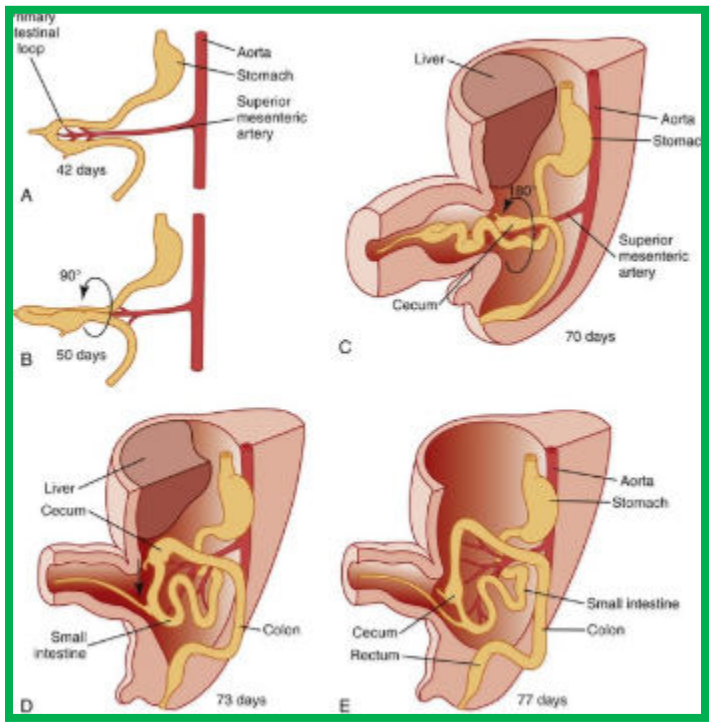
- In about 10%- lack dorsal mesentery and assume a spiral like an 'apple peel'

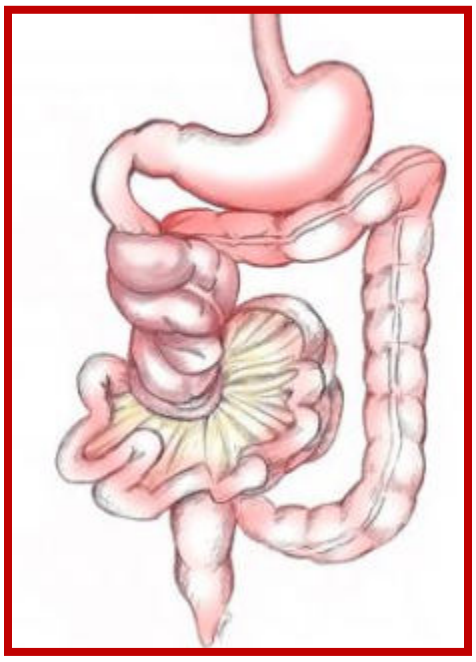
GASTROSCHISIS (18%)

- Fetal bowel eviscerates through a narrow abdominal wall defect.
- Exposed to **amniotic fluid**; associated with other **malformations**; **tight abdominal** compartment.



MALROTATION WITH MIDGUT VOLVULUS





MANAGEMENT

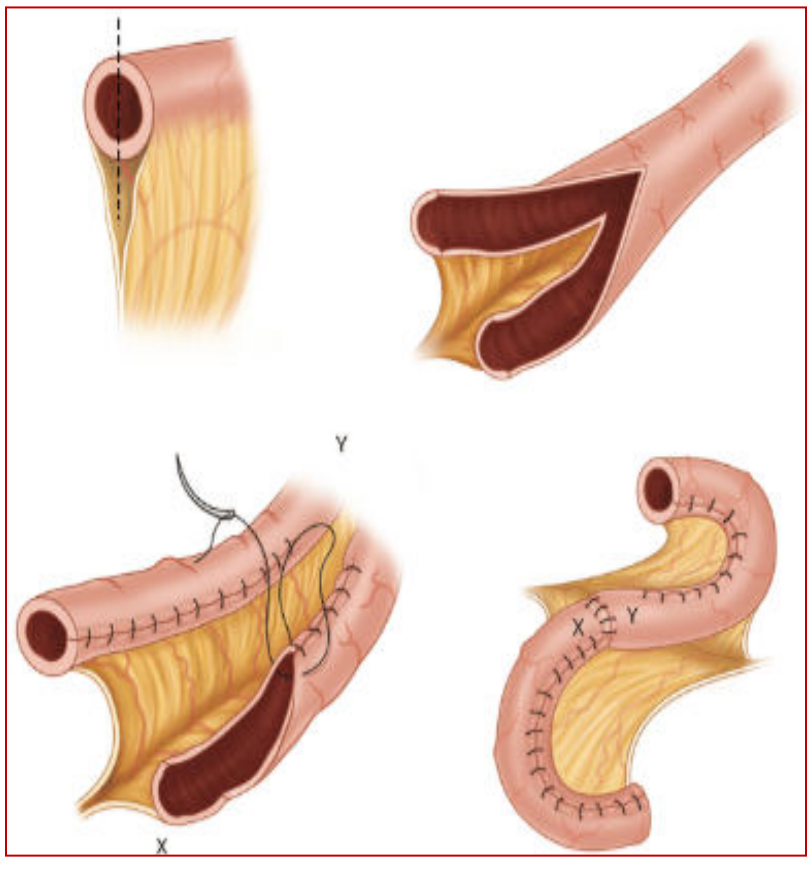
- Requires a multi-disciplinary approach that includes
  - neonatologists,
  - gastroenterologists,
  - surgeons,
  - nutritionists,
  - pharmacists,
  - stomal therapists,
  - nurses, etc.

SURGICAL MANAGEMENT

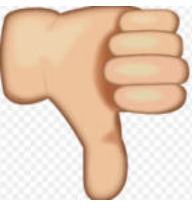
1. Bowel **conservation** at initial presentation.
2. Bowel **lengthening** surgeries.
3. Intestinal **transplantation**.

BOWEL LENGTHENING SURGERIES

- Longitudinal intestinal lengthening and tailoring (LILT) procedure(BIANCHI 1980).



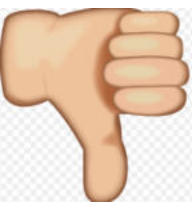
- Doubles bowel length.
- Improves peristalsis.



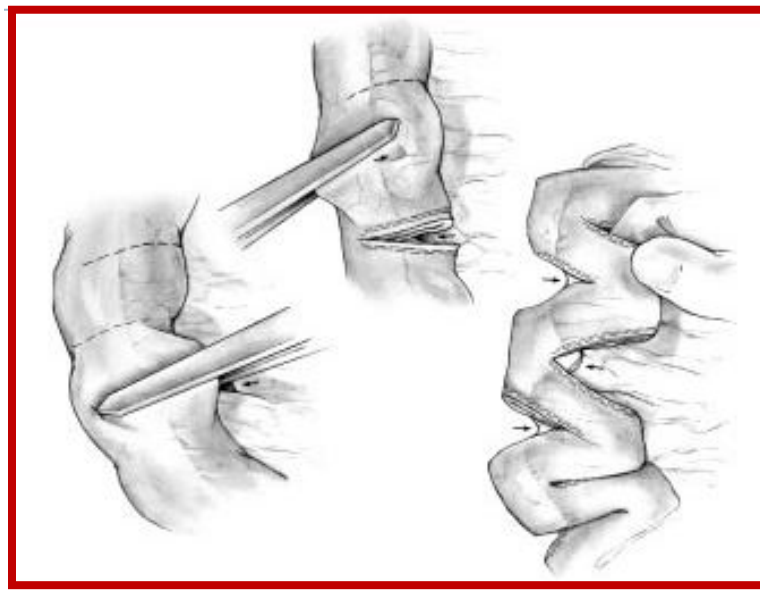
- Anastomotic leak
- Anastomotic stenosis
- Fistula formation
- Sepsis

BOWEL LENGTHENING SURGERIES

- Serial Transverse Enteroplasty (STEP) – creates a longer and narrower intestine.



- Staple line leak
- Hematoma
- Bowel obstruction
- Abscess

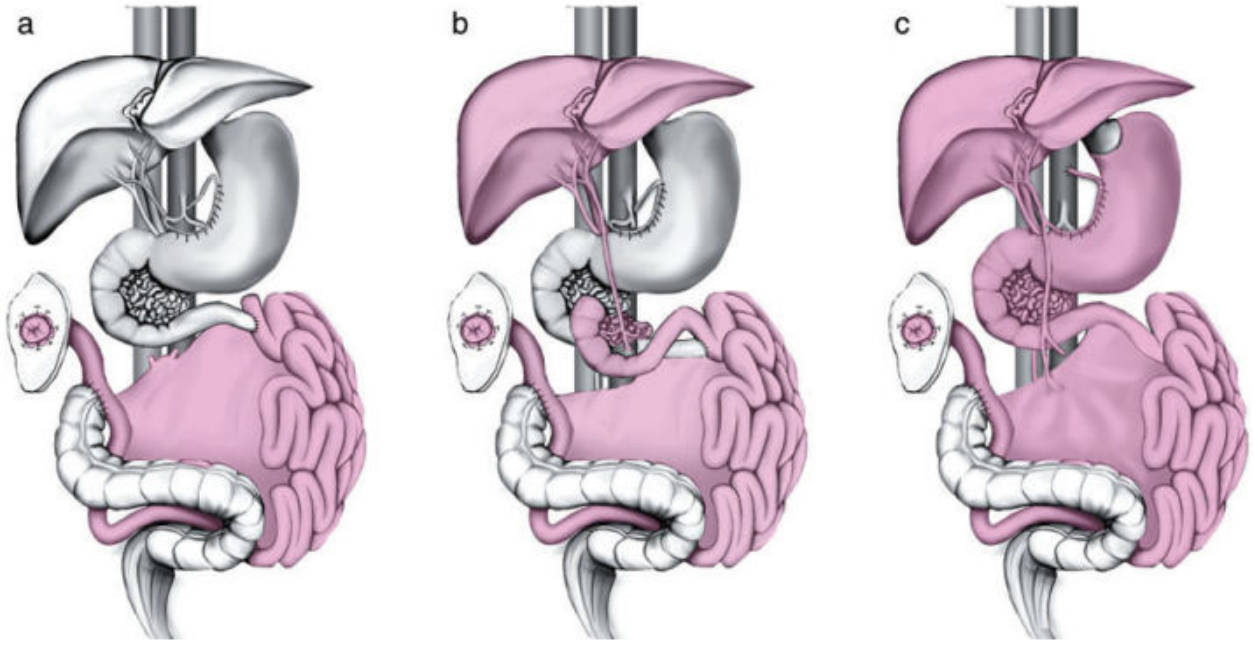


INTESTINAL TRANSPLANTATION

- Last resort in irreversible liver and intestinal failure.

- Types :

1. Isolated intestine
2. Combined intestine and liver
3. Multivisceral



INTESTINAL TRANSPLANTATION

Table 3 Currently-accepted indications for intestinal transplantation

Parenteral nutrition- associated complications
Two or more episodes of venous thrombosis with impending loss of venous access
Recurrent catheter-associated sepsis
Parenteral nutrition-associated liver disease with liver failure or portal hypertension
Failure of parenteral nutrition
Recurrent episodes of dehydration and/or electrolyte depletion
Hyperoxaluria-associated renal calculi

- **Complications**

- Acute rejection,
- Infection,
- Graft-versus-host disease, and
- Post-transplant lympho-proliferative disease.