

Examination of Fecal Specimens

Most Common Bacteria Isolated from Stool Samples

Gram positive

- *Clostridium perfringens* (type A&C)
- *Clostridium difficile*
- *Bacillus cereus* (toxin)
- *Staphylococcus aureus*

➤ Also *Mycobacterium tuberculosis*

Gram negative

- *Shigella spp.*
- *Salmonella spp.*
- *Campylobacter spp.*
- *Escherichia coli*
- *Vibrio cholerae*
- *Yersinia enterocolitica*

Commensals

- *Coliform bacilli*
- *Proteus sp.*
- *Pseudomonas*
- *Clostridium*
- *Bacteroides*
- *Enterococcus*
- *Lactobacilli*
- Also *Mycoplasma*, *Candida species* and a variety of protozoa and viruses.

The normal microbial flora of the gastrointestinal tract is greatly influenced by **diet**.

Stool samples are required in case of:

- Food poisoning.
- Parasitic infection.
- Diarrhea, pain, cramps.

Types of Specimens

- Stool specimen.
- Rectal swabs: Only when it is not possible to obtain stool.
- Duodenal or small bowel swabs/ aspirates/ biopsies.
- Rectal or large bowel (colon) biopsies.
- Gastric aspirates/biopsies (for *Helicobacter pylori*).

Collection of Stool

- Stool for microbiological examination should be collected during the acute stage of diarrhea.
1. Give the patient a clean, dry wide-necked container (no need to be sterile). Ask the patient to avoid contaminating the stool with urine.
 2. Transfer a portion (about a spoonful) of the specimen, especially that which contains mucus, pus, or blood, into a clean, dry, leak proof container and send them to the parasitology lab for identification.
 3. Label the specimen and send it with a request form.

Transport of Stool

- Stool samples should reach the laboratory within 1 hour.
- If a delay longer than 1 hour is anticipated, collect the specimen in Cary-Blair medium (expensive).
- *Salmonella serovars, Shigella, Vibrio and Yersinia* species survive well in Cary-Blair medium for up to 48 hours, and *Campylobacter* for up to 6 hours.
- *When cholera is suspected: Transfer about 1 ml of specimen into 10 ml of alkaline peptone water (enrichment of Vibrio cholera) and label. The specimen should reach the lab within 8 hours of collection.*
- When the specimen contains worms or tapeworm segments, add saline and send to parasitology lab.
- If processing is delayed, refrigerate at 4°C to prevent overgrowth of commensals.

Laboratory Examination of Stool

Macroscopic Examination of Stool

- **Describe the appearance of the specimen:**
 - ✓ Color of the specimen.
 - ✓ Consistency: formed, semi-formed, unformed or fluid.
 - ✓ Presence of blood, mucus or pus.
 - ✓ Presence of worms.
- **Normal Stool:** appear brown and formed or semi-formed.
- **Infant stool:** are yellow-green and semi-formed

Microscopic Examination

A- Wet preparation (saline and eosin):

To detect *E. histolytica* and other parasites

B- Methylene blue preparation:

Can be used to detect faecal leucocytes

Culturing the Stool

- When the specimen is formed or semifformed, make a thick suspension of it in about 1 ml of sterile peptone water.
- Culture on:
 1. Blood Agar.
 2. MacConkey Agar.
 3. HE or XLD Agar.
 4. Campylobacter selective culture media.
 5. Selenite Broth



Subculture 2nd day on:

MacConkey Agar & Hektoen

Gram stain

- Do Gram stain from culture media
- Then Biochemical reactions