BHARATHIDASAN UNIVERSITY

Tiruchirappalli-620024

Tamil Nadu, India.

Programme: M.Sc., Biomedical Science

Course Title : Clinical Microbiology

Course Code: BM36C9

Unit-I

Recommendation for Collection and Transport of Specimens

Dr.P.JEGANATHAN

Guest Lecturer

Department of Biomedical Science

RECOMMENDATION FOR COLLECTION AND TRANSPORT OF SPECIMEN

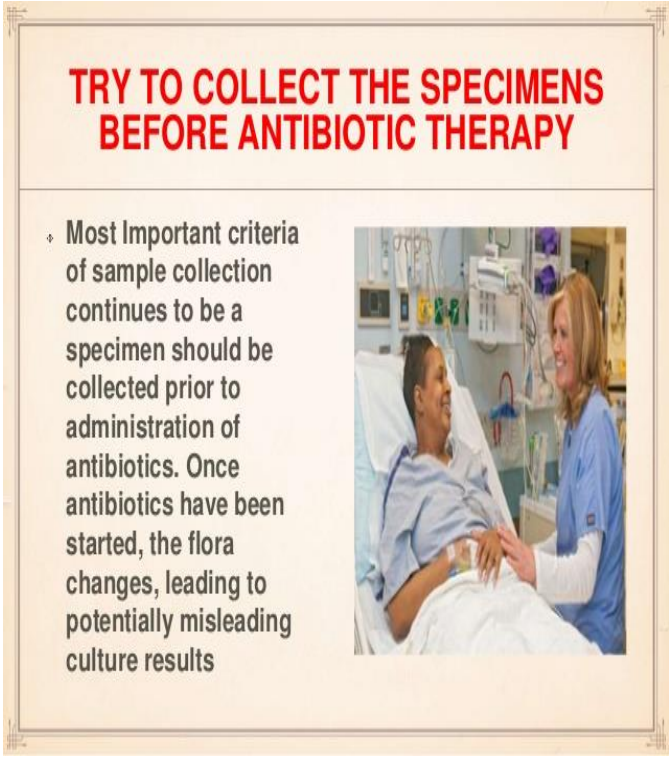
INTRODUCTION

- The proper collection of a specimen for culture is the most important step in the recovery of pathogenic organisms responsible for infectious disease.
- A poorly collected specimen may lead to failure in isolating the causative organism(s) and/or result in the recovery of contaminating organisms.
- The type of specimen, the appropriate time to obtain the sample, the way of sampling, the storage and transport are critical points in the diagnostic process.

General guidelines for proper specimen collection

- Utilize appropriate collection devices. Use sterile equipment and aseptic technique to collect specimens to prevent introduction of microorganisms during invasive procedure.
- Collect specimen before administering antimicrobial agents when possible.
- Collect an adequate amount of specimen. Inadequate amounts of specimen may yield false result.

- **All swabs are to be kept moist in a transport medium after the specimen is collected.**
- **Every laboratory should provide proper guidelines for collection of samples**
- **All diagnostic information depends on quality of sample recieved**
- **If sample collection, transport, media are not proper,it will give false result.**



- **Collect specimens in sturdy, sterile, screw-cap, leakproof containers with lids that do not create an aerosol when opened.**
- **Collect the specimen from the actual site of infection, avoiding contamination from adjacent tissues or secretions.**
- **Minimize transport time. Maintain an appropriate environment between collection of specimens and delivery to the laboratory.**

Specimens that are unacceptable for microbiological testing

- **Unlabeled or improperly labeled specimens**
- **Specimens received in leaking, cracked, or broken containers**
- **Specimens with obvious (visually apparent) contamination**
- **Unpreserved specimens received> 12 hours after being collected**
- **Specimens not appropriate for a particular test**

General guidelines for specimen collection.

- SPUTUM
- URINE
- FAECES
- BLOOD
- BONE MARROW
- PUS
- WOUND
- TISSUE
- BODY FLUIDS
- BRONCHIAL / WASH / LAVAGE
- THORAT SWAB

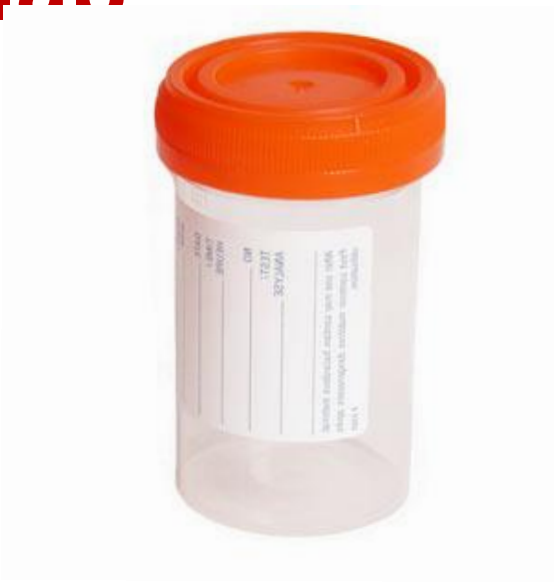
- BODY FLUIDS
- BRONCHIAL / WASH / LAVAGE
- THORAT SWAB

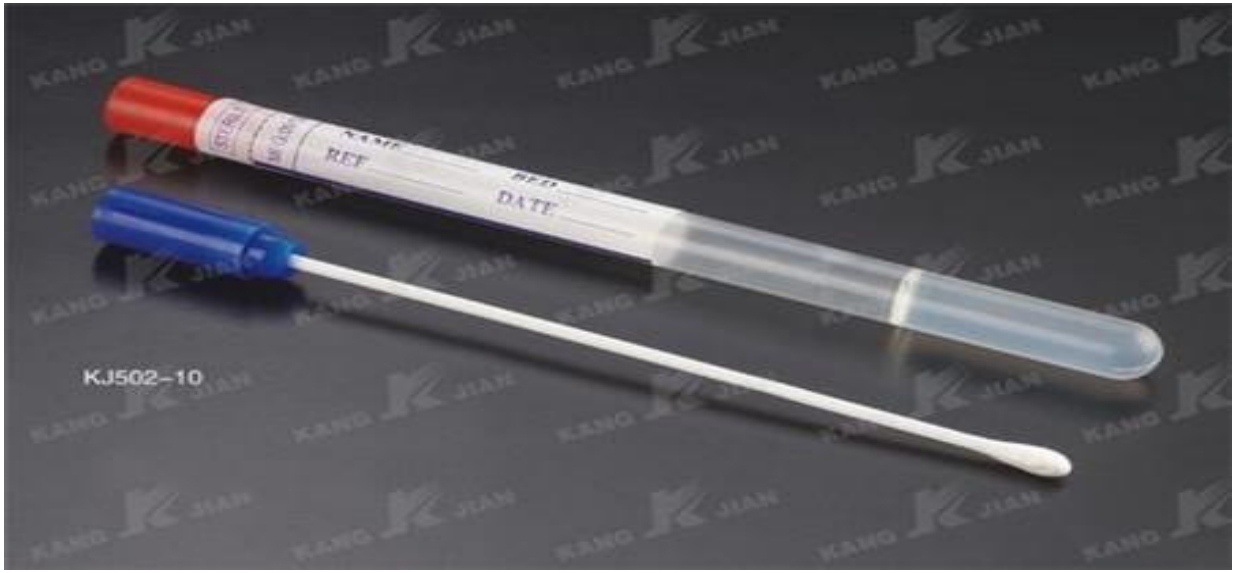
- EAR
- EYE

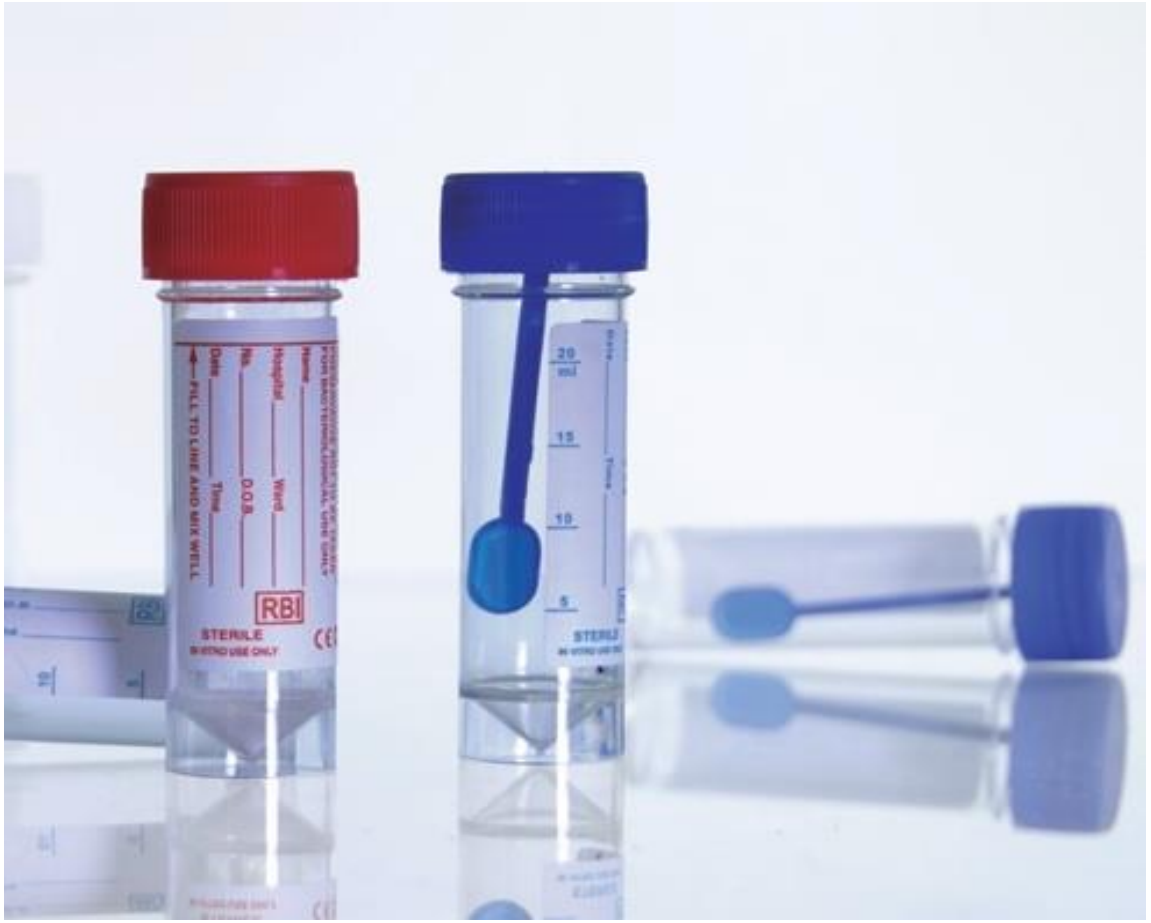
MYCOLOGY

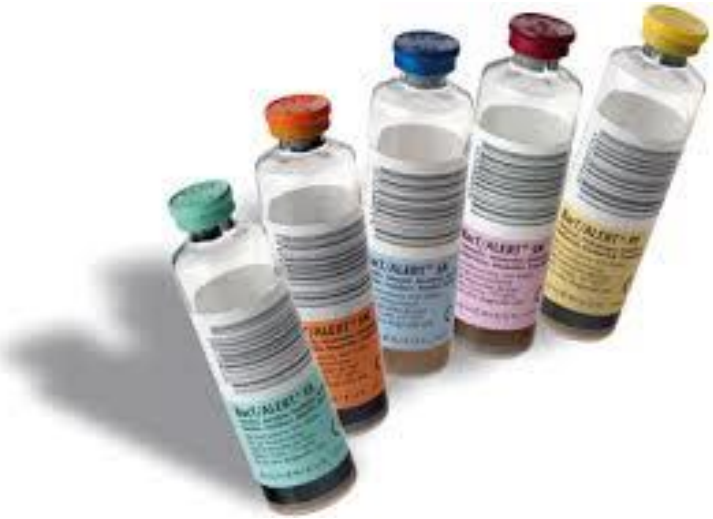
- Hair
- Nail
- Skin

Specimen collectors used in Micro lab






RBI
STERILE
FILL TO LINE AND MIX WELL
Name
Hospital
Ward
Rx
D.O.B.
Date
Time
20
15
10
5



Sputum

1.Assure patient cooperation to get an adequate specimen.

2.Instruct the patient as follows:

a. Rinse mouth with clean water to remove food particles and debris.

b.Have patient breathe deeply and cough several times to achieve a deep specimen.

c.Patient should expectorate into dry, sterile container.

d.Tuberculosis patients should expectorate sputum in the early morning, into a sterile container with lid sealed tightly.

3. **Transport immediately at ambient temperature.**
4. **Expectorated sputum is acceptable for bacterial, mycobacterial, and fungal culture.**
5. **Patients with clinical and chest x-ray findings compatible with TB should collect 3 first morning sputums (preferably on 3 separate days) for AFB culture.**

Urine for Bacterial, Fungal, AFB Cultures

Instructions for female patients to collect midstream urine for bacterial culture:

1.Wash hands thoroughly with soap and water, rinse them, and dry them.

2.Spread labia, with one hand, and keep them continuously apart.

3.Wash the urinary opening and the surrounding area .

4.Take the open sterile cup in the other hand without touching the rim or inner surface of the cup or lid.

- **Void 20 to 25 ml into the toilet and catch a portion of the rest of the urine in the container without stopping the stream. Do not touch the legs, vulva, or clothing with the cup.**
- **Place the lid securely on the cup.**
- **Immediately transport to the lab, refrigerate in case of delay.**

Instructions for male patients to collect midstream urine for bacterial culture:

- **Wash hands.**
- **Retract the foreskin completely.**
- **Wipe head of penis in a single motion with clean water. If not circumcised, hold foreskin back before cleansing.**
- **Void 20 to 25 ml into the toilet and catch a portion of the remaining urine in the cup without stopping the stream. Do not touch the cup with the penis.**

- **Place the lid on the cup securely**
- **Immediately transport to the lab, refrigerate in case of delay**

Specimen handling:

- **Label the container immediately.**
- **For AFB CULTURE: Entire first morning Urine specimen should be collected, on minimum three Consecutive days, in specially provided sterile containers**

Stool, Faeces

- **Collect specimen in a clean bed pan or use plastic wrap placed between the toilet seat and the bowl. Do not submit feces contaminated with urine or toilet water.**
- **Transfer specimen into a clean, dry container or the appropriate preservative.**
- **Transport at ambient temperature within two hours of collection.**

Blood

- Cleanse and scrub the site with 2-3 alcohol swabs. Allow it to dry for at least 30 seconds.
- Wear sterile gloves.
- A 10 cm area of the skin should be disinfected.
- Allow the site to dry at least 30 seconds before venipuncture.

- **Insert needle into vein and withdraw appropriate amount of blood.**
- **Insert the needle into the vein**
- **Try to keep the dominant hand sterile.**
- **Inoculate each culture bottle with exactly 8-10 ml of blood, using previously marked indicator line. A lesser amount can be considered when talking the blood specimens from infants and younger children**

- **Remove the tourniquet and butterfly needle from the site and cover with gauze dressing. Apply pressure to site as needed.**
- **Label the culture bottles with a label in the presence of the patient. Indicate the time that the specimen was obtained.**
- **Do not place label over bar-coded area of the bottle**
- **Fill out Microbiology-routine lab slip.**
- **Indicate suspected diagnosis, if necessary (required for rule out endocarditis).**

- **Include date and time of collection.**
- **Document that cultures were obtained on appropriate nursing form**
- **Send specimens to the laboratory as soon as possible. Never refrigerate blood culture specimens. Send specimens directly to the Microbiology Lab.**

Bone Marrow

- Physicians should wear gowns, masks, and gloves during specimen collection.
- Prepare skin as for blood cultures.
- Aspirate the marrow percutaneously using a sterile needle and syringe.
- Transfer 3-5 ml in to a sterile container.
- Transfer the specimen immediately to the ambient temperature.

Abscess (Pus)

- Decontaminate the surface with 70-95% alcohol and 1-2% tincture of iodine.
- Collect purulent material aseptically from an undrained abscess using a sterile needle and syringe.
- Transfer 5-10 ml of the aspirated material to sterile container. Transport immediately..If requesting AFB culture, transfer at least 1 ml of the aspirated material into a sterile container.

- **Swabs are a poor choice because they dry easily and because of the limited amount of material obtained. Swabs are not optimal for fungal, anaerobe cultures. Swabs are not accepted for mycobacterial cultures, perirectal abscesses, oral abscesses.**

Throat

- Use a cotton swab.
- Use a tongue blade and a good light source to ensure good visualization.
- both tonsil, and
- the posterior pharynx,
- lesion, or area of inflammation.
- Place the swab into the appropriate transport media and transport at ambient temperature.

Cerebrospinal Fluid

- **CSF must be collected by means of strict aseptic technique, both to minimize specimen contaminationand to pre-vent introduction ofbacteriainto the CNS**
- **The risk of contamina-tion is low when the skin is adequatelydisinfected prior to lumbar puncture; an iodine can be used for disinfection. The risk of contamination is higher when CSF is collected from catheters or shunts. (e.g., staphylococci) that cause many CSF catheter and/or shunt infections.**

- **Collect only 3-5 ml into a labeled sterile container.**
- **The fluid to be collected at the rate of 4-5 drops per second.**
- **Disinfectant the skin before aspirating the specimen.**
- **Lumbar puncture to collect csf for examination to be collected by physician trained in procedure with aseptic precautions to infection.**
- **The best site for puncture is inter space between 3,4 lumbar vertebrae.**

EYE

- **Do not touch external skin. Obtain maximum material. Culture both eyes. Use Star swabs with modified Stuarts.**

MYCOLOGY Cutaneous (Fungal only)
HAIR:

- Scrape the scalp with a blunt scalpel.
- Place specimen in a dry sterile container.
- Transport at ambient temperature.
- The following specimens are also acceptable:
- Hair stubs
- Contents of plugged follicles
- Skin scales
- Hair plucked from the scalp with forceps

Nails

- Cleanse the nail with 70-95% ALC.
- Remove the outermost layer by scraping with a scalpel.
- Place specimen in a dry, sterile container.
- Transport at ambient temperature.
- The following specimens are also acceptable:
- Clippings from any discolored or brittle parts of nail
- Deeper scrapings and debris under the edges of the nail

Skin

- Cleanse the skin with 70-95% ALC.
- Collect epidermal scales with a scalpel, at the active border of the lesion.
- Place specimen in a dry sterile container. Do not tape specimen to slide.
- Transport at ambient temperature.

General Guidelines for Proper Specimen Transport

- **Transport all specimens to the laboratory promptly to ensure the survival and isolation of fastidious**
- **organisms and to prevent overgrowth by more hardy bacteria. This will provide a more accurate diagnosis of the infectious-disease process.**

- **Alternatives to prompt delivery.**
- **Many specimens may be refrigerated at 2-8ºC. CSF, blood cultures, stool cultures, anaerobic cultures, and**
- **specimens submitted on selective media for Neisseria gonorrhoeae should not be refrigerated. Refer to details below:**
- **a. If blood is drawn into blood culture broth, hold it at room temperature.**
- **b. Specimens that may harbor temperature-sensitive organisms such as Neisseria species should be left at room temperature.**
- **c. For anaerobic culture specimens, use anaerobic transport and maintain at room temperature.**
- **d. Stool Specimens—fresh specimens must be received in lab within one hour of collection or use transpor**

- **Hold CSF specimens at room temperature (unless they are to be cultured for viruses).**
- **f. All specimens for viral culture must be refrigerated.**

- **Blood culture bottles should be transported immediately to the laboratory. Ifthis is not possible,**
- **bottles can be kept at room temperature or in an incubator at**
- **a temperature of 35°C to 37°C. These bottles should never be refrigerated. Blood collected in Isolator tubes (Wampole Laboratories, Cranbury, NJ) should be processed within 8 hours, since delays in processing may decrease the microbial yield**

- **CSF specimens should be trans-ported immediately to the laboratory. Systematic delays in trans-port should be identified and eliminated.**
- **From collection through processing, CSF specimens (except aliquots collected for viral cultures) should not be refrigerated until initial pro-cessing is completed.**

- **Because most respiratory tract specimens are likely to contain at least a few contaminating microorganisms, specimens should be transported quickly to the laboratory to minimize overgrowth of contaminants.**
- **If transportation or processing is delayed, specimens should be refrigerated. For fungal and mycobacterial cultures, prompt processing and refrigeration help prevent overgrowth of normal flora in the specimen.**

- **Most stool specimens are collected and then placed in vials containing different transport media and fixatives. A variety of such products are commer-cially available; each system typically includes a transport me-dium for culture and 10% neutral-buffered formalin and polyvi-nyl alcohol for ova and parasite examination**
- **Stool specimens submitted for culture typically are not stored for any length of time, since most laboratories set up all appropriate cultures at the time of receipt of the specimen.**

- **Only rarely is it necessary to retrieve a specimen for additional testing; such specimens should be refrigerated.**
- **Stool specimens submitted for ova and parasite examinations are typically stored at room temperature in a fixative.**
- **Speci-mens stored in 10% neutral-buffered formalin remain stable for many months, fresh stool specimens submitted for ova and parasite examination should be examined within 2 hours.**

- **viruses survive well at ambient temperature while in common transport media, recovery of viruses from specimens containing low numbers of viruses may be decreased following prolonged holding under these conditions. Therefore, it is advisable to transport specimens on ice or to keep them refrigerated**
- **Speci- mens should never be exposed to temperatures higher than room temperature**

REFERENCE

1.BOOK- Microbiology 2nd edition MWC.BROWN
2.www.ncbi.gov.com
3.virology.online.com
4.microbrnotrs.com
5.sciencedirect.com

THANK YOU