



Clinical Samples Collection and Preservation

Virus: A microorganism that is smaller than a bacterium that cannot grow or reproduce apart from a living cell. A virus invades living cells and uses their chemical machinery to keep itself alive and to replicate itself.

Viruses may contain either DNA or RNA as their genetic material. Herpes simplex virus and the hepatitis B virus are DNA viruses. RNA viruses include HIV and hepatitis C virus

❖ Viral Specimens collection

Viral Specimens collection plays a vital role in laboratory diagnosis. Proper sample collection leads to the proper diagnosis of disease. Sample should be collected aseptically. Appropriate samples from the appropriate site and an adequate amount should be collected. Once collected samples are recommended to emulsify or mixed properly with viral transport medium (VTM).

❖ Collection and Transport of Virological Specimens

- Specimen for detection of viruses should be collected as soon as possible after the appearance of the symptoms that is when the concentration of the virus is at its highest.
 - Blood for antibody testing should be collected as early in the disease as possible and also 5- 10 days later.
 - Two serum specimens (paired sera) are necessary to detect a rise in the titer of the Ab. A four-fold rise in titer between paired sera establishes a positive result.
- Central nervous system- (CSF)



➤ Respiratory system

Upper respiratory- (Throat swab, Nasopharyngeal swab, Ear discharge)



Lower respiratory- (Sputum, Bronchoscopy specimen, endotracheal aspirate, Lung biopsy/aspirates)

- Eye – (discharge)
- GIT- (Stool, Rectal swab, Ascitic fluid)
- Genitourinary system- (Urine, Vaginal/endocervical swab, Urethra discharge)
- Body fluids- (Blood, Bile, Peritoneal effusion, Pleural effusion, Pericardial effusion, Synovial fluid)
- Surface specimen- (Skin, nails, hair)
- Wound- (ulcers swabs)
- Surgical specimen- (Tissue biopsy, Abscesses)

The following information is intended only as a general guide for viral sample collection-

Feces

1. Place about 4-8 g of feces (small spoon) in a clean, dry, leak-proof container.
2. Deliver to the laboratory as soon as possible.
3. If there is likely to be a delay to more than a few hours in the specimens reaching the laboratory, suspend about one gram of feces in 9 ml of



phosphate-buffered saline. If possible centrifuge at 2000 g for 15 minutes, and then transfer the supernatant fluid to a clean leak-proof container.

4. Label and keep at -20 °C.
5. Send to the virology laboratory in a cold box.
6. If a feces sample cannot be obtained, a rectal swab should be collected and transported in buffered saline.

Nasopharyngeal secretions

1. Collect a specimen by passing a sterile cotton wool swab, through the floor of the nasal cavity as far as the nasopharynx.
2. After few seconds, slowly withdraw the swab and immerse the swab in a container of sterile VTM. A specimen of nasopharyngeal secretion can also be obtained by using a sterile mucus extractor.

Cerebrospinal fluid

- Collect 0.5- 1.0 ml of fluid in a dry, sterile, leak-proof container. Refrigerated immediately at 4°C.
- Transport in an insulated cold box.
- When meninges are infected, the CSF will contain lymphocytes and the CSF total protein will be raised.

Skin and ulcer specimens

1. Collect skin scrapings in a dry sterile container.
2. Refrigerate immediately at 4°C, and then transport in a cold box.



Blood for serological tests

1. Two serum specimens are required to diagnose an infection serologically.
2. Collect the sample within 5 days of the onset of the symptoms, and the second sample 5-10 days later.
3. Collect 5-10 ml of venous blood in a dry sterile, screw-cup glass tube or bottle.
4. After the blood is collected, collect it in a leak-proof container, refrigerate it at 4°C until transport in an ice box to the virology laboratory.

Transporting of specimens to the Virology laboratory

- Most Viruses are unable to survive temperature over 50°C, freezing or fluctuating in temperature.
- Viruses can also be damaged by light, drying, change in pH, and bacterial enzymes.
- The usage of VTM will prevent specimens from drying out and help to preserve viral activity.
- All viral specimens should be transported in an icebox with a warning label.

Storage and Transportation of Viral specimens

- Short term storage : +4°C
- Long term storage: -70°C/-190°C(liquid nitrogen)

Use of Viral Transport medium

- Specimens are emulsified in the medium VTM (Viral Transport Medium)
 - Composed of:



1. Buffered salt solution
 2. Proteins (Bovine serum albumin)
 3. Antimicrobial agents
 4. Indicator
- Function
1. Preserves viral infectivity within the specimen
 2. Prevents specimen from drying
 3. Prevents growth of bacteria and fungi

Criteria for rejecting Vial specimens

- Mismatch of information on the label and the request
 - Inappropriate transport temperature
 - Excessive delay in transportation
 - Inappropriate transport medium
1. specimen received in a fixative
 2. dry specimen
- Insufficient quantity
 - Leakage