

Diagnosing viral infections

No single viral test will necessarily yield a definitive diagnosis for viral infections. It may be necessary to test both for the presence of the virus in the specimen and also for a virus specific antibody response in the patient's serum.

WHICH TEST?

There are basically two approaches for the laboratory diagnosis of a viral infection:

1. Direct Virus Detection
2. Virus specific antibody (serology). The choice is influenced by the type of virus, the clinical syndrome and the tests available. Whenever possible, direct detection of the virus by PCR in an acute phase specimen is preferable to serological diagnosis of acute infection.

Virus Detection Methods	Sensitivity	Frequency of Use
PCR for nucleic acid detection	Highly sensitive	Most commonly used
Assay for viral antigens ¹	Less sensitive than PCR	Less frequently used
Isolation in cell cultures	Less sensitive than antigen detection	Infrequent
Visualisation of viral particles (electron microscopy)	Least sensitive	Rarely used slower and more expensive

¹Note: Antigen detection in serum is commonly used in assay for blood borne viruses such as Hepatitis B and HIV.

VIRUS SPECIFIC ANTIBODY DETECTION

Virus specific antibody detection in blood samples (Serology) may require either:

Paired sera

One serum sample collected near the onset of illness - *acute phase serum*.

The second 10 - 14 days later - *convalescent phase serum*.

OR

Single serum

For virus specific IgM antibody response - taken at or shortly after the onset of illness.

Note: IgM antibodies may be non specifically elevated or cross react, and demonstration of a rising IgG titre in a second sample may be necessary for confirmation.

WHAT SPECIMEN TO COLLECT? (see chart overleaf)

Correct selection and collection of specimens is crucial to virus detection and identification.

Close cooperation between the doctor and the laboratory significantly aids diagnosis.

WHAT WE NEED TO KNOW

Interpretation of results depends critically on knowing:

1. Date of onset of illness and recovery times after illness
2. Symptoms
3. Additional information such as;
 - behavioural risk factors, occupation, overseas travel etc.

VIRAL COLLECTION KITS

Please use Viral Swab (Green top) or Viral Transport Medium (VTM) or dry swabs for PCR testing.

To order please phone the IMVS Call Centre on 8222 3000 and ask for Consumer Products.

Bacterial media (e.g., Amies blue top) are unsuitable for viral tests.



Syndrome	Common Viral Causes	Specimen Type	Collection	Test
AIDS	HIV 1 or 2	Blood	White top	Antibody/antigen "Combo" test
Arthritis	Parvovirus, Ross River virus, Barmah Forest virus, Rubella	Blood	White top	Antibody
Cardiac Pericarditis /Myocarditis	Influenza, Adenovirus Enterovirus	Throat swab/NPA	Viral swab, VTM	PCR
		Faeces (Enterovirus only)	Sterile container	PCR
		Pericardial fluid	Sterile container	PCR
CNS Meningitis /Encephalitis	HSV, VZV, CMV, Measles, Mumps, Adeno, Enterovirus	CSF	Sterile container	PCR
		Throat swab	Viral swab, VTM	PCR
	Enterovirus	Faeces	Sterile container	PCR
	Cryptococcus	CSF, Blood	Sterile container White top	Antigen
Ocular Conjunctivitis /Keratitis	Adenovirus, Enterovirus, HSV, VZV	Conjunctival/ corneal swab, scraping, fluids	Viral swab, VTM Sterile container	PCR
	Chlamydia		Chlamydia collection kit	PCR
Gastrointestinal Diarrhoea	Rotavirus, Adenovirus, Norovirus	Faeces	Sterile container	PCR
Antibiotic-associated Colitis	<i>Clostridium difficile</i> toxin	Faeces	Sterile container	Toxin Detection
Hepatitis	Hepatitis A, B, C, D Hepatitis E (overseas travel only)	Blood	White top	Antigen/Antibody
Lymphadenopathy /Mononucleosis	EBV, CMV, HIV, Rubella, Toxoplasmosis	Blood	White top	Antibody
Perinatal Congenital and Neonatal infection (mother or child)	CMV, HSV, VZV, Rubella, Parvovirus, Enterovirus, Syphilis, Toxoplasmosis	Blood	White top	Antibody
		Throat/Lesion swab/NPA	Viral swab, VTM	PCR
		Urine, CSF, Amniotic Fluid, Blood	Sterile container Purple top	PCR
Rash/Skin Lesions Vesicular	HSV, VZV, Enterovirus, Adenovirus	Vesicle fluid/swab	Viral swab, VTM	PCR
Macules/Papules	Measles, Rubella, Parvovirus	Blood	White top	Antibody
		Urine, Throat swab, NPA	Sterile Container Viral swab, VTM	PCR (measles, rubella)
	EBV, CMV, HHV6, Ross River virus, Hepatitis B, HIV	Blood	White top	Antibody
Respiratory Viral and Bacterial	Influenza, Respiratory Syncytial virus, Adenovirus, Parainfluenza, Rhinovirus, Human Metapneumovirus, Pertussis, Mycoplasma.	NPA, Deep Nasal swab, sputum, tracheal aspirate, BAL, Blood	Sterile Container Viral swab, VTM, White top	PCR, Antibody
	Chlamydia (serology only) Legionella (serology only)	Blood	White top	Antibody
	Legionella antigen	Urine	Sterile container	Antigen
STD	HSV	Genital lesion swab	Viral swab, VTM	PCR
	Chlamydia trachomatis/Neisseria gonorrhoeae, Trichomonas	Urine (first catch)	Sterile container	PCR
		Genital swab	Chlamydia collection kit	PCR
	Syphilis	Blood	White top	Antibody
Zoonoses	Q fever, Leptospirosis, Brucellosis, Toxoplasmosis	Blood	White top	Antibody