

MEDICAL VIROLOGY LEARNING TABLES

Please note this table is not all inclusive! It serves to highlight the tremendous variety of viral infections and outcomes.

Virus	Major Disease	Major Route of Transmission	Confirmation of Infection*	Pathogenesis (over simplified)	Vaccines	Anti-viral Therapy	Long-term Consequences
Poliovirus +ss RNA	Poliomyelitis	Fecal-oral	Call CDC	Viremia, Invasion of CNS, Lytic Infection Of Anterior Horn Cells	OPV IPV	None	Paralysis Immunity
Hepatitis A virus +ssRNA	Hepatitis	Fecal-oral	Serology (acute IgM)	Viremia, liver is target Resolves	Inactivated	None	Immunity
Coxsackie viruses +ssRNA	Hand foot mouth disease Encephalitis/Myocarditis Depends on target tissue	Fecal-oral	Culture CSF	Viremia, Spread to Target Tissue Cell Death	None	Pleconoril in trials	Tissue Damage or Recovery
Echoviruses Enteroviruses +ssRNA	Encephalitis/Myocarditis Depends on target tissue	Fecal-oral	Culture CSF	Viremia, Spread to Target Tissue Cell Death	None	Pleconoril in trials	Tissue Damage or Recovery
Rhino viruses +ssRNA	Common Cold	Respiratory	Clinical	Lytic infection of Respiratory epithelium	None	Pleconoril in trials	No protective immunity to other serotypes
EEE, WEE and VEE +ssRNA, env. (Togaviridae)	Encephalitis	Mosquito bite	Serology	Viremia, CNS infection inflammation	For horses Only	None	Death (rare)/immunity
Rubella Virus +ssRNA, env.	“German Measles”	Respiratory (most infectious before the rash)	Serology	Replication in respiratory tract, viremia, skin rash	Live, attenuated MMR	None	Immunity, Congenital Rubella syndrome
Yello Fever Virus +ssRNA, env.	Yellow Fever	Mosquito bite	Serology History “Councilman bodies”	Viremia, extensive replication in liver and cell death	Live, attenuated	None	Death/Immunity

* Not the sole means, but most commonly used at the present time.

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Norwalk Virus RNA	Diarrhea	Fecal-oral	Clinical RT-PCR	Viral replication, lysis and shedding of epithelial cells	None	None	Reinfection by other serotypes
Astroviruses RNA	Diarrhea	Fecal-oral	Clinical	Viral replication, lysis and shedding of epithelial cells	None	None	Reinfection?
Herpes, Simplex Virus I, DNA, env.	Cold sores/Encephalitis	Contact	Clinical, PCR, CSF	Replicates in epithelia, latent in trigeminal, ganglia	None	Acyclovir TZP/U (in trials)	Latent infection recurrent
Herpes, Simples Virus II, DNA, env.	Genital Lesions Neonatal Herpes	Contact	Clinical, PCR CSF, culture skin or mucous membrane lesions	Replicates in epithelia, latent in sacral ganglia in adult	None	Acyclovir TZP/U (in trials)	Latent infection recurrent Neonatal death or neurologic impairment or recovery
Cytomegalovirus DNA, env.	Post-transplant pneumonia, Neonatal CMV	Contact	Pathology “owl’s eye” nuclei, culture-shell vial	Cell proliferation, inflammation CMI is critical	None	Ganciclovir	Latent infection
Epstein-Barr Virus DNA, env.	Infectious Mononucleosis	Respiratory, saliva	Serology	Replicates and latent in B-cells	None	None	Burkitts lymphoma, nasopharyngeal carcinoma
Human Herpes Virus 6 DNA, env.	Roseola/exanthem subitum, Febrile seizures	Respiratory	Clinical	High fever, faintly red rash appears, fever resolves	None	None	Latent infections, recurrent?
Varicella-Zoster Virus DNA, env.	Chicken pox/Shingles	Respiratory (before the rash and for 4 days after)	Clinical	Replicates in respiratory epithelium, viremia, rash, latent in dorsal root ganglia	Live-attenuated	Acyclovir	Latent infections, recurrence as shingles
Papilloma Virus DNA	Warts/Cervical Carcinoma	Contact	Clinical/Hybridization (Pap smear for malignant transformation)	Virus production tied to cell differentiation E6 and E7 bind tumor suppressors	Virus-like particles in trials	None	Type 16, 18, 31 Cervical Carcinoma

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Dengue Virus +ssRNA	Hemorrhagic Fever	Mosquito bite	Serology	Viremia Fever Rash	None	None	Increased severity if prior infection with another serotype
Hepatitis C Virus +ssRNA, env.	Hepatitis	Transfusion IV drug abuse	Serology, RT-PCR, or Plasma	Viremia; liver is a target, persistent infection	None	IFN and Ribavirin in some cases	Chronic hepatitis/hepatocellular carcinoma
St. Louis Encephalitis Virus +ssRNA, env.	Encephalitis	Mosquito bite	Serology	Viremia CNS infection Recovery	None	None	Death (rare) immunity
West Nile Virus +ssRNA, env. (Flaviviride)	Encephalitis, meningitis	Mosquito bite	RT-PCR, Serology	Viremia CNS Infection recovery	None	None	Death/immunity
Coronavirus +ssRNA	Common Cold/Gastroenteritis SARS	Respiratory, fecal-oral	Clinical Serology, RT-PCR	Local replication, Cell death Viremia?	None	None	Reinfection with recombinant viruses (new serotypes)
Parainfluenza Virus -ssRNA,env.	Cold/URI Croup LRI	Respiratory	Clinical or culture Of nasopharynx	Local replication in respiratory tract, necrosis of epithelial cells	None	Glucocorticoids for severe croup	No lasting immunity Repeated infections each year of less severity
Measles Virus -ssRNA, env.	Measles	Respiratory (before the rash!)	Clinical, CCKC	Replication in respiratory tract, viremia, rash	Live-attenuated MMR	None	Immunity SSPE (rare) Booster vaccination required
Mumps Virus -ssRNA, env.	Mumps	Respiratory (before the Parotitis)	Clinical	Replication in respiratory tract, viremia & viruria	Live-attenuated MMR	None	Immunity
Respiratory Syncytial Virus -ssRNA, env.	Severe respiratory infection of infants	Respiratory	Culture, detect viral Antigen	Local replication in respiratory tract, necrosis of epithelial cells	None Prevention – RSV monoclonal Ab or Ig for infants with BPD	Ribavirin-poor Efficacy	No lasting immunity Repeated infections each year of less severity

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Parvovirus SsDNA	Erythema Infectiosum (Fifth Disease) Fetal hydrops/aplastic crisis	Respiratory	Clinical/Serology PCR of serum for Aplastic crisis	Replicates in Erythroid precursor nuclei	None	Intravenous immune globulin for aplastic crisis in immunocompromised patient	Immunity
JC, BK Virus DNA (Polyomavirus)	PML Progressive Multifocal Leukoencephalopathy	?	Head CT Scan, PCR, CSF	Progressive in AIDS	None	None	None
Adenoviruses DNA	Multiple UR syndromes, Conjunctivitis	Respiratory	Clinical/Culture of nasopharynx	Replication in epithelial cells, viremia	Killed virus (military only)	None	Immunity
Smallpox Virus DNA, env.	Smallpox	Respiratory	Clinical	Viremia rash	Live-attenuated	None	Eradicated! Possible vaccine vector.
Molluscum Contagiosum DNA, env.	Molluscum contagiosum	Contact	Clinical, pearl-like lesions	Painless lesion, 2-12 months to resolve	None	None	Immunity Persistence in AIDS pts.
Hepatitis B Virus Partial dsDNA env.	Hepatitis	Mother-to-child, transfusion, IV drug abuse, sexual	Serology + antigen detection be able to describe!	Undergoes reverse transcription, persists in cells	Recombinant HbsAg	Lamivudine Hepsera	Chronic hepatitis HCC
Hepatitis Delta Virus Circular RNA HbsAg, env.	Fulminant Hepatitis	Same as Hep B	Serology Anti-HD Ag	Co-infection with HBV, fulminant hepatitis.	Recombinant HbsAg	Lamivudine Hepsera	Chronic hepatitis Death
Hepatitis E Virus +RNA virus	Hepatitis (developing world)	Fecal-oral	History, serology (not yet licensed)	Similar to HAV?	None	None	Immunity High mortality in pregnancy
HIV	AIDS	Same as Hep. B	Serology (PCR of blood in infants)	Depletion of CD4 + T cells	None	Multiple RT-inhibitors Protease inhibitors	Death

LIST OF ABBREVIATIONS

BPD	Bronchopulmonary dysplasia
CCCK	Cough, coryza, conjunctivitis, Koplick's spots
CMI	Cell mediated immunity
CPE	Cytopathic effect
CSF	Cerebral spinal fluid
HCC	Hepatocellular carcinoma
IFA	Immunofluorescence assay
IFN	Interferon
LRI	Lower respiratory tract infection
OPV	Oral polio vaccine (Sabin)
IPV	Inactivated polio vaccine (Salk)
MMR	Mumps, measles, rubella virus vaccine (all live-attenuated viruses)
Ig	Immune globulin
HBsAg	Hepatitis B virus surface antigen
RSV	Respiratory syncytial virus
PCR	Polymerase chain reaction
RV-TV	Rotavirus – tetravalent vaccine (FDA approved, then withdrawn)