4. Enterovirus infections

Enteroviruses enters the body via ingestion by mouth. Poliovirus is an enterovirus causes Poliomyelitis / Paralysis. Coxsackie A virus is an enterovirus causes Hand Foot and Mouth disease. Two vaccines are available against Polioviruses: SALK AND SABIN VACCINE.

- **Enteroviruses are a genus of the picornavirus family which replicate mainly in the gut.**
- **Single stranded naked RNA virus with icosahedral symmetry**
- Capsid has 60 copies each of 4 proteins, VP1, VP2, VP3 and VP4 arranged with icosahedral symmetry around a positive sense genome.
- At least 71 serotypes are known: divided into 5 groups
  - **Polioviruses**
  - **Coxsackie A viruses**
  - **Coxsackie B viruses**
  - **Echoviruses**
  - **Enteroviruses**

Poliovirus:

- 3 serotypes of poliovirus (1, 2, and3) but no common antigen.
- Have identical physical properties but only share 36-52% nucleotide homology.
- Humans are the only susceptible hosts.
- Polioviruses are distributed globally. Before the availability of immunization, almost 100% of the population in developing countries before the age of 5.
- The availability of immunization and the poliovirus eradication campaign has eradicated poliovirus in most regions of the world except in the Indian Subcontinent and Africa.
- Poliovirus was originally targeted for eradication by 2000. As of Poliovirus remain endemic in only 3 countries: Afghanistan, Pakistan and Nigeria

Clinical manifestation:

There are 3 possible outcomes of infection:

- **Subclinical infection (90 - 95%) - inapparent subclinical infection account for the vast majority of poliovirus infections.**
- **Abortive infection (4 - 8%) - a minor influenza-like illness occurs, recovery occurs within a few days and the diagnosis can only be**

made by the laboratory. The minor illness may be accompanied by aseptic meningitis

- **Major illness (1 - 2%) - the major illness may present 2 - 3 days following the minor illness or without any preceding minor illness. Signs of aseptic meningitis are common. Involvement of the anterior horn cells lead to flaccid paralysis. Involvement of the medulla may lead to respiratory paralysis and death.**

Prevention: by vaccination.

Compare and contrast: Salk and Sabin polio vaccine:

SALK VACCINE*****	SABIN VACCINE*****
1. Inactivated virus	1. Live attenuated virus
2. Injected	2.Oral administration
3. Administered as three injections	3.Administered as 3 oral doses
4. Fails to give gut immunity	4.Gives good gut immunity
5. Virus inactivated by Formaldehyde	5.Virus attenuated by growing in monkey kidney tissue culture
6. Not used now a days	6.It is used now a days

IRON LUNGS

- Philip Drinker and Louis Agassiz Shaw created the first iron lung in 1927. If a patient lost the ability to breathe independently due to injury or illness, such as polio, they were placed in the iron lung. Their bodies are put inside a steel drum-like contraption with only their heads and necks out of the chamber. The air-tight container uses air pressure to manipulate the patent's lungs to mimic the pattern of breathing.