Poliomyelitis

Objectives :

Identify the concept & Etiology

clinical features

Complications

Outline Management

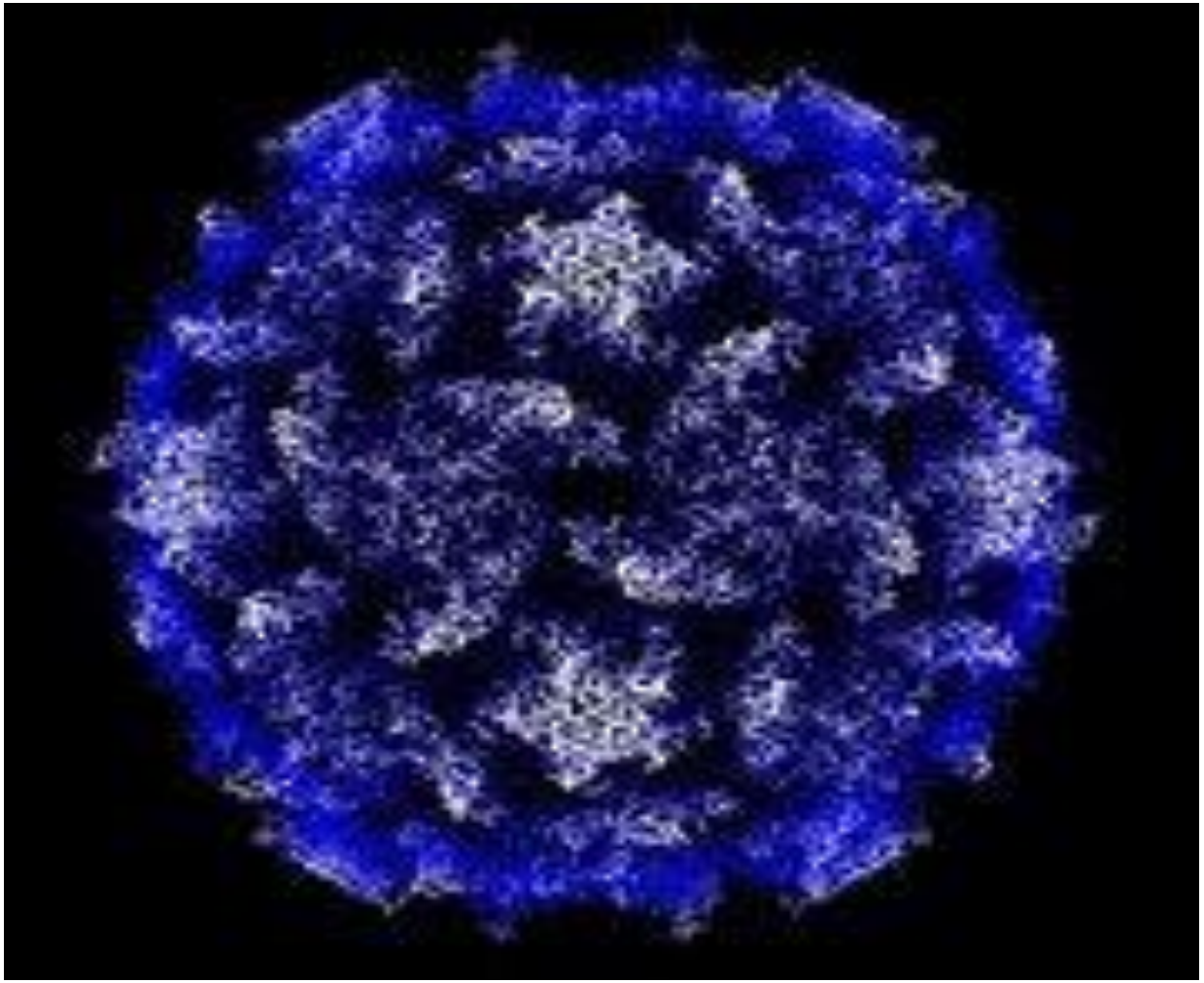
Prevention

Poliomyelitis is an acute infectious disease, caused by any of 3 serotypes of human enteric poliovirus. Usually the **infection is ltd to the GIT & NP & is often asymptomatic**. The (CNS), primarily the sp. cord, may be affected, ------ to rapidly progressive paralysis, coarse fasciculation & hyporeflexia. Motor neurons are primarily affected.

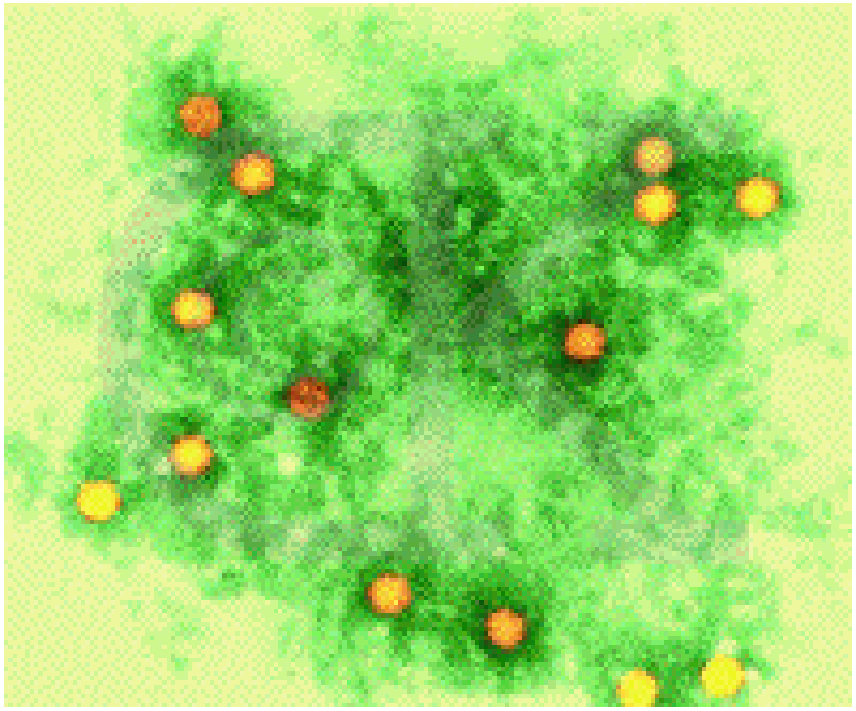
Encephalitis may also occur. The virus multiplies in the nervous system & may cause significant neuronal loss, esp. in the spinal cord.

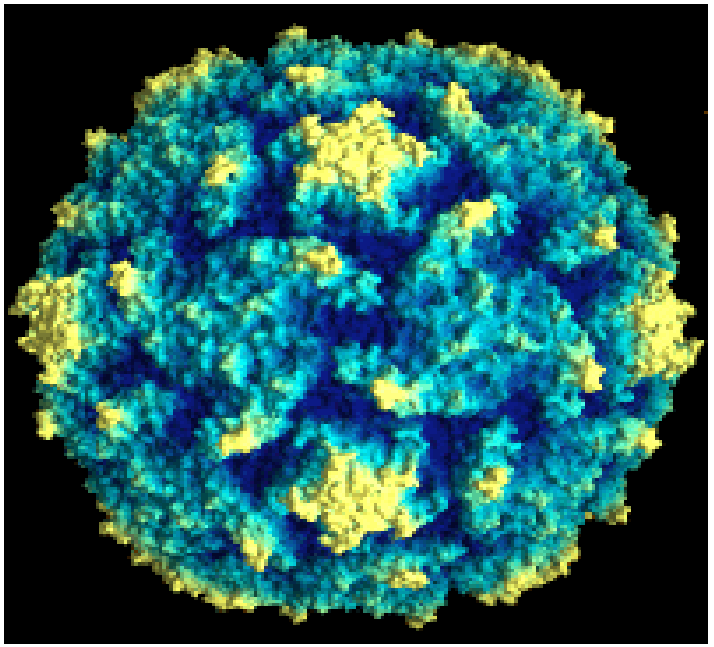
AFP of the legs is common.

Poliomyelitis



- **Poliomyelitis**: **Greek word is "Gray Matter."Attacks gray nerves in spinal cord first & cuts off the impulses that travel from brain to muscles & eventually causes muscles fibers to shrivel & die.**
- **Childhood disease ,but attacks adults as well.**
- **3 stages**: **acute, convalescent, chronic**.

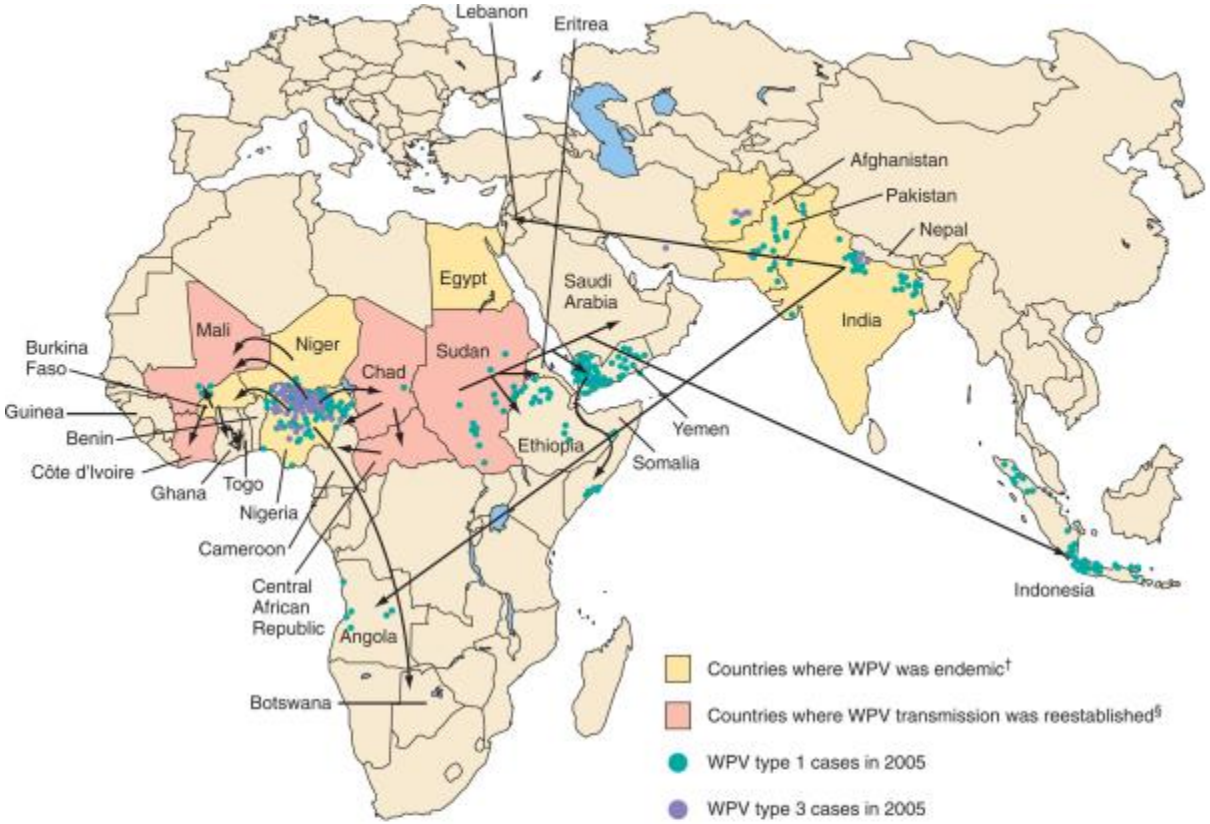




- **An ancient Egyptian stele, portraying a prince with a withered leg - probably polio.**

Poliomyelitis

- Polio is a virus that infects the NS of humans (only)
- It can cause temporary or permanent paralysis or death
- There is a vaccine for polio
- The WHO plans to eradicate polio from the world
- Polio outbreaks continue to occur in areas in which many are not vaccinated



*Routes (not all importation events) indicated by arrows.
†As of February 1, 2006, Niger and Egypt were considered no longer endemic for WPV because neither country had indigenous transmission during the preceding 12 months.
§Countries were considered to have reestablished transmission if WPV was detected for >1 year after importation. The majority of these countries have not experienced WPV type 1 transmission since July 2005.

Pathogenesis

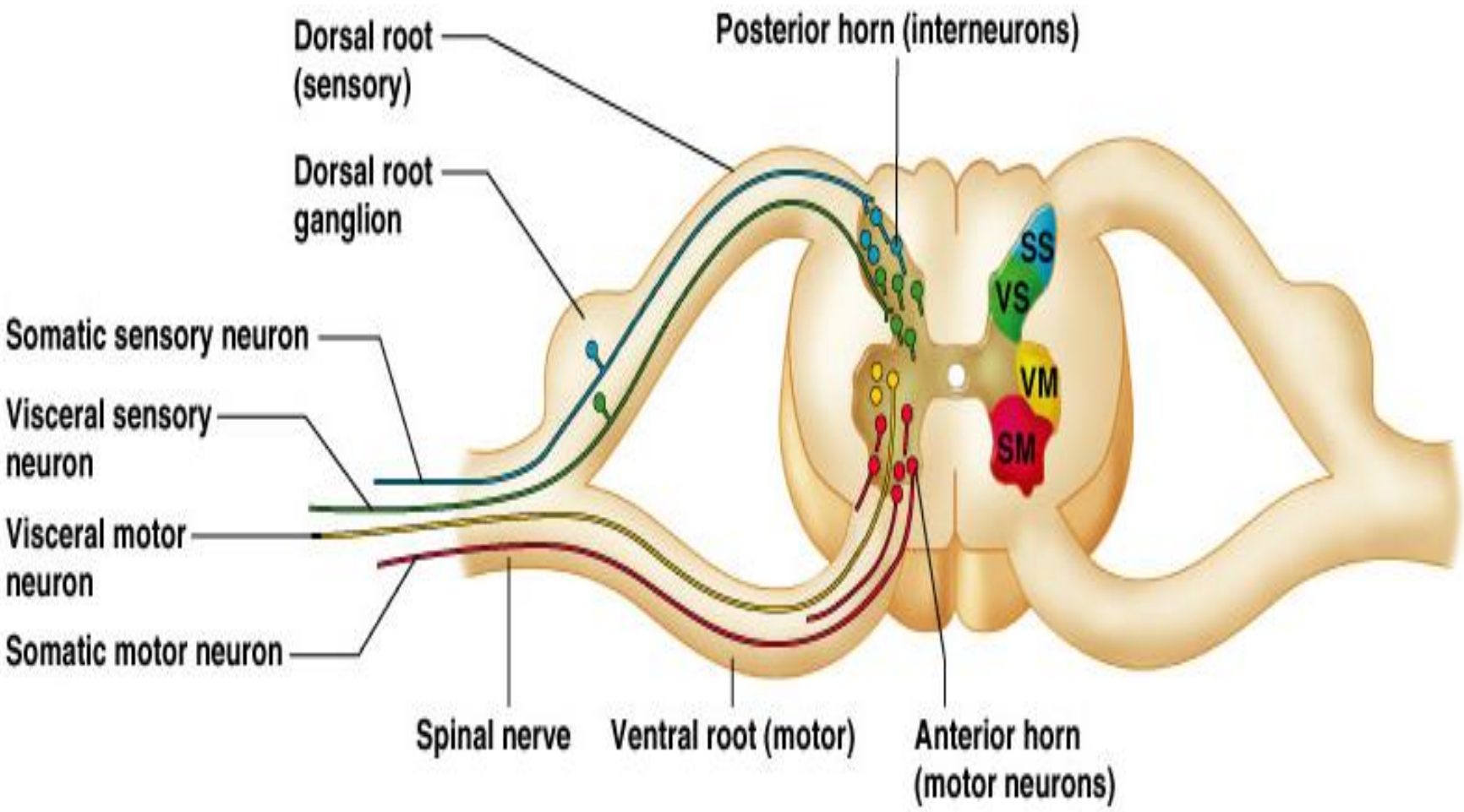
The IP is usually 7 - 14 days.

Following ingestion, the virus multiplies in the OP & intestinal mucosa.

The lymphatic system, esp. the tonsils & the Peyer's patches of the ileum are invaded & the virus enters the blood resulting in a transient viremia.

In a minority of cases , the virus may involve the CNS following dissemination.

Gray Matter: Organization



Clinical Manifestations

There are 3 possible outcomes of infection:

Subclinical infection (90 - 95%) - **unapparent 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 &Dx 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 & death.

Paralytic Poliomyelitis.

Develops in about 0.1% of persons infected with poliovirus, causing 3 clinically recognizable syndromes that represent a continuum of infection differentiated only by the portions of the CNS most severely affected. These are

(1) Spinal paralytic poliomyelitis,

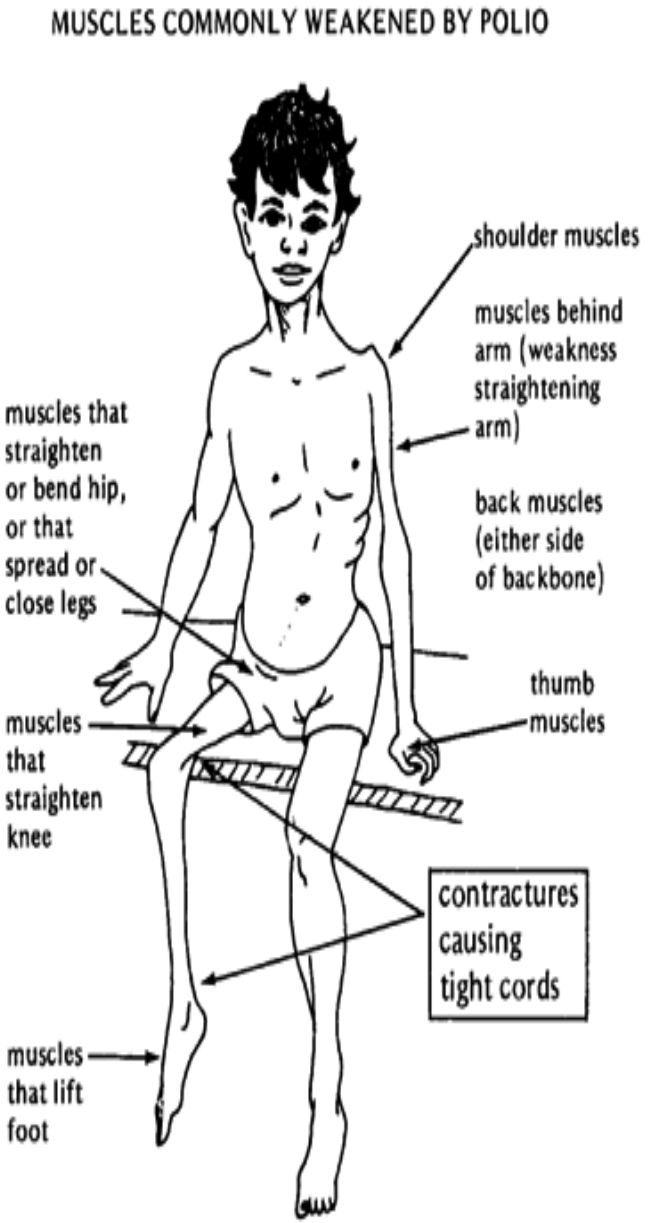
(2) Bulbar poliomyelitis,

(3) Polioencephalitis.

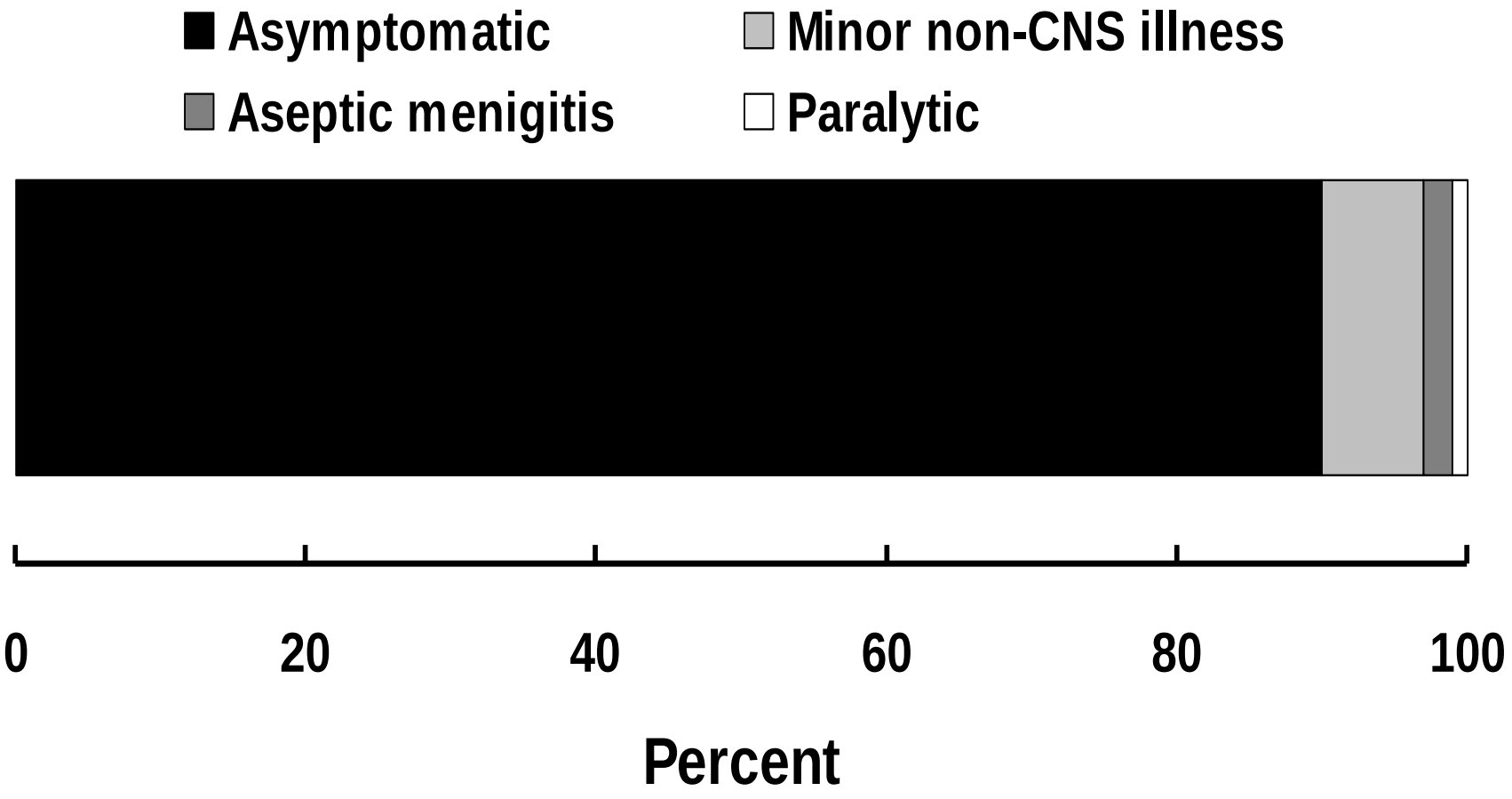
- Painful muscle spasms & incoordination of non-paralysed muscles may occur

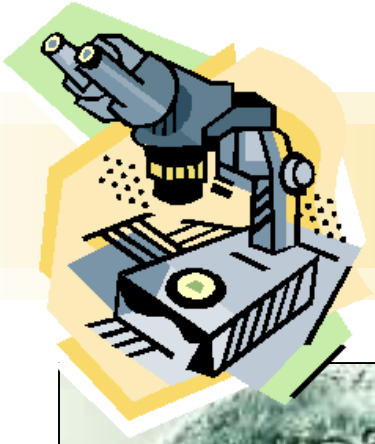
- Involvement of the medulla may lead to respiratory paralysis & death

- Paralysis usually develops over several days & some recovery may take place. Any effects persisting for more than 6 months are usually permanent

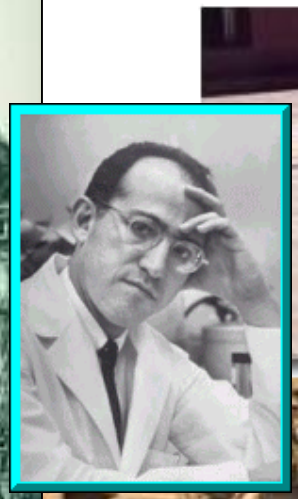


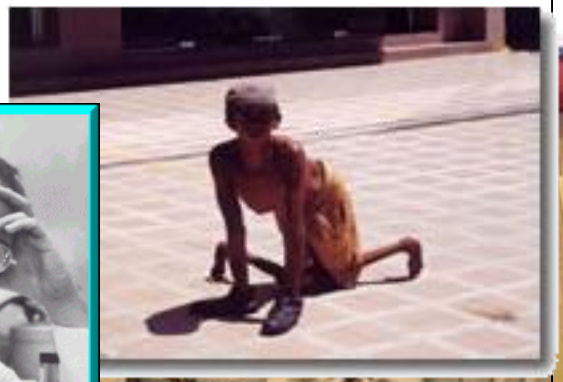
Outcomes of poliovirus infection





CO-EVOLUTION OF DISEASE





Polio

Complications

***Acute gastric dilatation** may occur abruptly during the acute or convalescent stage, causing further resp. embarrassment; immediate gastric aspiration & external application of ice bags are indicated.

***Melena** severe enough to require transfusion may result from single or multiple superficial intestinal erosions.

***Perforation** is rare.

***Mild HT** for days or weeks is common

***Hypercalcemia, Nephrocalcinosis**, Because of immobilization

***Cardiac irregularities are uncommon,** but ECG abnormalities suggesting myocarditis are not rare.

***Acute pulmonary edema** rare

Diagnosis

be confirmed by isolation & identification of poliovirus in the stool, with specific identification of wild-type & vaccine-type strains

2 stool specimens should be collected 24-48 hr apart as soon as possible after the Dx of poliomyelitis is suspected. Poliovirus

The CSF is often normal during the minor illness & typically contains a pleocytosis with 20-300 cells/mm^3 with CNS involvement

TREATMENT

There is no specific antiviral treatment for poliomyelitis

All IM injections & surgical procedures are C/I during the acute phase of the illness, esp. in the 1st wk of illness, because they might result in progression of disease.

Supportive Txt with analgesics, sedatives, an attractive diet, & bed rest until the child's temperature is normal for several days is usually sufficient

The Mx of pure bulbar polio consists of maintaining the airway & avoiding all risk of inhalation of saliva, food, and vomitus

Impaired ventilation must be recognized early; mounting anxiety, restlessness, & fatigue are early indications for intervention. Tracheostomy is indicated for some pts with pure bulbar poliomyelitis, spinal respiratory muscle paralysis, or bulbospinal paralysis because such pts are generally unable to cough, st for many mo. Mechanical respirators are often needed

Prevention

Vaccination is the only effective method of preventing poliomyelitis. Hygienic measures help limit the spread of the infection among young children, but immunization is necessary to control transmission among all age groups.
Both (IPV), and the live-attenuated OPV have established efficacy in preventing poliovirus infection and paralytic poliomyelitis.

Both vaccines induce production of antibodies against the 3 strains of poliovirus. IPV elicits higher serum IgG antibody titers, but the OPV also induces significantly greater mucosal IgA immunity in the oropharynx and gastrointestinal tract, which limits replication of the wild poliovirus at these sites.