POLIOMYELITIS

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Cause

- infection with a member of the genus *Enterovirus* known as poliovirus (RNA viruses). This group of prefers to inhabit the gastrointestinal tract
- Three serotypes of poliovirus have been identified—poliovirus type 1 (PV1), type 2 (PV2), and type 3 (PV3). PV1 is the most commonly encountered form, and the one most closely associated with paralysis.
- Rapidly inactivated by heat, formaldehyde, chlorine, ultraviolet light

Poliomyelitis Pathogenesis

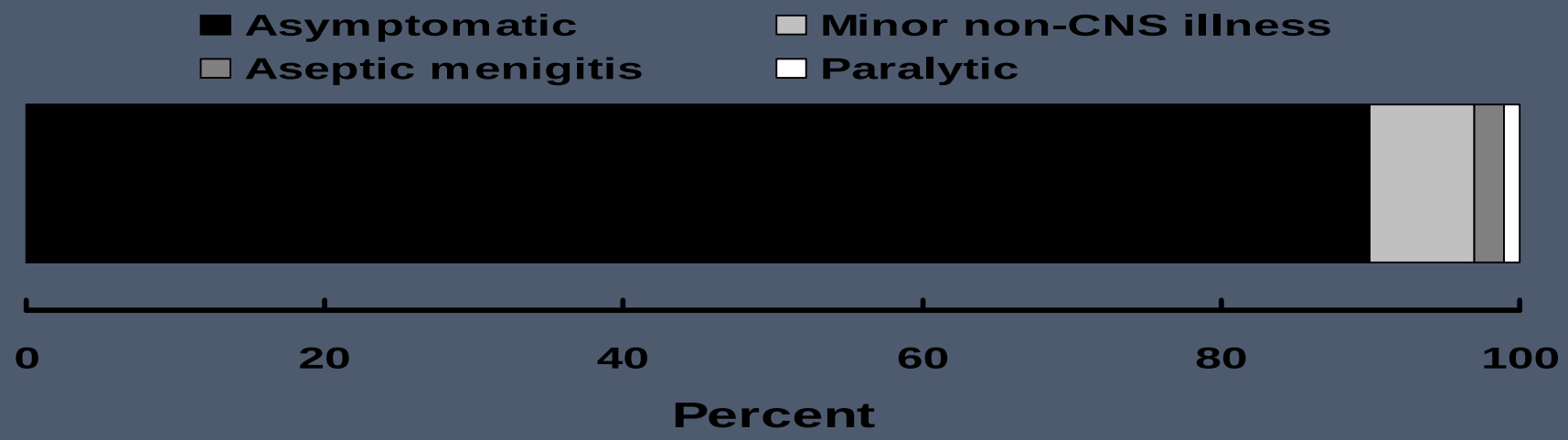
- Entry into mouth
- Replication in pharynx, GI tract, local lymphatics
- Hematologic spread to lymphatics and central nervous system
- Viral spread along nerve fibers
- Destruction of motor neurons

Transmission

- The disease is transmitted primarily via the fecal-oral route, by ingesting contaminated food or water
- occasionally transmitted via the oral-oral route

Classification

Outcome	Proportion of cases[
Asymptomatic	90 – 95%
Minor illness	4 – 8%
Non-paralytic aseptic meningitis	1 - 2%
Paralytic poliomyelitis	0,1 – 1,5%
— Spinal polio	79% of paralytic cases
— Bulbospinal polio	19% of paralytic cases
— Bulbar polio	2% of paralytic cases

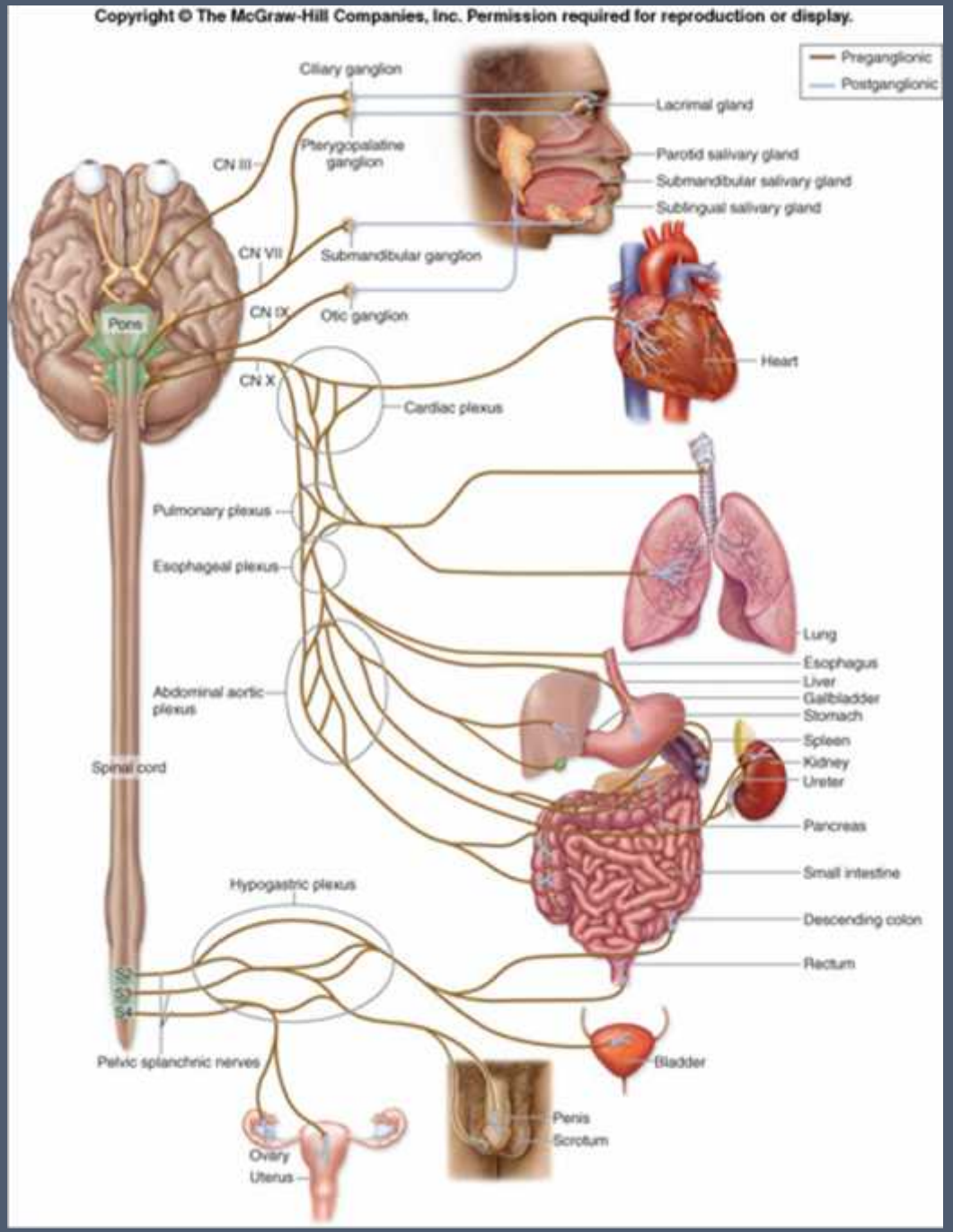


Bulbospinal Polio

- Accounts for 19% of paralytic cases
- Virus attack motor neuron anterior cornu spinal→ flaccid
- Affects extremities and cranial nerves
- Leads to severe respiratory involvement

Bulbar Polio

- Accounts for 2% of paralytic polio
- Virus attacks motor neurons in brainstem
- Affects cranial nerve function
- Primarily inhibits ability to breathe, speak, and swallow effectively



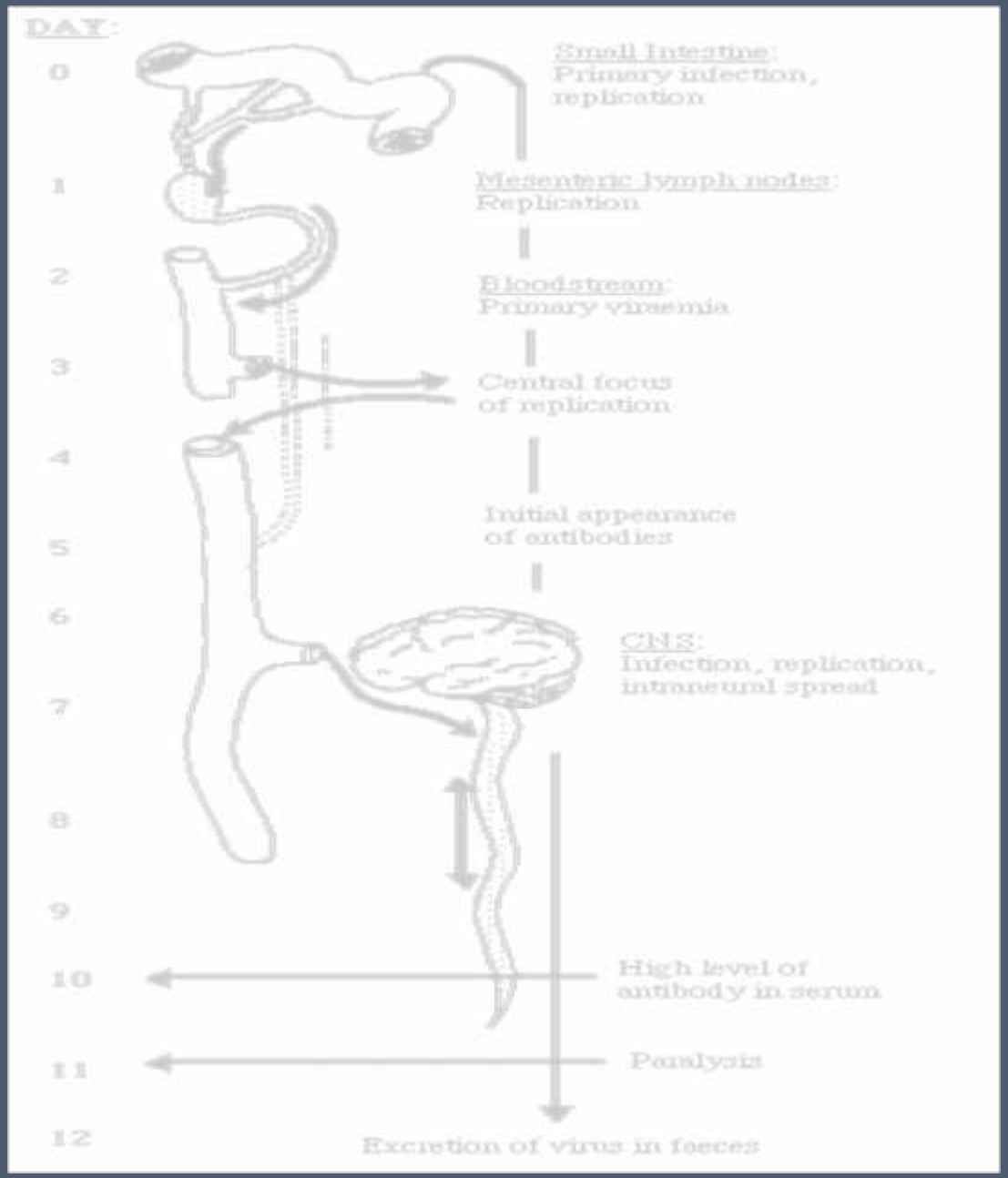
Symptoms & Signs

- acute onset of flaccid paralysis in one or more limbs with decreased or absent tendon reflexes in the affected limbs, that cannot be attributed to another apparent cause, and without sensory or cognitive loss

- Early symptoms of paralytic polio include high fever, headache, stiffness in the back and neck, asymmetrical weakness of various muscles, sensitivity to touch, difficulty swallowing, muscle pain, loss of superficial and deep reflexes, irritability, constipation, or difficulty urinating. Paralysis generally develops one to ten days after early symptoms begin, progresses for two to three days, and is usually complete by the time the fever breaks.

Pathophysiology

- Poliovirus → the mouth, infecting →the pharynx (throat) and intestinal mucosa. It gains entry by binding to a immunoglobulin-like receptor.
- The virus → begins to replicate. Poliovirus divides within gastrointestinal cells for about a week, from where it spreads to the tonsils, the intestinal lymphoid tissue, and the deep cervical and mesenteric lymph nodes, where it multiplies abundantly.
- The virus is subsequently absorbed into the bloodstream –> Known as viremia, the presence of virus in the bloodstream enables it to be widely distributed throughout the body. Poliovirus can survive and multiply within the blood and lymphatics for long periods of time, sometimes as long as 17 weeks. In a small percentage of cases, it can spread and replicate in other sites such as the reticuloendothelial tissues, and Rarely, this may progress and the virus may invade the central nervous system, provoking a local inflammatory response.
- In most cases this causes a self-limiting inflammation of the meninges, which is known as *non-paralytic aseptic.* The mechanisms by which poliovirus spreads to the CNS are poorly understood


DAY:
0
1
2
3
4
5
6
7
8
9
10
11
12
Small Intestine:
Primary infection,
replication
Mesenteric lymph nodes:
Replication
Bloodstream:
Primary viraemia
Central focus
of replication
Initial appearance
of antibodies
CNS:
Infection, replication,
intraneural spread
High level of
antibody in serum
Paralysis
Excretion of virus in faeces

Diagnosis

- A laboratory diagnosis : from a stool sample or a swab of the pharynx. Antibodies to poliovirus can be diagnostic, and are generally detected in the blood of infected patients early in the course of infection.Analysis of the patient's cerebrospinal fluid (CSF), which is collected by a lumbar puncture ("spinal tap"), reveals an increased number of white blood cells (primarily lymphocytes)

Treatment

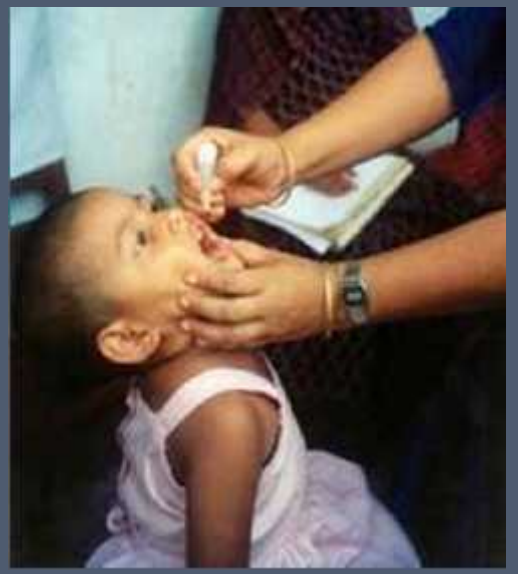
- There is no cure for polio
- Supportive measures include antibiotics to prevent infections in weakened muscles,
- analgesics for pain, moderate exercise and a nutritious diet.
- Treatment of polio often requires long-term rehabilitation, including physical therapy, braces, corrective shoes and, in some cases, orthopedic surgery

Prevention

- **Vaccine**

Two vaccines are used throughout the world to combat polio

1. was developed in 1952 by Jonas Salk →Salk vaccine, or inactivated poliovirus vaccine (given by injection)
2. Albert Sabin in 1960 developed an oral polio vaccine




Thank You