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# **POLIOMYELITIS**

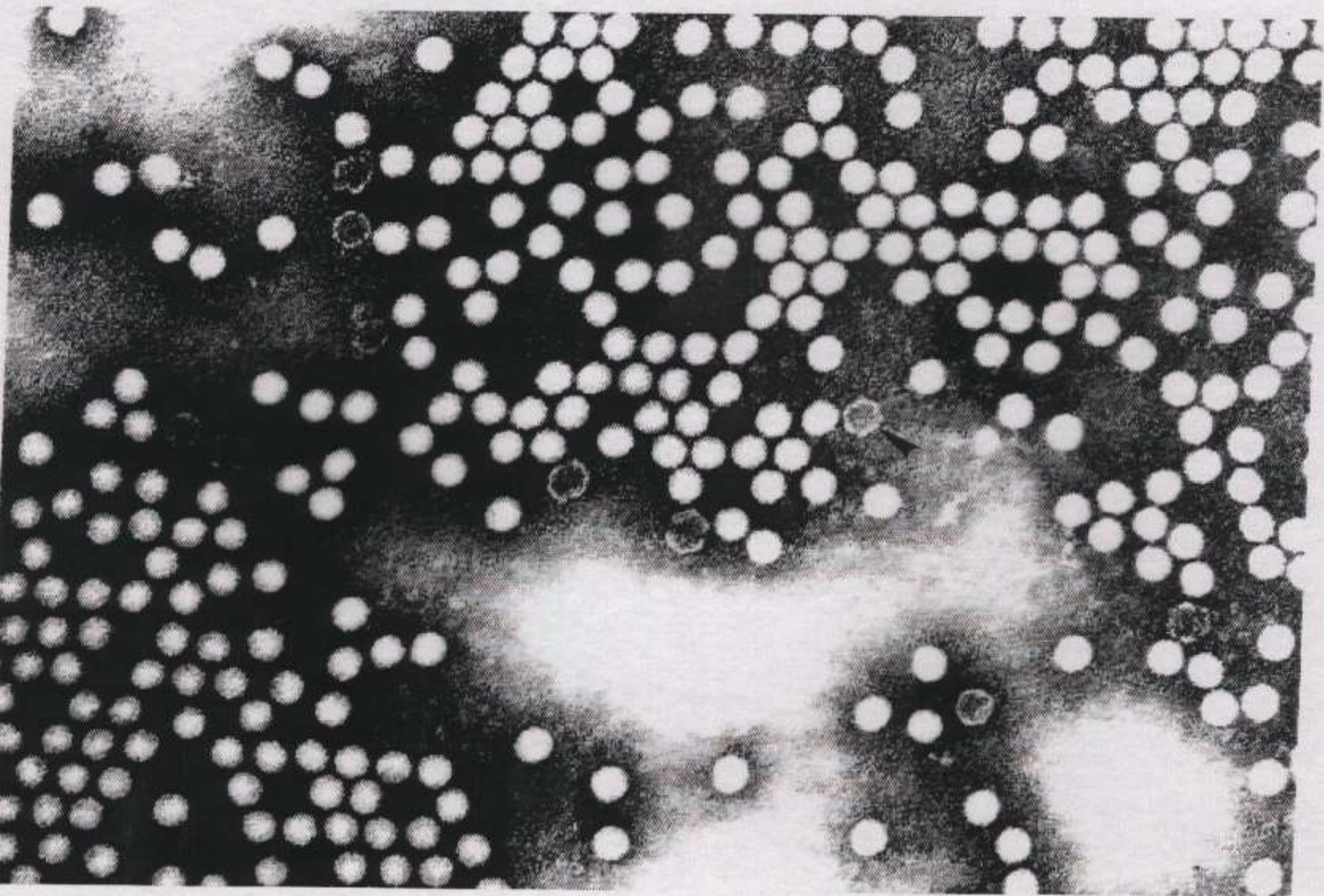
# **Poliomyelitis:**

- \* Enterovirus ( RNA virus)
- \* Picornaviridae family
- \* Subgroup
  - Coxsackieviruses
  - Echovirus

# **Poliovirus:**

- Type I- Out breaks/Paralysis
- Type II- Easiest to eradicate
- Type III- last to be eradicated

# Polio Virus



# Pathogenesis:

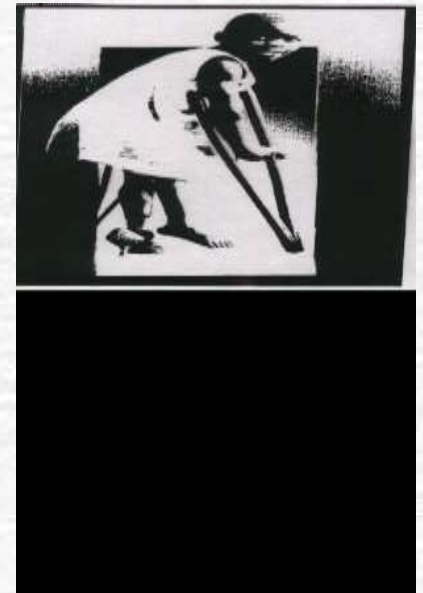
- \* Neuropathy is due to direct cellular destruction
- \* Immunological mechanism
- \* Neuronal lesion occur in
  - **Spinal cord (Ant. Horn cells)**
  - Medulla (vestibular & cranial nuclei, reticular formation)
  - Cerebellum (nuclei in roof, vermis only)
  - Midbrain (graymatter)
  - Thalamus, hypothalamus
  - Cerebral cortex (motor)
- \* Transplacentally acquired immunity 4-6 months

# **Epidemiologic Features of Poliomyelitis:**

- \* Highly infectious – 100% of household contacts will be infected
- \* Short incubation period – usually 7-14 days, but may be as short as 3 days
- \* Clusters of susceptible needed to maintain circulation
- \* Seasonal – late summer
- \* Silent transmission
- \* Person to person transmission fecal-oral route predominates

# Clinical Features of Poliomyelitis:

- \* Acute onset, flaccid paralysis
- \* Fever present at onset
- \* No progression after 2-3 days
- \* Asymmetric
- \* Legs affected most often
- \* Mortality rate 5-10%
- \* Paralysis is permanent
- \* Aseptic meningitis & non-paralytic illness



# Clinical Manifestations:

- \* Asymptomatic 90-95%
- \* Abortive 5%
- \* Non-paralytic 1%
- \* Paralytic 0.1%

## Abortive

- Non specific features
- Brief febrile illness
- Vomiting, constipation, abdominal pain
- Sore throat



# **Non-paralytic Poliomyelitis:**

- \* CNS manifestations
- \* Aseptic meningitis
- \* Headache, nausea, vomiting
- \* Nuchal & Spinal rigidity
- \* Tripod sign
- \* Kiss-the-Knee sign
- \* Changes in Superficial & deep reflexes
  - Indicate impending paralysis
  - Precede weakness by 12-24 hrs
  - No sensory deficit

# Paralytic Poliomyelitis:

- \* Flaccid Paralysis
- \* Sudden in onset
- \* Characteristically spotty
- \* Weakness of one or more muscle groups
- \* Pain, nuchal & spinal rigidity
- \* Respiratory & Cardiac arrhythmias
- \* Blood pressure changes
- \* No sensory deficit

# Clinical classifications of paralytic Poliomyelitis:

- \* Spinal Poliomyelitis
- \* Bulbar Poliomyelitis
- \* Bulbospinal Poliomyelitis
- \* Encephalitic Poliomyelitis

# Spinal Poliomyelitis:

- \* Weakness of muscles of neck, abdomen, trunk, diaphragm, thorax or extremities
- \* Commonly paralysis of lower limbs
- \* Respiratory insufficiency-paralysis of diaphragm and intercostals

# Bulbar Poliomyelitis:

- \* Weakness in motor distribution of cranial nerves
- \* 9<sup>th</sup>, 10<sup>th</sup>, 12<sup>th</sup> cranial nerves
- \* Paralysis of pharynx, tongue, larynx
- \* Airway obstruction

## Bulbospinal

# Encephalitic Poliomyelitis

- \* Irritability
- \* Disorientation
- \* Drowsiness
- \* Course tremors
- \* Paralysis

# Paralysis of Respiratory Muscles:

- \* Anxious look
- \* Inability to speak without pauses
- \* Use of alae nasi & accessory muscles
- \* Inability to cough
- \* Paradoxical abdominal movement
- \* Immobility of intercostal spaces
- \* Deltoid paralysis-Impending respiratory paralysis

# Bulbar Poliomyelitis with Respiratory Difficulties:

- \* Nasal twang
- \* Inability to swallow smoothly
- \* Accumulated pharyngeal secretions
- \* Absent effective coughing
- \* Nasal regurgitation
- \* Deviation of palate, uvula, tongue
- \* Irregular Respiration
- \* B.P changes
- \* Cardiac arrhythmias
- \* Rapid changes in body temp
- \* Vocal cord paralysis
- \* "Rope sign"




# Differential diagnoses of Acute flaccid paralysis

- \* Poliomyelitis
- \* Guillain-Barre syndrome
- \* Traumatic neuritis
- \* Transverse myelitis
- \* Neuropathies (diphtheria)
- \* Hypokalemic paralysis
- \* Botulism & tick paralysis



# Reasons Polio Can Be Eradicated:

- \* No animal reservoir
  - \* Limited persistence in the environment
  - \* No long – term carrier state
  - \* Permanent immunity following infection
  - \* Effective vaccines available
- 

# Management:

- \* Hospitalization of paralytic cases
- \* Strict Bed rest & neutral position
- \* No I/M Injection
- \* Analgesics & Sedatives
- \* Nutrition & Hydration
- \* Physiotherapy
- \* Splint & braces


# Prevention:

- \* Polio vaccine (OPV, IPV)
- \* 3 doses results in sustained & life long immunity



# **Poliomyelitis Eradication**

## **4 basic strategies**

- 1- Routine Immunization
  - 2- National Immunization days
  - 3- Acute flaccid paralysis Surveillance
  - 4-Mopping up immunization
- 



Thank You

# **AFP Case Definition**

Any patient under 15 years of age with acute, flaccid paralysis; or any in whom a clinician suspects polio

# AFP surveillance What is it ?

- \* Detect any case of AFP < 15 years of age and any case of any age in which a clinician suspects polio
- \* Collect 2 stool specimens  $\leq$  14 days of paralysis onset
- \* Perform virus isolation in a WHO-accredited laboratory
- \* Classify cases according to WHO scheme



# Why is AFP & poliovirus surveillance so critical ?

Every case represents an **outbreak!**

Must track where wild poliovirus is circulating

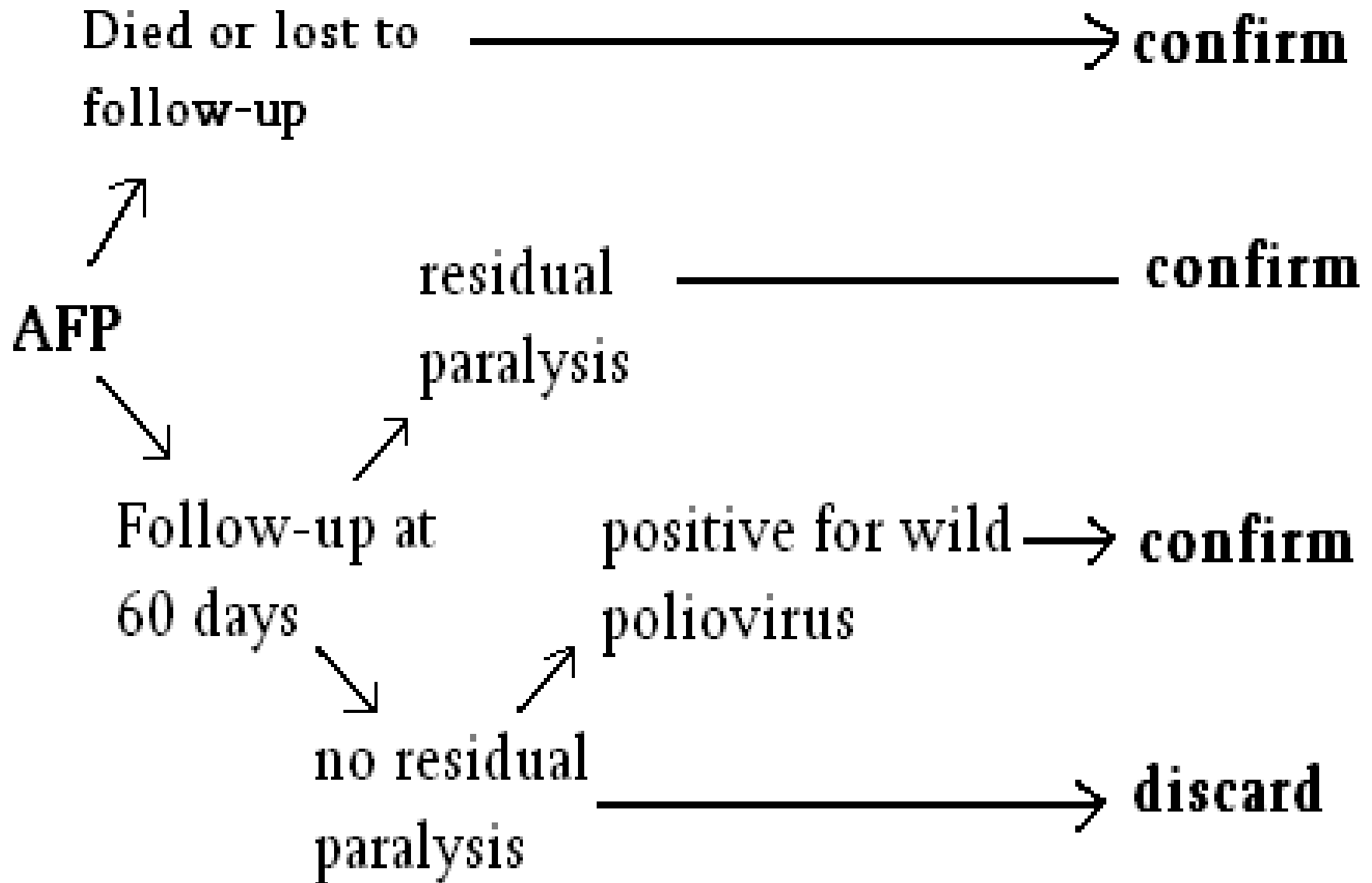
- If widespread → NIDs
- If focal ( & reliable surveillance) →

Mopping Up

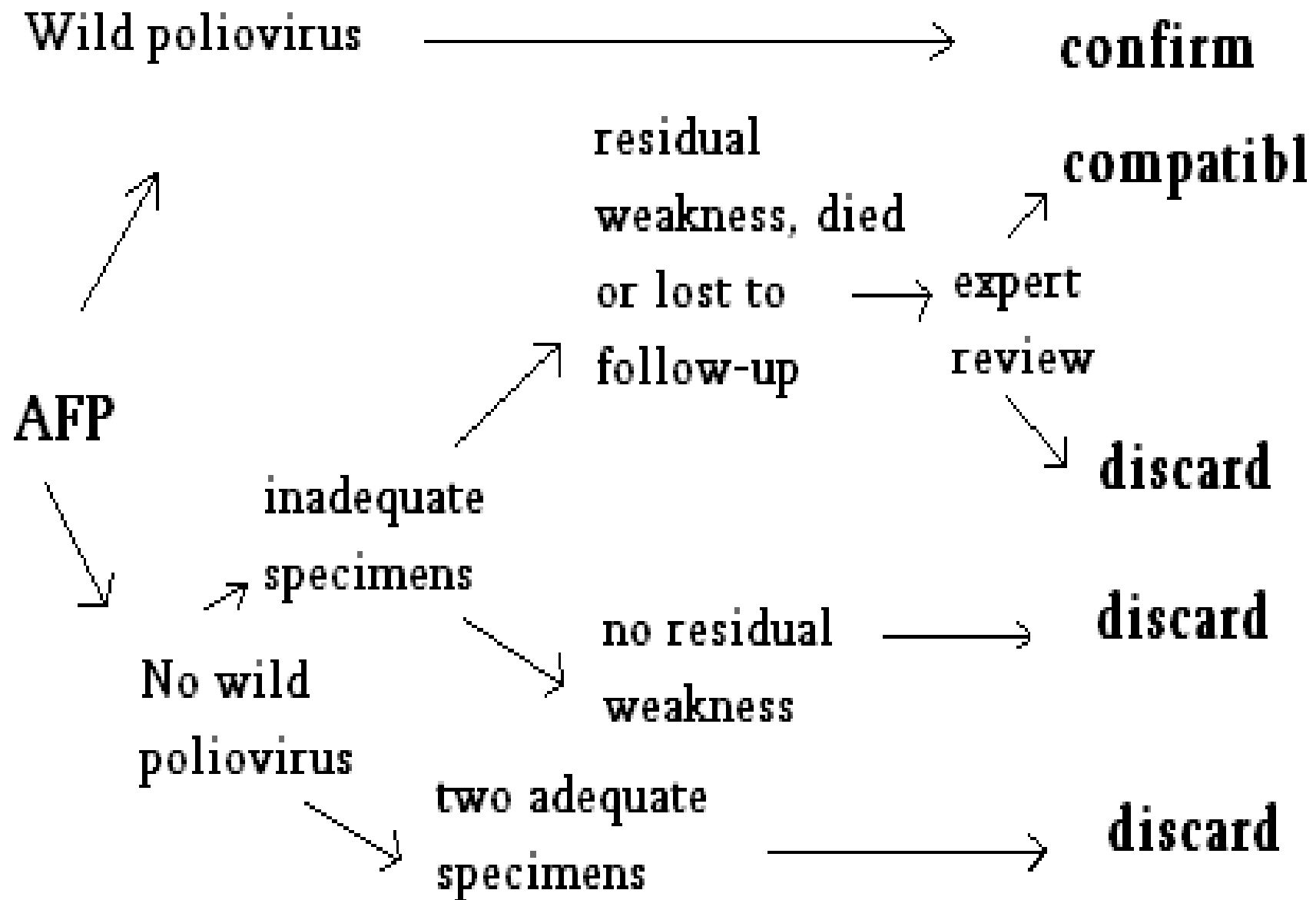
If mopping up, then must know where to mop up

Must provide evidence for certificate

# Clinical Classification of AFP Cases



# Virological Classification of AFP Cases



# The process of AFP surveillance

Onset of paralysis

↓ < 7 days of onset

Detection &  
notification

↓ < 14 days of onset < 3 days of  
being sent

Case investigation & specimen collection

Specimens  
arrive at  
national lab

< 28 days  
→

Virus isolation  
results reported

↓

↓ > 60 days of onset

Isolation sent to  
regional lab for  
intra-typic  
differentiation

Follow-up exam → Classification of case  
< 90 days of onset

←

# Surveillance Indicators:

- \* Non-Polio AFP Rate  $1/100,000 < 15$  years
- \* Detection of AFP case 7 days
- \* Notification of AFP case to DHO 24 hours
- \* Investigation of AFP case within 48 hours
- \* Adequate stool sample
- \* 60 days follow up
- \* Zero- Reporting

# How to collect stool sample:

- \* Use clean, dry & leak proof screw-top container/ if no designated stool container
- \* If possible, collect fresh stool from diaper/paper
- \* Volume should be 2 thumbanail/ 8 grams
- \* Use paper or spatula to place stool in container
- \* Side of the container not the cap should be labeled
- \* Maintain the reverse cold chain

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**Thank You**