General data

- Poliomyelitis is a wide spread enterovirosis, described in 1840.
- The etiologic agent was isolated in 1908 and cultivated on monkey kidney in 1949.
- During the time it produced epidemics with many deaths and paralytic complications.
- The discovery of the killed virus vaccine in 1955 (J.D. Salk) and of the alive attenuated virus in 1956 (A. Sabin) has opened the way to the poliomyelitis eradication.

The characteristics with epidemiological importance of the polioviruses

- the polioviruses are represented by three antigenic related types, but also with particularities; that's way the vaccine is trivalent;
- the antigenic structure, although complex, is stable, with strong immunogenic antigens, that conferees special advantages to vaccinoprevention;
- the polioviruses are environment resistant, but they can be destroyed using usual decontaminates, especially those based on chlorine;
- the polioviruses affinity for the respiratory and digestive apparatuses and for the central system explains the severe evolution of the infection in a part of the sick people.
Epidemiological process

I. Sources of pathogenic agent

The sources of polioviruses can be:

- **The sick man**, especially children that can present typical paralytic forms (1:14-40) and atypical, non-paralytic, sub-clinic, in-apparent forms; their infectiousness lasts 7-10 days from the beginning of the diseases and depends on the viruses presence in the rhino-pharingeal secretions and in the faeces;

- **The virus carrier man**:
  - *pre-infectious carrier* that spreads the virus for 4-5 days before the beginning of the disease by rhino-pharingeal secretions and faeces;
  - *healthy carrier* that spreads the virus for 1-3 week by the faeces;
  - *after ill carrier* that eliminated the virus by the faeces, for a period of days, weeks or months.

II. Modes and ways of transmission

- **The direct mode** of transmission is frequently implicated because poliomyelitis, as an enterovirus diseases is included in the group of diseases that affects especially the poor social-economical populations that haven’t got daily good hygienization. The direct mode transmission can be seen in crowd families and collectivities for the children medical-social assistance.

- **The indirect mode** intervenes in the transmission of the polioviruses that being resistant to the environmental factors action are easily vehiculated by water, food (especially milk and derivatives, vegetables), objects, hands, air, domestic flies etc.
Receptivity

- Receptivity (susceptibility) is general for the persons that haven't got specific antibodies, for the three types of the virus and protective amounts.
- Receptivity is extremely high in children without antibodies from their mother, after the passing through the infection or after vaccination.
- The post-infection and post-vaccinal immunity is long lasting but type specific. Both the children and the adults are suffering an “occult reimmunization” process by the contact with low doses of virus from the recently vaccinated children with alive attenuated virus.
- Some degrees of receptivity can be seen in some vaccinated persons that either are not responding strong enough to the vaccination or are rapidly loosing the antibodies, their amount becoming unprotective.
- In some epidemiological situations, poliomyelitis can be seen in teenagers, young adults and adults.

Manifestation forms of epidemiological process

# Under the influence of over three decades of systematic vaccination of children, poliomyelitis doesn’t have a natural evolution and the epidemiological and clinic manifestation forms are modified.

- The sporadic manifestation has become dominantly the diseases appear because of the “immune gaps”, and there are generally atypical.
- The endemic and epidemic manifestations are rarely seen situations in Africa and South-Eastern Asia. The epidemic outbreaks after 1990 in Holland and Canada have had as primary sources unvaccinated children from some religious sects.
- The vaccinal cover, that is over 50-70% also in the poorest areas, and is over 90% in many geographical areas, is obstructing the constitution of some extensive epidemiological processes and, step by step, it trends to eradication sporadicity: 0.03-0.01‰oo inhabitants, atypical cases.
Prevention

# General prevention include measures that are characteristic to the stage of the wild virus infection elimination and to poliomyelitis eradication until 2000-2005.

The epidemiological, clinic and laboratory surveillance has to assure:
- the maximum reduction of “immune gaps” by including all the children in the immunization program, with the careful recover of those with contraindications which, generally, are temporary;

- estimation of the specific immune background in correlation to the vaccination program and isolation followed by genetic analysis and the wild poliovirus strains, or the ones from alive attenuated virus vaccinations;

- epidemiological inquiries of the cases that are suspect of acute spinal-like paralytic virosis and of the peripheral motor neurone paralysis;

- avoiding “the import” of the poliovirus sources that are coming from “endemic geographical bags”;

- general hygienisation, decontamination and education, with special addressability for the risk collectivities.

# Specific prevention follows those measures that can constantly and more extend the “vaccinal covering” with 4 doses of the children until 1 year old.

- The WHO project, elaborated in 1984 and which stipulated for the vaccination with 4 doses of the children until 1 year old, in a proportion over 90% was followed by the decision of the 41% World Health Meeting in 1988.

- The incidence of poliomyelitis had declined to approximately 3500 cases/year, compared with an estimated 600,000 cases annually in the pre-vaccine era.
Control

# The poliomyelitis control is totally different from the operations realized in the past, being concentrated on the eradication program lines.

- The epidemiological inquiry has now as a major objective the detecting and neutralizing of every suspect case of poliomyelitis. A special attention is accorded to those cases of acute spinal-like paralysis and those with peripheral motor neurone paralysis.

- The isolation in specialized services, with epidemiological, viral and serologic investigations, will be followed by urgent and nominal report of the cases.