

Polio: the disease  
that affected many  
through the water  
supplies for over  
3000 ye...

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Polio is an infectious disease that has haunted the lives of many for over 3,000 years. The first record of Poliomyelitis in the human body dates back to ancient Egypt where inhabitants of the area engraved a documented version of paralytic Poliomyelitis into stone. When indoor plumbing came into use, in the 20th century, and sewage systems began to develop into complicated public works where waste was dumped into towns' water supplies; that is when Poliomyelitis began to spread. The disease causing organism, Poliomyelitis, spread throughout the United States and was a threat to the lives of the country's citizens for decades. It was finally entirely eradicated in the later half of the century, but a childhood vaccine is still recommended to be given in order to prevent the RNA based virus. Efforts have been made to eradicate the disease world wide, but doctors have not completely conquered the virus.

Poliomyelitis, a virus that's apart of the Picornavirus group, takes an icosahedral shape. That is, a geometric figure consisting of 20 triangular sides. The viral capsid is the actual structure that forms the isocahedral shape. The capsid is the protein coat that surrounds the nucleic acid of the virus. Poliomyelitis is a non-enveloped virus, meaning that it lacks a membrane-like structure on the exterior of its cell.

The life cycle of Polio is a lytic type of life style. The lytic life cycle is a five-step process where a virus invades a host cell, in this case the Poliovirus receptor (PVR). The procedure begins when the virus attaches itself to the host cell. The virus, using its tail fibers, attaches itself to a receptor site, a familiar place for a virus to attach itself. In the second stage of the lytic cycle, the viral DNA is released into the cell after an entrance is created. No

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actual hole is made in the cells surface; however, an enzyme, having been released from the virus, weakens a specific spot so that the viral DNA can be forced through and into the cell. After changing the cell's makeup so that proteins are synthesized differently, a translation process results in viral proteins and enzymes, as well as the replication of the viral DNA from the bacteria that is hosting the virus. Once the new viruses have been successfully assembled they are released through a process known as lysis. Lysis is a phase of the lytic cycle in which a newly created enzyme causes the disintegration of the cell.

Poliomyelitis enters the body through the mouth. Generally it is a case where the infected patient had come in contact with the disease-causing organism and passed the virus from their hands into their mouth by any number of ways. The primary multiplication of the Poliovirus cells occurs in the lymphoid tissues of the oropharynx (the back of the mouth) and the intestinal tract. Minor cases may only go as far as a slight fever, malaise, headache, sore throat, and vomiting. The symptoms follow about 3-5 days after being infected by the virus. The more rare and more severe cases result in fever, severe headache, stiff neck and back, and deep muscle pain. Hyperesthesias, an increased amount of sensitivity to certain stimuli by a specific type of sense, as well as paresthesias, a burning, prickling, itching, or tingling skin type of sensation can occur as a result from Polio. Paralysis is the most dangerous effect that can be brought upon an infected person. One in 200 people infected with Poliomyelitis are affected by severe paralysis; and in about 5-10% of the instances of Polio, the virus causes paralysis in the breathing muscles and the patient dies.

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Unfortunately enough there is no cure for a Polio patient. The best that doctors can do is one of the following. A person can be given a vaccine in order that they do not get the infectious disease. The vaccine is a modified version of Poliomyelitis that cannot affect the body. The immune system learns to fight off the virus and remembers how to deal with Polio if the patient is actually ever infected by the disease. If the vaccinated person is ever infected by Polio, their immune system “ recalls” the proper way to deal with the virus, and it simply rids its body from the danger. Treatment is very basic. Again, the best way to treat Polio is to prevent it before hand; however, if a patient has a non-paralytic for of Poliomyelitis then bed rest is the best treatment for the virus. Persons infected by more severe forms of Polio, involving paralysis, must undergo physical therapy. One fourth of the persons affected by a paralytic case of Polio have severe permanent physical disabilities. Another fourth of the persons affected by a paralytic case of Polio fortunately have only minor physical disabilities. The remaining half recover without any problems.