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## West Nile Virus

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# West Nile Virus

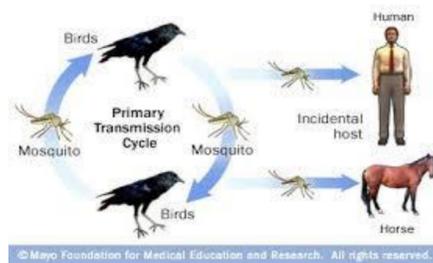
By: Sarene Smith and Preston Still



## Background

**Microorganism:** West Nile is a virus which means that West Nile is not a living organism and the only goal the virus has is to reproduce. The virus does this by taking over a host cell, attaching itself to the host cell and takes the cellular machinery needed to replicate itself. Once the virus is done and leaves, the host cell can also be used to infect other cells; therefore spreading the virus throughout the organism. (Campbell, Marfin, Lanciotti & Gubler, 2002).

Pictured to the right: A chart of the transmission cycle.



**Importance:** The West Nile virus is an infectious disease that is mainly found in birds, but can be transmitted to other mammals such as horses, by mosquitoes. There is a great amount of importance for people to understand what this disease is because the virus affects much of the bird population and humans are able to get the virus too. Not many people die once they get West Nile, but the virus is fatal to most birds. (Mayo Clinic, 2012).



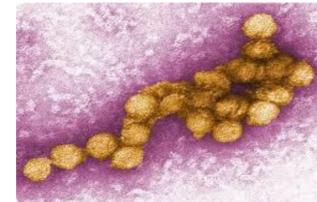
Pictured above: *Aedes aegypti* mosquito.

**Historical:** The largest outbreaks of WNV have been in Greece, Israel, Romania, Russia, and the USA. The outbreak of WNV in America was from 1999-2010 and since then has spread more widely across the world. This disease is seen as more of a threat to birds and horses, than the virus is to humans. Only 20% of the people infected with WNV show symptoms and less than 1% die from the virus. (CDC, 2013; Cornell University, 2014).

## Infection/Disease

**Immune Response:** The symptoms of West Nile virus in humans have different stages. Out of all the people infected with West Nile, 80% do not get any symptoms at all. About 20% of the people infected develop West Nile fever, a mild infection. The symptoms of this stage include, fever, headache, body aches, fatigue and back pain. Less than 1% of people with WNV end up getting a serious neurological infection. Symptoms include, meningitis, acute flaccid paralysis, high fever, severe headache, stiff neck, confusion, stupor, muscle jerking, lack of coordination, convulsions, pain, and sudden muscle weakening. The immune response to this virus is a rising of body temperature to help kill off the virus and increase the flow of white blood cells, which is why someone would get a fever. Another immune response to WNV would be inflammation of tissues resulting from the body sending out chemicals that attract white blood cells to eat and help destroy the virus. (Mayo Clinic, 2012; WHO, 2011; Solomon, Beasley & Mallewa, 2003).

Pictured to the right: West Nile virus.



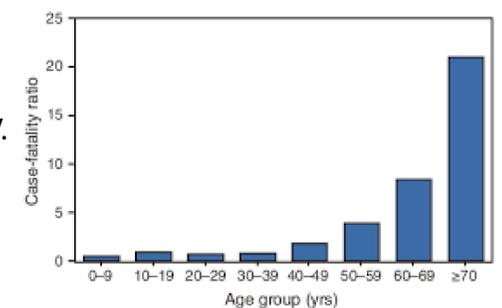
**Progression:** If someone only has the mild version of WNV then the symptoms usually go away on their own. If someone is experiencing the serious symptoms, then that person should see a doctor and possibly be hospitalized. The only treatment options available for the most common form of WNV is resting and taking things easy until the symptoms go away. (Mayo Clinic, 2012).

**Prognosis:** People rarely die from contracting West Nile and the symptoms usually are not too serious. This virus is widely spread but most of the time people do not even know they have the virus. To prevent a reoccurrence or to try not to obtain the virus, simply do your best to reduce your exposure to mosquitoes. (CDC, 2013).

## Treatment

**Options:** There is no special treatment for the common case of West Nile. The only thing that can be done is to rest and wait for the symptoms to pass. If someone develops severe headaches or pains, then that person should take pain medication. Someone with WNV would need to go to a hospital if they developed a serious case that had led to meningitis or acute flaccid paralysis. Treatments for these diseases are therapy, antibiotics, and fluids to stay hydrated. (WebMD, 2013; WHO, 2011).

Pictured to the right: a chart showing the fatal cases of WNV.



**Mechanism:** Therapy would help build up and bring back muscle use. Antibiotics help bring down brain swelling and contribute to preventing partial paralysis. Drinking lots of fluids would help flush out your system of all the unwanted germs. There is not much else that could be done after these options besides resting. (Kramer & Shi, 2007; CDC, 2013).

**Emerging:** There are not any new treatments for West Nile but scientists have come up with something called the PanBio test. The PanBio test works by detecting the levels of a particular antibody, IgM, to the disease in the patient's serum. IgM can be detected within the first few days of illness. The PanBio test is a valuable for the diagnosis of WNV, but since there are other closely related diseases, there would need to be a follow up test to confirm. (Mayo Clinic, 2012; WebMD, 2013).