Franklin Delano Roosevelt and Polio

Stephanie & Natalie
What is polio?

- Poliomyelitis
- Viral disease contracted through feces or bodily fluids
- Affects the spinal cord and may cause weakness or paralysis
- Most common in places with poor hygiene
- Spreads very easily
History of the Poliomyelitis Virus
History of Polio

- Polio was one of the most feared diseases in the world during the 20th century
- Introduction of the vaccine brought the disease under control
- First known Polio outbreak in 1894 in Vermont
- First Polio outbreak in New York City in 1916
History of Polio

- Polio primarily occurred in July, August, and September
- Kids were the ones who contracted it for the most part
- Affected whole communities
- People were quarantined after contracting the disease
Pathophysiology, Diagnosis & More
Scientifically, what is polio?

- Disease of the anterior horn neurons and spinal cord and brainstem caused by the poliovirus
- Three different strains of the virus
- All three are extremely virulent
- Polio *does not mean* paralysis
Pathophysiology

- small ribonucleic acid RNA viruses of the *enterobirus* group of the *pocornavirus* family
- protein capsid without a lipid envelope
- infect the human intestinal tract through the fecal-oral route
- colonize the oropharynx and intestine and take over cell function
Pathophysiology

- virus secreted into saliva and feces
- drains into cervical and mesenteric lymph nodes and then into bloodstream
- occasionally, virus enters the nervous system and takes over cells
  - causes paralysis
  - rare
Poliovirus Type 1 Mahoney

X-ray Structure determination:
J.M. Hogle, M. Chow, D.J. Filman (1985)

Three-dimensional Structure of Poliovirus at 2.9 Angstroms Resolution
Science, 229 1358

(PDB ENTRY: 2PLV)

Radial Depth Cue Rendering with grasp (A. Nicholls) on Silicon Graphics:
Causes

- Transmitted through fecal matter
- More prominent in areas with limited access to fresh water
- “The virus that causes polio is so contagious that anyone living with an infected person will likely become infected themselves”
- Most susceptible people are those with weak immune systems
- Increase your risk by: traveling to an area that has had a polio outbreak, taking care or living with someone who has polio, handling it in a lab, having your tonsils removed, extreme stress
Types of Polio

- **Sub-clinical**
  - do not include neurological symptoms

- **Non-paralytic**
  - include neurological symptoms

- **Paralytic**
  - include neurological symptoms and temporary or permanent paralysis of limbs
  - three types: spinal, bulbar, bulbospinal
Symptoms

- Sub-clinical polio:
  - headache
  - sore, red throat
  - slight fever
  - vomiting
  - general discomfort
Symptoms

- Non-Paralytic polio: all of the above, plus...
  - fatigue
  - abnormal reflexes
  - problems swallowing or breathing
  - muscle spasms/tenderness
  - back, neck, arm, leg stiffness
Symptoms

- Paralytic: all of the above, plus...
  - loss of reflexes
  - severe spasms
  - loose and floppy limbs -- due to the weakness of the spine
  - sudden paralysis
  - deformed limbs
Diagnosis

- Use symptoms to help determine polio as an option
- Definitive diagnosis: take sample of patient’s throat secretions, stool, cerebrospinal fluid
  - Samples then tested for poliovirus or a brain infection called aseptic meningitis
Treatment

- No cure but can ease symptoms by resting, painkillers, antibiotics, drugs, and more
- Therapies include:
  - physical therapy
  - occupational therapy
  - speech therapy
  - recreational therapy
Prevention

- **Vaccinations**
  - enhanced potency IPV vaccine
  - received four times

- **Decrease risk of polio**
  - Adults in the US are not at high risk
  - Avoid traveling to places that have had a recent outbreak
  - Avoid contaminated and unclean water
FDR’s Experience with Poliomyelitis
FDR & Polio

- FDR contracted Polio in 1921
  - He was 39 years old at the time
- He got Polio at Campobello
- He fell off his yacht into the cold water and felt “paralyzed”
  - Became very tired
  - Got a high fever
  - Three days later, lost all strength in his legs
FDR & Polio

- A few doctors misdiagnosed him
- Dr. Robert Lovett told him that it was Polio
- He left politics in 1921
  - Returned to New York City
  - Was hoping to make a full recovery
  - That proved to be impossible
- Worked towards getting back the strength in his legs
FDR & Polio

- In 1922 he got leg braces that allowed him to walk with assistance
- He was told that Warm Springs in Georgia would help him recover
  - Went in 1924, and continued to go
  - Believed it really helped him
- FDR bought Warm Springs in 1926
  - Put his friend Basil O’Connor in charge of it
FDR & Polio

- FDR returned to political life in 1924
  - He supported Al Smith in his run for Governor of New York State
- He campaigned for governor in 1928
- He made an incredibly successful return to political life
FDR & Polio

- FDR did not want to be seen as weak
- Hated to use a wheelchair in public but used one in private
- Was not completely comfortable with his health situation as President
- Asked press not to take photos of him in weak positions.
Sources

http://www.healthline.com/health/poliomyelitis#Causes
http://www.cdc.gov/vaccines/pubs/pinkbook/polio.html
http://www.polioeradication.org/Polioandprevention/Historyofpolio.aspx
http://amhistory.si.edu/polio/americanepi/communities.htm
http://amhistory.si.edu/polio/howpolio/fdr.htm
http://poliotoday.org/?page_id=13
http://www.fdrlibrary.marist.edu/aboutfdr/polio.html
http://rooseveltinstitute.org/policy-and-ideasroosevelt-historyfdr/polio-strikes