Hepatitis B Then and Now
Immunization Summit 2016

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Objectives

• Hepatitis B Virus (HBV) Overview
• The History of HBV
• HBV and West Virginia
  ▪ Immunization Recommendations
  ▪ Immunization Policy and Law
• HBV Prevention and Surveillance in West Virginia
Hepatitis B Overview

Hepatitis B in the United States (U.S.)
• 46k new infections each year
• 1.4 million with chronic HBV

Hepatitis B Worldwide
• 350 million infected
• >500k die each year of HBV complications

Hepatitis B in West Virginia
• Highest rate of HBV in the U.S.
• 14.7/100,000 population
Hepatitis B Overview

- Hepatitis B Infection
  - Acute
  - Chronic
- Transmission
- Incubation period
- Risk Factors
Hepatitis B Overview

Symptoms:
• Abdominal pain
• Dark urine
• Nausea and vomiting
• Weakness and fatigue
• Loss of appetite
• Joint pain
• Yellowing of the skin and eyes (jaundice)
Hippocrates (400 B.C.)
- Epidemic Jaundice
- Father of modern medicine
- Infectious nature suggested


Serum hepatitis (1883)

- Outbreaks following smallpox vaccination in Germany
- 191 of the vaccinated jaundiced
- Employees who received different batches were healthy

The History of Hepatitis B

20th Century Viral Hepatitis

• Largely descriptive, only the causes of jaundice identified and hypothesis were not examined or tested
• Hypodermic needles introduced, used, and reused

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Outbreaks Hypodermic needles
Outbreaks during World War II

- >50,000 cases of jaundice were recorded among American troops
The History of Hepatitis B

Willowbrook Hepatitis Experiments

- Some patients inoculated with protective antibodies and some with viral hepatitis to monitor both studies
- Proved the transmissibility from person to person

Dr. Baruch S. Blumberg (1925-2011)

- Discovered the virus
- Australia Antigen

Blumberg Discovers HBsAg
Maurice Hilleman

• First to inactivate the HBV

Blood derived HBV vaccine

• Vaccinate by injecting with HBV surface protein
• Blood from gay men and Intravenous drug users (IDU) to collect “surface protein”
• Did the samples contain HIV?
• Confident the vaccine was safe
• Vaccine was approved for use in 1981
The History of Hepatitis B

Pablo DT Valenzuela

- Replicated the HBV surface antigen in yeast
- Invented the world’s first recombinant vaccine

Recombinant HBV vaccine

- *Saccharomyces cerevisiae*, 1883
- Yeast produces the noninfectious surface protein
- Removes the risk of HBV DNA exposure

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Reports of Acute Hepatitis B – United States 1980-2012

http://www.cdc.gov/hepatitis/statistics/incidencearchive.htm
Hepatitis B Policy in West Virginia

Dr. Loretta Haddy PhD, MS
Dr. Mary Skinner

• West Virginia Department of Health and Human Resources Hepatitis B Clinical Control Services Policy 3220 written in 1986
Hepatitis B Immunization Recommendations

Advisory Committee on Immunization Practices

• MMWR: Universal Infant Vaccination, 1991
• All Infants should be vaccinated at birth

Vaccinate

• Provides immunity against the HBV

Effectiveness

• Full immune response in 85-90% of individuals
Hepatitis B Laws in West Virginia

Nationally Notifiable Disease

• Hepatitis B becomes reportable in West Virginia (1998)

West Virginia Communicable Disease Rule (64CSR7)

• Report Hepatitis B **within 24 hours** to local health department in the county of the patient’s residence

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Hepatitis B Surveillance in West Virginia

Acute Hepatitis B - West Virginia
Incidence* of Acute Hepatitis B by Year of Report-
West Virginia and U.S., 2006-2009 (n=328)
Viral Hepatitis Prevention Coordinator (2004)
• Provides hepatitis information to the public on hepatitis prevention, testing, linkage to care

Hepatitis B Epidemiologist (2004)
• Conduct surveillance on the incidence of HBV infection in West Virginia

Perinatal Hepatitis B Case Management (2001)
• Ensure at risk infants receive HBV vaccination


State-level funded positions
School Entry Requirement (2008)
• A child may not be admitted or received in any of the schools of the state or a state-regulated child care center until he or she has been appropriately immunized. WV Code § 16-3-4(c)

Vaccination Exemption
• Opting out of recommended and mandated vaccinations for medical, religious or philosophical reasons.

West Virginia has never allowed non-medical vaccine exemptions for school entry.
Immunization Action Coalition launches “Give Birth to the End of Hep B” (2013)

- Protect Newborns, administer HBV vaccine at birth
- Increased risk of chronic HBV, cirrhosis and liver cancer if infected
Hepatitis B Surveillance in West Virginia

Acute Hepatitis B - West Virginia
Incidence of Acute Hepatitis B by Year of Report - West Virginia and U.S., 2006-2013 (n=851)

West Virginia has ranked #1 in the incidence of Acute Hepatitis B in the US from 2007 to 2014
Hepatitis B Pilot Project

• Decrease the incidence of new infections of HBV by vaccinating high-risk populations (2013)

17 participating vaccination centers

• Implemented standing orders
• Provided hepatitis B education
• Vaccinated all adults who reported risk for HBV infection
President Obama visits West Virginia in response to increased drug abuse and drug overdoses (2015)

Harm Reduction - Syringe Access in West Virginia

- To combat viral hepatitis B and C infection among injection drug users.
- Cabell, Kanawha, and Ohio County

Hepatitis B rates rising

- Increased drug abuse
- High numbers of overdose deaths

www.healthyamericans.org
Hepatitis B Surveillance in West Virginia

Acute Hepatitis B - West Virginia, 2015
Incidence* of Acute Hepatitis B by Year of Report - West Virginia and U.S., 2006-2015 (n=1309)

*2015 West Virginia data is provisional as of 3/22/2016
West Virginia has ranked #1 in the incidence of Acute Hepatitis B in the US from 2007 to 2014
Hepatitis B Surveillance in West Virginia

Acute Hepatitis B - West Virginia, 2015
Risk Factors* Reported Among Acute Hepatitis B Cases (n=272)

Percentage of Risk Factors Reported

Age

Injection Drug Use
Used Street Drugs (Non-IV)
Incarcerated >6 months

*Patients can report more than one risk factor
Hepatitis B Virus
• A serious liver infection that can cause short term or lifelong infection

HBV History
• The infectious nature of the disease has been noted since 400 B.C.
• Several breakthroughs, and scientific discoveries have led to the HBV vaccine that we still use today

West Virginia
• There are epidemic amounts of HBV infection in West Virginia
• IDU has directly affected the high rates of HBV infection in West Virginia
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