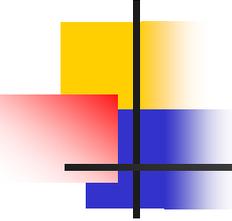


---

# Hepatitis B Virus

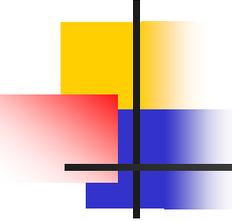
Elizabeth Draper, RN  
Nurse Consultant  
NC Immunization Branch  
NC Division of Public Health



# Learning Objectives

---

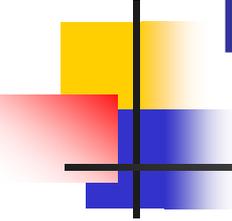
- Recognize modes of transmission
- Apply knowledge of Hepatitis B serologies to determine case definition
- Locate DPH web-based guidance for case investigation
- Apply the NC EDSS Algorithms when reporting HBV cases



# Hepatitis B Statistics

---

- 1980's - 26,000 cases year
- 2007 – 4,519 reported cases
  - CDC estimates 43,000
- 800,000 – 1.4 million chronic carriers
- 3,000 chronic liver disease deaths annually



# National/State Strategies

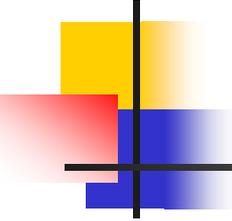
---

- 1990 - Perinatal Hepatitis B Prevention Program
- 1994 - Universal state-wide children's immunization program
- 2001 - Initiatives to vaccinate at-risk adults
- 2006 - Sixth Grade Hepatitis B Immunization Initiative

# Modes of Transmission

- HBV is a bloodborne pathogen.
  - Percutaneous
  - Perinatal
  - Sexual
  - Mucous membrane

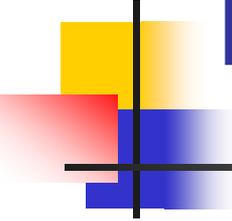




# Clinical Features

---

- Incubation
- Symptoms
- Often asymptomatic
- HBsAg positive



# Hepatitis B Lab Tests

---

HBsAg

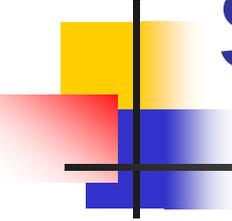
Anti-HBs

Anti-HBc

IgM anti-HBc

HBeAg

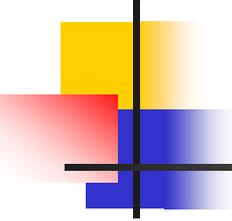
HBV DNA



# Surveillance and Reporting

---

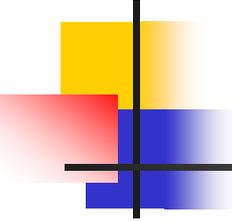
- 10A NCAC 41A .0101
  - Acute case reporting
  - Chronic carrier case reporting
  - Laboratory reporting
- NC EDSS – NC Electronic Disease Surveillance System



# Disease Specific Guidance

---

- Rules for Investigation and Reporting in NC EDSS
- ELR Generated Event Decision Tree
- Paper Copy Lab Decision Tree
- Hepatitis B Pregnancy Tracking
- Hepatitis B Perinatal Tracking
- Hepatitis B Perinatal Contact Entry
- Hepatitis B Household Contacts



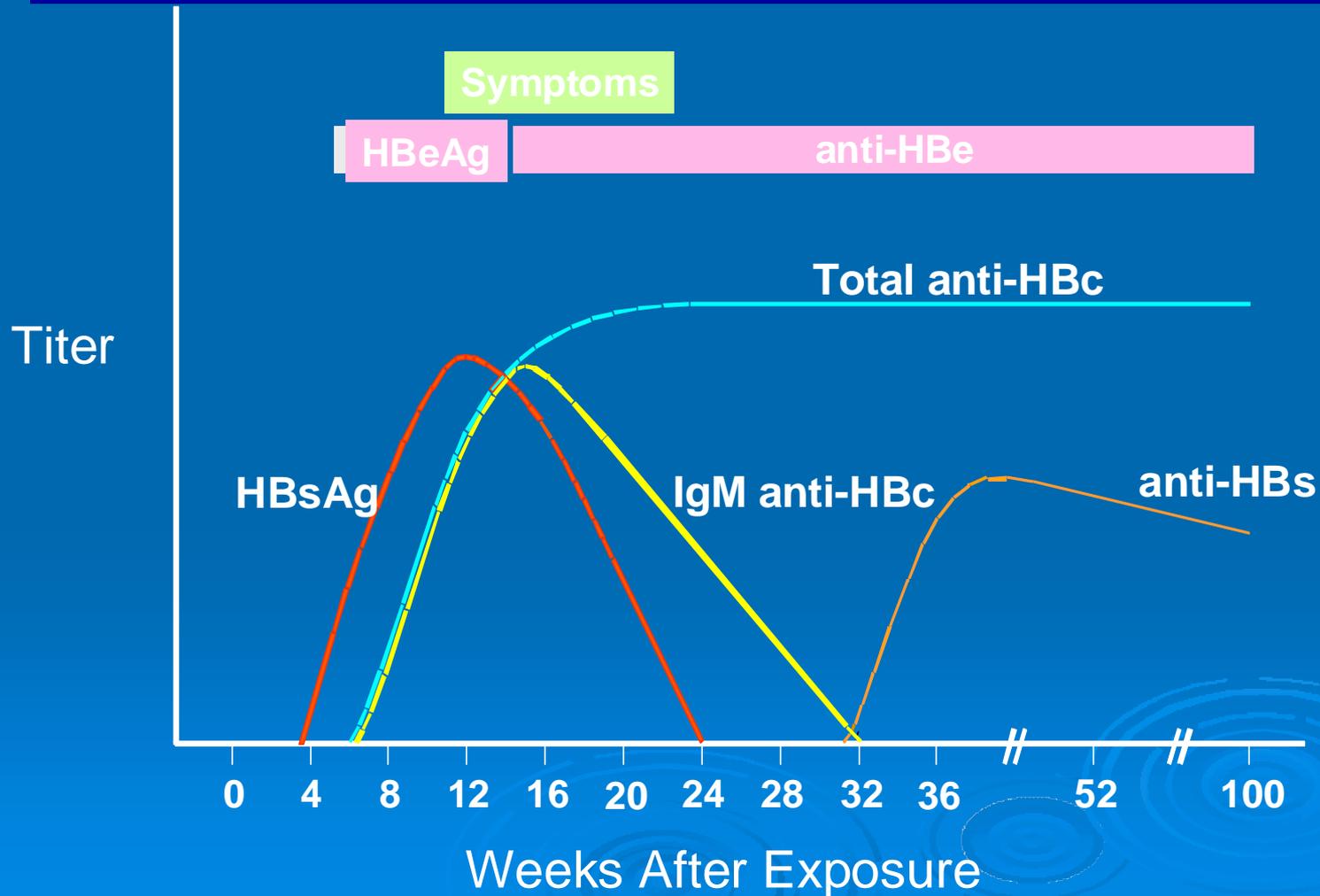
# Acute Hepatitis B

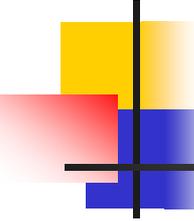
---

- An acute illness with
  - Discrete onset of symptoms
  - Jaundice or elevated serum aminotransferase levels (ALT > 200 IU/L)
- Laboratory criteria for diagnosis
  - IgM anti-HBc positive or HBsAg positive
  - IgM anti-HAV negative (if done)

# Acute Hepatitis B Virus Infection with Recovery

## Typical Serologic Course



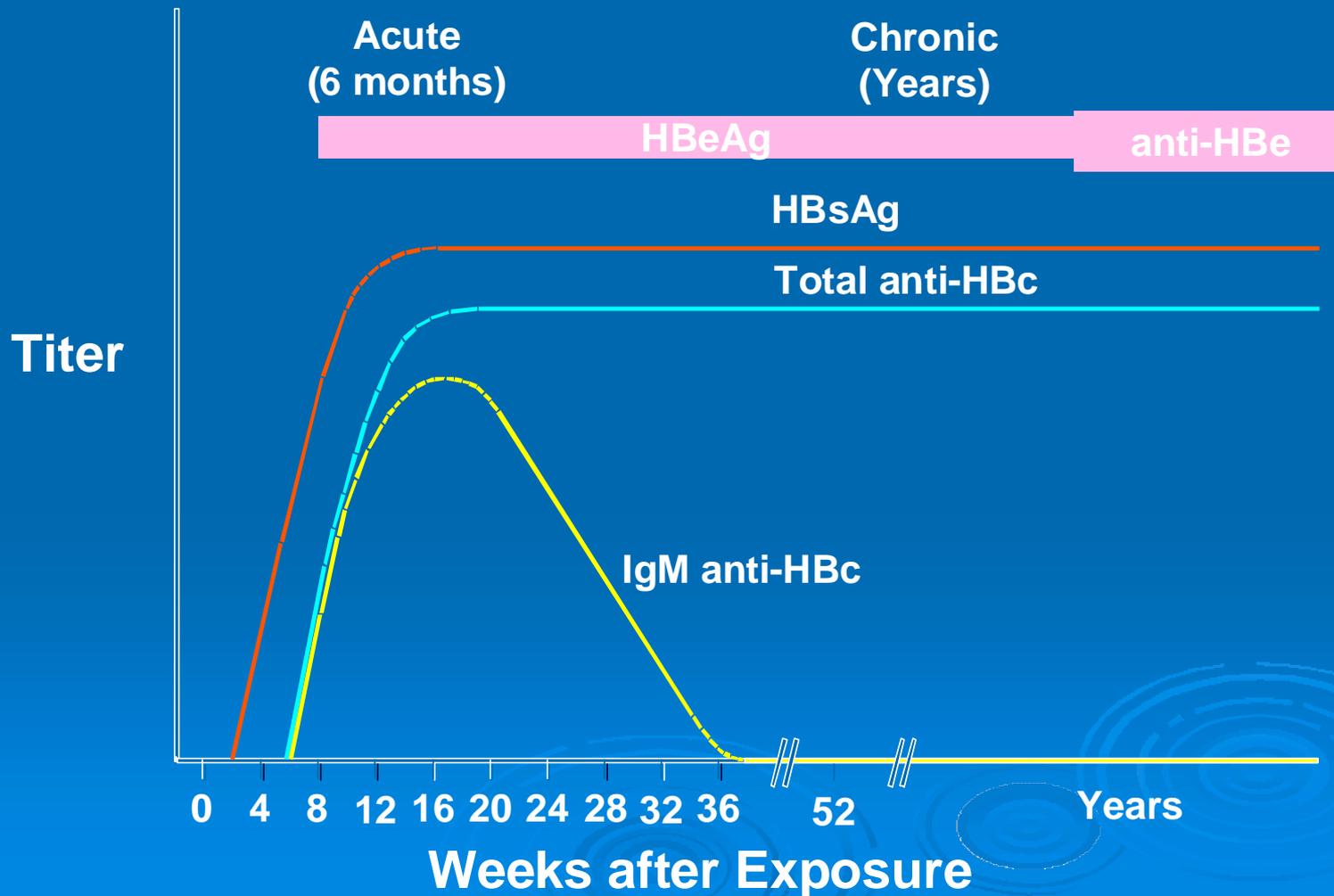


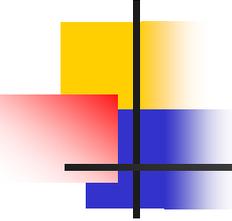
# Chronic Hepatitis B

---

- No symptoms/discrete symptom onset
- Probable Carrier:
  - Single positive HBsAg or HBeAg or HBV DNA test when no IgM anti-HBc results available
- Confirmed Carrier:
  - HBsAg or HBV DNA or HBeAg positive two times at least 6 months apart, **or**
  - IgM anti-HBc negative **and** a positive test for HBsAg or HBeAg or HBV DNA

# Progression to Chronic HBV Infection Typical Serologic Course

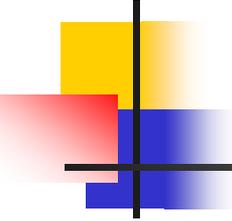




# Follow-up of Acute and Chronic Hepatitis B

---

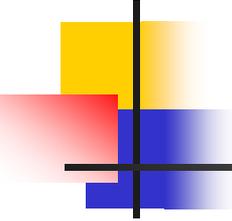
- Hepatitis B testing
- Control measures
- Prophylaxis:
  - Recommend HBIG, if indicated
  - State-supplied Hepatitis B vaccine
- Refer to private physician



# Control Measures

---

- 10A NCAC 41A .0203
- Section (a):
  - Infected person
- Section (b):
  - Exposed person
  - Infants of HBsAg positive and HBsAg unknown status mothers

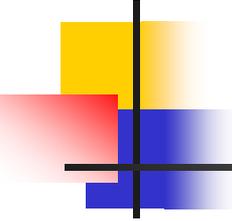


# Risk of Chronic Infection

---

Inversely related to age at time of infection-

- > 90% of infected adults resolve infection
- > 90% of acutely infected infants will become chronic carriers

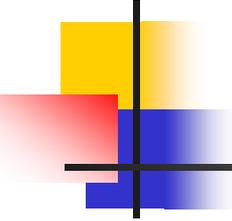


# Hepatitis B

## Perinately Acquired

---

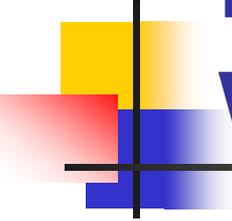
- HBsAg +
- Asymptomatic to fulminant
- Infant aged > 1 – 24 months born in U.S. or U.S. Territories to HBsAg positive mother



# Prevention Strategies

---

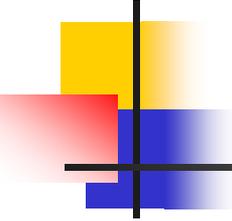
- Test pregnant women for HBsAg
- PEP and follow-up for infants born to HBsAg+ and HBsAg unknown status mothers
- Vaccinate newborns prior to hospital discharge



# HBsAg Positive Pregnant Women

---

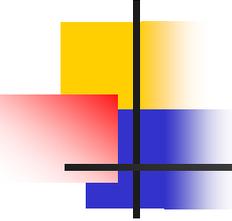
- Report to health department
- Refer for counseling, medical evaluation and possible treatment
- Inform of need for HBV PEP for newborn



# Post-Exposure Prophylaxis (PEP)

---

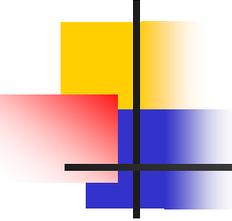
- Appropriate PEP:
  - HBIG
  - Hepatitis B vaccine
- Timely PEP:
  - within 12 hours of birth



# Follow-up of Infants of HBsAg Positive Mothers

---

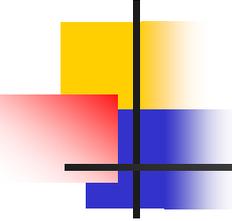
- HBIG and Hepatitis B birth dose
- Completion of vaccine series on recommended schedule
- Post-vaccination testing
- Reporting if HBsAg positive



# HBsAg-Negative Pregnant Women

---

- Assess for risk of infection
- Vaccinate if at-risk
- Counsel about HBV prevention
- Inform of the importance of newborn Hepatitis B vaccination

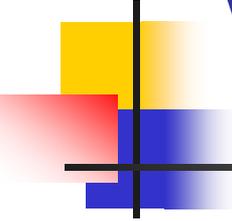


# Missed Opportunities

---

HBV vaccine should be offered at:

- STD clinics
- Drug abuse treatment sites
- HIV/AIDS testing sites
- Correctional facilities



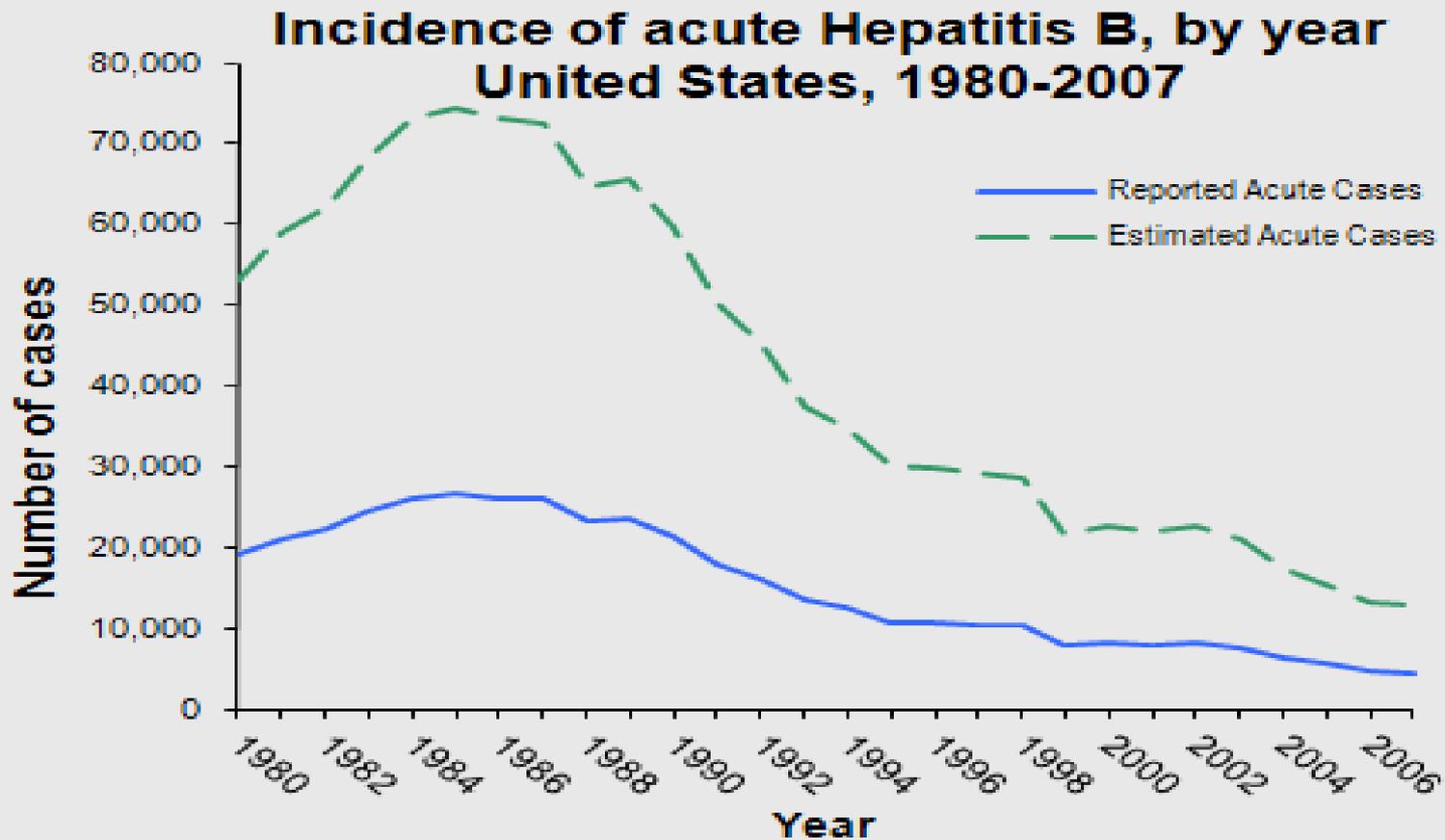
# Vaccine Non-Response

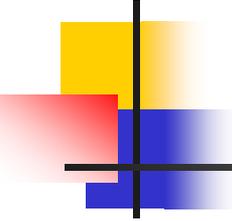
---

Post vaccination testing is advised for:

- Infants born to HBsAg+ mothers
- Dialysis patients/staff
- Persons with HIV
- Persons at occupational risk
- Sexual or needle-sharing partners of HBV cases

# Efforts Are Working

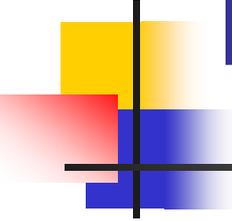




# References

---

- ACIP Recommendations: A Comprehensive Immunization Strategy to Eliminate Transmission of Hepatitis B Virus Infection in the United States:
  - Part I: Immunization of Infants, Children and Adolescents, MMWR, December 23, 2005, Vol. 54 (RR16).
  - Part II: Immunization of Adults, MMWR, December 8, 2006, Vol. 55 (RR16).
- Recommendations for Preventing Transmission of Infections Among Chronic Hemodialysis Patients, MMWR, April 27, 2001, Vol. 50 (RR-5).
- Updated U.S. Public Health Service Guidelines for the Management of Occupational Exposures to HBV, HCV, and HIV and Recommendations for Postexposure Prophylaxis, MMWR, June 29, 2001, Vol.50 (RR11).
- Recommendations for Identification and Public Health Management of Persons With Chronic Hepatitis B Virus Infection, MMWR, September 19, 2008, Vol. 57 (RR-8).



# Resources

---

- NC Communicable Disease Manual  
<http://www.epi.state.nc.us/epi/gcdc/manual/toc.html>
- CDC Hepatitis B website  
[www.cdc.gov/ncidod/diseases/hepatitis/b/](http://www.cdc.gov/ncidod/diseases/hepatitis/b/)
- NC Communicable Disease Branch  
[www.epi.state.nc.us/epi/gcdc](http://www.epi.state.nc.us/epi/gcdc)
- Immunization Action Coalition  
[www.immunize.org](http://www.immunize.org)
- NC Immunization website  
[www.immunizenc.org](http://www.immunizenc.org)