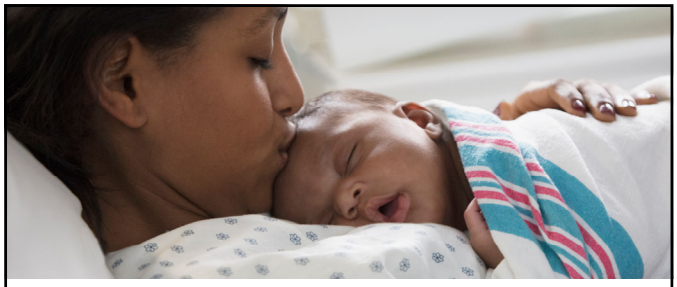


Perinatal Hepatitis B Prevention

November 2025 Lunch & Learn

Danni Pinnick, MPH - Immunization Surveillance Coordinator

NORTH Dakota Be Legendary. | Health & Human Services

1

Hepatitis

Inflammation of the liver
- Viral or bacterial infection
- Damage/trauma
- Tumor
- Toxic exposure (high amounts of alcohol or other chemicals, fungal toxins, etc.)
- Effects of another disease or condition

Liver function tests (LFTs)
- Enzymes: ALT, AST, ALP
- Waste product: Bilirubin
- Protein: Albumin
- Prothrombin Time (PT)

Signs and Symptoms
- Jaundice
- Itching
- Dark urine
- Light stool
- Fatigue
- Abdominal pain
- Nausea/vomiting

Viral hepatitis (A-E)
- Serology
  - Surface antigen: HbSAg(+)
  - Core antigen: HbC(+)
  - Surface antibody: anti-HBs(-)

2

Viral Hepatitis

Type	Spread	Vaccine	Chronic or acute	Epidemiology	Treatment
A	Fecal/oral, foodborne, water, sexual	Yes	Acute	Sporadic in US, usually travel-associated. Sometimes caused by contaminated food	Supportive
B	Bloodborne, vertical (mother to child), sexual, IV drug use	Yes	Acute or Chronic	Increasingly less common in the U.S., still prevalent globally	GI treatment, antivirals
C	Bloodborne, IV drug use, sexual	No	Usually chronic unless cured	Common in the U.S.	Antivirals
D	Bloodborne	Yes*	Actue or Chronic	Uncommon in the U.S.	GI treatment, antivirals
E	Fecal/oral, foodborne	No	Acute	Uncommon in the U.S.	Supportive

*Individuals must be infected with Hepatitis B to become infected by Hepatitis D virus

3

Hepatitis B

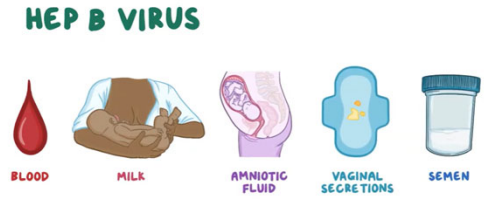
Mother-to-child transmission is the most common way to contract Hepatitis B

- A child born to a HBV+ mom has a 95% chance of contracting disease, UNLESS they are given HBV vaccine and/or HBIG
- If a child contracts HBV from their mother perinatally, or from another source while an infant, they have a 90% chance of developing chronic hepatitis B.
- Birth dose vaccination alone reduces this chance to under 10%
- Ig administration alone reduces this chance to under 30%
- Combined HBV vaccine and HBIG administration reduces this to almost zero

Only 13% of all people living with chronic hepatitis B infection know of their infection status. Only 3% of people living with HBV are receiving treatment.

4

How is hepatitis B spread?



5

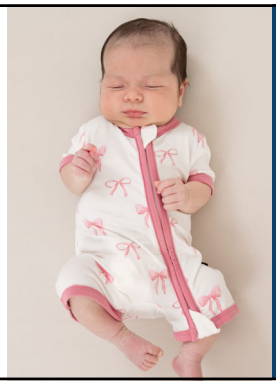
No one without Hep B immunity is zero risk

Hepatitis B vaccination is low risk. Hepatitis B infection is high risk.

6

Hepatitis B Adverse Events Summary - WHO

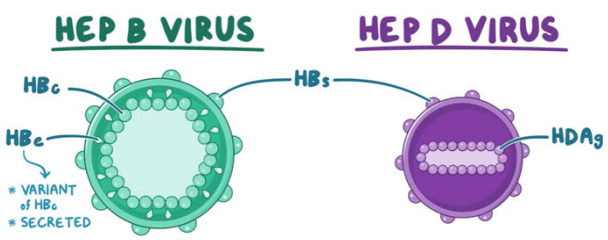
- Common events
  - Pain
  - Erythema
  - Swelling
  - Fever
  - Headache
- Very rare events
  - Anaphylaxis



Source: WHO, Global Manual on Surveillance of Adverse Events Following Immunization

7

7



8

8

Interpreting Hepatitis B Blood Test Results

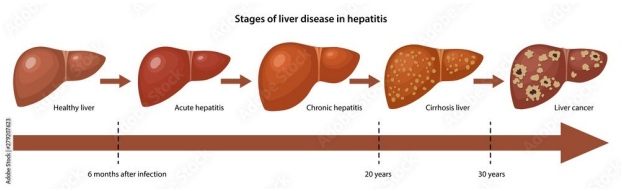
Interpretation & Action Needed	HBsAg Hepatitis B Surface Antigen	HBsAb (anti-HBs) Hepatitis B Surface Antibody	HBcAb (anti-HBc) Hepatitis B Core Antibody
Not Immune - Not Protected Has not been infected, but still at risk for possible hep B infection. Vaccine is needed.	–	–	–
***Immune Controlled - Protected** Surface antibodies present due to natural infection. Has recovered from a prior hep B infection. Cannot infect others. No vaccine is needed.	–	+	+
Immune - Protected Has been vaccinated. Does not have the virus and has never been infected. No vaccine is needed.	–	+	–
Infected Positive HBsAg indicates hep B virus is present. Virus can spread to others. Find a doctor who is knowledgeable about hep B for further evaluation. More Testing Needed.	+	–	+
***Could be Infected** Result unclear - possible past or current hep B infection. Find a doctor who is knowledgeable about hep B for further evaluation. More Testing Needed.	–	–	+

*Inform all doctors about a prior or current hepatitis B infection and include this information as part of your health history. Talk to doctors before taking immune-system-suppressing medications to understand the risk for possible hep. B reactivation.

9

9

Chronic Liver Disease Progression



10

Infant Hepatitis B Vaccination

U.S. Infant Hepatitis B Vaccine Schedules
For infants < 1 year of age

Vaccine	Dose 1 "Birth Dose"	Dose 2	Dose 3	Dose 4
3-dose vaccine series Brand names: Engerix-B, Recombivax HB	Within 24 hours of birth	1 month after dose 1	6 months after dose 1	
4-dose combination vaccine series (pentavalent or hexavalent) Brand names: Vaxelis, Pediarix	Within 24 hours of birth (Hepatitis B vaccine)	6 weeks of age (Combination vaccine)	14 weeks of age (Combination vaccine)	6 months of age (Combination vaccine)

Key: = Monovalent hepatitis B vaccine (protection against hepatitis B only); = Combination vaccine (protection against hepatitis B + other diseases)

11

Hepatitis B vaccination in children and adults

U.S. Children and Adult Hepatitis B Vaccine Schedules
For children ≥ 1 and adults
Note: the first dose should be given as soon as possible. Additional doses require minimum time intervals required between doses in order for the vaccine to be effective.

Vaccine	Dose 1	Dose 2	Dose 3
3 dose vaccine series Brand names: Engerix-B, Recombivax HB, Twinrix (hepatitis A and B - Adults ≥ 18 Years)	Now	1 month after dose 1	6 months after dose 1
2 dose vaccine series Adults ≥ 18 Years Brand name: Heplisav-B	Now	1 month after dose 1	

Key: = Monovalent hepatitis B vaccine (protection against hepatitis B only); = Approved for adults; = Approved for children

12

What is the birth dose recommendation?

All infants are recommended to receive Hepatitis B vaccine within 24 hours of birth

Children born to HBV+ moms are also recommended to receive HBIG

NORTH Dakota | Health & Human Services

13

Why vaccinate at birth?

- Having a universal birth dose recommendation catches children who may otherwise be missed.
- Risk-based recommendations are confusing and difficult to implement.
- Due to the disease's long incubation period, Hepatitis B vaccine is useful as post-exposure prophylaxis.
- If there is vertical exposure during birth, the infant may avoid infection.
- When birth dose vaccination programs are suspended, even briefly, there is a notable increase in perinatal infection.

NORTH Dakota | Health & Human Services

14

Why can't we just test mom?

- False negatives are possible for any test.
- Testing occurs early in pregnancy and is often not repeated.
- Continued exposure to Hep B virus is likely.
- Universal vaccination helps babies who would otherwise get missed.
- Birth mothers are the largest, but not the only, risk for exposure to infants.

NORTH Dakota | Health & Human Services

15

Goal is fully vaccinated by six months old.

Why?...

- Maternal antibodies passed to baby are expected to have worn off by the time the infant reaches 6 months of age.
- The cell mediated response will not be properly developed until 12 months , leaving children especially vulnerable in months 6-11 if they do not have their own humoral immunity (circulating antibodies).
  - This is also why, if they are infected in infancy (under 12 months), the infection is 90% likely to become chronic.

NORTH Dakota | Health & Human Services

16

HEPATITIS B (HepB) VACCINE

HEPATITIS B IS A SERIOUS LIVER DISEASE

who become infected between ages 1 to 5 years will have chronic disease.

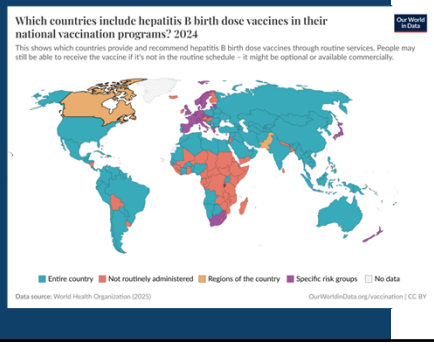
HepB vaccine prevents exposed babies and children from developing cancer later in life.

HepB VACCINE IS GIVEN TO NEWBORNS, WHO MAY BE UNKNOWINGLY EXPOSED AT BIRTH, TO START PROTECTION IN THE FIRST DAYS OF LIFE.

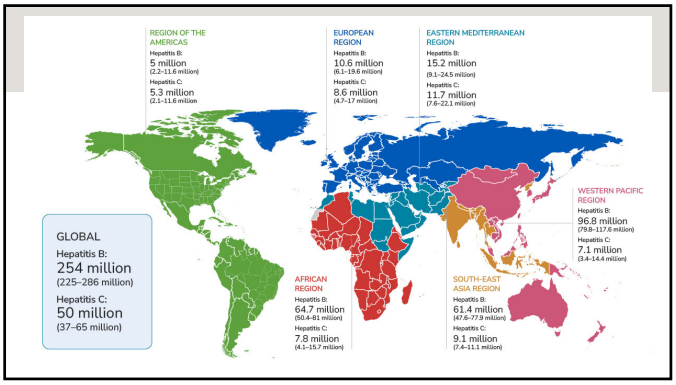
NORTH Dakota | Health & Human Services

Source: aap.org

17



18



19

No proven benefit in delaying vaccination

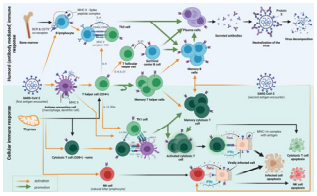
- Vaccines are given at stages in life when a human is most likely to contract and/or have serious consequences from a disease.
- Alternative vaccine spacing is impractical and time-consuming – both for parents and the medical professional who is vaccinating them.
- Extra trips to the doctor and more "pokes" can be more emotionally stressful to children.
- Vaccine schedules are based on an incredible amount of data and expertise. Delaying vaccines only lengthens the amount of time a child is vulnerable to potential disease.

NORTH Dakota | Health & Human Services

20

An infant's immune system is uniquely vulnerable

- Many vaccines are designed to build immunity in ways that immunity from disease can not.
- These tools are necessary for infants because they lack immune defenses that older children and adults may have.



NORTH Dakota | Health & Human Services

21

Perinatal Hepatitis B Prevention Program

When maternal hep B status is known to be positive:
HBV vaccine + HBIG at birth
Immunizations are given on schedule and finished by 6 months
Babies are tested for infection and antibodies at 9-12 months

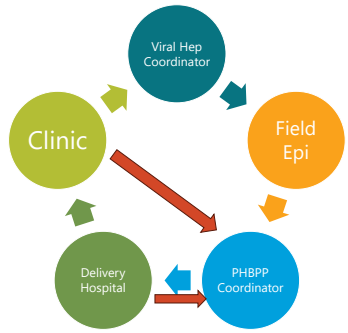
22

Hepatitis B Disease Reporting & Surveillance

- Hepatitis B is a mandatory reportable condition in North Dakota.
  - All HbSAg+ should be reported to Disease Control
    - Follow up tests and infectious disease consultation can determine additional
  - All HbSAg+ diagnosed during pregnancy should be reported along with the pregnancy status, estimated due date, and should be clearly noted on the mother and baby's charts
- All reported Hepatitis B cases are investigated by NDHHS.
- For female cases between 14 and 50 years of age, pregnancy status must be obtained for every Hepatitis B lab results reported.
  - Additional monitoring and follow-up is required for pregnant cases.
  - Pregnant cases are monitored throughout the duration of the pregnancy and post-delivery.
- **Birthing hospitals MUST notify us at Disease Control & Forensic Pathology when a pregnant woman is positive for Hep B and when she delivers**
- **HBIG and HBV must be entered into NDIIS**

NORTH Dakota | Health & Human Services

23



24

Additional resources

- CIDRAP Vaccine Integrity Project
- CHOP Children's Hospital of Philadelphia
- Hepatitis B Foundation
- AAP American Academy of Pediatrics
  - Red Book Section(s) on Hepatitis B: vaccination and perinatal prevention

25

Post-Test

- Successfully complete the five-question post-test to receive your certificate for nursing credit using the link below: https://ndhealth.co1.qualtrics.com/jfe/form/SV_eLEAtVXhm8aqZsa
- Credit for this session will be available until December 9, 2025.
- This presentation will be posted to our website at: www.hhs.nd.gov/immunizations

North Dakota | Health & Human Services

26

Immunization Unit Staff Members

For general immunization questions: vaccine@nd.gov

For NDIIS-specific questions: NDIIS@nd.gov

Immunization Unit

Mary Woinarowicz, MA Director	Phone: 701-328-2404 Email: mary.woinarowicz@nd.gov	NDIIS Manager	Phone: Email:
Abbi Berg, MPH VFC/Quality Improvement Manager	Phone: 701-328-3324 Email: alberg@nd.gov	Allison Dykstra, MS NDIIS Coordinator	Phone: 701-328-2420 Email: ardykstra@nd.gov
Miranda Baumgartner VFC/QI Coordinator (West)	Phone: 701-328-2035 Email: mlbaumgartner@nd.gov	Ronda Kercher NDIIS Data Admin	Phone: 701-226-1379 Email: rkercher@nd.gov
Rachel Flores VFC/QI Coordinator (East)	Phone: 701-328-9016 Email: rflores@nd.gov	Melissa Marto NDIIS Data Quality Coordinator	Phone: 701-328-4169 Email: mmarto@nd.gov
Jenny Galbraith Adult Immunization Manager	Phone: 701-328-2335 Email: jgalbraith@nd.gov	Lynde Monson CDC Public Health Advisor	Phone: Email: lyndemonson@nd.gov
Danni Pinnick, MPH Immunization Surveillance Coordinator	Phone: 701-239-7169 Email: dpinnick@nd.gov		

North Dakota | Health & Human Services

27