Whose Calling the Shots?
- A 2019 Vaccine Update

Frank Bell
Swedish Pediatric Infectious Disease
Jan 2019
2019 Vaccine Update

• Vaccines
  • Meningococcal serogroup B
  • HPV
  • Pertussis
  • Influenza

• Children with uncertain immunization history
Disclosures

• I have no financial conflicts of interest

• I do not intend to discuss use of off-label, unapproved or investigational products
Meningococcal Serogroup B Vaccines
### Figure 1. Recommended Immunization Schedule for Children and Adolescents Aged 18 Years or Younger—United States, 2018.

*For those who fall behind or start late, see the catch-up schedule (Figure 2).*

These recommendations must be read with the footnotes that follow. For those who fall behind or start late, provide catch-up vaccination at the earliest opportunity as indicated by the green bars in Figure 1. To determine minimum intervals between doses, see the catch-up schedule (Figure 2). School entry and adolescent vaccine age groups are shaded in gray.

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<th>Vaccine</th>
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- **Range of recommended ages for all children**
- **Range of recommended ages for catch-up immunization**
- **Range of recommended ages for certain high-risk groups**
- **Range of recommended ages for non-high-risk groups that may receive vaccine, subject to individual clinical decision-making**
- **No recommendation**
ACIP recommendations 2018 – ‘Clinical Discretion’

Men B vaccine

12 mo

Age 10+ yr

Age 16-18 yr

“Non-high-risk groups that may receive vaccine, subject to individual clinical decision making”
Meningococcal Disease

Infection: Meningococcal disease is a rare but serious infection in the blood or areas around the brain and spinal cord.

Deadly: The disease can kill. Even if treated, 10-12% of people who get it will die.

Sudden: Symptoms include sudden onset of fever, headache and stiff neck and can rapidly progress, causing death within hours of onset.

Anyone can get the disease. But it is most common in infants and people 16-23 years.

500-1000 people get the disease each year in the U.S. Survivors can suffer hearing loss, amputation of arms or legs, and brain damage.

Unpredictable: Most cases of meningococcal disease occur at random, often affecting otherwise healthy people.

Preventable: All 11 to 12 year olds should be vaccinated and 16 year olds should receive a booster. Check with your doctor about which meningococcal vaccines you need.

source: cdc.gov/meningococcal
College Outbreaks

Meningococcal Disease on U.S. College Campuses, 2013-2017

- **Studied colleges**: 107 major universities
- **Total Meningitis B cases**: 207
- **Total deaths**: 5

**Key Points**

- **High-risk locations**: California, Florida, Texas, Indiana, New York, Ohio, Illinois

**Campuses with Outbreaks**

- University of Oregon, 3 cases, 1 death (2016)
- University of California, Davis, 3 cases, 1 death (2015)
- Santa Clara University, 3 cases, 1 death (2016)
- University of Missouri, 2 cases (2015)
- Harvard University, 2 cases (2015)
- University of California, Santa Barbara, 2 cases (2015)
- University of Michigan, 2 cases (2015)

**Meningitis B Prevention**

- Ask your doctor about both vaccines available to prevent meningitis: MEN ACWY AND MEN B

**On NMA**

- Make sure your meningitis vaccine is up-to-date
GET VACCINATED AGAINST MENINGITIS B

Rutgers University—New Brunswick

Rutgers Student Affairs

TRUMENBA provides serogroup B meningococcal disease coverage to help protect 10 through 25 year olds.

Only TRUMENBA

- Targets both subfamilies, A and B, of meningococcal serogroup B disease
- Demonstrated a robust immune response
- In a US clinical trial: 81%-95%

GIVE IT A SHOT. STAY HEALTHY. GET YOUR MEN-B VACCINE

Where to get vaccinated:

- University Health Services


Sufficient data are not available on the safety and effectiveness of using Trumenba and other meningococcal group B vaccines interchangeably to complete the vaccination series. Safety and effectiveness has not been established in pregnant women.
Meningococcal Disease

Multiple (13+) serogroups

• B, C, Y, W commonest in US, EU

• A, X in Africa
Meningococcal Vaccines

• Protein-CPS Conjugate (ACWY)
  • Menactra® - MenACWY-D
  • Menveo® - MenACWY-CRM
Meningococcal Vaccines

• Protein-CPS Conjugate ACWY
  - Menactra® - MenACWY-D
  - Menveo® - MenACWY-CRM

• Serogroup B
  - Trumenba® - MenB-fHbp
  - Bexsero® - MenB-4C
Meningococcal serogroup B vaccine components

- Surface proteins
- +/- Membrane vesicles
MenB-fHbp vaccine components (Trumenba®)

2 variants of complement Factor H binding protein
MenB-4C vaccine components (Bexsero®)
Effectiveness and impact of a reduced infant schedule of 4CMenB vaccine against group B meningococcal disease in England: a national observational cohort study

Sydel R Parikh, Nick J Andrews, Kazim Beebeejaun, Helen Campbell, Sonia Ribeiro, Charlotte Ward, Joanne M White, Ray Borrow, Mary E Ramsay, Shamez N Ladhani

Summary

Background In September, 2015, the UK became the first country to introduce the multicomponent group B meningococcal (MenB) vaccine (4CMenB, Bexsero) into a publicly funded national immunisation programme. A reduced two-dose priming schedule was offered to infants at 2 months and 4 months, alongside an opportunistic...
Findings Coverage of 4CMenB in infants eligible for routine vaccination was high, achieving 95.5% for one dose and 88.6% for two doses by 6 months of age. Two-dose vaccine effectiveness was 82.9% (95% CI 24.1–95.2) against all MenB cases, equivalent to a vaccine effectiveness of 94.2% against the highest predicted MenB strain coverage of 88%. Compared with the prevaccine period, there was a 50% incidence rate ratio (IRR) reduction in MenB cases in the vaccine-eligible cohort (37 cases vs average 74 cases; IRR 0.50 [95% CI 0.36–0.71]; p=0.0001), irrespective of the infants’ vaccination status or predicted MenB strain coverage. Similar reductions were observed even after adjustment for disease trends in vaccine-eligible and vaccine-ineligible children.

Interpretation The two-dose 4CMenB priming schedule was highly effective in preventing MenB disease in infants. Cases in vaccine-eligible infants halved in the first 10 months of the programme. While ongoing national surveillance will continue to monitor the longer-term impact of the programme, these findings represent a step forward in the battle against meningococcal disease and will help reassure that the vaccine protects against this deadly infection.
Uncertainties

• Safety/tolerance
• Strain coverage
• Efficacy/effectiveness/impact
• Cost-effectiveness
Meningococcal Vaccines 2019

TWO KINDS OF VACCINES PREVENT AGAINST MENINGOCOCCAL DISEASE

MenB is the most common cause of disease in adolescents and young adults*

MenB VACCINE  
B  
C&Y  
MenACWY VACCINE

Vaccination is the best way to protect against it.

*Cases in 11-24 year olds in the US by serogroup (2009-2013)

Visit nfid.org/meningococcal to learn more about vaccines to prevent meningococcal disease
Use of Serogroup B Meningococcal Vaccines in Adolescents and Young Adults: Recommendations of the Advisory Committee on Immunization Practices, 2015

Weekly
October 23, 2015 / 64(41);1171-6

Recommendations for routine use of vaccines in children, adolescents, and adults are developed by the Advisory Committee on Immunization Practices (ACIP). ACIP is chartered as a federal advisory committee to provide expert external advice and guidance to the Director of the Centers for Disease Control and Prevention (CDC) on use of vaccines and related agents for the control of vaccine-preventable diseases in the civilian population of the United States. Recommendations for routine use of vaccines in children and adolescents are harmonized to the greatest extent possible with recommendations made by the American Academy of Pediatrics (AAP), the American Academy of Family Physicians (AAFP), and the American College of Obstetricians and Gynecologists (ACOG). Recommendations for routine use of vaccines in adults are harmonized with recommendations of AAFP, ACOG, and the American College of Physicians (ACP). ACIP recommendations approved by the CDC Director become agency guidelines on the date published in the Morbidity and Mortality Weekly Report (MMWR). Additional information is available at http://www.cdc.gov/vaccines/acip.
Current ACIP recommendations for MenB vaccine use

- Persons aged ≥ 10 years at increased risk for (serogroup B) meningococcal disease, including outbreaks
- Adolescents & young adults (age 16-23 years, age 16-18 preferred) (i.e. routinely offered, ‘optional’)
Serogroup B meningococcal vaccines:

Clinical discretion: “Adolescents ... ... who want vaccine”
12. Serogroup B meningococcal vaccines (minimum age: 10 years [Bexsero, Trumenba].

Clinical discretion: Adolescents not at increased risk for meningococcal B infection who want MenB vaccine.

MenB vaccines may be given at clinical discretion to adolescents 16–23 years (preferred age 16–18 years) who are not at increased risk.
- Bexsero: 2 doses at least 1 month apart.
- Trumenba: 2 doses at least 6 months apart. If the 2nd dose is given earlier than 6 months, give a 3rd dose at least 4 months after the 2nd.

Special populations and situations:
Anatomic or functional asplenia, sickle cell disease, persistent complement component deficiency (including eculizumab use), serogroup B meningococcal disease outbreak
- Bexsero: 2-dose series at least 1 month apart.
- Trumenba: 3-dose series at 0, 1-2, and 6 months.

Note: Bexsero and Trumenba are not interchangeable.

For additional meningococcal vaccination information, see meningococcal MMWR publications at: www.cdc.gov/vaccines/hcp/acip-recs/vacc-specific/mening.html.
12. Serogroup B meningococcal vaccines (minimum age: 10 years [Bexsero, Trumenba]).

Clinical discretion: Adolescents not at increased risk for meningococcal B infection who want MenB vaccine.

MenB vaccines may be given at clinical discretion to adolescents 16–23 years (preferred age 16–18 years) not at increased risk.

- 3 doses at least 1 month apart.
- 2 doses at least 6 months apart. If the 2 doses are earlier than 6 months, give a 3rd dose at least 1 month after the 2nd.

Indicated situations:
- Childhood immunodeficiency, chronic complement component deficiencies, serogroup B meningococcal outbreak.
- After meningococcal disease.
- MenB vaccine is preferred over MenACWY for MenB outbreaks at least 1 month apart.
- MenB vaccine is preferred over MenACWY for new series at 0, 1-2, and 6 months.

Additional meningococcal vaccination information, see meningococcal MMWR publications at: www.cdc.gov/vaccines/hcp/acip-recs/vacc-specific/mening.html.
Practicalities

• Either MenB vaccine can be used when indicated
• The two MenB vaccines are not interchangeable;  
  - the same vaccine product must be used for all doses in a series
• The minimum interval between any 2 doses of MenB vaccine is 4 weeks
• MenB-FHbp or MenB-4C may be administered concomitantly with other 
  vaccines indicated for this age, but at a different anatomic site
Human Papilloma Virus Vaccine
Figure 1. Recommended Immunization Schedule for Children and Adolescents Aged 18 Years or Younger—United States, 2018.

*For those who fall behind or start late, see the catch-up schedule (Figure 2).*

These recommendations must be read with the footnotes that follow. For those who fall behind or start late, provide catch-up vaccination at the earliest opportunity as indicated by the green bars in Figure 1. To determine minimum intervals between doses, see the catch-up schedule (Figure 2). School entry and adolescent vaccine age groups are shaded in gray.

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**Range of recommended ages for all children**

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**Range of recommended ages for catch-up immunization**

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**Range of recommended ages for certain high-risk groups**

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**Range of recommended ages for non-high-risk groups that may receive vaccine, subject to individual clinical decision-making**

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**No recommendation**
ACIP recommendations 2018 – HPV9

- Give from age 9 years, 2 doses needed if initiated before 15 years
- Efficacy in prevention of cervical pre-cancers, genital warts & anal pre-cancers
Pertussis Vaccine
Acellular Pertussis Vaccines

• 2 vaccines (3-component & 5-component)

• 5+1 doses (5 x DTaP + Tdap)

• + Tdap each pregnancy (at 27 to 36 weeks)
or postpartum if no history of Tdap

• Cocooning

• Immunize HCP if no history of Tdap(irrespective of prior Td)
Influenza Vaccine
2018 - 2019 Respiratory & Enteric Viruses
Seattle, Washington

Number of positives

- Respiratory Syncytial Virus (RSV)
- Parainfluenza (PIV)
- Adenovirus (ADV)
- Influenza A (FluA)
- Influenza B (FluB)
- Human Metapneumovirus (hMPV)
- Rhinovirus (RHV)
- Enterovirus (ENT)
- Coronavirus (CV)

Influenza Vaccines

• Egg grown > 6 mo
• Cell-culture based > 4 yrs
• Recombinant not (yet) licensed for children

Others coming...

• Live attenuated (LAIV) > 2 yrs
  ‘an option’ (ACIP)
Evaluation of individuals with uncertain immunization history
Evaluation of children with uncertain immunization history

• Obtain (written) individual vaccine records

• Look up National Schedules; expect DTwP, measles, ± hepB

• Care with OPV, M(not MR)

• Limited role for serologic testing

• Suggest administering MMRVx2, DTaP/Tdap + IPV for most

  + vaccines not administered in country of origin
## Management: Age-appropriate Revaccination

<table>
<thead>
<tr>
<th>Vaccine Ag</th>
<th>Recommend</th>
<th>Alternative</th>
</tr>
</thead>
<tbody>
<tr>
<td>DTaP / Tdap</td>
<td>Give single dose, then check DT (IgG)</td>
<td></td>
</tr>
<tr>
<td>Hep B</td>
<td>Check HepBsAg (+/- Ab) prior to vaccination</td>
<td></td>
</tr>
<tr>
<td>MMR(V)</td>
<td>(re)vaccinate</td>
<td>Serology (IgG)</td>
</tr>
<tr>
<td>Hep A</td>
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</tr>
</tbody>
</table>

Adapted from ACIP [https://www.cdc.gov/vaccines/hcp/acip-recs/general-recs/index.html](https://www.cdc.gov/vaccines/hcp/acip-recs/general-recs/index.html)
Questions?