Revising the Adolescent Meningococcal Vaccine Schedule: Term of Reference and Considerations

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The findings and conclusions in this presentation are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention.
Outline

- Vaccine recommendations and coverage
- Epidemiology
- Duration of vaccine-induced protection
- Options for changing the immunization schedule
MenACWY:
- Dose #1: 11–12 years
- Dose #2: 16 years

MenB* (shared clinical decision-making)
- 2- or 3-dose series between 16–23 years of age (preferred range: 16–18 years)

MenABCWY:
- Recommended when both MenACWY and MenB indicated at same visit
2022 Meningococcal Vaccine Coverage

- **MenACWY**
  - ≥1 dose at 13 years: 84.5% (81.3%-87.2%)*
  - ≥1 dose at 16 years: 89.8% (87.4%-91.8%)
  - ≥2 doses at 17 years: 60.8% (57.5%-63.9%)**

- **MenB**
  - ≥1 dose at 17 years: 29.4% (26.5%-32.4%)
  - ≥2 doses at 17 years: 11.9% (10.0%-14.1%)

*Coverage varies by metropolitan statistical area, poverty status, race/ethnicity, and health insurance status, although confidence intervals largely overlap

**Does not include adolescents who received 1st dose of MenACWY vaccine at age ≥16 years

Pingali C, et al. MMWR Morb Mortal Wkly Rep 2023: [http://dx.doi.org/10.15585/mmwr.mm7234a3](http://dx.doi.org/10.15585/mmwr.mm7234a3)
Meningococcal Disease Incidence — United States, 1996-2022*

*2021-2022 NNDSS data are preliminary
Average Annual Meningococcal Disease Incidence by Age-Group and Serogroup — United States, 2020-2022*

Source: NNDSS data with additional serogroup data from ABCs and state health departments
*2021 and 2022 data are preliminary
Average Annual Meningococcal Disease Incidence by Age-Group and Serogroup — United States, 2012-2021*

* Unknown serogroup (12%) and other serogroups (9%) excluded

SOURCE: CDC; National Notifiable Diseases Surveillance System with additional serogroup data from Active Bacterial Core surveillance and state health departments
Increasing Case Counts

- Preliminary data indicate 416* cases in 2023
  - Highest number of cases since 2014
- Rates of disease greatest in children <1 year of age
- Second peak in adolescence; among cases in 2021:
  - 19 of 210 (9.0%) total cases in 11-23 year-olds

*Confirmed and probable cases
Cases Averted Due to Vaccination

- Among adolescents 11-15 years old, incidence decreased:
  - 16.3% (12.1%-20.3%) during prevaccine period
  - 27.8% (20.6%-34.4%) during post-primary dose period
- Among adolescents 16-22 years old, incidence decreased:
  - 10.6% (6.8%-14.3%) during post-primary dose period
  - 35.6% (29.3%-41.0%) during post-booster dose period
- Estimated 222 cases of serogroup C,W,Y disease averted through vaccination of adolescents from 2006-2017

Mbaeyi S, et al. JAMA Pediatr 2020
Incidence of Meningococcal Disease by Serogroups Following MenACWY Vaccine Implementation

ACWY disease incidence substantially decreased in adolescents

B disease incidence was similar in adolescents over time

Source: National Notifiable Diseases Surveillance System (NNDSS) data with additional serogroup data from Active Bacterial Core surveillance (ABCs) and state health departments
Serogroup B Disease Risk is Higher among College Students

- College students have a 3.5-fold (95% CI: 2.2-5.4) higher risk of serogroup B disease than non-college students
- Serogroup B incidence peaks for 19 year-old college students and declines after age 20

Additional Factors Associated with Increased Risk among College Students

- 4-year college students had a **5.2**-fold (95% CI: 3.6-7.7) higher risk of serogroup B disease than non-undergraduates aged 18-24 years
  - Risk among 2-year college students was comparable to non-undergraduates (RR 1.0, 95% CI: 0.4-2.1)

- First-year students were at **3.8**-fold (95% CI: 2.4-6.0) higher risk of serogroup B disease than non-first-year students

- On-campus residents at **2.9**-fold (95% CI: 1.8-4.6) higher risk of serogroup B disease than off-campus residents

- Students participating in Greek life were at **9.8**-fold (95% CI: 4.6-21.2) higher risk of serogroup B disease than other students during outbreaks
Duration of Vaccine-Induced Protection

- **MenACWY**
  - Protection wanes 3 to <8 years postvaccination
    - <1 year: 79%
    - 1 to <3 years: 69%
    - 3 to <8 years: 61%

- **MenB**
  - Protection wanes 1-2 years following primary vaccination

Effectiveness of Bexsero against Gonorrhea

- Bexsero is recommended for prevention of serogroup B meningococcal disease
  - Some protection against gonorrhea is also likely
- *N. meningitidis* and *N. gonorrhoeae* closely genetically related
  - ~80 to 90% sequence homology
- Potential for outer membrane vesicle (OMV)-containing MenB vaccines (e.g., Bexsero) to provide protection against *N. gonorrhoeae*

Revising the Adolescent Meningococcal Vaccine Schedule

- Revisions to the schedule should optimize protection against meningitis

- Considerations for meningitis protection include:
  - Ages at higher risk for meningitis
  - Recent meningitis epidemiology
  - Duration of vaccine-induced protection
Revising the Adolescent Meningococcal Vaccine Schedule, cont.

- Maintaining harmonization with existing adolescent vaccination platform
- Pentavalent vaccine provides opportunity to reduce number of injections
Options for Revising Adolescent Meningococcal Vaccine Schedule

- **MenACWY**
  - Possibly eliminate 11-12 year-old dose
  - Change recommended age given recent epidemiology

- **MenB**
  - Change recommended age to increase protection upon college entry
  - Routine or risk-based recommendation
    - If risk-based recommendation, include permissive language for vaccination of persons in age group requesting protection but who may lack risk factors such as college attendance (equity considerations)
# Schedule Options for Further Consideration

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Proposed recommendations are for routine vaccination unless specified as “risk-based”; option numbers do not represent ordering of preference.
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SCDM, shared clinical decision-making
### Schedule Options for Further Consideration, etc.

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SCDM, shared clinical decision-making
Synthesis of Work Group Comments

- Variability in desire to keep vs. eliminate 11–12 year-old dose of MenACWY
  - Favor keeping: Has taken years to ingrain the 11–12 year-old platform, 11–12 year-old dose may have reduced carriage and ‘worked’
  - Favor eliminating: Epi seems to support starting series at 16 years
- Consider administering MenB dose #1 at age 15 years*
- Try to achieve acceptable efficacy for duration of disease incidence peak in young adulthood

*Not among 4 options for consideration
Synthesis of Work Group Comments, cont.

- Oppose SCDM recommendations
  - Poor uptake, missed opportunities, implementation challenges, lack of strong recommendation prevents many institutions from implementing policies, not understandable to clinicians
  - Interest in changing MenB to risk-based or routine recommendation

- Harmonization of MenACWY and MenB schedules may reduce number of injections
  - Extra antigen administration (as may occur with administration of pentavalent vaccine) has not been a concern before

- Change in schedule may impact school requirements
Discussion

- Does ACIP concur with the 4 schedule options for further assessment?

- What additional information will help ACIP determine the preferred option?
Acknowledgements

- Lucy McNamara
- Jennifer Collins
- Samuel Crowe
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