Immunization Update 2017

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Disclosures

- JoEllen Wolicki is a federal government employee with no financial interest in or conflict with the manufacturer of any product named in this presentation

- The speaker will not discuss the off-label use of any vaccines except MenACWY

- The speaker will not discuss a vaccine not currently licensed by the FDA
Disclosures

- The recommendations to be discussed are primarily those of the Advisory Committee on Immunization Practices (ACIP):
  - Composed of 15 non-government experts in clinical medicine and public health
  - Provides guidance on use of vaccines and other biologic products to DHHS, CDC, and the U.S. Public Health Service

- Watch the live webcast
  - [https://www.cdc.gov/vaccines/acip/meetings/webcast-instructions.html](https://www.cdc.gov/vaccines/acip/meetings/webcast-instructions.html)

CDC ACIP meeting website [http://www.cdc.gov/vaccines/acip/meetings/upcoming-dates.html](http://www.cdc.gov/vaccines/acip/meetings/upcoming-dates.html)

Next ACIP meeting
October 25–26, 2017
Overview

- Vaccination coverage rates
- 2017 immunization schedule for children 18 years of age and younger
- Vaccine supply updates
  - Hepatitis B (RecombivaxHB)
  - HPV
  - MenACWY (Menveo)
- Vaccine Information Statement updates
- Seasonal influenza update
- Recent Advisory Committee on Immunization Practices Immunization updates
  - HepB
  - Polio
  - HPV
  - MenACWY
  - MenB
  - Tdap
- Vaccine administration update
- Immunization resources
Vaccination Coverage Rates
**Estimated Vaccine Coverage Among Children Aged 19-35 Months, NIS 2015**

<table>
<thead>
<tr>
<th>State/Area</th>
<th>Combined Series* 4:3:1:3:3:1:4</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>United States</td>
<td></td>
<td>72.2%</td>
</tr>
<tr>
<td>Massachusetts</td>
<td></td>
<td>78.5%</td>
</tr>
</tbody>
</table>

*The combined (4:3:1:3:3:1:4) vaccine series includes ≥4 doses of DTaP, ≥3 doses of poliovirus vaccine, ≥1 dose of measles-containing vaccine, full series of Hib vaccine (≥3 or ≥4 doses, depending on product type), ≥3 doses of HepB, ≥1 dose of varicella vaccine, and ≥4 doses of PCV*
Estimated Percentage of Children Enrolled in Kindergarten With an Exemption From One or More Vaccines, United States, 2015–16 School Year

Massachusetts
(All kindergartners = 72,897)

<table>
<thead>
<tr>
<th>Exemption Type</th>
<th>N (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medical</td>
<td>216 (0.3%)</td>
</tr>
<tr>
<td>Religious</td>
<td>760 (1.0%)</td>
</tr>
<tr>
<td>Philosophic</td>
<td>N/A</td>
</tr>
</tbody>
</table>

MMWR 2016; 65(39):1057-1064
Estimated Vaccination Coverage among Adolescents Aged 13-17 Years, NIS-Teen, United States, 2016

<table>
<thead>
<tr>
<th>Vaccine</th>
<th>United States</th>
<th>Massachusetts</th>
</tr>
</thead>
<tbody>
<tr>
<td>≥1 Tdap</td>
<td>88.0%</td>
<td>96.7%</td>
</tr>
<tr>
<td>≥1 HPV (All–boys and girls)</td>
<td>62.8%</td>
<td>71.4%</td>
</tr>
<tr>
<td>HPV UTD (All–boys and girls)</td>
<td>43.4%</td>
<td>56.6%</td>
</tr>
<tr>
<td>≥1 MenACWY</td>
<td>82.2%</td>
<td>90.4%</td>
</tr>
<tr>
<td>≥2 MenACWY*</td>
<td>39.1%</td>
<td>-----</td>
</tr>
</tbody>
</table>

*≥2 doses of MenACWY or meningococcal-unknown type vaccine among adolescents 17 years. Does not include adolescents who received their first dose of MenACWY vaccine at ≥16 years.

MMWR 66(33);874–882
2017 Immunization Schedules
Recommended Immunization Schedule for Children and Adolescents Aged 18 Years or Younger, 2017

- Figure 1 – Routinely recommended vaccines based on age
- Figure 2 – Catch-up schedule for children who start late or are more than 1 month behind
- Figure 3 – Vaccines that might be indicated based on medical indications

ACIP Recommended Immunization Schedule for Children and Adolescents Aged 18 Years or Younger, UNITED STATES, 2017
www.cdc.gov/vaccines/schedules/hcp/child-adolescent.html
Childhood Immunization Schedule

Figure 3: Vaccines Based on Medical Indications

- Demonstrates most children with medical conditions can (and should) be vaccinated according to the routine immunization schedule

- Indicates when a medical condition is a precaution or contraindication

- Indicates when additional doses of vaccines may be necessary secondary to the child’s/adolescent’s medical condition
Vaccine Supply Updates
Hepatitis B (RecombivaxHB)

- **Merck is not currently distributing the hepatitis B vaccine:**
  - Adult formulation: Does not expect to be distributing vaccine between now and the end of 2018
  - Pediatric formulations will be unavailable between early August 2017 and early 2018
- **Merck’s supply of the dialysis formulation of Hepatitis B vaccine is not affected**
- **GSK has sufficient supplies of adult and pediatric Hepatitis B vaccines to address these anticipated gap in Merck’s supply**
  - Preferences for a specific presentation (i.e., vial versus syringe) may not be consistently met

CDC Current Vaccine Shortages & Delays: [https://www.cdc.gov/vaccines/hcp/clinical-resources/shortages.html](https://www.cdc.gov/vaccines/hcp/clinical-resources/shortages.html)
HPV Vaccine

- 2vHPV and 4vHPV vaccines are no longer being distributed in the United States

- 9vHPV (Gardasil9) is the only vaccine available in the U.S.

CDC Current Vaccine Shortages & Delays: [https://www.cdc.gov/vaccines/hcp/clinical-resources/shortages.html](https://www.cdc.gov/vaccines/hcp/clinical-resources/shortages.html)
MenACWY (Menveo)

- GSK reports potential shipping delays of Menveo (MenACWY), during late August and September
- Sanofi has sufficient supplies of Menactra to address potential supply gaps during this period

CDC Current Vaccine Shortages & Delays [https://www.cdc.gov/vaccines/hcp/clinical-resources/shortages.html](https://www.cdc.gov/vaccines/hcp/clinical-resources/shortages.html)
Vaccine Information Statement Update
Influenza Vaccine Information Statement (VIS)

- Flu VISs are no longer updated every year
- Current edition is dated 8/7/2015
- Use the inactivated flu VIS for:
  - Trivalent
  - Quadrivalent
  - Recombinant
  - Cell culture
  - Intradermal
  - High-dose
New and Recently Updated VISs

- New and recently updated VISs
  - Cholera
  - Td
- 9vHPV is the only HPV VIS
- VIS are available in foreign languages at [www.immunize.org](http://www.immunize.org)

Vaccine Information Statements: [www.cdc.gov/vaccines/hcp/vis/current-vis.html](http://www.cdc.gov/vaccines/hcp/vis/current-vis.html)
Seasonal Influenza Update
2016-17 Influenza Season Summary

- Flu activity during the 2016-2017 season has been moderate
- Influenza A (H3N2) viruses predominating
- H3N2-predominant seasons have been associated with:
  - More severe illness and mortality, especially in older people and young children, relative to seasons during which H1N1 or B viruses predominated

CDC Flu website: [www.cdc.gov/flu](http://www.cdc.gov/flu)
Recommended Composition of Influenza Vaccines for the 2017-2018 Influenza Season

- Trivalent vaccines for use during the 2017-2018 influenza season should contain the following:
  - A/Michigan/45/2015 (H1N1)pdm09-like virus [NEW]
  - A/Hong Kong/4801/2014 (H3N2)-like virus
  - B/Brisbane/60/2008-like virus

- Quadrivalent vaccines should contain the above three viruses and an additional influenza B virus
  - B/Phuket/3073/2013
### Inactivated Influenza Vaccines 2017–2018 Season

<table>
<thead>
<tr>
<th>Product/Manf</th>
<th>Presentation</th>
<th>Age Indications</th>
<th>Route</th>
<th>Number of Strains</th>
</tr>
</thead>
<tbody>
<tr>
<td>Afluria/Seqirus</td>
<td>0.5 mL MFS</td>
<td>5 years and older</td>
<td>IM</td>
<td>IIV3 and IIV4</td>
</tr>
<tr>
<td></td>
<td>5.0 MDV</td>
<td></td>
<td>IM: needle/syringe</td>
<td></td>
</tr>
<tr>
<td>Fluad/Seqirus</td>
<td></td>
<td></td>
<td></td>
<td>IIV3</td>
</tr>
<tr>
<td>Fluarix/GSK</td>
<td></td>
<td></td>
<td></td>
<td>IIV4</td>
</tr>
<tr>
<td>Flublok/Protein Sciences</td>
<td></td>
<td></td>
<td></td>
<td>RIV3 and RIV4</td>
</tr>
<tr>
<td>Flucelvax/Seqirus</td>
<td></td>
<td></td>
<td></td>
<td>cclIIV4</td>
</tr>
<tr>
<td>Flulaval/ID Biomedical</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fluvirin/Seqirus</td>
<td></td>
<td></td>
<td></td>
<td>IIV3</td>
</tr>
<tr>
<td>Fluzone/SP</td>
<td></td>
<td></td>
<td></td>
<td>IIV4</td>
</tr>
<tr>
<td>Fluzone High-Dose/SP</td>
<td>0.5 mL MFS</td>
<td>65 years and older</td>
<td>IM</td>
<td>HD-IIV3</td>
</tr>
<tr>
<td>Fluzone Intradermal/SP</td>
<td>0.1 mL microinjection system</td>
<td>18 through 64 years</td>
<td>ID</td>
<td>IIV4</td>
</tr>
</tbody>
</table>

New!

- **Afluria** is approved for children 5 years of age and older
- **FluLaval** is now approved for children 6 months of age and older
- The correct dose (amount) is **0.5 mL** for persons 6 months of age and older

MFS = manufacturer-filled syringe  SDV = single-dose vial  MDV = multidose vial
2017-18 Influenza ACIP Recommendations

- Annual influenza vaccination continues to be **recommended** for persons without contraindications or precautions **6 months of age and older**
- **Flumist Quadrivalent (LAIV4) should not be used** during the 2017–18 season due to concerns about its effectiveness against influenza A(H1N1)pdm09 viruses in the United States during the 2013–14 and 2015–16 influenza seasons

MMWR 2017;66(RR-2):1-20
### 2017–18 Pediatric Flu Vaccine Products for Children 6 Months of Age and Older Vaccine Doses and Schedule

<table>
<thead>
<tr>
<th>Product</th>
<th>Age</th>
<th>Dose (amount)</th>
<th>Schedule</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fluzone</td>
<td>6 through 35 months</td>
<td>0.25 mL</td>
<td>1 or 2 doses</td>
</tr>
<tr>
<td></td>
<td>36 months and older</td>
<td>0.5 mL</td>
<td>1 or 2 doses</td>
</tr>
<tr>
<td>FluLaval</td>
<td>6 months and older</td>
<td>0.5 mL</td>
<td>1 or 2 doses</td>
</tr>
</tbody>
</table>

**Schedule**

- **Administer 2 doses, separated by at least 4 weeks**
  - Previously unvaccinated children 6 months through 8 years of age
  - Dose (amount) based on product
  - Either product may be used for either dose
    - The 2-dose series can be completed with 2 doses appropriately spaced of Fluzone or FluLaval or 1 dose of Fluzone and 1 dose of FluLaval

- **Administer 1 dose to:**
  - Previously vaccinated children 6 months through 8 years of age
  - Children 9 years of age and older, regardless of immunization history
Potential Immunization Errors

- Wrong dose
  - Administration of 0.25ml dose of FluLaval to child 6-35 mos
  - Administration of 0.5 ml dose of Fluzone to child 6-35 mos
  - Administration of 0.25 ml dose of Fluzone to child or adult 36 mos or older
Influenza Vaccine During Pregnancy

- A published recently study showed women in early pregnancy who received two consecutive annual vaccines during 2010-11 and 2011-12, both of which included a 2009 pandemic H1N1 component, had an increased risk of miscarriage within 28 days after receiving the second vaccine.
- This study does not quantify the risk of miscarriage and does not prove that flu vaccine was the cause of the miscarriage.
- Earlier studies have not found a link between flu vaccination and miscarriage.
- There is an ongoing investigation to study this issue further.

Influenza Vaccine During Pregnancy

- The Advisory Committee on Immunization Practices (ACIP), the American College of Obstetricians and Gynecologists (ACOG) and the Centers for Disease Control and Prevention (CDC) continue to recommend that pregnant women get a flu vaccine during any trimester of their pregnancy.

- Influenza poses a danger to pregnant women and their developing babies. A flu vaccine can prevent serious illness, including hospitalization, in pregnant women.
Clinical Resources for Health Care Personnel

- You Call the Shots–Influenza module  www.cdc.gov/vaccines/ed/youcalltheshots.html
- Influenza Vaccine FAQs video  www.youtube.com/watch?v=TXaNvFDv_c
- Current influenza activity  www.cdc.gov/flu
- Influenza labels for storage units  www.cdc.gov/vaccines/hcp/admin/storage/guide/vaccine-storage-labels-flu.pdf
- Tools to Assist Satellite, Temporary, and Off-Site Vaccination Clinics  www.izsummitpartners.org/nails-workgroups/influenza-workgroup/off-site-clinic-resources/
ACIP Vaccine Updates
Hepatitis B (HepB)
Hepatitis B

- Monovalent Hepatitis B vaccine should be administered within 24 hours of birth for medically stable infants weighing ≥2,000 grams born to hepatitis B surface antigen (HBsAg)-negative mothers

- The recommendations for vaccination of infants <2,000 grams remain unchanged
  - Preterm infants weighing <2,000 g born to HBsAg-negative mothers should receive the first dose of vaccine 1 month after birth or at hospital discharge

- The recommendation for infants born to HBsAg-positive mothers or mothers whose hepatitis B status is unknown also remain unchanged

2017 ACIP Immunization Schedule for Children 18 Years of Age and Younger [www.cdc.gov/vaccines/schedules/hcp/child-adolescent.html](http://www.cdc.gov/vaccines/schedules/hcp/child-adolescent.html)
Polio (IPV)
## ACIP Routine Recommendations
### Polio Vaccine

<table>
<thead>
<tr>
<th>Dose</th>
<th>Routinely Recommended at</th>
<th>Minimum Age</th>
<th>Minimum Interval</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2 months of age</td>
<td>6 weeks</td>
<td>---------------</td>
</tr>
<tr>
<td>2</td>
<td>4 months of age</td>
<td>10 weeks</td>
<td>4 weeks</td>
</tr>
<tr>
<td>3</td>
<td>6-18 months of age</td>
<td>14 weeks</td>
<td>4 weeks</td>
</tr>
<tr>
<td>4</td>
<td>4-5 years of age</td>
<td>4 years</td>
<td>6 months</td>
</tr>
</tbody>
</table>

2017 ACIP Immunization Schedule for Children 18 Years of Age and Younger [www.cdc.gov/vaccines/schedules/hcp/child-adolescent.html](http://www.cdc.gov/vaccines/schedules/hcp/child-adolescent.html)
Additional Considerations

- A dose of IPV should be given on /after the 4th birthday
  - Even if 4 (or more) doses of IPV were given before
- Minimum interval between the next-to-last and last dose is 6 months
- A 4th dose not required if the 3rd dose was given at 4 years of age or older

MMWR 2009;58(30):829-30
Polio Vaccine Administered Outside the United States

- 2 recently published *MMWRs* provide guidance regarding assessment of children who have received poliovirus vaccine outside the U.S.
- If both OPV and IPV were administered, the total number of doses needed to complete the series is the same as that recommended for the U.S. IPV schedule
  - A minimum interval of 4 weeks should separate doses in the series, with the final dose administered on/or after the fourth birthday and at least 6 months after the previous dose
- If only OPV was administered, and all doses were given before age 4 years, 1 dose of IPV should be given at 4 years or older and at least 6 months after the last dose

*MMWR* 2017;66(01):23-25
*MMWR* 2017;66(7):196
Polio Vaccine Administered Outside the United States

- Only trivalent OPV (tOPV) counts toward the United States vaccination requirements
  - Doses of OPV, that minimum age and intervals, administered BEFORE April 2016 can count towards completion of a series regardless of how the dose is documented (unless it says “campaign”)
  - OPV administered April 1, 2016 through April 30, 2016 should be documented as tOPV for it to count towards completion of a series (unless it says “campaign”)
  - OPV administered on or after May 2016 should not be counted
  - If the dose documentation includes “campaign”, the dose does NOT count
Human Papillomavirus (HPV)
**Human Papillomavirus Vaccine**

**Routine Recommendations**

- Routinely vaccinate boys and girls at 11–12 years of age*

- Catch-up those previously unvaccinated or are missing doses including:
  - Females age 13 through 26 years
  - Males age 13 through 21 years
  - High-risk males age 22 through 26 years
    - Men who have sex with men and immunocompromised men (including HIV-infected men)

- Males aged 22 through 26 years of age may be vaccinated

*Vaccination series can be started at 9 years of age

MMWR 2015;64:300-4
ACIP HPV Immunization Recommendations
Previously Unvaccinated Adolescents

- Administer 2 doses of HPV vaccine to healthy adolescents starting the series at 9 through 14 years of age

- Follow the routine 2-dose schedule
  - Administer dose 2 6-12 months after the 1st dose

- If a 2nd dose is inadvertently administered prior to 6 months default to a 3-dose series
ACIP Immunization Recommendations
Previously Unvaccinated Adolescents

- Administer 3 doses of HPV vaccine to adolescents starting the series on or after the 15th birthday
- Routine 3-dose schedule: 0, 1-2, 6 months
  - Dose #2: Administer at least 1 to 2 months after dose 1
  - Dose #3: Administer at least:
    - 12 weeks after dose 2 AND
    - 6 months after dose 1
- An accelerated schedule using minimum intervals is not recommended
HPV Older Adolescents and Adults

- Based on 2015 data alone, as many as 9.1 million women and about 13.9 million men aged 19-26 years were unvaccinated and might benefit from HPV vaccination.
- These estimates reflect the current pool of females and males who could benefit from catch-up vaccination and the number of unprotected older adolescents adding to that pool annually.
- Studies have found that although HPV infection increases with increasing age after sexual debut, most have not been infected with all the high risk HPV types included in the vaccine.

ACIP Immunization Recommendations
Persons with an Incomplete Series

- Adolescents (and adults!) who initiated vaccination with 9vHPV, 4vHPV, or 2vHPV
  - Before their 15th birthday, are fully vaccinated if they received
    - 2 doses at the recommended dosing schedule (0, 6-12 month), OR
    - 3 doses at the recommended dosing schedule (0, 1-2, 6 month)
  - On or after the 15th birthday are fully vaccinated if they received
    - 3 doses at the recommended dosing schedule (0, 1-2, 6 month)

- All doses do not have to 9vHPV
- Additional doses of 9vHPV are not recommended for those who completed the series with 4vHPV or 2vHPV
ACIP HPV Immunization Recommendations

Medical Condition Considerations

- ACIP recommends HPV vaccination for immunocompromised females and males aged 9 through 26 years with 3 doses of HPV vaccine (0, 1-2, 6 months)

- Administer a 3-dose series to immunocompromised persons including those with:
  - Primary or secondary immunocompromising conditions that might reduce cell-mediated or humoral immunity, such as B lymphocyte antibody deficiencies, T lymphocyte complete or partial defects, HIV infection, malignant neoplasm, transplantation, autoimmune disease or immunosuppressive therapy
ACIP HPV Immunization Recommendations

Schedule Considerations

- **Number of recommended doses is based on:**
  - Age at administration of the first dose OR
  - Health status–immunosuppression

- **Series does not need to be restarted if interrupted**
  - There is NO maximum interval between HPV vaccine doses

- **HPV vaccine can be administered during the same clinical visit other vaccines**

- **9vHPV may be used to continue or complete a series started with 4vHPV or 2vHPV regardless of the dosing schedule**
ACIP HPV Immunization Recommendations
Additional Considerations

• No therapeutic effect on HPV infection, genital warts, cervical lesions

• Prevaccination assessments not recommended
  • HPV
  • Pregnancy testing
CDC HPV 2-Dose FAQs for Clinicians

CDC Clinician FAQ: CDC Recommendations for HPV Vaccine 2-Dose Schedules

HPV Resources: Clinicians

- The newly updated Tips and Timesavers for Talking with Parents about HPV vaccine addresses common questions parents may have

- Clinician FAQ: Consult this factsheet for explanations on the new 2-dose HPV vaccine recommendation

- Visit the HPV Clinician Webpage for more HPV facts, how to promote vaccination, and how to successfully communicate with parents

HPV Clinician Webpage: [www.cdc.gov/hpv/hcp/index.html](www.cdc.gov/hpv/hcp/index.html)
Meningococcal (MenACWY and MenB)
Rates of Meningococcal Disease (C and Y) by Age, 1999-2008

Active Bacterial Core surveillance (ABCs), 1998-2008
MenACWY Recommendations

- Administer MenACWY at age 11 or 12 years with a booster dose at 16 years of age

- Administer 1 dose at age 13 through 15 years if not previously vaccinated

- For persons vaccinated at age 13 through 15 years, administer a one-time booster dose, preferably at or after 16 through 18 years of age
Why Do We Give a Booster Dose of MenACWY?

- In most cases, meningococcal infection progresses rapidly, with fulminant disease occurring within 1-4 days after invasion of normally sterile body sites.
- There’s little time for immune memory cells to ramp up production of antibodies.
- Manufacturer serologic data show significant decline in antibody 3-5 years after vaccination, although few breakthrough cases have been reported.
- While vaccine-induced immunologic memory might be protective against infection with other disease-causing encapsulated bacteria, the presence of detectable circulating antibody appears to be important for protection against N. meningitides.
MenACWY Adolescent Vaccination Recommendations

- A booster dose is not recommended for healthy persons if the first dose is administered at or after 16 years of age.

- A booster dose is not recommended for healthy persons after 21 years of age if they are not at increased risk of exposure.
  - A booster dose is not recommended for healthy persons 22 years of age and older even if the first dose was administered at 11-15 years of age.

ACIP off-label recommendation
MMWR 2013;62(RR-2):10-11
Meningococcal ACWY Recommendations for HIV-infected Persons

- Accumulating evidence indicates that HIV infection increases the risk of invasive meningococcal disease
- At the June 2016 meeting ACIP voted to recommend routine MenACWY vaccination for all HIV-infected persons age 2 months and older
- Number of doses depends on age
  • Persons 2 years and older should receive 2 doses separated by 8 weeks

Morbidity and Mortality Weekly Report

Recommendations for Use of Meningococcal Conjugate Vaccines in HIV-Infected Persons — Advisory Committee on Immunization Practices, 2016

MMWR 2016;65(43):1189–1194
Use of 2- and 3-Dose Schedules of MenB-FHbp (Trumenba) Meningococcal Serogroup B Vaccine

- **Current ACIP Recommendations for Serogroup B Meningococcal (MenB) Vaccines**
  - Certain persons aged ≥10 years who are at increased risk for meningococcal disease should receive MenB vaccine (Category A)
  - A MenB vaccine series may be administered to adolescents and young adults aged 16–23 years to provide short-term protection against most strains of serogroup B meningococcal disease (Category B)

1 MMWR 2015;64(22):608-612
2 MMWR 2015;64(41):1171-1176
Use of 2- and 3-Dose Schedules of MenB-FHbp (Trumenba) Meningococcal Serogroup B Vaccine

- Changes to the dosage and administration section for MenB-FHbp approved by FDA on April 14, 2016

- Original FDA approved schedule:
  - 3 doses—0, 2, and 6 months

- Additional schedule:
  - 2 dose schedule—0 and 6 months

  - Recommended schedule is based on the risk of exposure and the patient’s susceptibility to meningococcal serogroup B disease
Use of 2- and 3-Dose Schedules of MenB-FHbp (Trumenba) Meningococcal Serogroup B Vaccine

- Follow the 3-dose schedule for persons at increased risk for meningococcal disease and during serogroup B outbreaks
  - 3 doses of Trumenba should be administered at 0, 1-2, 6 months intervals to provide early protection and maximize short-term immunogenicity
  - However, if the second dose of Trumenba is administered at an interval of ≥ 6 months, a third dose does not need to be administered

- Follow the 2-dose schedule for healthy adolescents who are not at increased risk for meningococcal disease
  - 2 doses of Trumenba should be administered at 0 and 6 months intervals
# Meningococcal B Job Aid

## Meningococcal Vaccine Recommendations by Age and Risk Factor for Serogroup B Protection

### Routine Recommendations for Meningococcal Serogroup B Vaccination

For infants and young adults ages 16 through 23 years who wish to be vaccinated. The preferred age is 16 through 18 years.

<table>
<thead>
<tr>
<th>Vaccine</th>
<th>Doses</th>
<th>Schedule</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bexsero (Medic, Zosano, Biova)</td>
<td>2 doses</td>
<td>0 through 6 months</td>
</tr>
<tr>
<td>Trumenba (Biotech, Phase)</td>
<td>2 doses</td>
<td>0 through 6 months</td>
</tr>
</tbody>
</table>

### Risk-based Recommendations for Persons with Underlying Medical Conditions or Other Risk Factors

For people ages 16 years or older who:
- Have persistent complement component deficiencies
- Have anatomic or functional asplenia, including sickle cell disease, for people ages 16 years or older who are having decreased risk for encapsulated bacteria (N. meningitidis) routinely working with N. meningitidis

<table>
<thead>
<tr>
<th>Vaccine</th>
<th>Doses</th>
<th>Schedule</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bexsero (Medic, Zosano, Biova)</td>
<td>2 doses</td>
<td>0 through 6 months</td>
</tr>
<tr>
<td>Trumenba (Biotech, Phase)</td>
<td>2 doses</td>
<td>0 through 6 months</td>
</tr>
</tbody>
</table>

**Note:** The two brands of meningococcal B vaccine are not interchangeable. The series must be started and completed with the same brand of vaccine.

**Footnotes:**
1. Persistent complement component deficiencies include inherited or chronic deficiencies in C3, C4, properdin, factor D, and factor H-encoding mutations.
2. Local state and public health authorities to determine if vaccination is recommended.
Tetanus, diphtheria and acellular pertussis (Tdap)
Tdap Update

- Children aged 7 through 10 years who receive a dose of Tdap as part of the catch-up series, an adolescent Tdap vaccine dose may be given at age 11 through 12 years
  - Consistent with guidance when Tdap is inadvertently administered to children in this age group
Vaccine Administration Errors

1. Shoulder Injury Related to Vaccine Administration
2. Influenza Vaccination Errors
Shoulder Injury Related to Vaccine Administration

- Shoulder injury related to vaccine administration (SIRVA) was added to the Vaccine Injury Compensation Table in March 2017
- Shoulder injuries related to vaccine administration are injuries to the musculoskeletal structure of the shoulder, including the ligaments, bursa, and tendons
  - They are thought to occur as a result of the unintended injection of vaccine antigen and/or trauma from the needle going into and around the underlying bursa of the shoulder
  - Symptoms include shoulder pain and limited mobility after the injection
Shoulder Injury Related to Vaccine Administration and Vaccine Administration Best Practices

- When administering a vaccine by intramuscular (IM) injection in the deltoid muscle, use:
  - Proper landmarks and technique to identify the injection site
  - The proper needle length based on the age, size of the patient and injection technique
### Intramuscular Injections and Adults

<table>
<thead>
<tr>
<th>Age group</th>
<th>Needle length</th>
<th>Site</th>
</tr>
</thead>
<tbody>
<tr>
<td>Men and women, &lt;60 kg (130 lbs)</td>
<td>1 inch (25 mm)*</td>
<td></td>
</tr>
<tr>
<td>Men and women, 60-70 kg (130-152 lbs)</td>
<td>1 inch (25 mm)</td>
<td></td>
</tr>
<tr>
<td>Men, 70-118 kg (152-260 lbs)</td>
<td>1-1.5 inches (25-38 mm)</td>
<td>Deltoid</td>
</tr>
<tr>
<td>Women, 70-90 kg (152-200 lbs)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Men, &gt;118 kg (260 lbs)</td>
<td>1.5 inches (38 mm)</td>
<td></td>
</tr>
<tr>
<td>Women, &gt;90 kg (200 lbs)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Some experts recommend a 5/8-inch needle for men and women who weigh <60 kg

Best Practices Guidance of the Advisory Committee on Immunization Practices (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)
Clinical Resources for Shoulder Injury Related to Vaccine Administration

- CDC Vaccine administration webpage for information and materials for health care personnel including
  - IM demonstration video
  - Job aids and infographics

www.cdc.gov/vaccines/hcp/admin/admin-protocols.htm

www.cdc.gov/vaccines/hcp/administer-vaccines.html

www.cdc.gov/vaccines/hcp/infographics/call-the-shots.pdf
### Influenza Vaccine Administration Errors Reported to VAERS, 2016–2017

<table>
<thead>
<tr>
<th>Vaccine error group*</th>
<th>0–18 years N (%)</th>
<th>All ages N (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Inappropriate schedule</td>
<td>82 (52)</td>
<td>118 (21)</td>
</tr>
<tr>
<td>2. Incorrect dose (amount)</td>
<td>45 (28)</td>
<td>96 (17)</td>
</tr>
<tr>
<td>3. Wrong vaccine</td>
<td>18 (11)</td>
<td>36 (6)</td>
</tr>
<tr>
<td>Administration error</td>
<td>7 (4)</td>
<td>125 (22)</td>
</tr>
<tr>
<td>Product quality</td>
<td>4 (3)</td>
<td>152 (27)</td>
</tr>
<tr>
<td>Contraindication</td>
<td>1 (&lt;1)</td>
<td>1 (&lt;1)</td>
</tr>
<tr>
<td>Equipment</td>
<td>1 (&lt;1)</td>
<td>29 (5)</td>
</tr>
<tr>
<td>General error</td>
<td>1 (&lt;1)</td>
<td>4 (&lt;1)</td>
</tr>
<tr>
<td>Prescribing/dispensing</td>
<td>0 (0)</td>
<td>0 (0)</td>
</tr>
<tr>
<td>Product labeling/packaging</td>
<td>0 (0)</td>
<td>2 (&lt;1)</td>
</tr>
</tbody>
</table>

| Total errors†        | 159 errors       | 564 errors    |

*Some groupings contain more than one MedDRA code; error groups are not mutually exclusive

†In persons aged 0–18 years: 154 reports; all ages: 549 reports. Individual report may be associated with more than one vaccination error or error group depending on assigned MedDRA terms.
Inappropriate Schedule

- Keep current reference materials available for staff, including:
  - Recommended childhood schedule
  - Minimum age and interval table

- Educate staff who administer immunizations about vaccines in the facility’s inventory

- Educate staff to schedule immunization appointments AFTER the child’s birthday

- Participate with and assess for vaccines using

ACIP General Best Practices, Table 3-1: [www.cdc.gov/mmwr/pdf/rr/rr6003.pdf](http://www.cdc.gov/mmwr/pdf/rr/rr6003.pdf)
ACIP Immunization Schedules for Children and Adults: [www.cdc.gov/vaccines/schedules/](http://www.cdc.gov/vaccines/schedules/)
Immunization Information Systems: [www.cdc.gov/vaccines/programs/iis/index.html](http://www.cdc.gov/vaccines/programs/iis/index.html)
Wrong Dose

- Only administer vaccines you have prepared and triple-checked
- Use standardized ACIP vaccine abbreviations
- Consider using standing orders

ACIP vaccine abbreviations: www.cdc.gov/vaccines/acip/committee/guidance/vac-abbrev.html
Immunization Action Coalition: standing orders templates: www.immunize.org/standing-orders/
Wrong Vaccine

- Label vaccines with type, age, and gender (if applicable):
  - Color coding labels can help

- Store some vaccines on separate shelves:
  - Pediatric and adult formulations of the same vaccine
  - Sound-alike and look-alike vaccines

IIIV4 (Fluzone)
(Quadrivalent Inactivated Influenza Vaccine)

Ages: 6 months and older
Dosage: 0.25 mL for 6 months through 35 months
        0.5 mL for 3 years and older
Route: Intramuscular (IM) injection

A maximum of 10 doses can be withdrawn from the multidose vial

CDC vaccine labels

CDC vaccine label examples: [www.cdc.gov/vaccines/hcp/admin/storage/guide/vaccine-storage-labels.pdf](http://www.cdc.gov/vaccines/hcp/admin/storage/guide/vaccine-storage-labels.pdf)
Reporting Vaccination Errors to Vaccine Adverse Event Reporting System (VAERS)

- HCP are encouraged to report all significant adverse events and vaccination errors that occur after vaccination of adults and children
- VAERS accepts all reports, including reports of vaccination errors including shoulder injury related to vaccine administration and others

There are 3 ways to report to VAERS – online, fax or mail

Vaccine Adverse Event Reporting System www.vaers.hhs.gov/esub/index
Strategies to Prevent Vaccination Errors

Knowledgeable Staff

- Before administering vaccines, all personnel who will administer vaccines should:
  - Receive competency-based training
  - Have knowledge and skills validated

- Integrate competency-based training into:
  - New staff orientation
  - Annual education requirements

- Ongoing education:
  - Whenever vaccine administration recommendations are updated
  - When new vaccines are added to inventory

- AND establish an environment that values reporting and investigating errors as part of risk management and quality improvement
Vaccine Administration Resources for Health Care Personnel

- CDC vaccine administration materials for health care personnel include:
  - Printable clinical job aids
  - Videos
  - Vaccine administration e-Learn

CDC Vaccine Administration: [www.cdc.gov/vaccines/hcp/admin/admin-protocols.html](http://www.cdc.gov/vaccines/hcp/admin/admin-protocols.html)
Immunization Resources
CDC Resources for Staff Education

- Multiple education products available free through the CDC website:
  - Immunization courses (webcasts and online self-study)
  - Netconferences
  - You Call the Shots self-study modules
- Continuing education available

You Call the Shots Web-Based Training

- New and updated and modules
  - Vaccine Administration
  - Human Papillomavirus
  - Vaccines For Children (VFC)
  - Vaccine Storage and Handling

You Call the Shots: [www.cdc.gov/vaccines/ed/youcalltheshots.html](http://www.cdc.gov/vaccines/ed/youcalltheshots.html)
Supplement includes information on:
• Human Papillomavirus
• Meningococcal disease
• Pneumococcal disease

Webinar series provides:
• Information about vaccine-preventable diseases and the vaccines that prevent them

2017 archived presentations available online now

Free continuing education

For more information:
www.cdc.gov/vaccines/ed/webinar-epv/index.html

CDC Epidemiology and Prevention of Vaccine-Preventable Diseases:
www.cdc.gov/vaccines/pubs/pinkbook/supplement.html
www.cdc.gov/vaccines/pubs/pinkbook/index.html

Course text available online – view, print, or download
Bound copies may be purchased
CDC Vaccine and Immunization Resources

Questions? Email CDC

Providers
nipinfo@cdc.gov

Parents and patients
www.cdc.gov/cdcinfo

Website
www.cdc.gov/vaccines

Twitter
@DrNancyM_CDC

Influenza
www.cdc.gov/flu

Vaccine Safety
www.cdc.gov/vaccinesafety
Additional Immunization Resources

- Massachusetts Immunization Program
- Immunization Action Coalition [www.immunize.org](http://www.immunize.org)
- Vaccine Education Center [www.chop.edu](http://www.chop.edu)
- American Academy of Pediatrics (AAP) [www.aap.org/immunize](http://www.aap.org/immunize)
- National Foundation for Infectious Diseases (NFID) [www.nfid.org](http://www.nfid.org)
Extra Slides
Special Consideration Influenza Vaccine and Egg Allergy

- People with egg allergies can receive any licensed, recommended age-appropriate influenza vaccine
  - Patients no longer have to be monitored for 30 minutes after vaccination
- People who have severe egg allergies should be vaccinated in a medical setting and be supervised by a health care provider who is able to recognize and manage severe allergic conditions
- These recommendations were updated for 2016-2017 flu season