Protecting Your Adult Patients From Vaccine Preventable Diseases

Michigan Physician Peer Education Project on Immunizations

November, 2018

Presenter Disclosure

- ACCME Disclosure
- Please fill in your pre-test in your packet
- Please sign in if you have not already done so

Today's Adult Immunization Overview

- Challenges to reaching the Healthy People 2020 goals
- Vaccine updates
- Strategies to improve immunization practices

Challenge: Disease Burden

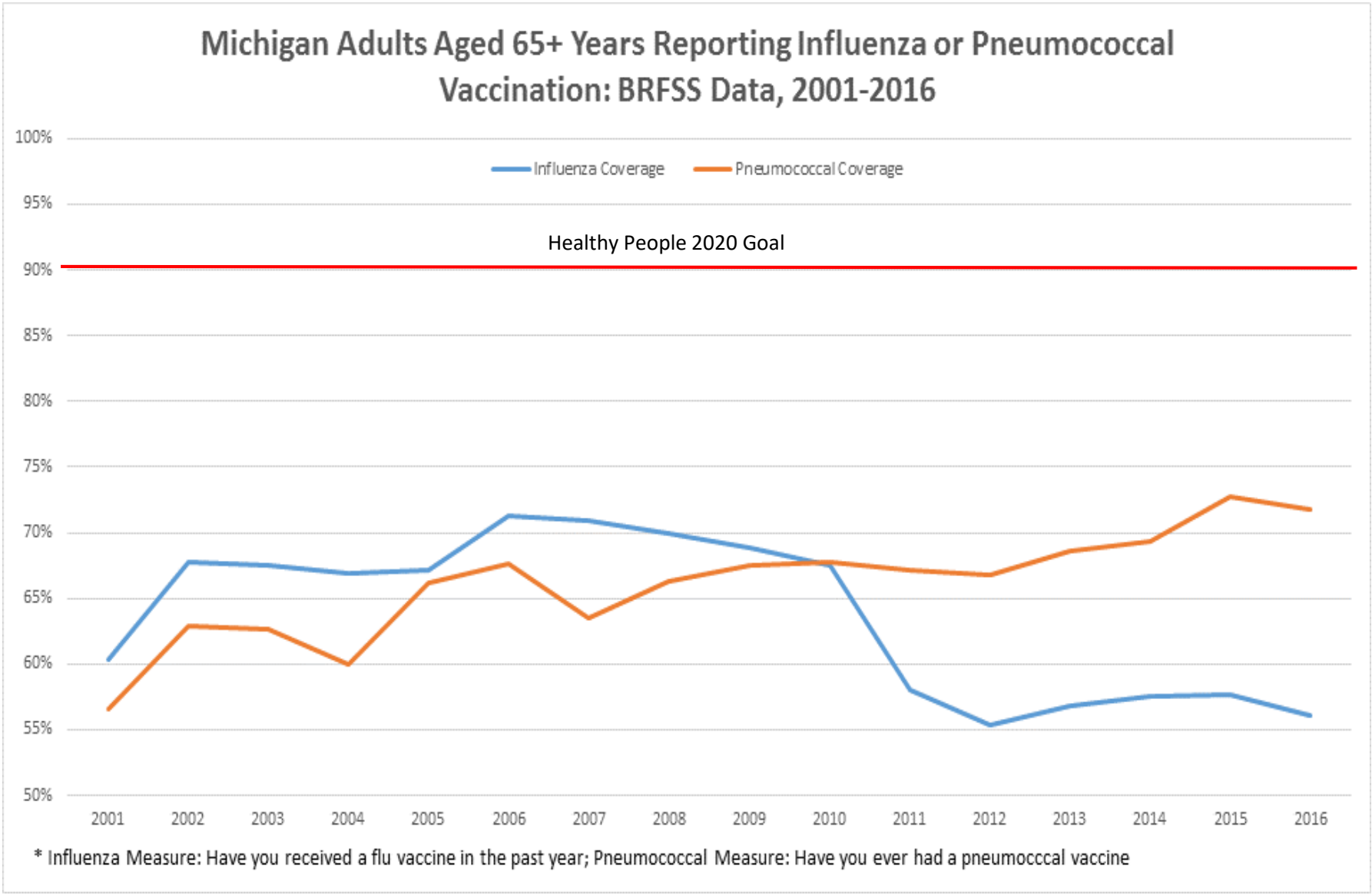
- Annual estimated U.S. mortality from vaccine preventable diseases:
  - 12,000-56,000 from Flu/its complications*
  - 5,000-6,000 from Hepatitis B
  - 4,000 from invasive pneumococcal disease
  - 4,000 from cervical cancer caused by HPV
- Influenza and pneumococcal disease combined are the 5th leading cause of deaths in adults greater than 65 years
- Measles, mumps, pertussis and varicella outbreaks

*The estimated U.S. mortality from flu is based on estimates from the 2010-2011 through the 2013-2014 flu seasons. This estimate will be updated every five years

Challenge: Disparities
Michigan Rates For Age 65 Years/Older

Adults Aged 65 Years/Older	2017 Rates In Michigan	2020 Healthy People Goals
Flu vaccine in 2017 (overall)	60.3%	90%
-White, non-Hispanic	61.0%	90%
-Black, non-Hispanic	50.1%	90%
1+ PPSV23 by 2016 (overall)	75.7%	90%
-White, non-Hispanic	76.8%	90%
-Black, non-Hispanic	65.3%	90%

Behavioral Risk Factor Surveillance System (BRFSS) Prevalence Data and Analysis 2017



Behavioral Risk Factor Surveillance System (BRFSS) Prevalence Data and Analysis

How Do We Start Improving On Adult Vaccine Preventable Disease (VPD) Protection?

Strategies To Improve Immunization Practices

- Ensure patients **understand** recommended vaccines
  - Based on age, risk condition, occupation and/or lifestyle
- **Strongly** recommend vaccines
- **Assess** immunization status at every visit
- Offer **all** recommended vaccines at every visit
  - Be prepared to make referrals for vaccines not available
  - Follow true contraindications-do not miss opportunities
- **Document** administered vaccines in MCIR
- **Remind** patients that family members and close contacts should also be fully vaccinated

Based on "Standards for Adult Immunization Practice" 2013

2018 Recommended Schedule For Adults

Recommended vaccinations indicated for adults based on **vaccine and age group**

Figure 1. Recommended immunization schedule for adults aged 19 years or older by age group, United States, 2018

This figure should be reviewed with the accompanying footnotes. This figure and the footnotes describe indications for which vaccines, if not previously administered, should be administered unless noted otherwise.

Vaccine	19–21 years	22–26 years	27–49 years	50–64 years	≥65 years
Influenza[1]	1 dose annually				
Tdap[2] or Td[2]	1 dose Tdap, then Td booster every 10 yrs				
MMR[3]	1 or 2 doses depending on indication (if born in 1957 or later)				
VAR[4]	2 doses				
RZV[5] (preferred)				2 doses RZV (preferred)	
or				or	
ZVL[5]					1 dose ZVL
HPV–Female[6]	2 or 3 doses depending on age at series initiation				
HPV–Male[6]	2 or 3 doses depending on age at series initiation				
PCV13[7]	1 dose				
PPSV23[7]	1 or 2 doses depending on indication				1 dose
HepA[8]	2 or 3 doses depending on vaccine				
HepB[9]	3 doses				
MenACWY[10]	1 or 2 doses depending on indication, then booster every 5 yrs if risk remains				
MenB[10]	2 or 3 doses depending on vaccine				
Hib[11]	1 or 3 doses depending on indication				

Recommended for adults who meet the age requirement, lack documentation of vaccination, or lack evidence of past infection

Recommended for adults with other indications

No recommendation

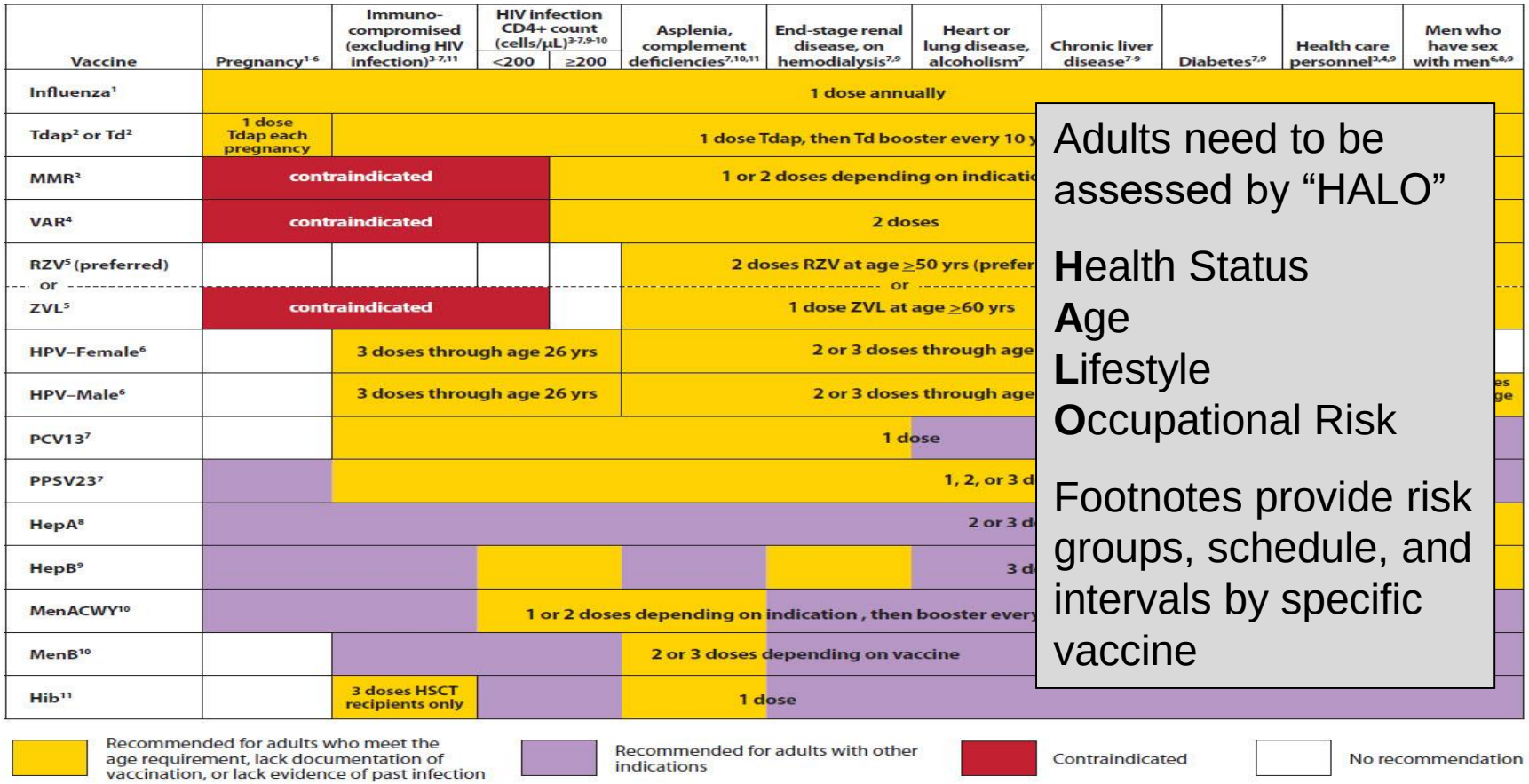
2018 CDC Adult Immunization Schedule by Vaccine and Age Group

2018 Recommended Schedule For Adults

Recommended vaccinations indicated for adults based on **medical and other indications**

Figure 2. Recommended immunization schedule for adults aged 19 years or older by medical condition and other indications, United States, 2018

This figure should be reviewed with the accompanying footnotes. This figure and the footnotes describe indications for which vaccines, if not previously administered, should be administered unless noted otherwise.



Adults need to be assessed by "HALO"

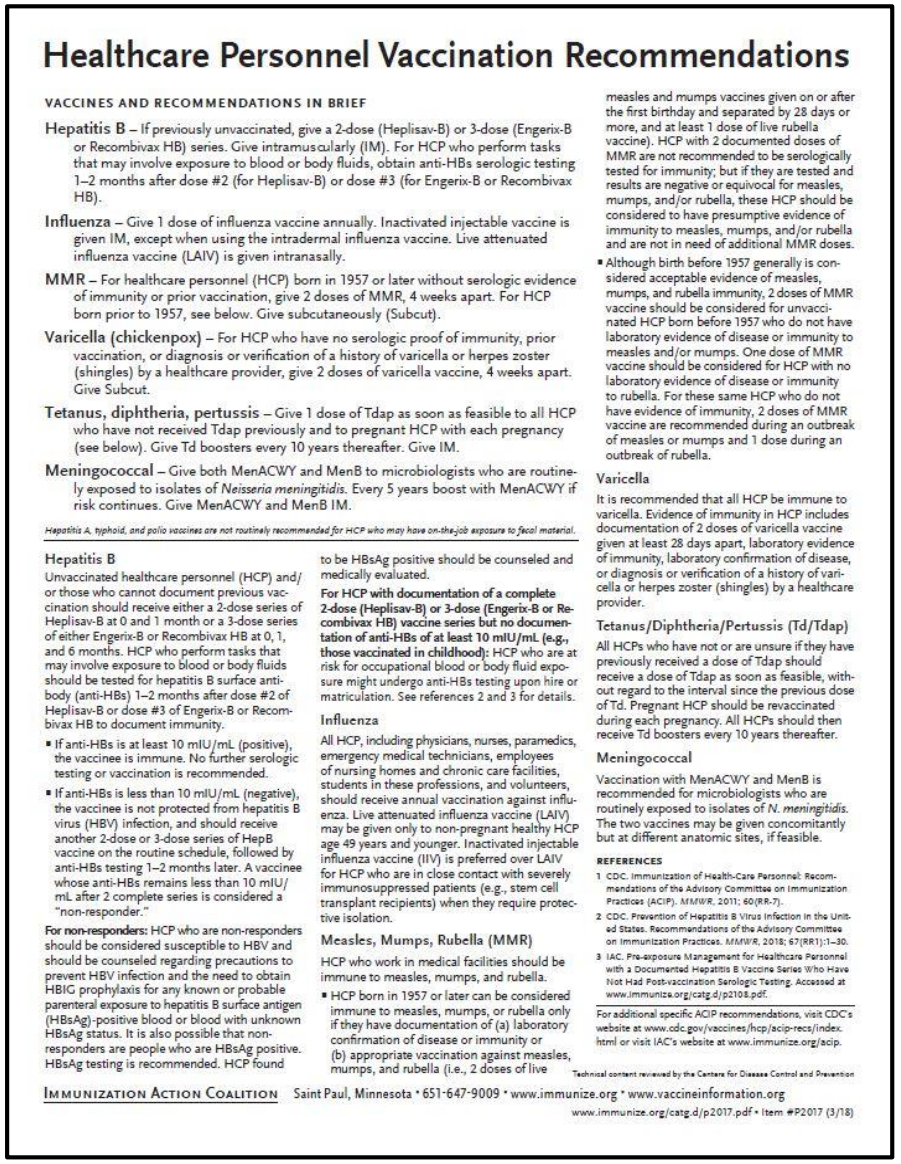
Health Status
Age
Lifestyle
Occupational Risk

Footnotes provide risk groups, schedule, and intervals by specific vaccine

2018 CDC Adult Immunization Schedule by Medical and Other Indications

Routine Vaccine Recommendations For Health Care Personnel

- Hepatitis B
- Influenza
- MMR
- Varicella
- Tetanus, diphtheria, pertussis
- Ensure **all** personnel within your clinic are protected



Healthcare Personnel Vaccination Recommendations

VACCINES AND RECOMMENDATIONS IN BRIEF

Hepatitis B – If previously unvaccinated, give a 2-dose (Heplisav-B) or 3-dose (Engerix-B or Recombivax HB) series. Give intramuscularly (IM). For HCP who perform tasks that may involve exposure to blood or body fluids, obtain anti-HBs serologic testing 1–2 months after dose #2 (for Heplisav-B) or dose #3 (for Engerix-B or Recombivax HB).

Influenza – Give 1 dose of influenza vaccine annually. Inactivated injectable vaccine is given IM, except when using the intradermal influenza vaccine. Live attenuated influenza vaccine (LAIV) is given intranasally.

MMR – For healthcare personnel (HCP) born in 1957 or later without serologic evidence of immunity or prior vaccination, give 2 doses of MMR, 4 weeks apart. For HCP born prior to 1957, see below. Give subcutaneously (Subcut).

Varicella (chickenpox) – For HCP who have no serologic proof of immunity, prior vaccination, or diagnosis or verification of a history of varicella or herpes zoster (shingles) by a healthcare provider, give 2 doses of varicella vaccine, 4 weeks apart. Give Subcut.

Tetanus, diphtheria, pertussis – Give 1 dose of Tdap as soon as feasible to all HCP who have not received Tdap previously and to pregnant HCP with each pregnancy (see below). Give Td boosters every 10 years thereafter. Give IM.

Meningococcal – Give both MenACWY and MenB to microbiologists who are routinely exposed to isolates of *Neisseria meningitidis*. Every 5 years boost with MenACWY if risk continues. Give MenACWY and MenB IM.

Hepatitis A, typhoid, and polio vaccines are not routinely recommended for HCP who may have on-the-job exposure to fecal material.

Hepatitis B

Unvaccinated healthcare personnel (HCP) and/or those who cannot document previous vaccination should receive either a 2-dose series of Heplisav-B at 0 and 1 month or a 3-dose series of either Engerix-B or Recombivax HB at 0, 1, and 6 months. HCP who perform tasks that may involve exposure to blood or body fluids should be tested for hepatitis B surface antibody (anti-HBs) 1–2 months after dose #2 of Heplisav-B or dose #3 of Engerix-B or Recombivax HB to document immunity.

- If anti-HBs is at least 10 mIU/mL (positive), the vaccinee is immune. No further serologic testing or vaccination is recommended.
- If anti-HBs is less than 10 mIU/mL (negative), the vaccinee is not protected from hepatitis B virus (HBV) infection, and should receive another 2-dose or 3-dose series of HepB vaccine on the routine schedule, followed by anti-HBs testing 1–2 months later. A vaccinee whose anti-HBs remains less than 10 mIU/mL after 2 complete series is considered a "non-responder."

For non-responders: HCP who are non-responders should be considered susceptible to HBV and should be counseled regarding precautions to prevent HBV infection and the need to obtain HBIG prophylaxis for any known or probable parenteral exposure to hepatitis B surface antigen (HBsAg)-positive blood or blood with unknown HBsAg status. It is also possible that non-responders are people who are HBsAg positive. HBsAg testing is recommended. HCP found to be HBsAg positive should be counseled and medically evaluated.

For HCP with documentation of a complete 2-dose (Heplisav-B) or 3-dose (Engerix-B or Recombivax HB) vaccine series but no documentation of anti-HBs of at least 10 mIU/mL (e.g., those vaccinated in childhood): HCP who are at risk for occupational blood or body fluid exposure might undergo anti-HBs testing upon hire or matriculation. See references 2 and 3 for details.

Influenza

All HCP, including physicians, nurses, paramedics, emergency medical technicians, employees of nursing homes and chronic care facilities, students in these professions, and volunteers, should receive annual vaccination against influenza. Live attenuated influenza vaccine (LAIV) may be given only to non-pregnant healthy HCP age 49 years and younger. Inactivated injectable influenza vaccine (IIV) is preferred over LAIV for HCP who are in close contact with severely immunosuppressed patients (e.g., stem cell transplant recipients) when they require protective isolation.

Measles, Mumps, Rubella (MMR)

HCP who work in medical facilities should be immune to measles, mumps, and rubella.

- HCP born in 1957 or later can be considered immune to measles, mumps, or rubella only if they have documentation of (a) laboratory confirmation of disease or immunity or (b) appropriate vaccination against measles, mumps, and rubella (i.e., 2 doses of live measles and mumps vaccines given on or after the first birthday and separated by 28 days or more, and at least 1 dose of live rubella vaccine). HCP with 2 documented doses of MMR are not recommended to be serologically tested for immunity; but if they are tested and results are negative or equivocal for measles, mumps, and/or rubella, these HCP should be considered to have presumptive evidence of immunity to measles, mumps, and/or rubella and are not in need of additional MMR doses.
- Although birth before 1957 generally is considered acceptable evidence of measles, mumps, and rubella immunity, 2 doses of MMR vaccine should be considered for unvaccinated HCP born before 1957 who do not have laboratory evidence of disease or immunity to measles and/or mumps. One dose of MMR vaccine should be considered for HCP with no laboratory evidence of disease or immunity to rubella. For these same HCP who do not have evidence of immunity, 2 doses of MMR vaccine are recommended during an outbreak of measles or mumps and 1 dose during an outbreak of rubella.

Varicella

It is recommended that all HCP be immune to varicella. Evidence of immunity in HCP includes documentation of 2 doses of varicella vaccine given at least 28 days apart, laboratory evidence of immunity, laboratory confirmation of disease, or diagnosis or verification of a history of varicella or herpes zoster (shingles) by a healthcare provider.

Tetanus/Diphtheria/Pertussis (Td/Tdap)

All HCPs who have not or are unsure if they have previously received a dose of Tdap should receive a dose of Tdap as soon as feasible, without regard to the interval since the previous dose of Td. Pregnant HCP should be revaccinated during each pregnancy. All HCPs should then receive Td boosters every 10 years thereafter.

Meningococcal

Vaccination with MenACWY and MenB is recommended for microbiologists who are routinely exposed to isolates of *N. meningitidis*. The two vaccines may be given concomitantly but at different anatomic sites, if feasible.

REFERENCES

1. CDC. Immunization of Health-Care Personnel: Recommendations of the Advisory Committee on Immunization Practices (ACIP). *MMWR*. 2011; 60(RR-7).
2. CDC. Prevention of Hepatitis B Virus Infection in the United States. Recommendations of the Advisory Committee on Immunization Practices. *MMWR*. 2018; 67(RR1):1–30.
3. IAC. Pre-exposure Management for Healthcare Personnel with a Documented Hepatitis B Vaccine Series Who Have Not Had Post-vaccination Serologic Testing. Accessed at www.immunize.org/catg.d/p2108.pdf.

For additional specific ACIP recommendations, visit CDC's website at www.cdc.gov/vaccines/hcp/acip-recs/index.html or visit IAC's website at www.immunize.org/acip.

Technical content reviewed by the Centers for Disease Control and Prevention

IMMUNIZATION ACTION COALITION Saint Paul, Minnesota • 651-647-9009 • www.immunize.org • www.vaccineinformation.org

www.immunize.org/catg.d/p2017.pdf • Item #P2017 (3/18)

Healthcare Personnel Vaccination Recommendations

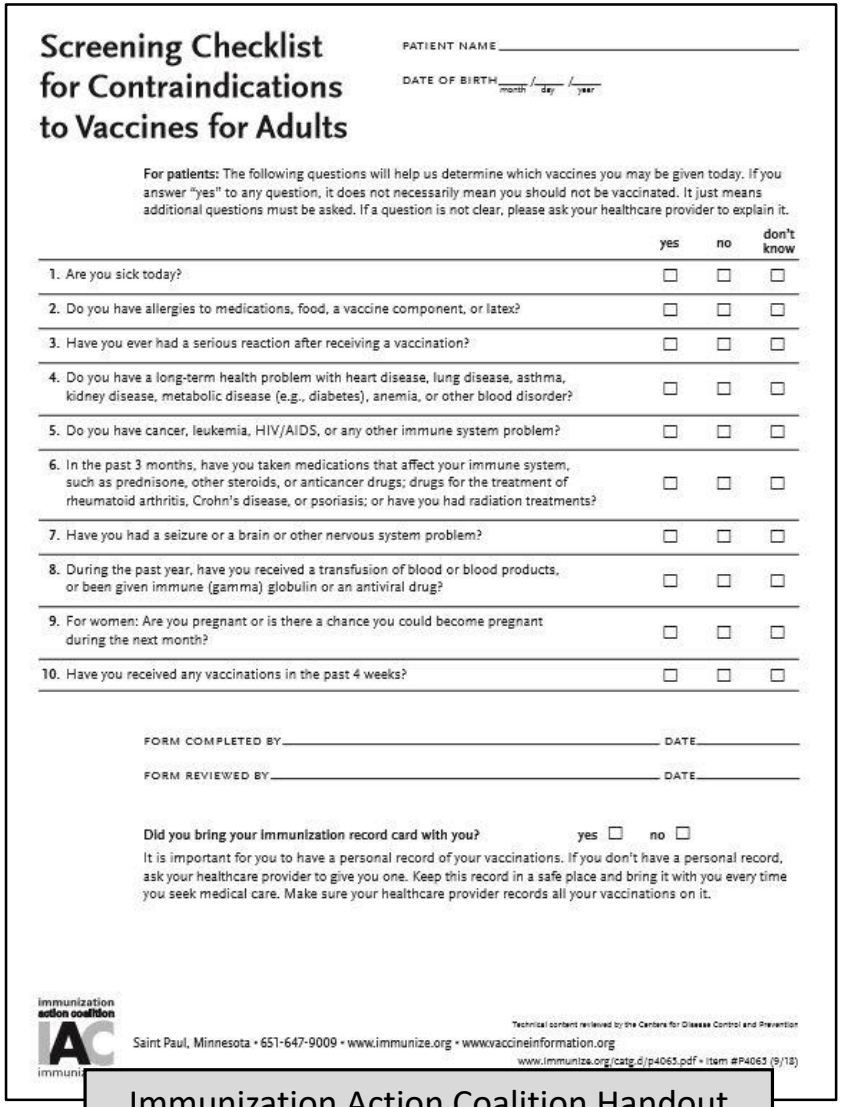
Contraindications and Precautions

- Contraindication:
  - Condition in a recipient that greatly increases the chance of a serious adverse reaction (i.e., anaphylactic reaction to a previous dose of vaccine or vaccine component)
- Precaution:
  - Condition in a recipient that might increase the chance or severity of an adverse reaction or might compromise the ability of the vaccine to produce immunity (i.e., moderate to severe illness (all vaccines), pregnancy (live vaccines)

Epidemiology and Prevention of Vaccine-Preventable Diseases-Chapter 4: Vaccine Safety

Screening for Contraindications and Precautions

- Screen at **every** visit, before **every** dose of vaccine is administered
  - Even if the same vaccine was previously administered
- Use a standardized screening tool to assess patients
- Follow only valid contraindications and precautions
- Document in the chart or EMR
  - Screening tool was used and the results
  - Note any permanent or temporary contraindications
- Safety net
  - Helps prevent serious adverse reactions



Screening Checklist for Contraindications to Vaccines for Adults

PATIENT NAME _____

DATE OF BIRTH ___ / ___ / ___ (month / day / year)

For patients: The following questions will help us determine which vaccines you may be given today. If you answer "yes" to any question, it does not necessarily mean you should not be vaccinated. It just means additional questions must be asked. If a question is not clear, please ask your healthcare provider to explain it.

	yes	no	don't know
1. Are you sick today?	☐	☐	☐
2. Do you have allergies to medications, food, a vaccine component, or latex?	☐	☐	☐
3. Have you ever had a serious reaction after receiving a vaccination?	☐	☐	☐
4. Do you have a long-term health problem with heart disease, lung disease, asthma, kidney disease, metabolic disease (e.g., diabetes), anemia, or other blood disorder?	☐	☐	☐
5. Do you have cancer, leukemia, HIV/AIDS, or any other immune system problem?	☐	☐	☐
6. In the past 3 months, have you taken medications that affect your immune system, such as prednisone, other steroids, or anticancer drugs; drugs for the treatment of rheumatoid arthritis, Crohn's disease, or psoriasis; or have you had radiation treatments?	☐	☐	☐
7. Have you had a seizure or a brain or other nervous system problem?	☐	☐	☐
8. During the past year, have you received a transfusion of blood or blood products, or been given immune (gamma) globulin or an antiviral drug?	☐	☐	☐
9. For women: Are you pregnant or is there a chance you could become pregnant during the next month?	☐	☐	☐
10. Have you received any vaccinations in the past 4 weeks?	☐	☐	☐

FORM COMPLETED BY _____ DATE _____

FORM REVIEWED BY _____ DATE _____

Did you bring your immunization record card with you? yes ☐ no ☐

It is important for you to have a personal record of your vaccinations. If you don't have a personal record, ask your healthcare provider to give you one. Keep this record in a safe place and bring it with you every time you seek medical care. Make sure your healthcare provider records all your vaccinations on it.

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Technical content reviewed by the Centers for Disease Control and Prevention

Saint Paul, Minnesota • 651-647-9009 • www.immunize.org • www.vaccineinformation.org

www.immunize.org/catg.d/p4065.pdf • Item #P4065 (9/18)

Immunization Action Coalition Handout

Adults Aged 19 Years And Older

Routine and High Risk Vaccine Recommendations

Pertussis Challenges

- Pertussis disease in Michigan
  - 2018: 408 (as of 9/30/18)
  - 2017: 773 (98% ↑ over 2016)
  - 2016: 389
  - 2015: 496
  - 2014: 1,424

Photo Courtesy of Franny Strong Foundation
Francesca Marie McNally Lost Her Life to Pertussis in May 2012

- Infants are at greatest risk for pertussis and its complications
  - 50% of infants < 1 year will be hospitalized
    - 1 out of 100 infants needing hospital treatment will die
- Vaccination is considered the best option for protection

CDC Pertussis Frequently Asked Questions
Summary of Vaccine Preventable Diseases Reported to MDHHS

Tetanus, diphtheria and pertussis (Tdap)

- Beginning at age 11 years, vaccinate all persons without a previous dose of Tdap

Adults/Group	National Rate
Age 19 years and older	26.6%
Health Care Personnel	49.0%

- To ensure pertussis protection, Tdap can be administered regardless of interval since last tetanus or diphtheria-toxoid containing vaccine
- No current recommendation for routine 2nd dose

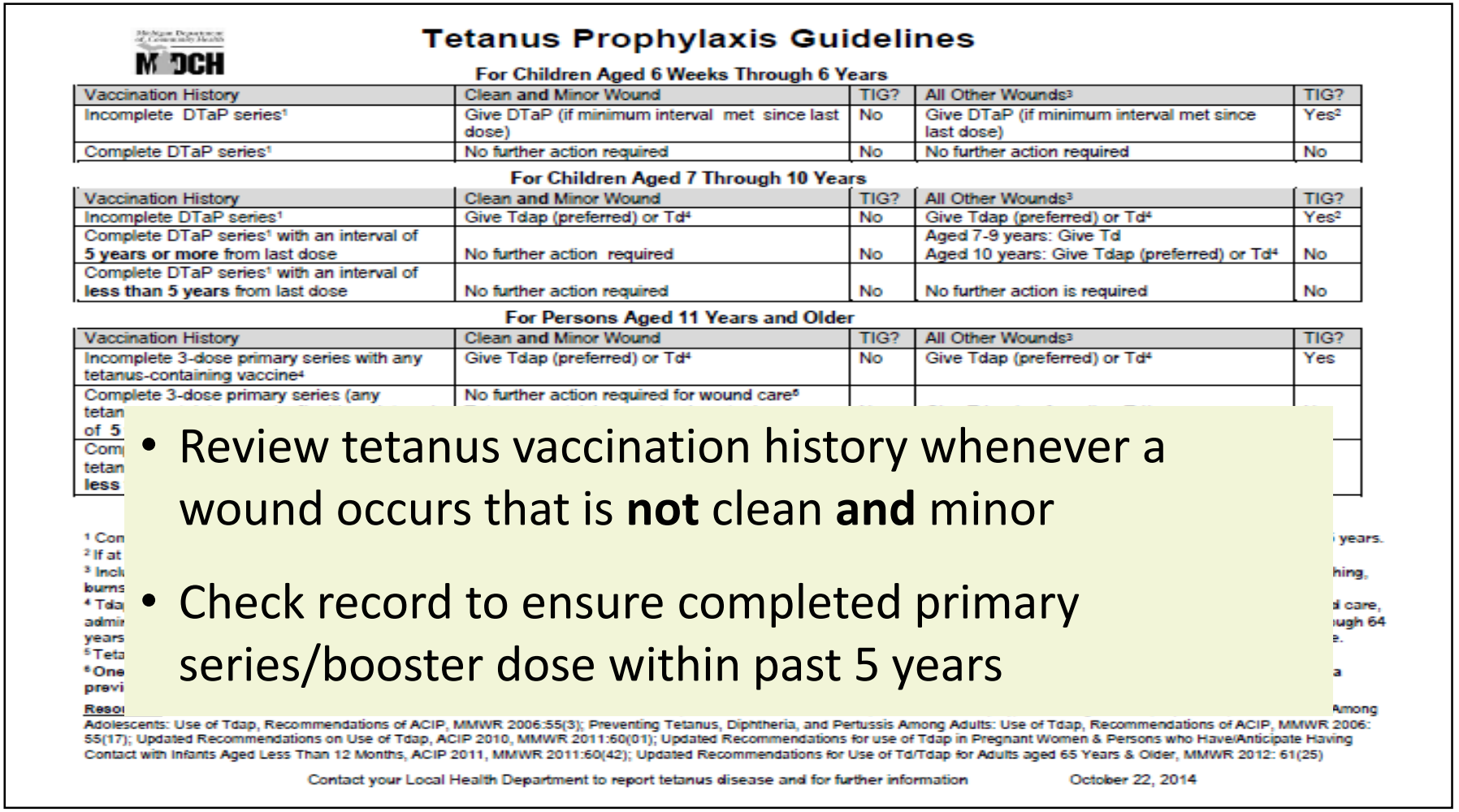
Vaccination Coverage Among Adults in the United States, National Health Interview Survey, 2016

Strategies For Protecting Infants

- Maternal Vaccination
  - Women should receive 1 dose of Tdap during every pregnancy
    - Preferably during the **early part** of gestational weeks 27 through 36
    - Will best ensure maternal antibody transfer to the fetus
  - If Tdap was **not** administered **prior to or during** pregnancy, give Tdap immediately postpartum (not optimal)
- 66 California mothers of infants <4 months with pertussis were interviewed
  - Only 30% appropriately received Tdap vaccine
- Strategies to increase Tdap coverage among pregnant women:
  - Promote on-site prenatal vaccination
  - Educate providers about Tdap Recommendations
  - Strengthen off-site referral
  - "Cocoon" the infant
    - Only 43.6% of persons living with an infant have received a Tdap vaccine

Updated Recommendations for Use of Tetanus Toxoid, Reduced Diphtheria Toxoid and Acellular Pertussis (Tdap) Vaccine in Pregnant Women
Vaccination Coverage Among Adults in the United States, National Health Interview Survey, 2016
Barriers to Receipt of Prenatal Tetanus Toxoid, Reduced Diphtheria Toxoid, and Acellular Pertussis Vaccine Among Mothers of Infants Aged < 4 months with Pertussis-California, 2016

Tetanus Prophylaxis Guidelines



Tetanus Prophylaxis Guidelines

For Children Aged 6 Weeks Through 6 Years

Vaccination History	Clean and Minor Wound	TIG?	All Other Wounds[3]	TIG?
Incomplete DTaP series[1]	Give DTaP (if minimum interval met since last dose)	No	Give DTaP (if minimum interval met since last dose)	Yes[2]
Complete DTaP series[1]	No further action required	No	No further action required	No

For Children Aged 7 Through 10 Years

Vaccination History	Clean and Minor Wound	TIG?	All Other Wounds[3]	TIG?
Incomplete DTaP series[1]	Give Tdap (preferred) or Td[4]	No	Give Tdap (preferred) or Td[4]	Yes[2]
Complete DTaP series[1] with an interval of **5 years or more** from last dose	No further action required	No	Aged 7-9 years: Give Td Aged 10 years: Give Tdap (preferred) or Td[4]	No
Complete DTaP series[1] with an interval of **less than 5 years** from last dose	No further action required	No	No further action is required	No

For Persons Aged 11 Years and Older

Vaccination History	Clean and Minor Wound	TIG?	All Other Wounds[3]	TIG?
Incomplete 3-dose primary series with any tetanus-containing vaccine[4]	Give Tdap (preferred) or Td[4]	No	Give Tdap (preferred) or Td[4]	Yes
Complete 3-dose primary series (any tetan… of 5	No further action required for wound care[5]			
Com… tetan… less				

- Review tetanus vaccination history whenever a wound occurs that is **not** clean **and** minor
- Check record to ensure completed primary series/booster dose within past 5 years

[1] Con… years.
[2] If at…
[3] Incl… hing, burns
[4] Tda… l care, admi… ugh 64 years… e.
[5] Teta…
[6] One… a previ…

Reso… Among Adolescents: Use of Tdap, Recommendations of ACIP, MMWR 2006:55(3); Preventing Tetanus, Diphtheria, and Pertussis Among Adults: Use of Tdap, Recommendations of ACIP, MMWR 2006: 55(17); Updated Recommendations on Use of Tdap, ACIP 2010, MMWR 2011:60(01); Updated Recommendations for use of Tdap in Pregnant Women & Persons who Have/Anticipate Having Contact with Infants Aged Less Than 12 Months, ACIP 2011, MMWR 2011:60(42); Updated Recommendations for Use of Td/Tdap for Adults aged 65 Years & Older, MMWR 2012: 61(25)

Contact your Local Health Department to report tetanus disease and for further information October 22, 2014

Michigan Department of Health and Human Services or Alliance in Michigan Immunization Provider Toolkit

HPV Infection

- By age 50, at least 4 out of every 5 (at least 80%) women will have been infected with HPV at one point in their lives. HPV is also very common in men[1]
  - Estimated 79 million Americans currently infected
  - 14 million new infections/year in the US
  - HPV infection is most common in people in their late teens and early 20s
- Easily Spread by intimate skin-to-skin contact during sexual activity
  - Not just with sexual intercourse
- Most people will never know they have been infected

[1]Basic Information about HPV and Cancer
CDC Basic Genital HPV Infection-Fact Sheet

HPV-Attributable Cancers

- Annually in the U.S., an average of 42,700 new cases of cancer occur in parts of the body where mucosal HPV types are found*
  - Cervix, vagina, vulva
  - Anus, penis
  - Oropharynx (including tongue and tonsils)
- Of these, about 31,200 attributed to HPV types that are preventable with the 9-valent HPV vaccine

* Based on Data from 2011 to 2015

HPV-Associated Cancer Statistics
United States Cancer Statistics Data Brief No. 4 August 2018

Updated HPV Vaccine Recommendations

- For persons who initiate an HPV series prior to their 15th birthday, use a 2-dose HPV schedule (0, 6-12 months)
  - Minimum interval is 5 months

- For persons who initiate HPV series at/after age 15 years and for persons who are immunocompromised (regardless of age at 1st dose), use a 3-dose schedule (0, 1-2, 6 months)
  - Minimum intervals: Dose 1 to 2 = 4 weeks; Dose 2 to 3 = 12 weeks; Dose 1 to 3 = 5 months

- Persons with a complete HPV series (regardless of brand) are not recommended to receive any additional doses

See MDHHS Handout: "A Quick Look at Using Human Papillomavirus (HPV) Vaccine" for Guidance

Further HPV Vaccine Points

For Females:	Aged 9-26 years
For Males:	Aged 9-21 years Aged 22-26 years if high risk (immunocompromised or MSM[1]) May give to males aged 22-26 years without a known risk factor
Routine age:	Ages 11-12 years

- Initiate HPV vaccine beginning at age 9 years to children and youth with any history of sexual abuse or assault
- While not contraindicated, HPV is not recommended during pregnancy
- If the series is initiated prior to the 27th birthday, it may be completed after age 26 years (may not be covered by insurance)

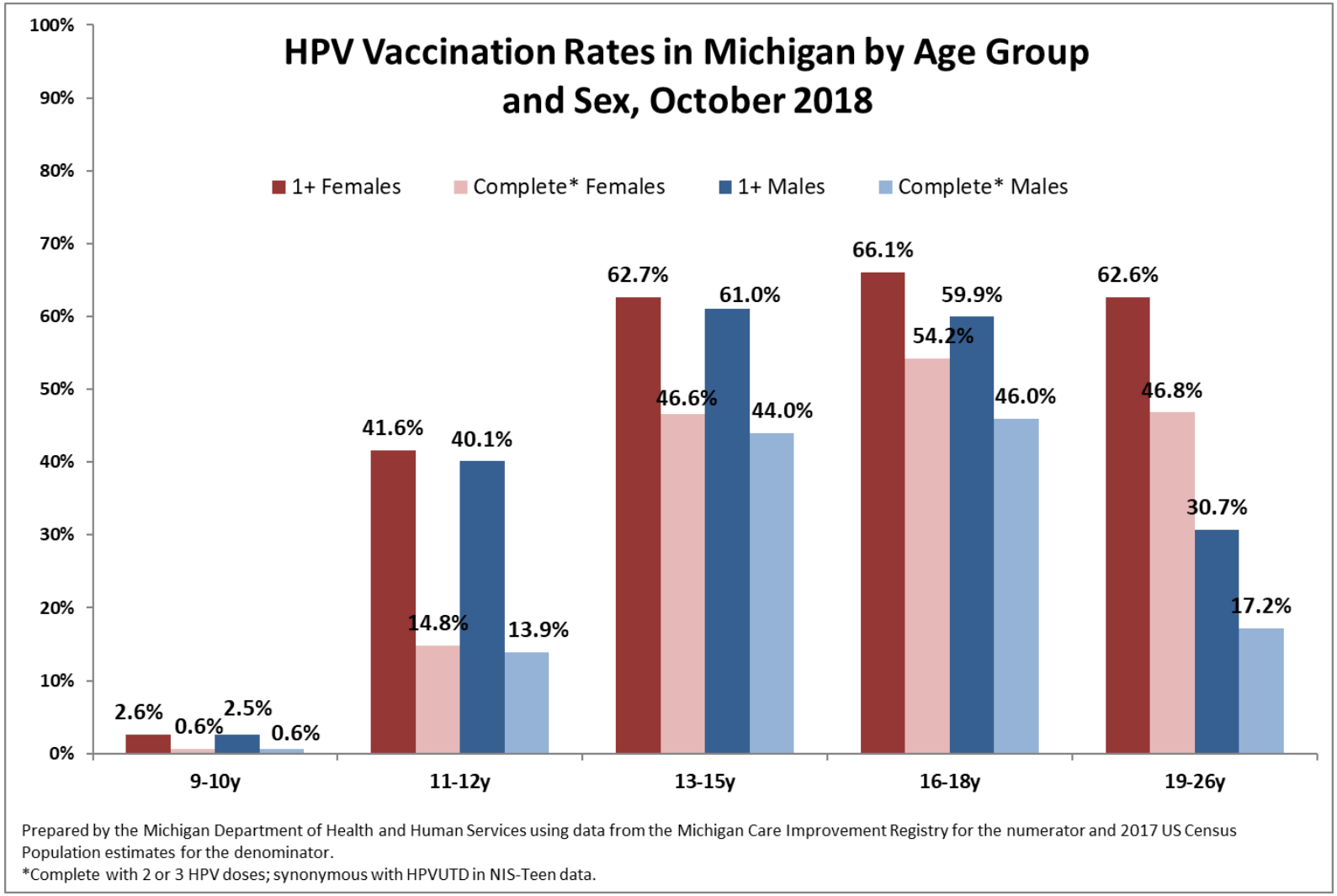
[1]Defined as gay, bisexual and other men who have sex with men; transgender persons are considered high risk for HPV

Studies On HPV Prevalence And Vaccine Efficacy

- Decrease in prevalence of HPV in 8 years of 4vHPV vaccine use in females (compared to pre-vaccine era)
  - Aged 14-19 years, 71% reduction (from 11.5% to 3.3%)
  - Aged 20-24 years, 61% reduction (from 18.5% to 7.2%)
- In clinical trials of 9vHPV, efficacy with 3 doses for HPV serotype 31, 33, 45, 52 & 58 = 96.7%
- 4vHPV prevalence in sexually active 14-24 year olds in 2011-2014:
  - Decreased 89% among those vaccinated
  - Decreased 34% among those unvaccinated (suggesting herd immunity)
- Studies suggest that vaccine protection is long-lasting; no evidence of waning immunity
  - Available evidence indicates protection for at least 10 years

"Use of 9-Valent Human Papillomavirus (HPV) Vaccine: Updated HPV Vaccination Recommendations of the Advisory Committee on Immunization Practices (ACIP)" MMWR March 27, 2015/Vol. 64(11)

"Prevalence of HPV Among Females After Vaccine Introduction-National Health and Nutrition Examination Survey," United States 2003-2014; The Journal of Infectious Diseases, September 1, 2017/Vol. 216(5) Pages 594-603



Prepared by the Michigan Department of Health and Human Services using data from the Michigan Care Improvement Registry for the numerator and 2017 US Census Population estimates for the denominator.

*Complete with 2 or 3 HPV doses; synonymous with HPVUTD in NIS-Teen data.

Meningococcal Disease Burden

- Incidence of U.S. disease peaks in 3 age groups
  - 0-59 months, 16-21 years, 65 years and older
- Proportion of U.S. serogroup disease based on age
  - B: 60% in age 0-59 months
  - C, Y, W-135: 73% in age ≥ 11 years
  - Y: 60% in age 65 years and older
- Overall case fatality of meningococcal disease is 10-15% even with appropriate antimicrobial therapy
  - Case fatality ratio for meningococcemia is up to 40%
- Approximately 20% of survivors have permanent sequelae such as: hearing loss, neurological damage, or loss of limb

Epidemiology and Prevention of Vaccine Preventable Diseases, 13th Edition, 2015

Meningococcal Conjugate Vaccine (MenACWY)

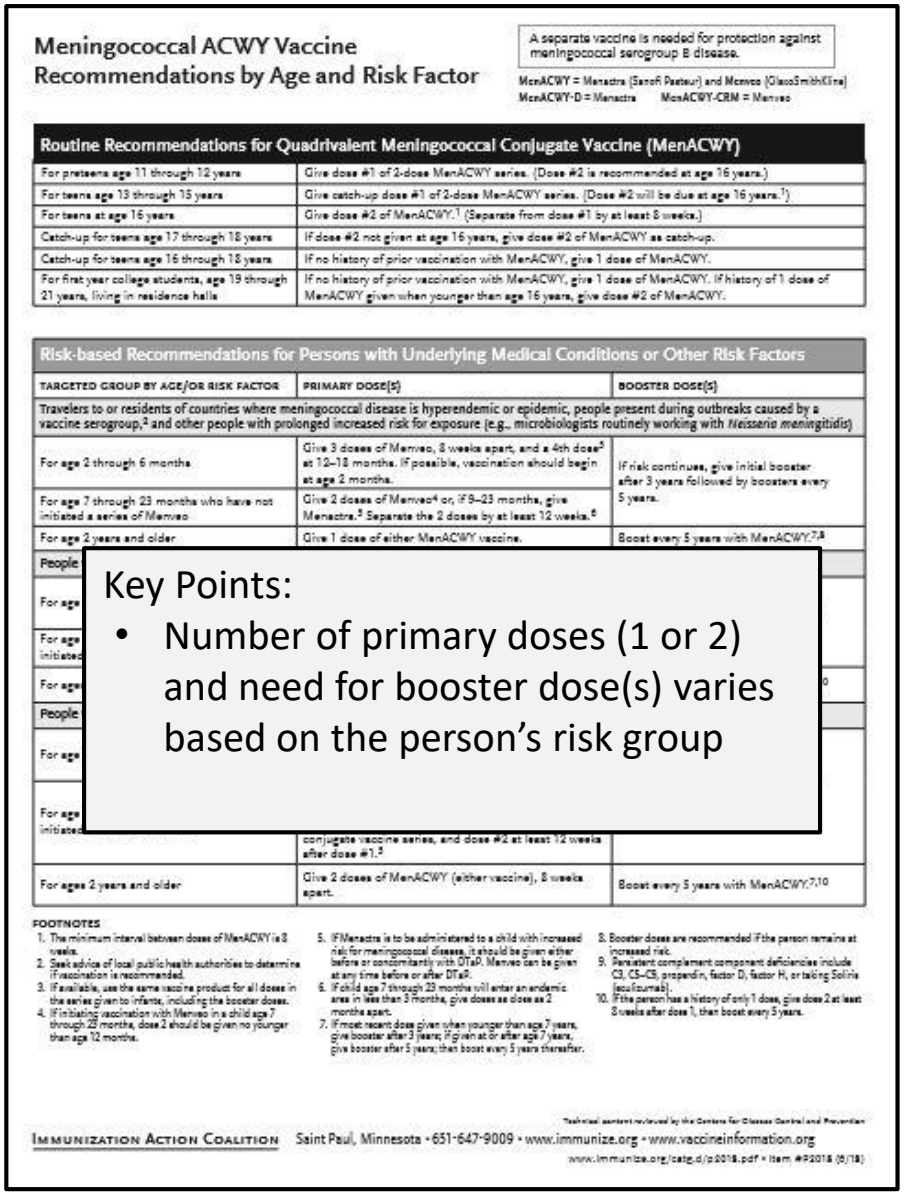
- According to MCIR data (county report cards):
  - By age 13-17 years, 79.8% have received at least **one dose**
  - However, only 47.3% are **fully protected** by age 17 years*
- For best protection, follow the recommended schedule
  - Give IM, 2 doses at ages 11-12 years & 16 years
    - Minimum interval between 2 doses is 8 weeks
    - If 1st dose is given at age 16 years or older, a 2nd dose is not needed
  - Ensure persons 21 years and younger, entering college/living in dorms have received a dose of MenACWY within the last 5 years
  - Not routinely recommended for healthy persons age 22 years and older

*Up-to-date with recommended number of doses

"Recommendations for Use of Meningococcal Conjugate Vaccines in HIV-Infected Persons" MMWR 2016
"Prevention and Control of Meningococcal Disease" MMWR 2013
MCIR data as of September 30, 2018: County Report Cards

Persons At Increased Risk For Meningococcal ACWY Disease

- Adolescents
  - Including college freshmen living in dorms
- Persons with certain medical conditions
  - Asplenia (functional or anatomic)
  - Persistent terminal complement component deficiency
  - HIV
  - Those taking medication Eculizumab (Soliris®)
- Persons who are living in or traveling to:
  - Areas with a high incidence of disease (i.e., parts of Africa)
  - Mecca during the annual Hajj (required for entry)
- Occupational risk
  - Microbiologists exposed to *N. Meningitides*
  - Military recruits
- Persons exposed to disease during a current community outbreak



Meningococcal ACWY Vaccine Recommendations by Age and Risk Factor

A separate vaccine is needed for protection against meningococcal serogroup B disease.

MenACWY = Menactra (Sanofi Pasteur) and Menveo (GlaxoSmithKline)
MenACWY-D = Menactra MenACWY-CRM = Menveo

Routine Recommendations for Quadrivalent Meningococcal Conjugate Vaccine (MenACWY)

For preteens age 11 through 12 years	Give dose #1 of 2-dose MenACWY series. (Dose #2 is recommended at age 16 years.)
For teens age 13 through 15 years	Give catch-up dose #1 of 2-dose MenACWY series. (Dose #2 will be due at age 16 years.[1])
For teens at age 16 years	Give dose #2 of MenACWY.[1] (Separate from dose #1 by at least 8 weeks.)
Catch-up for teens age 17 through 18 years	If dose #2 not given at age 16 years, give dose #2 of MenACWY as catch-up.
Catch-up for teens age 16 through 18 years	If no history of prior vaccination with MenACWY, give 1 dose of MenACWY.
For first year college students, age 19 through 21 years, living in residence halls	If no history of prior vaccination with MenACWY, give 1 dose of MenACWY. If history of 1 dose of MenACWY given when younger than age 16 years, give dose #2 of MenACWY.

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

TARGETED GROUP BY AGE/OR RISK FACTOR	PRIMARY DOSE(S)	BOOSTER DOSE(S)
Travelers to or residents of countries where meningococcal disease is hyperendemic or epidemic, people present during outbreaks caused by a vaccine serogroup,[2] and other people with prolonged increased risk for exposure (e.g., microbiologists routinely working with *Neisseria meningitidis*)		
For age 2 through 6 months	Give 3 doses of Menveo, 8 weeks apart, and a 4th dose[3] at 12–18 months. If possible, vaccination should begin at age 2 months.	If risk continues, give initial booster after 3 years followed by boosters every 5 years.
For age 7 through 23 months who have not initiated a series of Menveo	Give 2 doses of Menveo[4] or, if 9–23 months, give Menactra.[5] Separate the 2 doses by at least 12 weeks.[6]	
For age 2 years and older	Give 1 dose of either MenACWY vaccine.	Boost every 5 years with MenACWY.[7,8]
People		
For age		
For age initiated		
For age		
People		
For age		
For age initiated	conjugate vaccine series, and dose #2 at least 12 weeks after dose #1.[5]	
For ages 2 years and older	Give 2 doses of MenACWY (either vaccine), 8 weeks apart.	Boost every 5 years with MenACWY.[7,10]

Key Points:
- Number of primary doses (1 or 2) and need for booster dose(s) varies based on the person's risk group

FOOTNOTES
1. The minimum interval between doses of MenACWY is 8 weeks.
2. Seek advice of local public health authorities to determine if vaccination is recommended.
3. If available, use the same vaccine product for all doses in the series given to infants, including the booster doses.
4. If initiating vaccination with Menveo in a child age 7 through 23 months, dose 2 should be given no younger than age 12 months.
5. If Menactra is to be administered to a child with increased risk for meningococcal disease, it should be given either before or concomitantly with DTaP. Menveo can be given at any time before or after DTaP.
6. If child age 7 through 23 months will enter an endemic area in less than 3 months, give doses as close as 2 months apart.
7. If most recent dose given when younger than age 7 years, give booster after 3 years; if given at or after age 7 years, give booster after 5 years; then boost every 5 years thereafter.
8. Booster doses are recommended if the person remains at increased risk.
9. Persistent complement component deficiencies include C3, C5–C9, properdin, factor D, factor H, or taking Soliris (eculizumab).
10. If the person has a history of only 1 dose, give dose 2 at least 8 weeks after dose 1, then boost every 5 years.

*Technical content reviewed by the Centers for Disease Control and Prevention

IMMUNIZATION ACTION COALITION Saint Paul, Minnesota • 651-647-9009 • www.immunize.org • www.vaccineinformation.org
www.immunize.org/catg.d/p2018.pdf • Item #P2018 (5/18)

"Meningococcal Vaccination Recommendations by Age and/or Risk Factors"

Concerns Based On Medical Condition And/Or MenACWY Brand Administered

- Due to suboptimal response:
  - Persons age 2 years and older with asplenia, HIV or terminal complement deficiency require 2-dose primary series and continual boosters
- Persons with HIV or asplenia (functional or anatomic):
  - Persons should not be given Menactra® at the same time as PCV13 due to immune interference
    - Complete PCV13 dose(s) first then wait at least 4 weeks to give Menactra®

Note: if using Menveo®, there is no interval needed between PCV13; may give simultaneously

"General Best Practice Guidelines for Immunization" page 16

Meningococcal B (MenB)

- Meningococcal B Vaccines
  - Bexsero (Novartis) 2 doses at least 4 weeks apart
  - Trumenba (Pfizer) 2 doses at 0, 6 months **or** 3 doses at 0, 2, 6 months[1]
- Same brand must be used to complete the series
- MenACWY and MenB vaccines may be given at same visit

[1]Young adults aged 16 through 23 years who are healthy and not at increased risk for MenB disease may receive a 2-dose series of Trumenba at 0 & 6 months for short term protection against most strains of MenB disease. **All other persons are recommended to receive a 3-dose series, including those in an outbreak.** This is found in the footnotes of the 2018 Children and Adolescents Immunization Schedule

Meningococcal B Vaccine Recommendations

- Administer to persons aged 10 years and older
  - With persistent terminal complement component deficiency
  - With asplenia (anatomic or functional)
  - Who are taking the medication eculizumab (Soliris®)
  - Who are exposed during a community outbreak
  - Who are microbiologists exposed to *N. Meningitides*
- Based on clinical decision, persons aged 16-23 not in a high risk group, may be vaccinated
  - Providers need to discuss risks and benefits with these persons
  - Series preferably given at ages 16-18 years

Use of Serogroup B Meningococcal Vaccines in Persons Age ≥ 10 Years at Increased Risk for Serogroup B Meningococcal: Recommendations of the Advisory Committee on Immunization Practices, 2015

Persons Taking Eculizumab (Soliris®)

- Persons who take Soliris® have a 1,000 to 2,000-fold greater risk of invasive meningococcal disease compared to the general U.S. population
- When taking Soliris®, ACIP recommends both MenACWY & MenB vaccine
- Recent data showed:
  - Some vaccinated patients still developed meningococcal disease
    - Often from nongroupable *N. Meningitides*
- During Soliris® treatment, consider antimicrobial prophylaxis to potentially reduce the risk for meningococcal disease
  - Cannot be expected to prevent all cases of meningococcal disease
- If a person taking Soliris® presents with symptoms consistent for meningitis or meningococcemia, consider meningococcal disease as a potential diagnosis

High Risk for Invasive Meningococcal Disease Among Patients Receiving Eculizumab (Soliris) Despite Receipt of Meningococcal Vaccine July 14, 2017

Pneumococcal Vaccines

- There are 2 Pneumococcal Vaccines:
  - PCV13 (Pneumococcal Conjugate Vaccine)
    - Brand name: Prevnar13®
    - Given IM to ages 2 months and older
  - PPSV23 (Pneumococcal Polysaccharide Vaccine)
    - Brand name: Pneumovax®
    - Given IM to ages 2 years and older
- If both vaccines are recommended:
  - **Do not** give these 2 vaccines at the same visit
  - Administer PCV13 first (preferred) then PPSV23
  - Intervals between PCV13 & PPSV23 are based on age and risk
    - These will be discussed following a look at the risk groups

PCV13 (Prevnar13®) For Persons 6 Years And Older

- For persons with a high risk indication and **no previous dose** of PCV13:
  - Administer 1 dose to persons aged 6-64 years with:
    - CSF leaks, cochlear implants
    - Immunosuppression caused by disease or medications, HIV, functional or anatomic asplenia, sickle cell, general malignancy
- Routinely administer 1 dose to all persons aged 65 years and older with **no previous dose of PCV13**

Pneumococcal Vaccine Recommendations for Children and Adults Based on Age and/or Risk Factor Handout

Use of 13-Valent Pneumococcal Conjugate Vaccine and 23-Valent Pneumococcal Polysaccharide Vaccine Among Adults Aged > 65 Years: Recommendations of the Advisory Committee on Immunization Practices (ACIP) MMWR 2014

PPSV23 (Pneumovax®)

- For persons with a high risk indication:
  - Administer **1 dose to persons aged 19-64 years** who:
    - Smoke cigarettes or have asthma
  - Administer **1 dose to persons aged 2-64 years** with**:**
    - Chronic pulmonary, kidney or heart disease, diabetes mellitus, alcoholism, CSF leaks, or cochlear implants
  - Administer **2 doses to persons aged 2-64 years** with:
    - Immunosuppression caused by disease or medications, HIV, functional or anatomic asplenia (including sickle cell), malignancy
    - Minimum interval between 2 doses is 5 years
- Routinely administer 1 dose to **all** persons aged 65 years and older
  - Final recommended PPSV23 dose-regardless of risk factor

Administering PCV13 And PPSV23

Age Group	Underlying Conditions	Recommended Intervals	
		PCV13 to PPSV23[1]	PPSV23 to PCV13
24-71 months	•Immunocompetent with underlying conditions •Functional or anatomic asplenia •Immunocompromised	≥8 weeks	≥8 weeks
6-18 years	•High-risk immunocompetent (CSF leak, cochlear implant) •Functional or anatomic asplenia •Immunocompromised	≥8 weeks	≥8 weeks
≥19 years	•High-risk immunocompetent (CSF leak, cochlear implant) •Functional or anatomic asplenia •Immunocompromised	≥8 weeks	≥1 year
≥65 years	•Immunocompetent—not in a risk group listed under ≥19 years	≥1 year	≥1 year

Pneumococcal Resources

Pneumococcal Vaccine Timing for Adults

Make sure your patients are up-to-date!

Age 19 through 64 years with underlying conditions:*

Group	Persons	Schedule
A HIGH RISK	Immunocompetent persons • heart disease • diabetes mellitus • alcoholism • liver disease • lung disease • cigarette smoking	PPSV 23
B HIGHER RISK	Immunocompetent persons • cerebrospinal fluid leak • cochlear implant	PCV 13 → 8 weeks → PPSV 23
C HIGHEST RISK	Immunocompromised persons • chronic renal failure • nephrotic syndrome • asplenia	PCV 13 → 8 weeks → PPSV 23 → 5 years → PPSV 23

* See the reverse of this document for a more complete list of immunocompromised and underlying medical conditions.

Notes:

- If PPSV23 (Pneumovax®23) given previously, wait **1 year** before giving PCV13 (Prevnar 13®).
- For group **C** above, wait at least **5 years** before giving a second dose of PPSV23.
- If either vaccine is inadvertently given earlier than the recommended window, do not repeat the dose.
- **No more than 2 doses of PPSV23 are recommended before 65th birthday and 1 dose thereafter.**

Age 65 years or older:

- If PCV13 was given before age 65 years, **no additional PCV13 dose is needed.**

History	Schedule
No history of pneumococcal vaccines	PCV 13 → **1 year, except...** If group **B** or **C** above, then the interval is **8 weeks** → PPSV 23
Received PPSV23 before age 65	1 year → PCV 13 → **1 year, except...** If group **B** or **C** above, then the interval is **8 weeks**. ALWAYS ensure **5 years** between PPSV23 doses → PPSV 23
Received PPSV23 at age 65 or older	1 year → PCV 13

For further pneumococcal vaccination details, see: www.cdc.gov/vaccines/hcp/acip-recs/vacc-specific/pneumo.html

Michigan Department of Health and Human Services – Division of Immunization

Revised 1/2018

MDHHS AIM

MDHHS Pneumococcal Vaccine Timing for Adults Handout

Pneumococcal Vaccination Recommendations for Children[1] and Adults by Age and/or Risk Factor

Routine Recommendations

for Pneumococcal Conjugate Vaccine (PCV13) and Pneumococcal Polysaccharide Vaccine (PPSV23)

For children age 2 months and older	Administer PCV13 series to all children beginning at age 2 months, followed by doses at 4 months, 6 months, and 12–15 months (booster dose).
For adults age 65 years and older	Administer 1-time dose to PCV13-naïve adults at age 65 years, followed by a dose of PPSV23 6–12 months later.

Risk-based Recommendations

People with Underlying Medical Conditions or Other Risk Factors

		PCV13			PPSV23	
Risk Group	**Underlying medical condition or other risk factor**	Administer PCV13 doses needed to complete series to children through age 71 months	Administer 1 dose to PCV13-naïve children age 6 through 18 years	Administer 1 dose to PCV13-naïve adults age 19 through 64 years	Administer 1 dose of PPSV23 at age 2 through 64 years	Administer a second dose of PPSV23 5 years after first dose if age younger than 65 years
Immuno-competent	Chronic heart disease[2]	X			X	
	Chronic lung disease[3]	X			X	
	Diabetes mellitus	X			X	
	Cerebrospinal fluid leak	X	X	X	X	
	Cochlear implant	X	X	X	X	
	Alcoholism				X	
	Chronic liver disease, cirrhosis				X	
	Cigarette smoking (≥19 yrs)				X	
Functional or anatomic asplenia	Sickle cell disease/other hemoglobinopathy	X	X	X	X	X
	Congenital or acquired asplenia	X	X	X	X	X
Immuno-compromised	Congenital or acquired immunodeficiency[4]	X	X	X	X	X
	HIV	X	X	X	X	X
	Chronic renal failure	X	X	X	X	X
	Nephrotic syndrome	X	X	X	X	X
	Leukemia	X	X	X	X	X
	Lymphoma	X	X	X	X	X
	Hodgkin disease	X	X	X	X	X
	Generalized malignancy	X	X	X	X	X
	Iatrogenic immunosuppression[5]	X	X	X	X	X

immunize.org

www.immunize.org/catg.d/p2019.pdf • Item #P2019 (2/15)

Immunization Action Coalition's Pneumococcal Vaccine Recommendations Handout

Hepatitis B (HepB) Vaccine

- Recommended: persons at high risk for disease
  - Including those with diabetes, Hep A and Hep C
    - Please see the 2018 CDC Adult Immunization Schedule by Medical and Other Indications footnotes, for a list of all high risk groups
- Give IM, 3 doses at 0, 1, 6 month intervals (for the new Heplisav-B vaccine schedule, see next slide)
- Minimum interval between doses:
  - 4 weeks between dose 1 & 2
  - 8 weeks between dose 2 & 3
  - 16 weeks between dose 1 & 3
- No booster doses routinely recommended
- Doses not given IM or at appropriate sites must be repeated
  - Deltoid or anterolateral thigh muscle
- Do not repeat a dose or series which meets minimum intervals

Heplisav-B (HepB-CpG) Vaccine

- Licensed by FDA November 2017
- MMWR Released April 2018
- Recommended for those ≥ 18 years of age
  - 2 doses separated by one month
- Another hepatitis B vaccine option
  - Does not replace other HepB vaccines
  - Not preferred over other HepB Vaccines
- Seroprotection rates (SPR, defined as anti-HBs of 10mlU/ml or higher)
  - Seroprotective levels were achieved in:
    - 90-100% of subjects receiving HepB-CpG (Heplisav-B) compared to 70.5-90.2% of subjects receiving Engerix-B
- Likely to improve hepatitis B vaccine series completion and result in earlier protection
  - The hope is the two-shot series will have a higher completion rate

Recommendations of the Advisory Committee on Immunization Practices for Use of a Hepatitis B Vaccine with a Novel Adjuvant

Hepatitis A (HepA) Vaccine

- Recommended for persons at risk, including:
  - Persons who live with or care for a person with Hepatitis A virus (HAV)
  - Persons who have close contact with an adopted child from a place where HAV is common
  - Persons who have acute or chronic liver disease
  - Persons who have a clotting factor disorder
  - Persons who are traveling to or working in countries with high or intermediate endemicity of Hep A disease
  - Persons who use injection or non-injection illicit drugs
  - Persons who work with Hep A infected primates or with Hep A in a lab setting
  - Men who have sex with men (MSM)
  - Homelessness
- May be administered during pregnancy when indicated
- Post-vaccination testing is not recommended
  - High rate of vaccine response among adults and children

Routine Schedule: 2 doses at 0, 6-12 months

Minimum interval between dose 1 & 2 is 6 calendar months

Michigan Hepatitis A Outbreak

- Started August 2016 in City of Detroit, Wayne, Oakland, and Macomb Counties
- Injection and non-injection drug use, homelessness or transient housing, MSM, and those recently or currently incarcerated are at greater risk in this outbreak setting
- It is important to screen and assess for vaccination to ensure protection (www.Michigan.gov/hepatitisaoutbreak)

Influenza Vaccine: Every One, Every Year

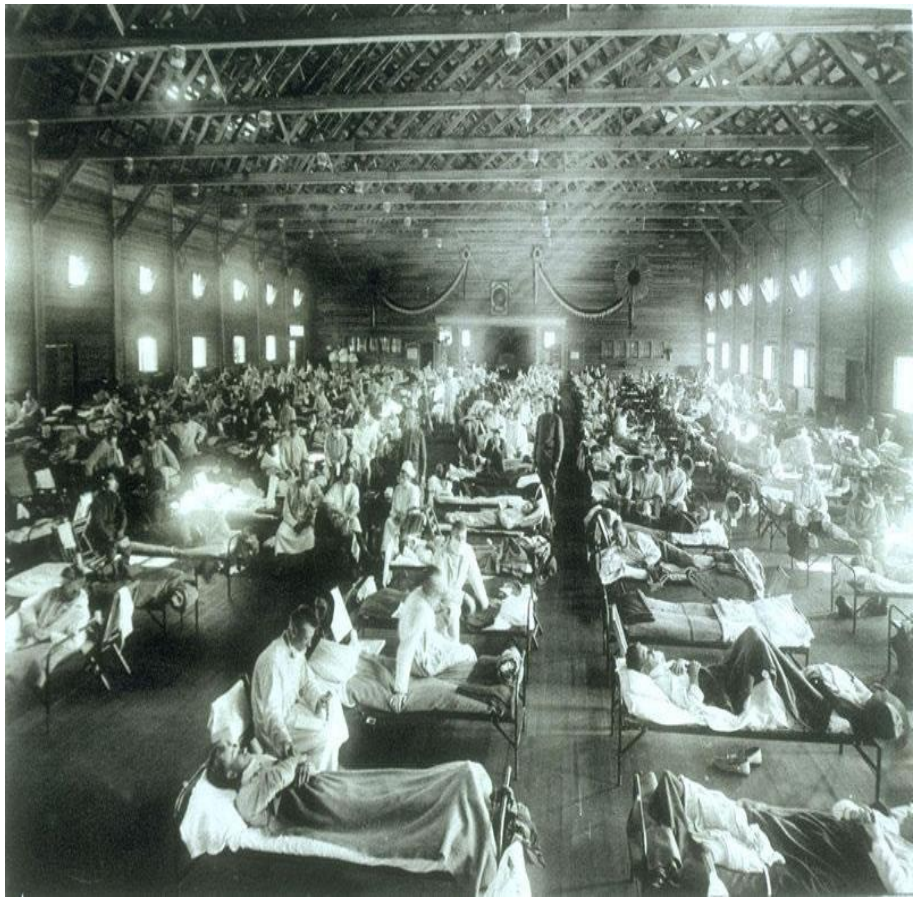


Photo Courtesy of the National Museum of Health and Medicine

- Recommended for all persons age 6 months and older!
- Vaccinate close contacts of those at high risk to provide another layer of protection including
  - Health Care Personnel (HCP)
  - Parents of infants less than 6 months of age
- Continue to ensure that persons at higher risk for influenza related complications are vaccinated
- Remember there is no preferential recommendation for one flu vaccine product over another

2018-2019 Influenza Vaccination Strains

- Trivalent vaccines will include:
  - A/Michigan/45/2015 (H1N1)pdm09-like virus
  - A/Singapore/INFIMH-16-0019/2016 (H3N2)-like virus **(NEW)**
  - B/Colorado/06/2017-like virus (B/Victoria/2/87 lineage) **(NEW)**

- Quadrivalent vaccines will include the above 3 strains and:
  - B/Phuket/3073/2013-like virus (B/Yamagata/16/88 lineage)

For further information on flu vaccine composition refer to:
http://www.who.int/influenza/vaccines/virus/recommendations/2018_19_north/en/
https://www.cdc.gov/mmwr/volumes/67/wr/mm6722a4.htm?s_cid=mm6722a4_e

Inactivated Influenza Vaccine (IIV)

Inactivated Influenza Vaccine, Trivalent	Inactivated Influenza Vaccine, Quadrivalent
IIV3 (flu shot, IM[1])	IIV4 (flu shot, IM[1])
3 flu strains: 2 A, 1 B	4 flu strains: 2 A, 2 B
Age 6 months & older**	Age 6 months & older**
For persons who are healthy, have any underlying medical conditions, are pregnant	

**Age indication varies by vaccine brand

[1]Inactivated influenza vaccines (trivalent or quadrivalent) labeled for IM administration **must** be given IM; if not dose must be repeated.

IIV3 High-Dose and Adjuvanted IIV3

High-Dose Inactivated Influenza Vaccine, Trivalent	Adjuvanted Inactivated Influenza Vaccine, Trivalent
HD-IIV3 (flu shot, IM[1])	aIIV (flu shot, IM[1])—Fluad®
3 flu strains: 2 A, 1 B	
Age 65 years and older	
Only use manufacturer's prefilled syringe	
Has 4 times more antigen than standard flu vaccine	1st adjuvanted seasonal flu vaccine in U.S. (MF59®); added ingredient to help create a stronger immune response
For persons who are healthy, have any underlying medical condition	

[1]Inactivated influenza vaccines (trivalent or quadrivalent) labeled for IM administration must be given IM; if not dose must be repeated

- To date, no randomized studies comparing the two vaccines
- No preference for either vaccine, do not miss an opportunity to vaccinate
  - If either vaccine is unavailable, use another age-appropriate influenza vaccine

Live Attenuated Influenza Vaccine Quadrivalent (LAIV4)

- During the 2016-17 and 2017-18 influenza seasons, the Advisory Committee on Immunization Practices (ACIP) recommended that LAIV4 not be used due to:
  - Concerns about low effectiveness against influenza A (H1N1) pdm09-like viruses circulating
- The manufacturer suggests that the new influenza A (H1N1) pdm09-like virus, A/Slovenia/2903/2015, has improved replicative fitness
  - No published effectiveness estimates for this formulation of the vaccine are yet available
  - ACIP will continue to review data concerning the effectiveness of LAIV4 as they become available
- On February 21, 2018, ACIP recommended that LAIV4 be an option for influenza vaccination of persons for **whom it is appropriate** for the 2018-19 season
  - Healthy non-pregnant persons age 2 through 49 years
- For the 2018-19 U.S. influenza season, providers may choose to administer any licensed, age appropriate influenza vaccine including LAIV4

Update: ACIP Recommendations for the Use of Quadrivalent Live Attenuated Influenza Vaccine (LAIV4)-United States, 2018-19 Influenza Season

How Well Are We Protected?

Age/Condition	Immunization Rate by Season		
	2016-17	2017-18	% Difference
Aged ≥ 18 years	43.3%	37.1%	↓ 6.2%
Aged 18-49 years	33.6%	26.9%	↓ 6.7%
Aged 50-64 years	45.4%	39.7%	↓ 5.7%
Aged 65 years and older	65.3%	59.6%	↓ 5.7%
Pregnant Women aged 18-24 years	41.7%	42.7%	↑ 1.0%
Pregnant Women aged 25-34 years	58.4%	50.5%	↓ 7.9%
Pregnant Women aged 35-49 years	58.5%	53.4%	↓ 5.1%

Estimates of Influenza Vaccination Coverage among Adults-United States, 2017-18 Flu Season

Influenza and Tdap Vaccination Coverage Among Pregnant Women-United States, April 2018

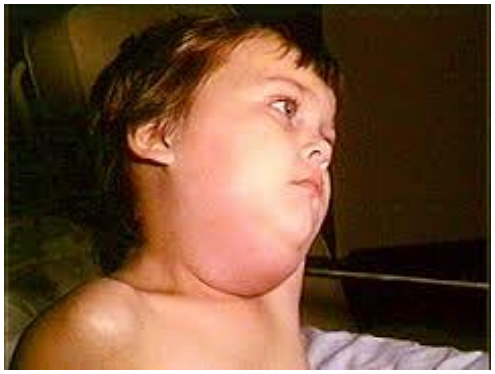
Treatment for Patients with Influenza

- Antiviral treatment is recommended as early as possible for any patient with confirmed or suspected flu who:
  - Is hospitalized
  - Has severe, complicated, or progressive illness
  - Is at higher risk for flu complications (including pregnant and post-partum women)
- Clinical benefit is greatest when treatment is administered early, within 48 hours of illness onset
  - Antivirals can be prescribed to persons with illness onset greater than 48 hours
- Decision to start antiviral treatment should not wait for lab confirmation of flu
- A history of flu vaccination does not rule out the possibility of influenza infection or the use of antivirals to treat flu

Influenza Antiviral Medications: Summary for Clinicians

Live Attenuated Vaccines

MMR/Varicella/Zoster



Looking At Mumps And Measles Resurgence

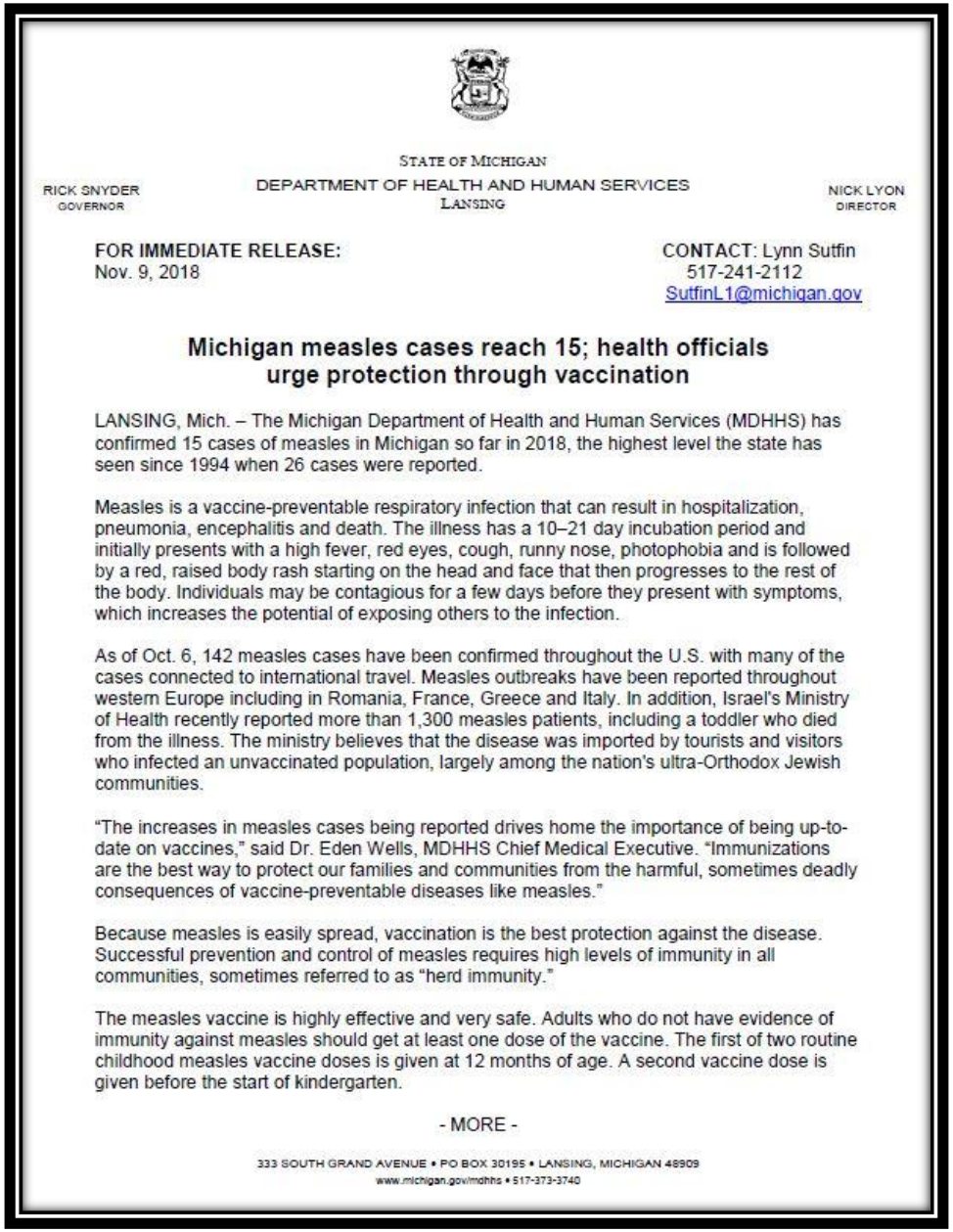
Measles Cases

- United States:
  - 2018: 142 (as of 10-6-18)
  - 2017: 122 (provisional)
  - 2016: 85
  - 2015: 188
  - 2014: 667
- Michigan:
  - 2018: 15 (as of 11-8-18)
  - 2017: 2
  - 2016: 1

Mumps Cases

- United States:
  - 2018: 1,885 (as of 10-6-18)
  - 2017: 5,629 (provisional)
  - 2016: 6,369
  - 2012: 229
- Michigan:
  - 2018: 32 (as of 9-30-18)
  - 2017: 46 (includes suspect)
  - 2016: 38

Source for Mumps and Measles
Summary of Vaccine Preventable Diseases Reported to MDHHS



STATE OF MICHIGAN
DEPARTMENT OF HEALTH AND HUMAN SERVICES
LANSING

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GOVERNOR

NICK LYON
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FOR IMMEDIATE RELEASE:
Nov. 9, 2018

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Michigan measles cases reach 15; health officials urge protection through vaccination

LANSING, Mich. – The Michigan Department of Health and Human Services (MDHHS) has confirmed 15 cases of measles in Michigan so far in 2018, the highest level the state has seen since 1994 when 26 cases were reported.

Measles is a vaccine-preventable respiratory infection that can result in hospitalization, pneumonia, encephalitis and death. The illness has a 10–21 day incubation period and initially presents with a high fever, red eyes, cough, runny nose, photophobia and is followed by a red, raised body rash starting on the head and face that then progresses to the rest of the body. Individuals may be contagious for a few days before they present with symptoms, which increases the potential of exposing others to the infection.

As of Oct. 6, 142 measles cases have been confirmed throughout the U.S. with many of the cases connected to international travel. Measles outbreaks have been reported throughout western Europe including in Romania, France, Greece and Italy. In addition, Israel's Ministry of Health recently reported more than 1,300 measles patients, including a toddler who died from the illness. The ministry believes that the disease was imported by tourists and visitors who infected an unvaccinated population, largely among the nation's ultra-Orthodox Jewish communities.

"The increases in measles cases being reported drives home the importance of being up-to-date on vaccines," said Dr. Eden Wells, MDHHS Chief Medical Executive. "Immunizations are the best way to protect our families and communities from the harmful, sometimes deadly consequences of vaccine-preventable diseases like measles."

Because measles is easily spread, vaccination is the best protection against the disease. Successful prevention and control of measles requires high levels of immunity in all communities, sometimes referred to as "herd immunity."

The measles vaccine is highly effective and very safe. Adults who do not have evidence of immunity against measles should get at least one dose of the vaccine. The first of two routine childhood measles vaccine doses is given at 12 months of age. A second vaccine dose is given before the start of kindergarten.

- MORE -

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www.michigan.gov/mdhhs • 517-373-3740

MDHHS November 9th Press Release: Michigan Measles Cases Reach 15; Health Officials Urge Protection Through Vaccination!

Highest number of cases since 1994!

Measles, Mumps, Rubella (MMR)

- Criteria for evidence of immunity for adults
  - Born in U.S. before 1957
    - Exception Health Care Personnel (HCP) and pregnant women
  - Born in 1957 or later with documentation of at least 1 dose of MMR
  - Lab evidence of measles, mumps and rubella immunity
- Adults at high risk: 2 doses
  - International travelers, college students, HCP, household contacts of immunocompromised persons
- Adults born in 1956 or earlier may receive 1-2 doses
  - Even with presumed immunity based on age

Routine Schedule: 1st dose at age 12 months or later

Minimum interval between dose 1 & 2 is 4 weeks

New Mumps Recommendation

- Substantial increase in the number of mumps outbreaks and outbreak associated cases has occurred in the United States since late 2015
- ACIP reviewed evidence and determined that a third dose of measles, mumps, and rubella (MMR) vaccine is safe and effective at preventing mumps
- New ACIP Recommendation
  - Persons **previously vaccinated** with 2 doses of a mumps virus containing vaccine who are **identified by public health authorities** as being part of an outbreak should receive a third dose of a mumps-virus containing vaccine
  - No additional dose is recommended for persons who already received ≥ 3 doses of mumps virus-containing vaccine

Recommendation of the Advisory Committee on Immunization Practices for Use of a Third Dose of Mumps Virus-Containing Vaccine in Persons at Increased Risk for Mumps During an Outbreak

Criteria For Evidence Of Immunity To Varicella

- Born in the U.S. before 1980
  - Exception: Health care personnel and pregnant women
- Documentation of age-appropriate vaccination
  - Adults: 2 doses
- Lab evidence of immunity or lab confirmation of disease
- A healthcare provider (physician, PA, nurse, NP):
  - Diagnosis of varicella or herpes zoster disease
  - Verification of history of typical varicella disease
- State law: Report individual cases of varicella disease to your local health department (LHD)
  - 567 cases of Varicella in Michigan in 2016

Anyone without evidence of immunity, administer 2 doses

For persons 13 years and older, minimum interval is 4 weeks

Herpes Zoster (HZ) and Postherpetic Neuralgia (PHN)

- About 1 million cases of shingles in the US annually
- Lifetime risk of developing HZ is 1 in 3 and is more common in those 65 years and older
- Incidence increases with age and immunocompromised status
  - By age 80, 35-50% will have had Herpes Zoster
- For adults 50 years and older with HZ, 10-18% develop PHN, increases with age
- Currently there are two licensed Herpes Zoster Vaccines:
  - Zoster Vaccine Live (**ZVL**, Zostavax™) for those 60 years and older; 31% of persons 60 years and older have received it
  - Recombinant Zoster Vaccine (**RZV,** Shingrix) for those 50 years and older **(preferred)**

CDC-Considerations for the Use of Herpes Zoster Vaccines

Herpes Zoster Vaccines

	RZV, Shingrix	ZVL, Zostavax
Indication for Use:	Indicated for prevention of Herpes Zoster	
Vaccine Type:	Inactivated Recombinant Vaccine	Live Attenuated Vaccine
Age Indication:	50 years and older	60 years and older
Schedule:	2 doses given at 0 and 2-6 months	1 dose
Administration:	IM (reconstitute prior to use)	SC (reconstitute prior to use)
Storage:	Store in Refrigerator	Store in Freezer
Vaccine Efficacy:	Vaccine efficacy in persons • 60-69 years of age is 97% • 70 years and older is 91%	Vaccine efficacy in persons • 60-69 years of age is 64% • 70-79 years is 41% • 80 years and older is 18%
Vaccination and Disease History:	**Give** regardless of prior receipt of: • Varicella vaccine[1] • ZVL[2] • Herpes zoster episode	• May give if previous history of shingles • If history of varicella vaccine should **not** receive ZVL

[1]RZV should be administered at least 8 weeks after receipt of varicella vaccine

[2]The minimum interval between ZVL and RZV is 8 weeks

Utilize MCIR
Michigan **C**are **I**mprovement **R**egistry

- Use of MCIR for adult immunizations is highly recommended
  - Ensures a comprehensive record of vaccines administered
  - Allows for historical data to be entered
  - Assesses for vaccine needs today and forecasts next dose dates
  - Contains over 7.1 million individual adult records

Note: All vaccines administered to persons less than 20 years of age are required to be entered into MCIR (Public Health Act 540 of 1996)

Immunization Resources

Please refer to your resource list handout
Sent via email

Remember…

They are counting on You!

Ensure that **all** your patients are protected against vaccine-preventable diseases

Please Complete Post-Lecture Survey

Optional Slides

- A Look at ccIIV4 and RIV4
- Seasonal Influenza Vaccine Presentation Chart 2017-18
- Influenza Vaccination of Persons with Egg Allergy
- Recent Study: Flu Vaccine in Pregnancy Making Headlines
- Key Messages to Communicate
- Strong Provider Recommendation + Vaccine Availability
- Why Get a Flu Vaccine?
- Cancers Caused by HPV in the U.S.
- MenB-ACIP Consideration for Boosters
- MenB Safety

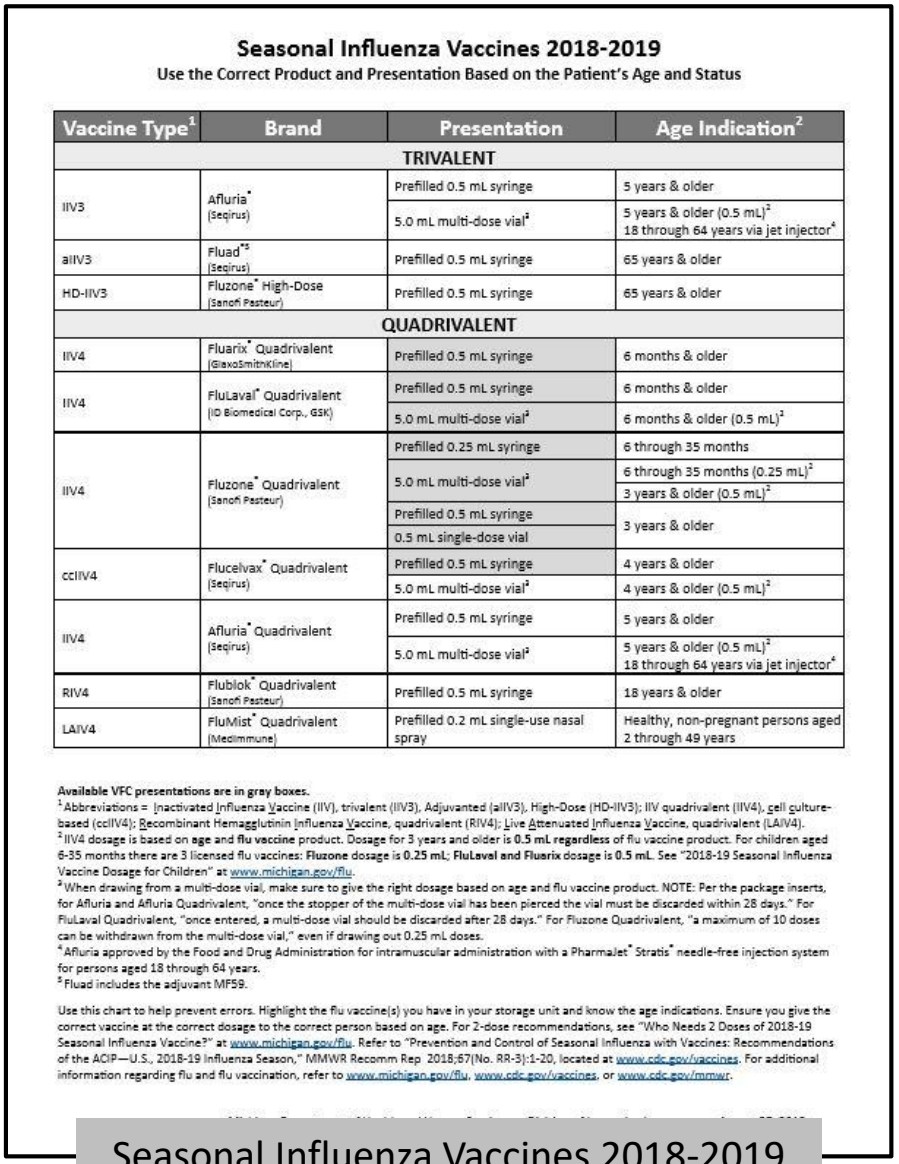
A Look at ccIIV4, and RIV4

Cell Culture-Based Inactivated Influenza Vaccine, Quadrivalent	Recombinant Hemagglutinin (HA) Influenza Vaccine, Quadrivalent
ccIIV4 (flu shot, IM)—Flucelvax® Quadrivalent	RIV4 (flu shot, IM)—FluBlok® Quadrivalent
4 flu strains: 2 A, 2 B	4 flu strains: 2 A, 2 B
Age 4 years and older	Age 18 years and older
Produced in mammalian cell line, not completely egg-free	Produced in an insect cell line Completely egg-free
For persons who are healthy, have any underlying medical conditions, are pregnant	

Do not miss an opportunity to vaccinate, use any age-appropriate flu vaccine that is available

Seasonal Influenza Vaccine Presentation Chart: 2018-2019

- Each flu vaccine product is licensed for different age groups
- This MDHHS handout helps to prevent vaccine errors
- Highlight the products and presentations that you carry
- Post in your vaccine prep area



Seasonal Influenza Vaccines 2018-2019

Use the Correct Product and Presentation Based on the Patient's Age and Status

Vaccine Type[1]	Brand	Presentation	Age Indication[2]
TRIVALENT			
IIV3	Afluria® (Seqirus)	Prefilled 0.5 mL syringe	5 years & older
		5.0 mL multi-dose vial[3]	5 years & older (0.5 mL)[2] 18 through 64 years via jet injector[4]
aIIV3	Fluad®[5] (Seqirus)	Prefilled 0.5 mL syringe	65 years & older
HD-IIV3	Fluzone® High-Dose (Sanofi Pasteur)	Prefilled 0.5 mL syringe	65 years & older
QUADRIVALENT			
IIV4	Fluarix® Quadrivalent (GlaxoSmithKline)	Prefilled 0.5 mL syringe	6 months & older
IIV4	FluLaval® Quadrivalent (ID Biomedical Corp., GSK)	Prefilled 0.5 mL syringe	6 months & older
		5.0 mL multi-dose vial[3]	6 months & older (0.5 mL)[2]
IIV4	Fluzone® Quadrivalent (Sanofi Pasteur)	Prefilled 0.25 mL syringe	6 through 35 months
		5.0 mL multi-dose vial[3]	6 through 35 months (0.25 mL)[2]
			3 years & older (0.5 mL)[2]
		Prefilled 0.5 mL syringe	3 years & older
		0.5 mL single-dose vial	
ccIIV4	Flucelvax® Quadrivalent (Seqirus)	Prefilled 0.5 mL syringe	4 years & older
		5.0 mL multi-dose vial[3]	4 years & older (0.5 mL)[2]
IIV4	Afluria® Quadrivalent (Seqirus)	Prefilled 0.5 mL syringe	5 years & older
		5.0 mL multi-dose vial[3]	5 years & older (0.5 mL)[2] 18 through 64 years via jet injector[4]
RIV4	Flublok® Quadrivalent (Sanofi Pasteur)	Prefilled 0.5 mL syringe	18 years & older
LAIV4	FluMist® Quadrivalent (MedImmune)	Prefilled 0.2 mL single-use nasal spray	Healthy, non-pregnant persons aged 2 through 49 years

Available VFC presentations are in gray boxes.

[1] Abbreviations = Inactivated Influenza Vaccine (IIV), trivalent (IIV3), Adjuvanted (aIIV3), High-Dose (HD-IIV3); IIV quadrivalent (IIV4), cell culture-based (ccIIV4); Recombinant Hemagglutinin Influenza Vaccine, quadrivalent (RIV4); Live Attenuated Influenza Vaccine, quadrivalent (LAIV4).

[2] IIV4 dosage is based on **age** and **flu vaccine** product. Dosage for 3 years and older is **0.5 mL regardless** of flu vaccine product. For children aged 6-35 months there are 3 licensed flu vaccines: **Fluzone** dosage is **0.25 mL**; **FluLaval and Fluarix** dosage is **0.5 mL**. See "2018-19 Seasonal Influenza Vaccine Dosage for Children" at www.michigan.gov/flu.

[3] When drawing from a multi-dose vial, make sure to give the right dosage based on age and flu vaccine product. NOTE: Per the package inserts, for Afluria and Afluria Quadrivalent, "once the stopper of the multi-dose vial has been pierced the vial must be discarded within 28 days." For FluLaval Quadrivalent, "once entered, a multi-dose vial should be discarded after 28 days." For Fluzone Quadrivalent, "a maximum of 10 doses can be withdrawn from the multi-dose vial," even if drawing out 0.25 mL doses.

[4] Afluria approved by the Food and Drug Administration for intramuscular administration with a PharmaJet® Stratis® needle-free injection system for persons aged 18 through 64 years.

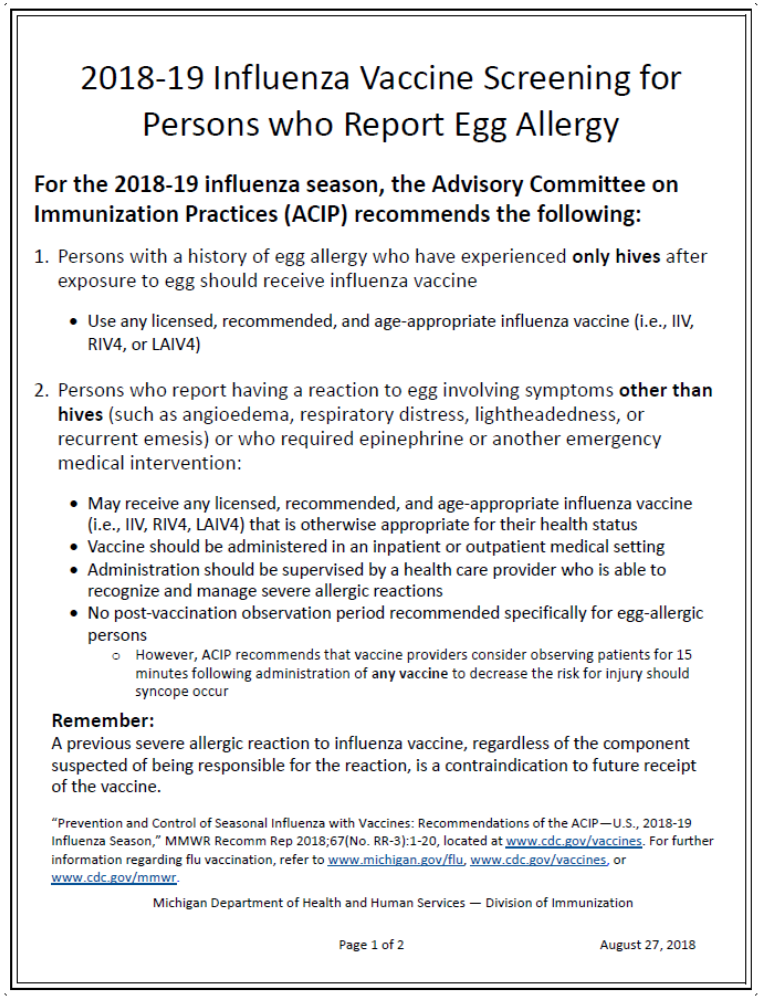
[5] Fluad includes the adjuvant MF59.

Use this chart to help prevent errors. Highlight the flu vaccine(s) you have in your storage unit and know the age indications. Ensure you give the correct vaccine at the correct dosage to the correct person based on age. For 2-dose recommendations, see "Who Needs 2 Doses of 2018-19 Seasonal Influenza Vaccine?" at www.michigan.gov/flu. Refer to "Prevention and Control of Seasonal Influenza with Vaccines: Recommendations of the ACIP—U.S., 2018-19 Influenza Season," MMWR Recomm Rep 2018;67(No. RR-3):1-20, located at www.cdc.gov/vaccines. For additional information regarding flu and flu vaccination, refer to www.michigan.gov/flu, www.cdc.gov/vaccines, or www.cdc.gov/mmwr.

Seasonal Influenza Vaccines 2018-2019

Influenza Vaccination of Persons with Egg Allergy

- No change from 2017-18 recommendations
- History of egg allergy and **only hives** after egg exposure: should receive flu vaccine
  - Use any licensed, recommended, age-appropriate vaccine (i.e., IIV, RIV4, LAIV4)
- History of egg allergy and symptoms **other than hives** (e.g. angioedema, respiratory distress) or required epinephrine/another emergency medical intervention: may receive flu vaccine
  - Any licensed, recommended, age-appropriate vaccine (i.e., IIV, RIV4, LAIV4) that is otherwise appropriate for their health status
  - Administer in inpatient or outpatient medical setting
  - Supervised by health care provider able to recognize and manage severe allergic conditions



2018-19 Influenza Vaccine Screening for Persons who Report Egg Allergy

For the 2018-19 influenza season, the Advisory Committee on Immunization Practices (ACIP) recommends the following:

1. Persons with a history of egg allergy who have experienced **only hives** after exposure to egg should receive influenza vaccine
   - Use any licensed, recommended, and age-appropriate influenza vaccine (i.e., IIV, RIV4, or LAIV4)
2. Persons who report having a reaction to egg involving symptoms **other than hives** (such as angioedema, respiratory distress, lightheadedness, or recurrent emesis) or who required epinephrine or another emergency medical intervention:
   - May receive any licensed, recommended, and age-appropriate influenza vaccine (i.e., IIV, RIV4, LAIV4) that is otherwise appropriate for their health status
   - Vaccine should be administered in an inpatient or outpatient medical setting
   - Administration should be supervised by a health care provider who is able to recognize and manage severe allergic reactions
   - No post-vaccination observation period recommended specifically for egg-allergic persons
     - However, ACIP recommends that vaccine providers consider observing patients for 15 minutes following administration of **any vaccine** to decrease the risk for injury should syncope occur

Remember:
A previous severe allergic reaction to influenza vaccine, regardless of the component suspected of being responsible for the reaction, is a contraindication to future receipt of the vaccine.

"Prevention and Control of Seasonal Influenza with Vaccines: Recommendations of the ACIP—U.S., 2018-19 Influenza Season," MMWR Recomm Rep 2018;67(No. RR-3):1-20, located at www.cdc.gov/vaccines. For further information regarding flu vaccination, refer to www.michigan.gov/flu, www.cdc.gov/vaccines, or www.cdc.gov/mmwr.

Michigan Department of Health and Human Services — Division of Immunization

Page 1 of 2 August 27, 2018

Note: A previous severe allergic reaction to influenza vaccine, regardless of the component suspected of being responsible for the reaction, is a contraindication to future receipt of the vaccine

Recent Study: Flu Vaccine In Pregnancy Making Headlines

- CDC-funded study that was published in *Vaccine*:
  - Found an association between spontaneous abortion and flu vaccination among women vaccinated during the first trimester of pregnancy with a flu vaccine containing the pandemic H1N1 component, who also had been vaccinated during the prior season with a flu vaccine containing the pandemic H1N1 component
  - Study detected an association between vaccination and miscarriage, but cannot quantify risk and cannot establish that vaccine was the cause of the miscarriage
  - Other study limitations:
    - Women who have increased risk for miscarriage might also be more likely to get flu vaccine
    - Many miscarriages occur early in pregnancy and may not come to medical attention
    - Possible impact of unidentified or unrecorded flu vaccinations

"Association of spontaneous abortion with receipt of inactivated influenza vaccine containing H1N1 pdm09 in 2010-11 and 2011-12"

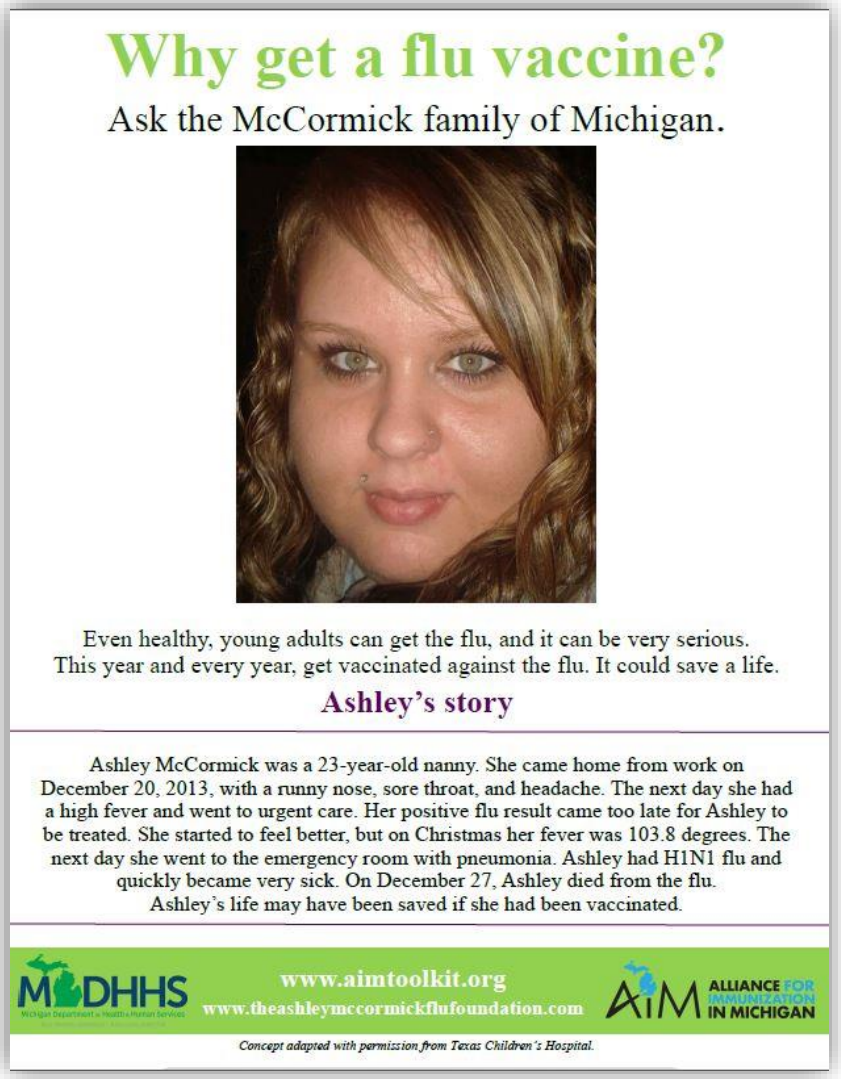
Key Messages to Communicate

- CDC continues to recommend that all pregnant women get flu vaccine during any trimester of pregnancy
- Influenza disease can put pregnant women and their developing baby at an increased risk of serious illness, so it is important for healthcare providers to continue to recommend and offer flu vaccine to pregnant patients
- Influenza vaccines have had a long and very good safety record
- CDC funded this study and has been following the results closely. They are continuing to collect data and will share future results to ensure that flu vaccines are safe and effective for pregnant women

Strong Provider Recommendation
+
Vaccine Availability
Protection!

When Pregnant Women Received	% Vaccinated
Flu recommendation; Offer of vaccine	63.8%
Flu recommendation; No offer of vaccine	37.6%
No flu recommendation; No offer of vaccine	9.0%

Influenza and Tdap Vaccination Coverage Among Pregnant Women-United States, April 2018



Alliance for Immunization in Michigan (AIM)

- A sad reminder that even young, healthy adults die from flu
- Ensure all your patients are protected

Cancers Caused By HPV In U.S.

Cancer site	Percentage probably caused by any HPV type	Number probably caused by any HPV type		
		Female	Male	Both Sexes
Cervix	**91%**	10,751	0	10,751
Vagina	**75%**	635	0	635
Vulva	**69%**	2,707	0	2,707
Penis	**63%**	0	803	803
Anus*	**91%**	4,008	1,949	5,957
Oropharynx	**70%**	2,160	10,725	12,885
TOTAL		**20,260**	**13,477**	33,737

*Includes anal and rectal cell carcinomas

Based on Data from 2011 to 2015

CDC, HPV-Associated Cancer Statistics

MenB Vaccine
ACIP Consideration For Boosters

- No ACIP guidance for booster doses to date
- Certain persons at increased risk for meningococcal disease likely to remain at increased risk throughout their life
- Data suggest waning protection after vaccination with serogroup B vaccines
  - Some as early as 12 months after completion of the primary series
  - Limited data available on duration of protection and efficacy of MenB booster doses
- Lots of discussion around booster doses-determined more data needed
  - Concern of how interval of booster doses will be determined
- Safety Summary:
  - MenB vaccines are more reactogenic than other vaccines given during adolescence
  - Safety and tolerability profiles are similar for the primary series and for one additional booster dose

ACIP Meeting Minutes from February 22-23, 2017
Meningococcal Vaccination for Adolescents: Information for Healthcare Providers

MenB Safety

- Local and systemic complaints are common following MenB administration but the reactions are generally self-limited
  - Most common adverse event is pain at the injection site
- To date, no concerning patterns of Serious Adverse Events have been reported for MenB vaccines
- Theoretical concerns have been raised from animal models about autoimmune disorders
  - Data do not suggest a higher incidence of autoimmune conditions following vaccination than what is observed in the general population
  - Post-licensure safety surveillance will be conducted to detect any potential safety signals

ACIP Meeting Minutes June 2015
Meningococcal Vaccination for Adolescents: Information for Healthcare Professionals