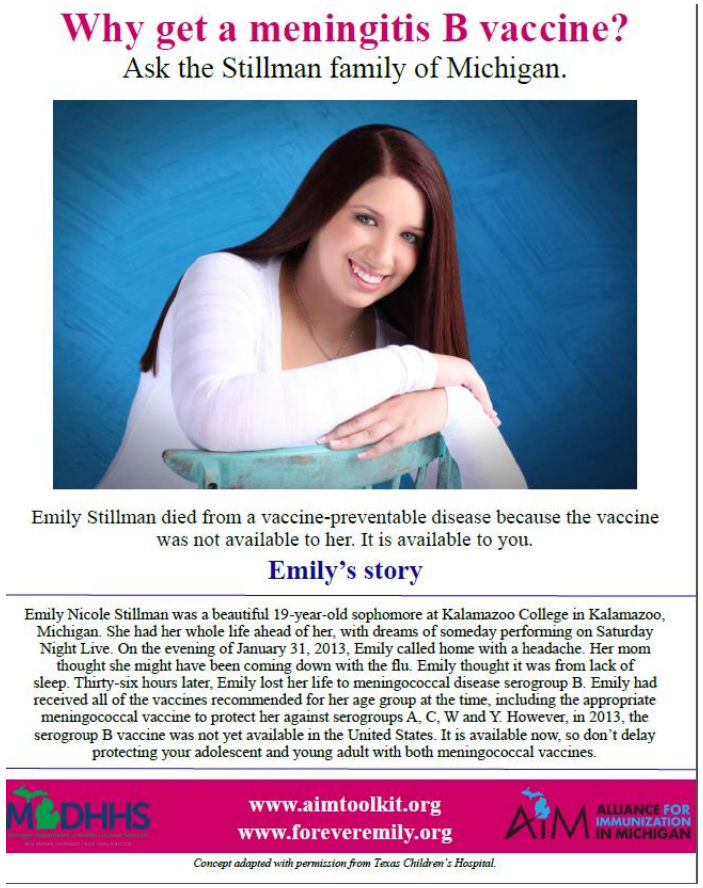


Meningococcal Disease

IT TAKES 2 TYPES OF MENINGOCOCCAL VACCINES

MDHHS
Michigan Department of Health & Human Services

FACES of Meningococcal Disease Specifically MenB

Meningococcal Disease Video

www.youtube.com/watch?v=7cuZwHk9vn0

Source: National Meningitis Association - Public Service Ad

Meningococcal disease is highly contagious.

True or False?

False

Meningococcal disease is not highly contagious. Those most at risk for meningococcal infection are persons who are in close contact with a person who has meningococcal disease.

Image Courtesy of CDC

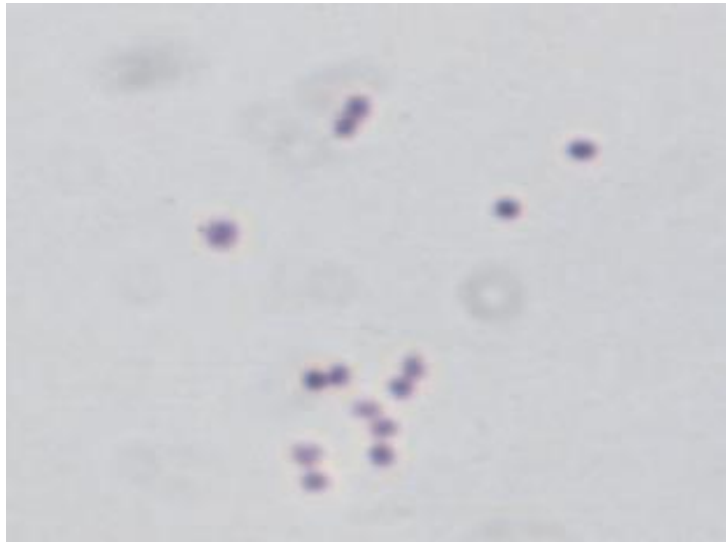
Meningococcal Disease

Meningococcal Disease Pathogenesis

- Transmitted by droplet aerosol or secretions from the nasopharynx of colonized persons
- Bacteria attach and multiply on the mucosal cells of the nasopharynx
- In some persons organism invades bloodstream and causes infection at a distant site
- In about 50% of bacteremic persons the organism crosses the blood-brain barrier
  - Goes into the cerebrospinal fluid and causes purulent meningitis

Neisseria Meningitidis

- Meningococcal disease is an acute, potentially severe illness caused by the bacterium *Neisseria meningitidis*
- *Neisseria meningitidis* is a leading cause of bacterial meningitis and sepsis in the United States
- Almost all invasive disease is caused by one of five serogroups: A, B, C, W, and Y
  - Three of these serogroups (B, C, and Y) cause most of the illness seen in the United States



Source: CDC
Photomicrograph of *Neisseria meningitidis*

Clinical Features (*Neisseria meningitidis*)

- Incubation period 3 to 4 days (range 2 to 10 days)
- Abrupt onset of fever, meningeal symptoms, hypotension and rash
- Although not common, meningococcal disease is very serious
- Case-fatality rate is 10%-15%, even with appropriate antibiotic therapy
- Case-fatality is up to 40% in those with meningococcemia
- As many as 20% of survivors have permanent sequelae:
  - Hearing loss
  - Neurologic damage
  - Loss of a limb

More on Meningococcal Disease

- *Neisseria meningitidis* is not spread as easily as other disease-causing organisms such as the viruses that cause chickenpox and measles
- Those most at risk for meningococcal infection are persons who are in close contact with a person who has meningococcal disease
- Spread from person-to-person through respiratory secretions

Image from Meningitis B Action Project

Meningococcal Meningitis

- Most common presentation of invasive meningococcal disease
- Common symptoms are:
  - Sudden onset of fever
  - Headache
  - Stiff neck
  - Often accompanied by symptoms such as nausea, vomiting, photophobia, and altered mental status

Meningococcal Sepsis

- Also called “Meningococcemia” (bloodstream infection)
- May occur with or without meningitis
- Symptoms include:
  - Abrupt onset of fever
  - Petechial or purpuric rash
  - Hypotension
  - Shock
  - Acute adrenal hemorrhage
  - Multiorgan failure

Recap of Symptoms

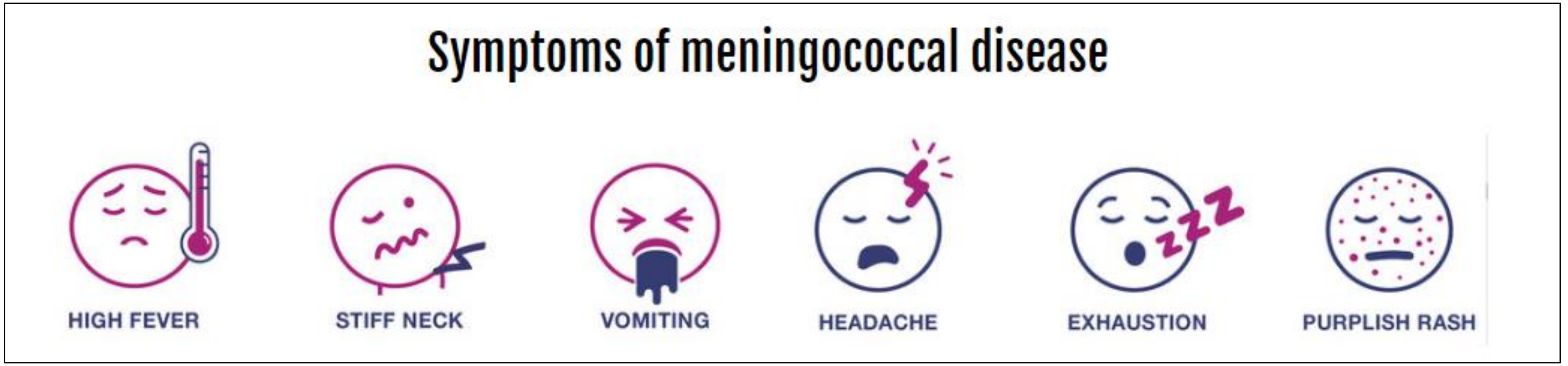


Image from Meningitis B Action Project

- Remember it can attack without warning
- Early symptoms can often be mistaken for the flu

Meningococcal Disease Incidence

Relatively rare – in 2017, there were ~350 cases of meningococcal disease reported (all serogroups)

www.cdc.gov/meningococcal/surveillance/index.html

Meningococcal Disease is a Serious Illness

1 in 10 die despite antibiotics

1 in 5 survivors have long-term sequelae:

Hearing Loss

Amputations

Cognitive Deficits

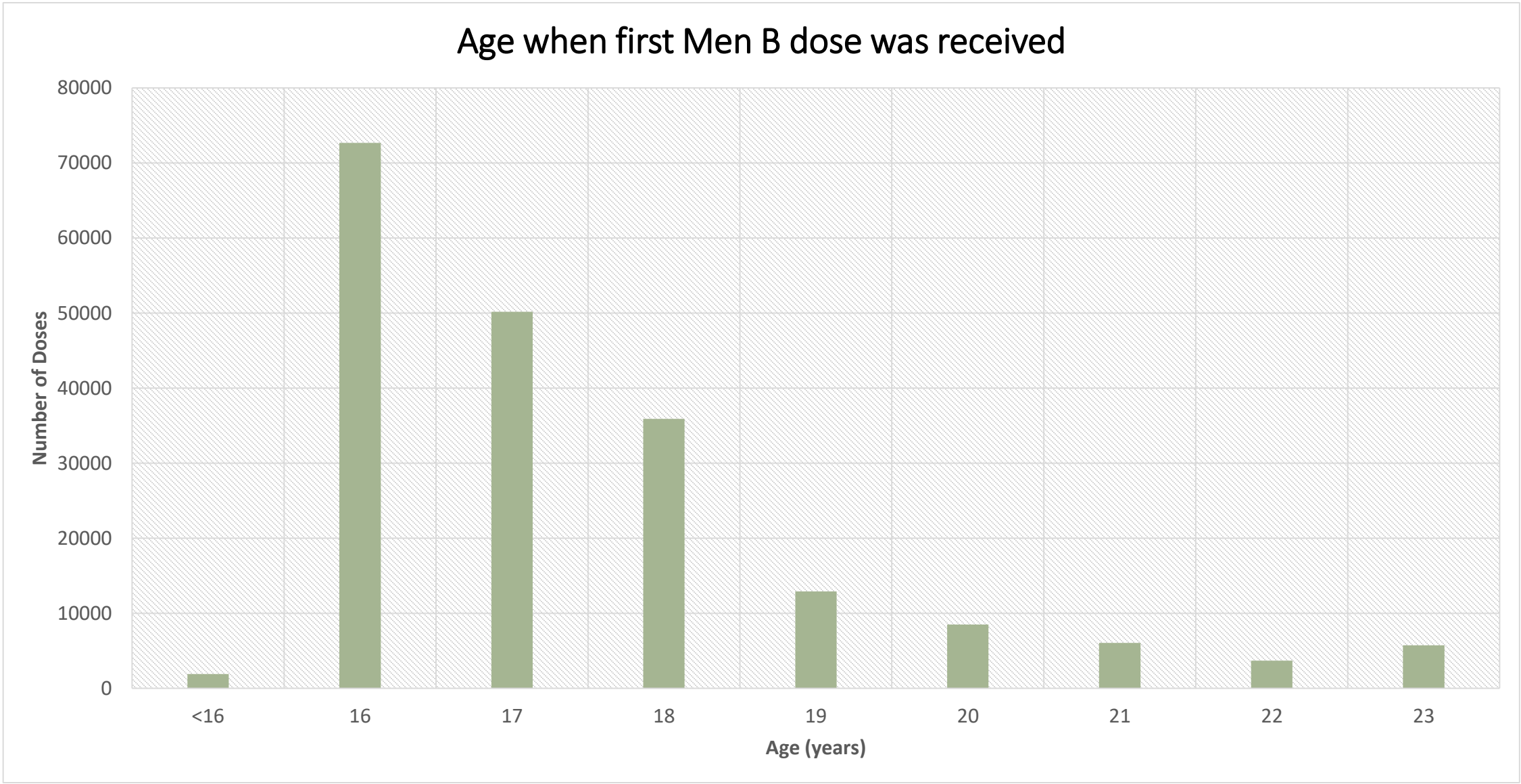
MenACWY and Men B Coverage

- Coverage for MenACWY according to MCIR data:
  - By age 13-17 years, 80.4% have received at least **1 dose**
  - However, only 47.2% are **fully protected** by age 17 years*

- Coverage for MenB according to MCIR data**:
  - 26.2% of adolescents 16 through 18 years of age have received 1 or more doses
  - 17.8% of persons 16 through 23 years of age have received 1 or more doses

*Up-to-date with recommended number of doses.

**Coverage is calculated using data reported to the MCIR for the numerator and the 2018 US Census Estimates for the denominator.


Age when first Men B dose was received
80000
70000
60000
50000
40000
30000
20000
10000
0
Number of Doses
<16
16
17
18
19
20
21
22
23
Age (years)

Meningococcal B Vaccine Administration

- 192,970 persons 16 through 23 years of age (as of September 28, 2019) have received 278,863 meningococcal B vaccines
  - 60.4% Bexsero
  - 39.4% Trumenba
  - 0.2% Unknown

- Facility type administering Men B and reporting the data to MCIR (based on MCIR Facility Type)
  - 51.8% of the doses were reported by Pediatrics
  - 32.9% Family Practices
  - 10.2% Local Health Departments
  - 1.0% School Based Health Clinic
  - 0.8% College/University Clinic

How Do We Protect?

Image Courtesy of CDC

VACCINATE!

2

Image from Meningitis B Action Project

It Takes 2 Types of Meningitis Vaccines

What is routine for meningococcal vaccination?

BEST Protection

- Adolescents are one of our highest risk groups
  **adolescents share everything
- Our best protection is to vaccinate with both meningococcal vaccines
  1. Meningococcal Conjugate (MenACWY or MCV4)
     - Trade names Menveo® and Menactra®
  2. Serogroup B Meningococcal (MenB)
     - Trade names Trumenba™ and Bexsero®

Image Courtesy of CDC

Meningococcal Vaccines

Meningococcal Serogroup ACWY Vaccines

- MenACWY or MCV4
  - Available since 2005-ACIP routine recommendations
    - In 2005-Routinely recommended at age 11-12 years
    - In 2010-Booster dose recommended at age 16 years

Been Around

Meningococcal Serogroup B Vaccines

- MenB
  - Available since late 2014-ACIP routine recommendations
    - In 2015-Routinely recommended for people at increased risk age ≥ 10 years
    - Later in 2015-"May be given" to healthy persons 16 through 23 years of age, preferred at 16-18

Newer vaccine

Source: MMWR 2013;62(RR-2):15; MMWR 2015;64:608-12

Meningococcal Conjugate Vaccine (MenACWY)

- Menveo or Menactra are the 2 vaccine options for MenACWY
- For best protection, **FOLLOW** the recommended schedule, ensure your patient receives 2 doses of a MenACWY vaccine
  - 1 dose at 11-12 years

    and
  - 1 dose at 16 years

16-year-old platform

- Ensure first-year college students who live in residential housing, receive 1 dose of MenACWY, if not previously vaccinated at age 16 years or older

If needed the minimum interval between the 2 doses is 8 weeks

Meningococcal B Vaccines (MenB)

- Bexsero® or Trumenba™ are the 2 vaccine options for MenB
- Know your vaccine:
  - Bexsero is 2 doses at least 4 weeks apart
  - Trumenba is either 2 doses at 0, 6 months OR 3 doses at 0, 2, 6 months
    - 2-dose Trumenba schedule is recommended for persons aged 16 through 23 years who are not in any risk group or outbreak
- What is “routine” for MenB vaccines?
  - **Based on clinical discretion**, MenB may be given to persons aged 16 through 23 years who are not at increased risk
    - Providers need to discuss vaccination and risk of disease
    - Series preferably given at ages 16-18 years

16-year-old platform

Did you know?

May give MenB at the same time as MenACWY –Don't miss an opportunity

- Both are recommended at 16 years of age **16-year-old platform**
- Both are administered IM—ensure correct administration, deltoid preferred site

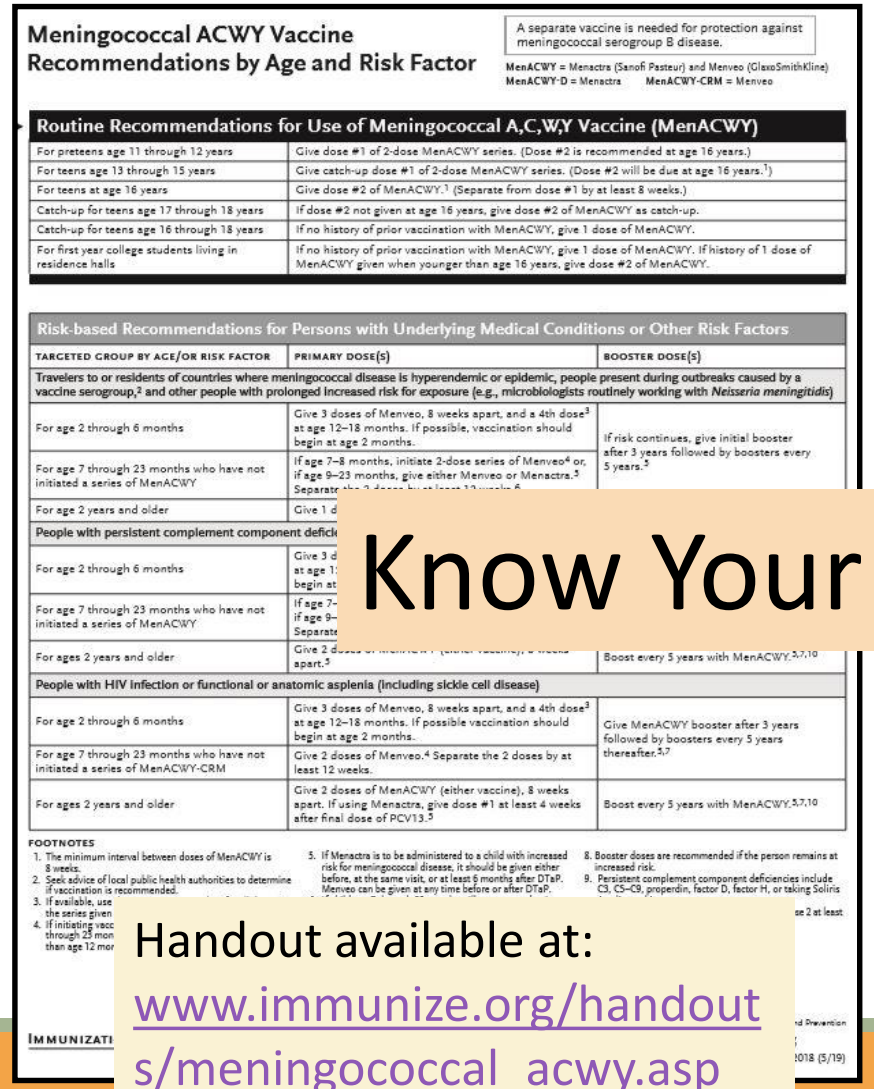
Avoid SIRVA!

(Shoulder Injury Related to Vaccine Administration)

Images Courtesy of CDC

High Risk Recommendations for Persons at Increased Risk for Meningococcal Disease

MenACWY



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 Use of Meningococcal A,C,W,Y 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 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 age 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.[5]
For age 7 through 23 months who have not initiated a series of MenACWY	If age 7–8 months, initiate 2-dose series of Menveo[4] or, if age 9–23 months, give either Menveo or Menactra.[5] Separate	
For age 2 years and older	Give 1 d	
People with persistent complement component deficie		
For age 2 through 6 months	Give 3 d at age 1 begin at	
For age 7 through 23 months who have not initiated a series of MenACWY	If age 7– if age 9– Separat	
For ages 2 years and older	Give 2 d apart.[5]	Boost every 5 years with MenACWY.[5,7,10]
People with HIV infection or functional or anatomic asplenia (including sickle cell disease)		
For age 2 through 6 months	Give 3 doses of Menveo, 8 weeks apart, and a 4th dose[3] at age 12–18 months. If possible vaccination should begin at age 2 months.	Give MenACWY booster after 3 years followed by boosters every 5 years thereafter.[5,7]
For age 7 through 23 months who have not initiated a series of MenACWY-CRM	Give 2 doses of Menveo.[4] Separate the 2 doses by at least 12 weeks.	
For ages 2 years and older	Give 2 doses of MenACWY (either vaccine), 8 weeks apart. If using Menactra, give dose #1 at least 4 weeks after final dose of PCV13.[5]	Boost every 5 years with MenACWY.[5,7,10]

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 series given
4. If initiating vacc through 23 mon than age 12 mo
5. If Menactra is to be administered to a child with increased risk for meningococcal disease, it should be given either before, at the same visit, or at least 9 months after DTaP. Menveo can be given at any time before or after DTaP.
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

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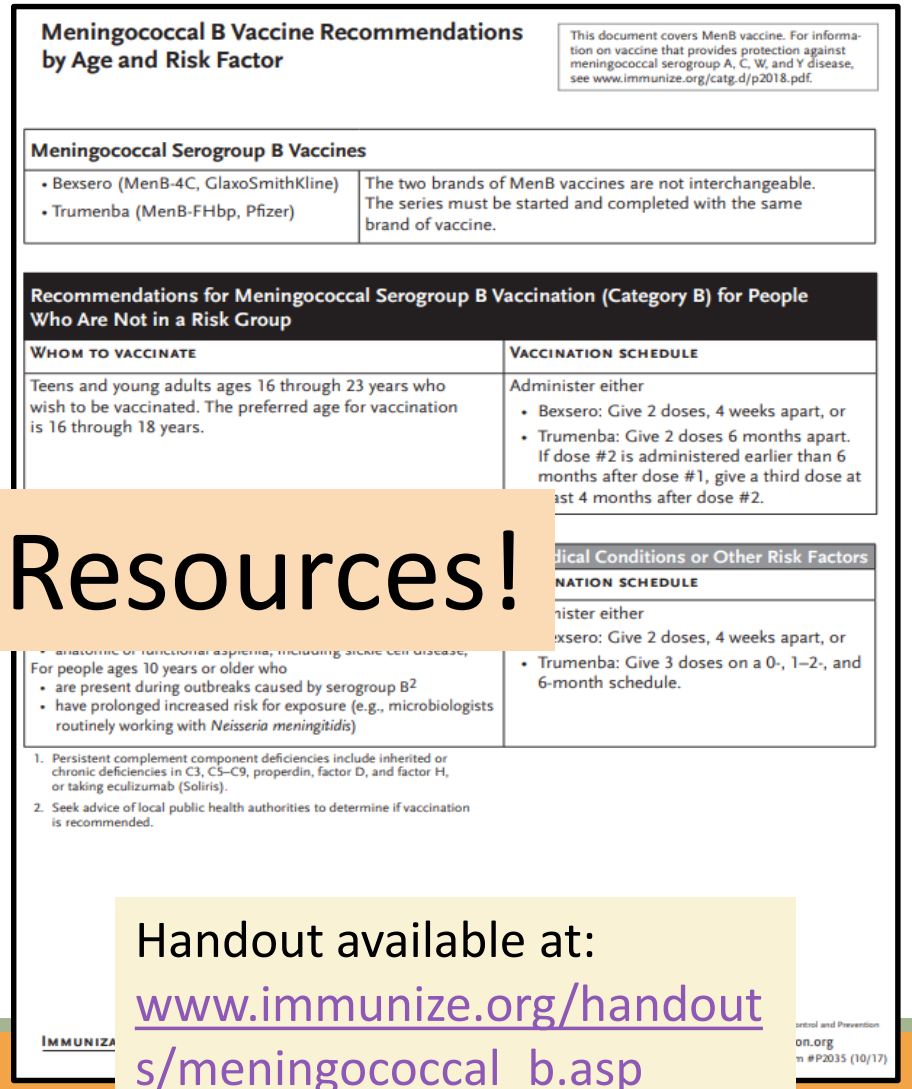
2018 (5/19)

MenB



Meningococcal B Vaccine Recommendations by Age and Risk Factor

This document covers MenB vaccine. For information on vaccine that provides protection against meningococcal serogroup A, C, W, and Y disease, see www.immunize.org/catg.d/p2018.pdf.

Meningococcal Serogroup B Vaccines	
• Bexsero (MenB-4C, GlaxoSmithKline) • Trumenba (MenB-FHbp, Pfizer)	The two brands of MenB vaccines are not interchangeable. The series must be started and completed with the same brand of vaccine.

Recommendations for Meningococcal Serogroup B Vaccination (Category B) for People Who Are Not in a Risk Group

WHOM TO VACCINATE	VACCINATION SCHEDULE
Teens and young adults ages 16 through 23 years who wish to be vaccinated. The preferred age for vaccination is 16 through 18 years.	Administer either • Bexsero: Give 2 doses, 4 weeks apart, or • Trumenba: Give 2 doses 6 months apart. If dose #2 is administered earlier than 6 months after dose #1, give a third dose at ast 4 months after dose #2.
	dical Conditions or Other Risk Factors NATION SCHEDULE
anatomic or functional asplenia, including sickle cell disease, For people ages 10 years or older who • are present during outbreaks caused by serogroup B[2] • have prolonged increased risk for exposure (e.g., microbiologists routinely working with *Neisseria meningitidis*)	nister either xsero: Give 2 doses, 4 weeks apart, or • Trumenba: Give 3 doses on a 0-, 1–2-, and 6-month schedule.

1. Persistent complement component deficiencies include inherited or chronic deficiencies in C3, C5–C9, properdin, factor D, and factor H, or taking eculizumab (Soliris).
2. Seek advice of local public health authorities to determine if vaccination is recommended.

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on.org

n #P2035 (10/17)

Know Your Resources!

Handout available at:
www.immunize.org/handouts/meningococcal_acwy.asp

Handout available at:
www.immunize.org/handouts/meningococcal_b.asp

Develop Your Office Immunization Culture

Setting up the 16-year-old platform

Why Do We Need a to Develop our Immunization Culture?

- FIRST and foremost, inconsistent messages from staff may confuse patients/parents and create mistrust
- Having a standard message in place shows your patients and families that:
  - You are committed to protecting all your patients through full coverage and on-time immunization

Remember:

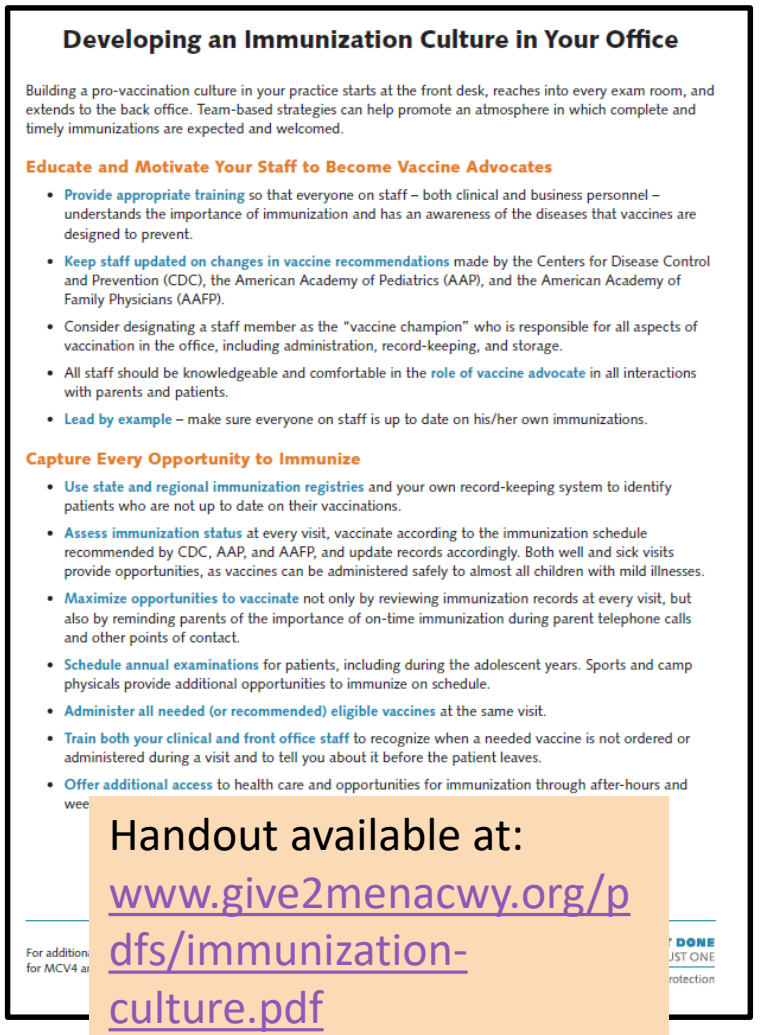
- You are their most trusted source
- Confidence is increased when the same message is received from different people

The Office Culture

- Building a pro-vaccine culture in your office starts with
  - The front desk
  - Reaches every exam room
  - Touches every area of your office (all the way to the back of the office)

Creating Your Office Immunization Culture

- Have an office Immunization Champion
- State your immunization philosophy and let your patients and parents know
- Give a strong provider recommendation and assess at every visit to avoid a missed opportunity
- Talk about vaccines and welcome questions
- Schedule follow-up immunization appointments before the patient leaves the office
- ALWAYS remind patients and parents/guardians about upcoming immunization appointments and contact those who miss appointments



Developing an Immunization Culture in Your Office

Building a pro-vaccination culture in your practice starts at the front desk, reaches into every exam room, and extends to the back office. Team-based strategies can help promote an atmosphere in which complete and timely immunizations are expected and welcomed.

Educate and Motivate Your Staff to Become Vaccine Advocates

- **Provide appropriate training** so that everyone on staff – both clinical and business personnel – understands the importance of immunization and has an awareness of the diseases that vaccines are designed to prevent.
- **Keep staff updated on changes in vaccine recommendations** made by the Centers for Disease Control and Prevention (CDC), the American Academy of Pediatrics (AAP), and the American Academy of Family Physicians (AAFP).
- Consider designating a staff member as the "vaccine champion" who is responsible for all aspects of vaccination in the office, including administration, record-keeping, and storage.
- All staff should be knowledgeable and comfortable in the **role of vaccine advocate** in all interactions with parents and patients.
- **Lead by example** – make sure everyone on staff is up to date on his/her own immunizations.

Capture Every Opportunity to Immunize

- **Use state and regional immunization registries** and your own record-keeping system to identify patients who are not up to date on their vaccinations.
- **Assess immunization status** at every visit, vaccinate according to the immunization schedule recommended by CDC, AAP, and AAFP, and update records accordingly. Both well and sick visits provide opportunities, as vaccines can be administered safely to almost all children with mild illnesses.
- **Maximize opportunities to vaccinate** not only by reviewing immunization records at every visit, but also by reminding parents of the importance of on-time immunization during parent telephone calls and other points of contact.
- **Schedule annual examinations** for patients, including during the adolescent years. Sports and camp physicals provide additional opportunities to immunize on schedule.
- **Administer all needed (or recommended) eligible vaccines** at the same visit.
- **Train both your clinical and front office staff** to recognize when a needed vaccine is not ordered or administered during a visit and to tell you about it before the patient leaves.
- **Offer additional access** to health care and opportunities for immunization through after-hours and wee

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Handout available at: www.give2menacwy.org/pdfs/immunization-culture.pdf

How Do We Get Vaccine Into Arms?

Follow the Standard of Care

RECOMMEND, EDUCATE, STRONG RECOMMENDATION, AND GIVE THE VACCINES

DO NOT MISS AN OPPORTUNITY!

Establish an Immunization Platform for Your Office

- The 16-year-old immunization platform

Teens on a diving platform in France. (Photo: alainwibert/Flickr)

- The 11 to 12-year-old immunization platform

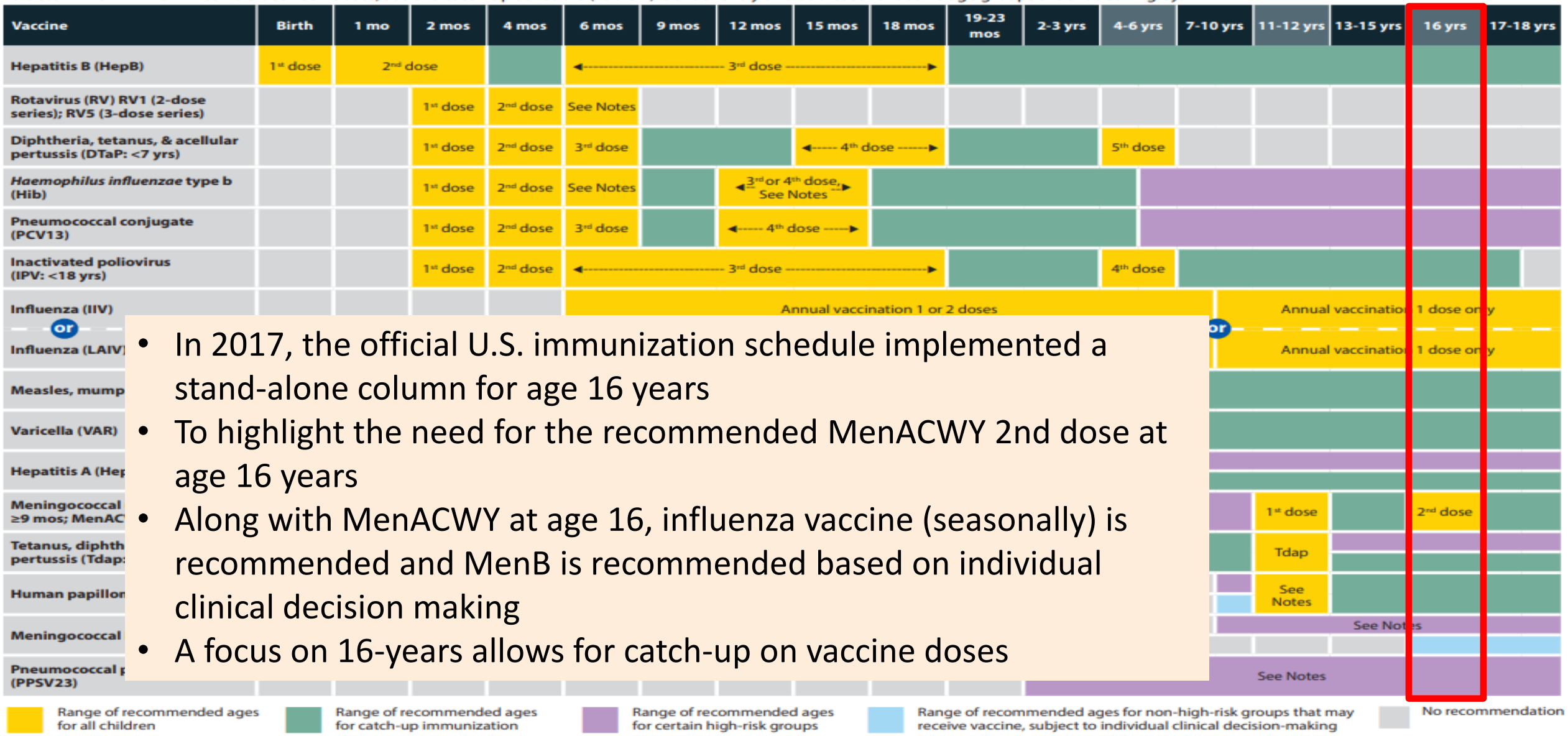
An Adolescent Immunization Platform

- Ensures your patients receive all their recommended vaccines
  - And if not done earlier, catch them up on any vaccines they may have missed
- Using the 16-year-old platform (and the 11 to 12-year-old platform)
  - Provides opportunities to review and complete all the recommended vaccines while the patients are still covered by public or private insurance
  - Following the ACIP immunization schedule will help families adhere to it
- Establish a 16-year-old visit in your office to make sure these patients receive the vaccines they need
- Develop strategies to improve adolescent vaccination rates in your healthcare setting

Source: Auslander B et al. J Adolescent Health 2017;60:475-6

Table 1 Recommended Child and Adolescent Immunization Schedule for ages 18 years or younger United States, 2019

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



- In 2017, the official U.S. immunization schedule implemented a stand-alone column for age 16 years
- To highlight the need for the recommended MenACWY 2nd dose at age 16 years
- Along with MenACWY at age 16, influenza vaccine (seasonally) is recommended and MenB is recommended based on individual clinical decision making
- A focus on 16-years allows for catch-up on vaccine doses

The Adolescent Immunization Platform

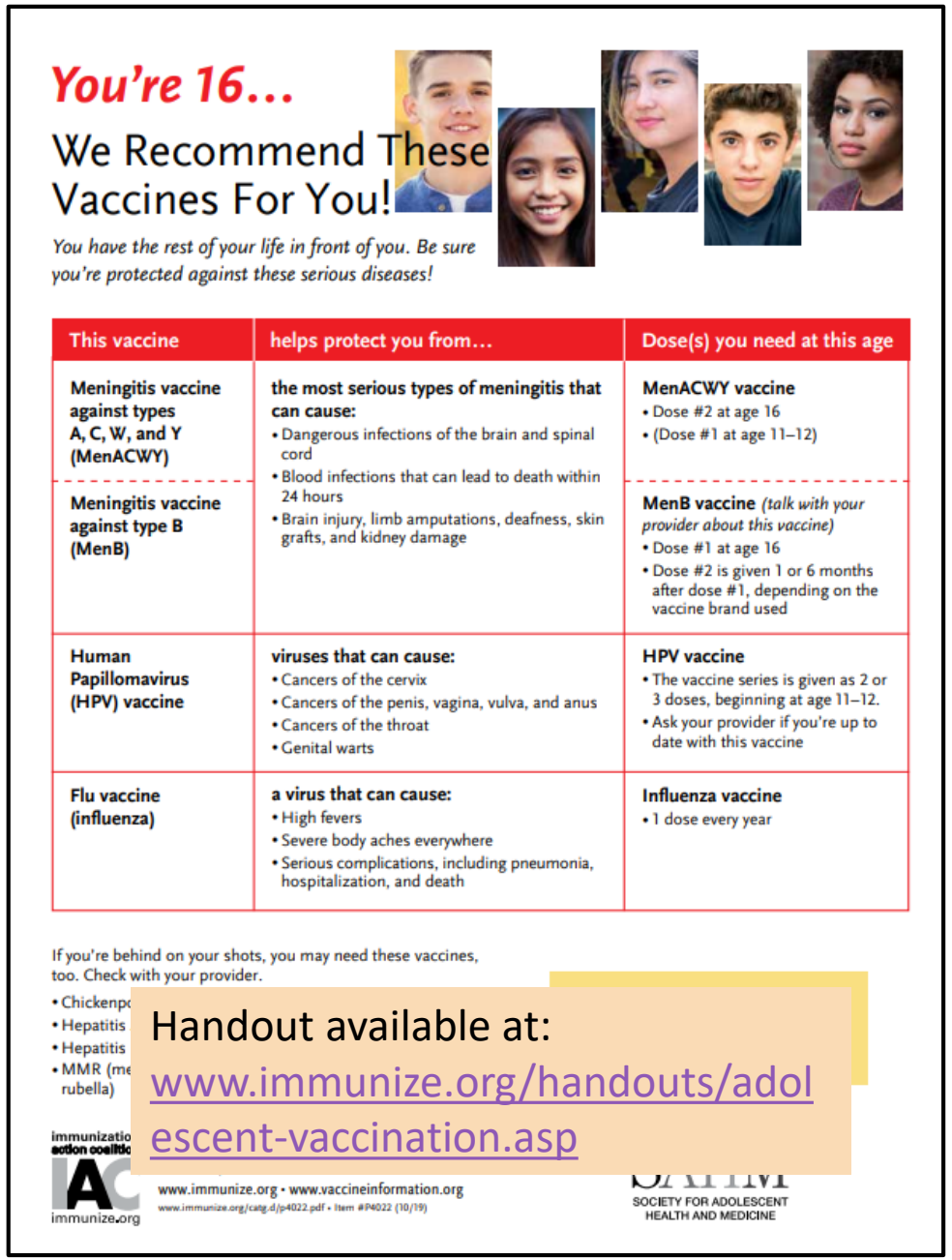
11 to 12-year-old Immunization Platform
• Tdap—once in lifetime dose • HPV—if the series is started at 9 through 14 years it will be a 2-dose series given at 0, 6 months • Flu—1 dose every year • MenACWY (dose 1)—recommended at age 11 to 12 years

16-year-old immunization platform
• Flu—1 dose every year • MenACWY (dose 2)—2nd dose is recommended at **16** to 18 years • MenB—preferred at **16** to 18 years, 1st dose in series   • Number of doses depends on Vaccine brand being used

~Assess for any vaccines that may need to be caught up on~

Updated Handout!

- Just received an email on Wednesday October 19, 2019 that this handout was updated:
  - Reviews what vaccines are recommended at 16
  - Gives a reminder on making sure you are up-to-date on all your vaccines
  - Follows the 16-year-old Immunization Platform



You're 16...

We Recommend These Vaccines For You!

You have the rest of your life in front of you. Be sure you're protected against these serious diseases!

This vaccine	helps protect you from...	Dose(s) you need at this age
Meningitis vaccine against types A, C, W, and Y (MenACWY)	**the most serious types of meningitis that can cause:** • Dangerous infections of the brain and spinal cord • Blood infections that can lead to death within 24 hours • Brain injury, limb amputations, deafness, skin grafts, and kidney damage	**MenACWY vaccine** • Dose #2 at age 16 • (Dose #1 at age 11–12)
Meningitis vaccine against type B (MenB)		**MenB vaccine** *(talk with your provider about this vaccine)* • Dose #1 at age 16 • Dose #2 is given 1 or 6 months after dose #1, depending on the vaccine brand used
Human Papillomavirus (HPV) vaccine	**viruses that can cause:** • Cancers of the cervix • Cancers of the penis, vagina, vulva, and anus • Cancers of the throat • Genital warts	**HPV vaccine** • The vaccine series is given as 2 or 3 doses, beginning at age 11–12. • Ask your provider if you're up to date with this vaccine
Flu vaccine (influenza)	**a virus that can cause:** • High fevers • Severe body aches everywhere • Serious complications, including pneumonia, hospitalization, and death	**Influenza vaccine** • 1 dose every year

If you're behind on your shots, you may need these vaccines, too. Check with your provider.

• Chickenpo
• Hepatitis
• Hepatitis
• MMR (me
rubella)

immunizatio
action coalitio
immunize.org

www.immunize.org • www.vaccineinformation.org
www.immunize.org/catg.d/p4022.pdf • Item #P4022 (10/19)

SOCIETY FOR ADOLESCENT HEALTH AND MEDICINE

Handout available at: www.immunize.org/handouts/adolescent-vaccination.asp

Meningococcal Vaccine Administration Question

Question:

- Given how important the MenACWY booster dose is for protection of older adolescents, should I also administer MenB vaccine to 16-year-old patients at the same time?

Answer:

- MenB vaccine may be administered based on shared clinical decision making
- Clinicians may administer MenB vaccine any time between 16–23 years of age
- ACIP states a preference of 16–18 years of age

Discussing Meningococcal Vaccination

- Talking points for Meningococcal vaccination:
  - Meningococcal disease is rare but can be deadly
  - Increased risk from mid-to-late teens into your early 20s
  - Meningococcal disease can be sudden, without warning
  - 10%–15% of people who develop meningococcal disease will die, even with appropriate antibiotic treatment
  - Up to 20% of people who survive will suffer lifelong disability, such as loss of limbs, loss of hearing, or brain damage
  - Meningococcal vaccines are safe, effective, and recommended for adolescents
  - Close the conversation with a strong recommendation for the vaccine—It will make a difference

Recommending MenACWY*:
What to Say and How to Say It

The National Vaccine Advisory Committee (NVAC) calls on all healthcare providers to[1]

- Incorporate immunization needs assessment into every clinical encounter.
- Strongly recommend all immunizations that patients need.
- Administer vaccines in your healthcare setting, or, if you can't, refer the patient to a provider who immunizes.
- Document the vaccination given.

A clinician's strong recommendation for a vaccine is known to be powerful and persuasive in building vaccine confidence and acceptance among patients and parents.

From October 2017–January 2018 in the United States, for example, a clinician's recommendation was a key factor in determining whether pregnant women were vaccinated against influenza. When the clinician made a recommendation and offered vaccination, 63.8% of pregnant women were vaccinated. If the clinician made a recommendation but did not offer vaccination, the immunization rate was 37.6%. Furthermore, if the clinician neither recommended nor offered vaccine, the rate was only 9%.[2]

Meningococcal disease: Recognizing risk

When it comes to discussing MenACWY* with patients and parents, focus can be placed on:

- The life-threatening nature of the disease
- A well-documented period of increased risk for adolescents and young adults
- The importance of being vaccinated with both the first and second doses of meningococcal ACWY vaccine

The first MenACWY dose is recommended at 11–12 years of age and a second (booster) dose at 16 years of age.[3] Dose #1 has been recommended since 2005, and the second dose was recommended in 2010. Unfortunately, immunization rates for dose #2 are lagging. The Centers for Disease Control and Prevention notes that "Health-care personnel should use every opportunity to provide the booster dose when indicated."[3]

Having the Conversation

Be sure to include meningococcal disease prevention as part of the anticipatory guidance for your teenage and young adult patients.

CONTINUED ON NEXT PAGE ▶

* MenACWY is a vaccine that helps protect against meningococcal disease resulting from infection with serogroups A, C, W, or Y.

Handout available at:
www.give2menacwy.org/pdfs/recommending-menacwy.pdf

Why Do We Vaccinate?

Why do we do all this?
Why do we create an office culture, establish an immunization champion, start the 16-year-old immunization platform, and create an office immunization philosophy?

BECAUSE……







Survivors of Meningococcal Disease Specifically MenB




Video—It is the Right Thing to Do

youtu.be/UWRZLQv7zX4

Source: National Meningitis Association

Thank you for all that you do!

MY BABY BROTHER. HE WAS ONE OF THE LUCKY ONES! A MENINGITIS SURVIVOR.

MENINGITIS IN 7TH GRADE (1990)

4 KIDS IN OUR SURROUNDING COMMUNITY CONTRACTED MENINGITIS AROUND THE SAME TIME (2 LIVED AND 2 PASSED AWAY)

Resources

- ACIP's Meningococcal Recommendations: www.cdc.gov/vaccines/hcp/acip-recs/vacc-specific/mening.html
- CDC's Meningococcal Infection: www.cdc.gov/meningococcal/index.html
- Children's Hospital of Philadelphia Vaccine Education Center Meningococcal: www.chop.edu/centers-programs/vaccine-education-center/vaccinedetails/meningococcal-vaccine
- Immunization Action Coalition: www.immunize.org
- Michigan Immunization Program: www.michigan.gov/vaccines
- Web pages that give a parent perspective:
  - meningitisbactionproject.org/about-meningitis
  - www.meningitis-angels.org/
- National Meningitis Association: www.nmaus.org/educational-resources/psas/