SURVEILLANCE, REPORTING AND CONTROL OF VACCINE PREVENTABLE DISEASES 2016

21th Annual Massachusetts Adult Immunization Conference
April 27, 2016

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Division of Epidemiology & Immunization, MDPH
We, Joyce Cohen and Marija Popstefanija, have been asked to disclose any significant relationships with commercial entities that are either providing financial support for this program or whose products or services are mentioned during my presentations.

We have no relationships to disclose.

We will discuss the use of vaccines in a manner not approved by the U.S. Food and Drug Administration.

But in accordance with ACIP recommendations.
TODAY’S TOPICS

• Epidemiology in a global context
  • Who we are and what we do
  • Reporting and controlling the spread of diseases

• Recent events in communicable disease worldwide

• Vaccine-preventable disease (VPD) epidemiology in Massachusetts
  • Overall trends
  • Mumps
  • Invasive meningococcal disease
  • Influenza
IN THE AUDIENCE TODAY:
RAISE YOUR HAND

• ...if you have talked to a patient who is apprehensive about getting vaccine.
• ...if you have ever reported a suspect case of a VPD to the health dept.
• ...if you have ever had to provide evidence of immunity due to an exposure in your workplace.
• ...if you have ever flown from one continent to another, in a matter of hours.
• ...if you have ever had to utilize prophylaxis for yourself or a patient after exposure to a VPD.
• ...if you are ever concerned about how quickly illnesses can be transmitted around the globe.
EPIDEMIOLOGISTS - OUR ROLE

Surveillance, reporting and control of vaccine-preventable diseases, and others, to reduce associated morbidity and mortality.
For suspect cases, we

- Partner with local health departments
- Ensure appropriate treatment
- Help determine if the case needs to be excluded from work or school and for how long
- Help identify “close contacts”
- Make recommendations for contacts including immunization, prophylaxis, treatment, and/or exclusion from work/school as needed
HEALTHCARE PROVIDER ROLE

- Notify patient of diagnosis
- Notify the LBOH or MDPH of an infectious reportable disease
- Inform patient that the LBOH may be calling
- Educate patient about protecting their family and close contacts
- Provide key information to the LBOH to complete the official “Case Report*”

*per 105 CMR 300.000
WHAT IS REPORTABLE BY WHOM?

- 105 CMR 300.000
- Reportable Diseases Lists:
  - Healthcare providers
  - Clinical laboratories
  - Local Boards of Health

Diseases in red are “immediate” diseases.

- Diseases in black are reportable within 1-2 business days.

mass.gov/dph/epi – click on “Reportable Communicable Diseases”
COLLABORATIONS IN DISEASE SURVEILLANCE AND CONTROL

Healthcare Provider

LBOH 1

School

MDPH

LBOH 2

Sports Team

Adult Immunization Conference 2016
Recent events in communicable disease worldwide

Massachusetts Department of Public Health
YOU RECEIVE A CALL FROM A PATIENT

- Who has recently returned from Rio de Janeiro covered with mosquito bites, and has discovered that she is pregnant
- Who has recently worked for the USDA in another state, euthanizing poultry suspected of having high-path avian influenza, and is now feeling very fatigued and feverish
- Who has recently returned from the Middle East, and is short of breath and very anxious
- Who has volunteered for a clean water organization in West Africa, and upon returning from Africa has had fever, rash, and conjunctivitis
ZIKA VIRUS

- Spread by mosquito bites
- Recently introduced to Central and South America and the Caribbean
- In general causes mild viral illness; most infected with Zika are asymptomatic
- **May cause birth defects like microcephaly when infection occurs during pregnancy**

Call 617-983-6800 for questions about testing patients with recent onsets, or testing of pregnant women with travel to Zika-affected areas.
MIDDLE EAST RESPIRATORY SYNDROME (MERS)

- Incubation period ~12 days
- Fever, cough, weakness, fatigue
- Pneumonia, ARDS
- Diarrhea in many cases
- About 3-4 out of every 10 patients reported with MERS have died.

Call 617-983-6800 for patients in respiratory distress with recent travel to the Middle East and other affected regions or countries.
HIGHLY PATHOLOGIC AVIAN INFLUENZA (HPAI)

• A disease of birds
• Rarely transmitted to humans
• Monitoring of exposed humans out of an abundance of caution

BIDLS role: If HPAI is found in Massachusetts, we will monitor exposed poultry workers for influenza-like illness, and provide testing at MA PHL to rule out HPAI as quickly as possible.
EBOLA VIRUS

• Usually abrupt onset 3–12 days after exposure
• Nonspecific initial signs and symptoms: fever and malaise, anorexia, headache, myalgia, arthralgia, sore throat, chest or retrosternal pain, conjunctival injection, lumbosacral pain, maculopapular rash
• Gastrointestinal signs and symptoms follow in first few days: nausea, vomiting, epigastric and abdominal pain, diarrhea
• The average EVD case fatality rate is around 50%. Case fatality rates have varied from 25% to 90% in past outbreaks.

Our role to date:
• assisting with evaluation and testing of suspect cases
• monitoring of returning travelers for 21 days
MASSACHUSETTS MORBIDITY

24/7 urgent disease control matters: 617-983-6800
### Vaccine-Preventable Diseases in Massachusetts*, 2006-2015

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<thead>
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<td>Hib &lt; 5</td>
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<td>2094</td>
<td>1585</td>
<td>1415</td>
<td>769</td>
<td>606</td>
<td>626</td>
<td>476</td>
<td>469</td>
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</table>

*Data are current as of 3/11/2016 and are subject to change.*

*Both confirmed and probable cases are reported for measles, mumps, rubella, and varicella to better reflect the true burden of disease. All other diseases include confirmed cases only. **Varicella surveillance prior to 2007 was conducted using different methodology and cannot be compared with subsequent years.*
RELIGIOUS AND MEDICAL EXEMPTIONS AMONG MASSACHUSETTS COLLEGE STUDENTS 1992-2015

% with Exemptions

Visit [www.mass.gov/dph/imm](http://www.mass.gov/dph/imm) to find School Immunization and Exemption data

Source: Massachusetts Annual College Immunization Survey

MDPH April 2016
## INVESTIGATIONS VS. CONFIRMED* CASES

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<td>Pertussis</td>
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<td><strong>Totals</strong></td>
<td><strong>911</strong></td>
<td><strong>350</strong></td>
<td><strong>807</strong></td>
<td><strong>292</strong></td>
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*Includes probable cases to more accurately reflect true burden of disease.
MUMPS

A systemic disease characterized by:

- Non-specific prodrome consisting of myalgia, loss of appetite, malaise, headache, low-grade fever
- Swelling of one or more salivary glands, usually the parotid glands, often tender or painful, with orchitis commonly reported in males after puberty
- 1/3 of infections may be asymptomatic or manifest as respiratory illness
- Rare complications include arthritis, encephalitis, thyroiditis, mastitis, ataxia, oophoritis, hearing loss, and others
MUMPS OUTBREAK 2016

There are now 6 confirmed cases of mumps at Harvard University. Officials have asked the students to "self-isolate" for five days.

- Initial notification on 2/24/16
- Clinical advisory issued on 3/2/16
- Emphasis on early recognition, prompt testing and isolation of ill patient for five days after onset of parotitis, and vaccination
- Mumps may occur in vaccinated individuals
- Two doses 88% effective (at best) in preventing mumps

MMR rates among MA college students, 2015-16 school year

<table>
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<tr>
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<th>Undergraduates</th>
<th>Graduate Students</th>
<th>Health Science</th>
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<tr>
<td>Harvard</td>
<td>99.8%</td>
<td>98.8%</td>
<td>100%</td>
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</tbody>
</table>

The Commonwealth of Massachusetts
Executive Office of Health and Human Services
Department of Public Health
Bureau of Infectious Disease and Laboratory Sciences
305 South Street, Jamaica Plain, MA 02130

MMR rates among MA college students, 2015-16 school year

1. Consider a diagnosis of mumps in those with symptoms, regardless of vaccination history.
2. Use standard and enhanced precautions to prevent transmission.
3. Obtain appropriate clinical specimen for testing at the Massachusetts State Public Health Laboratory. A second swab is performed for patients with recent exposure within five days of onset of swelling.
4. Isolate suspected and confirmed cases for five days after onset of swelling.
5. Report suspected cases to MDH at 857-561-7800. Cases diagnosed in Boston should be reported to the Boston Public Health Commission at 617-536-5014.

Vaccination: The original childhood immunity to mumps and rubella and measles with medical and religious exemptions.

March 2, 2016

Clinical Advisory: Mumps
MUMPS OUTBREAK 2016

- 56 confirmed in MA (as of 4/25/16), all but one by PCR
  - 34 confirmed cases at Harvard
  - Cases confirmed at seven other Boston-area universities
  - Probable cases at two other universities
  - 28 M/28 F (Age range 15-50 – Median age 21)
  - Majority with two MMR doses
- >300 suspect cases investigated since 2/15/2016

Call 617-983-6800 while patient is still in your office, to ensure collection of correct specimens and testing at MA PHL.
CHALLENGES – MUMPS OUTBREAK

• Many causes of parotitis (e.g., influenza)
• Asymptomatic and mildly ill may spread mumps
• Testing
  • Buccal swab in VTM for PCR soon after onset
  • **False negative PCR results may occur (intermittent shedding)**
  • IgM testing of limited value in vaccinated population
  • Acute/convalescent IgG titer comparison can rule in and rule out cases
• Isolation of patients who feel well and/or have negative results – extremely important!
• Social distancing in a college-age cohort
• Messaging – when two doses of MMR do not protect 100% of those who receive it.
INVASIVE MENINGOCOCCAL DISEASE

Meningococcal Meningitis
- Clinical Findings:
  - Fever
  - Headache
  - Stiff neck

Meningococcemia
- Clinical Findings:
  - Fever
  - Petechial or purpuric rash
  - Hypotension
  - Multiorgan failure
- May occur with or without meningitis
INVASIVE MENINGOCOCCAL DISEASE

- Onset typically abrupt, with fever, chills, malaise, myalgia, limb pain, prostration, and a rash that initially can be macular, maculopapular, petechial, or purpuric.
- Overall case fatality rate is 10-15% and is somewhat higher in adolescents
- Sequelae occur in 11-19% of survivors and include hearing loss, neurologic disability, digit or limb amputations, and skin scarring.
- Incubation period is 1 to 10 days, usually less than 4 days – intervention must be rapid.
- Call 617-983-6800 immediately when you suspect invasive meningococcal disease.
UPDATE: Meningococcal Disease in the Boston Adult Homeless Community

Summary: The Boston Public Health Commission (BPHC) has received reports of five confirmed cases of meningococcal disease in the Boston adult homeless community since the end of January. Four cases presented with meningococcemia; one presented with meningitis. Two cases developed fulminant disease and died. Close contacts of each case have been chemoprophylaxed. Serogrouping has been completed on four isolates; information on the fifth isolate is pending. Two isolates were determined to be serogroup C, and additional testing showed that they were genetically similar. Two isolates were serogroup Y. Given the number of cases, and the temporal and geographic clustering of cases in a distinct population cohort, BPHC continues to recommend vaccination against meningococcal disease for those in the Boston adult homeless community. Since February 17, 2016, the Boston Health Care for the Homeless Program (BHCHP) has vaccinated over 2,400 individuals at risk. Menactra (which covers serogroups A, C, W-135, and Y) is being used for vaccination.
INVASIVE MENINGOCOCCAL DISEASE

- Five cases in two months starting in late January among homeless people with ties to Boston – very unusual – 4 males/1 female
- Two deaths
- Antibiotic prophylaxis to close contacts
- Two serogroup C; three serogroup Y
- Large vaccination campaigns - ~4000 received vaccine
- Case-control interviews to determine risk factors
MEASLES

An acute illness characterized by:

- Generalized, maculopapular rash lasting $\geq 3$ days; and
- Fever $\geq 101^\circ F$ or $38.3^\circ C$; and
- Cough, coryza, or conjunctivitis.
**MEASLES IN MASSACHUSETTS 2015**

- **One confirmed case in a visiting exchange student**
  - Hundreds of exposures
  - People excluded from work, daycare, and public activities
  - Reminder that school vaccination requirements apply to visiting students
- **High suspect case in unvaccinated child**
  - Recent extensive domestic travel included tourist hubs
  - Imperfections with testing (positive result required confirmatory testing)
  - High vaccination exemption rates in region
  - Full-scale response included vaccination clinics and exclusions
  - Case eventually ruled out
Measles Control in Medical Settings – Initial Steps

Patients with fever, rash and respiratory illness may have measles. Measles usually starts with a prodrome consisting of mild to moderate fever, cough, conjunctivitis and/or coryza. This is followed by fever spikes, often as high as 104-105°F, and a red maculopapular rash that typically starts at the hairline, then face, then spreads rapidly down the body.

Patients who have recently (within three weeks) been in contact with other people with measles, have been in locations with recent cases of measles, have travelled internationally, or who have visited sites popular with international visitors (tourist attractions, airports) may be at increased risk.

1. **Assess, screen and mask all patients with febrile rash illness immediately on arrival.**
   
   Only staff with evidence of immunity to measles should attend suspect measles patients and should wear N95 or higher level of protection respirators to filter airborne particles when attending suspect measles patients if possible.

2. **Isolate:** Escort masked patients with rash illness or suspect measles to a separate waiting area or private room, preferably at negative pressure relative to other patient care areas.

3. **Ask:** Ask patient about risk factors for measles, such as international travel, known exposure to a measles case, vaccine history, and progression of rash.

4. **Report:** Immediately report the suspect case to your local board of health and to the MDPH Division of Epidemiology and Immunization at 617-983-8800. Cases diagnosed in Boston should be reported to Boston Public Health Commission at 617-983-5611.

5. **Test:** Obtain specimens including serum and NP swab or throat swab, and urine, for testing at the Hinton State Laboratory in Jamaica Plain (call 617-983-5600).

6. **Restrict:** Do not use the room which has been occupied by a suspect case for two hours following the case’s exit.

7. **Identify:** Identify all exposed patients and staff. This includes:
   
   a. Patients and families in the waiting and examination rooms up to two hours after suspect case was present;
   
   b. All staff both with and without direct patient contact (e.g., maintenance, administrative support); and
   
   c. Due to airborne route of transmission, areas of shared air space beyond those occupied by the patient may be considered exposed, potentially encompassing an entire facility.

8. **Document:** Acceptable evidence of immunity for healthcare workers:
   
   Three doses of MMR, serologic evidence of measles immunity, or laboratory confirmation of disease

**Depending on test results and index of suspicion, next steps may include:**

- **Notify patients quickly and offer MMR or immune globulin:** MMR within 72 hours of exposure may prevent illness. Beyond 72 hours it is usually still recommended to provide protection against exposure to future cases of measles. For high-risk contacts and those ineligible for vaccination, IG 45 days after exposure may modify or prevent illness.

- **Exclusions:** Your local health department and/or MDPH will provide assistance with quarantine requirements if exclusions are necessary. In general, susceptible individuals exposed to measles who are not appropriately vaccinated within 72 hours of the exposure may need to be excluded from all public activities from day 5 through day 21 after the exposure. In high-risk healthcare settings exclusion criteria may be more rigorous.
MASSACHUSETTS INFLUENZA-LIKE ILLNESS (ILI) AS OF 4/16/2016

Figure 1: Percentage of ILI visits reported by sentinel provider sites

- 2015-2016: 60 ILI Clusters (4/22/16)
- 2013-2014: 100 ILI Clusters as of 4/29/14
- 2012-2013: 129 ILI Clusters
- 2011-2012: 52 ILI Clusters

*Influenza-like illness (ILI, defined by fever >100F and cough and/or sore throat), as reported by Massachusetts sentinel surveillance sites

MMWR Week 15
April 10 - 16, 2016
2015-2016 INFLUENZA SEASON

- Relatively mild season relative to other recent seasons.
- Peak in early to mid March
- 2009 influenza A (H1N1) predominated.
- Two pediatric deaths in MA
- Circulating strains appeared to be a good match with the vaccine.
- Other respiratory pathogens circulated and caused respiratory illness: human rhino/entero, RSV, parainfluenza virus, human metapneumovirus, adenovirus, and human coronavirus.

*During 2008-2009, flu activity peaked twice because of the 2009 H1N1 pandemic. Activity in the United States peaked once in February due to seasonal influenza activity and then again in the Spring (June), with the first wave of 2009 H1N1 viruses. A second, larger peak of 2009 H1N1 activity occurred in October, the peak of the 2009-2010 season.

http://www.cdc.gov/flu/about/season/flu-season.htm
# Adult Vaccination

**Recommended Adult Immunization Schedule—United States - 2016**

Note: These recommendations must be read with the footnotes that follow containing number of doses, intervals between doses, and other important information.

### Figure 1. Recommended immunization schedule for adults aged 19 years or older, by vaccine and age group

<table>
<thead>
<tr>
<th>VACCINE</th>
<th>AGE GROUP</th>
<th>19-23 years</th>
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<tr>
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<td>Tetanus, diphtheria, pertussis (Td/Tdap)</td>
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<tr>
<td>Varicella</td>
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<tr>
<td>Human papillomavirus (HPV) Female</td>
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<tr>
<td>Human papillomavirus (HPV) Male</td>
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<tr>
<td>Zoster</td>
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<tr>
<td>Measles, mumps, rubella (MMR)</td>
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<td>Pneumococcal 13-valent conjugate (PCV13)</td>
<td>7</td>
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<td>Pneumococcal 23-valent polysaccharide (PPSV23)</td>
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<tr>
<td>Hepatitis A</td>
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<td>2 doses</td>
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<td>Hepatitis B</td>
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<td>3 doses</td>
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<td>Meningococcal 4-valent conjugate (MenACWY) or polysaccharide (MPSV4)</td>
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<td>1 dose</td>
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<tr>
<td>Meningococcal B (MenB)</td>
<td>12</td>
<td>3 doses</td>
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<tr>
<td>Haemophilus influenzae type b (Hib)</td>
<td>13</td>
<td>3 doses post-6RCT</td>
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*Covered by the Vaccine Injury Compensation Program*  
Recommended for all persons who meet the age requirement, lack documentation of vaccination, or lack evidence of past infection; zoster vaccine is recommended regardless of past episode of zoster  
Recommended for persons with a risk factor (medical, occupational, lifestyle, or other indication)  
No recommendation  
Contraindicated

**Figure 2. Vaccines that might be indicated for adults aged 19 years or older based on medical and other indications**

<table>
<thead>
<tr>
<th>VACCINE</th>
<th>INDICATION</th>
<th>Pregnancy</th>
<th>Immuno-suppressive conditions (excluding HIV infection)</th>
<th>HIV infection CD4 count (cells/mm³)</th>
<th>Men who have sex with men (MSM)</th>
<th>Kidney failure, end-stage renal disease, or hemodialysis</th>
<th>Heart disease, chronic lung disease, chronic renal disease, or chronic alcoholism</th>
<th>Arthritis and persistent complement pathway deficiencies</th>
<th>Chronic liver disease</th>
<th>Diabetes</th>
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<td>1 dose annually</td>
<td>1 dose annually</td>
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<tr>
<td>Tetanus, diphtheria, pertussis (Td/Tdap)</td>
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<td>Contraindicated</td>
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<td>Varicella</td>
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<td>Contraindicated</td>
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<tr>
<td>Human papillomavirus (HPV) Female</td>
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<td></td>
<td>1 dose</td>
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<td>Human papillomavirus (HPV) Male</td>
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<td></td>
</tr>
<tr>
<td>Measles, mumps, rubella (MMR)</td>
<td></td>
<td></td>
<td>1 or 2 doses depending on indication</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pneumococcal 13-valent conjugate (PCV13)</td>
<td></td>
<td></td>
<td>1 dose</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pneumococcal polysaccharide (PPSV23)</td>
<td></td>
<td></td>
<td>1, 2, or 3 doses depending on indication</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hepatitis A</td>
<td></td>
<td></td>
<td>2 or 3 doses depending on vaccine</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hepatitis B</td>
<td></td>
<td></td>
<td>3 doses</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Meningococcal 4-valent conjugate (MenACWY) or polysaccharide (MPSV4)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Meningococcal B (MenB)</td>
<td></td>
<td></td>
<td>1 or more doses depending on indication</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Haemophilus influenzae type b (Hib)</td>
<td></td>
<td></td>
<td>2 or 3 doses depending on vaccine</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Covered by the Vaccine Injury Compensation Program*  
Recommended for all persons who meet the age requirement, lack documentation of vaccination, or lack evidence of past infection; zoster vaccine is recommended regardless of past episode of zoster  
Recommended for persons with a risk factor (medical, occupational, lifestyle, or other indication)  
No recommendation  
Contraindicated

These schedules indicate the recommended age groups and medical indications for which administration of currently licensed vaccines is commonly recommended for adults aged ≥19 years, as of February 2016. For all vaccines being recommended on the Adult Immunization Schedule, a vaccine series does not need to be restarted, regardless of the time that has elapsed between doses. Licensed combination vaccines may be used whenever any components of the combination are indicated and when the vaccine’s other components are not contraindicated. For detailed recommendations on all vaccines, including those used primarily for travelers or that are issued during the year, consult the manufacturers’ package inserts and the complete statements from the Advisory Committee on Immunization Practices (www.cdc.gov/vaccines/hcp/acip-recs/index.html). Use of trade names and commercial sources is for identification only and does not imply endorsement by the U.S. Department of Health and Human Services.
HEALTHCARE WORKERS AND VACCINATION

**Recommended Immunizations**

**Health Care Personnel (HCP)**

<table>
<thead>
<tr>
<th>Vaccine</th>
<th>Recommended Immunization</th>
</tr>
</thead>
<tbody>
<tr>
<td>Influenza</td>
<td>1 dose of flu vaccine every flu season</td>
</tr>
<tr>
<td>Tdap/Td</td>
<td>1 dose of Tdap as soon as possible, then every 10 years</td>
</tr>
<tr>
<td>MMR (Measles, Mumps, Rubella)</td>
<td>2 doses of MMR, at least 4 weeks apart</td>
</tr>
<tr>
<td>Varicella</td>
<td>2 doses of varicella vaccine, 1 year apart</td>
</tr>
<tr>
<td>Hepatitis B</td>
<td>3 doses (0, 1, 6 months)</td>
</tr>
<tr>
<td>Meningococcal</td>
<td>1 dose of quadrivalent meningococcal vaccine, with additional doses as indicated</td>
</tr>
</tbody>
</table>

**Health care personnel** (HCP) include full- and part-time staff, volunteer, student, and patient work in patient care areas. See immunization requirements for health care personnel. For more information, visit www.cdc.gov/vaccines/hcp/immunization/practises.htm.

**Influenza:** All HCP should receive annual flu vaccine. Providers should offer influenza vaccine (IV) to any HCP. Give live attenuated influenza vaccine (LAIV) to nonpregnant healthy women, 40 years of age and younger, during influenza season.

**Tetanus, Diphtheria, and Pertussis (Td, Tdap):** All HCP, regardless of age, should receive a single dose of Tdap as soon as feasible. If they have not previously received Tdap, and regardless of the interval since last Td dose.

**Measles, Mumps, and Rubella (MMR):** All HCP should be immune to measles, mumps, and rubella. Documentation of immunity should be provided. HCP should be immune to Measles, Mumps, and Rubella (MMR) at the time of employment, or prior to the 1st birthday, and at least 1 month apart. Laboratory evidence of immunity to measles, mumps, and rubella may be obtained via serological confirmation of each disease. Consider HCP with "intermediate" or "questionable" immunity as susceptible. MMR should be administered 14 days before the 1st birthday. All HCP should be immune to varicella. Evidence of immunity to varicella for HCP includes documentation of 2 doses of vaccine, at least 21 weeks after the first dose.

Information on Vaccines:

Visit www.cdc.gov/vaccines/hcp/immunization/practises.htm or call MFR 0195.
HEALTHCARE WORKERS: PRESUMPTIVE EVIDENCE OF IMMUNITY

- Written verification of two appropriately-timed doses of vaccine (MMR, varicella)
- Lab evidence of disease
- Serologic evidence of immunity
- For varicella, year of birth (prior to 1980) or healthcare verification of varicella disease may be considered presumptive evidence of immunity in some low-risk medical settings

During an outbreak, healthcare workers may face exclusion if they do not have presumptive evidence of immunity.
### CLINICALLY SIGNIFICANT N. MENINGITIDIS SEROGROUPS

<table>
<thead>
<tr>
<th>Serogroup</th>
<th>Characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>leading cause of meningitis worldwide</td>
</tr>
<tr>
<td></td>
<td>most prevalent serogroup in Africa &amp; China</td>
</tr>
<tr>
<td></td>
<td>rare in Europe and the Americas</td>
</tr>
<tr>
<td>B</td>
<td>major cause of endemic disease in Europe, the Americas</td>
</tr>
<tr>
<td>C</td>
<td>major cause of endemic disease in Europe, the Americas</td>
</tr>
<tr>
<td>Y</td>
<td>associated with pneumonia; increasing in U.S.</td>
</tr>
<tr>
<td>W-135</td>
<td>small percentage of infections worldwide</td>
</tr>
<tr>
<td></td>
<td>outbreaks associated with Hajj pilgrims</td>
</tr>
</tbody>
</table>
### Six Meningococcal Vaccines

<table>
<thead>
<tr>
<th>Trade Name</th>
<th>Type of Vaccine</th>
<th>Serogroups</th>
<th>Year Licensed</th>
<th>Approved Ages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Menomune</td>
<td>polysaccharide</td>
<td>A,C,W,Y</td>
<td>1981</td>
<td>≥2 yrs</td>
</tr>
<tr>
<td>Menactra</td>
<td>conjugate</td>
<td>A,C,W,Y</td>
<td>2005</td>
<td>9 mo-55 yrs</td>
</tr>
<tr>
<td>Menveo</td>
<td>conjugate</td>
<td>A,C,W,Y</td>
<td>2010</td>
<td>2 mo-55 yrs</td>
</tr>
<tr>
<td>MenHibrix</td>
<td>conjugate</td>
<td>C,Y &amp; Hib</td>
<td>2012</td>
<td>6 wk-18 mo</td>
</tr>
<tr>
<td>Trumenba</td>
<td>protein</td>
<td>B</td>
<td>2014</td>
<td>10-25 yrs</td>
</tr>
<tr>
<td>Bexsero</td>
<td>protein</td>
<td>B</td>
<td>2015</td>
<td>10-25 yrs</td>
</tr>
</tbody>
</table>
Meningococcal Disease by Serogroup, Massachusetts 1999-2015

- Serogroup B
- Serogroup C
- Serogroup Y

Confirmed Cases of Invasive Meningococcal Disease

MENINGOCOCCAL B VACCINE

Two formulations now available for vaccination of those at increased risk

• Includes outbreaks caused by group B meningococcal disease

“Permissive use” for certain others
GROUPS AT INCREASED RISK OF MENINGOCOCCAL B DISEASE

High risk medical conditions:
- Persistent complement component deficiencies
- Functional or anatomic asplenia (including sickle cell)

Microbiologists who work with organism

Outbreaks
- Historically rare, causing 2-3% of all US meningococcal cases
- 200-1,400 fold increased risk in students during serogroup B outbreaks
- 6 serogroup B outbreaks 2006-2014
- 2 serogroup B outbreaks in 2015
- Sporadic cases of cases in college students
MENINGOCOCCAL B VACCINATION:
PERMISSIVE USE

‘Permissive’ recommendation for MenB vaccine (Category B)

- “Young adults aged 16–23 years (preferred age 16–18 years) may be vaccinated to provide short-term protection against most strains of MenB disease.”

WHO IS AT INCREASED RISK FOR WHICH SEROGRouPS?

<table>
<thead>
<tr>
<th>MenACWY</th>
<th>MenB</th>
</tr>
</thead>
<tbody>
<tr>
<td>Complement deficiency</td>
<td>Complement deficiency</td>
</tr>
<tr>
<td>Anatomic/Functional asplenia</td>
<td>Anatomic/Functional asplenia</td>
</tr>
<tr>
<td>Outbreak setting</td>
<td>Outbreak setting</td>
</tr>
<tr>
<td>Microbiologist</td>
<td>Microbiologist</td>
</tr>
<tr>
<td>Traveler to hyperendemic area</td>
<td></td>
</tr>
<tr>
<td>First year college student</td>
<td></td>
</tr>
<tr>
<td>Military Recruit</td>
<td></td>
</tr>
</tbody>
</table>
VACCINES FOR TRAVEL

• **CDC “Destinations” web site:**

• **CDC Yellow Book:**

• **Travel notices (CDC):**

**Warning Level 3, Avoid Nonessential Travel**

**Alert Level 2, Practice Enhanced Precautions**

**Watch Level 1, Practice Usual Precautions**
RESOURCES

Massachusetts Immunization Program
- 1-617-983-6800
- 1-888-658-2850
- Website http://www.mass.gov/dph/imm

CDC/NIP
- English and Spanish
- 1-800-232-INFO
- 1-800-232-4636
- TTY 888-232-6348
- Website http://www.cdc.gov/vaccines

State-Supplied Adult Vaccine Availability Table
- Effective April 1, 2015

<table>
<thead>
<tr>
<th>Vaccine</th>
<th>Adults (19 years of age and older) Eligible for State-Supplied Vaccine Administered in the Private and Public Sectors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Td</td>
<td>All adults as recommended by the ACIP.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Vaccine</th>
<th>Adults Eligible for State-Supplied Vaccine Administered in the Public Sector</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hep A</td>
<td>Only for uninsured adults in ACIP-recommended groups seen at public sites.</td>
</tr>
<tr>
<td>Hep B</td>
<td>Only for uninsured adults in ACIP-recommended groups seen at public sites.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Vaccine</th>
<th>Only for uninsured adults who are seen at public sites.</th>
</tr>
</thead>
<tbody>
<tr>
<td>HPV</td>
<td>MDPH-supplied HPV vaccine is not available for adults.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Vaccine</th>
<th>Only for uninsured adults in ACIP-recommended groups seen at public sites.</th>
</tr>
</thead>
<tbody>
<tr>
<td>MMR</td>
<td>Sites should take advantage of the MDPH Vaccine Assistance Program.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Vaccine</th>
<th>Only for uninsured adults in ACIP-recommended groups seen at public sites.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pneumococcal</td>
<td>Sites should take advantage of the MDPH Vaccine Assistance Program.</td>
</tr>
</tbody>
</table>

Massachusetts Department of Public Health (MDPH) Immunization Program

Eligibility:
- MDPH does not provide vaccines for adults seen at private provider sites. The only exception to this is tetanus toxoid, (Td) vaccine, which MDPH continues to provide for all Massachusetts residents, regardless of where they receive care.
- Except where otherwise noted, MDPH provides a very limited supply of vaccines listed below only for adults who are uninsured and seen in public sector sites.
- Employees of public sector sites are not eligible for state-supplied vaccine.
- Sites with billing capacity should purchase vaccine and seek reimbursement from health insurers.

Notes:
- All changes appear in bold and italics.
MORE RESOURCES FOR PATIENTS AND PROVIDERS

- Links to CDC, Children’s Hospital of Philadelphia (CHOP), American Academy of Pediatrics (AAP), Immunization Action Coalition (IAC)
- [http://www.mass.gov/dph/imm](http://www.mass.gov/dph/imm), click on “Vaccine Safety”
QUESTIONS?