SURVEILLANCE, REPORTING AND CONTROL OF VACCINE PREVENTABLE DISEASES 2014

19th Annual Massachusetts Adult Immunization Conference
May 20, 2014

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Epidemiologists
Epidemiology & Immunization Division, MDPH
# PRESENTER DISCLOSURE INFORMATION

**HILLARY JOHNSON**

<table>
<thead>
<tr>
<th>Category</th>
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<tr>
<td>Consultant</td>
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<td>Off Label Use of Vaccines</td>
<td>Will be discussed, but in accordance with current ACIP recommendations</td>
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TODAY’S TOPICS

• Vaccine-preventable disease (VPD) epidemiology in Massachusetts
  • Who we are and what we do
  • Overall trends
  • Measles update and case study
  • Hepatitis A update and case study
  • Your questions answered
WHO ARE YOU?
STAND UP/SIT DOWN

• ...if you have talked to a patient who is apprehensive about getting vaccine
• ...if you know someone who has had a vaccine-preventable disease even though they’ve been appropriately vaccinated
• ...if you have heard that some communicable diseases and conditions are reportable in Massachusetts
• ...if you know someone who is skeptical about the potential severity of influenza
• ...if you know someone who has ever been exposed to a communicable disease on the job
• ...if you think you can be exposed to a VPD through consumption of food
VPD EPIDEMIOLOGISTS – OUR ROLE

Surveillance, reporting and control of vaccine-preventable diseases, 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
- Collaborate with the LBOH to complete the official Case Report
What is reportable and by whom?
Collaborations in Disease Surveillance and Control

Healthcare Provider → LBOH 1 → School → LBOH 2 → Sports team

MDPH
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*Data preliminary as of March 2014.*
CONFIRMED CASES & INVESTIGATIONS ARE NOT THE SAME THING

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MASSACHUSETTS INFLUENZA-LIKE ILLNESS (ILI) AS OF 4/19/2014

2013-2014: 100 ILI Clusters as of 4/29/14
2012-2013: 129 ILI Clusters
2011-2012: 52 ILI Clusters
ILI CLUSTERS 2013-2014

- 100 clusters reported in LTCFs as of 4/29/14
  - 3 clusters in residential group homes and day programs for medically fragile adults with developmental delays.
- Reminder that medically fragile populations (including people with developmental delays and neuromuscular disorders) are at increased risk for medical complications.
  - Importance of vaccinating staff and residents.
PERTUSSIS IN MASSACHUSETTS - 2013

- Decrease in the number of confirmed cases compared to 2012

![Graph showing annual confirmed pertussis cases from 2003 to 2013](image-url)
MEASLES 101

• Acute viral illness

• PRODROME:
  • FEVER: (as high as 105°F) and malaise, cough, coryza, and conjunctivitis.

• RASH: maculopapular
  • Usually appears 14 days after exposure.
  • Spreads from head to trunk to lower extremities.

• POSSIBLE COMPLICATIONS:
  • pneumonia, encephalitis, and death.
  • miscarriage, stillbirth, preterm delivery.
MEASLES TRANSMISSION

- Highly Contagious: can be spread to others from four days before to four days after the rash appears.
- The virus lives in the mucous in the nose and throat of the infected person.
  - The virus can live on contaminated surfaces or in the air for up to 2 HOURS.
MEASLES IN MASSACHUSETTS 2014

Baystate Medical Center in Springfield patient infected with measles; 300 potentially exposed

UPDATED: Samba's Patrons, Bose Employees May Have Been Exposed to Measles, Along With Trader Joe's Customers

The Massachusetts Department of Public Health confirmed a second case of measles from another MetroWest community, with associated exposures at Bose headquarters in Framingham.

Posted by Susan Petroni (Editor), February 25, 2014 at 02:49 PM
MEASLES 2014 MASSACHUSETTS

- In MA, 8 confirmed cases so far in 2014 (0 in 2012, 1 in 2013)
  - Rash Onsets: 1/26, 2/1, 2/13, 2/14, 2/19, 2/26 (while traveling internationally), 3/2, 4/1.
  - Age Range: 2 pediatric (11 months, 13 months), 2 (21-30 yrs), 4 (>40 yrs)
- 6/8 cases had recent international travel (Europe, Middle East, India and South America).
- Vaccination status:
  - 2 cases with 2 doses (international records)
  - 1 case with a history of 1 dose
  - 2 cases with unknown history
  - 3 cases unvaccinated (two infants with missed opportunity for vaccination prior to travel; one US-born prior to 1957)
- No epidemiologic links identified between the cases, although several were temporally and geographically close to each other.
MEASLES 2014 - MASSACHUSETTS

• As a result of these cases over 2000 exposed individuals were identified.

• Exposures in multiple healthcare facilities, workplaces, stores, flights and taxis, as well as dorms
  - Hundreds of contacts exposed at healthcare facilities, dorms, and workplaces.

• No known secondary cases to date. Many suspect cases investigated.

• Contact investigation included:
  - Evaluation of immunity status
  - Implementation of control measures
  - Educational presentations and vaccination clinics facilitated by Local Boards of Health.
MEASLES TESTING

- Collection of appropriate specimens is essential to rapid and accurate diagnosis
- MDPH epidemiologists will provide guidance on specimen collection
- Testing at HSLI:

<table>
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<tr>
<th>Test</th>
<th>Specimen</th>
<th>Timing (1st Specimen)</th>
<th>Timing (2nd Specimen)</th>
<th>Turnaround Time</th>
<th>Rule Out Infection?</th>
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<tr>
<td>Measles IgM</td>
<td>Serum (red top or serum separator tube)</td>
<td>Acute, at time of diagnosis</td>
<td>Day 4 of rash or later</td>
<td>1-2 days</td>
<td>Yes (if 2nd specimen negative)*</td>
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<tr>
<td>PCR</td>
<td>NP swab in Viral Transport Medium</td>
<td>ASAP, no later than day 5 of rash</td>
<td>N/A</td>
<td>1-2 days</td>
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<td>Culture</td>
<td>NP/Urine</td>
<td>ASAP, no later than day 5 of rash</td>
<td>N/A</td>
<td>Up to 2 weeks</td>
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* In certain circumstances (compelling clinical presentation, known exposure), additional testing may be necessary to rule out disease.
MEASLES TESTING

- Nasopharyngeal (NP) swabs are VERY IMPORTANT for virus isolation & detecting measles RNA.
  - MAKE SURE swab is in Viral transport medium (VTM).
  - It must be immersed in 1-3ml liquid. Dry swabs cannot be tested.

Most successful when samples are collected on the first day of rash through the 3 days following onset of rash.
Serologic tests may be falsely positive, so positive commercial IgM tests should be confirmed at the HSLI.

If acute serum for IgM is negative, and the clinical picture continues to point to measles, the acute serum and a convalescent serum drawn ≥ 14 days from the acute serum should be tested simultaneously for IgG.

For best results with viral culture, collect specimens ≤ 3 days after rash onset. Diagnostic yield is low for specimens collected >10 days after rash onset.

IG should be considered for immunocompromised patients (unless they have recent serologic proof of immunity), and any susceptibles with contraindications to measles-containing vaccine, particularly pregnant women and infants <12 months of age.

Contacts do not need to be quarantined for the full 21 days if evidence of immunity is shown by titer or 2 dose vaccine history.
MEASLES CASE STUDY
MEASLES CASE STUDY – SCENARIO

• 28 year old female presents to health center on Saturday, February 1st with 2 days of fever of 100°F, malaise, and injected eyes. Sent home with URI diagnosis (not tested).

• Returns to HC on Sunday with fever of 102°F. Mild sinus congestion. Patient insists she should be tested for Coronavirus and measles, as she just traveled internationally.

If you saw this patient, what additional questions would you ask?
What would you test for?
MEASLES CASE STUDY - SCENARIO

• Where and when did you travel?
• What makes you concerned about Coronavirus/measles?
• Have you been around anyone else who was sick?
• What do you do for work?
• Are you vaccinated?
MEASLES CASE STUDY – SCENARIO

- **Sunday** – sent via taxi from Health Center to local hospital ER with URI diagnosis (dehydration & high fever).
- While waiting in the ER, spots appear on her hairline. Patient temp increases to 103°F.
- Eventually admitted to hospital for dehydration and fever. Put in room on airborne precautions.
- **Monday** – Maculopapular on her forehead, ears, and chest & back appears. Some exudate in her throat.

If you saw this patient, what additional questions would you ask? What would you test for?
MEASLES CASE STUDY – SCENARIO

- **Travel**: Was traveling for the last month in UAE, England, Belgium, and Spain. Returned Friday to US.

- **Country of Birth**: Patient grew up in Poland.

- **Vaccination**: Has 2 childhood doses of what appears to be MMR on record from Poland. (14 months & 16 months)

- **Recent Sick Contacts**: Was staying with/visited friend in the hospital in London who she believes was diagnosed with measles.
SUSPECT CASES OF MEASLES: INITIAL STEPS

• Notify your local board of health and MDPH at 617-983-6800 when measles is first suspected – an epidemiologist can walk you through what to do

• This includes:
  • Specimen collection and testing at the Hinton State Lab Institute (HSLI)
  • Control recommendations for patients, exposed staff
MEASLES CASE STUDY – FIRST STEPS

• Health Center & ER begin to identify exposed patients and staff and evaluate staff evidence of immunity
  • Entire HC/ER exposed from time of patient arrival through two hours after departure
  • Office should close to new arrivals to minimize additional exposures (if applicable & in 2 hr window)
Case is confirmed by IgM and PCR testing at HSLI on Tuesday. PCR specimens sent to CDC for genotyping.
MEASLES EXPOSURES: NEXT STEPS

- **Identify** all close contacts among staff and patients exposed to the suspect case.
- **Assess** all exposed individuals - both staff and patients - for acceptable evidence of immunity, as outlined in the next slide.
- **Vaccinate** all susceptible individuals.
- **Exclude** all susceptible contacts from work from day 5 through day 21 after exposure.
- **Surveillance** for early identification of secondary cases through two incubation periods after rash onset.
MDPH RECOMMENDATIONS FOR HEALTHCARE WORKERS & YOUR PATIENTS

- **Healthcare workers**
  - Need 2 doses of MMR or serology – regardless of year of birth.
  - Review the immunization status of all children and adults.
    - Exemptions: Re-evaluate the status of those with medical or religious exemptions and offer vaccine, if indicated or appropriate.
    - Make sure all are age-appropriately immunized.

- **Travelers**
  - Everyone ≥ 12 months of age should have 2 doses of MMR at least 28 days apart.
  - Children 6 to 11 months of age should receive 1 dose of MMR. Since the immune response to doses given before 12 months of age is variable, these children must receive a normal 2-dose series starting at age 12 months.
MEASLES CASE STUDY – HEALTHCARE EXPOSURES

- Saturday & Sunday Health Center exposures
  - Who was there up to 2 hours after patient left?
  - Healthcare workers include non-clinical staff (reception, janitorial, etc.)
  - Patients in the waiting room? In appointments up to two hours after the index patient left?

- Staff members without evidence of immunity – exclusion begins 5 days after exposure & continues through 21 days after exposure.

Who are we missing from this exposure?
All exposed patients must be notified about exposure – even if we know they have documented immunity.

Why is this?

Companions (people who accompanied patients)

**Speed is important:**
- Post-exposure vaccination can help within 72 hours of exposure & can prevent exclusion.
- IG can help within 6 days of exposure.
DEFINING THE INFECTIONOUS PERIOD

- Measles is infectious 4 days before through 4 days after rash onset.

In the event of an exposure, could you quickly determine who among your staff was susceptible?
LBOH is vital in assisting with these exposures:

Day 0: Rash Onset

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- International Flights
- Logan Airport
- Taxi Cabs
- Grocery Stores
- Friends
- Apartment Building

Health Center Exposures

Hospital Exposures
DO YOU KNOW THESE IMPORTANT ANSWERS REGARDING YOUR PATIENTS?

- What does your patient do for work?
  - Where do they go to school?
- Who does your patient live with?
  - Children at home? Ages?
- Did they travel recently? Where?
- Any visitors recently?
- Have they been around sick contacts?
- What is their vaccination history?
DO YOU KNOW THESE IMPORTANT ANSWERS REGARDING YOUR STAFF?

- What is their vaccination history?
- Who is up to date with documented evidence of immunity?
QUESTIONS?