

Measles in the Northeast: A Panel View

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1

Disclosures

Darlene Morse has nothing to disclose with regard to commercial relationships



2

Learning Outcomes

Participants will be able to:

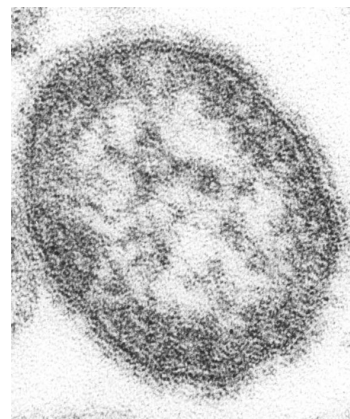
- Discuss measles case identification and testing
- Discuss control measures used during measles outbreaks and exposures
- Identify risk factors to consider when evaluating patients with “Non-classic” presentations for measles



3

Measles (Rubeola)

- Single-stranded, enveloped RNA virus with 1 serotype
- Member of the Morbillivirus in the Paramyxoviridae family
- Humans are hosts



4

Clinical Presentation

- Acute viral respiratory illness
- Prodrome-fever (as high as 105° F.) and malaise
- Three “C”s-cough, coryza and conjunctivitis
- Koplik spots followed by a maculopapular rash
- Rash presents usually about 14 days following exposure



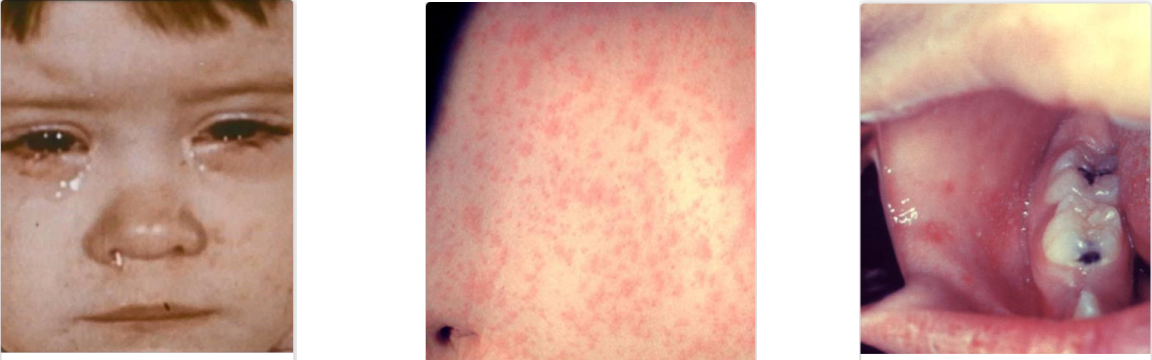
5

Clinical Presentation (2)

- Incubation 10-12 days
- Prodrome lasts 2-4 days
 - Step increase in fever to 103-105° F
 - Cough, coryza, conjunctivitis
 - Koplik spots
- Rash
 - 2-4 days after prodrome, 14 days after exposure (persists 5-6 days)
 - Begins on face and upper neck
 - Maculopapular, becomes confluent
 - Fades in order of appearance



6




Young child with moderate illness: runny nose, teary eyes caused by measles infection.
Source: "Measles Clinical Features" video

Skin of a patient after three days with measles rash.
Source: [CDC/PHIL](#)

This patient presented on the third pre-eruptive day with "Koplik spots" indicative of the beginning onset of measles.
Source: [CDC/PHIL](#)


Photos from CDC photo library



7

Pathogenesis

- One of the most contagious diseases—9 out of 10 susceptible persons exposed will develop measles
- Airborne spread or direct contact with droplets, and remains in the air for up to two hours
- Replication of the virus occurs in the nasopharynx and lymph nodes
- Primary viremia 2-3 days after exposure
- Secondary viremia 5-7 days after exposure with spread to tissues

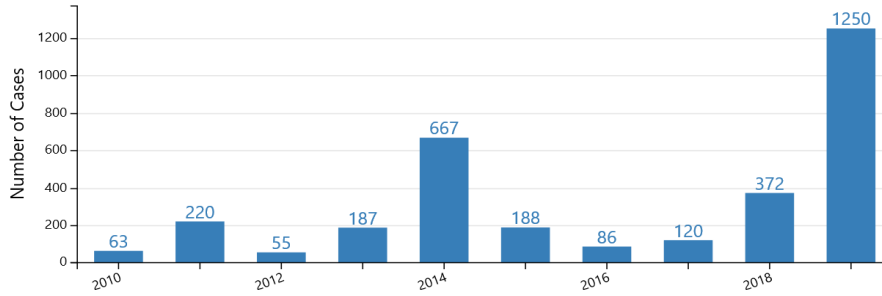


8

Current Measles Epidemiology

Number of Measles Cases Reported by Year

2010-2019**(as of October 3, 2019)



Data Table

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Measles Cases	63	220	55	187	667	188	86	120	372	1250

<https://www.cdc.gov/measles/cases-outbreaks.html>



9

Laboratory Testing

- Serology-IgG and IgM
- Detection of specific IgM antibodies in a serum sample collected within the first few days of rash onset can provide presumptive evidence of a current or recent measles virus infection. However, because no assay is 100% specific, serologic testing of non-measles cases using any assay will occasionally produce false positive IgM results. Serologic tests can also result in false-negative results when serum specimens are collected too early with respect to rash onset.
- Oropharyngeal Swab-PCR

<https://www.cdc.gov/measles/lab-tools/serology.html>



10

NH Measles Investigation

- Heightened awareness due to National Epidemiology
- NH Providers asked report suspect cases- Health Alert sent to providers 4/30/2019
- May 17, 2019-NH received a report from a pediatrician who had a 15 month old who the provider felt was at risk for measles



11

NH Case

- 15 mo old
- 5 days before rash onset
 - Conjunctivitis
 - Runny nose
 - Decreased appetite
 - Fever (102° F)
- Rash (back and chest-none face or arms)
- And...10 days earlier had received an MMR vaccine



12

Discussion continues....

- The Pediatrician had consulted with the Infectious Disease Pediatrician and instructed to call Public Health
- Testing was recommended, Serology as well as Oropharyngeal Swab
- PCR in the NH PHL was positive—That specimen to be sent to CDC for confirmation
- CDC consulted in the setting of a positive PCR with previous vaccine



13

Contact Investigation begins

- **From 5/12-5/17 (Prior to rash onset)**
 - Church
 - Daycare
 - Health care setting-Pediatrician office
 - Health care Walk in clinic



Images from Google Images



14

Community and Public Health Collaborations

- Investigation began Friday after close of business
- Public Health Lab staff called in to do testing
- Healthcare settings and providers needed to be contacted throughout the weekend
- Engaged local Police to contact school/daycare provider afterhours
- Contacted Church leadership to discuss exposure



15

Response Activities throughout the Weekend

- Health Alert sent to providers
- All participants that attended day care during the infectious period were called by Public Health Nurses to advise about exposure and recommendation of age appropriate vaccination
- Press release to the public to identify persons who may have attended church services during the infectious period for this child



16

Response (2)

- The Healthcare facility was simultaneously calling patients that had been in the healthcare setting when the child was there as well as 2 hours after the child had left
- Vaccination clinic was stood up by the healthcare facility for those patients who needed to get an MMR
- Public Health arranged for a Public Inquiry Line



17

Then on Wednesday 5/22

- Results received from Wadsworth-CDC testing of the specimen

According to the CDC website....

- The following 19 genotypes have been detected since 1990:
 - A*, B2, B3, C1, C2, D2, D3, D4, D5, D6, D7, D8, D9, D10, D11, G2, G3, H1, H2
 - *All vaccine strains (e.g. Moraten, Edmonston-Zagreb) are genotype A.
- During 2014, six genotypes were identified by global surveillance:
 - B3, D4, D8, D9, G3, H1



18

Our Specimen

To differentiate wild type measles from vaccine type measles we referred our sample for Measles Genotype A Reverse-Transcriptase quantitative PCR (MeVA) testing. Detection of this strain indicates vaccine strain virus.

This test should be performed when a person has been both exposed to measles and has received an MMR vaccination within 21 days of symptom development.

Our case was Genotype A—Vaccine Strain



19

Challenges Encountered During this Response

- Friday afternoon after regular business hours
- CDC specimen could not be sent until Monday 5/20
- Difficulties obtaining contact information for key facilities
- Creating communication materials during the response
- Crafting messaging around vaccine, not to undermine trust
- Attempting to avoid rumors by exposed patients
- Bringing in public health resources over the weekend



20

Things That Went Well.....

- Immediate Public Health response
- Engaged healthcare providers in conference calls to help organize response
- Our community partners were helpful in facilitating this response
- Public Health Nurses made calls to all the daycare attendees to determine vaccination status and to give direction for those not vaccinated



21

Contact Information

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22