



Risk Mitigation Plan for Contagious Disease Management-C920

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Measles Outbreak 2015





2015 Measles outbreak in the United States

Source: CDC, California Department of Public Health, California Department of Health Services, Minnesota Department of Health, North Dakota Department of Health, Nebraska Department of Health & Human Services, South Dakota Department of Health

CDC website: <http://www.cdc.gov/mmwr/preview/mmwrhtml/mm6009a1.htm>

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Measles Outbreak 2015





What Are the Advantages of Having Everyone Vaccinated?

Measles is a highly contagious virus that can spread easily from person to person. It is one of the leading causes of death in children worldwide. Vaccination is the best way to prevent measles and its complications.

NO VACCINATION: Measles spreads easily from person to person. If one person has measles, they can infect many others. This can lead to a large outbreak.

SOME VACCINATION: If some people are vaccinated, the virus can still spread, but it will be slower and fewer people will get sick.

HIGH VACCINATION: If almost everyone is vaccinated, the virus cannot spread. This is called herd immunity, and it protects everyone.

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Signs/Symptoms of Measles

Clinical Manifestations:

- Fever
- Cough
- Coryza
- Conjunctivitis
- Rash, starting on face and spreading downward and outward
- (Prodromal)-Koplik spots

Epidemiology:

- Humans are the only natural host
- Transmitted by direct contact with infectious droplets/airborne spread
- Incubation period is 7-21 days from exposure to onset of symptoms



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Red Book® 2015, 2015

Characteristic confluent measles (rubeola) rash over the back of this child.



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Figure Legend:

Koplik spots of measles in a 7-year-old white male. Courtesy of Larry Frenkel, MD



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Measles



Diagnostic Tests:

- Positive result from measles Immunoglobulin (IgG) antibody or RNA [RT-PCR] from clinical specimens (urine, blood, throat, or nasopharyngeal secretions)
- Simplest method is testing for IgM antibody from serum

Treatment:

- No specific antiviral treatment is available

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Measles



Incubation: 7-21 days after exposure

Contagious Period:

- 4 days before rash appears until 4 days after
- Contact/airborne/standard precautions
- Duration of isolation:
 - in healthy children: isolate for 4 days after onset of rash
 - in immunocompromised patients: for the duration of the illness

Source: Redbook 2015 accessible online at Children's through virtual library - section titled Isolation of the Hospitalized Patient

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Measles



Evidence of Immunity to Measles:

- Documentation of age-appropriate vaccination with a live measles virus-containing vaccine
 - Preschool aged children: 12-15 months- 1st dose
 - 4-6 years of age: 2nd dose
- Laboratory evidence of immunity
- Laboratory confirmation of disease
- Born before 1957

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Measles

Care of exposed people:

- Measles vaccine will provide protection/disease modification if given to susceptible individuals *within 72 hours of exposure*

Use of Immune Globulin:

- Either IM or IV administration
- Recommended dose of IGIM = 0.5 mL/kg (up to a max of 15 mL)
- IVIG = 400 mg/kg

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Omaha, NE and surrounding area



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Omaha Outbreak Timeline



12/16/14: Index family visited Disneyland x four days
 12/30/14: Grandmother broke out in rash; presumed +
 1/11/15: Attended Church services
 1/12/15: Index case develops fever
 1/15/15: Index case develops rash; visits Children's Museum and dance studio in neighboring town
 1/16/15: Presents in pediatricians' office for "well child" visit (has rash + oral temperature of 99.6 degrees F); Measles diagnosed

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Omaha Outbreak Timeline, cont.



- 1/16/2015: 124 people identified as having been exposed to Measles in the clinic
- 1/20/15: positive measles culture
 - Contact with County Health Department to develop plan

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Scope of Exposure



- Inclusion criteria of 50 feet radius of symptomatic patient during and one hour after
 - Individual interviews for each of these families
 - Questions included:
 - a) who accompanied the patient?
 - b) anyone immunocompromised?
 - c) ages of anyone exposed?
 - d) vaccinations up to date?

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Scope of Exposure, cont.



Criteria for exposure:

- > 6 months of age
- Not previously vaccinated (normally vaccinated at 12 months of age and 4 years)
- No history of prior significant disease (measles)

Results:

- 20 significant exposures

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Primary Care- Mitigation Efforts



- Three phases Primary Care experienced with measles exposure:
 - Identification (20 significant exposures)
 - Planning
 - Implementation

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Primary Care-Planning



- CAO, MDs, staff RNs and Infection Prevention nurses huddled to develop plan
 - Immediate need-vaccination or Immunoglobulin (Ig) for at risk patients
 - Assessed inventory of vaccine; recognized need for more
 - Communicated with Pedi ID for patients needing Ig
 - Developed mitigation plan and communicated via Daily Safety Briefing/written communication to all providers
 - Communication of positive case led to influx of "worried well"

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Primary Care-Implementation



- Scope of exposure (patients/family members) finalized at 124 individuals; of this, 20 patients were significantly exposed and quarantined through 2/6/15
- Douglas County Health Department issued a bulletin to the public
- Scripting developed for families calling in about measles and possible exposure
- Increased MMR vaccine volume
- Frequent communication to all staff and providers

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Primary Care-Implementation



- Developed electronic medical record (EMR) template to manage influx of calls (volume in the hundreds)
- Developed a daily surveillance template to monitor quarantined patients-assigned one staff member
- Held multiple vaccine clinics, including Sunday afternoon
- Not one of the 20 patients developed measles!

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Hospital Mitigation Efforts



1/21/15:

- COO completing Executive Rounds with ED Director; notified by clinic administration of measles exposure
- Infectious Disease MD joins conversation, along with ED attending MD and Infection Prevention nurses
- Impromptu work group forms, including previously mentioned individuals and representatives from ED, Pharmacy, Facilities, Marketing (including Valet Parking), Security and Transport

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Hospital Mitigation Efforts, cont.



Issues Identified:

- Potential volume of “worried well” creating throughput issues in the ED (15 bed unit)
- Only one negative pressure room
- Public Relations/Media disruption with phone calls for information
- Parking issues related to volume
- Shortage of IMIG doses
- Exposure of immunosuppressed patients in the ED lobby

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Hospital Mitigation Efforts, cont



- Emergency Department staff education regarding management of measles (other patients and themselves)
- System to capture and follow exposed patients was identified as a high priority-IT contacted to assist with creation of screening tool (similar to what was used for Ebola screening)
- Transport staff assisted with creation of 3 patient areas in the Ambulance Bay

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Hospital Mitigation Efforts



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Hospital Mitigation Efforts



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Airborne Infection Isolation



- Refers to isolation of patients infected with organisms spread via droplet nuclei $<5\ \mu\text{m}$ (5 microns) in diameter
- Need a minimum of ≥ 6 air changes per hour (ACH) for construction prior to 2001
- Negative pressure, defined as the direction of the air flow moving from the outside adjacent space (e.g., the corridor) into the room

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Airborne Infection Isolation, cont.



- May be recirculated provided that the return air is filtered through a high-efficiency particulate air (HEPA) filter
- Efficacy of AII requires continuous negative air pressure in relation to the air pressure in the corridor
- Monitor air pressure daily via testing/visual exam
- Ensure that rooms are well sealed and ≥ 6 air exchanges occur (CHMC = 18.6 ACH)

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Airborne Infection Isolation, cont.

- Direct exhaust to the outside; if not practical, the air from the room can be recirculated after passing through a HEPA filter (removes particles down to 0.3 μ in size with 99.97% efficiency)
- Stored HEPA filters for easy exchange



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Airborne Infection Isolation





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Airborne Infection Isolation





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Pharmacy Impact

Shortage of Immunglobulin/Measles vaccine

- Discussion regarding best approach for use (IVIG vs. IGIM)
- Inability to obtain additional doses prior to the weekend-enough for 8-10 patients, depending on size
- Dosing: 0.25 ml/kg IM (anterolateral) within 6 days of exposure *(0.5ml/kg if immunocompromised)

Miscellaneous note: Pharmacy Intern was assigned to the Emergency Room for use as patient transport, runner, etc.

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Crowd Control

Anticipatory Management of "Worried Well"

- Valet Parking signs to reserve spaces for known positive exposures (clinics called ahead)
- Security notification of surge potential
- Media/Press support by Media Relations Liaison
 - Caregiver Talking Points (masking, wait times, construction noise)
 - Measles AfterCare Instructions (stay away from public places, wear a mask if in public)

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The Hero – Special Edition

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1/23/2015, Second Exposure Efforts

Friday Evening "Fireside Chat"

- Contacted by Infectious Disease MD on call with additional patients needing IMIG
- Phone conference quickly scheduled including ID MD, Hospital EVP & COO, Pharmacy Director, ED Director and Home Health Manager
- Discussions centered on the number of patients needing IMIG, preventing exposure of patients within the ED, scarcity of resources
- Plan for Home Health to give IGIM in patients' homes

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Weekend Efforts

- Home Health Manager coordinated data, supplies, staff, IMIG, etc
- Infectious Disease MD created "Immune globulin for measles post exposure prophylaxis" consent form and obtained H/P, date of exposure, weight, etc.
- Pharmacy Director coordinated IG supplies, teaching sheets for both patients and nursing
- Pharmacy staff assembled anaphylaxis kits for potential use in the home. Includes: Epipen, IM benadryl, syringes, blunt tip needles, IM needles

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Weekend Efforts

- Instructions for nursing staff and patient instructions were customized for each patient
- HH nursing concerns included potential for anaphylaxis; Infectious Disease MD personal cell phone given to HH nursing staff for ease of orders in the event of significant reaction/other adverse effects

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Meanwhile...



- Infection Prevention/Employee Health identified 56/1900 (2.9%) employees who could not verify nor had documentation of vaccinations
- All non-immune employees wore a mask until up to date
- Additional vaccines ordered by Employee Health and offered to physicians

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Meanwhile...



Information Technology

- Consulted with Infection Prevention nurses and built screening tool for use in EMR
- System approach including Inpatient, Surgery (including Pre and Post), ED and Urgent Care
- Additional efforts underway in the Primary Care offsite practices as well as the clinics adjoined to the hospital

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Infectious Disease Screening

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Do you or your child have signs & symptoms of Measles: fever, rash, runny nose, red eyes, or/and cough?

A patient with exposure has been identified in the Omaha area. If you or your child been to one of these locations on the identified dates/times, you have been exposed:

- County Bible Church near Blair on Sunday, Jan. 11 from 11:00 a.m. to 2:00 p.m.
- Cretes at 12200 View Dodge Road on Monday, Jan. 12 from 8:00 a.m. to 3:00 p.m.
- Omaha Children's Museum on Thursday, Jan. 15 from 12 noon-5:00 p.m.
- Dave Center Center on Thursday, Jan. 18 from 4:00-7:00 p.m.
- Little Blossoms Day Care (Blair) from Jan 20-23 from 7:00am-4:00pm
- Julius Bar & Grill (Blair) Jan 21 at 9:30pm-10:00pm

If you, or someone in your household, was exposed to any of these locations, do not seek immediately.

If the person is over 16 years of age, they are advised to get a measles vaccine shot as soon as possible. If a vaccine is not available, please the child and family in a room away from the door and follow all infection prevention procedures.

Has this person (adult or child) been exposed to or do they currently have active Tuberculosis (TB)?

Does the Person currently signs & symptoms of an acute Respiratory Acute illness: Runny Nose, Cough, Cold/Flu, Fever, Run Throat? Childs will also apply.

QUESTIONS FOR CHILDREN ONLY

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Lessons Learned

- If/when patient arrives for care (clinic or ED/Urgent Care) with fever and rash, get them into isolation!
- Remember to cover the patient's mouth –tenting or masking, depending on age
- Immediately notify Public Health authorities
- Discuss communication plan and keep Marketing/Public Relations in the loop proactively
- Pull representatives of all areas together upfront to save confusion and rework on the back end

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Lessons Learned

- Designate a leader to coordinate all aspects
- A solid, working relationship with the Infection Prevention staff is key (exposure start and ending periods coordinated with EMR screening tools)
- Lack of airborne isolation rooms can be managed proactively
- Proactively coordinate with the department of Public Health to ensure a hotline is available-and staffed-when needed
- Communicate, communicate, communicate

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Contact Information



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