Risk Mitigation Plan for Contagious Disease Management-C920

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Measles Outbreak 2015

2015 Measles outbreak in the United States

Measles Outbreak 2015

What are the Activities of Medical Sciences Researcher®
### 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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**Figure Legend:**
- Koplik spots of measles in a 7-year-old white male. Courtesy of Lorry Frenkel, MD
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

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 third isolation of the Hospitalized Patient

Measles

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

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

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?
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

Primary Care- Mitigation Efforts

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

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"
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

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!

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
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

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

Hospital Mitigation Efforts
Airborne Infection Isolation

- Refers to isolation of patients infected with organisms spread via droplet nuclei <5 µm (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

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)
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
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.

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)

The Hero – Special Edition
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

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

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
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

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

Infectious Disease Screening
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

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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