Local Trends in Vaccine Preventable Diseases - Immunization Update

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Photos courtesy of http://aapredbook.aappublications.org/
Case

48 yo male

- Fever
- URI sx
- Conjunctivitis
- Diffuse maculopapular rash
  - Started at scalp/face, moved downward
- Recent travel to Phillippines
  - Returned 3 days ago, spent 2 weeks there
Symptoms of Measles

• Incubation Period: 7-18 days
• Prodrome onset: day 2-4
Fever: > 101°F
Cough
Coryza
Conjunctivitis
Koplik spots
Maculopapular rash
  - hairline to generalized
  - duration 5-6 days
Lab testing

Collect specimens for measles testing:

- Draw 1-2 ml blood
  - NOTE: capillary blood alternative for infants
- Obtain a throat or NP swab
  - viral culturette in viral transport media.
- Collect urine in a sterile container
- Arrange via public health laboratory.*

http://www.acphd.org/measles/clinicians.aspx
Public Health Response

- Confirm case
  - Isolate
  - Lab testing

- Contact investigation
  - Assess contact exposure
  - Assess contact immune/susceptible
  - Provide post-exposure prophylaxis
  - Assess if Sensitive Occupation or Situation (SOS)

- Quarantine if SOS

- Surveillance
Investigation

Contact: (during infectious period)
- Lives with case OR
- Shared air space for up to 2 hours after unmasked case present
- AND Susceptible
Which adults are presumed immune?

- Born before 1957
- Antibody + (Rubeola IgG)
- 2 doses of MMR
- Served in the US armed forces
- Born in US >=1970 & attended a US elementary school*
- Entered the US >=1996 with immigrant visa or green card*

*Unless known UNvaccinated
Measles infectiousness

- Transmission:
  - Respiratory droplets
  - Aerosolized droplet nuclei
- Remains airborne for 2 hrs

- Attack rate:
  - 90%

- >95% vaccination needed for herd immunity

- PBE rates in CA (2013)—2.03%
  - Alameda County – 1.24%
  - Berkeley -
Measles Cases and Outbreaks,
January 1 to June 6, 2014*

397
Case
16
Outbreaks


representing 84% of reported cases this year

*Provisional data reported to CDC’s National Center for Immunization and Respiratory Diseases

http://www.cdc.gov/measles/cases-outbreaks.html
Local Data - CA

As of 6/6/14:  60 confirmed in 2014
  • 10x as many as by 6/6/13

As of 4/18/14:
  ➢ 12 hospitalized
  ➢ >90% importation associated
  ➢ From Philippines, India, Singapore, Vietnam, Western Europe
  ➢ Local exposures: health care settings, households, airplanes, school/daycares

http://www.cdph.ca.gov/HealthInfo/discond/Pages/Measles.aspx
http://www.cdc.gov/mmwr/preview/mmwrhtml/mm6316a6.htm
Vax status of CA cases

- 43% (25) unvaccinated
  - 76% (19) PBE
  - 12% (3) too young
  - 12% (3) unknown
- 31% no documentation available

- 19% (11) 2 doses documented
- 4 with + antibody/immunity

http://www.cdc.gov/mmwr/preview/mmwrhtml/mm6316a6.htm
As of 6/12/14:

- Total confirmed cases: 4
- February – May 2014
- Age Range: 18 months – 63 years
- Contacts investigated: ~365
- 5 contacts quarantined
- 24 suspect cases ruled out
- ~70 specimens tested
MMR recommendations

Vaccinate:

- Patients born after 1956 w/o hx of 2 MMR
- Especially health care personnel
- Before international travel:
  - Infants >6 mos. – give MMR
  - Children >12 mos. – 2 doses 28d apart
- Routine Childhood Schedule:
  - 12 -15 mos
  - 4-6 years
Costs to Public Health/Healthcare

- **Public Health:**
  - Up to $100-150,000 per case or outbreak

- **2 hospitals – Tucson, AZ – 14 cases**
  - ~$799,136

What can providers do?

- **Educate** your patients and families
- **Ensure** immunizations **UTD**
  - especially before international travel
  - Track yours & your staff
- **Mask** & **isolate** suspected cases immediately
- **Test** suspected cases
- **Report** to your local health dept

http://www.acphd.org/measles.aspx
Case Presentation

- 15 yo F presents with cough times 2-1/2 weeks
  - No fevers > 101.5
  - Started with cold symptoms, some rhinorrhea & sneezing, and cough has gradually worsened
  - Coughing is so frequent and severe - can’t talk on cell phone for longer than 5”
  - No change in her coughing based on time of day or night, nonproductive
  - Once or twice her coughing has been so severe she has thrown up
PMH, SH, Exam

- Attended a slumber party ~1 week ago - host was coughing
- History of wheezing as an infant, + family hx of asthma
- Denies smoking cigarettes or other substances

- Afebrile, VS wnl including nl RR
- Several coughing episodes during history/exam
- Exam is otherwise unremarkable
What is Pertussis & what are the symptoms?

- Aka “Whooping Cough”
- Caused by *Bordetella Pertussis*
- Infectious disease that starts like a cold, then progresses to severe coughing & coughing spasms
- Classically cases have a high-pitched “whoop” at the end of a spasm

How is it spread?

- Saliva, runny nose, sneezing, mucous from infected person
- Most commonly by a household member or caregiver
Why is it underdiagnosed?

- Among teens and adults symptoms are less “typical.”
- Lots of other causes of “chronic cough”
- Testing is difficult and results are not timely
  - NP swab
  - Cx vs PCR
# How is pertussis treated?

## Pertussis (Whooping Cough)

<table>
<thead>
<tr>
<th>Age</th>
<th>Azithromycin</th>
<th>Erythromycin</th>
<th>Clarithromycin</th>
<th>Alternative</th>
</tr>
</thead>
<tbody>
<tr>
<td>Younger than 1 mo</td>
<td>10 mg/kg/day as a single dose for 5 days(^b)</td>
<td>40 mg/kg/day in 4 divided doses for 14 days</td>
<td>Not recommended</td>
<td>Contraindicated at younger than 2 mo of age</td>
</tr>
<tr>
<td>1 through 5 mo</td>
<td>See above</td>
<td>See above</td>
<td>15 mg/kg per day in 2 divided doses for 7 days</td>
<td>2 mo of age or older: TMP, 8 mg/kg/day; SMX, 40 mg/kg/day in 2 doses for 14 days</td>
</tr>
<tr>
<td>6 mo or older and children</td>
<td>10 mg/kg as a single dose on day 1 (maximum 500 mg), then 5 mg/kg/day as a single dose on days 2 through 5 (maximum 250 mg/day)</td>
<td>40 mg/kg/day in 4 divided doses for 7-14 days (maximum 1-2 g/day)</td>
<td>15 mg/kg/day in 2 divided doses for 7 days (maximum 1 g/day)</td>
<td>See above</td>
</tr>
<tr>
<td>Adolescents and adults</td>
<td>500 mg as a single dose on day 1, then 250 mg as a single dose on days 2 through 5</td>
<td>2 g/day in 4 divided doses for 7-14 days</td>
<td>1 g/day in 2 divided doses for 7 days</td>
<td>TMP, 320 mg/day; SMX, 1600 mg/day in 2 divided doses for 14 days</td>
</tr>
</tbody>
</table>

**Note:**
- TMP indicates trimethoprim; SMX, sulfamethoxazole.


\(^b\) Preferred macrolide for this age because of risk of idiopathic hypertrophic pyloric stenosis associated with erythromycin.
How does it spread?

- "respiratory droplets"
- Contact with respiratory secretions (saliva, runny noses, sneeze, mucous)

- Non-immune household contacts are at highest risk of catching it from an ill patient
- Incubation period is ~7-10 d, up to 21 d
- Most infectious from the time symptoms start until 2-3 weeks after the cough starts
  - Or up until 5 days after antibiotics have started
A couple other tidbits she adds:

- I also baby sit my 3 mos. old niece after school and on the weekends

- What are other key aspects to her management?
Report to public health

- Pertussis is on the list of legally notifiable diseases
- Prophylaxis should be recommended and provided to close contacts
  - Especially those at highest risk...infants, immunocompromised
CA epidemiology

January 1 – May 27 2014

- 2,649 cases in CA
- More than all of 2013
- 104 hospitalized, most <4 mos
  - 1 death
- Multiple outbreaks

http://www.cdph.ca.gov/HealthInfo/discond/Documents/CDPH%20pertussis%20health%20alert%20May%202014.pdf
Figure 2. Pertussis cases by month of onset -- California, 2009-2014*

*Reported to CDPH as of 5/27/2014

Will increase due to reporting delays
Figure 3. Pertussis cases by age - California, 2014*

*Reported to CDPH as of 5/27/2014
annotations in black indicated recommended vaccine doses
Alameda County Data

Pertussis cases reported to ACDPH

<table>
<thead>
<tr>
<th>Year reported</th>
<th>Case definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>2007*</td>
<td>Unknown: 54</td>
</tr>
<tr>
<td></td>
<td>Suspect: 58</td>
</tr>
<tr>
<td>2008*</td>
<td>Unknown: 32</td>
</tr>
<tr>
<td></td>
<td>Suspect: 62</td>
</tr>
<tr>
<td>2009*</td>
<td>Unknown: 231</td>
</tr>
<tr>
<td></td>
<td>Suspect: 79</td>
</tr>
<tr>
<td>2010</td>
<td>Unknown: 46</td>
</tr>
<tr>
<td></td>
<td>Suspect: 42</td>
</tr>
<tr>
<td>2011</td>
<td>Unknown: 136</td>
</tr>
<tr>
<td></td>
<td>Suspect: 33</td>
</tr>
</tbody>
</table>

*Case definitions added to CDSS in 2010
An ounce of prevention...
How can we prevent pertussis infections?

- Good hand and respiratory “hygiene”
- VACCINE!
- Secondary prevention:
  - Prophylaxis of close and high-risk contacts to cases
DTaP

- Routine Schedule:
  - 2 mos, 4 mos, 6 mos
  - 15-18 mos
  - 4-6 years

- During an outbreak:
  - 1st dose of DTaP can be given @ 6 weeks
Tdap Recommendations

- Adolescents aged 11 - 18 years, preferred at 11 or 12 years
  - Adults aged 19 and older
  - Focus on adults in contact with infants – “cocoon”
    - Pregnant women
    - Healthcare professionals
    - Parents and siblings
    - Grandparents (including those >65 years of age)
    - Other caregivers
- During an outbreak:
  - Ok to boost @ 10 years old
Tdap for Pregnant Women

- Administer Tdap during each pregnancy
  - Regardless of number of years since prior Td/Tdap
  - Preferably between 27-36 weeks
- If not during pregnancy, Tdap should be given immediately postpartum
- Other parents/caregivers should be UTD
Pertussis Take Home Points

- Report cases to your local health department
- Consider who needs prophylaxis
  - Infants are at highest risk
- Vaccinate!
  - Pregnant patients & 10-12 year olds/7th graders get booster Tdap
  - Encourage “cocoon” vaccination
  - Get Tdap booster if you haven’t already!
ALAMEDA COUNTY IMMUNIZATION RATES
Expanded Kindergarten Retrospective Survey 2014

- 1352 blue cards
- 21 randomly selected schools
- Kindergarteners in Fall 2013
- UTD IZ @ 2yo = (4 DTP, 3 Polio, 1MMR)
- 72% immunization coverage @ 2 yo
- Healthy People 2020 goal: 80%
EKRS Data – by Race
Alameda County 2014

% UTD at 24 months for the 4:3:1 series

- Total: 72%
- White: 73%
- Black Race: 60%
- Hispanic: 77%
- Asian: 76%
- Other: 74%
EKRS By Year, 2009, 2011, 2014

Race by Year

% UTD at 24 months 4:3:1 series
Alameda County
Kindergarten PBE Trend

Percent

Year
2000-2001
2001-2002
2002-2003
2003-2004
2004-2005
2005-2006
2006-2007
2007-2008
2008-2009
2009-2010
2010-2011
2011-2012
2012-2013
AB 2109

- Effective in 2014
- New documentation requirement for PBE
- Signature that a Health Care Provider has informed parent:
  - Benefits/risks of IZ
  - Risks to student AND the community

http://www.shotsforschool.org/
Vaccine preventable diseases & PBEs are increasing

Partner with public health to:
- Prevent
- Contain