Preventing Pertussis: Current and Needed Strategies
June 16, 2016 | 6PM – 8PM

Acknowledgements

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For instructions, go to: immunizeusa.org/education/pertussisceu/
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[link]

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Awards 1.0 Contact Hours to Nurses
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- Attend the entire presentation
- Turn in your completed evaluation form

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Reporting of Perceived Bias

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The toll-free number is 1-866-262-9730. Today’s evaluation form will ask you to inform us of any perceived bias in the presentations today.

immunizeusa.org/education/pertussisceu/

Learning Objectives

1. Discuss current rates of pertussis in Houston and how they compare to state and national levels.
2. Discuss current recommendations and strategies to prevent pertussis in young infants.
3. Describe the challenges and opportunities to implementing the recommended strategies.

Continuing Medical Education

Please see the CME handout on the right-hand side of your screen.

You will need to sign in on the electronic sign-in sheet.

You will receive an evaluation via e-mail tomorrow.

immunizeusa.org/education/pertussisceu/
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Slides from today’s presentations are under the “handouts” section on the right-hand side of your screen, and will also be uploaded onto our website www.immunizeUSA.org.

Questions can be typed into the question box on the right-hand of your screen.

Housekeeping Items

If you haven’t completed the pre-test, please do so now.
Please take a moment to fill out the post-webinar survey. We appreciate your feedback!

If for some reason you have to step away from the computer or phone, please do not place your phone on hold.

Agenda

• Welcome and Introductions
• Epidemiology of Pertussis
  Essi M. Havor, MSN, APHN, RN
  Houston Health Department
• Preventing Pertussis:
  Current and Needed Strategies for Reducing Pertussis in Infants
  Michele Curtis, MD, MPH
• Q&A
• Adjourn
“Haleigh was too young to receive the vaccine. It would have saved her life.”

Rodney Throgmorton

Source: Vaccine-preventable Disease: The Forgotten Story

Pertussis Trends in Houston, Texas

Essi M. Havor MSN, APHN, RN
Houston Health Department
Immunization Bureau

Pertussis Clinical Case Definition

Cough lasting at least 2 weeks and with one of the following:

- Paroxysmal of coughing or,
- Inspiratory “whoop” or,
- Post-tussive vomiting
- If under 1 year old, apnea with or without cyanosis
Laboratory Criteria for Diagnosis

- Isolation of Bordetella Pertussis from a clinical specimen (culture)
  or
- Positive polymerase chain reaction (PCR) for B Pertussis*

*Direct fluorescent antibody (DFA) staining of a patient's specimen and serological laboratory results (pertussis IgG or IgM) are NOT considered confirmatory for pertussis.

Epidemiological Trends

Figure A.

Chart courtesy of CDC
**Figure 1.**

![Bar chart showing Pertussis Incidence Rates in Texas, 2010 - 2014](chart1.png)

*Graph provided via Texas DSHS*

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**What Is Going On In Houston!!!!??**

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**Figure 3.**

![Line chart showing Pertussis cases by Month 2010 - 2014](chart3.png)
Figure 4.

Figure 5.

Figure 6.
Reportable by Law in Texas

- Healthcare Provider/Facilities responsibilities:
  - Report confirmed & probable case to your local health department within one work day of diagnosis
- Laboratory responsibilities:
  - Report positive lab reports immediately to healthcare provider
  - Report positive lab reports within one work day of diagnosis to the local health department
- Outbreaks are to be reported immediately!

Conclusions

- The average number of pertussis cases significantly increased in 2013 which may be linked to the waning effectiveness of the pertussis vaccine after 3-4 years.
- The highest incidence of pertussis was observed in Hispanic Female infants under one year of age.
- The high rates within the Hispanic community may be due to a low level of immunization coverage in this group.
- Most reported cases are unvaccinated due to being under age making them more susceptible to infection.
- A Majority of cases in Houston occur between May and August, peaking in late June – early July.

Reference

- Figure A: http://www.cdc.gov/pertussis/images/incidence-graph-age.jpg
- Figure 1: http://www.dshs.state.tx.us/dgcd/disease/pertussis/statistics/
Acknowledgements

- Houston Health Department,
  - Bureau of Epidemiology, Staff, Provider, and Patients.
  - Thomas Johnson, Public Health Investigator
- CDC Funding Agency

Reminders

Questions can be typed into the question box on the right-hand of your screen.

For instructions on obtaining CEUs, please go to:
immunizeusa.org/education/pertussisceu/

Preventing Pertussis: Current and Needed Strategies for Reducing Pertussis in Infants

Presented by Michele Curtis, MD, MPH
June 2, 2016
The Pertussis Problem

Infants <2 months have an annual incidence of pertussis of 160 per 100,000

1/2 of infants <1 year with pertussis are hospitalized

Sources:
CDC (2015). “Pertussis (Whooping Cough).” [Website URL]

The Pertussis Problem

<table>
<thead>
<tr>
<th>Disease</th>
<th>Reproductive Rate</th>
<th>Herd Immunity Threshold</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pertussis</td>
<td>12-17</td>
<td>92-94%</td>
</tr>
<tr>
<td>Measles</td>
<td>12-18</td>
<td>83-94%</td>
</tr>
<tr>
<td>Mumps</td>
<td>4-7</td>
<td>75-86%</td>
</tr>
<tr>
<td>Influenza</td>
<td>1.19-1.37</td>
<td>&gt;60%</td>
</tr>
<tr>
<td>Ebola</td>
<td>1.5-2.5</td>
<td></td>
</tr>
</tbody>
</table>

Pertussis is roughly 6 times more contagious than Ebola
Requires a high herd immunity threshold

Sources:
Michigan Center for Public Health Awareness. [Website URL]
Estimates of the reproductive number for seasonal, pandemic, and zoonotic influenza: a systematic review of the literature. [Website URL]
Seasonal influenza in the United States, France, and Australia: transmission and prospects for control. [Website URL]

Current Strategies

Early Childhood Vaccination
Adolescent and Adult Vaccination
“Cocooning”
Maternal Vaccination
Current Strategies

Early Childhood Vaccination
Adolescent and Adult Vaccination
“Cocooning”
Maternal Vaccination

BENEFITS
Effective for 8 or 9 out of 10 children
Among children who get all 5 doses of DTaP vaccine on schedule 98 out of 100 are fully protected within the year following the 5th dose
7 out of 10 of children are fully protected 5 years after getting their last dose of DTaP vaccine and the other 3 are protected against serious disease.

Recommended Schedule, 2016

Sources:
- Center for Disease Control and Prevention, www.cdc.gov/vaccines
- National Immunization Survey, 2014

Current Strategies

Early Childhood Vaccination
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Maternal Vaccination

Pertussis Vaccination among Children 19-33 months, 2014

Sources:
- Acellular pertussis vaccines protect against disease but fail to prevent infection and transmission in a controlled primate model, https://www.pnas.org/content/111/2/787

Current Strategies

Early Childhood Vaccination
Adolescent and Adult Vaccination
“Cocooning”
Maternal Vaccination

CHALLENGES
First dose isn’t until 2 months
Immunity wanes over time
Multiple doses mean more opportunities to fall behind, as is demonstrated by the difference in rates between 3 doses and 4 at the state level
Some evidence showing it doesn’t prevent transmission, only disease

Sources:
- Acellular pertussis vaccines protect against disease but fail to prevent infection and transmission in a controlled primate model, https://www.pnas.org/content/111/2/787
Current Strategies

Early Childhood Vaccination
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Maternal Vaccination

BENEFITS
Provides a booster to protect and continue immunity
Given at the same time as other adolescent vaccines
Doubles as a tetanus booster
In general, protects 7 out of 10 people who receive it
Protects younger family members

Source: Center for Disease Control and Prevention,

**Recommendation: 1 dose at age 11-12**

**Recommendation: 1 dose during adulthood**
Current Strategies

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Maternal Vaccination

Disease Outbreaks and Exemptions

Current Strategies

Early Childhood Vaccination
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“Cocooning”
Maternal Vaccination

CHALLENGES
Booster dose may come too late, as immunity from childhood vaccination begins to wain around ages 7-10 years
Many adults don’t know about the recommendation
Protection fades over time. Only 3 or 4 out of 10 people are fully protected 4 years after getting Tdap

Sources:
Center for Disease Control and Prevention, https://www.cdc.gov/vaccines
National Immunization Survey, 2014
2013 Pertussis Hot Spots
Non-Medical Exemptions

CHALLENGES
Booster dose may come too late, as immunity from childhood vaccination begins to wain around ages 7-10 years
Many adults don’t know about the recommendation
Protection fades over time. Only 3 or 4 out of 10 people are fully protected 4 years after getting Tdap

Sources:
Center for Disease Control and Prevention, https://www.cdc.gov/pertussis/pregnant/mom/vacc-efficacy.html
Current Strategies

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Current Strategies

Early Childhood Vaccination
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Maternal Vaccination

BENEFITS
Because a young infant is most likely to get pertussis from someone close to them, vaccinating all close contacts at least 2 weeks prior to meeting the baby helps to limit opportunities for exposure.

Source:
Center for Disease Control and Prevention, www.cdc.gov/pertussis/pregnant/mom/protection.html

Current Strategies

Early Childhood Vaccination
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Maternal Vaccination

Pertussis Vaccination in past 8 years, 2013 and 2014

Source:
Vaccination Coverage Among Adults, Excluding Influenza Vaccination — United States, 2013, www.cdc.gov/mmwr/preview/mmwrhtml/mm6404a6.htm
Surveillance of Vaccination Coverage Among Adult Populations — United States, 2014, www.cdc.gov/mmwr/volumes/65/ss/ss6501a1.htm
Current Strategies

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Maternal Vaccination

**CHALLENGES**
- Not effective on its own
- Access challenges for low-income adults, including many childcare workers

**BENEFITS**
- Most effective strategy for preventing pertussis in infants <8 weeks old
- Safety profile has been well established

**Recommendation:** 1 dose during every pregnancy at 27-36 weeks' gestation regardless of interval since prior Td or Tdap vaccination.**
Strong Provider Recommendation is Critical to Vaccine Uptake

Presumptive recommendation vs permissive recommendation

Presumptive: “I’d like to give you the Tdap vaccine today to protect your baby from pertussis. Do you have any questions?”

Permissive: “Would you like the Tdap vaccine today?”

Offering the vaccine is not the same as recommending it.

Recommending: “I want you and your baby to be protected against pertussis. I think it’s really important that you receive the vaccine today.”

Offering: “If you’d like, we can vaccinate you against pertussis today.”

Same day: Recommend AND administer Tdap vaccine during the same visit, if possible
Responding to Hesitancy Using the CASE Method

Corroborate
Acknowledge the parents’ concern and find some point on which you can agree. Set the tone for a respectful, successful talk.

About Me
Describe what you have done to build your knowledge base and expertise.

Science
Describe what the science says.

Explain/Advise
Give your advice, based on the science.

Source: Autism Science Foundation

Current Strategies

Early Childhood Vaccination
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Maternal Vaccination

CHALLENGES
Not all prenatal care providers stock vaccines at their site

Needed Strategies

Increase education/outreach among key populations
Increase Collaborations with Pharmacists
Enact Policies that Encourage Uptake and Increase Access
Improve Vaccine Effectiveness
Increase education/outreach among key populations

- Providers
- Pregnant Women
- Adults with infants under 1 year
- Childcare Workers
- Pharmacists

Increase Collaborations with Pharmacists

Pharmacists can provide additional immunization services for patients whose healthcare providers do not stock vaccines. Communication between pharmacists and other health care providers is critical to ensure continuity of care.

Enact Policies that Encourage Uptake and Increase Access

- Change Immunization Registry from Opt-in to Opt-out
- Tightening exemptions around school vaccine requirements
- Consider modifying vaccination schedule to incorporate booster dose(s) earlier and/or more often
Enact Policies that Encourage Uptake and Increase Access

- Expand access through Adult Safety Net Program
- Allow commercial pharmacies and other convenient locations to participate
- Broaden criteria so that more low-income adults can participate
- Revisit childcare worker vaccination policy law to more strongly encourage Tdap requirements for infant caretakers

Improve Vaccine Effectiveness

- In addition to maintaining a strong safety profile, a new vaccine is needed that:
  - Has longer immunity
  - Prevents transmission as well as disease
  - Can be given in fewer doses
  - Some have suggested a return to former vaccine, DTP, for the first dose or for the entire series

Questions?

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Follow-up
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Thank you!