Public Health
Seattle & King County

Issue Brief – Prevention of Pertussis in Infants, January 2012

Pertussis disease is increasing in King County and Washington State posing a serious health risk to infants. The risk of severe pertussis, including hospitalization and death, is higher for infants than any other age group, and two infant deaths occurred in Washington during 2011. King County pertussis cases increased significantly in 2011 compared to 2010 (97 and 59, respectively), with infants younger than one year comprising 16% of the 97 reported cases. In 2011, 20% of infant cases required hospitalization and infant cases continue to occur in 2012.

Infants younger than 6 months account for 90% of all pertussis-related deaths and the majority of hospitalizations.[1] Susceptible adolescents and adults, in whom the disease is under-diagnosed, serve as a reservoir for transmission to infants.

- The most likely source of infection for 69% of King County infant pertussis cases in 2011 was a household member. Other studies have shown household members are responsible for 75%–83% of pertussis transmission to infants. Parents represented more than half of the source cases; mothers were the source in more than one-third.[2,3,4]
- Pertussis can also lead to substantial morbidity in adults and adolescents among whom it causes 13–20% of cases of cough illnesses lasting longer than 2–3 weeks.[5]

Vaccination of adults and adolescents in close contact with young infants may eliminate a substantial proportion of infant pertussis; it is estimated that 35–55% of infant cases could be prevented by vaccinating parents against pertussis.[6]

- Despite this, the Tdap coverage rate among adults 18–64 years in the U.S. for 2008 was under 6%, and it was only 15% for healthcare workers.[7]

Preventing Pertussis in Infants
- **NEW in 2011: The Advisory Committee on Immunization Practices (ACIP) recommended that *pregnant women who have not already received a Tdap booster should be vaccinated during pregnancy*, preferably during the third trimester or late second trimester (after 20 weeks gestation)[8].** If not vaccinated during pregnancy, unvaccinated women should be vaccinated in the immediate post-partum period before discharge.
- Other adult and adolescent household members and close contacts of infants should also be vaccinated before or during the pregnancy to protect them and the newborn against pertussis.

ACIP also recommends that the following groups receive Tdap as soon as feasible, ideally at least 2 weeks before beginning close contact with the infant[8]:
- Adults >65 years who have or anticipate contact with infants age <1 year (e.g., grandparents, child care providers, healthcare providers), *regardless of the interval since the last Td.*
- Adults and adolescents 11 years and older who have not received a prior dose of Tdap or for whom pertussis vaccination history is unknown, *regardless of the interval since the last Td.*
- Children 7–10 years who are unvaccinated or have not received a complete DTaP primary series.

Pregnant women due for tetanus booster
- <u>If a tetanus and diphtheria booster vaccination is indicated during pregnancy for a woman who has previously not received Tdap (i.e., more than 10 years since previous Td), then health care providers should administer Tdap during pregnancy, preferably during the third or late second trimester (after 20 weeks gestation).</u>

Pregnant women with unknown or incomplete tetanus vaccination
- <u>To ensure protection against maternal and neonatal tetanus, pregnant women who never have been vaccinated against tetanus should receive three vaccinations containing tetanus and reduced diphtheria toxoids during pregnancy. The recommended schedule is 0, 4 weeks, and 6 to 12 months. Tdap should replace 1 dose of Td, preferably during the third or late second trimester of pregnancy (after 20 weeks gestation).</u>

Pertussis Testing and Reporting
Pertussis should be suspected in the differential diagnosis of:
- Respiratory tract symptoms of any duration in infants <12 months, even if they have been immunized against pertussis or test positive for RSV (respiratory syncytial virus) because co-infections have been documented
- Cough illness >2 weeks duration in patients of any age, even if they have been immunized against pertussis
- Respiratory illness of any duration in patients of any age who have had contact with persons with a prolonged cough illness, or a confirmed pertussis case

If you suspect pertussis, a nasopharyngeal specimen for pertussis polymerase chain reaction (PCR) is the preferred test because it is more sensitive and more rapid than culture. Pertussis cases are reportable to Public Health at (206) 296-4774.
- PCR testing is available through the King County Public Health Laboratory (206-744-8950) and at many commercial reference labs.

REFERENCES
1. Tanaka M. Trends in Pertussis among Infants in the United States, 1980-1999. *JAMA*. 2003;290:2968.
2. Wendelboe AM, Njamkepo E, Bourillon A, et al. Transmission of bordetella pertussis to young infants. *Pediatric Infectious Disease Journal*. 2007;26:293-299.
3. Bisgard KM, Pascual FB, Ehresmann KR, et al. Infant pertussis: who was the source? *Pediatric Infectious Disease Journal*. 2004;23:985-989.
4. Gerbie MV, Tan TQ. Pertussis disease in new mothers: effect on young infants and strategies for prevention. *Obstetrics & Gynecology*. 2009;113 (2 Pt 1):399-401.
5. Cherry JD. Epidemiological, clinical, and laboratory aspects of pertussis in adults. Clin Infect Dis. 1999 Jun;28 Suppl 2:S112-7.
6. CDC. Prevention of Pertussis, Tetanus, and Diphtheria Among Pregnant and Postpartum Women and Their Infants MMWR May 30, 2008 / 57 (04);1-47,51.
7. CDC. Tetanus and pertussis vaccination coverage among adults aged ≥18 years -- United States, 1999 and 2008. MMWR October 15, 2010 / 59(40);1302-1306.
8. CDC. Advisory Committee on Immunization Practices (http://www.cdc.gov/vaccines/recs/default.htm).