JULY 2024

# PERTUSSIS QUICKSHEET

Kentucky Public Health
Prevent. Promote. Protect.

## SYMPTOMS

### CATARRHAL STAGE

Onset of cold-like symptoms (coryza, sneezing, occasional cough). Fever is absent or minimal. This stage lasts approximately 1-2 weeks with cough gradually becoming more severe.

### PAROXYSMAL STAGE

Spasms of severe coughing are followed by a sudden deep inspiration, often resulting in a characteristic “whooping” sound. Post-tussive vomiting is common in all ages. Illness may be milder in previously vaccinated people. Infants <1 year of age (particularly very young infants) may present differently:

- may have a shorter catarrhal stage
- may gag, gasp, or stop breathing (apnea)
- may have facial color changes (turn blue, purple, or red)
- may not have noticeable cough or “whoop”
- likely to have leukocytosis (high white blood cell count) with an increased absolute lymphocyte count

### CONVALESCENT STAGE

Decreasing frequency and severity of coughing, whooping, and vomiting. Coughing paroxysms may recur with subsequent respiratory infections. Classic pertussis is 6-10 weeks in duration, but cough may last longer in some people.

**ETIOLOGIC AGENT**

*Bordetella pertussis (bacteria)*

**TRANSMISSION**

- Person-to-person through respiratory droplets or contact with airborne droplets.
- Exposure to fomites

**COMMUNICABILITY**

- Highly communicable
- Infectious from catarrhal stage through third week of paroxysms

**INCUBATION PERIOD**

*Typically, 7-10 days*

*Range, 5-21 days*

**PERTUSSIS CONTAINING VACCINES**

- DTaP (Daptacel & Infanrix)
- Tdap (Adacel & Boostrix)
- DTaP-HepB-IPV (Pediarix)
- DTaP-IPV-Hib (Pentacel)
- DTaP-IPV (Kinrix & Quadracel)
- DTaP-IPV-Hib-HepB (Vaxelis)

## KENTUCKY PERTUSSIS OCCURRENCE

| MMWR Year | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Confirmed Case Count | 91 | 542 | 302 | 268 | 196 | 413 | 391 | 162 | 162 | 40 | 19 | 25 |
| Probable Case Count | 11 | 142 | 84 | 40 | 26 | 54 | 65 | 39 | 45 | 13 | 7 | 6 |



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# PERTUSSIS QUICKSHEET
## CASE DEFINITIONS

### CLINICAL CRITERIA

In the absence of a more likely diagnosis, a cough illness lasting >2 weeks with at least one of the following:

- Paroxysms of coughing;* **OR**
- Inspiratory "whoop;" **OR**
- Post-tussive vomiting; **OR**
- Apnea+ (with or without cyanosis)

*Sudden uncontrollable "fits" or spells of coughing where one cough follows the next without a break for breath.
+Transient cessation of respiration occurring spontaneously or after a coughing spasm. Apnea is generally associated with cyanosis or syncope and might be the only presenting sign of pertussis in young infants with no cough but is rarely associated with pertussis in older children and adults.

### LABORATORY CRITERIA

- Isolation of *B. pertussis* from clinical specimen **OR**
- PCR test for *B. pertussis*

PCR has optimal sensitivity during the first 3 weeks of cough when bacterial DNA is still present in the nasopharynx. PCR is unlikely to be useful 5 or more days after start of antimicrobial therapy.

Serologic results are currently not accepted as laboratory confirmation for purposes of national surveillance.

### PROBABLE CASE

- In the absence of a more likely diagnosis, illness meeting the clinical criteria **OR**
- Illness with cough of any duration, with at least one of the following signs or symptoms:
  - Paroxysms of coughing;* **OR**
  - Inspiratory "whoop;" **OR**
  - Post-tussive vomiting; **OR**
  - Apnea+ (with or without cyanosis) **AND**
  - Contact with a laboratory confirmed case (epidemiologic linkage)

### CONFIRMED CASE

Acute cough illness of any duration with:

- Isolation of *B. pertussis* from a clinical specimen (culture positive) **OR**
- PCR positive for *B. pertussis*

### EPIDEMIOLOGIC LINKAGE

Contact with a laboratory-confirmed case of pertussis

### OUTBREAK

Three or more cases have occurred within 42 days of each other and clustered in a common setting.

- For reporting, the cluster category is accepted nationally as cases exclusive to a "household"

*Enter the outbreak in the REDCap project: 2024 DEHP Outbreak Management

# PERTUSSIS QUICKSHEET
## CASE INVESTIGATION

1. Confirm that the known or suspected case meets the pertussis case definition (confirmed or probable)
    a. Obtain basic clinical information available at the time of the interview; follow-up to assess cough duration for case classification is not needed
    b. For infant cases <4 months of age or cases requiring hospitalization, more detailed information on the clinical course, hospitalization, and mother's Tdap vaccination history and the case's DTaP vaccination history should be obtained
2. Ensure that the case has been recommended to receive antibiotic treatment if it is <21 days from cough onset
3. Determine if the case has any high-risk contacts (see definition of high-risk contact)
    a. In general, only high-risk contacts should be recommended to receive antibiotic postexposure prophylaxis (PEP)
    b. Identifiable high-risk close contacts are typically those in the case's household or childcare setting; if the case is a healthcare worker, there could also be high-risk contacts in a healthcare setting
    c. Obtain contact information for identifiable high-risk contacts who are not in the case's household
    d. Follow-up on identifiable high-risk contacts outside of the case household and recommend PEP
    e. High-risk contacts should receive PEP as soon as possible and within 21 days of last exposure to the infectious case
    f. Instruct high-risk contacts to seek medical attention if early symptoms of pertussis develop
4. Advise lower-risk household and childcare contacts to monitor for symptoms and seek treatment if symptoms develop; follow-up of such contacts is not necessary
5. For cases who are K-12 students, please record the name of the school
    a. Other than pregnant staff or students, contacts in a K-12 school setting are typically lower-risk and do not require PEP
    b. Communications should include:
        i. The signs and symptoms of pertussis
        ii. Information about acellular pertussis vaccines and waning immunity
        iii. The recommendation that pregnant staff and students should receive Tdap vaccine at the earliest opportunity between 27-36 weeks gestation
        iv. Information that infants <1 year of age are at the highest risk of severe pertussis and that the healthcare providers of high-risk household members, including infants <1 year and pregnant women in their third trimester, should be contacted to discuss PEP
6. Recommend vaccination for all persons who are not up to date for pertussis vaccine, using Tdap for people >7 years of age who have not already received it
7. When pertussis incidence is high in the community and it is difficult to follow up on all cases, local health departments may choose to prioritize the investigation of cases in infants <1 year, children aged 1-12, and women of childbearing age
    a. Infants are at highest risk of severe pertussis and may have other infant contacts
    b. Younger children may be more likely to have pregnant mothers, infant siblings, or other infant contacts
    c. Women of childbearing age may have an infant or be pregnant in their third trimester

The Pertussis Surveillance Worksheet may be used as a guideline for the investigation

# PERTUSSIS QUICKSHEET
## CONTACT DEFINITION & MANAGEMENT

## CLOSE CONTACT

Close contacts are defined as persons with exposure to a pertussis case where contact with respiratory aerosols is likely. The duration and intensity of exposure needed to cause infection are unclear. Being a household member, attending or working in the same childcare setting, receiving a cough or sneeze in the face, performing a medical examination of the mouth, nose or throat, sitting at adjacent desks or the same table at school, or sharing a confined space with an infectious person for >1 hour are generally considered significant exposures.

## HIGH-RISK CONTACT

Contacts at the highest risk of severe disease or of transmitting disease to high-risk people should be prioritized for PEP. High-risk contacts include:

- Infants <1 year of age, particularly infants <4 months of age who have not yet received any doses of DTaP;
- Pregnant people in their third trimester
- Caregivers and household contacts of infants (e.g., family members, friends, or babysitters who spend time caring for an infant)
- All those attending or working in a childcare setting (i.e., same room) if there is an infant or a pregnant woman in her third trimester in the setting

## HEALTHCARE WORKERS

Healthcare workers with unprotected (i.e., unmasked) exposure to pertussis cases may be managed in two ways:

1. They may be offered PEP*; or
2. They may self-monitor for symptoms for 21 days from the time of exposure

*Decisions on whether to offer PEP or initiate symptom watch should take into consideration the patient population served by the Healthcare worker and the likely frequency of exposures, (e.g., PEP would likely be preferred over symptom watch for Healthcare workers in a neonatal intensive care unit), but symptom watch may be preferred for Healthcare workers in a pediatric clinic where repeated exposures are likely.

## EXCLUSION/QUARANTINE

The CDC and the American Academy of Pediatrics recommend exclusion from school/work for individuals with pertussis until they have completed five days of antibiotic treatment

# PERTUSSIS QUICKSHEET

SCHOOL AND CHILDCARE SETTINGS

## GENERAL RECOMMENDATIONS

- Educate staff, parents, and students about pertussis symptoms, prevention, and the importance of vaccination.
- Establish a clear communication plan to quickly inform all relevant parties in the event of a suspected or confirmed case or outbreak
- Conduct regular health checks and encourage staying home when symptomatic to prevent spread
- Monitor for symptoms such as severe coughing fits, whooping sound and vomiting after coughing
- Report any suspected cases to the local health department
- Exclusion of under- or unvaccinated exposed students is generally not recommended, though schools may consider this on a case-by-case basis
    - If school exclusion is being considered, please contact KDPH for consultation
- Local health departments should assist with pertussis communications to the school community
- Ensure students and staff are up-to-date with their DTaP or Tdap vaccines

## SPECIMEN COLLECTION FOR LABORATORY TESTING

| Test Name | Specimens to take | Timing for specimen collection | Notes |
|---|---|---|---|
| PCR<br>**Preferred diagnostic* | Nasopharyngeal swab or aspirate<br>*(A pernasal swab with a thin, flexible wire shaft must be used.*<br>*Swabs with a rigid shaft are unsuitable and will not be processed.)* | Within the first 2 weeks of cough onset | PCR should be validated with culture when possible. |
| Culture | Posterior nasopharyngeal swab or aspirate | Within the first 2 weeks of cough onset | A negative culture does NOT rule out pertussis. |
| Serology | Serum | 2 to 8 weeks of cough onset | Serologic results are currently not accepted as laboratory confirmation for purposes of national surveillance. |

CDC| Pertussis Specimen Collection and Diagnostic Testing

# PERTUSSIS QUICKSHEET
## POSTEXPOSURE CHEMOPROPHYLAXIS (PEP)

While antibiotics may prevent pertussis if given prior to symptom onset, no data indicates that widespread use of PEP among contacts effectively controls or limits the scope of pertussis outbreaks. Therefore, Local health departments should focus PEP efforts on infants <1 year of age and their contacts since serious complications and death are primarily limited to young infants.

- CDC and AAP currently recommend PEP for all household contacts, regardless of age or immunization status, because secondary attack rates in households are high even among vaccinated persons. However, KDPH considers it reasonable to prioritize PEP only to high-risk contacts or households, as noted above
- Lower-risk contacts who have not received PEP should be instructed to monitor themselves closely for cold-like symptoms for 21 days after last exposure and contact their healthcare provider if symptoms occur to implement antibiotic treatment immediately
- If pertussis is not widespread in the community, broader use of PEP may be considered in limited closed settings; however, if exposure is ongoing, multiple courses of PEP are not recommended
- If 21 days have elapsed since last exposure to an infectious case, PEP has limited value but should be considered for households with high-risk contacts

| AGE GROUP | AZITHROMYCIN | ERYTHROMYCIN | CLARITHROMYCIN | ALTERNATE AGENT: TMP-SMX |
|---|---|---|---|---|
| Younger than 1 month | 10 mg/kg/day as asingle dose daily for 5days | 40 mg/kg/day in 4divided doses for 14days | Not recommended | Contraindicated at younger than 2 months |
| 1 through 5 months | 10 mg/kg/day as a single dose daily for 5days | 40 mg/kg/day in 4divided doses for 14days | 15 mg/kg/day in 2divided doses for 7days | 2 months or older:TMP, 8 mg/kg/day;SMX, 40 mg/kg/day in2 doses for 14 days |
| 6 months or older and children | 10 mg/kg as a single dose on day 1(maximum 500 mg),then 5 mg/kg per day as a single dose on days 2 through 5(maximum 250mg/day) | 40 mg/kg/day in 4divided doses for 7-14days (maximum 1-2 gper day) | 15 mg/kg/day in 2divided doses for 7days (maximum 1g/day) | 2 months or older:TMP, 8 mg/kg/day;SMX, 40 mg/kg/day in2 doses for 14 days |
| Adolescents and adults | 500 mg as a single dose on day 1, then 250 mg as a single dose on days 2 through 5 | 2g/day in 4 divided for7-14 days | 1g/day in 2 divided doses for 7 days | TMP 320 mg/day; SMX,1600 mg/day in 2divided doses for 14days. |



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- Contacts under 7 years old:
  - Infants may be immunized as early as six weeks of age
  - Close contacts who are unimmunized or under-immunized should receive age appropriate vaccination
  - Children who received their 3rd dose 6 or more months ago should receive a 4th dose of diphtheria and tetanus toxoids and acellular pertussis (DTaP)
  - Children who received their 4th dose 3 or more years before exposure should be given a 5th dose of DTaP vaccine
- Contacts who are over the age of 7 years:
  - A single dose of Tdap vaccine is recommended by ACIP for children aged 7 through 10 years who are not fully vaccinated against pertussis
  - A single dose of Tdap should be administered to contacts 10 years or older (Boostrix licensed for persons 10 to 18 years of age; Adacel licensed for persons 11 to 64 years of age). These vaccines are only licensed for a single lifetime dose
  - Tetanus and diphtheria antigens are generally given every 10 years. Tdap can be administered regardless of interval since the last Td
  - ACIP recommends adults age 65 years and older receive a single dose of Tdap to replace the decennial dose of Td
  - ACIP recommends the use of Tdap during every pregnancy
    - Optimal timing for Tdap administration is between 27 and 36 weeks gestation, although Tdap may be given at any time during pregnancy
    - If not administered during pregnancy, Tdap should be administered immediately postpartum