

Pertussis Surveillance Training Program for Public Health



Immunization Division
Texas Department of Health

Complications

Infants with pertussis are at highest risk:

- 59% Hospitalization
- 12% Pneumonia
- 1% Seizures
- 0.2% Encephalopathy
- 0.7% Death

What is Whooping Cough?

- Pertussis—Whooping Cough
- Caused by *Bordetella pertussis* (bacteria)
- Young infants at greatest risk
- Milder disease in adolescents, adults, and those partially protected by vaccination
- Growing public health problem in Texas and the United States

Infant Deaths 1999 – May, 2002

Clinical Features of Pertussis

- Toxin-mediated disease
- Incubation period 5-21 days
- Fever absent or minimal
- Catarrhal stage 1 - 2 weeks
- Paroxysmal stage 1 - 6 weeks
- Convalescence stage weeks to months

Pertussis in Adolescents and Adults

- Waning immunity
- Milder disease
- Persistent cough (>7 days)
- Often first case in household

Sounds of Pertussis



Source: Centers for Disease Control and Prevention

Pertussis in Adults—Mild?



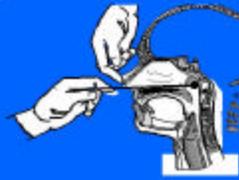
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Transmission of Pertussis

- Humans are the only reservoir
- Transmission by respiratory drops
- Highly communicable
- Most infectious during initial stage

Pertussis Trends Texas, 1947-2001

Appropriate Positioning of Nasopharyngeal Swab



Adolescent Case Report

- 12 year-old female index case in school
- Onset of April 23rd, paroxysmal cough started April 30th, diagnosis on May 18th
- Initially diagnosed and treated for cough due to allergies
- Nineteen additional probable cases (adolescents and adults) were identified
- Treatment offered to over ninety close contacts

Diagnosis and Management Problems

- Distinguishing from other upper respiratory infections
- Ruling out pertussis based on vaccination history
- Waiting for laboratory results to begin treatment of patient AND contacts
- Waiting for laboratory results to notify local health authority
- Failing to treat close contacts based on vaccination history

Remember...

- Adults with pertussis may only present with a prolonged cough
- Adolescents and adults are common source for infants and children
- Vaccinated adolescents and adults are susceptible due to waning immunity
- Vaccinated persons may have pertussis

Infant Case Report #1

- 7-week-old Hispanic female with history of cough lasting 3 weeks taken to ER mid-May
- Symptoms: paroxysmal cough, inspiratory whoop, post-tussive vomiting, and apnea
- DFA and culture positive
- Recovered after treatment with erythromycin
- Discharged from hospital in early June
- Source appeared to be 15-year-old mother with cough illness that started one week prior to infant's cough onset

Role of Public Health

- Investigate all suspected cases
- Ensure all close contacts are treated when appropriate
- Collect and analyze surveillance data
- Publicize information on pertussis

Infant Case Report #2

- Cough onset Jan. 18th when infant was 1 month old
- Treated for ear infection and runny nose.
- Cough became paroxysmal Jan. 24th
- Treated with omnicef, albuterol, nystatin, nose drops
- Seen by physicians 4 times and 3 different clinics prior to ER visit
- By fourth visit on Jan 29th symptoms included vomiting and mild to moderate distress with cough

Importance of Reporting

- Reporting suspected cases helps identify outbreaks (two or more related cases) quickly
- Triggers public health response

Infant Case Report #2

- Waited 5 hours in the ER and then transferred twice—hospitalized Feb. 5th
- Symptoms: paroxysmal cough, inspiratory whoop, post-tussive vomiting, apnea, and cyanosis
- DFA and PCR positive from NP specimen
- Died Feb. 8th.
- 11 close contacts and several secondary
- Adolescent with paroxysmal cough with post-tussive vomiting 18 days prior to the infant

Report Immediately...

When pertussis is suspected! Call:

1-800-705-8868

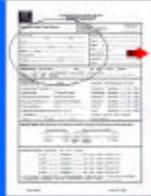
OR

1-800-252-9152

Pertussis Investigation

- Follow the TDH *Vaccine-Preventable Disease Surveillance Guidelines*
- Use the current version posted at <http://www.tdh.state.tx.us/removal/index9490000.pdf>

Demographic Information

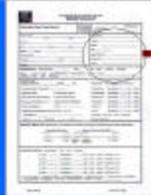


DEMOGRAPHICS: When a suspected Pertussis case is first reported, make certain that the patient's demographic information is collected, i.e. name, address, date of birth, etc.

Pertussis Investigation

- Investigate all suspected cases of pertussis promptly
- Begin a Case Track Record (CTR) and report preliminary information to TDH
- Identify exposed contacts
- Provide or coordinate prophylaxis of all close contacts including appropriate antibiotics and pertussis vaccine
- Test or coordinate testing of asymptomatic contacts (prior to treatment if possible, or within 2 days)

Reported by and Report Given to



REPORTED BY: When a suspected Pertussis case is first reported, make certain that you indicate the name and agency of the person reporting, and the date the report is filed.

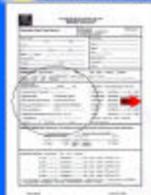
REPORT GIVEN TO: If the report does not belong to you, list the name, organization, and telephone of the person you have given the report to for investigation and for the report immediately.

REMEMBER THAT TDH SHOULD BE INFORMED OF ALL SUSPECTED PERTUSSIS CASES REPORTED TO YOUR OFFICE.

Laboratory Tests

- The test of choice is culture and/or PCR
- TDH currently provides culture and DFA tests but plans to change to culture and PCR
- Regan Lowe transport media is available from TDH (overnight upon request, 512-458-7561) and some local health departments, commercial labs, and hospitals
- Test or coordinate testing of asymptomatic contacts coughing less than 3 weeks
- Test is more likely to yield positive results if taken early in infection (<1 week of cough)

Clinical Data



CLINICAL DATA: Collect as much of the clinical data as possible. Check all symptoms described. The cough duration must be completed at the final interview. The final interview or follow up should be done at least 2 weeks after the initial report if the patient is still coughing (1 to 3 days for cough cessation).

Close Contact Examples

- All household contacts
- Contacts who spend 2 or more hours per day in the same room
- Social contacts who visit face to face
- Students who car-pool together or sit together on a bus
- Health care workers who provide direct care or are exposed to respiratory secretions

Treatment, Outcome, and Physician's Diagnosis



TREATMENT: If the reported case has been treated with antibiotics, specify the antibiotic(s), the date(s) started, and how many days the medication(s) were actually taken. At the final interview, ask how many days were completed and whether alternative medications were started.

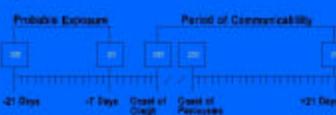
OUTCOME: If the patient dies, be sure to notify TDH immediately. It is critical to know as soon as possible. Show the date of death by the outcome.

PHYSICIAN DIAGNOSIS: Please note the physician diagnosis if it is available.

Pertussis Case Track Record

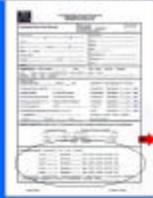
- A Case Track Record (CTR) or Investigation Form is required for all suspected cases of Pertussis and their symptomatic contacts
- In addition to the CTR, a copy of lab results should be included for tests performed at labs other than TDH
- The CTR should be completed within 30 days of the initial report

Infection Timeline



INFECTION TIMELINE: Fill in the infection timeline that you use for information when asking about the exposure history, close contacts, and activities where possible spread may have occurred.

Vaccination History



VACCINATION HISTORY: CDC is now requesting complete vaccine histories on all cases reported through NETSS. Include the Manufacturer, Lot numbers, and Type on the CDC. If the patient has not been vaccinated, please indicate the reason.

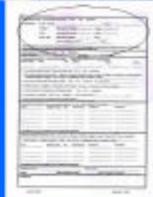
Investigator's Name and Comments



INVESTIGATOR'S NAME: The actual investigator investigating the actual report must fill out this section. If there are questions or needs to verify information, the investigator listed in this section will be contacted for clarification. Note that the final interview should occur after the cough has lasted or has a duration of at least 2 weeks. Two copies of completed CRs to IIR at (712) 459-1544.

COMMENTS: List any additional comments as necessary.

Laboratory Data



LABORATORY DATA: If lab testing has been done, specify the name of the Lab, type of lab test done, any specimens was collected, and the results. Submit a copy which results for tests performed at labs other than IIR. If any case that the PCR test is not listed on the CR, but should be sent under laboratory data and considered as a valid Pertussis lab test.

Final Status and NETSS



FINAL STATUS: IIR makes the final decision on the status of the case.

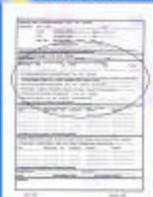
Confirmed: Cases that are laboratory confirmed and occur with a cough duration > 2 weeks that are directly (first generation) linked to laboratory-confirmed cases.

Probable: Sporadic cases that meet the clinical case definition and close contacts that have a cough lasting > 2 weeks.

Unlikely: Cases with a cough duration < 2 weeks (unless culture positive), and include cases that do not meet the clinical case definition.

NETSS #: The number given to the case report entered in NETSS and transmitted to CDC on a weekly basis.

Source of Infection



SOURCE OF INFECTION: If the source of infection is a known or suspected case, make contact that the name of contact is listed. Gather as much of the information as possible. When the source of infection is a case facility, such place, an others reporter may have assessed.

Clinical Case Definitions

- For endemic or sporadic cases, a cough illness lasting at least 2 weeks with one of the following and without other apparent cause (as reported by a health professional):
 - Paroxysms of cough
 - Inspiratory whoop
 - Post-tussive vomiting
- For outbreak settings, including all household exposures, use the outbreak definition of: A cough illness lasting at least 14 days.

Household Contacts



HOUSEHOLD CONTACTS: List all contacts in the household. Include date, pertussis vaccination history. If the contact is asymptomatic, a separate CR must be completed on that contact. All household contacts of a known or suspected case should be properly listed even if they have more than 2 weeks since their exposure and they still have no symptoms. If a contact is hospitalized, list the type of antibiotic prescribed and the date. If the contact is institutional, enter the reasons for admission. If you're not at home, please information on a separate sheet of paper and attach it to the CR.

Case Classification: Confirmed

- Bordetella pertussis* is isolated by culture
- Positive PCR test and cough \geq 14 days
- Patient is directly (first generation) linked to a laboratory-confirmed case and has a cough lasting \geq 14 days

Possible Spread Contacts



POSSIBLE SPREAD CONTACTS: List all close contacts under possible spread contacts. Call IIR IIR surveillance staff in order to be the CDC Classification for the Classification of Pertussis Outbreaks. Includes: identifying close contacts in home or special settings. Provide the case information and follow-up the close contacts as described above for household contacts.

Case Classification: Probable

- Symptoms meet the clinical case definition, but case is not laboratory confirmed, or epidemiologically linked to a laboratory-confirmed case
- Positive PCR test and cough < 14 days
- Patient is epidemiologically linked to a probable case or indirectly to a confirmed case and has cough \geq 14 days

Evaluation of Surveillance

- Close contacts identified within and outside of the household
- CTR completed on all coughing contacts
- Close contacts prophylaxed
- Vaccination history completed
- Specimens submitted for persons coughing < 3weeks

Outbreak in Dallas 2000 Control Measures

- Alerted area ERs
- Sent letter to providers in the area
 - Consider Pertussis as possible diagnosis
 - Report suspected cases
 - Provide prophylaxis
- Publicized outbreak
- Organized in-services
- Worked with community
 - Counsel those in contact with suspected cases
 - Culture and treat household contacts
 - Distribute Pertussis Fact Sheet

QUESTIONS?

If you have any questions pertaining to the CASE TRACK RECORD, please contact our office at 1-800-252-9152.

Outbreak in Dallas Distribution of 2000 cases

Total cases=124

Outbreak Response

- Letter to area physicians
- Notification of hospitals
- Letter to parents from school health officials
- Press release
- Coordination with surrounding counties
- Active surveillance

Strategies to Battle Pertussis

- Maintain high DTaP coverage
- Educate
- Intensify community surveillance
- Prompt reporting of suspected cases
- Ensure prompt treatment of all cases and their close contacts
- Improve public health communication systems

Active Surveillance

- Alert area physicians, hospital infection control and emergency room staff, and urgent care facilities
- Include reporting criteria and contacts
- Call a sample of area hospitals, physicians, schools, and laboratories and ask about possible pertussis activity

Challenges

- Vaccine shortages
- Low vaccination coverage levels
- Community outreach
- Coordinated response—individual providers and public health

Evaluation: Outbreak Response

- Control measures implemented
- Number of cases with onset prior to report of index case compared to those after investigation and response initiated
- Percentage of cases with culture or PCR confirmation

Texas Vaccination Levels

Age/DTP Doses	Coverage Levels	
	Texas	U.S.
3 mos/1st/DTaP1	64%	67%
5 mos/1st/DTaP2	72%	77%
7 mos/1st/DTaP3	67%	69%
13 months/DTaP3	64%	69%
18-23 months/DTaP4	77%	82%



We all have the same goal...

Protecting the most vulnerable among us,
our little Texans.

