

**Include in the pathway: (Patients may be any of these)**

- Infants presenting with multiple episodes of apnea
- Patients with paroxysmal cough
- Patients with known pertussis by culture, or PCR
- Patients with cough and perioral cyanosis or post-tussive emesis AND clinical suspicion for pertussis

**Exclusion from the pathway: (Patients with any of these)**

- Patients with significant co-morbid conditions (eg: CHD, severe neurological impairment)
- Patients with complication from pertussis (seizures, encephalopathy)

**Patients should be considered for removal from the pathway if:**

*(nursing staff should contact physician if any of the following apply)*

- Worsening apnea
- Development of complication; seizures or encephalopathy
- Diagnosis seems questionable

**Criteria for Admission:**

- Persistent cough with cyanosis or post-tussive emesis
- Infants < 6 mos.
- SpO<sub>2</sub> < 92% on RA
- Clinical evidence of dehydration

**Criteria for Discharge:**

- Prophylaxis given to close household contacts (including immunized children)
- Maintaining hydration
- Teaching complete
- No apnea for 24 hours
- SpO<sub>2</sub> > 92% on RA
- Safe home environment

**Background Information:**

- Diagnosis of pertussis can include severe paroxysms of cough followed by emesis or cyanosis
- Disease in infants < 6 mos. of age can be atypical with apnea being the only symptom
- Pneumonia is a common complication, occurring in up to 22% of cases
- After paroxysms are established, antibiotics usually have no effect on the course of the illness but are recommended to prevent spread of organisms to others.
- Macrolides are the drugs of choice for infected people and their contacts.
- Culture is still considered the gold - standard for diagnosis. PCR is highly sensitive and specific; however, PCR lacks sensitivity in immunized individuals. PCR is more rapid than culture.
- Inhaled corticosteroids and B-agonists may be effective in reducing paroxysms of coughing but no definitive studies have been done showing efficacy

**Goals:**

- Provide teaching for parents to allow home care
- Encourage NG feeds rather than IVF for babies refusing to feed
- To prophylax all close household contacts if patient is pertussis positive or if pertussis is highly suspected, to reduce spread of organism
- To encourage updating immunizations in patients that are under immunized

*American Academy of Pediatrics. Pickering LK, et al. Red Book: 2006 Report of the Committee of Infectious Diseases 27th ed. 2009 Red Book, 28th ed.*

Weight:

Allergies:

Time/ General  
Date:

- 1) Dx: Pertussis
- 2) Estimated length of stay = 6 days
- 3) Condition: Stable
- 4) Respiratory Droplet isolation
- 5) CR monitor < 6 mos. of age
- 6) Vitals and pain assessment: every 6 hours and as needed for pain
- 7) BP on admission and routine
- 8) Activity: as tolerated
- 9) Initiate "Learning Assessment" and implement pertussis education
- 10) On admit, assess discharge needs and make appropriate referrals (see pediatric admission database).

**Education**

- 1) Begin education on admission
- 2) Teach signs of worsening respiratory distress and signs of dehydration
- 3) Review "Patient education sheet" with family
- 4) If patient demonstrated apnea during course of illness, schedule CPR training for family
- 5) If patient is using albuterol or inhaled steroid, do MDI teaching
- 6) Encourage care provider to update patient's immunization status after discharge

**Diet and Fluids**

- 1) Diet: Age appropriate; hold feeds for severe retractions or consistent respiratory rate > 70.
- 2) I's and O's
- 3) Do not start I.V. unless patient requires I.V. fluids. If already in place, saline lock PIV and do not restart if I.V. infiltrates.

**Criteria for supplemental feedings or I.V. fluids:**

- Oral intake consistently inadequate (< 75% of maintenance for > 24 hours; \*see below for definition of maintenance)
- Severe retractions or consistent respiratory rate > 70
- Dehydration

**NG feeds are preferred for inadequate intake or mild dehydration.** I.V. fluids are preferred for respiratory distress. Nurse may initiate NG feedings or I.V. fluids based on the above guidelines and using clinical judgement.

- For NG feeding, place NG tube and initiate feedings using age-appropriate formula at 15ml/kg every 3 hours. Obtain nutrition consult and adjust feedings per nutrition recommendations. Discontinue NG tube when able to resume feedings.
- If I.V. fluids are required, place I.V. and begin maintenance I.V. fluids (see below). When able to resume feedings, saline lock and do not restart if I.V. infiltrates. (Nurse to call pharmacy if I.V. fluids needed)

Physician's Signature/ID Number: \_\_\_\_\_ Date: \_\_\_/\_\_\_/\_\_\_ Time: \_\_\_\_\_

**Pertussis**

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Patient Label



**Physician's Order Sheet**

Weight:

Allergies:

Time/  
Date:

Definition of maintenance Fluids:

|          |  |
|----------|--|
| 1-10 kg  | 4ml/kg/hr                              |
| 11-20 kg | 40ml/hr + (2ml/kg/hr for each kg > 10) |
| >20 kg   | 60ml/hr + (1ml/kg/hr for each kg > 20) |

Choice of I.V. Fluids:

for children  $\leq$  15 kg, use D5  $\frac{1}{4}$  NS; add 20 mEq KCl/L  
for children > 15 kg, use D5  $\frac{1}{2}$  NS; add 20 mEq KCl/L

**Oxygen and Monitoring**

- 1) O<sub>2</sub> to keep sats  $\geq$  92%
- 2) CR monitor, O<sub>2</sub> sat monitor
- 3) Bag and mask set-up for blow-by oxygen.

**Medications**

- Azithromycin 10 mg/kg PO once daily for 5 days
- OPTIONAL: Albuterol MDI 2 puffs every 4 hrs PRN for wheezing (check if wanted)
- OPTIONAL: Fluticasone 44 mcg/puff MDI 2 puffs BID (check if wanted)
- Acetaminophen 15 mg/kg/dose po/pr/ng every 4hrs PRN T> 101° or mild pain  
(maximum single dose = 650 mg/dose and maximum daily dose = 75 mg/kg/day or 4000 mg/day, whichever is less)

**Nursing**

- Suction with bulb syringe, nasal aspirator or catheter and saline PRN for airway obstruction (only use catheter with significant respiratory compromise)

**Diagnostic Tests**

- Pertussis PCR
- CBC with auto diff (if not done in ER)

**Follow-up**

- 1) Bedside nurse to acquire list of all direct household contacts, with their body weight and medication allergies, for prophylaxis, print and complete antibiotic prophylaxis sheet as indicated.
- 2) Fax discharge instructions and Medication Reconciliation Form to primary care physician

Physician's Signature/ID Number: \_\_\_\_\_ Date: \_\_\_/\_\_\_/\_\_\_ Time: \_\_\_\_\_

**Pertussis**

page 2

Patient Label

0032



pathway 8/2009

Children's  
Hospital  
Central California 

**Physician's Order Sheet**

## Interdisciplinary Patient/Family Learning Evaluation

### Initial Patient/Family Learner Assessment

A learning evaluation is done with each initial teaching intervention for each learner. Teaching interventions should be documented in an ongoing manner with ongoing assessment and evaluation of readiness to learn, barriers to learning, and learning outcomes. Use your department or topic specific Interdisciplinary Patient/Family Education Documentation forms for ongoing patient/parent/family education documentation. Use this form for the initial assessment of a learner and keep this form with the ongoing patient/family education documentation forms.

| Initial Learner Evaluation (assess one or multiple learners)   |  |  |  |
|--|--|--|--|
| 1. _____ Date _____<br>(Pt./Primary care giver)  | 2. _____ Date _____<br>learner   | 3. _____ Date _____<br>learner   | 4. _____ Date _____<br>learner   |
| <b>Prior Knowledge of Plan of Care or care needs:</b><br><input type="checkbox"/> Comprehensive<br><input type="checkbox"/> Good<br><input type="checkbox"/> Limited<br><input type="checkbox"/> None<br><input type="checkbox"/> Other _____  | <b>Prior Knowledge of Plan of Care or care needs:</b><br><input type="checkbox"/> Comprehensive<br><input type="checkbox"/> Good<br><input type="checkbox"/> Limited<br><input type="checkbox"/> None<br><input type="checkbox"/> Other _____  | <b>Prior Knowledge of Plan of Care or care needs:</b><br><input type="checkbox"/> Comprehensive<br><input type="checkbox"/> Good<br><input type="checkbox"/> Limited<br><input type="checkbox"/> None<br><input type="checkbox"/> Other _____  | <b>Prior Knowledge of Plan of Care or care needs:</b><br><input type="checkbox"/> Comprehensive<br><input type="checkbox"/> Good<br><input type="checkbox"/> Limited<br><input type="checkbox"/> None<br><input type="checkbox"/> Other _____  |
| <b>Primary Language:</b> check<br><input type="checkbox"/> English<br><input type="checkbox"/> Spanish<br><input type="checkbox"/> Hmong Other _____<br><input type="checkbox"/> Writes <input type="checkbox"/> Reads   | <b>Primary Language:</b> check<br><input type="checkbox"/> English<br><input type="checkbox"/> Spanish<br><input type="checkbox"/> Hmong Other _____<br><input type="checkbox"/> Writes <input type="checkbox"/> Reads   | <b>Primary Language:</b> check<br><input type="checkbox"/> English<br><input type="checkbox"/> Spanish<br><input type="checkbox"/> Hmong Other _____<br><input type="checkbox"/> Writes <input type="checkbox"/> Reads   | <b>Primary Language:</b> check<br><input type="checkbox"/> English<br><input type="checkbox"/> Spanish<br><input type="checkbox"/> Hmong Other _____<br><input type="checkbox"/> Writes <input type="checkbox"/> Reads   |
| <b>Readiness to learn:</b> check<br><input type="checkbox"/> Asking pertinent questions<br><input type="checkbox"/> Actively Listening<br><input type="checkbox"/> Unreceptive<br><input type="checkbox"/> No interest demonstrated<br><input type="checkbox"/> Distracted   | <b>Readiness to learn:</b> check<br><input type="checkbox"/> Asking pertinent questions<br><input type="checkbox"/> Actively Listening<br><input type="checkbox"/> Unreceptive<br><input type="checkbox"/> No interest demonstrated<br><input type="checkbox"/> Distracted   | <b>Readiness to learn:</b> check<br><input type="checkbox"/> Asking pertinent questions<br><input type="checkbox"/> Actively Listening<br><input type="checkbox"/> Unreceptive<br><input type="checkbox"/> No interest demonstrated<br><input type="checkbox"/> Distracted   | <b>Readiness to learn:</b> check<br><input type="checkbox"/> Asking pertinent questions<br><input type="checkbox"/> Actively Listening<br><input type="checkbox"/> Unreceptive<br><input type="checkbox"/> No interest demonstrated<br><input type="checkbox"/> Distracted   |
| <b>Barriers to learning:</b> check<br><input type="checkbox"/> No barriers<br><input type="checkbox"/> Low literacy or Edu level<br><input type="checkbox"/> Cultural<br><input type="checkbox"/> Language<br><input type="checkbox"/> Visual, hearing, speaking<br><input type="checkbox"/> Religious, spiritual<br><input type="checkbox"/> Cognitive<br><input type="checkbox"/> Emotional<br><input type="checkbox"/> Motivation<br><input type="checkbox"/> Pain or fatigue<br><input type="checkbox"/> Other _____<br>Accommodation:<br><input type="checkbox"/> Interpreter <input type="checkbox"/> Audio<br><input type="checkbox"/> Visuals <input type="checkbox"/> Handouts<br><input type="checkbox"/> Explanations<br><input type="checkbox"/> Demonstrations <input type="checkbox"/> Other | <b>Barriers to learning:</b> check<br><input type="checkbox"/> No barriers<br><input type="checkbox"/> Low literacy or Edu level<br><input type="checkbox"/> Cultural<br><input type="checkbox"/> Language<br><input type="checkbox"/> Visual, hearing, speaking<br><input type="checkbox"/> Religious, spiritual<br><input type="checkbox"/> Cognitive<br><input type="checkbox"/> Emotional<br><input type="checkbox"/> Motivation<br><input type="checkbox"/> Pain or fatigue<br><input type="checkbox"/> Other _____<br>Accommodation:<br><input type="checkbox"/> Interpreter <input type="checkbox"/> Audio<br><input type="checkbox"/> Visuals <input type="checkbox"/> Handouts<br><input type="checkbox"/> Explanations<br><input type="checkbox"/> Demonstrations <input type="checkbox"/> Other | <b>Barriers to learning:</b> check<br><input type="checkbox"/> No barriers<br><input type="checkbox"/> Low literacy or Edu level<br><input type="checkbox"/> Cultural<br><input type="checkbox"/> Language<br><input type="checkbox"/> Visual, hearing, speaking<br><input type="checkbox"/> Religious, spiritual<br><input type="checkbox"/> Cognitive<br><input type="checkbox"/> Emotional<br><input type="checkbox"/> Motivation<br><input type="checkbox"/> Pain or fatigue<br><input type="checkbox"/> Other _____<br>Accommodation:<br><input type="checkbox"/> Interpreter <input type="checkbox"/> Audio<br><input type="checkbox"/> Visuals <input type="checkbox"/> Handouts<br><input type="checkbox"/> Explanations<br><input type="checkbox"/> Demonstrations <input type="checkbox"/> Other | <b>Barriers to learning:</b> check<br><input type="checkbox"/> No barriers<br><input type="checkbox"/> Low literacy or Edu level<br><input type="checkbox"/> Cultural<br><input type="checkbox"/> Language<br><input type="checkbox"/> Visual, hearing, speaking<br><input type="checkbox"/> Religious, spiritual<br><input type="checkbox"/> Cognitive<br><input type="checkbox"/> Emotional<br><input type="checkbox"/> Motivation<br><input type="checkbox"/> Pain or fatigue<br><input type="checkbox"/> Other _____<br>Accommodation:<br><input type="checkbox"/> Interpreter <input type="checkbox"/> Audio<br><input type="checkbox"/> Visuals <input type="checkbox"/> Handouts<br><input type="checkbox"/> Explanations<br><input type="checkbox"/> Demonstrations <input type="checkbox"/> Other |
| <b>Learning Preferences:</b><br><input type="checkbox"/> Demonstration<br><input type="checkbox"/> Written handouts<br><input type="checkbox"/> Verbal or audio<br><input type="checkbox"/> Video or TV<br><input type="checkbox"/> Hands on<br><input type="checkbox"/> Other _____   | <b>Learning Preferences:</b><br><input type="checkbox"/> Demonstration<br><input type="checkbox"/> Written handouts<br><input type="checkbox"/> Verbal or audio<br><input type="checkbox"/> Video or TV<br><input type="checkbox"/> Hands on<br><input type="checkbox"/> Other _____   | <b>Learning Preferences:</b><br><input type="checkbox"/> Demonstration<br><input type="checkbox"/> Written handouts<br><input type="checkbox"/> Verbal or audio<br><input type="checkbox"/> Video or TV<br><input type="checkbox"/> Hands on<br><input type="checkbox"/> Other _____   | <b>Learning Preferences:</b><br><input type="checkbox"/> Demonstration<br><input type="checkbox"/> Written handouts<br><input type="checkbox"/> Verbal or audio<br><input type="checkbox"/> Video or TV<br><input type="checkbox"/> Hands on<br><input type="checkbox"/> Other _____   |
| Signature _____<br>Date _____  | Signature _____<br>Date _____  | Signature _____<br>Date _____  | Signature _____<br>Date _____  |
| Signature _____<br>Date _____  | Signature _____<br>Date _____  | Signature _____<br>Date _____  | Signature _____<br>Date _____  |

Patient Label

0006



pathway



**Patient/Family Learner Assessment**



## **Pertussis**

### **What is pertussis?**

Pertussis (whooping cough) is an infection in the airways of the lungs that causes the breathing tubes (airways) to swell and narrow, leading to irritation and cough.

### **How did my child get pertussis?**

It is caused by a bacteria called Bordetella pertussis. Pertussis is easily spread from one person to another person. The infection may seem like a bad cold. People get it by breathing in air droplets released from the nose or throat of an infected person during coughing, sneezing or talking. It is also spread by contact with drainage from the nose or throat of an infected person.

### **How will I know if my child has pertussis?**

The first signs are like that of a cold (runny nose, cough, sneezing, mild fever). Usually, over the next 2 weeks the cough becomes worse. The cough comes in spasms and can be followed by a high-pitched 'whoop' sound when taking in a breath. The whoop is from breathing through the narrow airways. Often children under 2 years of age do not whoop. The coughing spells are worse at night and can last for 1 to 2 months. The coughing can make your child

- Vomit
- Turn blue (face, lips or nails)
- Have difficulty eating or drinking

### **Who gets pertussis?**

Anyone can get pertussis. Infants/children/adults that are unvaccinated or incompletely vaccinated are at risk. Infants under the age of one are most at risk. Pertussis is most dangerous to infants less than 1 year old. Older children and adults can get it because protection from the vaccine lasts only 5 to 10 years from the last shot.

### **How can I prevent the spread of pertussis?**

- Complete your immunizations.
- If your child has pertussis, he/she can infect others up until 5 full days of antibiotics have been completed.
- **WASH YOUR HANDS** frequently throughout the day
- It is best to keep your child away from others who are sick. (kissing can spread respiratory germs)
- Keep your baby or child from coughing or sneezing on others
- Do not share drinks or food.
- Clean drinking and eating utensils well after use

### **What is the treatment for pertussis?**

The treatment for pertussis may include:

- Antibiotics
- Breathing treatments
- Oxygen therapy
- Medicines for a fever

### **What can I do at home?**

- Keep your child calm, explain what's happening. If you need further help on how to do this, talk with your nurse. Your nurse can also refer you to others who can help, for example, Child Life specialists, play therapists, etc.
- Encourage your child to drink plenty of fluids and get lots of rest. Warm apple juice is comforting and can help break the coughing spasms.
- Use cool mist humidifiers
- Raise the head of the bed if possible, so your child is not lying flat. This may make it easier for him/her to breathe. DO NOT use pillows for infants.
- Hold infants upright for feedings and place on side after feedings.
- Give small frequent feedings.
- Burp frequently.
- **NO SMOKING:** Tobacco smoke makes coughing worse. Children who have respiratory infections are more likely to have trouble breathing if they are around tobacco smoke. Do not let anyone smoke around your child or inside of your home or car.
- **AVOID** smells that trigger coughing like perfumes, air fresheners, candles, hair spray, smoke from fireplaces

### **When should I call my child's doctor?\***

If your child has:

- Coughing spasms that cause their face, hands, or feet to turn blue
- nasal flaring (the openings of the nose open wide with breathing)
- retractions (sinking of the skin between the ribs)
- breathing that becomes faster
- paleness to area around nose and mouth
- a poor appetite, not drinking, or ability to eat or feed has worsened
- difficulty waking up or is less active than usual
- become very irritable or anxious, increase in complaint of pain or you are unable to calm him or her
- Fever of 100.4 degrees Fahrenheit for children two months of age or younger.  
Do not give Acetaminophen (Tylenol) or Ibuprofen (Pediaprofen) before calling your doctor.
- A fever you are concerned about

\*\*If you cannot reach your child's doctor, and your child has any of the symptoms described above, take your child to the Emergency Department closest to you.

**Call 911, if your child**

- makes a grunting noise when breathing
- turns blue or gray in color
- passes out
- stops breathing
- has a seizure

**Start CPR if needed.**

**1** Name: \_\_\_\_\_ Relationship: \_\_\_\_\_ DOB: \_\_\_\_\_ Wt: \_\_\_\_\_ kg.  
Allergies: \_\_\_\_\_ Other Med/Medical conditions: \_\_\_\_\_

Funding source: \_\_\_\_\_ Rx Given/Type: \_\_\_\_\_ Filled:  yes  no  
PMD: \_\_\_\_\_

**2** Name: \_\_\_\_\_ Relationship: \_\_\_\_\_ DOB: \_\_\_\_\_ Wt: \_\_\_\_\_ kg.  
Allergies: \_\_\_\_\_ Other Med/Medical conditions: \_\_\_\_\_

Funding source: \_\_\_\_\_ Rx Given/Type: \_\_\_\_\_ Filled:  yes  no  
PMD: \_\_\_\_\_

**3** Name: \_\_\_\_\_ Relationship: \_\_\_\_\_ DOB: \_\_\_\_\_ Wt: \_\_\_\_\_ kg.  
Allergies: \_\_\_\_\_ Other Med/Medical conditions: \_\_\_\_\_

Funding source: \_\_\_\_\_ Rx Given/Type: \_\_\_\_\_ Filled:  yes  no  
PMD: \_\_\_\_\_

**4** Name: \_\_\_\_\_ Relationship: \_\_\_\_\_ DOB: \_\_\_\_\_ Wt: \_\_\_\_\_ kg.  
Allergies: \_\_\_\_\_ Other Med/Medical conditions: \_\_\_\_\_

Funding source: \_\_\_\_\_ Rx Given/Type: \_\_\_\_\_ Filled:  yes  no  
PMD: \_\_\_\_\_

**5** Name: \_\_\_\_\_ Relationship: \_\_\_\_\_ DOB: \_\_\_\_\_ Wt: \_\_\_\_\_ kg.  
Allergies: \_\_\_\_\_ Other Med/Medical conditions: \_\_\_\_\_

Funding source: \_\_\_\_\_ Rx Given/Type: \_\_\_\_\_ Filled:  yes  no  
PMD: \_\_\_\_\_

**6** Name: \_\_\_\_\_ Relationship: \_\_\_\_\_ DOB: \_\_\_\_\_ Wt: \_\_\_\_\_ kg.  
Allergies: \_\_\_\_\_ Other Med/medical conditions: \_\_\_\_\_

Funding source: \_\_\_\_\_ Rx Given/Type: \_\_\_\_\_ Filled:  yes  no  
PMD: \_\_\_\_\_

**7** Name: \_\_\_\_\_ Relationship: \_\_\_\_\_ DOB: \_\_\_\_\_ Wt: \_\_\_\_\_ kg.  
Allergies: \_\_\_\_\_ Other Med/Medical conditions: \_\_\_\_\_

Funding source: \_\_\_\_\_ Rx Given/Type: \_\_\_\_\_ Filled:  yes  no  
PMD: \_\_\_\_\_

Patient Label

0540



Pertussis Pathway 12/2002



Exposure Contact List

# Discharge Sheet

## For Hospital Use Only

Dictation: 1-800-411-1001 (#963)

Discharge sheet FAXed to primary care physician \_\_\_\_\_  
initial/date

D/S Job #: \_\_\_\_\_

Follow-up appointment SCHEDULED with primary care physician \_\_\_\_\_  
initial/date

PATIENT'S NAME: \_\_\_\_\_ DISCHARGE DATE: \_\_\_\_\_

Dx: 1) Pertussis or Pertussis Syndrome

### Hospital Course

- Pertussis PCR: negative (circle one)      Pertussis Culture (if done): negative (circle one)  
positive
- CXR findings (if done) \_\_\_\_\_  
positive

Patient admitted for paroxysmal cough, cyanosis or apnea

Patient diagnosed with pertussis/pertussis syndrome. Treated per pathway orders.

Complications during hospitalization: \_\_\_\_\_

DISCHARGE CONDITION: \_\_\_\_\_ Discharge weight: \_\_\_\_\_

## Instructions to Patient

**Activity:** No one should smoke near the baby. Avoid all other exposure to smoke (including fireplace and barbeque); avoid contact with other infants; limit travel.

**Diet:** Regular diet; formula or breast feed as before, encourage oral intake.

**Medications:** See Medication Reconciliation Form. Follow up with: \_\_\_\_\_

Check outpatient prescription for Azithromycin

Check with your primary care doctor to assure your child's immunizations are up to date.

**Additional instructions:** Return immediately if child has difficulty breathing, stops breathing or cannot eat. Please ensure that all close household contacts have been prescribed antibiotics to prevent spread of the disease.

Signed: \_\_\_\_\_ M.D. \_\_\_\_\_  
Signature of Parent or Guardian

\_\_\_\_\_  
Attending Physician

\_\_\_\_\_  
Attending Resident

\_\_\_\_\_  
Primary Care Physician

\_\_\_\_\_  
City

## Pertussis



Patient Label

## Discharge Instructions