

# CONTAGIOUS COMMENTS

## Department of Epidemiology

### Respiratory Season 2006 – 2007 Prevent Transmission!

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Yes Virginia, there is a Respiratory Season. Whether we like it or not, the time is here once again. This edition is designed to remind you of standard basic principles and to provide you with further details on our plan for managing Patients and Visitors at The Children's Hospital (TCH) with viral respiratory symptoms / illness this season. (For more information on influenza, refer to our October 2006 issue of Contagious Comments "Influenza 2006 – 2007: Vaccinate Children!"

<http://eames.thechildrenshospital.org:6300/psp/poprd/EMPLOYEE/EMPL/e/?url=http%3a%2f%2fwww.thechildrenshospital.org%2fpublications%2fcc%2findex.cfm>

The fall of 2006 has been relatively quiet in terms of the detection of respiratory viruses by our Virology Lab. Adenovirus was the most common virus isolated and we had only a little parainfluenza virus to contend with because parainfluenza virus peaks during fall of odd-numbered years. However RSV and influenza are on the horizon, so monitor "[Bug Watch](#)" for weekly updates.

#### **REMEMBER THESE TOP 10 POINTS:**

##### **1. Visitation "RE-VISITED" - WE NEED YOUR HELP!**

**\*\*\*PLEASE\*\*\***

**ADVISE YOUR FAMILIES OF THESE RESTRICTIONS  
WHEN REFERRING THEM TO TCH TO PREVENT ANY  
CONFUSION  
UPON THEIR ARRIVAL HERE.**

**\*\* 12/15/06 TO 4/15/07 \*\***

#### **Inpatient:**

- 2 visitors per bedside at one time (includes parents).
- For visitors 12 years of age and younger, we will only allow WELL siblings (no relatives or friends this age are allowed). Apple screening for illnesses will be required at the nurse's stations before each visit.
- No ill visitors.

#### **Outpatient Visits & Surgery Procedure/Visits:**

Due to an increase in respiratory illnesses in the community during these months, we discourage bringing brothers, sisters or friends who are 12 years of age or younger to your child's scheduled outpatient visits.

- 2. Respiratory Viruses** are spread mainly by contact with secretions and contaminated surfaces. They do not usually spread via the airborne route.
- 3. Droplet Precautions** (gown, mask and gloves) should be used for all patients with respiratory symptoms. All staff must comply if having contact with the patient or the room

environment. We have shown that **Cohorting of Patients** with like-respiratory symptoms does not increase the risk of transmission as long as everyone adheres to the isolation procedures.

- 4. Do not order viral testing unless it will alter your medical management of the patient.** Testing of already hospitalized patients with new onset of respiratory symptoms may prove useful for epidemiologic purposes and perhaps patient management in certain circumstances.
- 5.** About 2/3 of the time, **nebulized bronchodilator** use in children with RSV does NOT benefit, and can actually make the patient worse. Remember: "*Prove it (works) or don't use it.*" (Refer to therapy evaluation tips on page 5).
- 6. Adequate hydration, upper airway suctioning, and oxygenation** are the mainstays of treatment for most infants with pneumonia and bronchiolitis.
- 7. Pulse Oximetry** should only be used to supplement (not as a replacement for) clinical judgment. Continuous pulse oximetry is NOT recommended for the non-ICU setting. Baseline oximetry in room air followed by spot checks every 8 hours for the first day and daily thereafter, unless clinical signs indicate (e.g., worsening clinical score, deciding on need for home O<sub>2</sub>) is recommended.
- 8. CPT and Steroids** have not been proven to be effective therapies for the management of bronchiolitis.
- 9. Synagis (palivizumab) is for RSV prophylaxis only.** It does not prevent acquisition of RSV, nor should it be used to treat RSV infection. This medication is used to reduce the severity of RSV disease in select, high-risk patients. (Refer to table on page 6 for criteria.) Limited number of patients, who meet the strict criteria for receiving this product, will do so on a monthly basis from November through March/April. If a patient receiving Synagis develops RSV, they should continue to get their monthly dose during the remainder of "the season" as it is possible that the child could get subsequently re-infected with a similar or different strain of RSV.
- 10. HAND HYGIENE**  
You need to remove your gloves and **WASH YOUR HANDS** between patients and before going to common areas. It is the most important step in preventing the spread of infection. The use of alcohol based hand rub solutions has made this easier and quicker and we have plenty of them around the facility.



# Respiratory Infection Tips & Tools

## Mode of Transmission of Most Respiratory Agents

### Transmitted in large droplets by:

- Direct or close contact with secretions (e.g., close face to face contact), or
- Touching contaminated objects in the environment and inoculating self or others (e.g., hand-to-eye, hand-to-mouth).

### Remember...

#### RSV Persists:

- Up to 30 minutes for secretions in facial tissues.
- 30 minutes or more on hands.
- Up to 6 hours on surfaces (some viruses can be even longer).

**Incubation Period** is 2 - 8 days (4 - 6 days most common).



## Epidemiology

Organism	Illnesses	Season
Adenovirus	<ul style="list-style-type: none"> <li>• Pharyngitis</li> <li>• Tonsillitis</li> <li>• Croup</li> <li>• Bronchiolitis</li> <li>• Pneumonia</li> <li>• Keratoconjunctivitis</li> <li>• Common cold</li> </ul>	Late Winter through Summer. (but we have seen it this fall)
Coronavirus	Common cold	Varies
Human Metapneumovirus (hMPV)*	<ul style="list-style-type: none"> <li>• Bronchiolitis</li> <li>• Croup</li> <li>• Pneumonia</li> </ul>	Year round, but mostly late Fall to late Spring.
Influenza	<ul style="list-style-type: none"> <li>• Flu</li> <li>• Bronchitis</li> <li>• Croup</li> <li>• Pneumonia</li> <li>• Secondary bacterial infections</li> </ul>	<ul style="list-style-type: none"> <li>• December / January.</li> <li>• Spring. (Another strain could circulate.)</li> </ul>
Parainfluenza	<ul style="list-style-type: none"> <li>• Croup</li> <li>• Bronchiolitis</li> <li>• Bronchitis</li> <li>• Pneumonia</li> <li>• Common cold</li> </ul>	<ul style="list-style-type: none"> <li>• Type 3 – Spring.</li> <li>• Type 1 - Fall. ( Odd years – so not this year ☺ )</li> </ul>
RSV	<ul style="list-style-type: none"> <li>• Bronchiolitis</li> <li>• Pneumonia</li> <li>• Croup</li> </ul>	December through April.
Rhinovirus	Common cold	Fall and Spring.



## Cohorting

At TCH, cohorting based on symptoms has proven very effective in the past in preventing the nosocomial spread of infection and increasing bed utilization during high census

### 2006 – 2007 Cohorting Guidelines:

#### Patients with like Symptoms **May** be Cohorted

- Respiratory symptoms/illnesses (e.g., croup, bronchiolitis, URI).\*\*
- Asthma / RAD:
  - **No Isolation:** If more than 3 years old, the temp. should be less than 38.5 in the previous 3 days without antipyretics and there should be no clinical signs or symptoms of viral infection.
  - **Isolation:** Any asthmatic patient with fever and/or URI symptoms and those asthmatic patients less than 3 years old without fever or URI symptoms require isolation.
- Pertussis - lab confirmed only.
- Acute Gastroenteritis - (polys or blood, or pus not present in stool).
- Chronic Diarrhea. (Note: Do not cohort acute with chronic.)
- R/O Sepsis - Patients may have fever.
- Wound (dirty) - May not cohort with clean / surgical wounds.
- Cellulitis.
- Non-infectious conditions / diagnoses:
  - Newborns with BPD.
  - High-risk cardiac conditions.
  - Clean surgical cases.
  - Immunodeficiency (hypogam, chronic steroids).

\*\* Rapid viral testing is not required to determine cohorting.

For questions regarding appropriate cohorting, contact the nursing supervisor (Pager 303-890-4344).

#### Patients with the following conditions (known or suspected) **May Not** be cohorted.

- MRSA (methicillin resistant Staph aureus).
- VRE (vancomycin resistant enterococcus).
- Other significant drug resistant organisms. (See "[Drug Resistant Organisms, Guidelines for](#)" infection control policy and procedure).
- Cystic Fibrosis. (Except CF siblings may be cohorted.)
- *Haemophilus influenzae* type B. (H flu type B)\*\*
- Immunodeficiency. (Solid organ & BMT transplant patients or patients on chemotherapy.)
- Pulmonary patients with a 30%-40% loss in lung function (as determined by the Pulmonary attending MD).

Continued on following page...

- Hepatitis A.
- HIV.
- Measles (Rubeola).\*
- *Neisseria meningitidis*.\*\*
- SARS (Severe Acute Resp. Syndrome).\*
- Smallpox.\*
- Tuberculosis.\*
- Varicella (Primary Chickenpox).\*
- Zoster (Recurrent shingles).
  - "Regular" in normal host.
  - "Disseminated" in any host.\*
  - "Regular" in immunocompromised host.\*

\* Requires that the patient be in a negative pressure room.

\*\* Isolate until 24 hours of effective antibiotics.

(11/06)



## Isolation – Basic Infection Control

The following policy is for patients with symptoms of a “suspected” or a “proven respiratory” infection from any cause and includes:

### Droplet Precautions

1. Gown, glove and mask or face shield whenever coming into contact with the patient or anything in the environment. **ALSO, REMEMBER TO USE EYE PROTECTION WHEN SUCTIONING OR IN CLOSE CONTACT WITH A COUGHING PATIENT.** If no such contact occurs, and you are not within a few feet of the patient, you are exempt as long as you are healthy and nothing in the room is touched!
2. Hospital personnel with even a mild respiratory illness **SHOULD NOT CARE FOR HIGH-RISK, UNINFECTED PATIENTS**, and should wear a mask / face shield and gloves during any patient contact. Employees with serious respiratory illness should report to Employee Health Services.
3. Use good handwashing / hand hygiene after removing gloves prior to leaving the room and/or between patients if two patients are cohorted in the same room.
4. Don't forget to disinfect your stethoscope between patients.



### Sick Employees

Many viruses exhibit themselves in adults as a slight cold; however, large amounts of virus can be shed and can cause severe disease in our patients. If you have mild URI symptoms (minus fever), you may work if you wear a mask (changed frequently throughout the day), wear gloves with patient contact, and wash hands frequently or use alcohol based hand rub.

Exceptions:

1. You should not care for high-risk, uninfected patients.
2. No ill employees allowed in the BMT unit.

WASH YOUR HANDS after removing gloves.

**Avoid contact with high-risk patients if you are ill.**



### Visitation

From December 15, 2006 to April 15, 2007, TCH will be implementing VISITATION RESTRICTIONS for both inpatient and outpatient areas.

### Inpatient Visitation:

1. Only two visitors (including parents) per patient at any given time.
2. For children 12 years of age and younger: Only WELL siblings may visit patients or be on the inpatient units. “Apple sticker” screening for illnesses will be required at the nurses desk before each visit. **NO** relatives or friends in this age group are allowed to visit. Please advise your patient’s family of our visitation restrictions when referring them to TCH to prevent any confusion when they arrive at our facility.
3. Visitors must adhere to isolation precautions on the door sign and are to wash hands before leaving the room. *Exception: Parents and siblings may refrain from wearing isolation apparel, but need to wash hands each time upon entering and before leaving the room.*
4. Ill visitors are discouraged from visiting. In the event the primary caretaker has a respiratory illness, he / she is requested to wear a mask when outside the room and to limit activity (and wear a mask) during the following:
  - Obtaining food in cafeteria (should return to patient room to eat, if possible).
  - Avoid crowded areas in hospital (e.g., gift shop).
  - Avoid high-risk patient visitation (if possible); if unavoidable (primary caregiver only), must wear a mask, gown and gloves. Discourage “close” patient contact.
5. Some units may implement additional restrictions for the safety of their patient population.

### Outpatient Visits & Surgery Procedure/Visits:

Due to an increase in respiratory illnesses in the community during these months, we discourage bringing brothers, sisters or friends who are 12 years of age or younger to your child’s scheduled outpatient visits.



### Human Metapneumovirus

Human metapneumovirus (or hMPV) is a newly-described paramyxovirus first identified in 2001 in the Netherlands and is now known to cause acute respiratory disease worldwide, including Colorado. Genetically, hMPV is most closely-related to a turkey respiratory virus, but clinically it most closely-resembles RSV. Otherwise healthy children usually have mild or moderate symptoms with hMPV, but severe disease requiring hospitalization can occur, especially in very young children, premature infants, children with underlying cardiopulmonary disorders, immunocompromised individuals of any age, and the elderly. hMPV-associated infections in hospitalized children manifest primarily as bronchiolitis, with croup, pneumonia, and exacerbations of reactive airway disease also described. hMPV is a frequent co-pathogen with other respiratory viruses, although whether other viral illnesses are worsened by hMPV is controversial. At TCH, hMPV is recoverable from a significant proportion (5-15%) of respiratory specimens during the winter-spring. . Serosurveys show that all children are infected at least once by 5 years of age. Recurrent infections occur throughout life and tend to be milder than the primary infection.

## Diagnosis

### Specimens:

Nasopharyngeal washes or tracheal aspirates are acceptable specimens for most patients. BALs can also be tested. Lower respiratory tract specimens may be required for maximum sensitivity in older patients. Specimens on swabs are not recommended. Well-collected specimens yield the highest virus recovery, so for best results, follow our standardized Microbiology [Nasopharygeal Wash Procedure](#) which is posted on the on-line Test Directory on the TCH Intranet and TCH public website. (See "Clinical Services, Pathology Department.") The table below lists our testing algorithm for wintertime respiratory pathogens. Call Microbiology (303-861-6703) if you need requisitions or have questions.

### Ordering Tests:

Tests for respiratory viruses should be sent **ONLY** if the results will be used for patient management. Testing should NOT be performed for cohorting, since respiratory viruses are all transmitted in a similar fashion and many patients are infected simultaneously with other viruses. Otherwise normal children who are admitted during the peak of RSV season with typical symptoms may not need virus tests at all!

### Testing May be Indicated for:

- Severely ill or immunocompromised patients who may need antiviral therapy or who may be started on multiple antibiotics, and a positive virus test might permit modification or discontinuation of antibiotics.
- An unusually-severe illness in an otherwise normal child.
- Monitoring efficacy of antiviral therapy in high-risk patients who cannot be assessed by symptoms alone.

If testing is indicated, three rapid assays are available! Our Respiratory Virus DFA or Direct immunoFluorescent Assay detects RSV, influenza, parainfluenza virus, human metapneumovirus (hMPV) and adenovirus. Testing is performed twice a day during the week and once a day on weekends. After hours, an Influenza ImmunoAssay (IA) is available if flu is suspected and a STAT result would influence patient care, e.g., guide antiviral use. RSV EIA is no longer offered. PCR for hMPV, is also available for DFA-negative specimens.

The following three work-ups are available to tailor testing to the needs of the patient:

- Rapid test (Respiratory DFA or Flu IA) - and after hours. Only for patients who can benefit from a rapid result.
- Rapid test with culture backup (and hMPV PCR on request) for those more seriously ill admitted patients whose treatment will be altered based on the result.
- Rapid test with concurrent culture (and hMPV PCR on request) for patients with an underlying condition requiring all viruses to be detected, even if results will take days-weeks.

## 2006 – 2007 Lab Tests for Respiratory Pathogens:

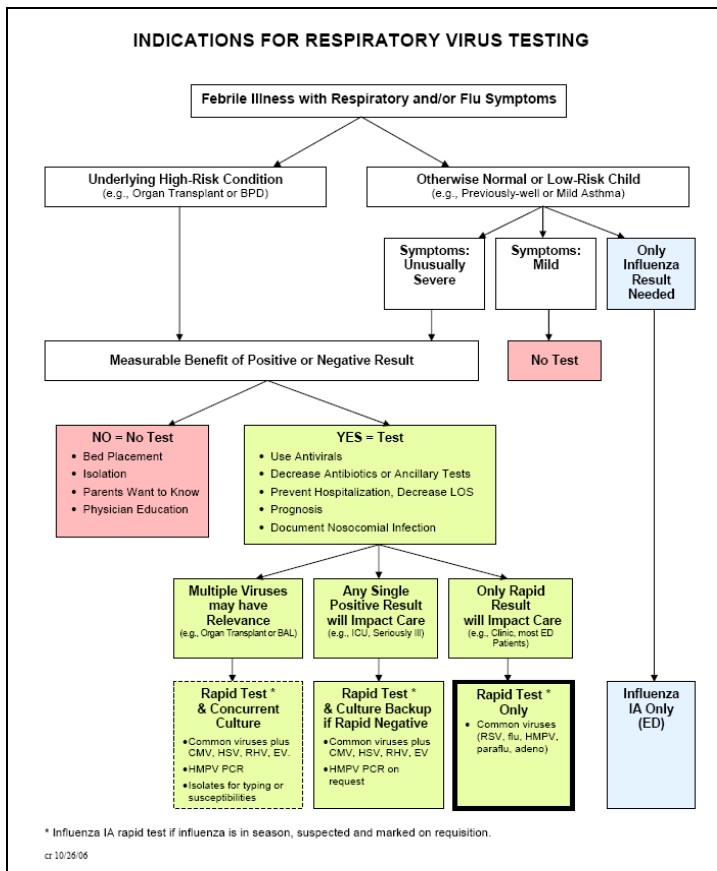
### Viruses:

Tests	Results	Comments
Respiratory Virus DFA	<b>Twice daily, M-F:</b> In by 7 AM, out by 9 AM. In by 1 PM, out by 3 PM.  <b>Once daily Sat &amp; Sun:</b> Afternoon.	Detects RSV, influenza* and parainfluenza with high sensitivity (greater than 85%) and specificity (greater than 95%) for adenovirus (50%).
Flu A & B IA	Available STAT (less than 1 hour) when DFA is not available, flu is suspected and patient to be treated if positive.	Differentiates flu A from flu B.* Slightly less sensitive than DFA.
hMPV PCR	<b>Performed Wednesday:</b> In by 7AM, out by 5 PM.	Specimen must be DFA or Flu IA negative and cultured for other viruses as well.
Respiratory Virus Culture	<b>Rapid Culture:</b> 2-3 days.  <b>Standard Culture:</b> 2 weeks.	Detects 10-15% more DFA viruses plus rhinovirus, CMV, enterovirus, HSV and 50% more adenoviruses. ! Cannot detect hMPV Not needed for most short-stay patients.
<i>*Will detect avian (H5N1) influenza, but cannot differentiate between typical and avian strains.</i>		

### Other:

Tests	Results	Comments
<i>B. pertussis</i> PCR	1-3 days.	Nasal wash.
<i>Chlamydia trachomatis</i> Culture	2-3 days.	Nasal wash. Children less than 1 year.
<i>Chlamydia pneumoniae</i> Culture	3-10 days.	Throat swab in MT medium. Children more than age 2.
<i>Mycoplasma pneumoniae</i> PCR, IgM	<b>PCR:</b> 3-10 days. <b>IgM:</b> Daily.	<b>PCR:</b> Throat swab in MT medium. <b>IgM:</b> Red top.

## Indications for Respiratory Virus Testing:



## Therapies

**Supportive Therapy:** Hydration, oxygenation, and upper airway suctioning are the mainstay of treatment for most babies, even those who are hospitalized with pneumonia and bronchiolitis.

**Bronchodilators:** Conditionally indicated if Respiratory Distress Score (RDS) is more than 4 with ongoing documented objective benefit per Bronchiolitis/Viral Pneumonia Care Algorithm. (See Clinical Care Guidelines, <http://planetch/policies/general/pdf/538.pdf>.)

## Evaluating Clinical Status and Response to Treatment:

1. Suction upper airway first to eliminate all upper airway secretions / noises.
2. Determine RDS score. (See below.)
3. Maintain same position – child at rest.
4. Give single treatment. (No other treatments or procedures, e.g., CPT or suction.)
5. Re-evaluate clinical score after 15 minutes.
6. Be objective:
  - Don't be confused by transmitted upper airway noise!
  - Don't assume nebs work.

**“Prove it or don't use it.”**

## Respiratory Distress Score (RDS) Tool:

Component	0	1	2	3
<b>Retractions</b>	None.	Lower chest wall retractions.	Marked lower chest wall retractions.	Marked lower chest wall and xiphoid +/- suprasternal retractions.
<b>Inspiratory: Expiratory Ratio</b>	Less than 1:1.	1:2.	More than 1:3.	N/A
<b>Wheezing</b>	None.	Localized or intermittent expiratory.	Generalized continuous.	Audible wheeze without stethoscope.
<b>Crackles</b>	None.	Inspiratory.	Inspiratory and expiratory.	N/A

*Suction upper airway prior to each assessment.  
Mild 0 - 4; Moderate 5 - 6; Severe more than 7*

## Oxygen Therapy / Pulse Oximetry:

O<sub>2</sub> is probably the most effective therapy in infants and children with bronchiolitis and/or viral pneumonia.

- Oxygen to achieve SaO<sub>2</sub> more than 92%. (Room air O<sub>2</sub> sat spot checks are recommended BID and for clinical change - not continuous monitoring.)
- Suction upper airway (use saline PRN):
  - Prior to feeding.
  - During clinical assessment.
  - PRN evidence of upper airway obstruction.



## Ribavirin

Ribavirin is a FDA approved synthetic nucleoside analogue for treatment of moderate to severe RSV disease. Ribavirin is a very expensive drug that may be irritating or toxic to healthcare workers exposed to the aerosol. Treatment protocols are initiated on an inpatient basis for the delivery of this intermittently aerosolized medication, but Ribavirin remains controversial because of conflicting results of efficacy trials.

## 2006 – 2007 TCH Guidelines for Ribavirin Use (Suspected or Proven RSV):

Category	Patients	Guidelines
I High Risk	<ul style="list-style-type: none"> <li>• Complicated Congenital Heart Disease (including pulmonary hypertension).</li> <li>• Children on chronic oxygen therapy (i.e., CHD, BPD, CF and other chronic lung infections, etc.).</li> <li>• Transplant or intensive chemotherapy.</li> <li>• Other conditions significantly affecting cardiopulmonary or immune system (useful guidelines include blood gas concentrations and response).</li> <li>• BMT with proven infection.</li> </ul>	Observe patients carefully. Ribavirin may be considered under critical care monitoring conditions if severely ill or rapidly deteriorating.*

Category	Patients	Guidelines
II Low Risk	Previously healthy kids, children with intermittent RAD, children with underlying disease not affecting cardiopulmonary or immune system.	Ribavirin is <u>not</u> indicated.

\* See separate guidelines for BMT / severely immune suppressed Oncology patients available from BMT / Pharmacy.



## RSV Prophylaxis

### **Synagis (Palivizumab) Dosing Guidelines / Restrictions:**

Principle: RSV immune products will be given based on scientific, "evidence based," nationally accepted recommendations or as an element of a funded research study. TCH began giving Synagis on November 13, 2006 for this season. Reminder: Respigam (RSVIG) is no longer available.

#### *Indications for prophylaxis with Synagis:*

- Any infant less than 2 years of age with chronic lung disease (defined as a history or persistent oxygen requirement during the first month of life) AND has required one of the following medical managements within the past 6 months:
  - Supplemental oxygen
  - Use of inhaled or oral bronchodilators
  - Corticosteroid therapy
  - Regular or intermittent use of diuretics to treat pulmonary disease
- Any infant born at 28 weeks or less with or without chronic lung disease who is less than 12 months of age.
- Any infant born at 29-32 weeks gestational age with or without chronic lung disease who is less than 6 months of age.
- Any infant born at 32 to 35 weeks gestational age who is less than 6 months of age AND meets at least 2 risk factors:
  - Attends day care
  - School-age siblings
  - Exposure to environmental air pollutants (excludes tobacco smoke, which is a controllable risk factor by the family or caregiver of the infant)
  - Congenital anomalies of the airways
  - Severe neuromuscular disease
- Any infant up to 2 years of age with hemodynamically significant heart disease defined as having one or more of the following:
  - Receiving medication to control congestive heart failure ( antihypertensive, diuretics)
  - Diagnosed with moderate to severe pulmonary hypertension
  - Diagnosed with cyanotic heart disease

#### *Additional Information:*

- RSV immune products **will not be used for the treatment** of RSV infections.
- Presentation with RSV infection does not preclude continuing prophylactic therapy with Synagis.
- Ordering any RSV immune product for prophylaxis:

- Synagis has been given to inpatients prior to discharge IF the case manager for the particular patient has received approval for its payment from the patient's insurance company. This is TCH Pharmacy's procedure prior to dispensing (since some of these patients are hospitalized for a long time and need the medication).
- First dose administration of Synagis needs to occur in a controlled setting where there is physician back-up.
  - TCH Special Care Clinic (for SCC patients only).
  - TCH Synagis Clinic.

- In the event that a patient does not meet the above criteria for use of RSV immune products, a subcommittee of the Pharmacy and Therapeutics Committee will be available to review individual cases. These special patient cases for consideration should be forwarded to the P&T Committee Secretary (Amy Poppy, Director of Pharmacy, Box 375). Requests for use outside the recommended guidelines must be supported by convincing, evidence-based literature. Special patient case individuals must be participating in an active research protocol.

### **Contraindications for Synagis Prophylaxis:**

A history of severe reaction to a previous Synagis dose.

Finally, remember to adhere to infection control practices and isolation procedures. Avoid inappropriate use of antibiotics for viral illness and now that you are knowledgeable about the management of patients with viral bronchiolitis etc., you can help to dispel the many widely prevalent myths regarding ineffective therapies and patient management.



## Bug Watch

Up-to-date information on currently circulating respiratory and enteric viruses and *B. pertussis* detected by the TCH Laboratory provided to you weekly. Posted on the TCH Internet <http://www.thechildrenshospital.org/pro/publications/bug.pdf> and/or sent by broadcast FAX. Contact Carolyn Brock by e-mail [brock.carolyn@tchden.org](mailto:brock.carolyn@tchden.org) or phone (303-861-6412) to begin receiving your personal copy.

### **VISITATION REMINDER!**

**12/15/06 TO 4/15/07**

#### **Inpatient:**

- 2 visitors at bedside at one time (includes parents).
- For child visitors 12 years of age and younger: Only WELL siblings will be allowed. No relatives or friends in this age group will be allowed to visit.
- NO sick visitors, please!

#### **Outpatient:**

Due to an increase in respiratory illnesses in the community during these months, we discourage bringing brothers, sisters or friends who are 12 years of age or younger to your child's scheduled outpatient visits.

**Thank You!**



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**CONTAGIOUS COMMENTS**  
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