While we all plan for the upcoming holiday season, we need to also prepare for the inevitable viral respiratory season that fills our clinics and our inpatient beds with sick children. Specifics for influenza were covered in the October edition of Contagious Comments; therefore this edition will highlight management of other respiratory viruses.

Each year, a multidisciplinary group of Children’s Hospital clinicians meet to review virus epidemiology data from years past and also what viruses we expect we will see circulating this season. Preventative strategies are discussed to determine what should be implemented this year to minimize the spread of these infections at Children’s. Although our influenza vaccination campaign has been in full swing for several weeks, that alone is not enough.

This edition will provide you with reminders about basic principles as well as new information on virus testing, patient management, visitation practices and prevention. Throughout the season, be sure to monitor “Bug Watch” so you can see what viruses we are detecting in our lab from patients seen throughout our Children’s Hospital system.

Important information for this season:

**Visitation Restrictions:** December 15, 2011 – April 30, 2012

**Inpatient Visitor Screening and Restrictions**

On December 15, 2011 we will implement our respiratory season visitation restrictions on the inpatient units to help protect these patients from ill visitors. Our visitation hours are 9a – 9p. The visitation restrictions program includes the following:

1) All visitors (including siblings) must be at least 13 years of age to visit. Please advise your patient’s family of our visitation restrictions when referring them to Children’s to prevent any confusion when they arrive at our facility. This really helps!

2) Only 4 visitors (this number includes the parents) at a patient bedside at a given time.

3) No ill visitors.

4) ALL parents and visitors will be screened daily before entry into the inpatient units. Each unit has a screening station located at the entry to the unit. All visitors who meet criteria and are not ill will be given an apple sticker to wear indicating they have been screened.

5) Visitors must adhere to any isolation precautions noted on the patient room door sign and are to wash hands before leaving the room. **Exception:** Parents may refrain from wearing isolation apparel, but need to wash hands each time upon entering and before leaving the room.

6) In the event the primary caretaker (parent/guardian) has a respiratory illness, he / she is requested to wear a mask and wash hands when outside the room and to limit activity (and wear a mask) during the following:

   a. Obtaining food in cafeteria (should return to patient room to eat, if possible).

   b. Avoid crowded areas in hospital (e.g., gift shop).

   c. Avoid high-risk patient visitation (if possible); if unavoidable (primary caregiver only), must wear a mask, gown and gloves. Discourage “close” patient contact.

7) Some of our higher risk units (ICUs, BMT) have more stringent visitor restrictions that may affect the number of people allowed at the bedside or may include an approved visitor list for each patient.

8) Decreasing the number of people visiting a single patient will decrease exposure risks and also provide an opportunity to educate a select group of visitors on the important steps to prevent transmitting infectious illnesses to our patients.

**Outpatient Clinic /Therapy & Surgery/Procedure Visits:**

Due to an increase in respiratory illnesses in the community during these months, we discourage bringing siblings or friends who are under 13 years of age, especially when ill, to your child’s scheduled visits to these areas.

**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).

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### Epidemiology

<table>
<thead>
<tr>
<th>Organism</th>
<th>Illnesses</th>
<th>Season</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adenovirus</td>
<td>Pharyngitis, Tonsillitis, Croup, Bronchiolitis, Pneumonia, Keratoconjunctivitis, Common cold</td>
<td>Year-round with peak late winter-spring</td>
</tr>
<tr>
<td>Coronavirus</td>
<td>Common cold, Croup, Pneumonia</td>
<td>Fall-winter</td>
</tr>
<tr>
<td>Human meta-pneumovirus (HMPV)</td>
<td>Bronchiolitis, Croup, Pneumonia</td>
<td>Year round, but mostly late winter-spring.</td>
</tr>
<tr>
<td>Influenza (seasonal)</td>
<td>Flu, Bronchitis, Croup, Pneumonia, Secondary bacterial infections</td>
<td>Late Dec/Jan/Feb, Spring when influenza B or another strain of influenza A often circulates.</td>
</tr>
<tr>
<td>Parainfluenza</td>
<td>Croup, Bronchiolitis, Bronchitis, Pneumonia, Common cold</td>
<td>Type 1 - fall, Type 2 - year round, Type 3 - spring</td>
</tr>
<tr>
<td>RSV</td>
<td>Bronchiolitis, Pneumonia, Croup</td>
<td>December through April</td>
</tr>
<tr>
<td>Rhinovirus</td>
<td>Common cold</td>
<td>Year-round with peaks in fall and spring</td>
</tr>
</tbody>
</table>

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### Isolation

**Basic Infection Control**

For patients with symptoms of a “suspected” or a “proven respiratory” illness.

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**Droplet Precautions**

1. PLEASE do not tell patients in isolation that they can walk in halls or go to playroom, cafeteria, etc.

2. Gown, glove and mask or face shield are needed whenever coming into contact with the patient or anything in the environment. ALSO, REMEMBER TO USE EYE PROTECTION WHEN SUCTIONING OR IF 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 do not touch any items in the room!

3. N95 masks should be used by staff performing cough inducing and aerosol generating procedures such as nasal suctioning.

4. Hospital staff with respiratory illnesses should report to Employee Health Services (EHS) for evaluation to help determine if they should be working with patients or are too ill to be at work. Employee Health is open Mon - Fri 0700am-4:00pm including the lunch hour. After hours you should call the on call EHS nurse at 303-520-7517.

5. Use good handwashing / hand hygiene after removing gloves (prior to leaving the patient room).

6. Don’t forget to disinfect your stethoscope and any other equipment that is used between patients.

7. Patients in isolation are not allowed to leave their room unless they are going to another department for a procedure that cannot be performed in their room. Isolation precautions are to be used during transport and the receiving department should be notified in advance of the need for isolation precautions for the patient.
DISCONTINUING ISOLATION
FOR PATIENTS WITH VIRAL RESPIRATORY ILLNESS*
(This does not apply to patients with Pertussis.)

May discontinue isolation if ALL of the following conditions are met:

A. Patient is currently asymptomatic.
B. It has been at least 7 days from first positive specimen.
C. Patient will be hospitalized at least 2 more weeks.
D. No underlying immunodeficiency or chronic respiratory condition.
E. If repeat PCR for the virus involved is negative.

1 If immunocompromised or with a chronic respiratory condition, then the individualized decision requires Epidemiology evaluation and consensus recommendation (at least 2 members of the Infection Control Executive Committee). Epidemiology will document recommendation in the patient record (progress notes).

For BMT patients refer to “BMT Respiratory and Enteric Disease Isolation Guidelines” P&P (ONC-001-A) in the IC manual on Planet TCH.

*Children’s Infection Control Policy: “Isolation and Standard Precautions (IC-008).”

Sick Employees

Many viruses exhibit themselves in adults as a slight cold; however, large amounts of virus can be shed by sneezing/coughing, etc, and when transmitted 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 patients (e.g. BMT, organ transplant, and immunocompromised).
2. No ill employees allowed in the BMT unit.
3. WASH YOUR HANDS after removing gloves.

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

Diagnosis

Specimens:
A nasopharyngeal wash or aspire is the best specimen to submit for respiratory virus detection in most patients. Please collect these specimens by following the standardized Microbiology Nasopharyngeal Wash Procedure posted on the Laboratory Test Directory. The Test Directory can be accessed on the Children’s Hospital Intranet (Lab Test Dir Icon on Planet TCH Quick Links) or the Children’s Hospital public website (http://www.childrenscolorado.org/ “Clinical Resources, Lab and Microbiology Test Directory”). Lower respiratory tract specimens can also be tested and may provide maximum sensitivity in immunocompromised patients.

New Respiratory Virus Protocol this Winter:
As of November 15, all testing for respiratory viruses will be performed by molecular methods. Two such tests will be available, the respiratory virus PCR (RVP) and Influenza A/B PCR. Respiratory Virus Direct Stain (DFA) is being discontinued because molecular tests are more sensitive and specific, and RVP detects more virus types than DFA. Eliminating DFA also reduces costs, decreases turnaround time of a full respiratory virus workup, and simplifies ordering.

CMV/HSV culture will no longer be performed automatically and must now be separately ordered when it is relevant, e.g. for lower respiratory tract specimens and transplant patients.

RVP detects RSV, HMPV, adenovirus, parainfluenza virus types 1-4, the four human coronaviruses (229E, OC43, NL63, and HKU1), the rhinovirus/enterovirus “group,” influenza A, and influenza B. All subtypes of influenza A are identified, but only H3N2 is separately reported. RVP can be performed on many specimen types, including nasopharyngeal aspirates/washes, tracheal aspirates, bronchoalveolar lavage, and lung tissue. It is performed daily. There is a new RVP test schedule - specimens received by 6 am will now be resulted by 3 pm.

Influenza A/B PCR detects any influenza A, influenza B, and separately reports the 2009 H1N1 subtype of influenza A if it is present. The test will be available once influenza is circulating in Colorado. Results will be available 24/7 within 5 hours or less once specimens are received at the Main Campus laboratory. Nasopharyngeal aspirates or washes are the only suitable specimen for this test.

The table below compares these two tests.
Who should be tested?

Tests for respiratory viruses should only be ordered if the results will affect patient management. The algorithm at right depicts our latest recommendations for ordering respiratory virus tests.

Tests for respiratory viruses are expensive and consume valuable hospital resources. We therefore recommend that such tests be ordered only if the results will affect clinical management. To better understand why respiratory viral tests are being ordered and how results are affecting patient care, we are conducting a quality improvement study. At the time a respiratory viral PCR test is ordered, you will be asked to answer one question regarding the most important reason for placing the order. Answers will be compared to clinical management of the patient and to a follow-up question about the final value of the results. Please help us by accurately answering the initial question and the final question which will appear in your EPIC Inbox.
**Figure 2**
Bronchiolitis Care Algorithm

All Patients should receive upper airway suctioning prior to classification of disease severity. **Do not use treatment algorithm in the toxic appearing patient.**

**Mild Disease**
- Observe
- Supportive care (suctioning, fluids)
- Teach supportive home care
- Discharge when criteria met
- Supplemental oxygen if RA sat consistently less than or equal to 88%

**Moderate Disease**
- Consider supportive care measures only
- If nebulizer treatment considered,
  - First Choice: Racemic epinephrine 0.25 mL (less than 5kg) or 0.5 mL (5kg+) via nebulizer *
  - Alternate Choice: May consider Albuterol 2.5 mg ↑
- If positive response† to neb suggest:
  - Observe
  - Supplemental oxygen
  - Supportive care (suctioning, fluids)
  - Teach supportive home care
  - Discharge when criteria met
- If no response to neb suggest:
  - Observation
  - Supplemental oxygen
  - Supportive care

**Severe Disease**
- First Choice: Racemic epinephrine 0.25 mL (less than 5kg) or 0.5 mL (5kg+) via nebulizer *
- Alternate Choice: May consider Albuterol 2.5 mg ↑
- If positive response† to neb suggest:
  - Observe
  - Supplemental oxygen
  - Supportive care (suctioning, fluids)
  - Teach supportive home care
  - Discharge when criteria met
- If no response to neb suggest:
  - Blood gas
  - Supplemental oxygen
  - Consider CXR
  - Consider other etiologies - heart disease, sepsis, metabolic conditions
  - May require intubation and ICU care

*data suggestive that may be helpful in outpatient setting (1 to 2 doses)  
† data is not good for any benefit  
‡ 15 to 30 minutes post neb- decrease in one level of severity classification

**Bronchiolitis Severity Classification**

<table>
<thead>
<tr>
<th>Mild Disease</th>
<th>Moderate Disease</th>
<th>Severe Disease</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alert, active, feeding well</td>
<td>Alert, consoles, feeding decreased</td>
<td>Fussy, difficult to console, poor feeding</td>
</tr>
<tr>
<td>None to minimal retractions</td>
<td>Minimal to moderate retractions</td>
<td>Moderate to severe retractions</td>
</tr>
<tr>
<td>RR normal to mildly elevated (less than 50)</td>
<td>RR is mildly to moderately elevated (50-70)</td>
<td>RR is moderately to severely elevated (greater than 70)</td>
</tr>
</tbody>
</table>

Therapies

Supportive Therapy: Adequate hydration, upper airway suctioning, and oxygenation are the mainstays of treatment for most infants with viral pneumonia and bronchiolitis.


Evaluating Clinical Status and Response to Treatment:

1. On initial assessment, determine Severity Classification
2. Decide on intervention (based on Care Algorithm (Figure. 3)
3. Repeat severity classification to determine if intervention was helpful

Respiratory Severity Classification:

| Mild Disease       | Alert, active, feeding well       |
|                   | None to minimal retractions       |
|                   | RR normal to mildly elevated (less than 50) |
| Moderate Disease  | Alert, consoles, feeding decreased |
|                   | Minimal to moderate retractions    |
|                   | RR is mildly to moderately elevated (50-70) |
| Severe Disease    | Fussy, difficult to console, poor feeding |
|                   | Moderate to severe retractions,    |
|                   | RR is moderately to severely elevated (greater than 70) |

Supportive Care - Routinely Indicated:
Oxygen is probably the most effective therapy in infants and children with bronchiolitis and/or viral pneumonia.

- Oxygen to achieve SaO2 at or above 90%
- P.O. / I.V. fluids as needed
- Suction upper airway (use saline PRN):
  - Prior to feeding
  - Prior to clinical assessment
  - PRN evidence of upper airway obstruction

RSV Prophylaxis
In 2009, the American Academy of Pediatrics Committee on Infectious Diseases (Redbook) updated their recommendations on prophylaxis for RSV in an effort to ensure optimal balance of benefit and cost of this intervention. The recommendations were based on additional data regarding seasonality of RSV disease as well as limitations in available data on risk factors for identifying children at increased risk for serious RSV lower respiratory tract disease.

To view these new recommendations please use the following link:
http://www.cdc.gov/rsv/clinical/prophylaxis.html

Some Final Thoughts
Finally, remember to adhere to infection prevention practices and isolation procedures. Avoid inappropriate use of antibiotics for viral illness, continue vaccination for influenza 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 detected by the Children’s Microbiology/Virology Laboratory can be provided to you weekly during the wintertime or twice a month spring-fall. It is also posted on the TCH Internet at: http://www.childrenscolorado.org/news/publications/bug.aspx or you may receive it by email. Contact Carolyn Brock by email carolyn.brock@childrens.colorado.org or phone (720-777-6412) to begin receiving your personal copy.

VISITATION REMINDER!
12/15/2011 – 4/30/2012

Inpatient Units:
All visitors (including siblings) must be at least 13 years of age to visit.
Only 4 visitors (this # includes parents) at the bedside at a given time
No ill visitors.
ALL parents and visitors will be screened daily before entry into the inpatient units.

Outpatient clinics/Network of Care sites:
Due to an increase in respiratory illnesses in the community during these months, we discourage bringing siblings or friends who are under 13 years of age to your child’s scheduled visits to these areas.

Thank You!
We are modifying our distribution process for Contagious Comments. If you wish to receive this publication please provide us with your E-mail address below.

Name: ____________________________________________

E-mail Address: ______________________________________

Both the Contagious Comments and Bug Watch publications are always posted on Children’s Hospital Colorado website at: http://www.childrenscolorado.org/news/publications/index.aspx

Please return your E-mail address to: Carolyn Brock, The Children’s Hospital, Epidemiology – Box B276, 13123 E. 16th Avenue, Aurora, CO 80045 or E-mail address: carolyn.brock@childrenscoloardo.org.

Thank you for your interest in our publication.

CONTAGIOUS COMMENTS
Department of Epidemiology©

EDITOR:
Kelly Pearce
Children’s Hospital Colorado, Dept. of Epidemiology, B-276
13123 E. 16th Avenue, Aurora, CO 80045
Phone: 720-777-6072; FAX: 720-777-7295
mailto:kelly.pearce@childrenscoloardo.org
www.childrenscoloardo.org

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