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. This year, influenza arrived in October which is earlier than most previous seasons. Furthermore, this does not preclude the possibility of seeing another strain of Influenza circulate in the coming months. 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 Colorado clinicians meet to review virus epidemiology data from years past and also what viruses we expect we will see circulating this season. Preventive 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 1st, 2012 – April 30, 2013

**Inpatient Visitor Screening and Restrictions**

On December 1st, 2012 we implemented our respiratory season visitation restrictions on the inpatient units to help protect these patients from ill visitors. This date is a few weeks earlier than usual due to the early arrival of Influenza. Our visitation hours are 9a – 9p. The visitation restriction 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 to visit based on a pre-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).

<table>
<thead>
<tr>
<th>Epidemiology</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, Note the early arrival of influenza in October 2012! 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 1,2 - fall, Type 3 – spring, Type 4 – spring, fall</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>

**Isolation**

**Basic Infection Control**

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

**Droplet Precautions**

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

2. Gown, glove and mask or face shield are needed by staff 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, collecting nasopharyngeal washes or swabs etc.

4. Hospital staff with respiratory illness should consult policy Employee Infectious Illness Exposure (OHS-003) to assess if they should be working with patients or are too ill to be at work. If you have any questions regarding this policy you can reach Occupational Health at 7-6577.

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.
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.1
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

*Sick Employees

Many virus infections present 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:
Deep nasopharyngeal (NP) aspirates or washes remain the preferred specimen for hospitalized or immunocompromised children.

Beginning this winter, however, flocked swabs can also be used to collect NP specimens from non-immunocompromised outpatients. Flocked swabs have soft, tiny projections which are good at dislodging virus-infected cells and secretions, and releasing this material into the universal transport medium provided with the swab. Therefore other types of swabs or viral transport medium should not be used. Well-collected NP flocked swabs or aspirates from previously-healthy outpatients should provide the same test results. Flocked swabs are not recommended for children with immune deficiencies. These patients can shed small amounts of virus, so all fluid should be sent for best results.

Flocked swabs will be stocked by Materials Management. Swab availability will be announced in “Materials Matters” soon. Collection instructions will be posted under “Clinical Policies and Procedures” and on the “Laboratory Test Directory” on the Children’s Hospital intranet. The Respiratory Care Department is also teaching the swab collection method to key staff in each clinical section. A helpful animation demonstrating this new method is on their website at


Lower respiratory tract specimens can also be tested and provide maximum sensitivity in immunocompromised patients.

Testing: All testing for respiratory viruses is now done by polymerase chain reaction (PCR), which detects the viral genome. PCR is highly sensitive, so virus from recent and current infections can sometimes be detected in a specimen. Two tests are available, a comprehensive respiratory virus PCR (RVP) and Influenza A/B PCR.

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 B. RVP can be performed on many specimen types, including NP aspirates or flocked swabs, tracheal aspirates, bronchoalveolar lavage, and lung tissue. It is performed daily. Specimens received by 6 am are resulted by 3 pm, 7 days a week.

Influenza A/B PCR detects only influenza A and B. The test is now available 24/7 because influenza is circulating. Results are available in a mean of 3 hours once specimens arrive at the Main Campus laboratory. NP aspirates and NP flocked swabs are the only suitable specimen for this test.

CMV and HSV culture must be separately ordered. These viruses can cause lower respiratory tract infection, especially in immunocompromised patients, and can respond to antiviral treatment. Consider ordering CMV or HSV culture for seriously ill children, even if more common respiratory viruses have been detected.
The table below compares these two tests.

**Who should be tested?**

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. The algorithm at right depicts factors that should be carefully considered before ordering respiratory virus tests.
**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.

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**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:
  - May repeat
  - Supportive care (suctioning, & fluids)
  - Supplemental oxygen
  - Admit appropriate medical service

  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

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**Bronchiolitis Severity Classification**

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<th>Moderate Disease</th>
<th>Severe Disease</th>
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<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>
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<tr>
<td>RR normal to mildly elevated (less than 50)</td>
<td>RR is mildly to moderately elevated (50-70)</td>
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*Always check intranet for latest version:
**Therapies**

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

Bronchodilators: Consider these if Severity Classification is moderate or severe. First Choice: Racemic Epinephrine. Alternate Choice: Albuterol via nebulizer. (See Clinical Care Guidelines)

**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:**

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**Supportive Care - Routinely Indicated:**

- 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 regarding 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 increase risk of serious RSV lower respiratory tract disease.

To view these new recommendations please use the following link: [http://www.cdc.gov/rsv/clinical/prophylaxis.html](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 Children’s Colorado Internet at: [http://www.childrenscolorado.org/news/publications/bugwatch.aspx](http://www.childrenscolorado.org/news/publications/bugwatch.aspx) or you may receive it by email. Contact Carolyn Brock by email [carolyn.brock@childrenscolorado.org](mailto:carolyn.brock@childrenscolorado.org) or phone (720-777-6412) to begin receiving your personal copy.

**VISITATION REMINDER!**

12/1/2012 – 4/30/2013

**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.

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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 Children’s Hospital Colorado, Epidemiology – Box B276, 13123 E. 16th Avenue, Aurora, CO 80045 or E-mail address: carolyn.brock@childrenscolorado.org.

Thank you for your interest in our publication.

**We Recycle!**