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Children's Hospital Colorado

CONTAGIOUS COMMENTS

Department of Epidemiology

Respiratory Season 2019-20

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During the winter months we see a variety of respiratory viruses causing coughs and colds, as well as lower respiratory tract disease.

This edition provides reminders about basic principles as well as information on testing, patient management, visitation practices and prevention of respiratory virus infections. Throughout the season, be sure to monitor "Bug Watch" so you can see what pathogens the CHCO lab is detecting from the pediatric patient population.

Important information for this season

Visitation Restrictions: December 1, 2019 – April 30, 2020

Inpatient Visitor Screening and Restrictions

Inpatient visitor screening and restrictions will begin on December 1, 2019 and apply system-wide. The visitation restriction program includes the following:

1) Visitation hours are 9am – 9pm.
2) 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!
3) Only 4 visitors (this number includes the parents) at a patient bedside at a given time.
4) No visitors with symptoms of illness.
5) 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.
6) Visitors must adhere to any isolation precautions (i.e. gown, gloves, mask) noted on the patient room door sign and are to wash hands before leaving the room. *Exception: Parents, siblings, or guardians living in the same household as the patient may refrain from wearing isolation apparel but need to wash hands each time upon entering and before leaving the room.*
7) In the event the primary caretaker (parent/guardian) has a respiratory illness, he /she is requested to report this to the patient's nurse or other screener and to wear a yellow apple sticker and mask, to wash hands when outside the room, and to limit activity (and wear a mask) during the following:
   a. When obtaining food in cafeteria (should return to patient room to eat, if possible).
   b. When walking through crowded hospital areas.
8) 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.
9) Limiting the number of visitors who visit a single patient on any unit during an admission. This practice decreases exposure risks. Counseling visitors about the practice provides an opportunity to educate them about important steps to prevent transmitting infections 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. Surgery schedulers will notify families when we are using visitation restrictions and suggest making other arrangements for other children under 13 years of age.

Please remember, these practices are utilized to protect our patients by preventing transmission of illness to them while they are in our care!

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)

Did you know?

Respiratory viruses can remain on surfaces (e.g. hands, countertops, tissues) for several minutes to hours.

Epidemiology

Organism	Illnesses	Season
Adenovirus	• Pharyngitis • Tonsillitis • Croup • Bronchiolitis • Pneumonia • Conjunctivitis/ "pink eye" • Common cold	Year-round peak late winter-spring
Bordetella pertussis, B. parapertussis	• Whooping cough • "Pertussis" • Milder form caused by *B. parapertussis*	No clear seasonality
Coronavirus	• Common cold • Croup • Pneumonia	Fall-winter
Enterovirus	• Asthma exacerbations • Pneumonia • Acute flaccid myelitis	Spring-Fall
Human meta-pneumovirus (HMPV)	• Bronchiolitis • Croup • Pneumonia	Year round; mostly late winter - spring.
Influenza virus (seasonal)	• Flu • Bronchitis • Croup • Pneumonia • Secondary bacterial infections	Usually Dec -Feb (longer if new strains appear)
Parainfluenza	• Croup • Bronchiolitis • Bronchitis • Pneumonia • Common cold	Type 1,2 - fall Type 3 – spring Type 4 – year-round; peak in fall
RSV	• Bronchiolitis • Pneumonia • Croup	December - April
Rhinovirus	• Common cold	Year- round, peaks in fall and spring

Isolation Basic Infection Control

Droplet Precautions should be implemented for any patient with symptoms of a "suspected" or a "proven" respiratory illness. A negative respiratory pathogen PCR is not an indication for removal of isolation if the patient is otherwise symptomatic for a respiratory illness.

DISCONTINUING ISOLATION FOR PATIENTS WITH VIRAL RESPIRATORY ILLNESS[1]

(This does not apply to patients with Pertussis.)

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

A. Patient has been asymptomatic for 48 hrs.
B. Patient is not receiving antiviral therapy.
C. It has been at least 7 days from first positive specimen.
D. Patient will be hospitalized for at least 2 more weeks.
E. No underlying immunodeficiency or chronic respiratory condition.[2]
F. If repeat PCR for the virus involved is negative (e.g., if influenza A/B PCR was used for diagnosis, must be repeated).

Sick Staff

Many respiratory illnesses present in adults as a slight cold or persistent cough; however, many organisms can be shed by sneezing/coughing, etc. When transmitted, these organisms have the potential to cause severe disease in our patients. **Avoid contact with high-risk patients if you are ill.** 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 staff allowed in the BMT unit.
3. WASH YOUR HANDS after removing gloves.

Per hospital policy, if you are too ill to work and/or if you have fever or GI symptoms (vomiting or diarrhea), notify your supervisor/charge to call out sick. In addition, you must call 720-77SICK1 (74251) and note the department in which you work, the time your symptoms started, and a list of your symptoms.

[1] Children's Infection Control Policy: "Isolation Precautions – Isolation General Information".
[2] For guidance regarding patients with chronic respiratory conditions or are immunocompromised, refer to the algorithm "Discontinuing Droplet Precautions for Patients with Respiratory Viral Illness"

Diagnosis

Specimens: Flocked swabs are now preferred to collect nasopharyngeal (NP) specimens for respiratory pathogen detection. For best results, swabs should reach the posterior NP and rotated for 10-15 seconds before placing into transport medium. See the CHCO "Nasopharyngeal Flocked Swabs" Policy, an educational video on the Respiratory Care webpage, or our "NP Swab Clinical Micro-brief" available from Microbiology (720-777-6703) for more information. Swabs of the anterior nares are not acceptable because recovery rates for most pathogen are poor. NP aspirates, however, can still be sent. They may have slightly higher yield than NP swabs from immunocompromised children, although bronchoalveolar lavage may be the most informative.

Testing: Several polymerase chain reaction (PCR) assays are available. The Respiratory Pathogen PCR (RPP) detects the 17 viruses/types and 3 "atypical" bacteria outlined in the following table. RPP can detect *Bordetella pertussis,* but *B. pertussis/parapertussis* PCR is best to diagnose "whooping cough." This is because the *B. pertussis* component of RPP is less sensitive than the Pertussis PCR and RPP misidentifies *B. parapertussis* as *B. pertussis,* necessitating a confirmatory assay which delays the diagnosis. The Memorial North laboratory at CHCO Colorado Springs uses the RPP2 system, which adds identification of *B. parapertussis*. A PCR to type a positive enterovirus/rhinovirus sample as EV-D68 is available at the CHCO – Anschutz microbiology lab and can be ordered on samples positive for RV/EV on the RPP.

Sensitivity and specificity of influenza virus detection by RPP and Influenza PCR are comparable, but the charge for influenza PCR is much lower. The influenza A/B PCR cannot, however, be run on lower airway specimens. Both the CHCO lab and Memorial North will be using the Cepheid Xpert, Xpress Flu and RSV PCR.

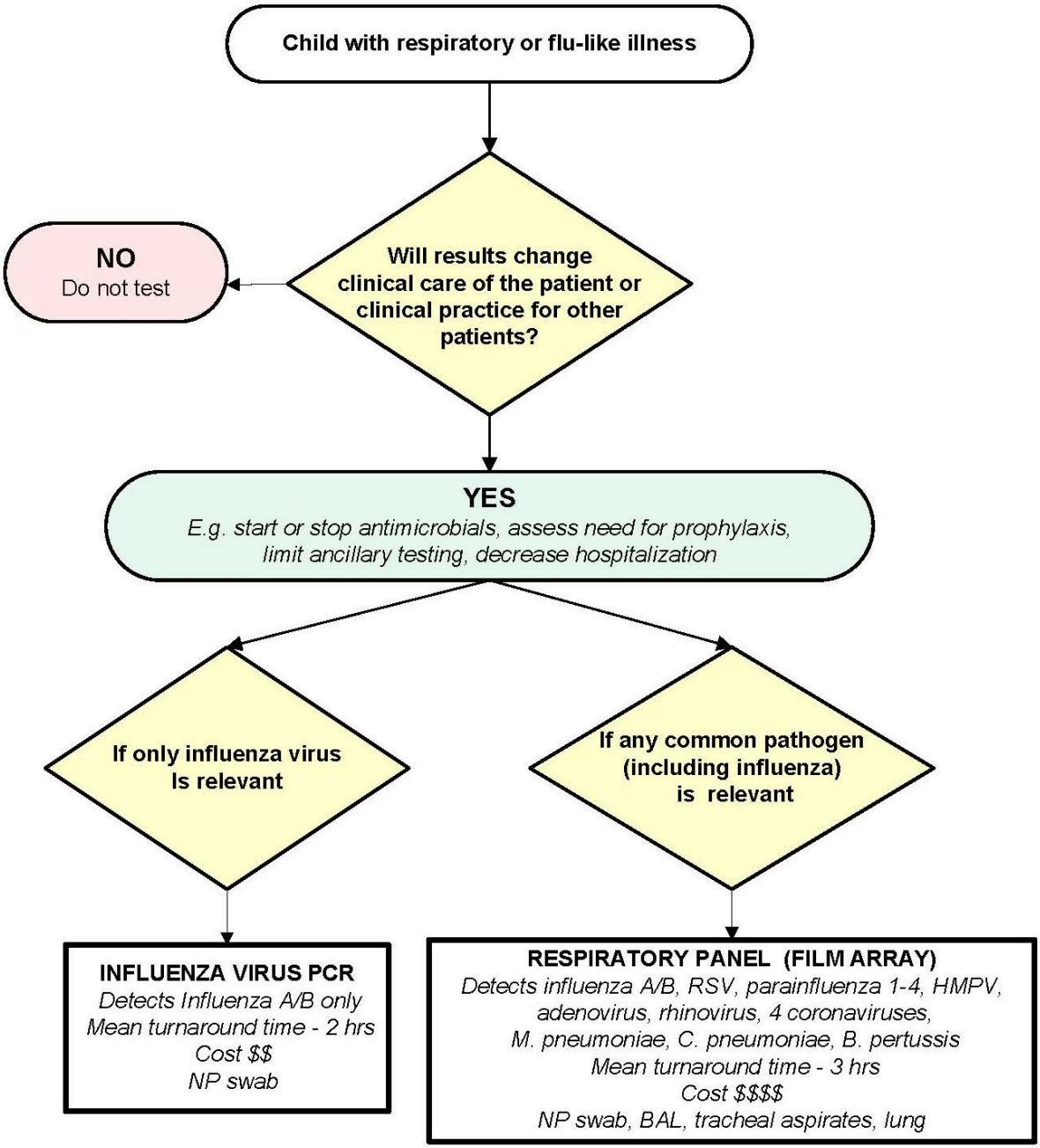
Testing for the Middle-Eastern Respiratory Syndrome coronavirus (MERS)is available only through the State Health Department. If MERS or a novel influenza virus is suspected, contact Epidemiology and Infectious Diseases for guidance for isolation and appropriate testing.

ORGANISM DETECTED	TESTS AND RELATIVE VALUE		
	Resp. Pathogen PCR RPP and RPP2 (Biofire FilmArray)	**Influenza/RSV Xpert Xpress PCR**	***B. pertussis/ B. parapertussis* PCR**
Influenza A, B	++++	++++	0
Influenza A Subtypes	Reported	Detected but not reported	0
RSV	++++	0	0
Parainfluenza Virus	++++ Reports all 4 types	0	0
HMPV	++++	0	0
Adenovirus	+++ Resp. types only	0	0
Rhinovirus/ Enterovirus	++++ Detects but does not report EV-D68	0	0
Coronavirus	++++ Doesn't detect MERS or SARS	0	0
B. pertussis	++ B. pertussis/para-pertussis PCR preferred	0	++++
B. parapertussis	Only in RPP2 for Colorado Springs (Memorial North)	0	
C. pneumoniae ***M. pneumoniae***	++++	0	0
Acceptable Specimens	NP swab (NP aspirate) BAL, tissue	NP swab (NP aspirate)	NP swab (NP aspirate)
Mean Turnaround	<3 hours at CHCO; TAT dependent on workload at CSH	<2 hours	1.5 day
Relative Cost	$$$$	$$	$$$ (if both ordered)

Who to test?

The algorithm below summarizes our recommendations for ordering of respiratory pathogen tests, organisms detected, and specimen requirements. Viral testing is not routinely indicated in bronchiolitis. If considering treating for influenza, order flu A&B PCR.

RESPIRATORY PATHOGEN TEST ALGORITHM



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Bronchiolitis

Remember to refer to the Bronchiolitis Clinical Care Guideline for recommendations on evaluation for, diagnosis of, and treatment of bronchiolitis, as well as steps recommended for escalation of care when necessary.

Supportive Therapy: Adequate hydration, upper airway suctioning, and oxygenation are the mainstays of treatment for most infants with viral pneumonia and bronchiolitis. Current AAP guidelines suggest that clinicians may consider a trial of nebulized hypertonic saline to infants and children who are hospitalized with bronchiolitis. Though commonly utilized, routine chest physiotherapy is also not supported in the current guidelines.

Bronchodilators: Guidelines from the AAP clearly state that children with bronchiolitis should not routinely receive bronchodilators (including racemic epinephrine and albuterol). Consider a trial of albuterol in patients who do not improve as expected or who progress from moderate to severe respiratory function. Any such trial should be evaluated using objective clinical severity criteria.

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

- Oxygen to achieve SaO_2 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

Evaluating Clinical Status and Response to Treatment:

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

RSV Prophylaxis

The 2015 AAP guidelines for bronchiolitis include revised recommendations for the use of palivizumab (Synagis®). Children who are otherwise healthy and with a gestational age of at least 29 weeks and 0 days should not receive palivizumab. Those for whom 5 doses of palivizumab are recommended include infants during the first year of life with hemodynamically significant heart disease or chronic lung disease of prematurity defined as preterm infants <32 weeks 0 days' gestation who require >21% oxygen for at least the first 28 days of life.

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 with some knowledge about the management of patients with viral bronchiolitis, you can help to dispel the many widely prevalent myths regarding ineffective therapies and patient management.

Bug Watch: Classic and 2.0: Up-to-date information about currently circulating respiratory and enteric viruses detected by the CHCO Microbiology/Virology Laboratory is available in our Bug Watch publication, which is emailed weekly during the winter or twice per month from spring through fall. Bug Watch is also available on MyChildrensColorado. If you are interested in receiving it by email, please contact Gail Vittitoe by email gail.vittitoe@childrenscolorado.org or phone (720-777-6412) to begin receiving your personal copy.

In addition, interactive Bug Watch dashboards "Bug Watch 2.0" are now available for CHCO-based personnel only. Staff can access this feature on the "Infection Prevention and Control" home page via QuickLinks on MyChildrens Colorado. Individual dashboards enable users to visualize the number and types of respiratory, gastrointestinal, or meningitis-encephalitis viruses and bacteria identified by PCR in a stacked graph with user-selected axes to display data for pathogens detected during specific time periods and by individual pathogen. Please contact Gail Vittitoe as noted above if you would like more information.

If you wish to receive this publication, please provide us with your E-mail address below.

Name: _____
(Print clearly please)

E-mail Address: _____
(Print clearly please)

Both the Contagious Comments and Bug Watch publications are always posted on Children's Hospital Colorado website at:
http://www.childrenscolorado.org/health-professionals/publications/bug-watch

Please return your E-mail address to: Gail Vittitoe Children's Hospital Colorado, Epidemiology – Box B276, 13123 E. 16th Avenue, Aurora, CO 80045 or E-mail address: gail.vittitoe@childrenscolorado.org.

Thank you for your interest in our publication.

CONTAGIOUS COMMENTS
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