#1: DON'T test non-admitted children for respiratory viruses, unless antiviral therapy for influenza is indicated (CPS statement) and testing can be resulted within 48 hours of disease onset.

In community and clinic settings, there is no data to support that viral testing reduces antibiotic usage. In fact, testing may actually increase antibiotic use. A community study of influence of rapid influenza tests in children presenting with suspected influenza found that compared with children seeing a pediatrician without a rapid test, those who had a rapid test had higher rates of antibiotic prescriptions (9.5% vs 3.9%).

Data supporting effectiveness of NAI's for influenza are lacking. Increased rate of neuraminidase inhibitor (NAI) prescription but may lead to inappropriate prescribing in children with low risk of serious illness.

Consideration should be given to testing immunocompromised patients, even if not admitted, as treatment may be indicated.

References:
CPS statement: http://www.cps.ca/en/documents/position/use-of-antiviral-drugs-for-influenza-paediatric-summary-2012-2013

Poehling KA et al. Accuracy and impact of a point-of-care rapid influenza test in young children with respiratory illnesses. Arch Pediatr Adolesc Med 2006;160 (7):713-8.

Wang M et al. Incidence of viral infection detected by PCR and real-time PCR in childhood community-acquired pneumonia: a meta-analysis. Respirology 2015;20 (3):405-12.
Cohen R et al. Impact of the rapid diagnosis downtown in the assumption of responsibility of the children in period of influenza. Arch Pediatr 2007;14 (7):926-31.

#2: DON'T routinely send, for bacterial culture, VP shunt apparatus nor catheter tips/tubing from percutaneous drains (JP drains, nephrostomy tubes, chest tubes etc.) upon removal.

Reference:
Steinbok P, Cochrane DD, Kestle JR. "The significance of bacteriologically positive ventriculoperitoneal shunt components in the absence of other signs of shunt infection." J Neurosurg. 1996 Apr; 84(4):617-23.

#3: DON'T routinely use, in the outpatient setting, cephalosporins for treatment of community-acquired pneumonia.

Preschool-aged children with CAP (community acquired pneumonia) frequently do not require antibiotics, as most disease is caused by viral infections. Children with suspected CAP of bacterial origin should usually receive amoxicillin for outpatient treatment, or ampicillin or penicillin G for inpatient treatment. These agents have sufficient activity against the common bacterial pathogens causing CAP without being unnecessarily broad. Third-generation cephalosporins should be reserved for children who are unimmunized or with severe infection, or where there are high rates of penicillin-resistance among invasive pneumococcal isolates. Additional agents may be indicated in cases of suspected staphylococcal pneumonia, atypical pathogens, or influenza.

References:

Bradley JS, Byington CL, Shah SS, Alverson B, Carter ER, Harrison C, Kaplan SL, Mace SE, McCracken GH Jr, Moore MR, St Peter SD, Stockwell JA, Swanson JT, Pediatric Infectious Diseases Society and the Infectious Diseases Society of America. The management of community-acquired pneumonia in infants and children older than 3 months of age: clinical practice guidelines by the Pediatric Infectious Diseases Society and the Infectious Diseases Society of America. Clin Infect Dis. 2011 Oct;53(7):e25-76. doi: 10.1093/cid/cir531. PubMed PMID: 21880587.

Le Saux N, Robinson JL; Canadian Paediatric Society, Infectious Diseases and Immunization Committee.. Uncomplicated pneumonia in healthy Canadian children and youth: Practice points for management. Paediatr Child Health. 2015 Nov-Dec;20(8):441-50. English, French. PubMed PMID: 26744558; PubMed Central PMCID: PMC4699530.

Jain S, Williams DJ, Arnold SR, Ampofo K, Bramley AM, Reed C, Stockmann C, Anderson EJ, Grijalva CG, Self WH, Zhu Y, Patel A, Hymas W, Chappell JD, Kaufman RA, Kan JH, Dansie D, Lenny N, Hillyard DR, Haynes LM, Levine M, Lindstrom S, Winchell JM, Katz JM, Erdman D, Schneider E, Hicks LA, Wunderink RG, Edwards KM, Pavia AT, McCullers JA, Finelli L; CDC EPIC Study Team.. Community-acquired pneumonia requiring hospitalization among U.S. children. N Engl J Med. 2015 Feb 26;372(9):835-45. doi: 10.1056/NEJMoa1405870. PubMed PMID: 25714161; PubMed Central PMCID: PMC4697461.

#4: DON'T routinely use a bag for collection of urine cultures to diagnosis urinary tract infections in non-toilet trained children.

Bacterial growth in cultures of bag urine specimens are more likely to be falsely positive in young children with suspected urinary tract infection (UTI) due to contamination with perineal flora. A bag urine culture cannot therefore be used to establish the diagnosis of UTI and may lead to overtreatment. Although a negative bag culture would rule out a UTI, a positive culture requires confirmation by a more specific method, incurring substantial delay. Cultures of urine specimens obtained by catheterization or suprapubic aspiration are more specific and as such are preferred as the routine method of urine collection in non-toilet trained children. Clean-catch, the standard technique of urine collection for toilet-trained children, is a non-invasive method sometimes attempted in infants but is also associated with relatively high rates of contamination.

References:
Urinary Tract Infection: Clinical Practice Guideline for the Diagnosis and Management of the Initial UTI in Febrile Infants and Children 2 to 24 Months. SUBCOMMITTEE ON URINARY TRACT INFECTION, STEERING COMMITTEE ON QUALITY IMPROVEMENT AND MANAGEMENT. Pediatrics Aug 2011, peds.2011-1330; **DOI:** 10.1542/peds.2011-1330

Urinary tract infection in infants and children: Diagnosis and management. Joan L Robinson, Jane C Finlay, Mia Eileen Lang, Robert Bortolussi; Canadian Paediatric Society , Community Paediatrics Committee, Infectious Diseases and Immunization Committee. Paediatr Child Health 2014;19(6):315-19

Evaluation of a New Strategy for Clean-Catch Urine in Infants.
Mélanie Labrosse, Arielle Levy, Julie Autmizguine, Jocelyn Gravel . Pediatrics Aug 2016, e20160573; DOI: 10.1542/peds.2016-0573

Tosif, S., Baker, A., Oakley, E., Donath, S. and Babl, F. E. (2012), Contamination rates of different urine collection methods for the diagnosis of urinary tract infections in young children: An observational cohort study. Journal of Paediatrics and Child Health, 48: 659–664. doi:10.1111/j.1440-1754.2012.02449.x

#5: DON'T routinely collect or process specimens for *Clostridium difficile* testing in infants less than 1 year of age with diarrhea.

Infants are commonly asymptomatic carriers of *C. difficile* (14-63%), but clinical illness is rarely reported before 12-24 months of age. It has been hypothesized that infants lack the cellular machinery for *Clostridium* toxin internalization. When investigating an infant with diarrhea, alternative diagnoses should be considered even with a positive test for *C. difficile*. Testing should be limited to immunosuppressed infants or those with underlying intestinal conditions (e.g. Hirschprung disease, inflammatory bowel disease) when other etiologies have been ruled out.

References:
Schutze GE, Willoughby RE; Committee on Infectious Diseases; American Academy of Pediatrics. Clostridium difficile infection in infants and children. Pediatrics 2013 Jan;131(1):196-200.

Upton D Allen; Canadian Paediatric Society. Paediatr Child Health 2014;19(1):43-8

#6: DON'T treat Group A strep pharyngitis without first doing a confirmatory diagnostic test (culture or rapid Ag), and if positive to treat symptomatic strep pharyngitis with oral Penicillin or Amoxicillin as first line.

“There is broad overlap between the signs and symptoms of streptococcal and nonstreptococcal (usually viral) pharyngitis, and the ability to identify streptococcal pharyngitis accurately on the basis of clinical grounds alone is generally poor. Therefore, except when obvious viral clinical and epidemiological features are present, a laboratory test should be performed to determine whether GAS is present in the pharynx. Efforts have been made to incorporate the clinical and epidemiological features of acute pharyngitis into scoring systems that attempt to predict the probability that a particular illness is caused by GAS pharyngitis. These clinical scoring systems are helpful in identifying patients who are at such low risk of streptococcal infection that performance of a throat culture or an RADT is usually unnecessary. However, the signs and symptoms of streptococcal and nonstreptococcal pharyngitis overlap too broadly for diagnosis to be made with the requisite diagnostic precision on the basis of clinical grounds alone. Even subjects with all clinical features in a particular scoring system can be confirmed to have streptococcal pharyngitis only about 35%–50% of the time, and this is particularly the case in children. The clinical diagnosis of GAS pharyngitis cannot be made with certainty even by the most experienced physicians, and bacteriologic confirmation is required.

Testing for GAS pharyngitis usually is not recommended for children or adults with acute pharyngitis with clinical and epidemiological features that strongly suggest a viral etiology (eg, cough, rhinorrhea, hoarseness, and oral ulcers; strong, high).

Patients with acute GAS pharyngitis should be treated with an appropriate antibiotic at an appropriate dose for a duration likely to eradicate the organism from the pharynx (usually 10 days). Based on their narrow spectrum of activity, infrequency of adverse reactions, and modest cost, penicillin or amoxicillin is the recommended drug of choice for those non-allergic to these agents (strong, high). Treatment of GAS pharyngitis in penicillin-allergic individuals should include a first generation cephalosporin.”

References:
Direct quote from: Clinical Practice Guideline for the Diagnosis and Management of Group A Streptococcal Pharyngitis: 2012 Update by the Infectious Diseases Society of America(IDSA). Stanford T. Shulman et al.

#7: DON'T obtain repeat nasopharyngeal specimens for respiratory virus PCR testing to determine if a hospitalized child with a respiratory virus can be taken off additional precautions.

Hospitalized pediatric patients with respiratory viral syndromes (microbiologically confirmed or not) are placed on droplet/contact precautions to prevent the nosocomial transmission of respiratory viruses. Infection Prevention and Control guidelines recommend the discontinuation of additional precautions once the patient no longer has symptoms of a respiratory viral infection. Obtaining a nasopharyngeal specimen for respiratory virus PCR testing to determine the discontinuation of additional precautions is not useful since PCR-based tests are known to remain positive for several weeks after the onset of infection, and a positive test cannot differentiate between live and dead viral genetic material.

#8: DON'T routinely treat acute hematogenous osteomyelitis with prolonged intravenous therapy.

Large retrospective cohort studies have shown no difference in treatment failure rate between children with acute hematogenous osteomyelitis treated with prolonged IV therapy when compared with shorter IV therapy and early transition to oral, to complete the course of therapy. 'Prolonged' IV therapy was defined as 10 days in one cohort, and was a median of 6 days in another cohort. Of note, complications with PICC lines in the prolonged treatment arms were seen at a rate between 3-15%.

Consideration for use of prolonged IV therapy is in complicated disease.

Guidance as to when to consider transition to oral therapy include a good clinical response and normalization of inflammatory markers.

References:

Peltola H et al. Simplified treatment of acute staphylococcal osteomyelitis in children. Pediatrics 1997; 99:846-850.

Le Saux N et al. Shorter courses of parenteral antibiotic therapy do not appear to influence response rates for children with acute hematogenous osteomyelitis: a systematic review. BMC infectious diseases. 2002. 2:16.

Ruebner R et al. Complications of central venous catheters used for the treatment of acute hematogenous osteomyelitis. Pediatrics. 2006 Apr;117(4):1210-5.

Zaoutis T et al. Prolonged intravenous therapy versus early transition to oral antimicrobial therapy for actue osteomyelitis in children. Pediatrics 2009; 123:636.

Keren, Ron, et al. "Comparative effectiveness of intravenous vs oral antibiotics for postdischarge treatment of acute osteomyelitis in children." *JAMA pediatrics* 169.2 (2015): 120-128.