



INCLUSION

- 28 d/o – 2 y/o
- Dx bronchiolitis

EXCLUSION

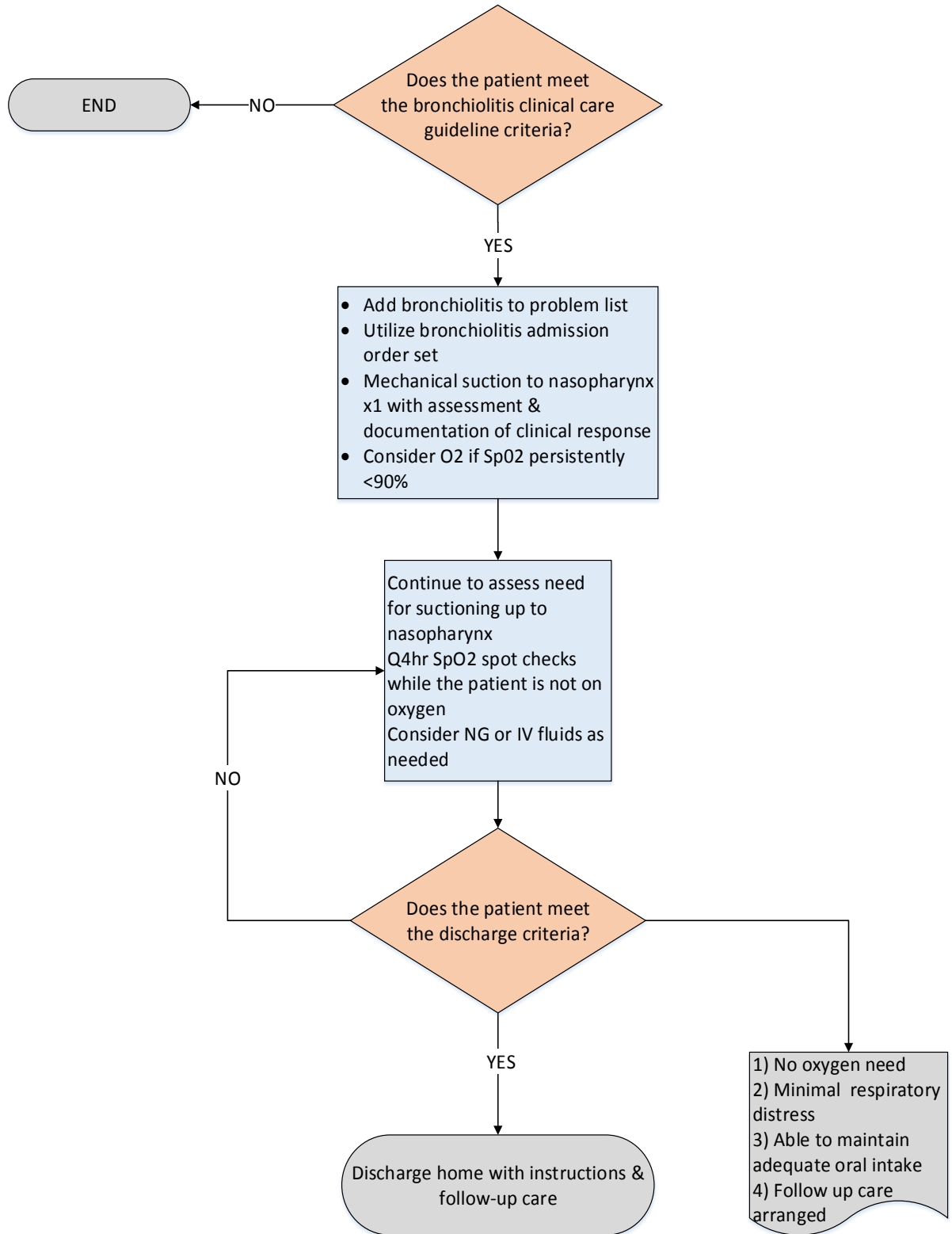
- No CV/Pulm disease or other chronic disease

CONSIDERATIONS

-2014 AAP Bronchiolitis Guidelines do not recommend albuterol use and/or racemic epinephrine

-It is not recommended to have patients on continuous oximetry if they are not on concurrent oxygen. (Society of Hospital Medicine: Pediatric Hospital Medicine Choosing Wisely Campaign 2013)

-2014 AAP Bronchiolitis Guidelines infer that 3% Hypertonic Saline may decrease LOS for patients with respiratory distress. (Evidence Quality: B; Recommendation Strength: Weak Recommendation [based on randomized controlled trials with inconsistent findings]).





Evidence

Al-Ansari K, Sakran M, Davidson BL, Sayyed RE, Mahjoub H, Ibrahim K. Nebulized 5% or 3% Hypertonic or 0.9% Saline for Treating Acute Bronchiolitis in Infants. *Journal of Pediatrics* 2010; 157: 630-4.

Anil AB, Anil M, Saglam AB, Cetin N, Bal A, Aksu N. High Volume Normal Saline Alone Is as Effective as Nebulized Salbutamol-Normal Saline, Epinephrine-Normal Saline, and 3% Saline in Mild Bronchiolitis. *Pediatric Pulmonology* 2010; 45(1):41-7.

Brooks, C. G., Harrison, W. N., & Ralston, S. L. (2016). Association Between Hypertonic Saline and Hospital Length of Stay in Acute Viral Bronchiolitis: A Reanalysis of 2 Meta-analyses. *JAMA Pediatr*, 170(6), 577-584. doi: 10.1001/jamapediatrics.2016.0079

Florin, T. A., Byczkowski, T., Ruddy, R. M., Zorc, J. J., Test, M., & Shah, S. S. (2014). Variation in the management of infants hospitalized for bronchiolitis persists after the 2006 American Academy of Pediatrics bronchiolitis guidelines. *J Pediatr*, 165(4), 786-792 e781. doi: 10.1016/j.jpeds.2014.05.057

Grewal S, Ali S, McConnell DW, Vandermeer B, Klassen TP. A randomized trial of nebulized 3% hypertonic saline with epinephrine in the treatment of acute bronchiolitis in the emergency department. *Arch Pediatr Adolesc Med*. 2009 Nov;163(11):1007-12.

Ipek IO, Yalcin EU, Sezer RG, Bozaykut A. The efficacy of nebulized salbutamol, hypertonic saline and salbutamol/hypertonic saline combination in moderate bronchiolitis. *Pulmonary Pharmacology & Therapeutics* 2011; 24: 633-7.

Jacobs JD, Foster M, Wan J, Pershad J. 7% hypertonic saline in acute bronchiolitis: a randomized controlled trial. *Pediatrics*. 2014 Jan;133(1):e8-e13.

Kusik BA, Al Qaghi SA, Kent S, Flavin MP, Hopman W, Hotte S et al. Nebulized Hypertonic Saline in the Treatment of Viral Bronchiolitis in Infants. *Journal of Pediatrics* 2007; 151: 266-70.

Kuzik BA, Flavin MP, Kent S, Zielinski D, Kwan CW, Adeleye A, Vegsund BC, Rossi C. Effect of inhaled hypertonic saline on hospital admission rate in children with viral bronchiolitis: a randomized trial. *CJEM*. 2010 Nov;12(6):477-84.

Landrigan, C. P., Conway, P. H., Stucky, E. R., Chiang, V. W., & Ottolini, M. C. (2008). Variation in pediatric hospitalists' use of proven and unproven therapies: a study from the Pediatric Research in Inpatient Settings (PRIS) network. *J Hosp Med*, 3(4), 292-298. doi: 10.1002/jhm.347

Luo Z, Liu E, Luo J, Li S, Zeng F, Yang X, Fu Z. Nebulized hypertonic saline/salbutamol solution treatment in hospitalized children with mild to moderate bronchiolitis. *Pediatr Int*. 2010 Apr;52(2):199-202.

Luo Z, Fu Z, Liu E, Xu X, Fu X, Peng D, Liu Y, Li S, Zeng F, Yang X Nebulized hypertonic saline treatment in hospitalized children with moderate to severe viral bronchiolitis. *Clin Microbiol Infect*. 2011 Dec;17(12):1829-33.

Mandelberg A, Tal G, Witzling M, Someck E, Houry S, Balin A, Priel IE. Nebulized 3% hypertonic saline solution treatment in hospitalized infants with viral bronchiolitis *Chest*. 2003 Feb;123(2):481-7.

McCulloh, R., Koster, M., Ralston, S., Johnson, M., Hill, V., Koehn, K., . . . Alverson, B. (2015). Use of Intermittent vs Continuous Pulse Oximetry for Nonhypoxemic Infants and Young Children Hospitalized for Bronchiolitis: A Randomized Clinical Trial. *JAMA Pediatr*, 169(10), 898-904. doi: 10.1001/jamapediatrics.2015.1746



Evidence

Mussman, G. M., Parker, M. W., Statile, A., Sucharew, H., & Brady, P. W. (2013). Suctioning and length of stay in infants hospitalized with bronchiolitis. *JAMA Pediatr*, 167(5), 414-421. doi: 10.1001/jamapediatrics.2013.36

Parikh, K., Hall, M., Mittal, V., Montalbano, A., Mussman, G. M., Morse, R. B., . . . Shah, S. S. (2014). Establishing benchmarks for the hospitalized care of children with asthma, bronchiolitis, and pneumonia. *Pediatrics*, 134(3), 555-562. doi: 10.1542/peds.2014-1052

Ralston, S., Comick, A., Nichols, E., Parker, D., & Lanter, P. (2014). Effectiveness of quality improvement in hospitalization for bronchiolitis: a systematic review. *Pediatrics*, 134(3), 571-581. doi: 10.1542/peds.2014-1036

Ralston, S., Garber, M., Narang, S., Shen, M., Pate, B., Pope, J., . . . Ryan, M. (2013). Decreasing unnecessary utilization in acute bronchiolitis care: results from the value in inpatient pediatrics network. *J Hosp Med*, 8(1), 25-30. doi: 10.1002/jhm.1982

Ralston, S. L., Lieberthal, A. S., Meissner, H. C., Alverson, B. K., Baley, J. E., Gadomski, A. M., . . . American Academy of, P. (2014). Clinical practice guideline: the diagnosis, management, and prevention of bronchiolitis. *Pediatrics*, 134(5), e1474-1502. doi: 10.1542/peds.2014-2742

Ralston S, Hill V, Martinez M. Nebulized hypertonic saline without adjunctive bronchodilators for children with bronchiolitis. *Pediatrics*. 2010 Sep;126(3):e520-5.

Sarrell EM, Tal G, Witzling M, Someck E, Houry S, Cohen HA, Mandelberg A. Nebulized 3% hypertonic saline solution treatment in ambulatory children with viral bronchiolitis decreases symptoms. *Chest*. 2002 Dec;122(6):2015-20.

Schroeder, A., Marmor, A., Pantell, R., Newman, T. (2004). Impact of Pulse Oximetry and Oxygen Therapy on Length of Stay in Bronchiolitis Hospitalizations. *Arch Pediatr Adolesc Med*, 158, 527-530.

Schuh, S., Freedman, S., Coates, A., Allen, U., Parkin, P. C., Stephens, D., . . . Willan, A. R. (2014). Effect of oximetry on hospitalization in bronchiolitis: a randomized clinical trial. *JAMA*, 312(7), 712-718. doi: 10.1001/jama.2014.8637

Sharma BS, Gupta MK, Rafik SP. Hypertonic (3%) saline vs 0.9% saline nebulization for acute viral bronchiolitis: a randomized controlled trial. *Indian Pediatr*. 2013 Aug;50(8):743-7.

Tal G, Cesar K, Oron A, Houry S, Ballin A, Mandelberg A. Hypertonic saline/epinephrine treatment in hospitalized infants with viral bronchiolitis reduces hospitalization stay: 2 years experience. *Isr Med Assoc J*. 2006 Mar;8(3):169-73.

Contributors:

Eric Jones
Desty Kamm, RN, BSN, MS

Sangeeta Schroeder, MD, MS
Yiannis Katsogridakis, MD, MPH