

# LESS IS BEST

## BRONCHIOLITIS: CREATING A TOOLKIT FOR CHANGE

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# Baby B

- 6 m old in ED with runny nose, cough and mild work of breathing
- CXR: Perihilar infiltrates with ? R sided early consolidation vs atelectasis
- IV was attempted 3x times and ultimately decision made for IM CTX
  - Could this have been prevented?
  - What can we do to improve the care we deliver in patients with bronchiolitis?



# Objectives

1

Discuss the latest evidence for *Less Is Best* in Bronchiolitis management

2

Review barriers to reducing overuse and impactful change ideas

3

Introduce National Choosing Wisely Bronchiolitis Toolkit to empower clinicians and families

# A Global Burden and So Many Guidelines..

POSITION STATEMENT

**Bronchiolitis: Recommendations for diagnosis,  
monitoring and management of children one to 24  
months of age**

**Posted:** Nov 3, 2014 | **Updated:** Nov 30, 2021

**NICE** National Institute for  
Health and Care Excellence

**AUSTRALASIAN  
BRONCHIOLITIS  
GUIDELINE**

American Academy of Pediatrics

DEDICATED TO THE HEALTH OF ALL CHILDREN®



# Less is Best

## TO DO

- Hydration
- Fever control
- Oxygen for sats < 90%



## NOT TO DO

- Chest x-ray
- Antibiotics
- Viral testing
- Continuous pulse oximetry
- Steroids
- Bronchodilators

# Double Harm of Chest X-Rays

- Unnecessary radiation
  - CXR often ordered as exam findings can be inconclusive with bronchiolitis
- Unnecessary antibiotics use
  - Infants undergoing CXR at least 10 times more likely to receive antibiotics
  - False positive misinterpreted as pneumonia
  - Prevalence of underlying secondary bacterial infection is low
  - Antimicrobial resistance is EVERYONE'S problem



## SAY NAY TO THE X-RAY

Diagnosing bronchiolitis should be based on history and physical examination. Using chest X-rays can lead to an incorrect diagnosis of bacterial pneumonia and unnecessary antibiotic treatment.

# Pulse Oximetry

- Continuous pulse oximetry leads to unnecessary hospitalizations and prolonged ED stay (*Schuh et al, JAMA 2014*)
- Children with URTI have transient desaturations at home without consequences (Principi et al, JAMA 2016)

**Do not use continuous pulse oximetry routinely in children with acute respiratory illness unless they are on supplemental oxygen.**

American Family Physician and Society of Hospital Medicine - Choosing Wisely US

Many infants and young children with bronchiolitis can experience transient episodes of desaturation without any clinical consequence. Continuous pulse oximetry can lead to overdiagnosis of hypoxemia and subsequent oxygen use that is of no benefit to the child while also contributing to unnecessary admissions, prolonged length of stay and other resource utilization. Desaturation not accompanied by other signs of respiratory distress, is an isolated finding that should not change management in an otherwise well-appearing child. [Read Rational.](#)

# Respiratory Viral Testing

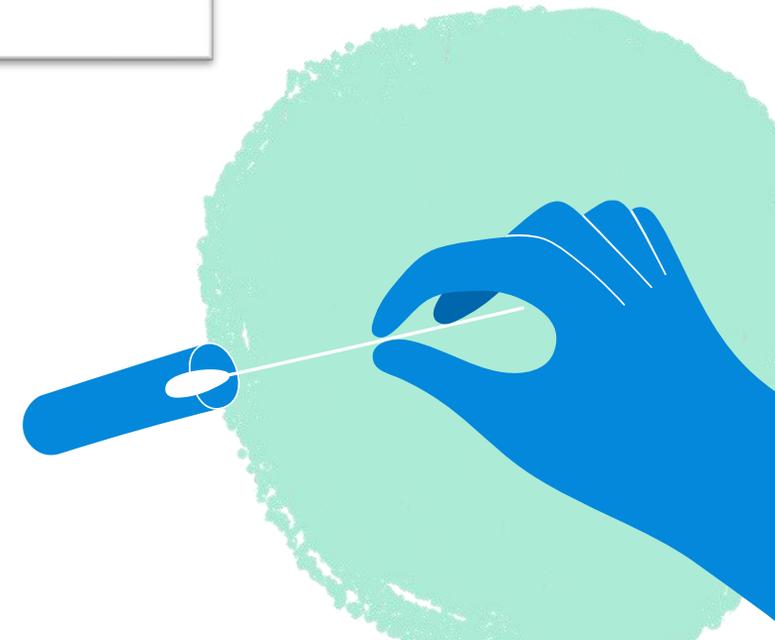
## **Do not obtain comprehensive viral panel testing for patients who have suspected respiratory viral illnesses.**

Paediatric Emergency Medicine - Choosing Wisely Canada and Choosing Wisely US

Viral illnesses are diagnosed clinically and usually do not require confirmatory testing. Consistent evidence is lacking on the impact of comprehensive viral panels (i.e., panels simultaneously testing for 8-20+ viruses) on clinical outcomes or management. Hence, most guidelines do not recommend their routine use. Some viral tests are quite expensive, and obtaining nasopharyngeal swab specimens is uncomfortable for children. Comprehensive viral panel testing can be considered in high-risk patients (e.g., immunocompromised) or in situations in which the results will directly influence treatment decisions. (e.g., antivirals for influenza) or public health recommendations (e.g., isolation for SARS-CoV-2).

[Read Rational.](#)

- Expensive
- Does not alter management
- Uncomfortable



# What About Salbutamol?

- Salbutamol is for bronchoconstriction → doesn't work in bronchiolitis
- Guidelines recommend against it
  - CPS: not recommended if Dx is clear
  - NICE: Do not use
  - AAP: Should not, strong recommendation
  - Australasian guidelines: Not in < 12 months
- Well established evidence recommend against it
  - Cochrane review 2014 – no reduction in LOS or admission
  - Meta-analysis 2020 – no benefit in < 24 months
- *May consider if uncertain about diagnosis*



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# Heated High Flow Nasal Cannula (HHFNC) in Bronchiolitis

Early studies showed HHFNC may reduce ICU use, intubations

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RCTs with ~2900 mild-moderate patients, found no benefit in ICU, oxygen duration, intubation, LOS

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Long-term observational studies found either no change in outcomes or paradoxical increase in ICU use

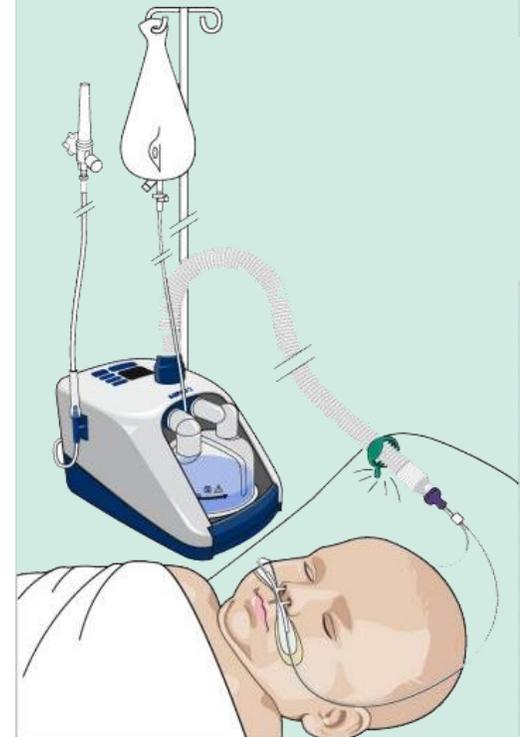
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We are now in the de-implementation phase!

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The routine use of HHFNC is not indicated in mild-moderate illness.

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# What Should We Aim For?

**TABLE 2** Performance After QI Interventions With ABC Methods Calculated for Selected Measures of Overuse in Bronchiolitis

Study	Repeated Bronchodilators (95% CI)	Doses per Patient (95% CI)	Steroid Use (95% CI)	Chest Radiograph Use (95% CI)	Antibiotic Use (95% CI)
Adcock et al <sup>25</sup>	—	11 (8.5–13.5)	—	—	43% (31–55)
Harrison et al <sup>28</sup>	—	13 (7.7–18.3)	—	—	55% (44–66)
Wilson et al <sup>30</sup>	—	—	0% (NR)	—	16% (14–24)
King et al <sup>35</sup>	37% (30–44)	—	10% (6–14)	—	22% (16–28)
Todd et al <sup>29</sup>	—	—	—	51% (45–57)	75% (70–90)
Black and Brennan <sup>36</sup>	37% (31–45)	—	—	—	—
Walker et al <sup>37</sup>	16% (11–21)	—	1% (0–2)	—	9% (3–15)
Perlstein et al <sup>27</sup>	41% (37–45)	5.1 (4.7–5.5)	—	60% (56–64)	50% (46–54)
Muething et al <sup>33</sup>	23% (18–28)	1.3 (1–1.6)	—	46% (40–52)	39% (33–45)
Kotagal et al <sup>31</sup>	54% (51–57)	6.1 (5.5–6.7)	9% (7–11)	65% (62–68)	47% (46–50)
Mittal et al <sup>38</sup>	17% (16–18)	—	11% (9–13)	42% (40–44)	30% (28–32)
<b>ABC</b>	<b>16%</b>	<b>NA</b>	<b>1%</b>	<b>42%</b>	<b>17%</b>

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# What Drives Overuse?



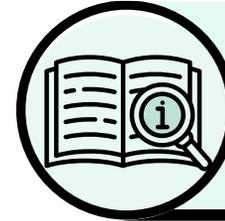
# Drivers of Overuse

## Providers Survey

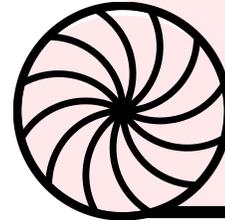
*Wolk CB, Schondelmeyer AC, Barg FK, Beidas R, Bettencourt A, Brady PW, et al. Barriers and Facilitators to Guideline-Adherent Pulse Oximetry Use in Bronchiolitis. J Hosp Med. 2021 Jan;16(1):23–30.*



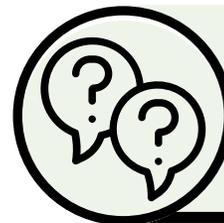
**Desire to do something  
and help symptoms**



**Knowledge gaps**



**Therapeutic illusion  
"Just in case"**



**Perception of parental  
discomfort**

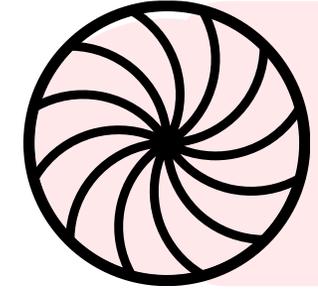


**Unclear local policies**

# Knowledge Gaps



- **50%** of RT & RNs believed SABA and steroids would improve WOB
  - Compared to approx 1% of physicians
- **50%** of RNs & **25%** of MD felt that increasing O2 despite no hypoxemia would improve WOB
- **Close to 70%** of RNs who had infant already on O2 felt need to escalate to improve WOB compared to 36% if received infant not on O2



# Therapeutic Illusion

- Tendency amongst pts & physicians to overestimate benefits of medical interventions and underestimate harms

*Casarett D. The science of Choosing Wisely: overcoming the therapeutic illusion. NEJM 2016;374(13):1203-05*

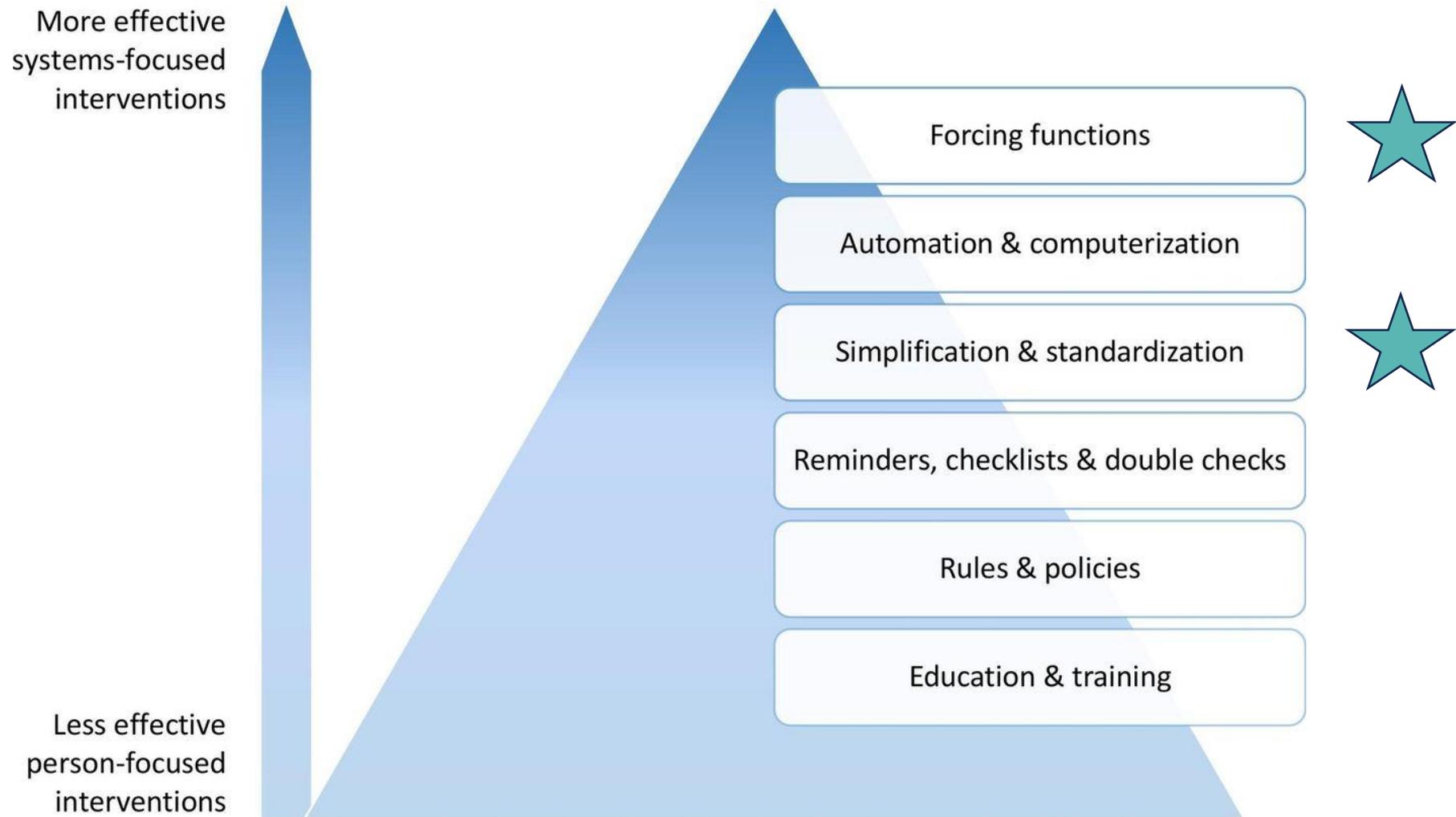
*Hoffman TC. Clinicians' expectations of benefits & harms of Rx, screening and tests: systematic review JAMA Intern Med 2017*

# What Are Caregiver Expectations?



- Clear information about diagnosis
- Advice on symptom relief
- Reassurance
- Safety net advice (ie. Contingency plan)– follow-up instructions if things don't improve and/or what to look out for
- Patients are receptive to communication that stresses the impact of antibiotic overuse

# The hierarchy of intervention effectiveness (Adapted from the Institute for Safe Medication Practices<sup>25</sup> and Patient safe Implementing effective safety solutions.<sup>43</sup>.)



Christine Soong, and Kaveh G Shojania *BMJ Qual Saf* 2020;29:353-357

# What Can You Do to Reduce Continuous Oximetry?

## Perception of parental discomfort

- Educate caregivers
- Empower caregivers to help treat their child's symptoms

## Unclear policies

- Clear instructions on indications for specific interventions
  - When to do CXR
  - When to do bloodwork
  - When to do continuous pulse oximetry and how to stop
- Removing interventions in order set (i.e. continuous sats)

## all staff Difficulty educating

- Target rotating trainees, new nurses, overnight RNs (Orientation)
- Target specific non-EBM interventions
- Use high yield learning videos
- Offer CME credits

## Culture

- Visual cues (posters)
- Competition amongst units
- Audit and feedback
- Alignment with other overuse priorities

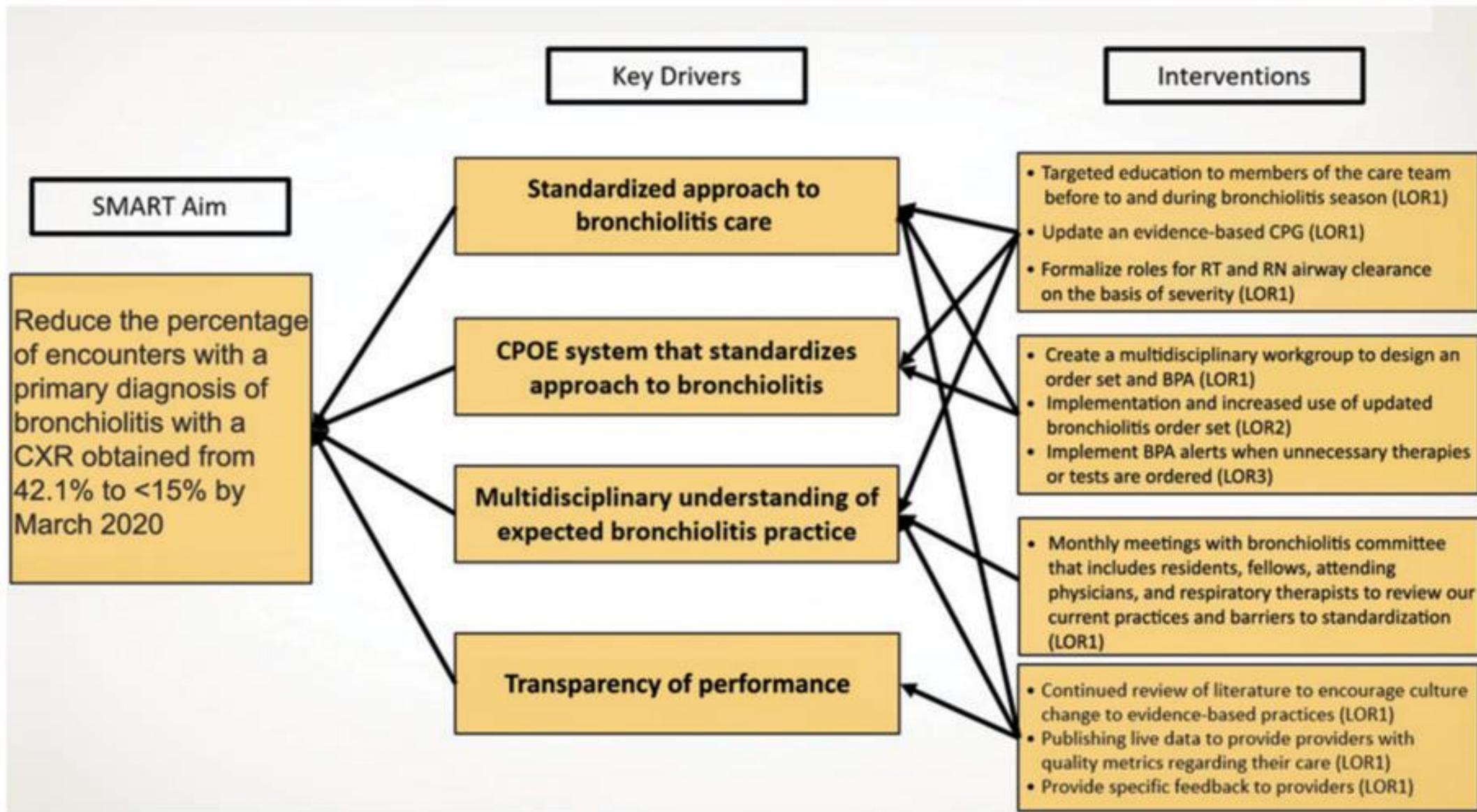
## Clinician discomfort

- i.e for discomfort on not using continuous pulse oximetry:
  - More frequent spot checks
  - Education on normal transient desat in patients
  - Education on appropriate use of O2 monitoring
- Close follow-up for re-assessment
- Education on red flags

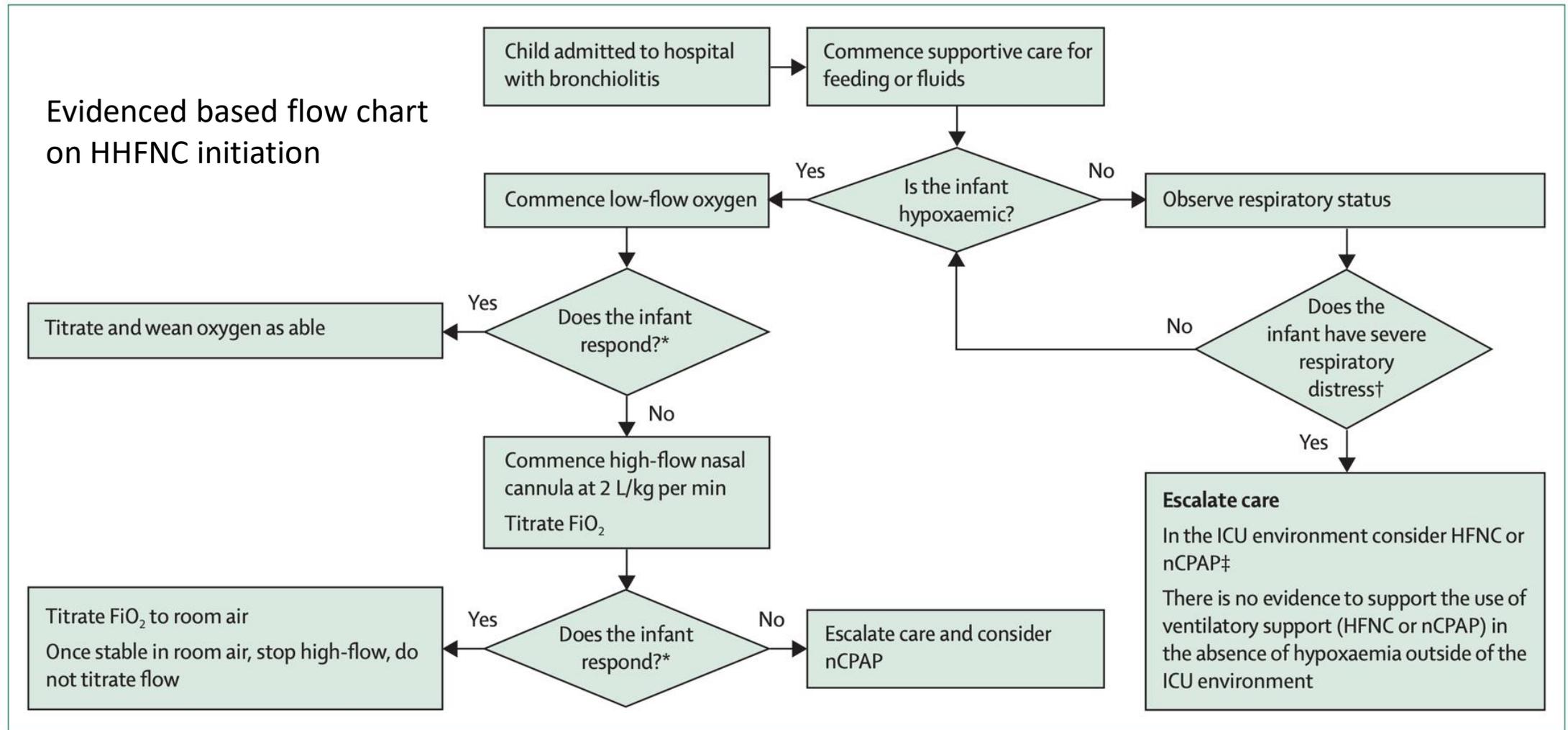
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# Reducing Chest Radiographs in Bronchiolitis Through High-Reliability Interventions

- High reliability most helpful in sustained change – Forcing Functions & automatisisation
- Lower reliability interventions (i.e. education) is needed but not enough for sustained change



# Simplification and Standardization



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# Resources to Address Barriers to Overuse



## Bronchiolitis: Less is Best

A Toolkit for the Management & Assessment of  
Bronchiolitis in Primary Care & Emergency Departments

V1

Last Updated:  
October 2023

# Recommendations

**Do not obtain radiographs in children with bronchiolitis, croup, asthma, or first-time wheezing.**

Paediatric Emergency Medicine - Choosing Wisely Canada and Choosing Wisely US

**Do not obtain comprehensive viral panel testing for patients who have suspected respiratory viral illnesses.**

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**Antibiotics should not be used for viral respiratory illnesses (sinusitis, pharyngitis, bronchitis and bronchiolitis).**

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# Recommendations

## **Do not obtain radiographs in children with bronchiolitis, croup, asthma, or first-time wheezing.**

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In children presenting with first-time wheezing or with typical findings of bronchiolitis, croup, or asthma, radiographs rarely yield clinically significant findings and expose patients to radiation, increased cost of care, and prolonged length of stay. Guidelines emphasize the history and physical examination in making an accurate diagnosis and excluding serious underlying pathology. Radiography performed in the absence of significant findings is associated with overuse of antibiotics as it can commonly show patchy infiltrates which are not from bacterial pneumonia. As bacterial pneumonia is uncommon in young children greater than 2 months of age, radiographs should not be routinely obtained unless findings such as significant hypoxia, focal abnormalities on lung exam, prolonged illness course, or severe distress are present. [Read Rationale.](#)

## **Antibiotics should not be used for viral respiratory illnesses (sinusitis, pharyngitis, and bronchiolitis).**

American Family Physician and Society of Hospital Medicine - Choosing Wisely US

Antibiotics do not help in the treatment of viral respiratory infections, like bronchiolitis, nor do they prevent complications from these viruses. Unnecessary antibiotics can lead to side effects and other harms, including antimicrobial resistance, and can complicate clinical assessments and accuracy. Evidence shows that caregivers are seeking a diagnosis and support for symptom management, not unnecessary antibiotics. [Read Rationale.](#)

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**THANK YOU!**  
Questions?

**Website:**

[www.ChoosingWiselyCanada.org/  
Primary-Care-Bronchiolitis](http://www.ChoosingWiselyCanada.org/Primary-Care-Bronchiolitis)

**Email:**

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