Community of Practice: Choosing Wisely in Paediatrics

Moderator:

Dr. Olivia Ostrow
Paediatrician and Patient Safety Lead, Paediatric Emergency Medicine
Associate Director, SickKids Choosing Wisely Program

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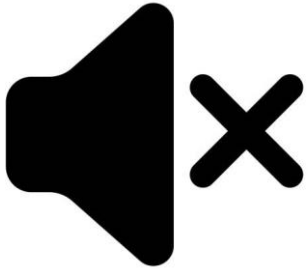
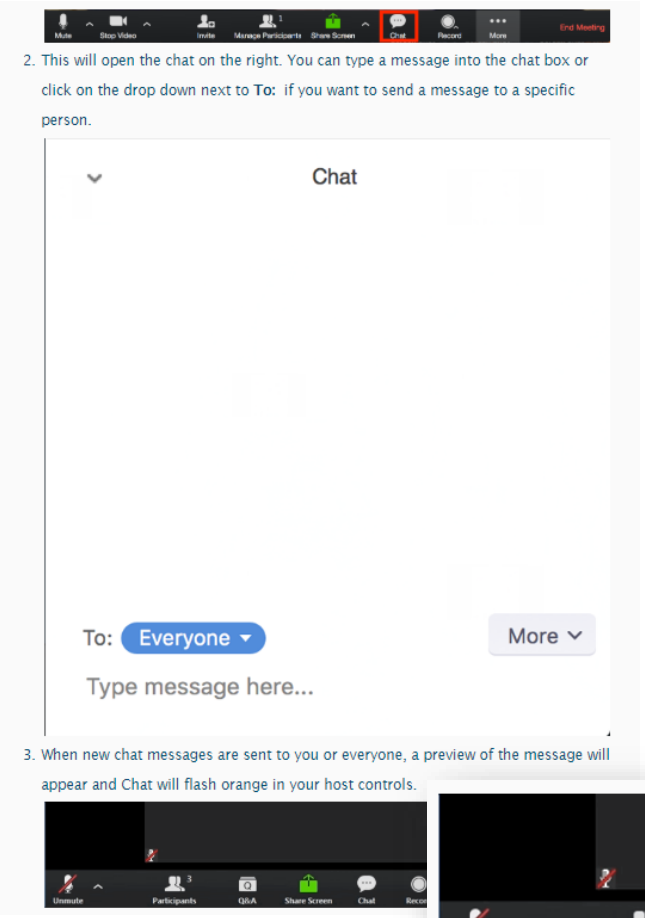
Housekeeping

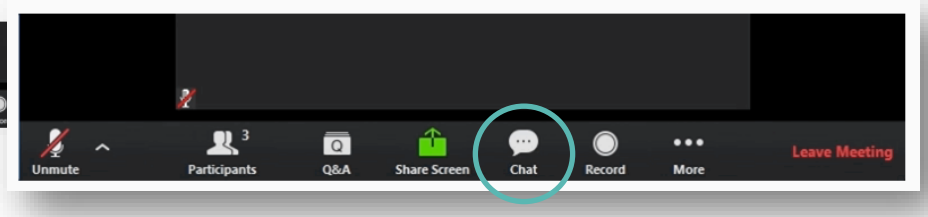


- Note: please keep your microphone on **mute while others are presenting.**



Have a Question?

- Use the **chat function** in Zoom at anytime
- If you wish to contribute to the conversation, be sure to **un-mute** on the Zoom dashboard
- Note: *we will moderate the Q&A after all presentations have been completed*



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Agenda

2:00 – 2:05	**Welcome and Introductions**
2:05 – 2:20	**Presentations** **BC Children's Hospital's experience as part of the AAP's HI-FLO: High flow Interventions to Facilitate Less Overuse in Bronchiolitis Project** Drs. Claire Seaton and Dylan Ehman
2:20 – 2:35	**Bronchiolitis-"Less is More": Our experiences de-implementing non-evidenced based interventions** Drs. Marie-Pier Lirette, Larissa Shapka, and Maria Jose Conejero Muller
2:35 – 2:50	**Is performing a lateral chest x-ray necessary in diagnosing pneumonia in infants and children?** Drs. Tim Lynch and Sepideh Taheri
2:50 – 3:00	**Q&A**

Welcome (and welcome back)!

The Choosing Wisely in Paediatrics Community of Practice (CoP) mandate is to foster knowledge sharing and collaborative learning to promote high-quality, value-added care by focusing on overutilization of certain tests and therapies. Facilitated through:

- Building capacity in QI / resource stewardship (Choosing Wisely) by sharing lessons learned and successful initiatives
- Supporting continuous QI / resource stewardship (Choosing Wisely) efforts
- Promoting consistency in recomm locally, provincially and nationally
- Supporting spread of evidence-based best practices
- Developing a central repository for idea sharing
- Engaging in new opportunities for collaboration

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- **The Choosing Wisely in Paediatrics Health Hub**
  - Connects individuals with "like" peers across Canada to share information and exchange resources
  - Provides information (including recordings) from past webinars and updates on upcoming events
  - **Visit https://choosingwisely.squarespace.com/**

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In collaboration with:

Association Médicale Canadienne

Canadian Medical Association

Choosing Wisely Canada's

National Meeting

May 25 & 26, 2022 | Online

Register at **choosingwiselycanada.org**

All content included in the National Meeting will be presented free of charge.

BC Children's Hospital's experience as part of the AAP's HI-FLO: *Highflow Interventions to Facilitate Less Overuse in Bronchiolitis* Project

Dr. Dylan Ehman
MD, MSc, FRCPC
Paediatric Hospital Medicine Fellow
BC Children's Hospital

Dr. Claire Seaton
BM, BCh, MRCPCH, FRCPC
General Paediatrics and BCCH Asthma Clinic
Department of Paediatrics, BC Children's Hospital
Clinical Assistant Professor, University of British Columbia

BC Children's Hospital

THE UNIVERSITY OF BRITISH COLUMBIA
Division of General Pediatrics
Department of Pediatrics | Faculty of Medicine

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Background – Rationale

- Use of High Flow Nasal Cannula (HFNC) therapy in bronchiolitis is increasing
- Limited data until recently on benefit of HFNC vs conventional low-flow (LF) oxygen
- Recent meta-analyses of RCTs show:

Useful as a “rescue” therapy if needing support beyond LF to prevent escalation to positive pressure ventilation

No difference in:
- Duration of respiratory support
- ICU utilisation
- Intubation rates
- Admission length of stay

No change in HR, RR or comfort scores at 24h

Lin J, Zhang Y, Xiong L, Liu S, Gong C, Dai J. High-flow nasal cannula therapy for children with bronchiolitis: a systematic review and meta-analysis. Arch Dis Child. 2019;104(6):564-576. doi:10.1136/archdischild-2018-315846

O'Brien S, Craig S, Babl FE, et al. 'Rational use of high-flow therapy in infants with bronchiolitis. What do the latest trials tell us?' A Paediatric Research in Emergency Departments International Collaborative perspective. J Paediatr Child Health. 2019;55(7):746-752. doi:10.1111/jpc.14496

Background – Rationale

- Efficient use of HFNC is important
  - Limited resource
  - Increased health care resource use
  - Potential delayed weaning or need for transfer to higher level of care
  - Potential aerosol-generating medical procedure
- BCCH developed and implemented guideline on initiation, use, and weaning of HFNC in uncomplicated bronchiolitis in August 2021
  - Available province-wide on the PHSA Shared Health Organizations Portal: **shop.healthcarebc.ca/phsa**
  - Defined the clinical criteria for starting HFNC
  - Emphasised optimizing supportive management prior to initiation

Background – AAP Project

- The American Academy of Pediatrics' (AAP) QI network, Value in Inpatient Pediatrics (VIP), network announced a multi-institutional QI project in May 2021
- **HI-FLO: High Flow Interventions to Facilitate Less Overuse**
- Two arms:
  - Can proportion of bronchiolitis patients started on HFNC be reduced with a standardized initiation pathway which included a "pause" emphasising maximal supportive care prior to HFNC initiation?
  - Can the process of weaning from HFNC be improved with a standardized process including regular "holidays" off HFNC?

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AAP Project – Process

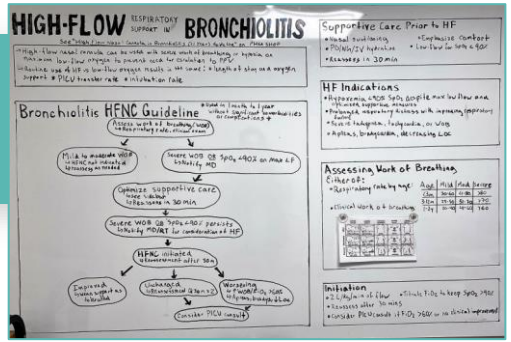
- Once accepted the AAP provided:
  - Recommended timeline
  - Guide for IRB approval if needed
  - Project rationale, aims, methodology, specific criteria for patient selection, and recommendations for data collection
  - Posters/QR codes for information dissemination
  - Regular webinars, “coaching calls” and available peer mentorship to support planning and implementation

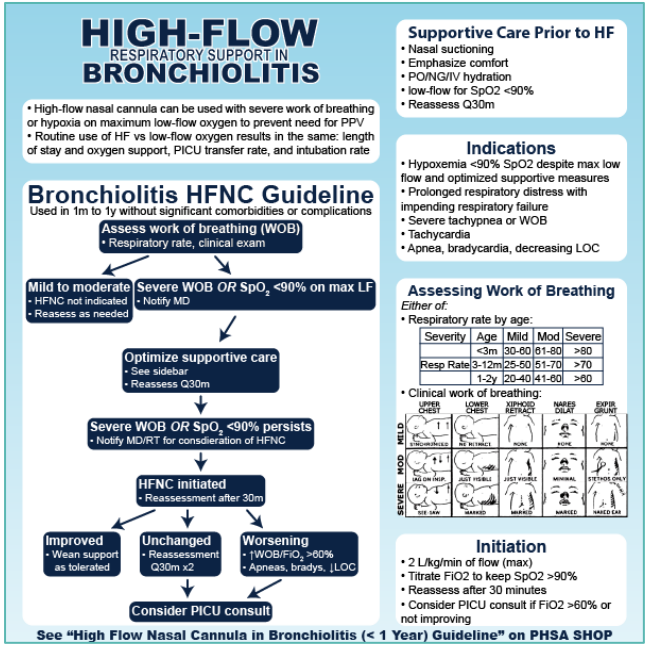
AAP Project – Aims

Primary Aims	• Reduce the proportion of infants with bronchiolitis treated with HFNC by 30% • Reduce the total hours of treatment with HFNC in infants with bronchiolitis by 30%
Process Measure	• 80% of patients started on HFNC will be appropriately started on HF as per the BCCH HF in bronchiolitis guidelines
Balancing Measures	• ED length of stay • Inpatient length of stay

AAP Project – Implementation

- The AAP had recommended processes for implementing the “pause” and promoting awareness
- Our guideline was already implemented so our implementation process primarily focused on promoting awareness and contents of the guideline:
  - Promotion by RTs
  - Emails/websites/displays
  - Academic rounds
  - Nursing information presentations
  - Province-wide seminars





AAP Project – Data Collection

- Required data:
  - ER presentation, admission, and discharge date and times
  - Age, weight, gender
  - Location and service when starting HF
  - Supportive care prior to HF initiation
  - Duration of HF therapy
  - Clinical status at HF initiation and withdrawal

We worked with respiratory therapy leadership to implement data collection tool done by RTs at the bedside

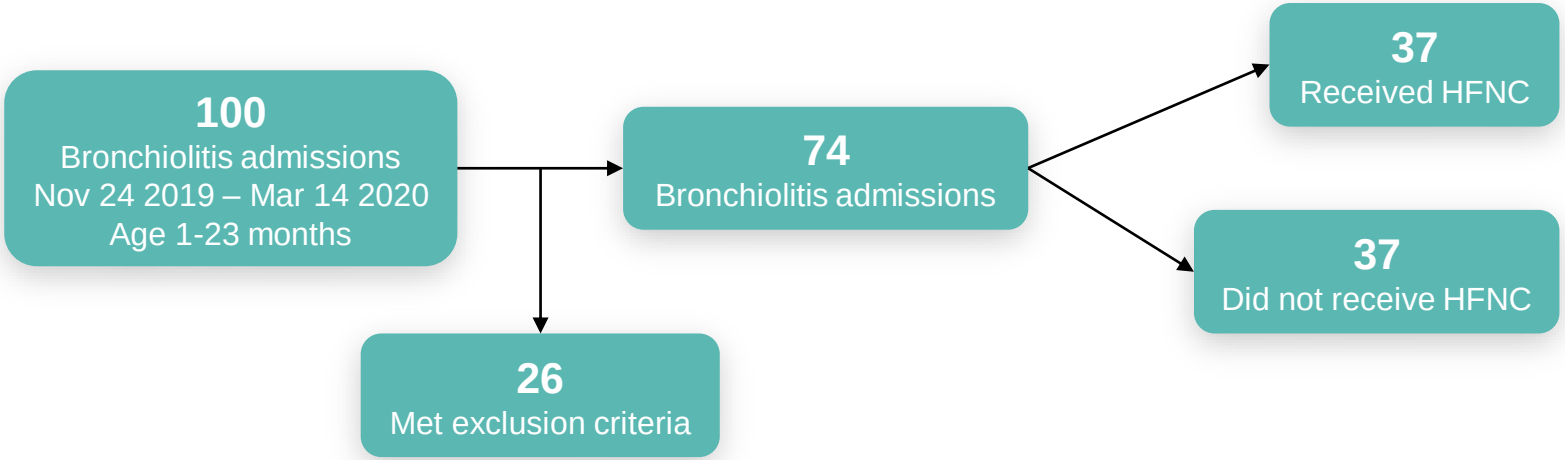
Inclusion Criteria	Exclusion Criteria
• Age 30 days to 23 months on admission • Discharged between November 24, 2019 and March 14, 2020 (baseline) or November 28, 2021 and March 19, 2022 (intervention) • ICD-10 Discharge diagnosis of bronchiolitis (J21 and its subcategories)	• Born <32 weeks gestational age • Hemodynamically significant cardiac disease requiring cardiac medications • Chronic lung disease (bronchopulmonary dysplasia) on home oxygen and/or diuretics • Significant neuromuscular disease requiring assistance with breathing or feeding • Requires home oxygen or airway clearance support at baseline for any reason • Patient presenting with apnea • Patient requiring CPAP, BiPAP or intubation at any time during hospitalization • Transferred from outside facility

AAP Project – Challenges

- Research vs QI?
- Multiple departments with multiple research/QI committees to navigate through
- Obtaining data
  - Retrospective admission data
  - Prospective bedside data
- Converting to new EMR

Results (Preliminary)

Baseline period:



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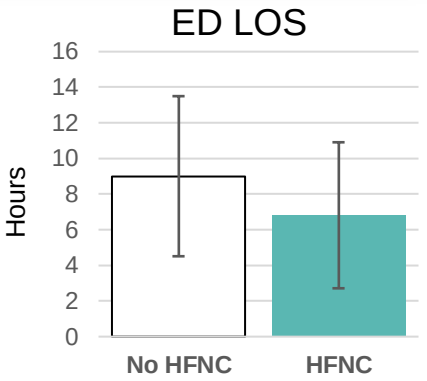
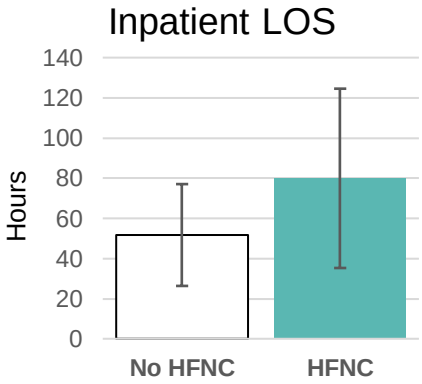
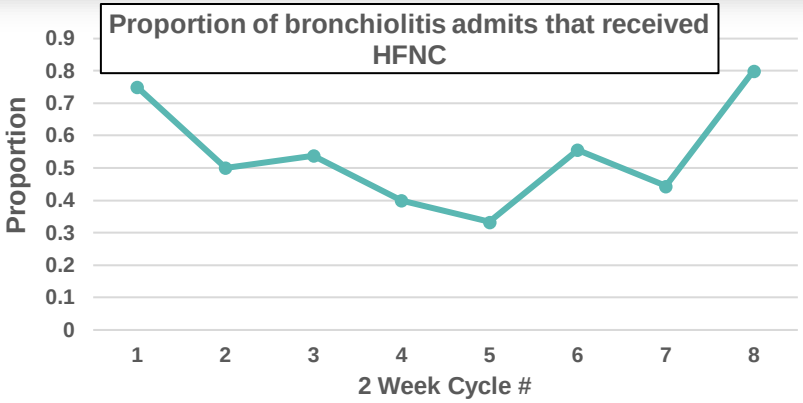
Results – Baseline (Preliminary)

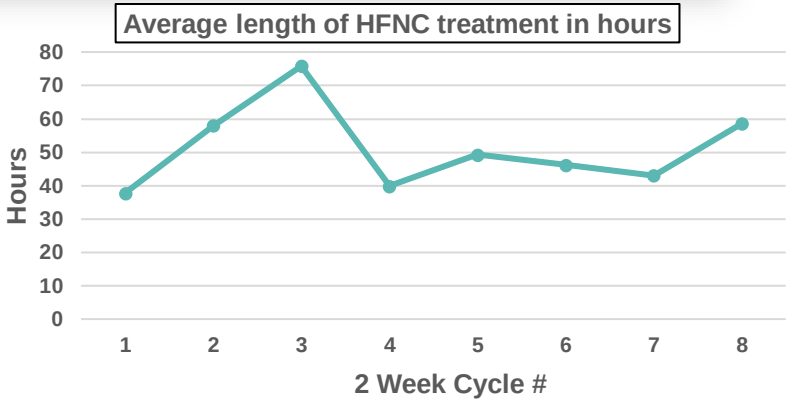
	No HFNC (n=37)	Received HFNC (n=37)
Age in days (mean)	251 ± 173	220 ± 163
Sex (Percent male)	59.4%	59.4%
Weight in kg (mean)	8.3 ± 3.1	7.5 ± 2
ED length of stay in hours (mean)	9.0 ± 4.5	6.8 ± 4.1
Inpatient length of stay in hours (mean)	51.7 ± 25.3	80.0 ± 44.6

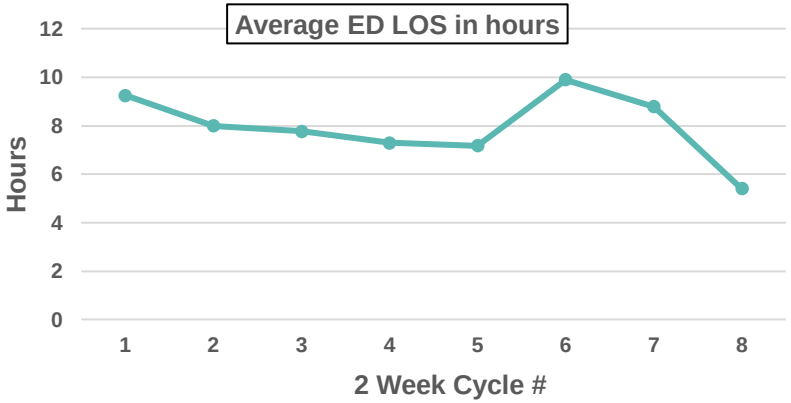


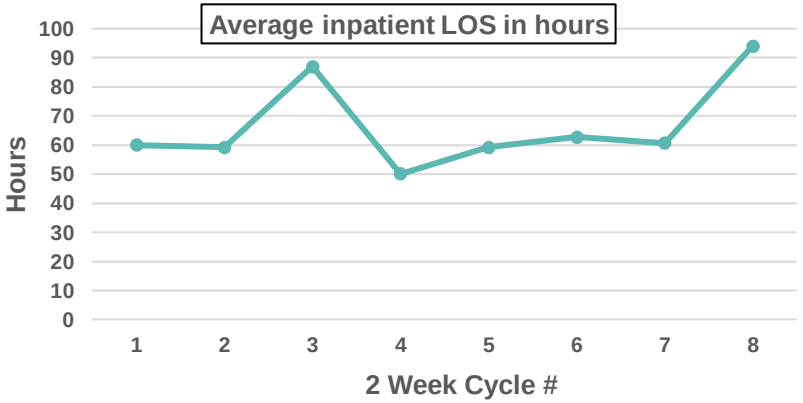


Results – Baseline (Preliminary)









Results – Intervention (Preliminary)

- November 28, 2021 to March 19, 2022
- Awaiting provincial health authority data for reconciliation
- Preliminary data from bedside collection tool:
  - 35 HFNC recorded
  - Guideline explicitly considered in 60.7% of applicable starts
  - 37.1% arrived to BCCH already on HFNC

Summary and Next Steps

- AAP and other network projects provide opportunity to contribute to large projects and answer important questions in pediatric care
  - Much of planning is provided which is convenient
  - Challenges in fitting a generic project to a specific site
- Awaiting full intervention data to draw conclusions of any local effects of guideline implementation
- Future plan to implement the other arm of the project improving the process of weaning HFNC and reducing time on therapy

Bronchiolitis - "less is more"

Our experience de-implementing non-evidence based interventions

Presenters:

- Marie-Pier Lirette (Paediatric Emergency Medicine Fellow)
- Maria Jose Conejero Muller (Paediatric Hospital Medicine Fellow)
- Larissa Shapka (PGY-4 Paediatrics)

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SickKids

TEMERTY FACULTY OF MEDICINE
UNIVERSITY OF TORONTO

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Today's objectives

1) Describe our QI initiative to reduce HFNC & non-evidence based interventions in bronchiolitis

2) Discuss our successes & challenges, including our experiences participating in a North American VIP study

3) Share our lessons learned

QI initiative: our goals at SickKids

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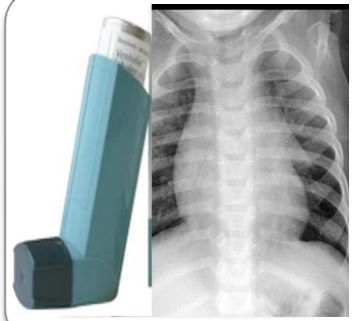
1) HFNC initiation

- Reduce overutilization of HFNC therapy by 30%
- Implement a HFNC initiation pause (HIP)
- Part of VIP HIFLO project



2) Non-evidence based interventions

- Standardize bronchiolitis care
- Reduce unnecessary interventions by 50%
- Create care efficiencies
- SickKids specific

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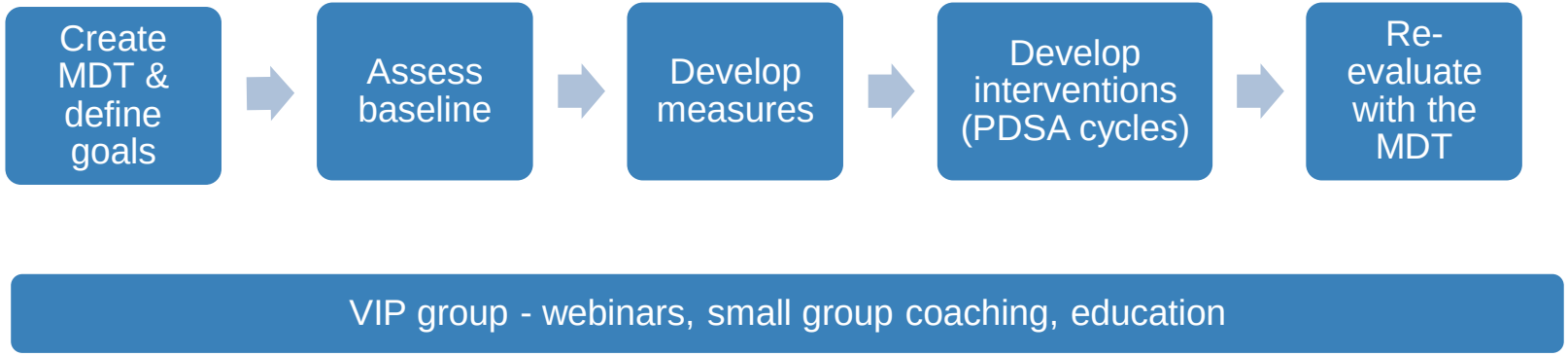
Our journey



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Our power team

Create MDT

ED leads

- Anjelica Guytingco
- Andrea Boysen
- Marie-Pier Lirette
- Olivia Ostrow
- Suzanne Schuh

RRT leads

- Dianne Soares
- Jennifer Thiele

Inpatient leads

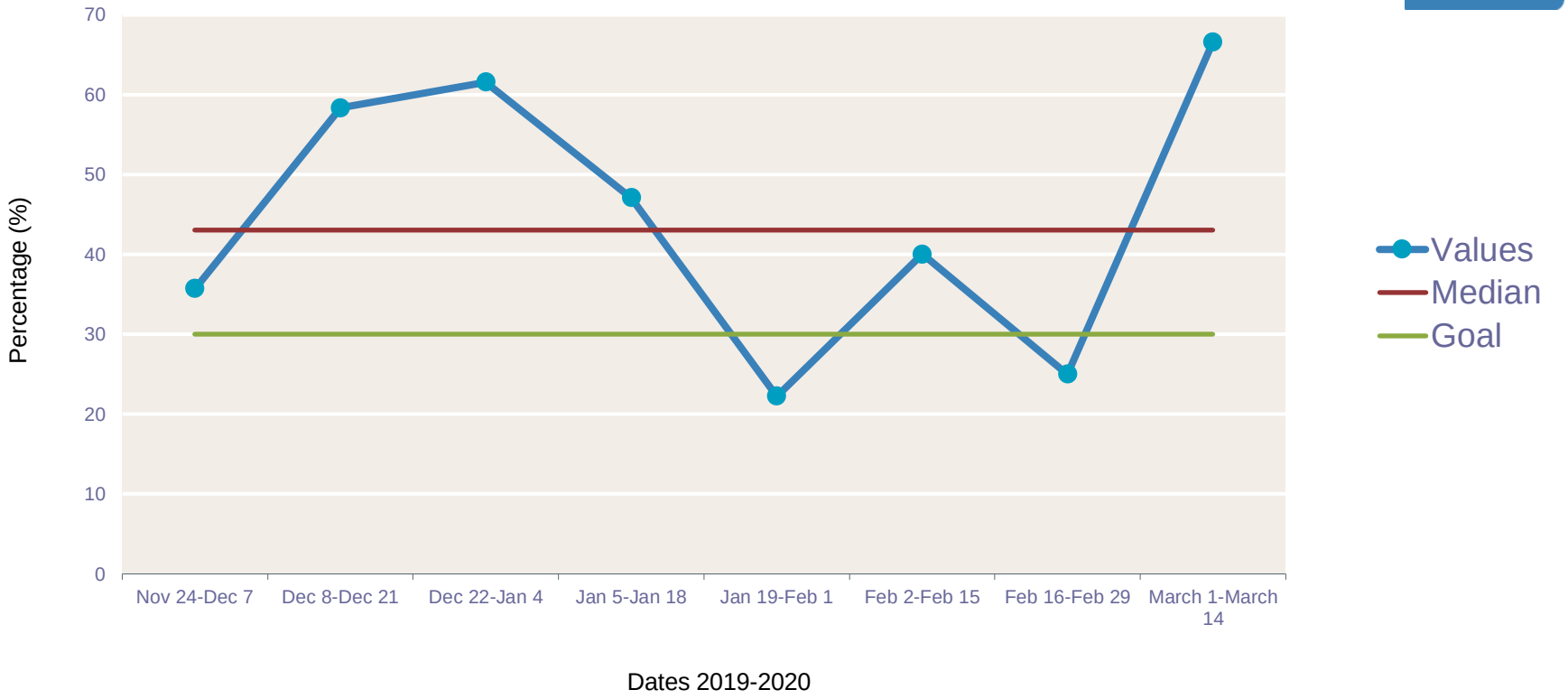
- Noel Wong
- Maria Jose Conejero Muller
- Larissa Shapka
- Julie Johnstone
- Shawna Silver
- Gail Annich (PICU)

Hospital Leadership

- Jeremy Friedman

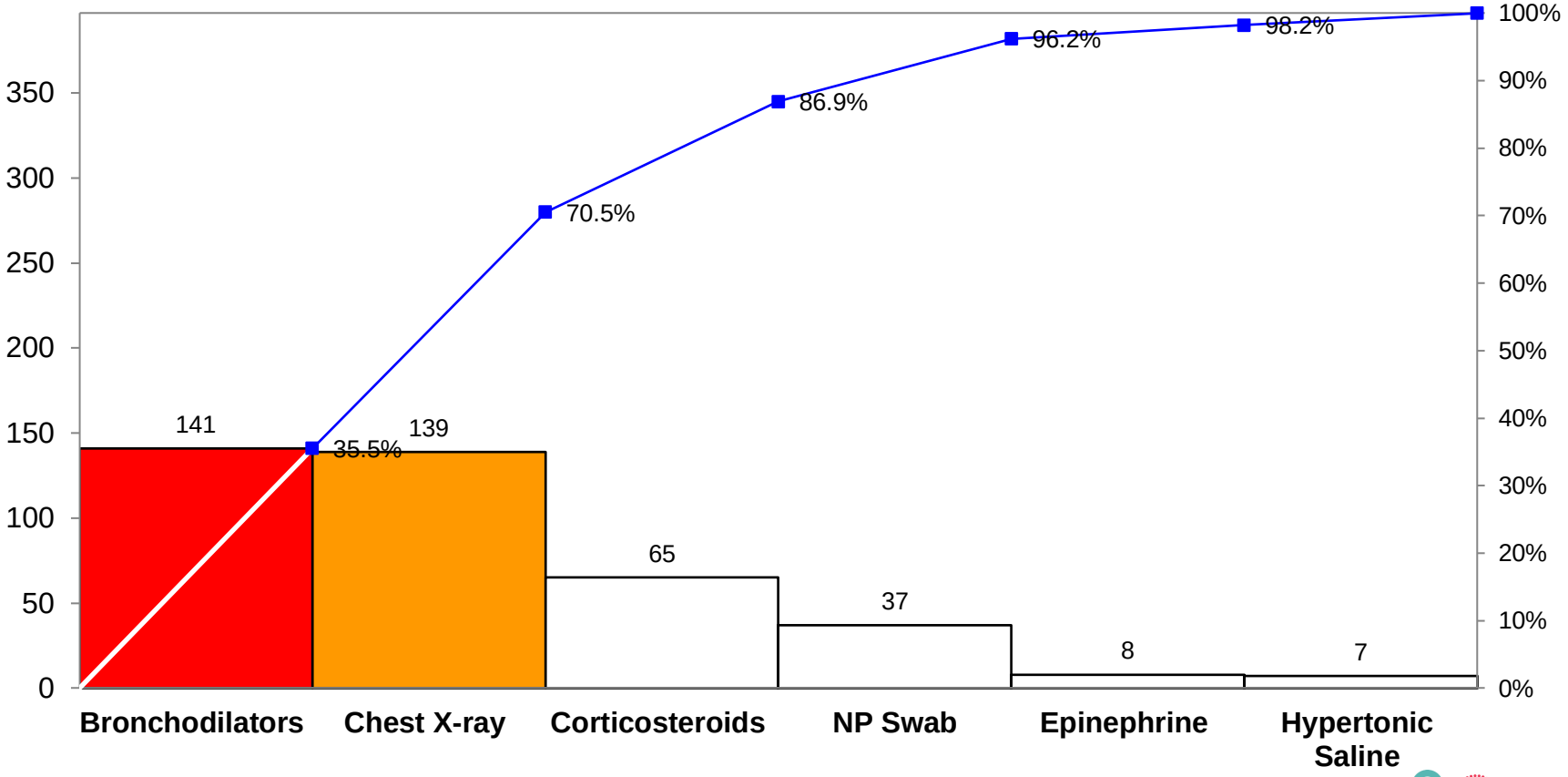
Baseline HFNC initiation (#HFNC/ #Bronchiolitis Admissions)

Assess baseline



Baseline Non-Evidenced Based Interventions Pareto Chart

Assess baseline



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Measures

Develop measures

Measures	Reducing HFNC	Reducing non-EBM interventions
Outcome	% HFNC initiation	% non-EBM interventions
Process	% HIP performed	% order set use
Balancing	ED LOS, inpatient LOS	ED LOS

HFNC initiation workflow

Develop interventions (PDSA cycles)

Bronchiolitis possibly requiring Heated High Flow Nasal Cannula (HHFNC)
(i.e. concerning level of respiratory distress and need for supplemental oxygen)

Yes

Team assesses and RN documents bronchiolitis severity score*

Respiratory support needed immediately?

Yes

Pathway does not apply
- Page RRT
- Initiate HHFNC
- Consult CCRT if required

No

RN completes and documents Bronchiolitis Bundle Interventions:
- Antipyretics
- Assess hydration, encourage oral feeding if safe
- Reposition and suction nasal passages
- Low flow nasal cannula if O2 saturation <88% when asleep or < 90% when awake
- Minimal handling when possible and dim lights
- Bundle cares

Team re-assesses after 15-30 minutes and RN documents bronchiolitis severity score

PASS:
Patient improves

No improvement

FAIL:
Patient worsens

Team re-assesses and determines if pass or fail

- ED: Assess and document bronchiolitis severity score every 2 hours
- Inpatient: Assess and document bronchiolitis severity score as per bedside PEWS

- Page RRT
- Consider initiating HHFNC as per policy
- RRT documents using EPIC HHFNC initiation template

***Bronchiolitis Severity Score**

SEVERITY CRITERIA		0 point	1 point	2 point	3 point
RR	<2 months		50-59	60-69	≥70
	2-<12 months		40-49	50-59	≥60
	12-24 months		30-39	40-49	≥50
Retraction Signs		None	Intercostal only	Intercostal with subcostal and/or substernal indrawing	Intercostal and subcostal with nasal flaring and/or chest wall indrawing
Wheezing		None	Expiratory	Inspiratory and Expiratory	Audible without Stethoscope

Note. Adapted from "Inter-Observer Agreement Between Physicians, Nurses, and Respiratory Therapists for Respiratory Clinical Evaluation in Bronchiolitis," by V. Gajdos, N. Beydon, L. Bommenel, B. Pellegrino, L. de Pontual, S. Ballinex, P. Labrune, and J. Bouyer, 2009, *Pediatric Pulmonology, 44*, p. 755. Copyright 2009 by Wiley-Liss, Inc.

Mild: 1-3 points
Moderate: 4-6 points
Severe: 7-9 points

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Bronchiolitis severity score

Develop interventions (PDSA cycles)

Benefits

- Common language
- Objective measurement

Limitations

- Not validated
- Not part of VIP study
- Lack of familiarity

SEVERITY CRITERIA		0 point	1 point	2 point	3 point
RR	<2 months		50-59	60-69	≥70
	2-<12 months		40-49	50-59	≥60
	12-24 months		30-39	40-49	≥50
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Mild: 1-3 points
Moderate: 4-6 points
Severe: 7-9 points

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Other interventions

Develop interventions (PDSA cycles)

Hospital bronchiolitis policy

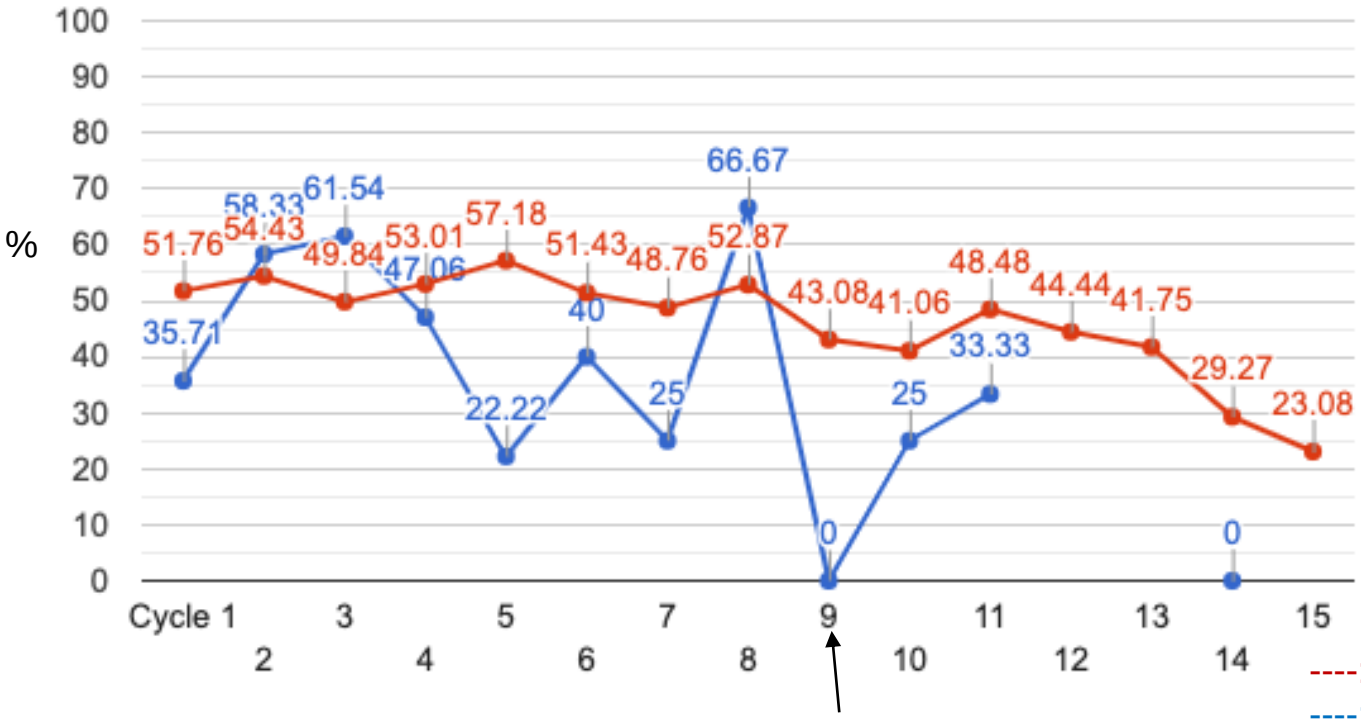
IT changes (EPIC)

- ED & inpatient bronchiolitis order sets
- HFNC order modifications
- RN charting - bronchiolitis severity score & bundle
- RT documentation template

Education

HFNC initiation (#HFNC/#Admissions)

Results

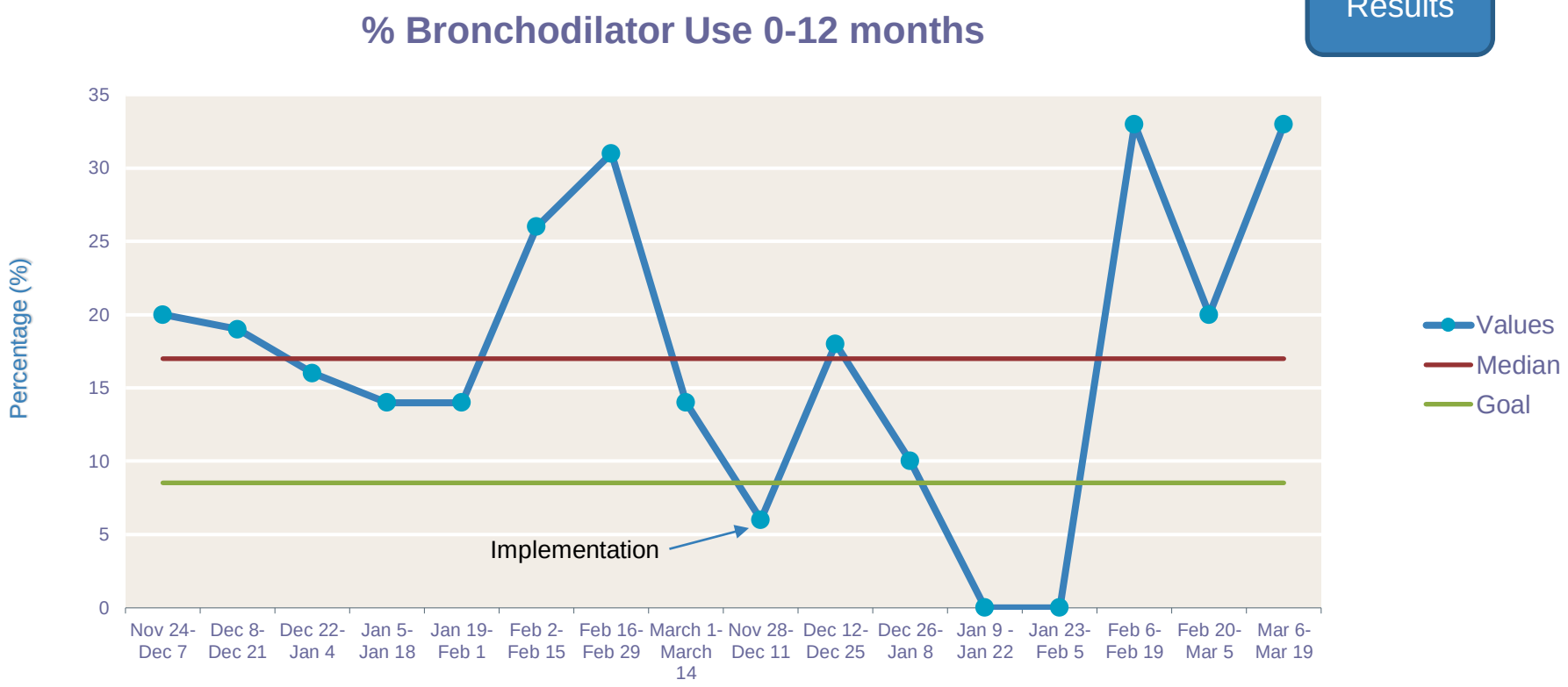


Implementation

----: All centers

----: SickKids

Results



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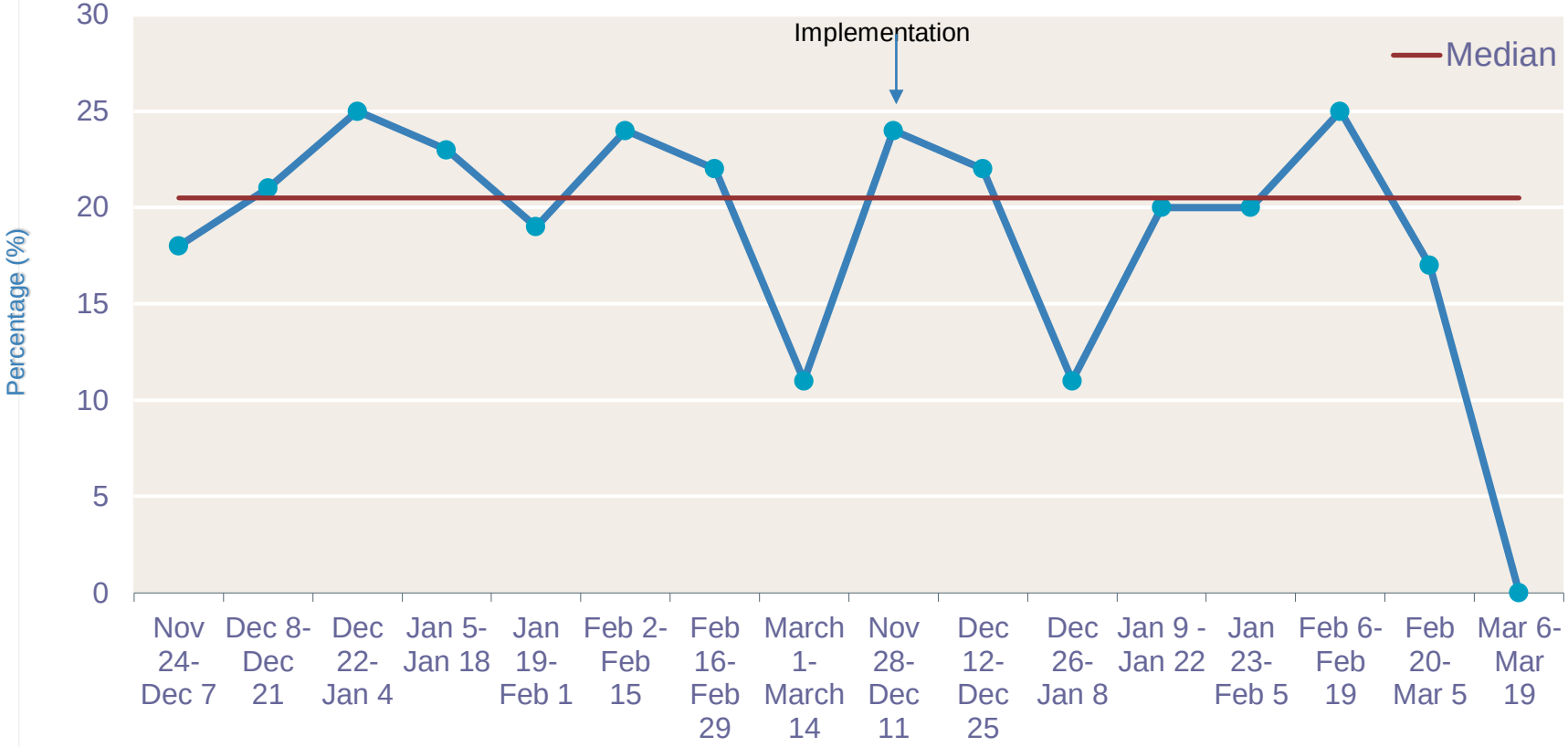
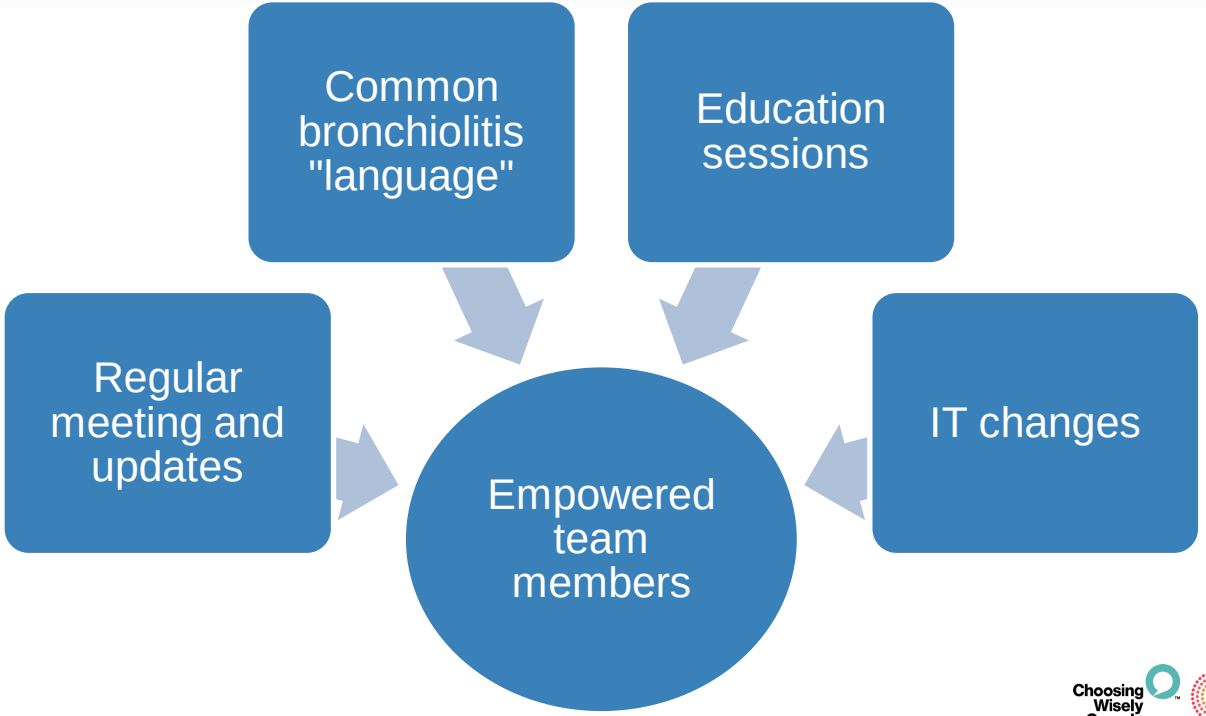
% CXR Use 0-24 months old

Results



Our successes



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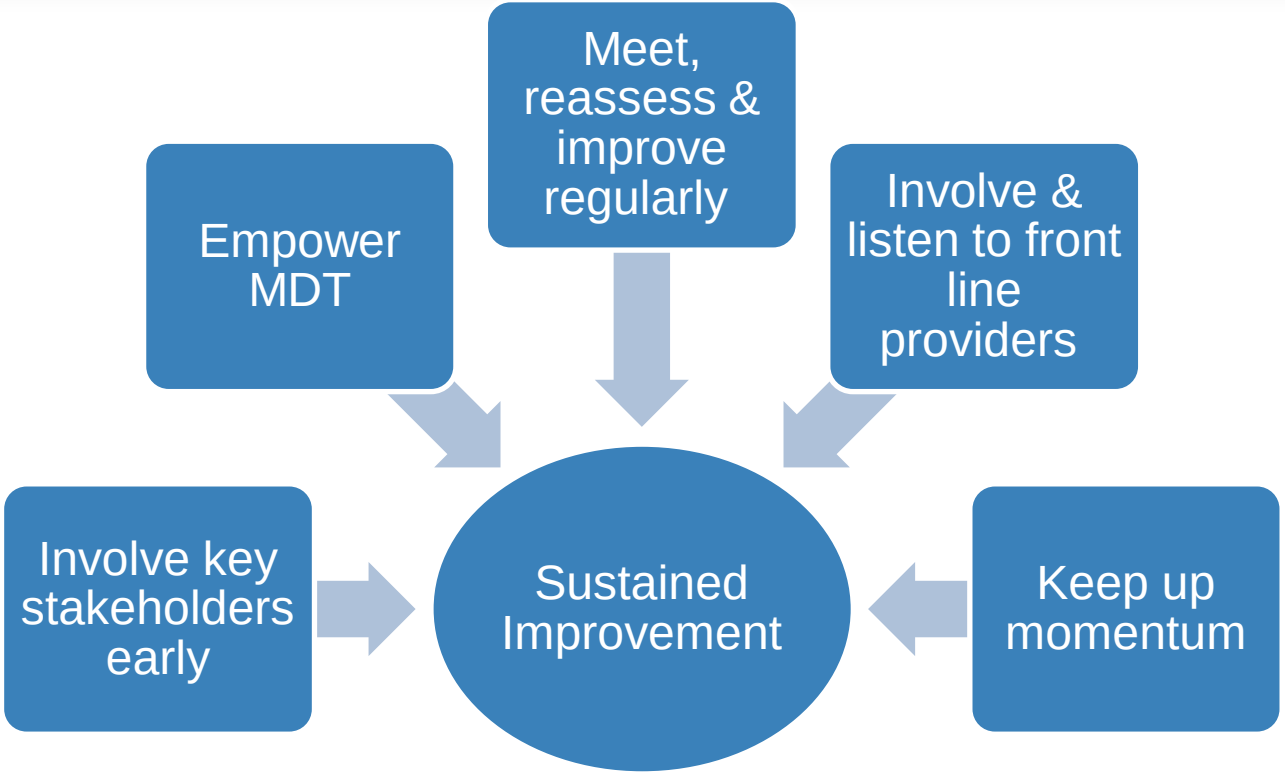
Our challenges

- Low number of admissions (everywhere!)
- Competing priorities
- Data entry/analysis
- Low baseline of non-EBM interventions
- Documentation of HIP
- Variability in inpatient LOS

Lessons learned



Proposed choosing wisely recommendations

1) HFNC

- Do not initiate HFNC in mild-moderate bronchiolitis without first optimizing the infant
  - *Treat fever*
  - *Encourage oral feeding if safe*
  - *Reposition & suction nasal passage*
  - *Minimize handling*
  - *Apply low-flow O2 via nasal prongs to maintain SpO2 >88% asleep & >90% awake*

2) Non-evidence based interventions

- Do not routinely administer bronchodilators or perform CXR in mild-moderate bronchiolitis

Questions?

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Is performing a lateral chest x-ray necessary in diagnosing pneumonia in infants and children?

Dr. Tim Lynch, MD, FRCPC Paediatric Emergency Medicine, Children's Hospital, London Health Sciences Centre
Associate Professor, Western University

Dr. Sepi Taheri, MB ChB, FRCPCH (UK) Academic General Paediatrics, Children's Hospital, London Health Sciences Centre
Assistant Professor, Western University

Schulich MEDICINE & DENTISTRY

Western

Children's Hospital
London Health Sciences Centre

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Background – Childhood pneumonia

- Pneumonia is common in children
- Diagnosis clinical
- Etiology:
  - Viruses most common cause of pneumonia in infants and pre-school children
  - Streptococcus pneumonia most common bacterial cause in all children
- Chest X-rays:
  - ED > Ambulatory

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Background – Current pneumonia guidelines

- Pediatric Infectious Disease Society (PIDS) and Infectious Disease Society of America (IDSA) – pneumonia is a clinical diagnosis
- Canadian Paediatric Society (CPS) – pneumonia includes chest radiography in making the diagnosis
- Translating Emergency Knowledge for Kids (TREKK)
- Canadian Association of Emergency Physicians (CAEP)

Background – imaging in childhood pneumonia

- Radiographic technique has traditionally dictated the need for two views
  - frontal and left lateral view
- However, this recommendation has been challenged due to:
  - additional exposure to ionizing radiation
  - the increased time to perform the lateral radiograph
  - increased healthcare-associated expenses
  - results that increase the use of unwarranted antibiotics.

Background – Imaging in diagnosis of pneumonia

- Recommendation against lateral X-rays:
  - WHO
  - British Thoracic Society
- Evidence suggests that one view may be sufficient, yet this has not been incorporated into clinical guidelines in Canada
- CPS guidelines suggest routinely performing 2 chest radiographs for diagnosis of pneumonia (PA/lat)

Background: CPS statement

- "When bacterial pneumonia is suspected clinically…a chest radiograph (both postero-anterior and lateral) should usually be obtained. The reason for imaging is that the clinical features of other conditions overlap with bacterial pneumonia, and antibiotics may be avoided if the chest radiograph does not suggest bacterial pneumonia. However, in cases where the diagnosis of bacterial pneumonia is highly suspected from history, combined with typical clinical and physical findings and the child is not sufficiently ill to require hospitalization, a chest radiograph is not essential."

Aim

To perform an up-to-date review of the evidence to determine whether:

1) *A chest radiograph should routinely be obtained for a child with a clinical diagnosis of pneumonia*
2) *A single radiograph (postero-anterior) of the chest of a child presenting with suspected pneumonia is sufficient*

Aim

- To decrease medical radiation and cost
  - carry little significance to the individual
- Very important given the vast number of these radiographs that are performed in Canada

Does the Lateral Chest Radiograph Help Pediatric Emergency Physicians Diagnose Pneumonia? A Randomized Clinical Trial

Lynch, T, Gouin, S, Larson, C and Patenaude, Y. AEM 2008

- RCT in Paed ED
- 570 patients, 1–16 years, ? pneumonia
- PA/Lat chest radiographs
- ED doctors interpreted:
  - Group 1: frontal film alone
  - Group 2: frontal & lateral films
- Compared with consensus interpretation by paediatric radiologists who interpreted both views.

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Results

- Clinicians' interpretations:
  - equal in sensitivity: group 1 - 91%, group 2 - 87% (p = 0.321),
  - equal in specificity: group 1- 58%; group 2 - 57% (p = 0.888).

Conclusion:

- *"The addition of the lateral chest radiograph to the frontal view did not improve the sensitivity or specificity of pediatric emergency physicians in their diagnosis of pneumonia in children."*

Lateral chest radiography and the diagnosis of pneumonia in children

Audette LD. Emerg Med J. 2017 Jan;34(1):57-58.

Is a standard frontal view CXR as good as standard frontal and lateral views at diagnosing pneumonia in children with a clinical suspicion of pneumonia?

3 articles presented as the best evidence

Conclusion:

Addition of a lateral view **does not appear to significantly improve the accuracy of pneumonia diagnosis in children by emergency physicians**, when compared with frontal view alone.

Recommendation

1. *Don’t routinely perform a chest radiograph in otherwise healthy infants (greater than 3 months of age) and children presenting with a clinical diagnosis of uncomplicated pneumonia.*
2. *Don’t routinely perform a lateral chest radiograph for uncomplicated pneumonia*

Next Steps

- *Collaborate with CPS Acute Care Committee to revise guidelines/practice points*
- *Disseminate knowledge through Choosing Wisely CoP presentations, publications.*
- *Other suggestions?*

Key references

1. Kennedy J, Dawson KP, Abbott GD. Should a lateral chest radiograph be routine in suspected pneumonia? Aust Paediatr J. 1986 Nov;22(4):299-300. doi: 10.1111/j.1440-1754.1986.tb02152.x. PMID: 3566677
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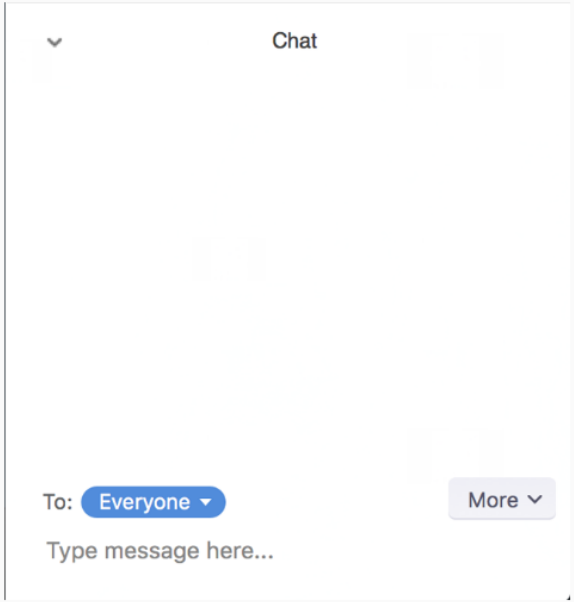
Key references

6. Lynch, T., Gouin, S., Larson, C., & Patenaude, Y. (2003). **Should the lateral chest radiograph be routine in the diagnosis of pneumonia in children? A review of the literature.** *Paediatrics & Child Health, 8*(9), 566-568.

7. Harris M, Clark J, Coote N, et al British Thoracic Society guidelines for the management of community acquired pneumonia in children: update 2011 Thorax 2011;66:ii1-ii23.

8. Lynch, T., Gouin, S., Larson, C., & Patenaude, Y. (2004). **Does the lateral chest radiograph help pediatric emergency physicians diagnose pneumonia? A randomized clinical trial.** *Academic Emergency Medicine, 11*(6), 625-629.

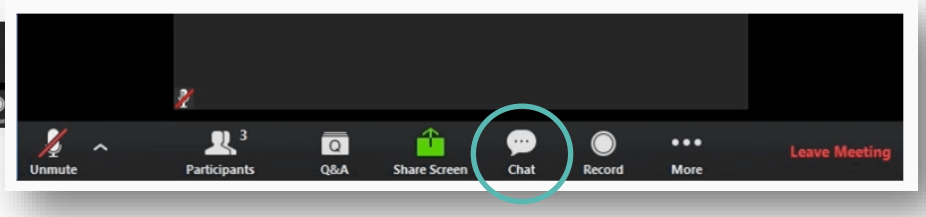
2. This will open the chat on the right. You can type a message into the chat box or click on the drop down next to **To:** if you want to send a message to a specific person.



3. When new chat messages are sent to you or everyone, a preview of the message will appear and Chat will flash orange in your host controls.

Q&A

- Please enter your questions using the **chat function**
- If you wish to contribute to the conversation, be sure to **un-mute** on the Zoom dashboard



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Thank you!

Next Webinar – Fall 2022

If you are interested in presenting, have resources you wish to share, or would like to be added to the mailing list, please complete the webinar feedback survey or email lauren.whitney@sickkids.ca

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