NORTHWEST HEALTHCARE
Response Network.

PREPARE.

RESPOND.

Pediatric Fall Respiratory Refresher Course

Virtual Webinar

October 16, 2024; noon-2pm

RECOVER.

Welcome, Introductions and Logistics

Vicki L. Sakata, MD, FAAEM, FAAP
Professor, Department of Pediatrics, University of Washington
Sr. Medical Advisor
Northwest Healthcare Response Network

Bernardo Lactaoen
Coalition Program Administrative and Volunteer Coordinator
Northwest Healthcare Response Network

Logistic

- Muted throughout the webinar
- Please use Q&A function at anytime. We will answer them during our panel discussion.
- Slides and Recording will be available and posted on our website: www.nwhrn.org
- Videos – adjust your volume accordingly
- Unfortunately no CME available – we will try and correct this for future trainings
- Contact: clinical@nwhrn.org
- Poll

Case Presentation

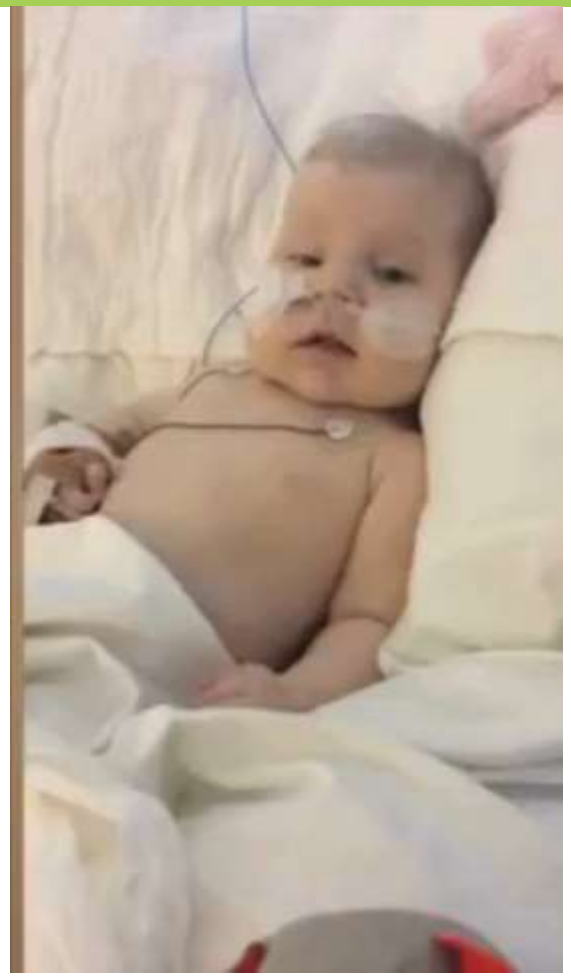
ED: Room 1

- 8 month old, 38 week, healthy, no previous wheezing, presents with <24 hours of cough and wheeze,
- Robust 11 kg 90th % HR 140 RR 40, Fever 102; 02 sat 98%
- PE: mild cough, minimal retractions, drinking from a bottle, smiling

Timmy

ED – Room 2

- 8 month old infant presenting to ED with fever and shortness of breath. Day 3 of symptoms, worsening. Tylenol 6 hours ago. No ibuprofen. Feeding slight decreased but still adequate urine output.
- Routine immunizations UTD, including flu; no nirsevimab.
- No respiratory history, and benign neonatal course
- PE: 8kg infant (25th %), HR 172, RR 77, Temp 102^{5}F, O2 sat 93% RA
- Crying with tears, brisk capillary refill. Tired, but reacts appropriately to exam. Tachypneic with intercostal and subcostal retractions, cough paroxysms, wheezing / squeaks / crackles in all lung fields



Tommy

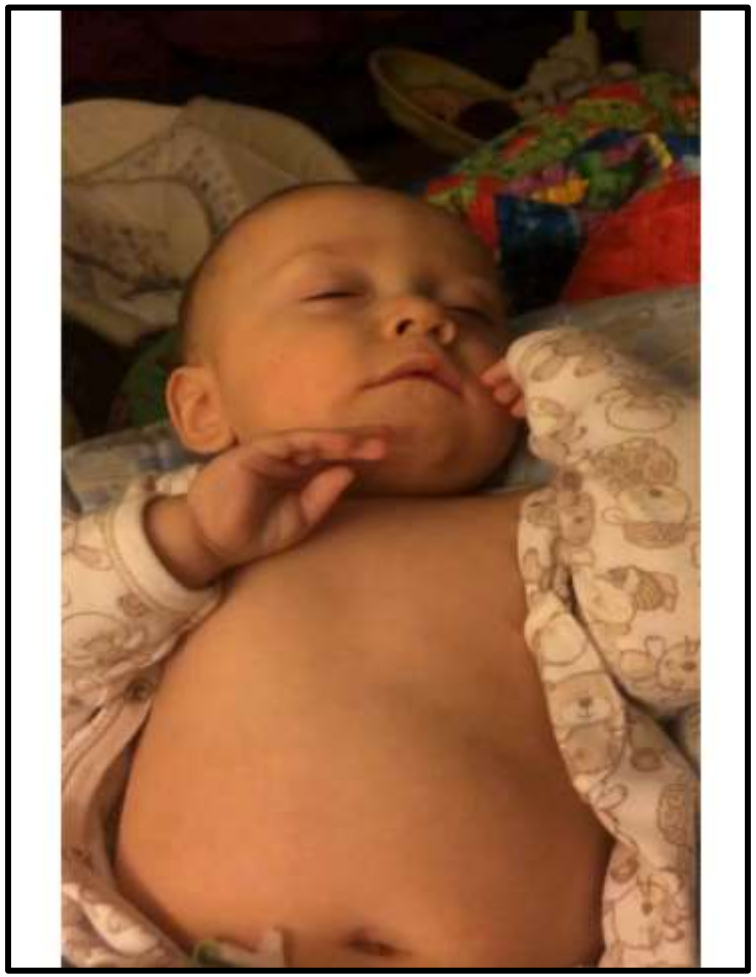
Initial Evaluation of Pediatric Respiratory Illness

Russ Migita, MD
Professor, Department of Pediatrics, University of Washington
Clinical Director, Emergency Services
Seattle Children's Hospital

Approach to the young child in respiratory distress

- Retractions
  - Subcostal
  - Intercostal
  - Suprasternal/Supraclavicular
- See-saw breathing
- Head bobbing
- Nasal flaring
- Grunting
- Mental status changes

Video



Terry

What is the cause of the distress?

Recognizing Respiratory Problems Flowchart

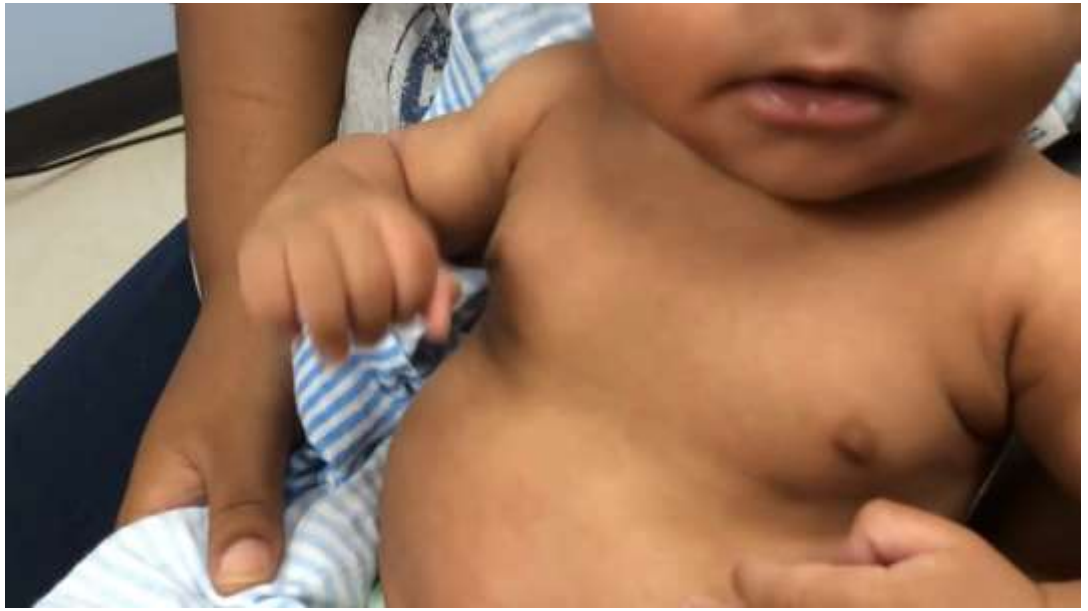
Clinical signs		Upper airway obstruction	Lower airway obstruction	Lung tissue disease	Disordered control of breathing
Airway	Patency	Airway open and maintainable/not maintainable			
Breathing	Respiratory rate/effort	Increased			Variable
	Breath sounds	Stridor (typically inspiratory) Barking cough Hoarseness	Wheezing (typically expiratory) Prolonged expiratory phase	Grunting Crackles Decreased breath sounds	Normal
	Air movement	Decreased			Variable

Inspiratory Obstruction

Upper airway obstruction

- Relatively loud inspiratory stridor
- Increased work primarily on *inspiration*
- Barky cough
- Drooling or hypoxemia are worrisome signs
- Croup, Foreign Body Aspiration, Epiglottitis, Bacterial Tracheitis

Tracy



Example

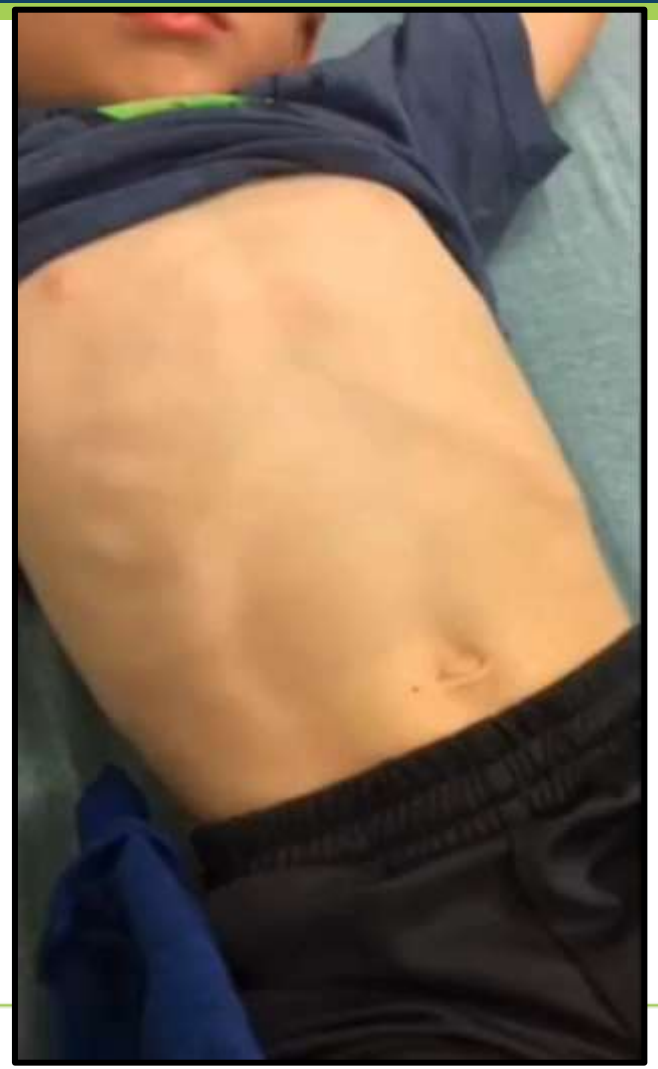
Expiratory Obstruction

Lower airway (bronchioles) obstruction

- Most of the effort is going into the expiratory phase
- Wheezes in children aren't always high-pitched and vibratory
- You have to move air to make a wheezing sound.
- Asymmetry is common
- Asthma vs Bronchiolitis

Video #1

Video #2



Teddy

Terry

Lung Tissue Disease

- Fast and shallow
- Similar on inspiration and expiration
- Inspiratory crackles
- Hearing diminished breath sounds in young children can be hard
- Pneumonia vs pneumonitis vs pulmonary edema

(apologies, video unavailable)

Bronchiolitis

- Leading cause of hospitalization in children under 2 years of age
- Hospitalization peaks 2-6 months of age
- Combination of upper respiratory congestion and lower respiratory obstruction and congestion
- Caused by many viruses: RSV, hMPV, Parainfluenza, Seasonal coronavirus, SARS-CoV-2, rhinovirus, influenza, human bocavirus
- Bronchiolitis is a clinical diagnosis
- RSV is NOT synonymous with bronchiolitis
- For first time wheezers less than 2 years of age with a clinical picture consistent with bronchiolitis, you can treat it as bronchiolitis

Assessment – Respiratory Scoring

Variable	0 points	1 point	2 points	3 points
RR				
0-8 weeks		≤60	61-69	≥70
2-11 months		≤50	51-59	≥60
12-23 months		≤40	41-44	≥45
2-3 years		≤34	35-39	≥40
4-5 years		≤30	31-35	≥36
6-12 years		≤26	27-30	≥31
≥13 years		≤23	24-27	≥28
Retractions	None	Subcostal or intercostal	2 of the following: subcostal, intercostal, substernal OR nasal flaring (infant)	3 of the following: subscostal, intercostal, substernal, suprasternal, supraclavicular OR nasal flaring / head bobbing (infant)
Dyspnea				
<2 years	Normal feeding, vocalizations and activity	1 of the following: difficulty feeding, decreased vocalization or agitated	2 of the following: difficulty feeding, decreased vocalization or agitated	Stops feeding, no vocalization, drowsy or confused
2 to 4 years	Normal feeding, vocalizations and play	1 of the following: decreased appetite, increased coughing after play, hyperactivity	2 of the following: decreased appetite, increased coughing after play, hyperactivity	Stops eating or drinking, stops playing OR drowsy and confused
>4 years	Counts to ≥10 in one breath	Counts to 7-9 in one breath	Counts to 4-6 in one breath	Counts to ≤3 in one breath
Auscultation	Normal breathing, no wheezing present	End-expiratory wheeze only	Expiratory wheeze only (greater than end-expiratory wheeze)	Inspiratory and expiratory wheeze OR diminished breath sounds OR both

- Liu et al., *Pediatric Pulmonology*, 2004
- MDCalc - Respiratory Score for Asthma (Liu et al) (mdcalc.com)
- Seattle Children's bronchiolitis pathway - CSW Bronchiolitis Pathway (seattlechildrens.org)

Testing

NOT Routinely Recommended

- Chest x-rays
- Viral testing
- CBC or blood cultures (after 3 weeks of age)

Treatment

NOT Routinely Recommended

- Albuterol and/or ipratropium
- Steroids
- Racemic epinephrine
- Antibiotics
- Chest physiotherapy
- Hypertonic nebulized saline

Recommended Treatment

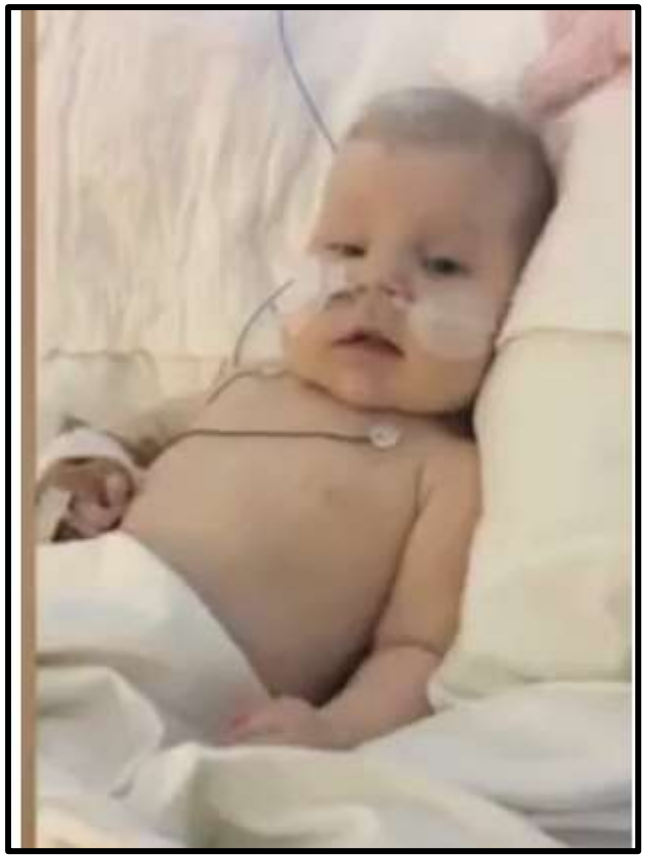
- Suctioning
- Hydration
- Fever and comfort control (acetaminophen and/or ibuprofen)
- Reassessment

Disposition Decision

- Children who need supportive care
  - Persistently hypoxemic
  - Unable to orally hydrate on their own
  - Subjectively working hard enough that you don’t feel comfortable sending them home

ED Room 2: Case Update

- Rapid Resp panel results: COVID neg, Influenza neg, RSV positive
- VS: HR 152 RR 53, O2 sat now consistently 88-89% on 1 lpm NC, Temp 100.9
- PE: Mild improvement in WOB, less irritable

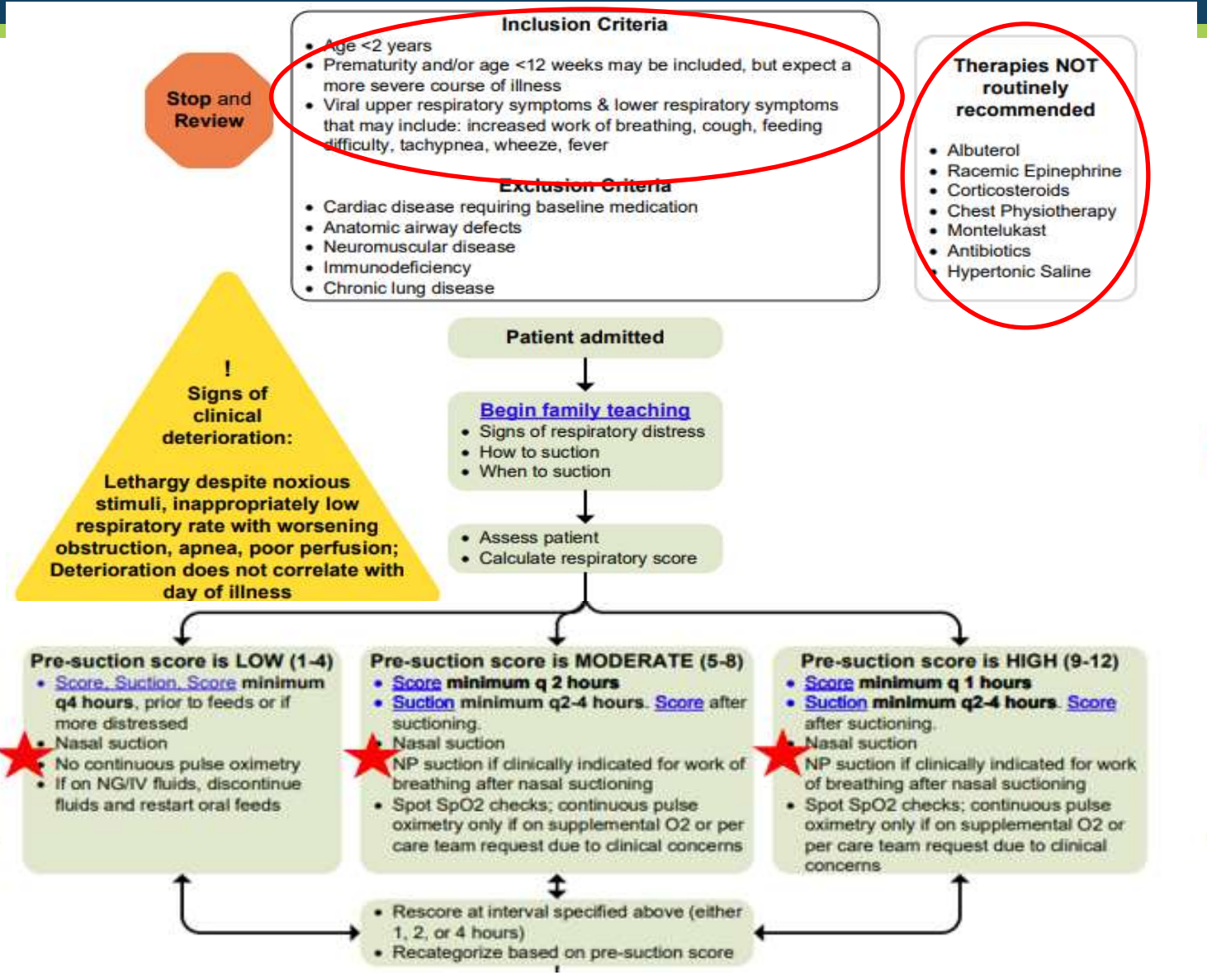


Tommy

Bronchiolitis: In-Hospital Care

Amanda Striegle, MD, MS
Clinical Associate Professor, Department of Pediatrics, University of Washington
Director, Pulmonary Clinical Operations
Medical Director Respiratory Care
Seattle Children's Hospital
UW Department of Pediatrics Division of Pulmonary and Sleep Medicine

SCH Bronchiolitis Pathway



Equity Opportunity

- When using a pulse oximeter, be aware that skin pigmentation is one of multiple factors that can affect the accuracy of a reading (Shi 2022).

SCH Bronchiolitis Pathway

Treatment: Suctioning

Suctioning is not widely evaluated in the literature, but is considered essential to bronchiolitis care.

- Used to clear secretions from the nares / airway that the child is unable to clear himself / herself.
- Induces coughing, which allows child to clear lower airway secretions.
- Reduces work of breathing and improves oral intake.
- Suction gaps may be associated with longer LOS.
- Patients admitted with bronchiolitis should receive suction of the nares at frequent intervals.

Mussman 2013, AAP 2014

Mouth-operated nasal aspirator
(To be used by caregiver only)

Nasopharyngeal (NP) suction catheter

Olive tip suction

Bulb suction

Disclaimer: no RCTs of suctioning type, method or frequency have been completed to date

SCH Bronchiolitis Pathway

Treatment: NG or IV Fluids

Intravenous (IV) or nasogastric (NG) fluid administration should be considered if the patient cannot maintain hydration orally or is severely dehydrated (AAP 2014).

- NG hydration is as effective as IV hydration in patients with bronchiolitis, and requires fewer attempts at placement. It is advisable to involve caregivers in the decision of how to hydrate their child.
- Because respiratory distress may increase the risk of aspiration:
  - Patients with significant coughing, choking, gagging, or worsening tachypnea with feeds should be made NPO, and IV/NG feeds started.
  - Patients with a sustained respiratory rate > 60 should be evaluated for safety of a feeding trial. If severe distress, do not attempt feeding trial and make NPO.

SCH Bronchiolitis Pathway

Treatment: Supplemental Oxygen

Supplemental oxygen should be provided if SpO2 falls persistently below 90%. The goal is to provide oxygen to maintain SpO2 at or above 90%. (AAP 2014)

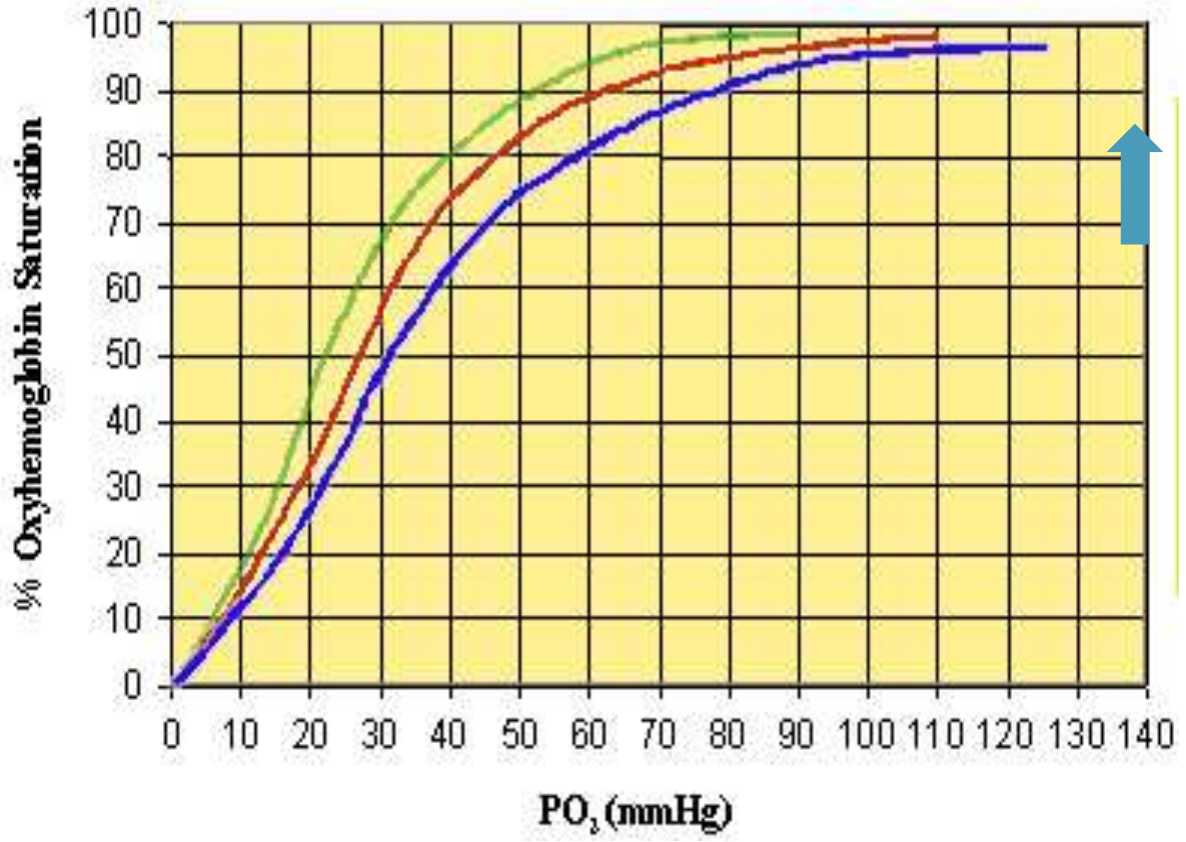
- Oxygen is supplied via nasal cannula, using the lowest flow possible.
- SpO2 drops to 88% are acceptable during sleep.
- <20 sec drops in SpO2 to the 80s in the sleeping child do not require supplemental oxygen; these may occur in healthy infants. (Hunt 1999)
- Deeper self-resolving desaturations may not be clinically meaningful in mild-to-moderate bronchiolitis patients, who should therefore be taken off continuous pulse oximetry once off supplemental oxygen. (Principi 2016)

Cunningham S, and the Bronchiolitis of Infancy Discharge Study (BIDS) group. Lancet. 2015 Sep;386(9998):1041-8

Can you give too much Oxygen?

8kg infant with respiratory rate 40/min

Delivery Device	F_DO_2
Blow-by: 2 inches from face	95%
Blow-by: 4 inches from face	48%
Nasal cannula 0.25 L/min	28%
Nasal cannula 1 L/min	52%
Nasal cannula 2 L/min	84%
Simple Face Mask 5 L/min	56%
Simple Face Mask 7 L/min	60%



Going With (the) Flow

Minute ventilation (Mve)

Total gas exchanged over unit time

= Tidal volume x Respiratory Rate

MVe for 8kg patient, RR 50/min

= at least 2.4 L/min

Impacted by metabolic demands (ie, illness or fever)

Inspiratory Flow

Rate of gas flow entering the lungs

= Tidal volume / Inspiratory Time

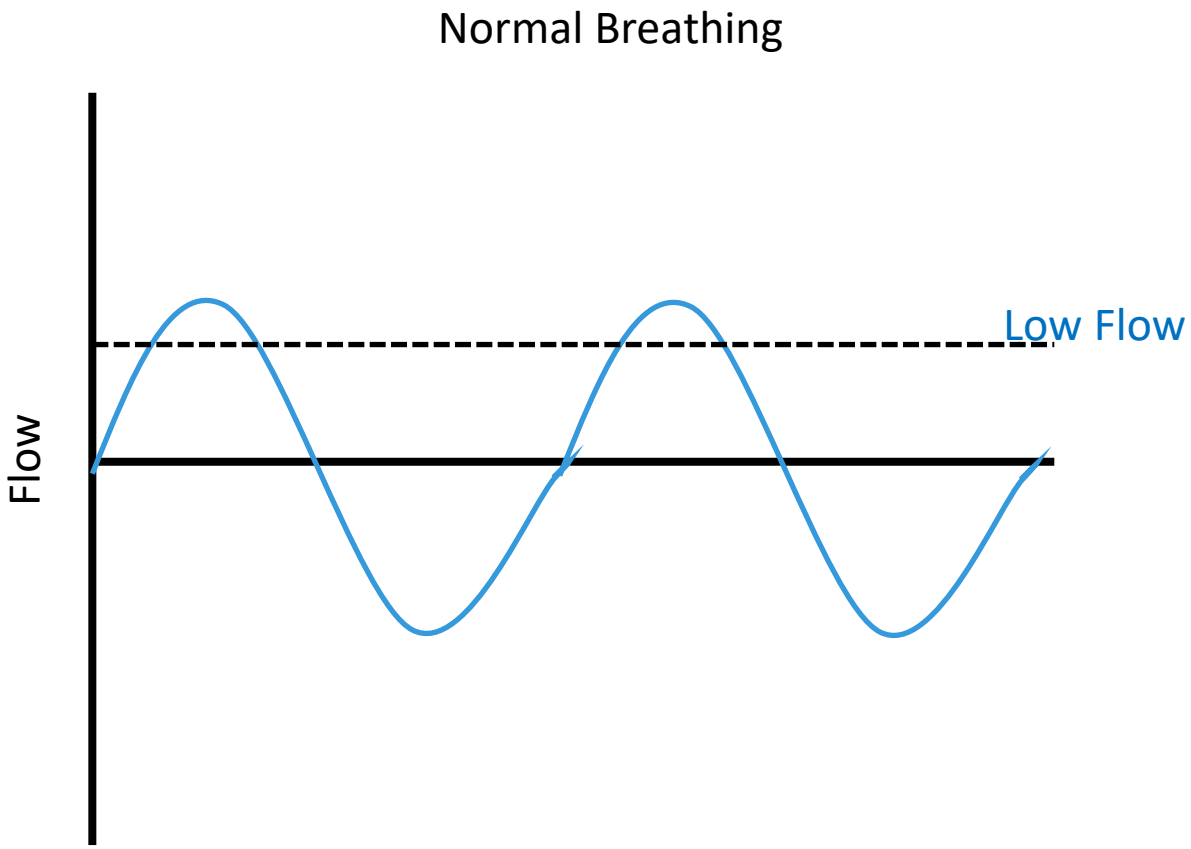
Insp. Flow for 8kg patient, RR 50/min

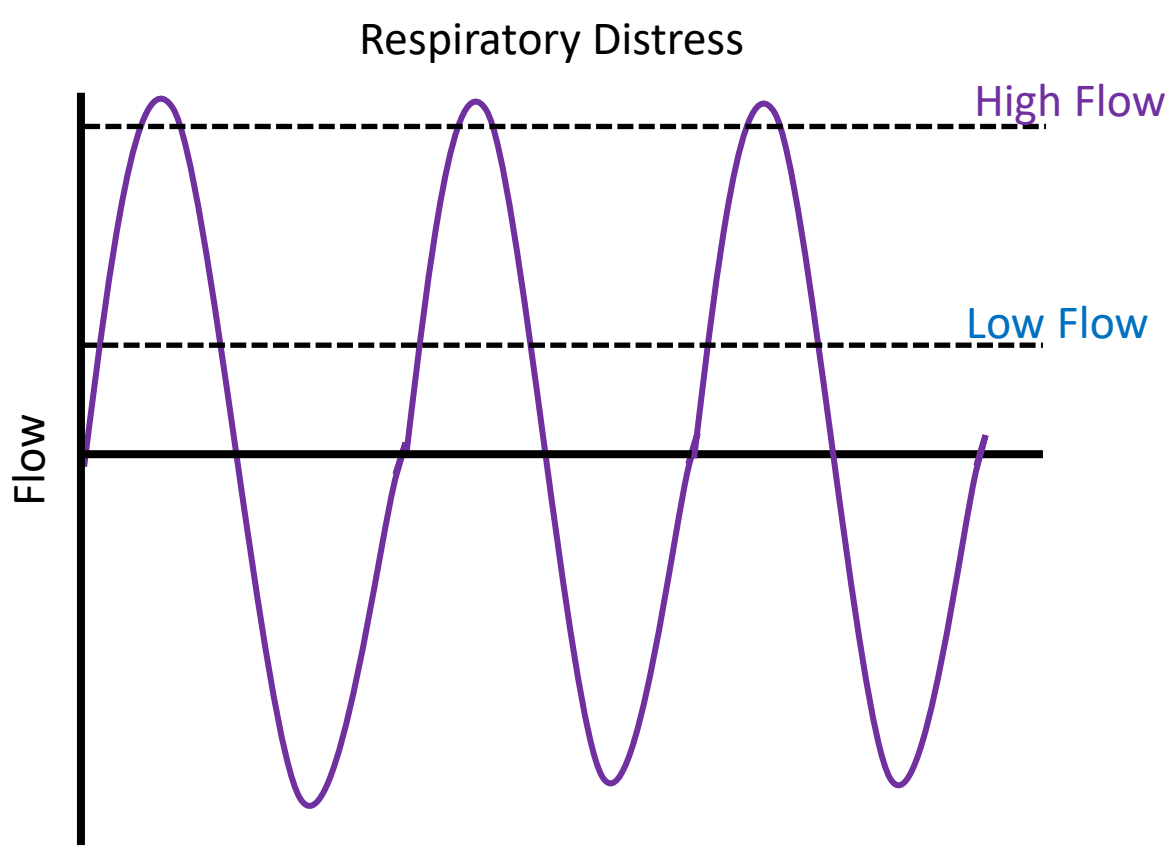
= at least 4.8 L/min

Impacted by airway resistance, respiratory rate, strength

When delivered flow > patient flow, we are better positioned to modify gas exchange and relieve work of breathing

Going With (the) Flow

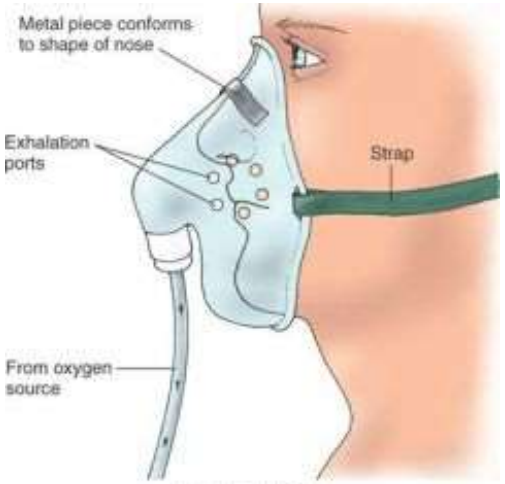




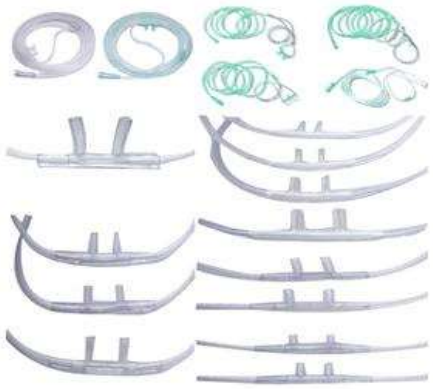
Low-Flow Therapy

- **Gas flow rate < patient inspiratory flow**

- **Typically does not utilize a blender (F_IO_2 1.0)**
- **Oxygen delivery varies as respiratory pattern varies, 22-95% F_DO_2** (hard to know for sure)
  - **Entrainment of ambient air**
  - **Tidal volume, respiratory rate and effort**
  - **Position of device**

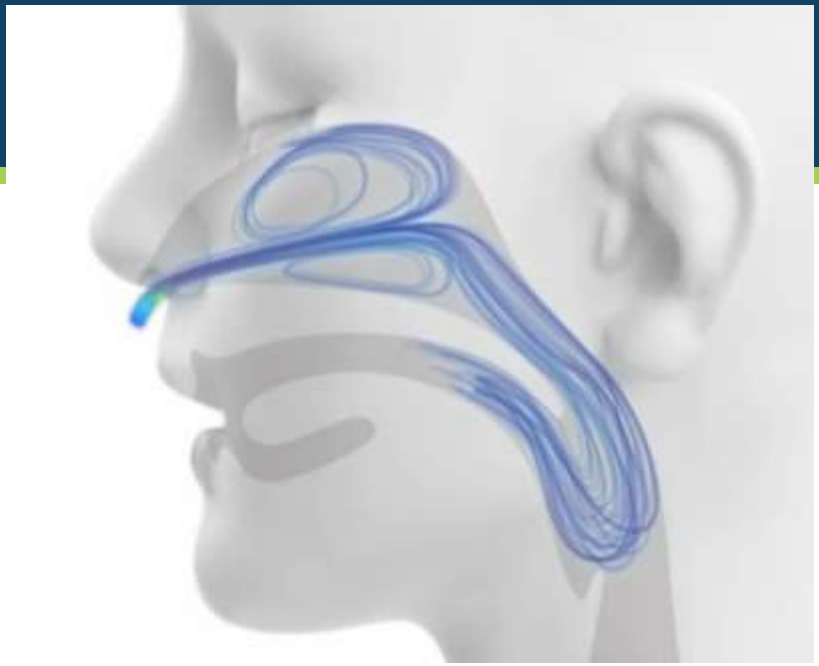


Simple Face Mask



Nasal Cannulae

High-Flow Therapy



- **Gas flow rate ≥ patient inspiratory flow**

- **Blenders allow for precise titration of F_IO_2**
- **O_2 delivery more consistent, 22-100% F_DO_2**
- **CO_2 washout from oro/nasopharynx improves efficiency of ventilation**
- **Reduces work needed to overcome nasal airway resistance**
- **End-expiratory pressure – variable by age, cannula size, flow rate**

High-Flow Therapy

Leaning on the evidence

- Retrospective analyses report lower intubation rates after HFNC adopted
- In randomized trials, HFNC is not clearly superior to standard NC O_2 with respect to RR, LOS and intubation rates; however, most trials have evaluated cohorts with mild disease
- HNFC is comparable to CPAP with respect to duration of support, intubation and mortality rates in a single center trial[1]
- Pre-emptive HFNC for all bronchiolitis patients with O2 need likely lengthens LOS[2]

1 - Ramnarayan P, et al. JAMA. 2022;328(2):162.

2 - Armarego M, et al. Cochrane Rev. 2024;3(3). Epub 2024 Mar 20.

High-Flow Therapy

	Acute Care Minimum 0.5 LPM/kg		Acute Care Maximum 1.5 LPM/kg		ICU Maximum HFNC 2 LPM/kg	
	HFNC minimum (L/min)	Estimated PEEP (cm H20)	HFNC maximum (L/min)	Estimated PEEP (cm H2O)	HFNC maximum (L/min)	Estimated PEEP (cm H2O)
0-90d	3	2	4	3	8	10
91d-6mo	4	<1	6	2	10	6
>6mo-1yr	5	<1	8	2	12-20	4-10
>1 yr-2yr	5	<1	10	3	15-20	6-10

Flow rates >2 LPM/kg are not superior in prevention of treatment failure, and are associated with longer ICU LOS and greater discomfort

Milesi, C et al. Intensive Care Med (2018) 44:1870–1878

Initiate HFNC at 1.5 L/min/kg*
(max 25 L/min), FiO2 21%

- Titrate FiO2 to keep SpO2 ≥ 90%; max acute care FiO2 is 50%
- Vital signs q30 min x3
- Ensure NPO

Hypoxia or Respiratory Distress Improved

- Wean flow rates and FiO2 as tolerated (see below)
- Suction q2-4 hours until off HFNC
- Vitals q2 hours x 12 hours, then q4 hours
- Encourage NG over IV for hydration if clinically stable; otherwise NPO
- May orally feed once weaned to 0.5 L/min/kg and safe for feeding

Minimum flow	Maximum flow*
0.5 L/min/kg	1.5L/min/kg (max 25 L/min)

*Delivery of flow may be limited by the cannula that the patient's face can accommodate; recommended nare occlusion of 50% should be used to size the cannula

Weaning HFNC in Improving Patients

- Daily weaning trial and as often as q4 hours as tolerated
  - On 21% FiO2: trial off HFNC at least daily
  - On > 21% FiO2: trial to 0.5 L/min/kg at least daily, then off HFNC
  - Avoid gradual weans using other flows

Call for Help / Transfer

- Worsening / failure to improve despite 2lpm/kg HFNC
- SpO2 <90% despite 40% FiO2
- Apnea requiring intervention
- Markedly asymmetric exam or imaging
- Evidence of fatigue
- Medical complexity
  - Congenital heart disease with cyanosis or over-circulation
  - Hypotonia
  - Prematurity related lung disease

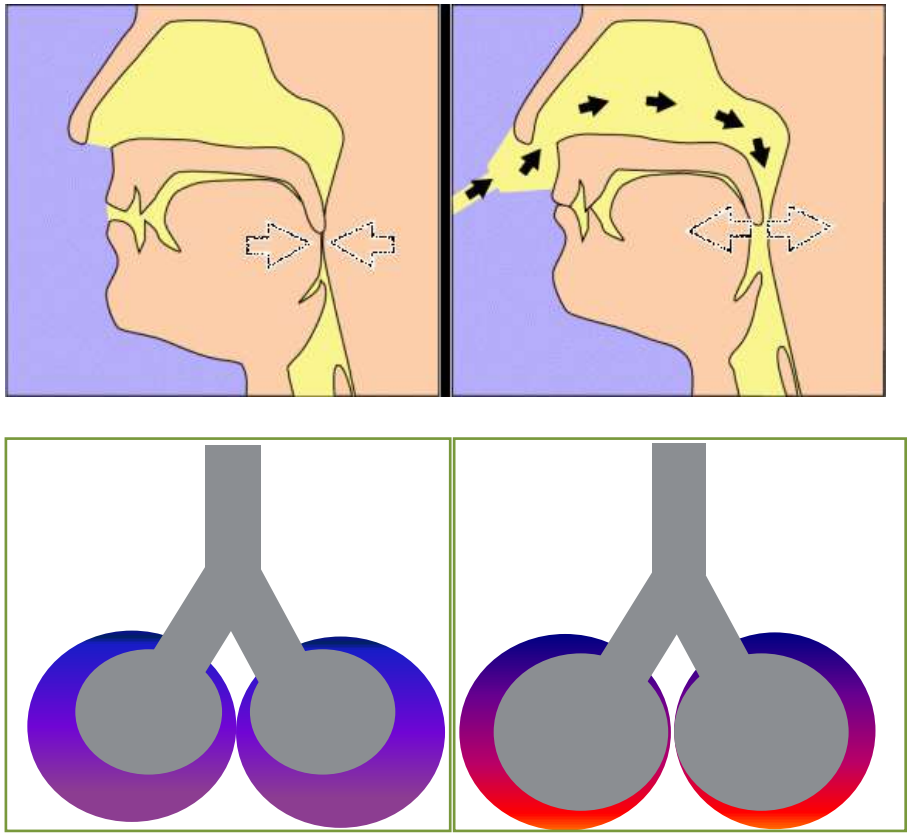
Non-invasive Positive Pressure (NIPPV)

- **High flow blended gas delivered through a sealed system (nasal or face mask)**
- **Targets a set airway pressure**
  - **CPAP = Constant (inspiratory = expiratory)**
  - **Bilevel = Variable (inspiratory > expiratory)**
- **Reliable oxygen delivery**
- **Reduces work**
- **Can improve both oxygenation and ventilation**

CPAP

Continuous positive airway pressure (CPAP)

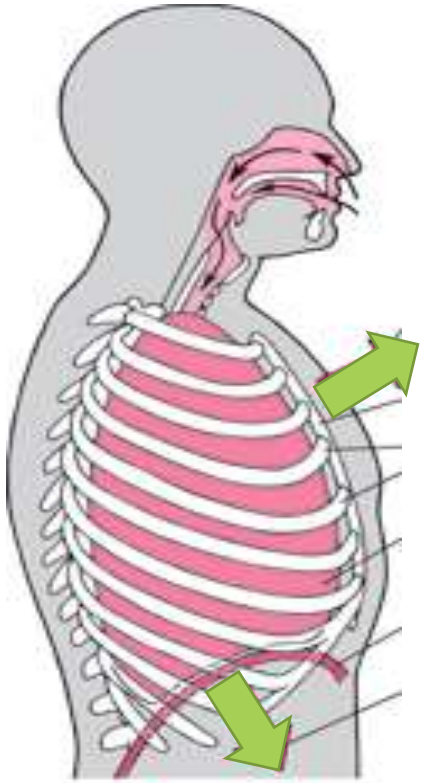
- Single set pressure, typically 5-12 cmH_2O
- Stents airways open
- Reduces respiratory work due to high airway resistance & low pulmonary compliance
- Increases functional residual capacity (FRC)



BiLevel PAP

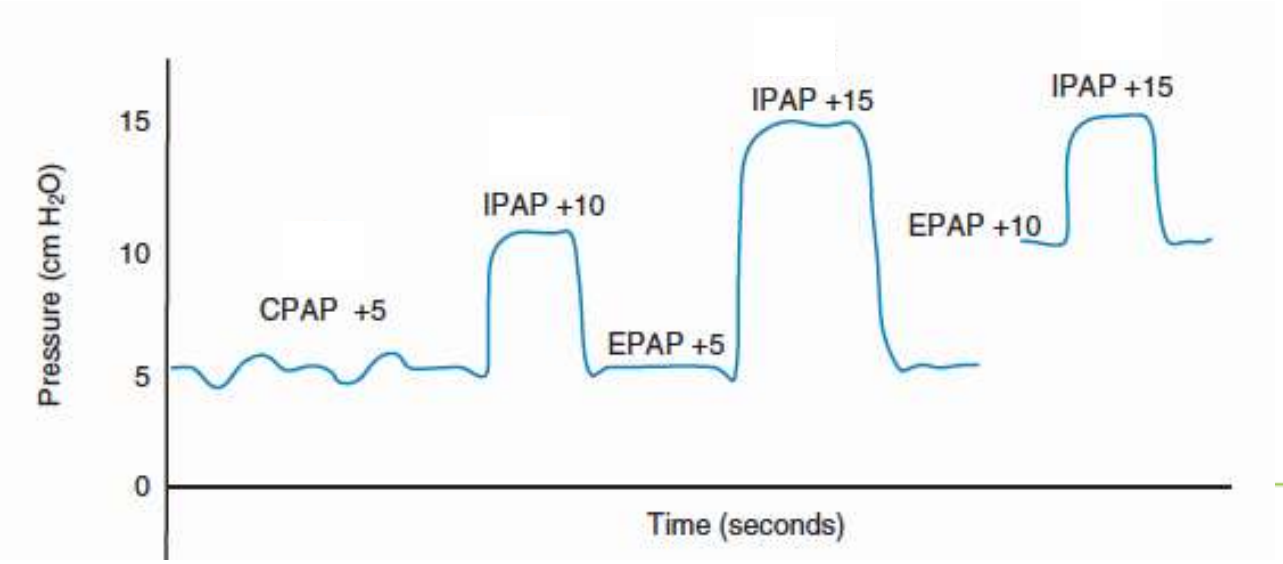
Bi-level or variable positive airway pressure (BiPAP/VPAP)

- Higher inspiratory and lower expiratory set pressure, difference 6-10cmH_20
- Stents airways open
- Reduces work of breathing & supports fatigued inspiratory muscles
- Increases minute ventilation
- Can overcome central apnea (if rate set)



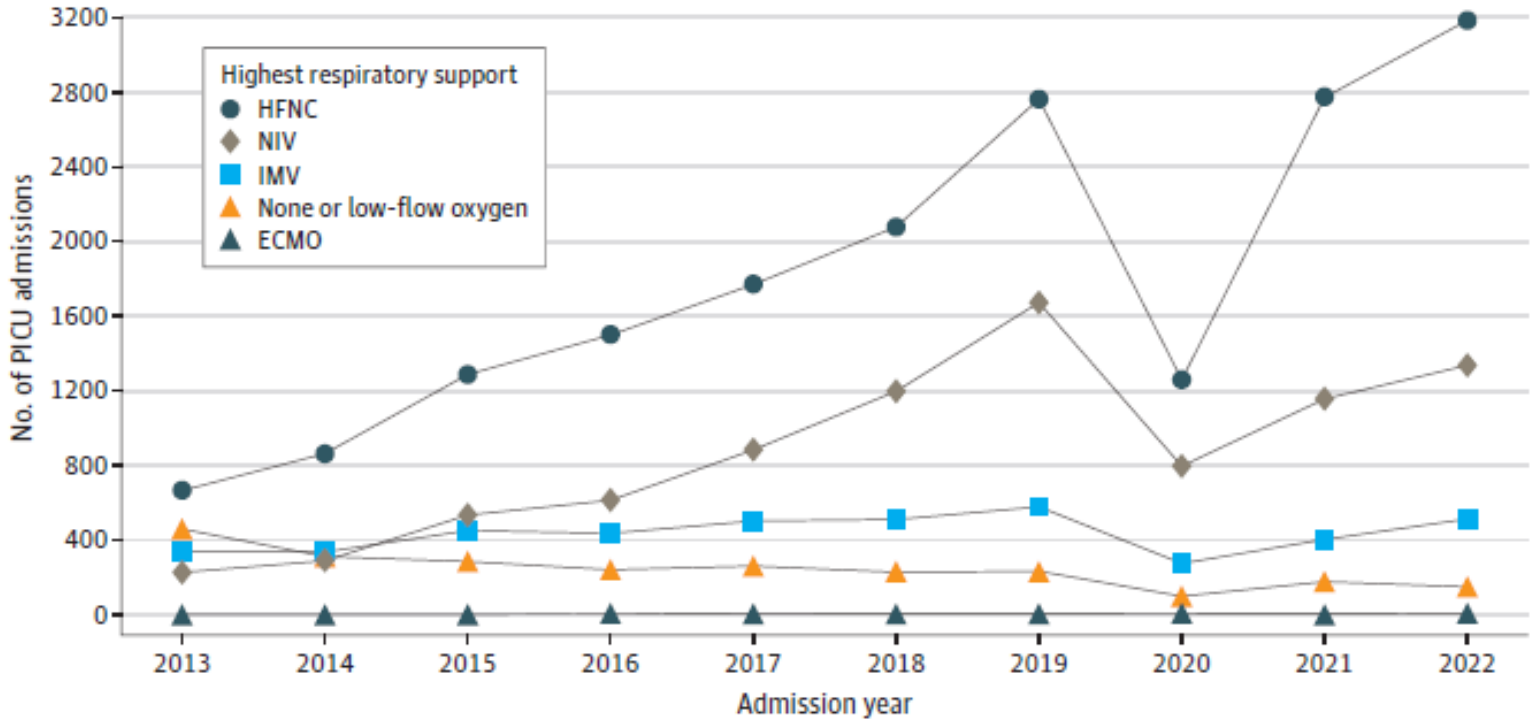
BiLevel PAP

Mode	Patient Characteristics	Pressure Settings	Time Settings	Phase Variables
S Spontaneous	Drive intact, strong	IPAP 10-20 EPAP 5-8	N/A	Trigger – very sensitive (low number) Rise – fast (low number)
S/T **Spontaneous/Timed**	Having apnea, weak or getting tired	IPAP 10-20 EPAP 5-8	Rate 12-20 I-Time 0.5-1	



Intubation & mechanical ventilation

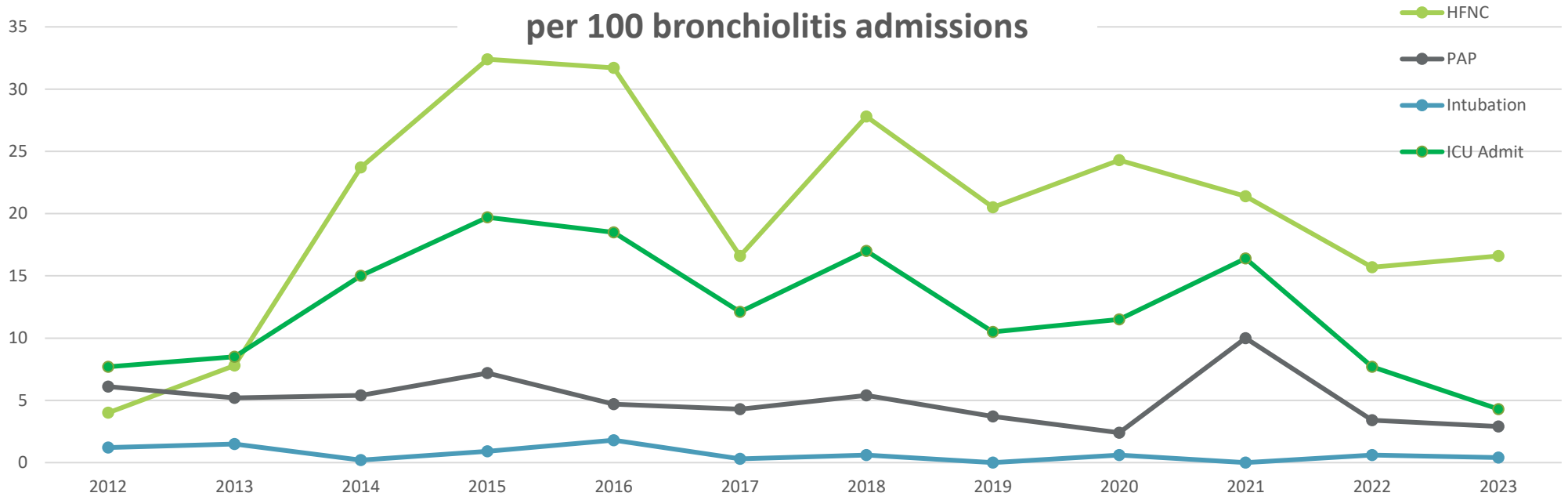
Figure 1. Bronchiolitis Pediatric Intensive Care Unit (PICU) Admissions Over Time Stratified by Maximum Level of Respiratory Support Required



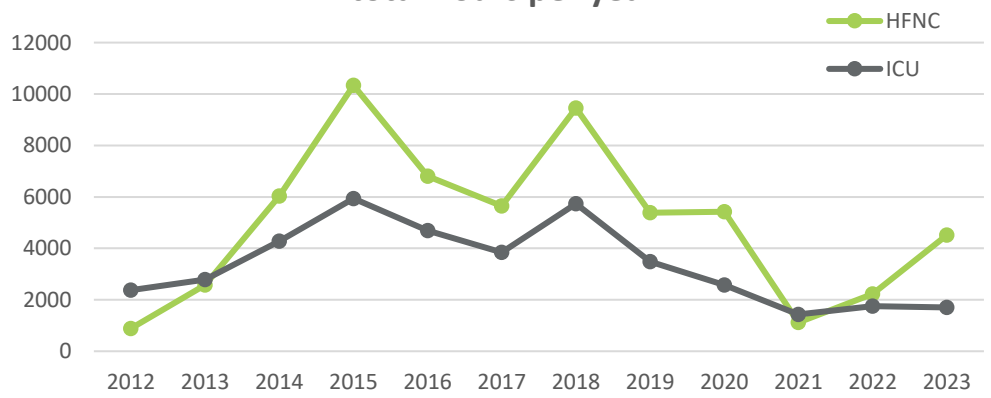
Intubation rates range 3-7% for otherwise healthy infants in the published literature

Pelletier, et al. JAMA Network Open. 2024;7(5):e2410746.

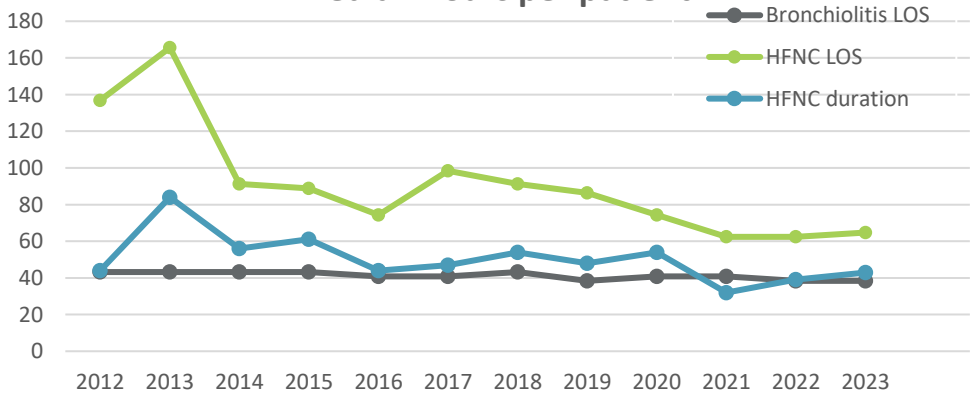
Respiratory Support, SCH 2012-2023
per 100 bronchiolitis admissions



Resource Utilization, SCH 2012-2023
total hours per year



Care Duration, SCH 2012-2023
median hours per patient



Intubation and mechanical ventilation

Risks

- Cardiorespiratory arrest – 1-2% of all intubation attempts
- Airway injury & inflammation – up to 1/3 undergo repeat attempts
- Impairs passive mucociliary clearance
- Lessens cough response and effectiveness
- Sedation
- Ventilator associated lung injury

Bronchiolitis “plus”

When to expect a more severe course:

- Premature birth <32 weeks
- Maternal history of asthma or atopic infant (food allergies, eczema)
- Prior wheezing episode needing pharmacotherapy, ED or admission
- Laryngomalacia or other airway abnormality
- Cystic Fibrosis
- Trisomy 21
- Hypotonia

Bronchiolitis “plus”

Therapies to consider <u>case by case</u> -

- Bronchodilators
- Systemic corticosteroids
- Nebulized hypertonic saline (3% or 7%)
- Antibiotics

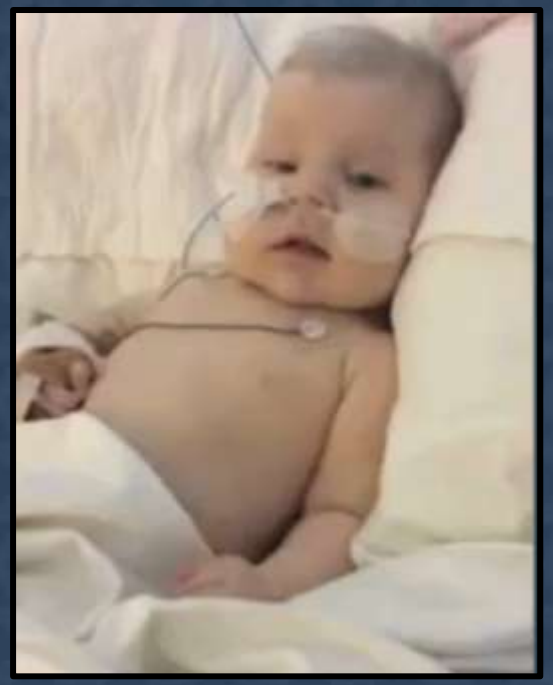
Therapies that are <u>not recommended</u> -

- Chest physiotherapy
- Heliox
- Monoclonal antibodies (nirsevimab or palivizumab) for acute disease
- Daily leukotriene modifiers or inhaled steroids after first episode

Panel Discussion Q&A

Tracy

Timmy



Tommy

Terry

Teddy

Clinical Resources:

Facility Pathways/Recommendations:

- Mary Bridge Clinical Practice Guidelines (CPG)
  - Mary Bridge Children's Bronchiolitis CPG
- Seattle Children's Clinical Standard Work Pathways
  - Seattle Children's Bronchiolitis Pathway ED Management
- Sacred Heart: Bronchiolitis, HFNC Weaning, PICU
- Swedish:

NWHRN Clinical Pediatric Clinical Resources

2024-2025 Respiratory Virus Update

Mary Fairchok, MD
Medical Director, Pediatric Infectious Diseases
Medical Director, Infection Control
Mary Bridge Children's Hospital, Multicare Health System
Clinical Professor, Department of Pediatrics, University of Washington

Updates on SARS-COV-2 and other respiratory viruses

Mary P Fairchok MD

MultiCare

2024/2025 Outlook

Respiratory Illnesses Data Channel | Respiratory Illnesses | CDC

- Likely a similar or lower peak number of combined hospitalizations from COVID-19, influenza, and RSV compared to last year.
  - However, peak hospitalizations from all respiratory viruses remain likely to be substantially higher than they were before the emergence of COVID-19.
- COVID-19 activity this fall and winter will be dependent on the progression of the ongoing summer COVID-19 wave. https://www.cdc.gov/cfa-qualitative-assessments/php/data-research/resp-dis-season-outlook/
- Influenza and RSV seasons generally begin in October, although they can vary in timing and burden.
- CDC will update this outlook every two months during the fall and winter virus season and if there are big changes in how COVID-19, flu, or RSV are spreading.

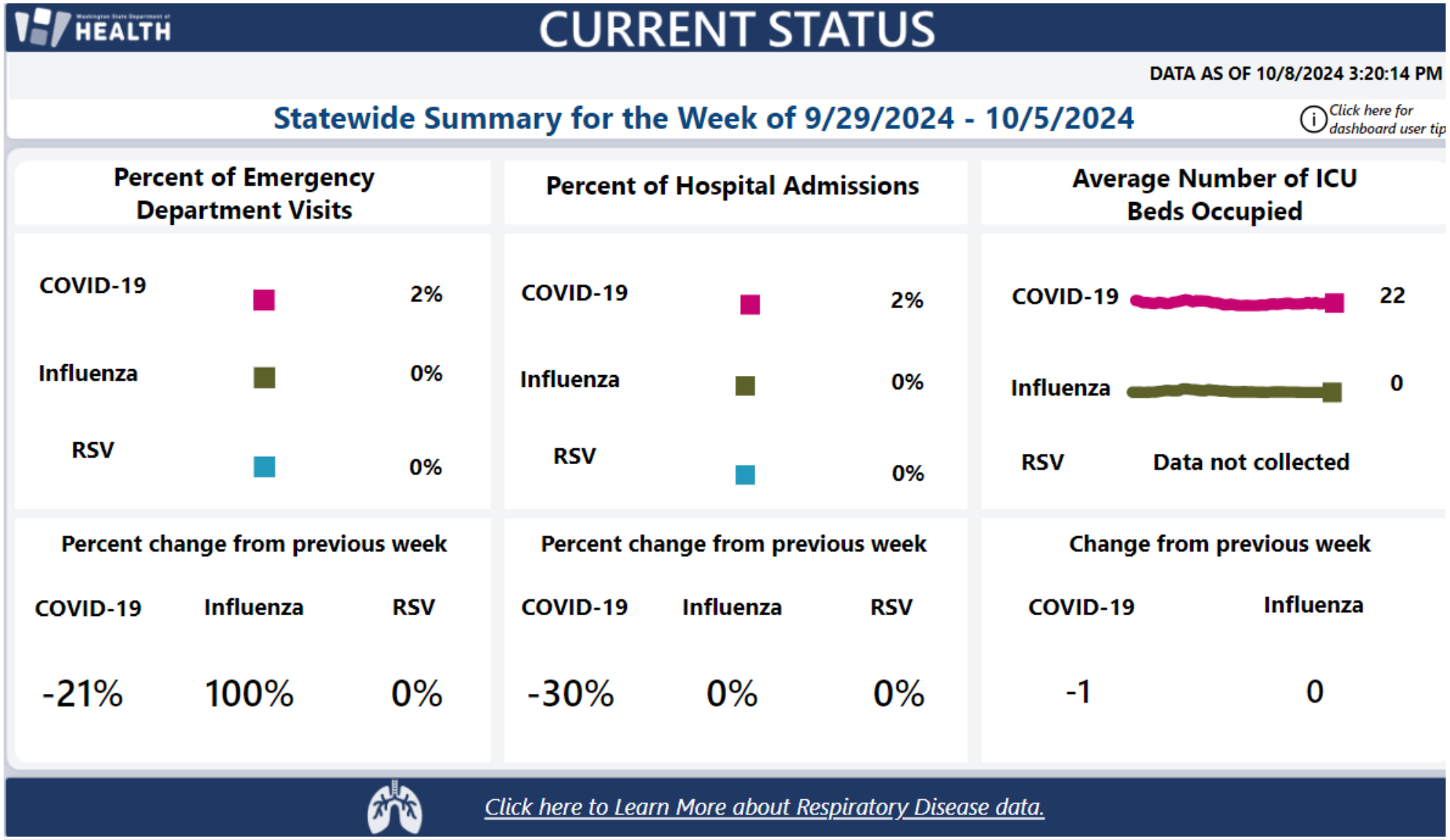
Reported on Monday, October 14 , 2024.

Current Activity

Respiratory Illnesses Data Channel | Respiratory Illnesses | CDC

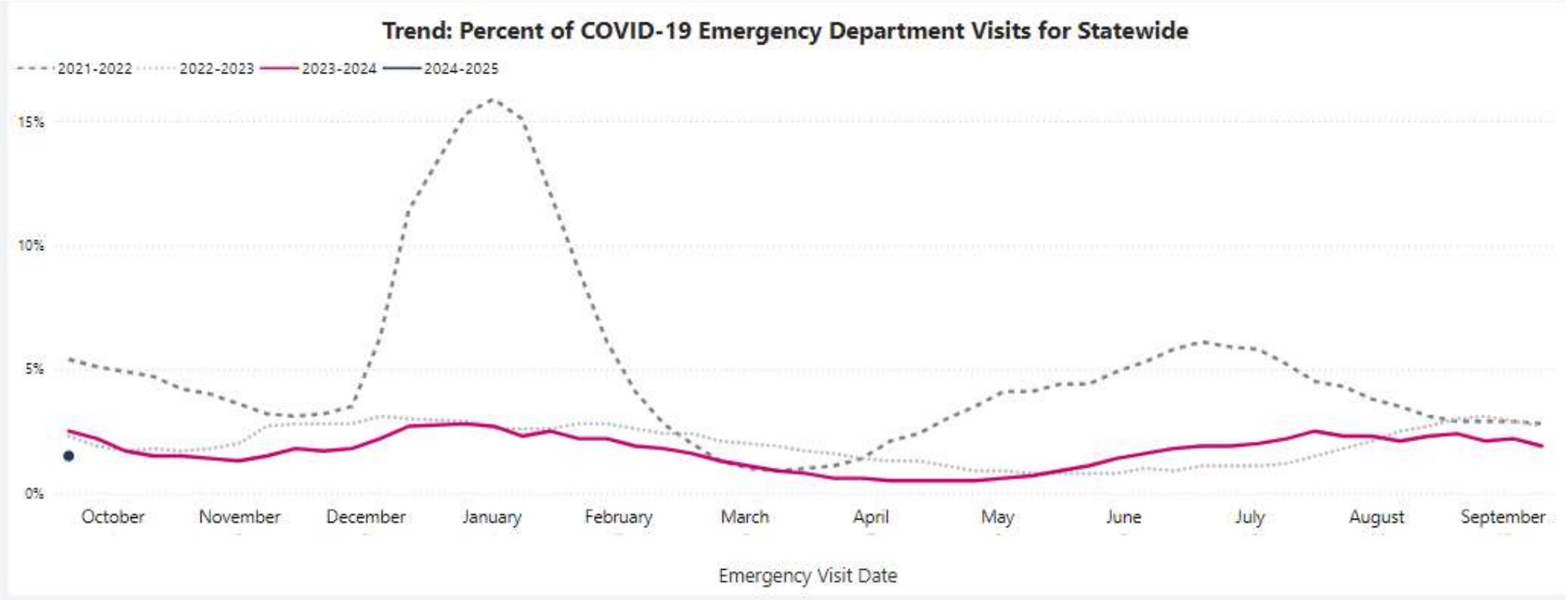
- Seasonal influenza and RSV activity are low nationally, but signs of increased RSV activity has been detected in SE US.
- COVID-19 activity is declining in most areas.
  - ED visits for COVID-19 are highest among infants and older adults.
  - Hospitalizations for COVID-19 are highest among older adults.
  - Deaths associated with COVID-19 have remained stable at 2.0% of all deaths nationally.
- 2024-2025 COVID-19 vaccines are expected to provide protection against circulating variants

Respiratory Viruses-the big 3, Current Status in WA



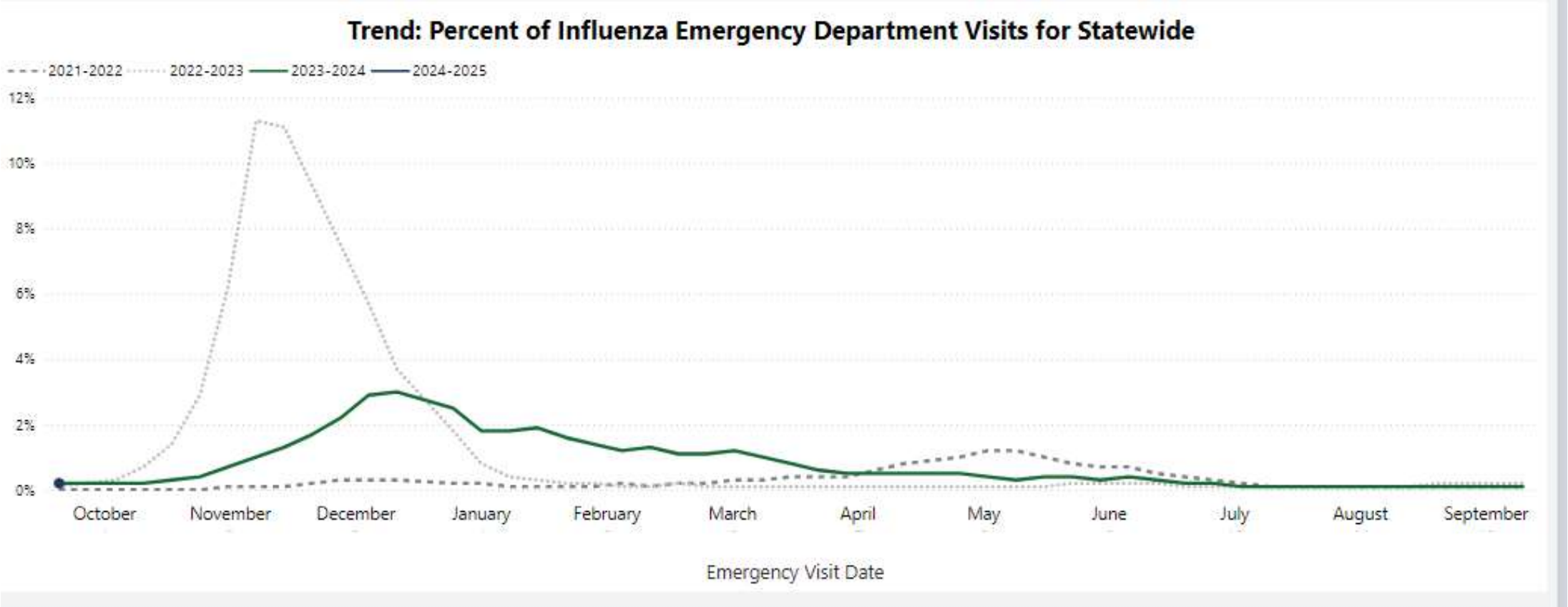
MultiCare

Current WA State Activity - COVID-19



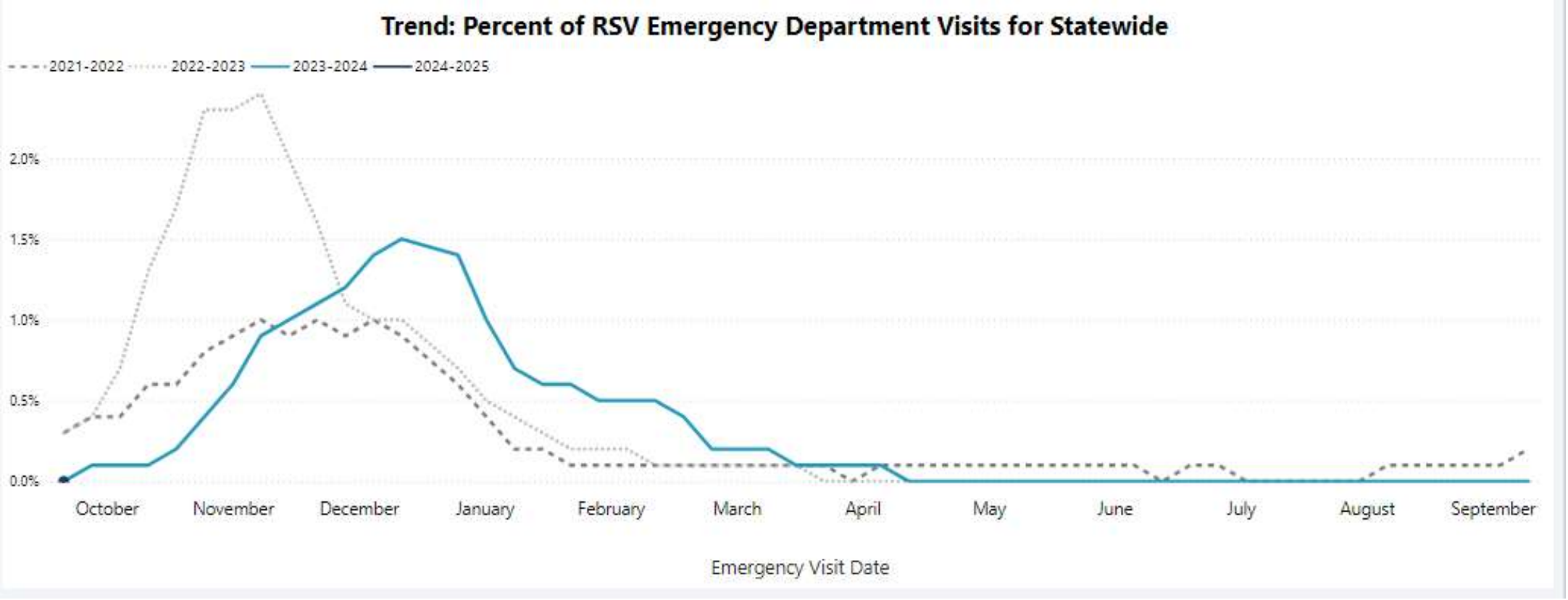
[Respiratory Illness Data Dashboard | Washington State Department of Health]

Current WA State Activity - Influenza



Respiratory Illness Data Dashboard | Washington State Department of Health

Current WA State Activity - RSV

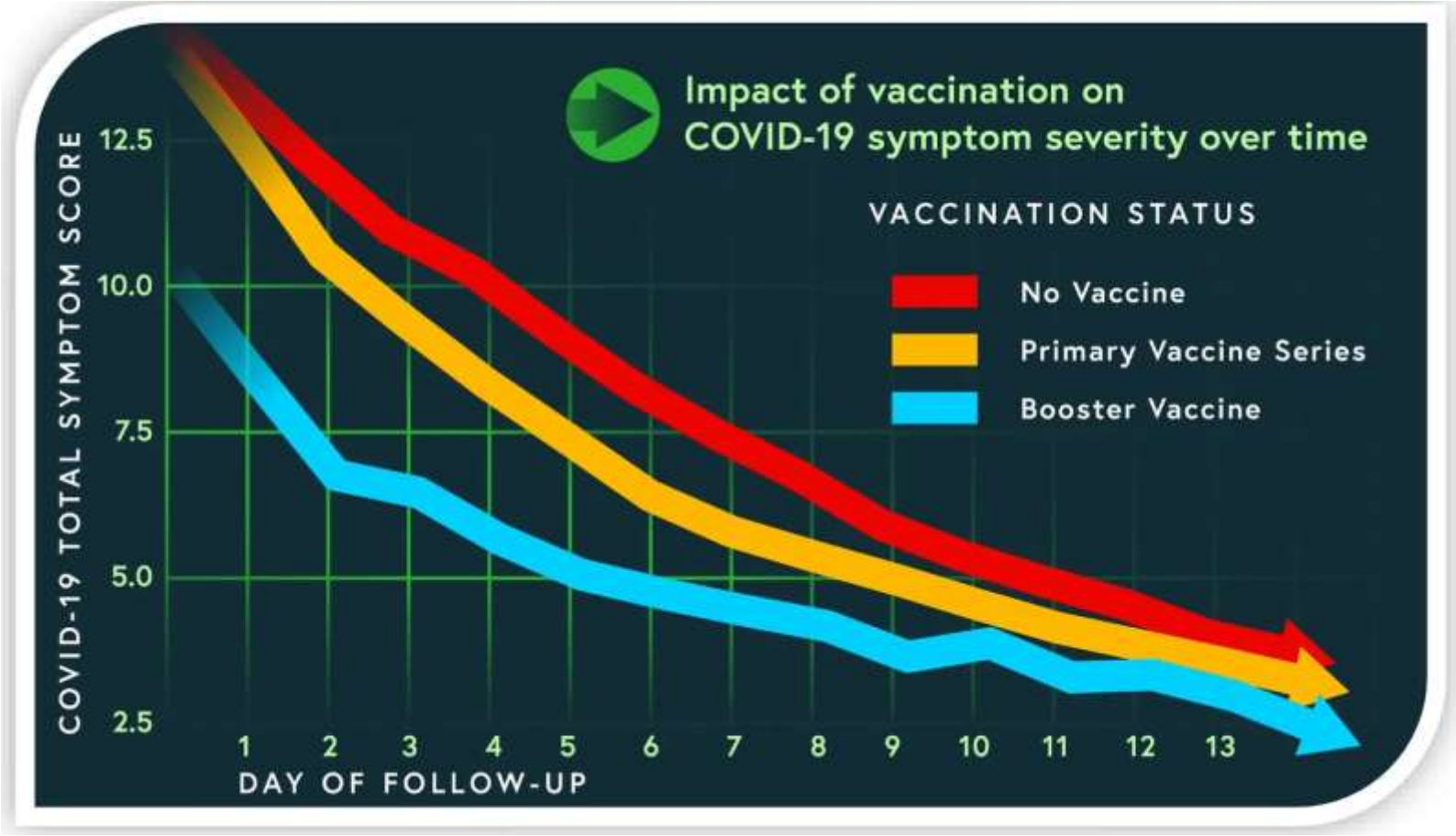


Respiratory Illness Data Dashboard | Washington State Department of Health

COVID 19 Vaccine

- Fall vaccine has been updated to target Omicron subvariants circulating (JN.1->KP.2)
- WHO: Everyone 6 months and older
- Moderna: 6 months and older (KP.2)
- Pfizer: 6 months and older (KP.2)
- Novavax: 12 years and older (targets JN.1)

- Source: *Clin Infect Dis*, Volume 76, Issue 3, 1 February 2023, Pages e1–e9 https://doi.org/10.1093/cid/ciac772



When to get the COVID booster

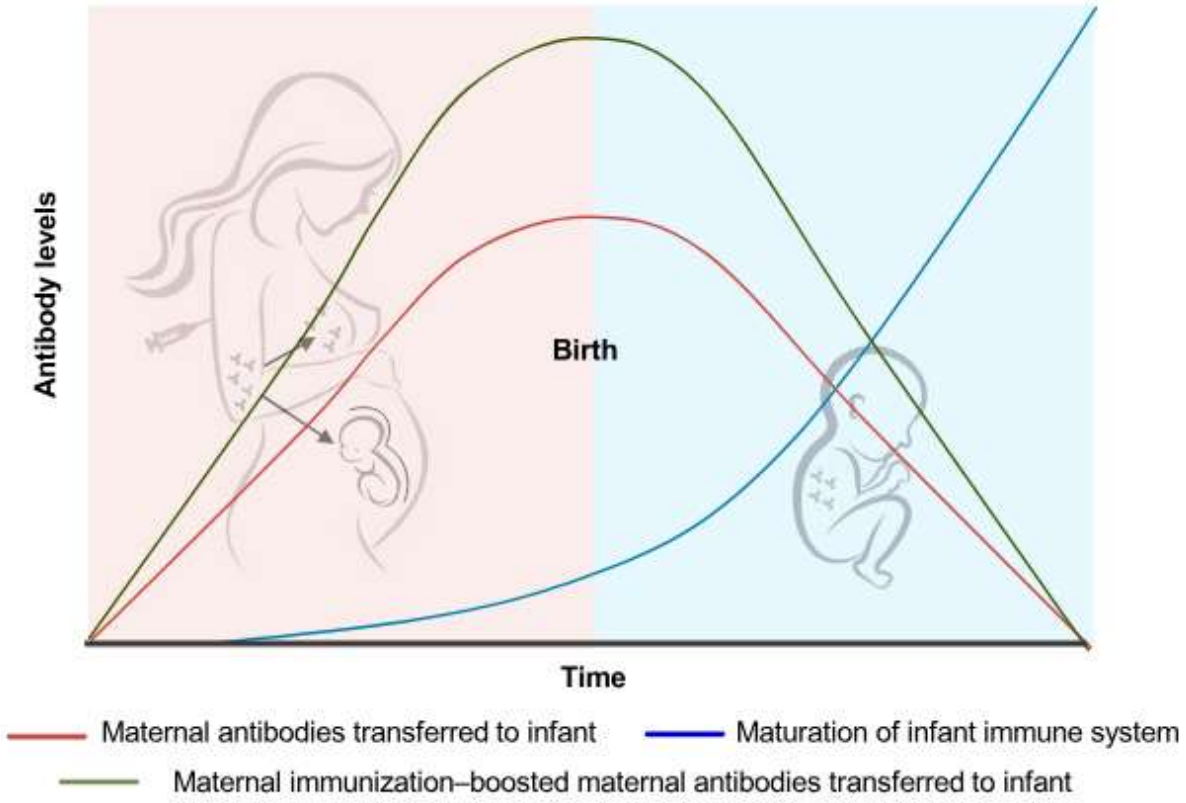
- Ok to get at any time after infection BUT
- Booster doesn’t add much benefit when given within 60-90 days of infection/immunization-will boost neutralizing abs, but doesn’t broaden B cell memory
- The longer we wait after infection/vaccination, the better the boost BUT waiting is a gamble. Maximum wait: 8-12 months
- SUGGESTION:
- ***Over 65 or at risk for severe disease***: Vaccinate 3-4 months after infection/previous vaccine. Don’t wait.
- ***Under 65 and not high risk***: Wait at least 6 months if possible, but if a wave is starting to take off, get the vaccine.

RSV

Finally some progress in prevention!

Active immunization during pregnancy protects infants

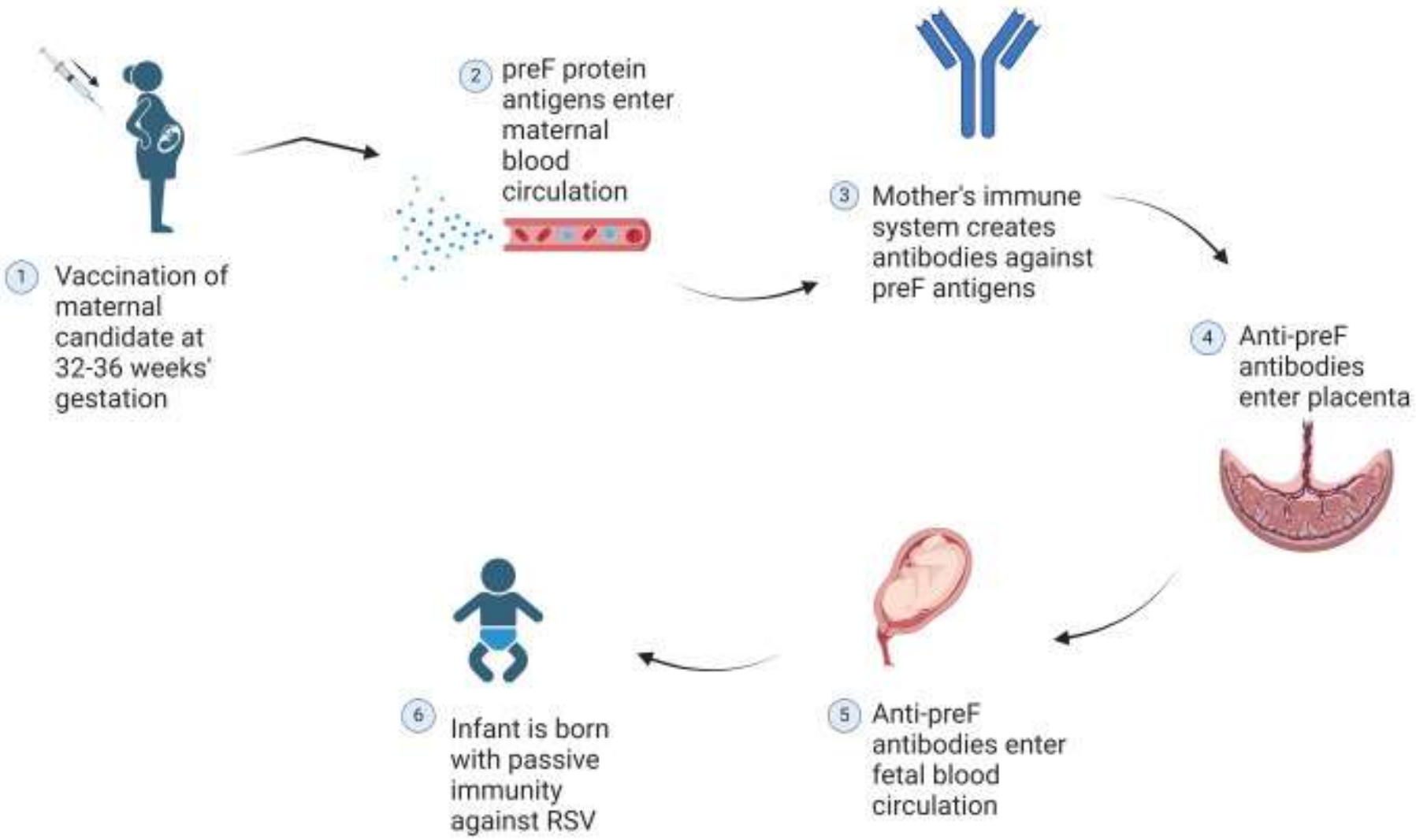
Maternal Abs begin transfer ~ 27 weeks



Maternal antibodies transferred to infant will decay over time

Vaccine induced maternal Abs may decay slower, affording protection for ~ 6 months

This protection allows infant to reach age where active vaccination of infant will provide protection


1 Vaccination of maternal candidate at 32-36 weeks' gestation
2 preF protein antigens enter maternal blood circulation
3 Mother's immune system creates antibodies against preF antigens
4 Anti-preF antibodies enter placenta
5 Anti-preF antibodies enter fetal blood circulation
6 Infant is born with passive immunity against RSV

Maternal RSV vaccination: indications and dosing

- Endorsed by CDC, ACOG
- One time dose 0.5ml IM **at 32 0/7 wks-36/6/7 wks** seasonally
- Ok to administer with other vaccines (eg Tdap, influenza, COVID)
- Additional data needed whether to repeat with future pregnancies
- No published data yet on efficacy post marketing

WHY NOT BEFORE 32 WEEKS?

- More premature deliveries seen in vaccine vs placebo group
- Did not establish causality, but not approved <32 weeks to avoid this potential risk.
- When subanalyzed for >32 weeks, premature ratio reversed for US infants

	Trial dosing interval (24 – 36 weeks gestation)				Approved dosing interval (32 – 36 weeks gestation)			
	RSVpreF vaccine N=3,568		Placebo N=3,558		RSVpreF vaccine N=1,628		Placebo N=1,604	
	n	% (95% CI)	n	% (95% CI)	n	% (95% CI)	n	% (95% CI)
Preterm birth[¶]	202	**5.7** (4.9–6.5)	169	**4.7** (4.1–5.5)	68	**4.2** (3.3–5.3)	59	**3.7** (2.8–4.7)
Low birthweight**	181	**5.1** (4.4–5.8)	155	**4.4** (3.7–5.1)	67	**4.1** (3.2–5.2)	54	**3.4** (2.5–4.4)
Neonatal jaundice	257	**7.2** (6.4–8.1)	240	**6.7** (5.9–7.6)	102	**6.3** (5.1–7.6)	107	**6.7** (5.5–8.0)

¶ Less than 37 weeks' gestation.
** Less than ≤5.5 lbs (2,500 g).

US Preterm Birth Data[2]

- The United States was the largest contributing country in the trial comprising 45.4% of participants
- The imbalance in preterm births reversed:
  - Trial dosing interval: **5.7%** *(N=95)* in vaccine vs. **5.3%** *(N=88)* in placebo recipients
  - Approved dosing interval: **4.0%** *(N=29)* in vaccine vs. **4.4%** *(N=32)* in placebo recipients

1. Fleming-Dutra KE et al. MMWR Weekly / Oct 6, 2023 / Early Release / 72. Use of the Pfizer Respiratory Syncytial Virus Vaccine During Pregnancy for the Prevention of Respiratory Syncytial Virus-Associated Lower Respiratory Tract Disease in Infants: Recommendations of the Advisory Committee on Immunization Practices — United States, 2023. MMWR. cdc.gov (accessed online 10/6/2023)
2. Fleming-Dutra K. EIR Framework Updates. Pfizer Maternal RSVpreF Vaccine. https://www.cdc.gov/vaccines/acip/meetings/downloads/slides-2023-09-22/06-Mat-Peds-Fleming-Dutra-508.pdf (accessed 9/24/23)

Nirvsevimab (Beyfortus, Sanofi/AstraZeneca)

Monoclonal antibody binding to Prefusion F Protein

Prolonged serum half-life, one dose lasts the season!

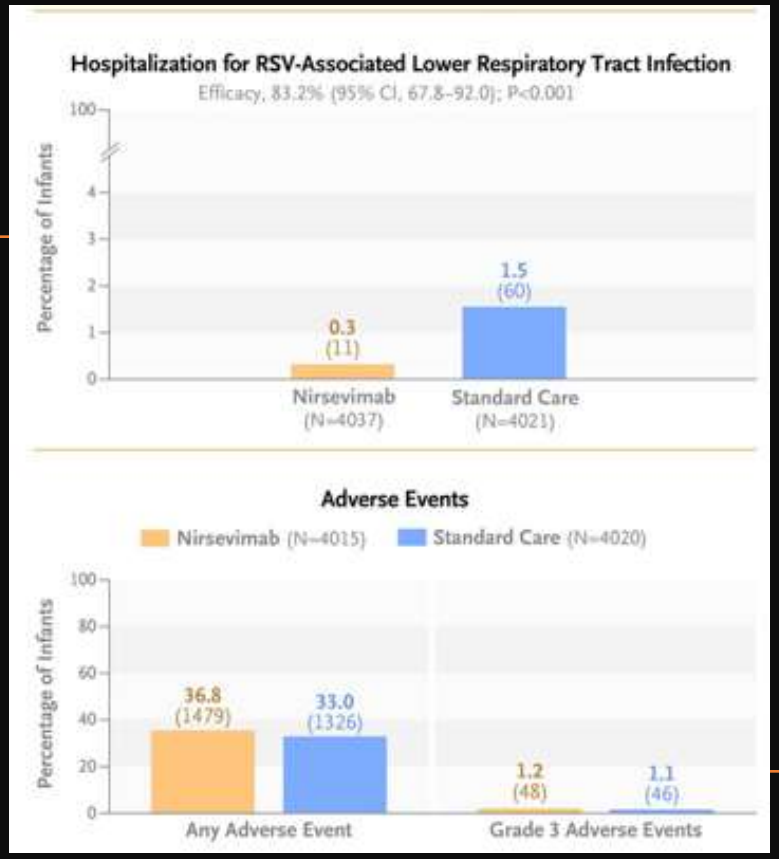
Nirsevimab for prevention of hospitalizations due to RSV in infants. NEJM 2023;389:2425-2435

- Randomized 1:1 infants 0-12m born at least 29 weeks entering first RSV season to receive single dose nirsevimab vs nothing
- Primary endpoint: hospitalization for RSV associated LRTI
- Secondary endpoint: very severe RSV infection (hospitalization with need for supplemental oxygen)
- 8058 infants enrolled

Results

CONCLUSIONS

Nirsevimab protected infants against hospitalization for RSV-associated lower respiratory tract infection in conditions that approximated real-world settings.



Who should receive it?

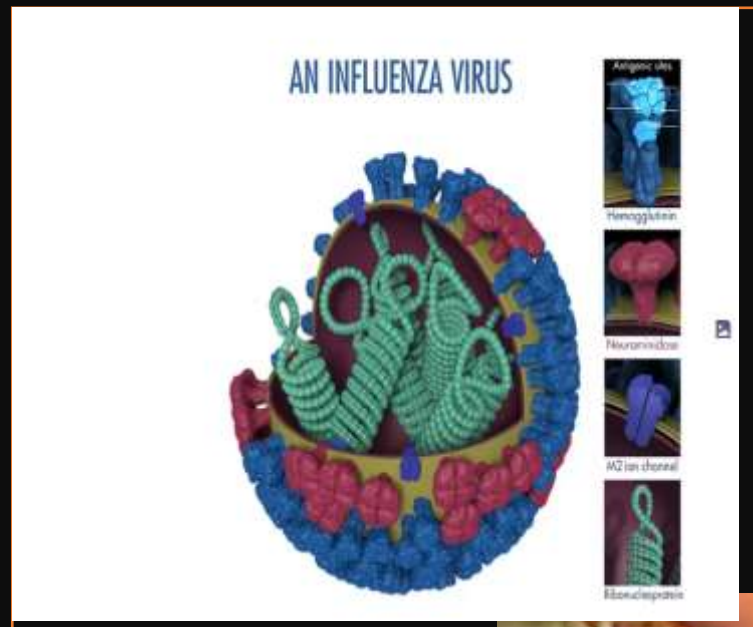
All children < age 8 months during RSV season unless mom immunized during pregnancy >14 days before delivery

High risk children 8-19 months during RSV season

- Children with PLD requiring ANY medical support any time during 6 months prior to RSV season
- Severe immunocompromise
- CF with severe lung disease (prior hosp or persistent abnormalities on CXR of wt/length <10th percentile)
- American Indian and Alaska native children

Ok to give with any vaccine

Influenza Updates-Catch the Drift



Impact of Influenza Worldwide

- ~ Billion cases of seasonal influenza annually, including 3–5 million cases of severe illness.
- 290,000 – 650,000 deaths annually.
- 99% of deaths in children under 5 years of age from flu are in developing countries.
- Strains included in the 2024-25 vaccine: A(H1N1)pdm09, A(H3N2), B/Victoria (B/Yamagata has not circulated since March 2020 and is not included in 2024-25 vaccine)

Flu Vaccine

Who should get it?

Everyone 6 months and older

Pregnant women, immunocompromised

Proven to reduce hospitalizations, death and severity of illness

What should they get? Multiple brands are available

- All vaccines in the US are trivalent
- Under age 65 yrs-no preference for type of flu vaccine
- Recombinant Flublock only approved age 18 and older
- LAIV intranasal only 2yr-49yr and not for pregnant or immunocompromised
- High dose and adjuvanted approved for 65 yrs and older only
- 65 and older: prefer Fluzone high dose, Flublock recombinant, or Fluad adjuvanted

Don’t Forget to Vaccinate!

- National vaccination coverage for COVID-19, influenza, and RSV vaccines was low for children and adults for the 2023-24 respiratory illness season.
- Vaccinate!

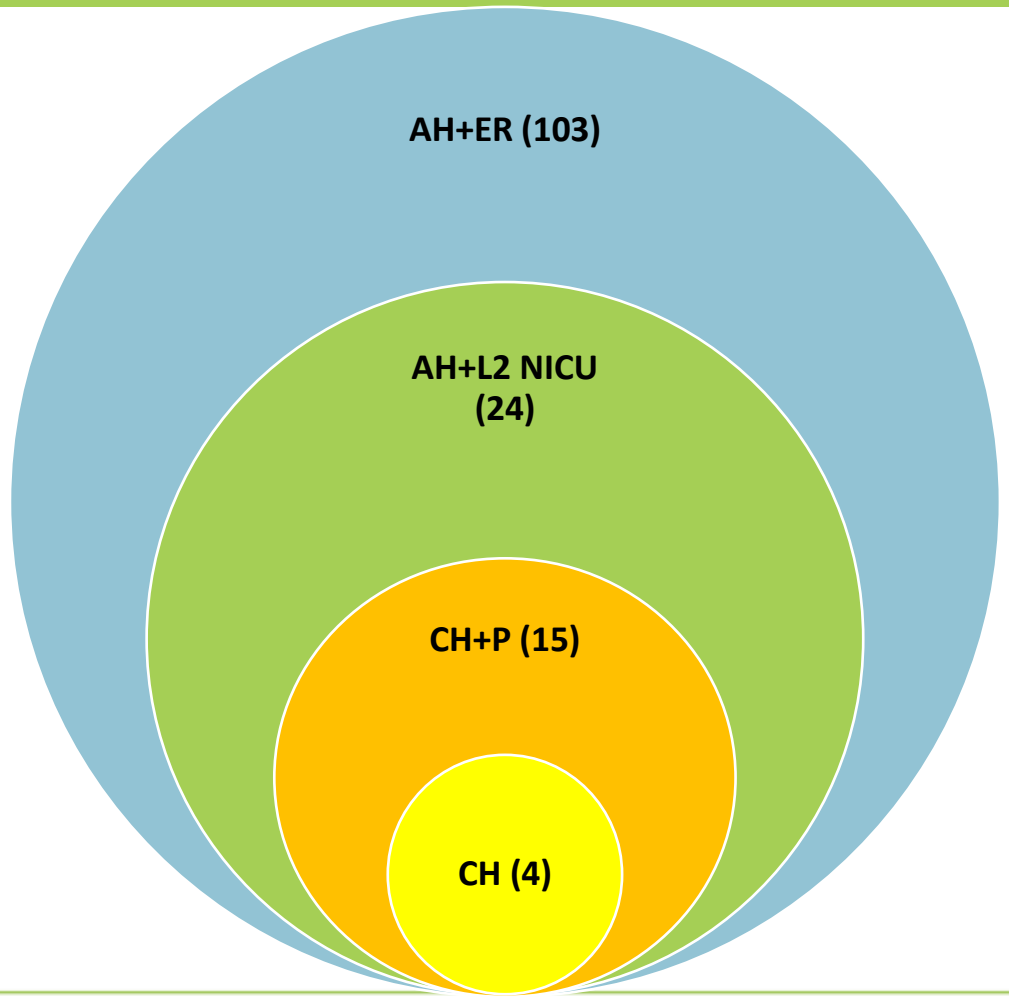
Regional Pediatric Surge Planning Resources & JIT Training

Regional Surge Planning: (WA State)

FACT: Pediatric specialty facilities are a scarce resource

During Overwhelming Surge:

- Sick kids will rely on Community facilities for their stabilization and care
- Tiered approached
- Usual Transfer Procedures
- Washington Medical Control Center (WMCC)
- PMOCC



WMCC
PMOCC

206-520-7222 | 877-520-7222

Pediatric Surge Resources

NWHRN Pediatric Surge Annex

- Pediatric "Toolkit": Planning and Caring for Pediatric and Neonatal Patients in Disasters

WRAP-EM Pediatric Surge Playbook (Domains)

- Hospital and Hospital Systems
- Interagency Domain
- PMOCC

R1 Regional Disaster Health Response System: Mass General

NWHRN Clinical Pediatric Resources

Pediatric Acute Care Education Sessions (PACES) – UC Davis Health

Wrap-Up
Survey
Thank you!

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Thank you!

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