

# Initiating a High Flow Nasal Cannula (HFNC) Quality Improvement Project on the Inpatient Pediatric Unit



## Purpose

The purpose of initiating High Flow Nasal Cannula (HFNC) on the inpatient pediatric unit was to improve quality of care for children, to reduce the number of children transferred, to provide a higher level of care for the community's children.

## Outcomes

- 83% more children are receiving health care in their community
- Unit has increased care capacity and acuity with the addition of a new population by caring for children admitted on HFNC
- Evidence-based care practices improved on the unit
- Professional development of staff occurred by the addition of a new skill set

## HFNC therapy has improved every year

- First by decreasing transfer rates
- Second by adding older children and new diagnoses that cause respiratory distress
- Third by increasing the number of children served each year from 11 to 36 to 91 three quarters of the way through FY22

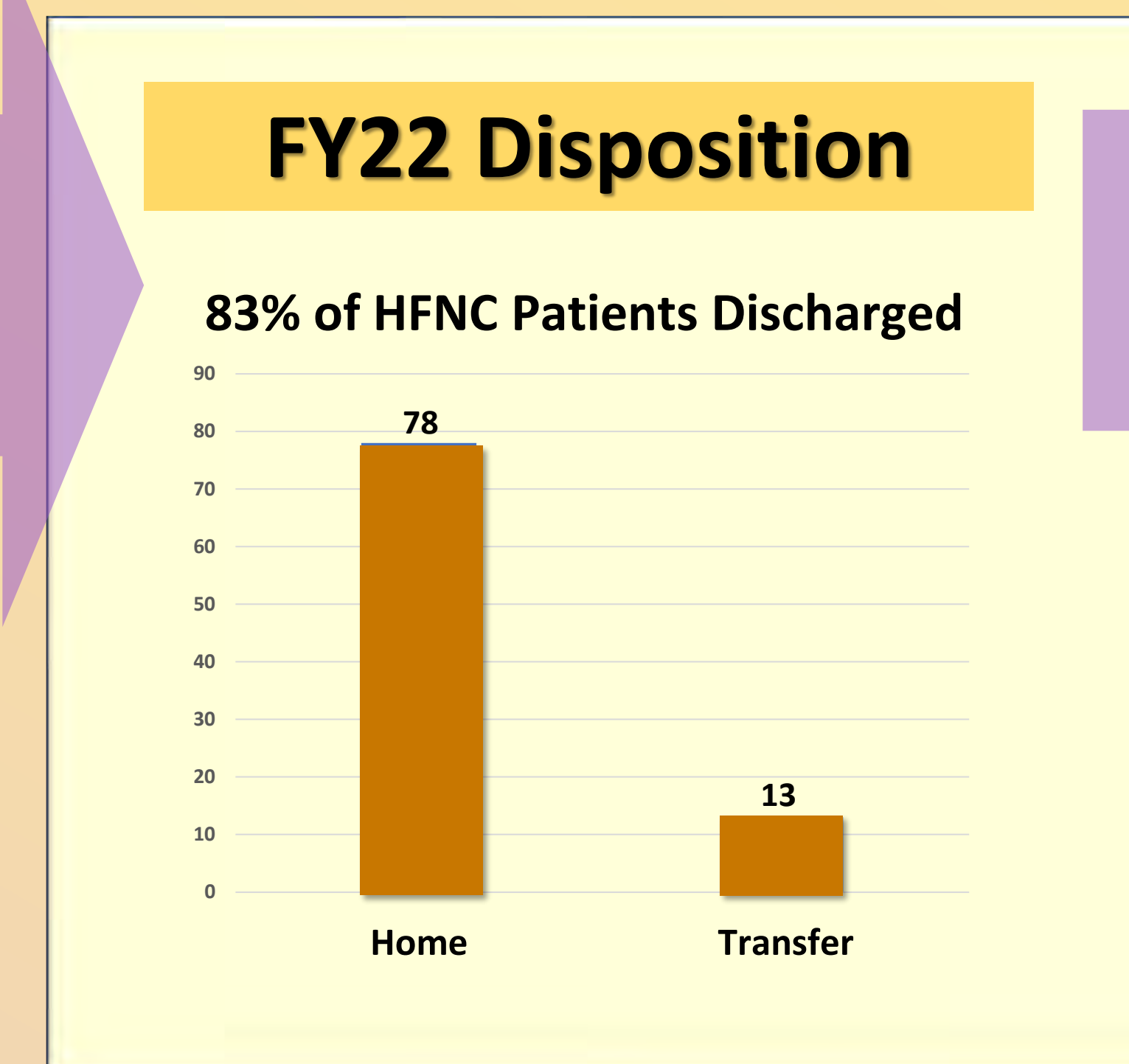
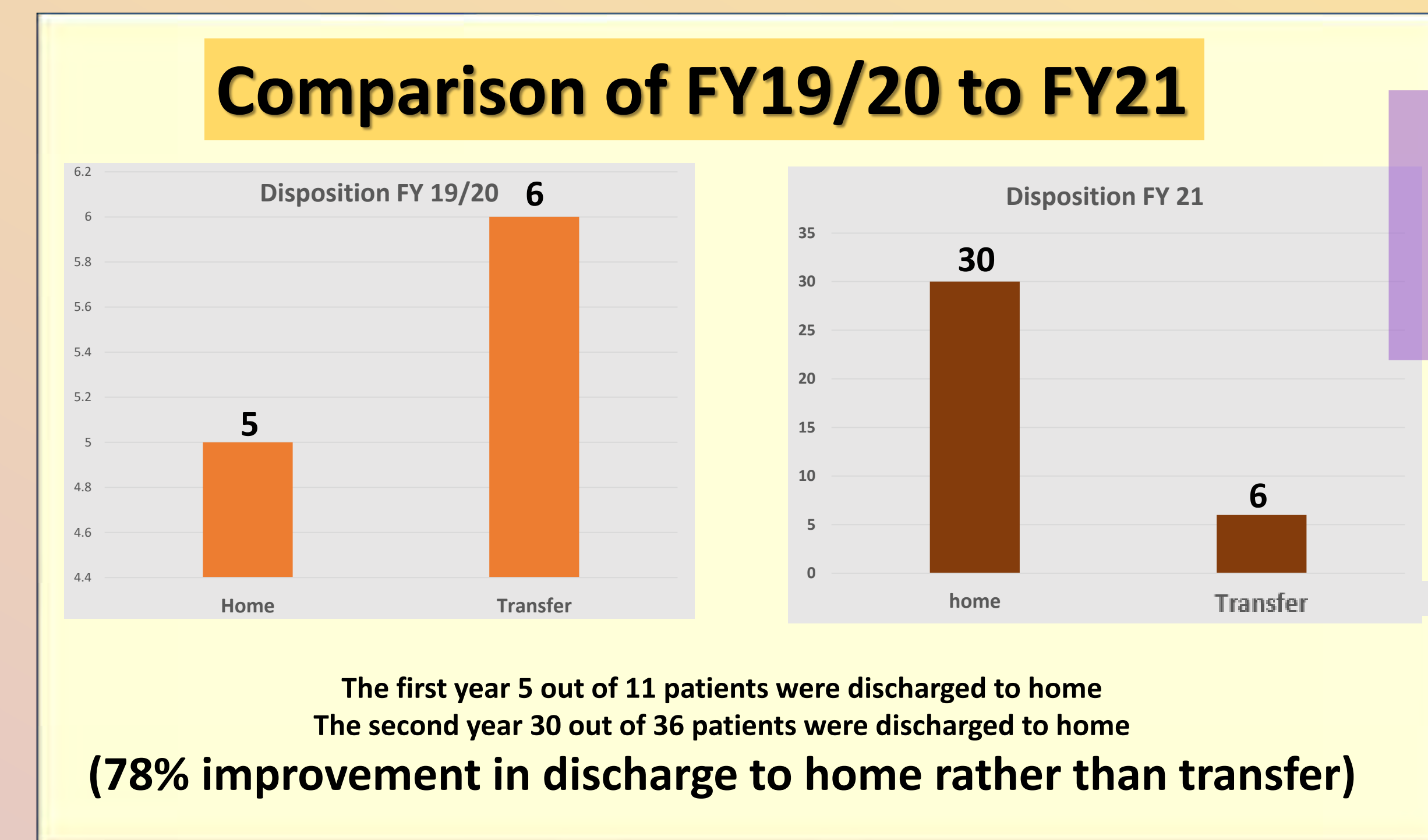
## What We Learned

- **With a safety plan** HFNC can be safely administered to children on a general medical/surgical pediatric unit without an on-site Pediatric Intensive Care Unit.
- **It is more effective** to follow best evidence.
- **FY 2021-2022 HFNC better outcomes are achieved when best evidence is followed.**
- **For all children** FiO2 was adjusted based upon oxygenation.
- **As staff became more comfortable** caring for the patient, they became more interested in learning about the mechanics and machinery supporting HFNC so additional education improves staff satisfaction and skills.

## STAKEHOLDERS

**Pediatric patients**  
 w/ respiratory illnesses & their families in the community  
 Pediatric staff members, Pediatric Hospitalists, Respiratory Therapists  
 Policy, Procedure, and Guideline committee members

**Special thanks** to the Respiratory Therapy Department for their in-service on the use of HFNC and their guidance at the bedside. Thank you to Chief of Pediatrics, for her support in initiating the project. With appreciation to pediatric staff & pediatric hospitalists for their dedication in providing the highest standard of care for our pediatric patients.

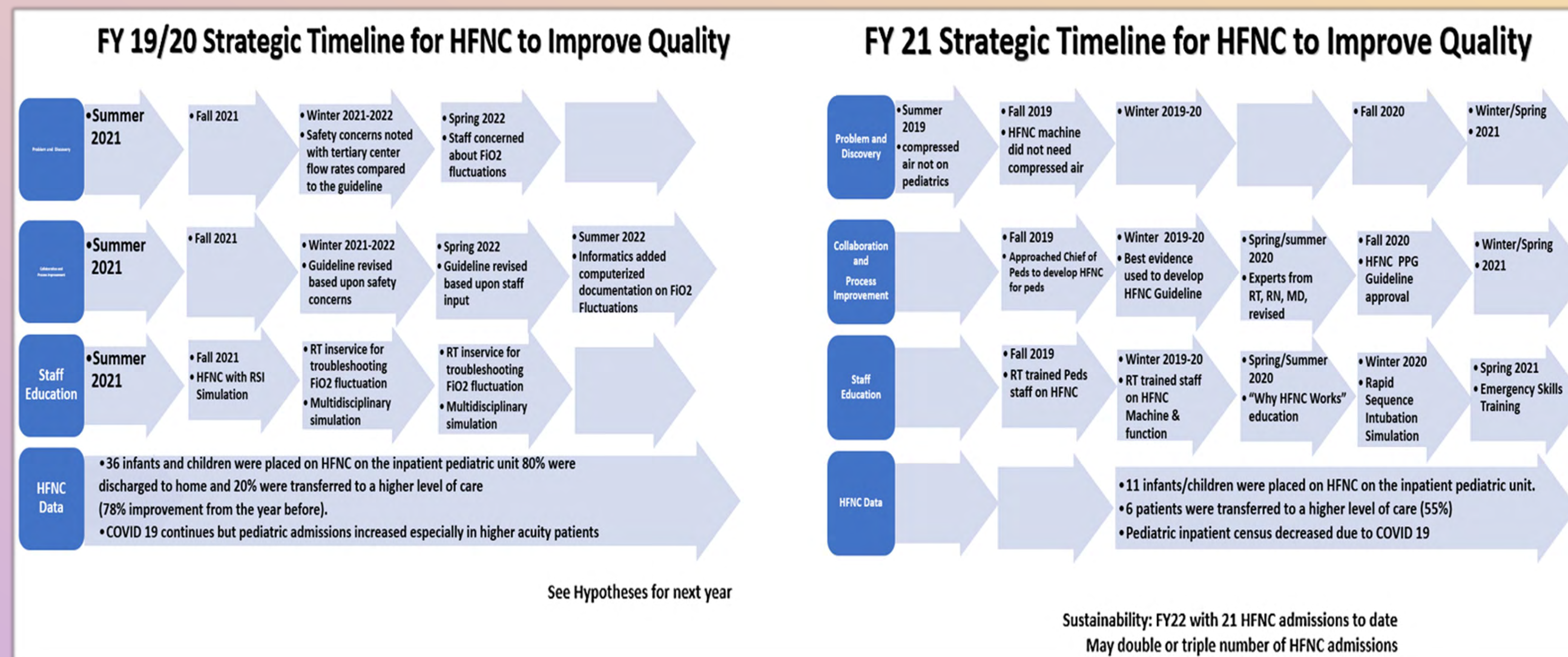


### Collaborated with Respiratory Therapy (RT) to Educate Staff

**Barriers to Staff Education**  
 Coordinating multiple disciplines to be in the same place at the same time  
 Staff participation  
 Preparation of equipment and room is time consuming

**Overcoming Barriers to Staff Education**  
 Coordinating times for educating through multidisciplinary meetings.  
 Taking Staff Surveys for best dates & times for educational offerings.

**RT in-service**



### Revised HFNC Flow Rates

1 L/kg/min

- Infants under 6 months not to exceed 6 L/min
- 6 months to 18 months not to exceed 12 L/min
- 18 months up to 5 years of age not to exceed 15 L/min
- Greater than or equal to 5 years of age not to exceed 22 L/min

Once a patient reaches a flow rate greater than 1 L/kg/min or an FiO2 greater than 40%, consider a PICU consult and/or transfer.

### Multidisciplinary HFNC Deterioration Simulation with Rapid Sequence Intubation

Intubated HFNC Deteriorated Patient

Transporting Intubated HFNC to ED

### Sustainability and Future Plans

Since the July FY22 the inpatient pediatric unit has already admitted 91 infants/children on HFNC

At this rate of admissions the unit is on track to tripled and may quadruple the amount of pediatric inpatients on HFNC

HFNC is branching out from a treatment for only bronchiolitis to a treatment modality for other respiratory illnesses in children such as asthma and pneumonia

### Increase in Care Capacity and Acuity After HFNC

**Prior to HFNC**

**Would Have Been Transferred**

**392!**

**Extra Days**

REFERENCES -- Coletti, K. D., Bagdure, D. N., Walker, L. K., Remy, K. E., & Custer, J. W. (2017, August). High-flow nasal cannula utilization in pediatric critical care. *Respiratory Care*, 62(8), 1023-1029. ● Dell Children's Medical Center. Asthma Pathway Guidelines. 2014. ● Lodestero, F. (2018, August 20). High flow nasal cannula (HFNC) - Part I: How it works. R.E.B.E.L. EM. ● Magruder, T.G., Narayanan, S., Walley, S., Powers, T., Whitlock, H., Harrington, K., and Wall, T.C. 2017, 2 (5). Improving inpatient asthma management: The implementation and evaluation of a pediatric asthma clinical pathway. ● Milesi, C., Boubal, M., Jacquot, A., Baleine, J., Durand, S., Pons Odona, M., & Cambois, G. (2014, September 30). High-flow nasal cannula: recommendations for daily practice in pediatrics. *Annals of Intensive Care*, 4(29). https://doi.org/10.1186/s13613-014-0029-5 ● Miller, A. G., Gentile, M. A., Tyler, L. M., & Napolitano, N. (2018, July). High-flow nasal cannula in pediatric patients: A survey of clinical practice. *Respiratory Care*, 63(7), 894-899. ● NSW Government Health Guideline Summary. (2016, January 29). Humidified high flow nasal cannula oxygen guideline for Metropolitan Paediatric Wards and EDs. NSW Government Health Guideline Summary. ● Nunn, A.J. and Greg, I. *British Medical Journal*, 1989, 298: 1068-1070. ● Parkin et al., *Journal of Clinical Epidemiology*, 49 (8): 821-825. ● Polgar, G. and Promadhat, V. Pulmonary function testing in children: Techniques and standards, Philadelphia, WB Saunders Co, 1979. Children's Hospitals and Clinics of Minnesota. ● Rieses, J., Fierce, J., Rieses, A., & Alverson, B. K. (2015, December). Effect of a hospital-wide high-flow nasal cannula protocol on clinical outcomes and resource utilization of bronchiolitis patients admitted to the PICU. *Hospital Pediatrics*, 5(12). ● The University of Chicago Medicine, Comer Children's Hospital. 2019.