Northwestern University Feinberg School of Medicine

The 'Gray Zone' Unit: A New PACU Model of Care

Angelica Vargas MD, Amod Sawardekar, MD MBA, Santhanam Suresh MD, Lisa Sohn MD MS, Narasimhan Jagannathan, MD MBA

Department of Pediatric Anesthesiology, Ann & Robert H. Lurie Children's Hospital of Chicago; Chicago, Illinois

Ann & Robert H. Lurie Children's Hospital of Chicago®

Introduction

- Stepdown units are prevalent in adult and some pediatric institutions
- Our tertiary 250-bed pediatric institution has an observed an increased volume of "high risk" ENT patients that required ICU-level identified of care for short period of time following anesthesia
- We therefore proposed and piloted a new PACU Phase 1 Observation Unit for immediate and efficient postoperative care for these subacute patients

Model of Care Goals

- **Aim :** To create a new model of PACU Phase 1 Observation Unit care focused on ENT surgical patients to decrease ICU admissions
- Advantages include the ability to provide respiratory support (e.g. BiPAP, HFNC, Vapotherm) and tracheal intubation if needed"Gray-zone" patients are observed 4-8 hours post-op until ENT & Anesthesia teams declare the patient's best postoperative destination
- No overnight stays allowed in this unit

Outcome Measures

Care Model 'Success' Criteria:

- Rate of reintubation in the PACU to be less than 5%
- Secondary transfer to the PICU from phase II to be less than 2%
- Overall reduction of admission to the ICU and cancelled ICU beds by 20%, for patients in pilot
- A decrease in the number of ICU denials from ENT service

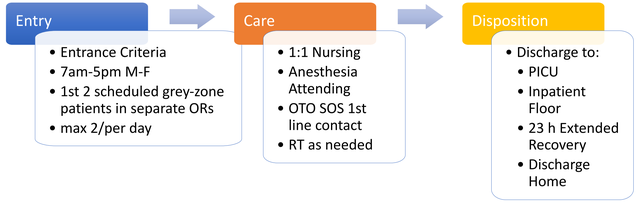
Care Model 'Failure' Criteria:

- Occurrence of any code event in phase II
- More frequent staff assists than evaluations by Anesthesiologist
- Any patient event resulting in temporary or permanent harm

Care Model 'Red Flags'

- Equipment unavailability or lack of device instruction/knowledge
- Inadequate nurse staffing, Respiratory Therapy, or LIP
- Unclear scheduling of "gray zone" patients or identification of these patients prior to cast start
- Inability to transfer patients to PICU, if needed, at end of observation period.

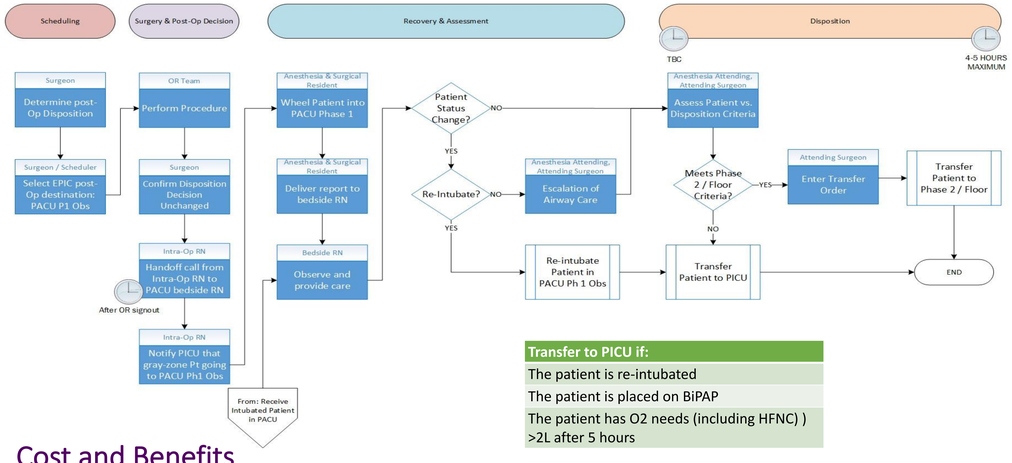
Pilot: Workflow and Staffing



Staffing for 2 patients/day Model	
Anesthesia Team	• 1 FTE Anesthesiologist Attending/Fellow
Surgical Team	• Surgical attending
PACU Nursing Team	• 1 FTE RN, 1 FTECNA
Respiratory Therapy	• 1.5 FTE
Logistics, EVS	• 1 FTE

Entry Criteria into PACU Observation Unit	
T&A with AHI >20	Supraglottoplaty
T&A with O2 Nadir <80	Posteriorlaryngeal cleft repair
T&A under 2years old	MLB on trach patients
	Laryngoscopy with intervention

Coreflow



Transfer to PICU if:
The patient is re-intubated
The patient is placed on BiPAP
The patient has O2 needs (including HFNC)) >2L after 5 hours

Guidelines for discharge to Extended Observation Unit
Oxygen requirements – No greater than 2 L NC or 40% FIO2
Posterior laryngeal cleft repair and supraglottoplasty – must stay the full 5 hours. At the 5 hour mark, they will discharge to the level of care dictated by their oxygen requirements and surgeon/anesthesia discretion
Trach patients – may transfer once suction requirements are at intervals supported by extended obs
T&A patients – must stay at least 2 hours but no more than 5 hours. They may transfer prior to 5 hours if they meet all of the following criteria: • They are stable on Extended-Obs level oxygen without sustained (>30 sec) desaturations below 85% for the most recent hour • No scheduled narcotics. (PRNs okay per surgeon discretion) • The operating surgeon approves early transfer

Cost and Benefits

Expected Costs	
Capital[1]	
• 2 x LTV 1200 ventilators	$27K (rent $500/mo)
• 2 x V60 PPV	$30K (rent $400/mo)
• 2 x HFNC @ $400/month	$2.4K 6 mos
• Voalte phone for ENT SOW	$2.1K
• Handheld devices for patients	$2K
Expense	**$63.5K (plus)**
One-Off	
• Training time for RN's [2]	$3.5K
• Overtime during pilot	TBD

Expected Costs Savings

Benefits:

- Reduce total transfers from OR to PICU
- Reduce disruption in PICU bed planning
- Reduce PICU bed occupancy by gray-zone type patient
- Nov-15 to Mar-17 turned away 90 PICU patients

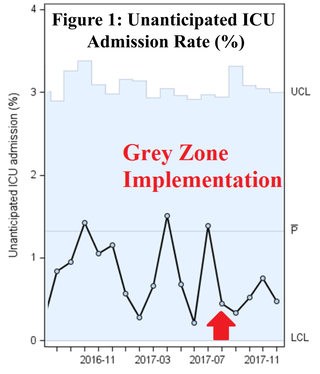
Projected Savings

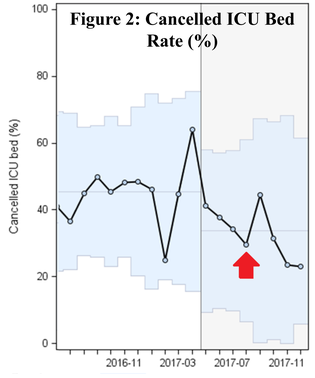
$2.4-3.5M in cost savings/year

Results

- Total of **21 patients** in Gray Zone' unit
  - July 21st - September 28th (10 weeks)
- Takeaways:
  - Decrease in ICU bed utilization
  - PACU Nurses comfortable managing higher acuity patients

- **Patient Discourse:**
- 19% (**n=4**) admitted to PICU
  - 2 directly from OR
  - 1 from phase I
  - 1 from phase II
- 43% (**n=9**) to 23h observation
- 38% (**n=8**) discharged home





Conclusion/ Discussion

We have implemented a new PACU care model. To date it appears to reduce the total amount of patients admitted to the PICU, and seems to be a feasible model of care for post ENT surgical patients who require intensive care for a brief period of time

Benefits include

- Reduce disruption in PICU bed planning
- Create the opportunity to increase OR and PICU throughput
- Decreased cost to hospital and family of patient

Future goals

- Expanding patient capacity (3 to 5 PACU beds)
- Expanding to other services beyond ENT
- Move from Pilot to Standard Daily Operations