Pediatric Perioperative Surgical Home: A Surgical Home for Children with Medical Complexity
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Disclosure Information

• I have nothing to disclose.

Objectives

1. Define the term “children with medical complexities”.
2. Understand the importance of preoperative anesthesia risk assessment.
3. Identify tools for provider/caregiver partnership in surgical decision making.
Describing the Population

The term ‘children with special health care needs’ (CSHCN) describes a broad group of children who have, or are at increased risk for, physical, developmental, or psychiatric conditions, and consequently, have requirements for healthcare beyond those of children generally (McPherson, 1998).

A small subset of CSHCN are extremely medically-fragile and have the most intensive healthcare needs, and are referred to as ‘children with medical complexity’ (CMC) (Cohen, 2011).

An emerging population with many names

Terms traditionally used to describe the CMC subgroup include a combination of children with 1 or more of the following terms:

- Complex, chronic, medical, conditions, and/or needs
  (examples include complex chronic conditions [CCCs], complex medical needs, complex medical conditions, and complex health conditions), as well as medically complex children.

Children with Medical Complexity

Who are they ……

Children with medical complexity are children from birth to age twenty-one who have multiple chronic, complex conditions that often result in profound functional limitations, technology dependence, and high resource use. Although fewer than 1 percent of the children in the United States are classified as having medical complexity, the group accounts for a disproportionate 15-33 percent of health care expenditures (or $50-$110 billion annually) (Cohen 2011).
Understanding the Population

CMC are a rapidly growing pediatric population with a substantial impact on the health care system. These children have lifelong, life-limiting chronic conditions and multiple comorbidities related to the impairment of multiple organ systems, which make coordinating their care and optimizing their health a challenge.

They experience frequent, costly hospitalizations that are often lengthy and include major surgical interventions required to improve their daily functioning.

Due to their associated medical complexity and fragility, surgery in these children may be complicated and have a high likelihood of perioperative adverse events and other suboptimal outcomes.


Background & Significance

*Disproportionately* increased healthcare costs & adverse events

- Increased hospital readmissions, LOS, & healthcare costs (Berry et al., 2017; & Menger et al., 2017)
- 10% population, 50% of all pediatric medical expenses (Raman et al., 2017)

**CMC are Children with Surgical Complexity**

Conceptualizing the Impact

Is <1% a significant number of patients? Let’s do the math…

According to the US census report in 2019, there were 73 million children in the United States, accounting for 22% of our nation’s population.

1% of 73 million = 730,000
Background & Significance

Perioperative Quality & Costs (Berwick et al., 2008; IOM, 1999)

- Adverse Events Preventable & Costly
  - 44% deemed preventable (Edwards & Slawski, 2016)
  - $5.6 million annually first case OR delays; single complication = $13,000
  - Readmission = $84,700 per event (Girotto et al., 2016; Rangel, 2017)

Perioperative Care Expense
- 29% US healthcare budget or $572 billion—$912 billion by 2025
  (Health Care Cost Institute, 2018)

Preoperative Anesthesia Risk Assessment

Benefits
- Solidify plan for day of surgery
- Identify preventable causes for cancellation of surgery
- Optimize medical management
- Provides an opportunity for child and parents to become familiar with the day of surgery process
- Reduces day of surgery cancellation and Operating Room (OR) delays
- Improved OR utilization

Preoperative Risk Assessment continued

Goal: Proactively identify clinical factors that may complicate the patient's perioperative course.

- Complete medical history
- Physical examination
- Review of systems
- Family medical history
- NPO status
- Review appropriate testing
- Understand the social determinants of health for the family

Preoperative Assessment of CMC

23 m.o., female w/CPM of prematurity (born 27w2d gestation), severe BPD with respiratory failure (trach/vent dependent), refractory hypercarbia, refractory hypertension, severe prematurity with spinal dysraphism (Dandy-Walker variant), multi organ failure including respiratory and hepatic failure, multi drug resistant organisms, hypothyroidism, and NG tube dependence who presents for anesthesia consult for placement of long term feeding access.
Partnership in Surgical Decision Making

Plan of Care

One Patient - One Team

Surgeon: Primary - Dr. A

Time Frame: Date and time of surgery

Surgical Procedure:
1) Gastrosomy tube placement (open), liver biopsy, Dr. A
2) Airway evaluation - possible revision of tracheostomy, Dr. F
3) Echocardiogram, 15 minutes prior to echo lab 31849 or 50962
4) Dental evaluation, Dr. M
5) Retcam photos and FA, Dr. H

Anesthesia Procedures:
1) Regional anesthesia block
2) Arterial line

Assessment/Plan: Vent dependent 23 month old medically complex female who has spent ~597 days of her life at GCH now requiring a sedation for replacement of long term feeding access, liver biopsy, echocardiogram (BP D/pulm htn), tracheostomy/airway evaluation possible revision of stoma, and brief dental evaluation requiring complex coordination in preparation for OR case on 6/7/21. This case was discussed in the interdisciplinary setting of PP SH meeting as well as in several follow-up discussions. Dr. K, Dr. V, & Dr. L have created the below plan of care focused on optimizing her cardio pulmonary status utilizing a high pressure, low rate ventilation strategy.

Anesthesia Plan:
- If it’s possible to keep the tracheal cuff deflated during entire procedure, we will. If this doesn’t work because of pushing on abdomen, etc, then will inflate with saline/water to allow for proper lung mechanics.

Endocrine: She has adrenal insufficiency and will need stress dose steroids.

Off to sleep (will have parents help us decide if they prefer inhalation or intramuscular).

Will keep cuff down in either case but will use our anesthesia machine/vent in order to make adjustments if needed

Vascular Access: PIV/Aline (will sew in)

Will plan to use the arterial line to check gases along the way and make ventilatory adjustments as needed.

Pain Management: Regional anesthesia to the abdomen to decrease pain/sympathetic discharge during tube and decrease need for opioids during intra/postoperative phases of care.

She can get opioids, but would try to avoid a drip.

Pediatric Surgery:
Gas troscopy tube insertion (open)/Liver biopsy by Dr A. Goal would be to limit paralytic as able.

Cardiology:
Asleep echocardiogram at end of Dr. A procedure (this will allow time to switch anesthetic approaches and try to get her spontaneously breathing for airway exam)

Call echo lab at 31849 or 50962 15 minutes prior to exam to allow time for echo staff to come to OR.

If still doing very well, then proceed with airway exam and consideration of tracheal intervention.

ENT:
Dr. F will perform an airway evaluation focused on the status of her tracheal shelf.

Defer ABR (60 min), Audiology team felt that it was reasonable to do this at a later point in time.

Dental: Dr. M will be by to briefly evaluate the teeth, r/t concern of very sharp teeth.

Ophthalmology: Dr H will be by to get retcam photos and FA

OR Dispo: She can be put Supportive Care: Will send message to NP letting her know procedure is scheduled.

Social Work: Will send message to LM SW alerting her to planned PICU admission.

Benefits of combined procedures under one anesthesia

- Decreased stress and anxiety for patients and caregivers
- Less medical trauma
- Less NPO time
- Decrease in # of hospitalizations
- Decrease in exposure to inhaled volatile anesthetics
- Reduced exposure to medical care and iatrogenic injuries

Cost of multiple procedures under 1 anesthetic:
It can add difficulty, additional equipment and staff, multiple locations, increased stress and anxiety for staff if not well coordinated and communicated.