

INTRODUCTION

- Pulmonary hypertension (PH) has multiple etiologies and can contribute to substantial perioperative morbidity and mortality.
- Hospital charges in the United States for pediatric PH hospitalization have increased from \$926 million in 1997 to \$3.12 billion in 2012¹.
- Inhaled nitric oxide (iNO) has long been the preferred treatment but inhaled epoprostenol has been shown to be a possible alternative².
- We examined our children's center's use of Flolan® during surgical procedures over a 14-month period and report on our experience, challenges and recommendations.

METHODS

- We conducted a retrospective chart review of all children <18 years of age that were treated with Flolan at the Johns Hopkins Bloomberg Children's Center between 7/1/16 and 8/30/17.
- Anesthetic record(s) of the patients who underwent surgical procedures while receiving Flolan were reviewed.

RESULTS

Table 1: Surgical procedures while on Flolan	N (%)
Patients treated with Flolan from 7/1/2016 – 8/30/2017	74
Patients who underwent surgical procedures while on Flolan	24 (32.4)
Surgical procedures while on Flolan	38
- Staffed by pediatric cardiac anesthesiologist	25 (65.6)
- Staffed by pediatric anesthesiologist	13 (34.4)
- Male	14 (58.3)
- Female	10 (41.7)
Receiving additional pulmonary vasodilators at the time of procedure	29 (76.3)
Complications encountered with delivery of Flolan	8 (21)

- Challenges associated with Flolan delivery: 1) loss of end-tidal CO₂, 2) inability to monitor exhaled volatile anesthetic concentration and 3) malfunction of the water trap within the gas sampling module
- These are likely secondary to the pH of the solution (10.2 – 10.8) and use of glycine as a diluent

REFERENCES

- 1- Maxwell BG, et al. Pediatrics. 2015;136(2):241-50
- 2- Preston IR, et al. Pulm Circ. 2013; 3(1):68-73

DISCUSSION

Lessons learned on the use of Flolan in the operating room:

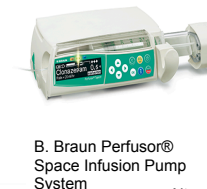
- A reliable nebulizing system is required
- A reliable pump to continuously administer the medication to the nebulizing system is also needed
- Ensure accurate gas sampling from the anesthesia circuit and motoring of ventilator parameters
- A heat and moisture exchanger (HME) should be removed from the anesthesia breathing circuit
- Transport patients with use of Aeroneb delivery system with portable self-inflating AMBU bag to prevent disruption of medication administration

Circumventing the problem:

- 1- Use the ICU ventilator
- 2- Use of additional filter/water trap devices to prevent interference with gas sampling module
- 3- Use of Veletri® instead of Flolan since it is diluted in saline (no clogging issues)



Aerogen® ProX Controller



B. Braun Perfusor®
Space Infusion Pump
System



Alternative for iEpo delivery with aquanot between etCO₂ and defend module