Pediatric Anesthesia Challenges in Low-Middle-Income Countries (LMICs)
• In LMICs 50% of population is < 15 years old.
• 85% of the pediatric population will required surgery at age 18
Common conditions encountered in Children in developing countries

- Undiagnosed congenital disorders including congenital heart disease and airway abnormalities
- Malnutrition
- Respiratory infections (acute and chronic, including tuberculosis)
- Anemia from worms or malaria
- Lice, scabies, etc.
- Advanced disease (due to late referrals and difficult access to healthcare)
- Accidents (including burns) and abscesses are common problems.
Decision making

Should I go to this trip?

• Level of comfort caring for children in a low resource setting.
• Are you familiar with the surgeon, the hospital, the equipment or the operations you will be doing?
• Try contacting an anesthetist who is familiar (preferably someone you know) and ask lots of questions
• Do you provide anesthesia to pediatric patients on a regular basis?
• Are you familiar with the type of operations you will be providing anesthesia for?
Considerations while on the field
Considerations while on the field - Preop

• What types of cases will be performed?
• How are patients selected?
• Is there an age requirement?
• Does the organization has preop guidelines?
• How comfortable do I feel cancelling cases?
Preparing for the cases – safety pearls

- What is the NPO and fluid status in this patient?
- Should we use premedication?
- Consider type of anesthesia
  General (GA) vs “sedation” vs Regional?
- Facemask vs LMA vs ETT
Performing the cases – safety pearls

- Spontaneous ventilation vs IPPV
- Induction considerations – PPI, IV
- Need for muscle relaxation for intubation?
- Maintenance options to consider
Recovery

- Where patients are going to recover?
- Do you have appropriate personnel and equipment for monitoring of the patients in the recovery area?
- Do not start the next case until you are sure the previous case is stable.
- Recognize there will probably not be oxygen or a portable pulse oximeter.
Post-operative Analgesia

• How painful are the procedures that are being performed?
• What options do we have for post-operative analgesia?
• Avoid/minimize opioids if possible, use regional/local anesthetics when appropriate.
• Paracetamol/Acetaminophen is very helpful.
Regional/Local Anesthesia

- Stoic patients
- Local for skin infiltration. Max local calculation.
- Consider a caudal block if appropriate (1ml/kg of 0.125-0.25% bupivacaine).
Case 1

In a 6 month old presenting for a peritoneal dialysis catheter placement, history of renal failure secondary to renal tubular necrosis due to dehydration after a viral enteritis that received late treatment. No history of prior anesthetics. Patient lives with mother and 2 older brothers (3y and 5y old), He had diarrhea and vomit and presented unresponsive to the emergency room 3 days ago. Mom didn’t seek medical attention earlier because they live about 5 hours away from the city and didn’t have help for transportation.

• What other information would you like to know?
• At your hospital you have the possibility to send for some labs, which ones will you order?
• What are your main concerns about this case?
• What anesthesia technique will you choose?
• What will be the challenges of having these case in a low resource setting?
• Discussion
Case 2

6 year old presenting for fasciotomies and I and D of left lower extremity. She had been bitten on the right foot by a snake three days earlier while playing with her friends at her backyard in a faraway rural area. The type of snake was not determined. A tourniquet was not applied and her father attempted to remove the venom from the wound by suction. She was evaluated by the local doctor, he placed involved foot and leg in ice, and administered polyvalent antivenin intramuscularly and a tetanus toxoid vaccine. After that she was transferred to the main pediatric hospital where you were you work. After two days the affected leg was swollen and had become cyanotic. She had increased pain and decreased perfusion in her extremity.

- What other information do you want to know?
- At your hospital you have the possibility to send for some labs, which ones will you order?
- What are your main concerns about this case?
- What anesthesia technique will you choose?
- What will be the challenges of having these case in a low resource setting?
- Discussion
Case 3

8 y/o with Arthrogriposis multiple presenting for an appendectomy, open vs laparoscopic depending if the laparoscopy equipment is working and if the surgeon who knows how to operate the equipment is available. Finally patient was brought to the OR and the case will be done laparoscopically but still they have some concern about equipment malfunctioning that they are trying to fix.

• During the case patient was intubated with a rapid sequence induction (RSI) with Tiopental, Fentanyl and Succynilcholine. About 20 minutes after the abdominal insufflation, patient became hypotensive and tachycardic, and the end tidal CO2 (ETCO2) increased progressively.

• What other information would you like to know?

• What are your differential diagnosis?

• At your hospital you have the possibility to send for some labs, which ones will you order?

• What are your main concerns about this case?

• What will be the challenges of having these case in a low resource setting?