ROTATION SUMMARY
PEDIATRIC ANESTHESIA / PEDIATRIC CARDIAC ANESTHESIA ELECTIVE

Rotation Contacts and Scheduling Details

Rotation Director: Calvin Kuan, M.D.
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Pager 14191; email preferred.

Administrator: Jessica Martinez
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Length of elective: 4 week elective; anesthesia may be combined with pain or cardiac anesthesia to total 4 weeks. Rotations with pain and/or cardiac anesthesia must be specifically arranged in advance). This elective is offered throughout the year from September through June; during July and August PICU Fellows have priority and resident slots will not be open. While residents may elect to participate in the rotation at any point, Pediatric Anesthesia Fellows are less willing to forego procedures at the beginning of the year and they are in the OR every day. The rotation is open to all training levels. One month advance notice for scheduling is required but there are a limited number of spots each year. If you schedule your rotation later in the academic year you will likely get more procedures and better teaching as it is more likely that you will be assigned to a room with a fellow than with a less experienced resident. We will have few rooms for major cases with attending working alone.

The rationale behind a 4 week rotation includes: 1) as a visitor, you will have to get to know the attendings, fellows and residents before they will be willing to give up procedures for you. This may take a few days to a week. 2) the schedule changes frequently, and there may be many days where all the patients are already intubated and lined up, so there may not be any procedures for you to do. 3) to really understand the pharmacokinetics and pharmacodynamics of the various anesthetic drugs, you must see how they affect the patients over time and over many different cases and patients.

Positions Available: Given the limited number of positions, this elective is limited to residents pursuing additional training in PICU, NICU, or ED or those planning a Hospitalist career. The elective can accommodate one pediatric resident per month most months of the year; 10 positions are traditionally available.

Introduction

This elective may be undertaken as a full-time elective in pediatric anesthesia, pediatric cardiac anesthesia, pediatric pain management, or a combination of the three. For residents interested in doing ONLY the pain management elective (without any OR time), please see the distinct rotation summary and contact Julie Good, M.D., Rotation Director for inquiry. For those looking to maximize sedation experience, please contact Julie Kim, Rotation Director for Sedation Elective.

The aim of this rotation is to increase resident skills related to airway management, vascular access, and pharmacology. Generally residents increase proficiency via observation and hands on experience in the Operating Room. The rotation leadership recognizes that most participants have focused interest in anesthesia and select the rotation to maximize procedural and airway opportunities. To maximize these opportunities, however, participants must function as part of the anesthesia team, develop a level of trust with the anesthesia faculty, and show a commitment to the rotation.

Weekly Schedule

Time	Monday	Tuesday	Wednesday	Thursday	Friday
0630		0630 – 7 Anesthesia lecture (Anes Conference Room – 3rd Flr SUH)	*Pediatric Cardiac Multidisciplinary Conference (Falk Center 2nd Floor Conference Room)*	Pre-round	Pre-round
0645	Anesthesia Grand Rounds (Location to be determined)				
0700		Meet Team in Preop or OR	Meet Team in Preop or OR	Meet Team in Preop or OR	Meet Team in Preop or OR
0730		Cases Begin	Cases Begin	Cases Begin	Cases Begin
0745					

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0800	Meet Team in preop or OR location	Morning Report	Morning Report	Morning Report	Grand Rounds (8:00-9:00)
0830-	Cases begin				
-1130					
1130-1200					
1100-1200					
1200-1300		Conference	Conference	Conference	Conference
1300 - 1800					

** Morning Report and Noon Conference: you are not restricted from attending the pediatric department lectures or conferences, however, keep in mind that things move along quickly in the OR. From the anesthesia attending and trainee's perspective—think of each case like a dinner party with your relatives: it is not nice to come in and do a procedure without helping to set up beforehand, meet the patient and family, or clean up afterwards.

Dr. Kahana supports your ability to make the appropriate decision for your own training regarding which conferences to attend. If an opportunity in the OR presents itself and this opportunity would be foregone by attending morning report, stay and take advantage of the opportunity. If however, things are slow, attendance at conference is expected.

Additionally, given the disproportionate number of opportunities during the morning, residents should attempt to **attend continuity clinic in the afternoon while on the anesthesia rotation.**

Rotation Specifics

Orientation

Please review the orientation packet and readings in advance of the rotation. It is the resident's responsibility to take initiative and ask questions as this is a very different clinical environment with its own expectations.

Assignments

Each day you will be assigned to a specific room working with an attending and/or fellow. Expect an email from Dr. Kuan each evening (after 1700) with your assignment for the following day. If you don't get an e mail from Dr. Kuan by 2100-2200, please remind him in case he is still working and have forgotten. If you still haven't received an email, check again in the morning before you come in. Dr. Kuan will try to assign you to rooms with an attending working alone, but most rooms will have a resident and/or fellow involved (we have 5 anesthesia residents and 2-4 pediatric anesthesia fellows each month). The rare rooms with attendings working alone are usually cases that are simple and often do not require any procedures, so they may not be of much interest to you. If there are no appropriate rooms with attendings working alone, he will try to assign you to a room with a fellow or senior resident because they are more likely to be willing to give up a procedure (IV or intubation) for you. However, many of the cases that fellows are assigned to are more sick and complex so it will then be up to the attending to decide whether or not you will be allowed to do any procedures. [Disclosure: in the general OR very few cases will need arterial lines, so the residents/fellows themselves are not likely going to be willing to give them up. The same is true for fiberoptic intubations, central venous lines and epidural catheters, so realistically only expect to get to do peripheral IV's, LMAs, and endotracheal intubations.]

Pagers

The Resident is expected to carry her pager from 6am through the end of the work-day on weekdays.

Call Schedule & Weekends

There are no call, holiday or weekend responsibilities associated with this elective. You are welcome to stay as late as you want to see the end of a case, but there are no requirements.

Resident Roles and Responsibilities

Most Pediatric Residents opt to partake in an Anesthesia elective to gain procedural and airway management experience. Interest in the pharmacology and other Anesthesia skills may be limited. We recognize each individual learners goals; however, in order to accommodate you obtaining your educational goals, we request that you function as part of the anesthesia team and participate in some of the non-procedural duties.

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- Cases start at 0830 on Mondays, and 0730 every other weekday. Residents should plan to be in the OR or PREOP area no later than 30 minutes ahead of time to meet their team. Once they get to know the teams, they may arrange to meet even earlier to help with the OR setup.
- The ideal pediatric resident doing an anesthesia rotation would:
    - 1) read the relevant chapters in the Basics of Anesthesia book listed below—general anesthesia, anesthesia machine, induction agents, inhaled agents, muscle relaxants, opioids, local anesthetics, and pediatric anesthesia.
    - 2) ask to learn how to help set up for cases
        - set up IV boats
        - debubble IV tubing
        - draw up drugs
        - check the anesthesia machine
    - 3) learn to use the anesthesia record to help chart during the case
    - 4) ask politely to place the IV and/or intubate
    - 5) discuss anesthetic issues and concerns about the specific case; and ask questions about why the anesthesiologist chose to manage the anesthesia a certain way
    - 6) observe and learn the pharmacology of the anesthetic agents, and their effects on the patient's physiology.

Evaluation and Feedback

1. This rotation requires you to keep a case and procedure log including date, name or patient, type of surgery, name of attending or fellow, and the procedures you did. A copy of the log must be submitted to Dr. Kuan in order to complete the rotation. You should also add this log to your Medhub Profile or Professional File in the Program office
2. Dr. Kuan will use the list of individuals you worked with to solicit feedback and then complete a group evaluation in Medhub.

References

1) Basics of Anesthesia, 5th Ed. , Stoelting, Robert, and Miller, Ronald.
The chapters printed in the reading packet are copied from the 4th edition of this book.
2) Clinical Anesthesiology, 4th Ed. Morgan, G Edward.
3) Anesthesiologist's Manual of Surgical Procedures, 4th Ed. Jaffe, Richard.
4) A Practice of Anesthesia for Infants and Children, 4th Ed. Cote, Charles J.

FAQs- as answered by two recent LPCH pediatric residents

1) Why four weeks?

"I initially requested a 2 week rotation, but after discussing it with Calvin, I realized that I would miss several days due to clinic and being post-call, leaving only 6 days out of 2 weeks for the rotation. Calvin suggested that I wait until I could be on the rotation for 4 weeks, which was excellent advice, especially if one of your goals for the rotation is to perform procedures. It takes a couple days to figure out the layout of the ORs and become comfortable with which rooms/attendings will be highest yield. In terms of procedures, I did most during my 3rd and 4th weeks- by this point in the rotation I was familiar with several attendings, and they had seen me around for a while, which led to more procedural opportunities"

2) Which cases/rooms/locations are particularly useful for a non-anesthesiologist or pediatrician?
"For LPCH peds residents, it was great to be in the cardiac rooms for a couple of days. Interesting to get a better idea of what goes on in the OR before we assume care of kids in the CVICU. I also enjoyed helping with anesthesia/sedation for CT/MRI, as writing for sedation is often our responsibility as peds residents. The ENT cases in the APU offered substantial opportunities to place IVs and practice airway management/intubation."

"Residents should realize that there is an enormous amount to learn about medications and physiology - I would encourage them to stay in a room even if they miss the intubation/PIV to learn the choices made for anesthesia for various patients - and ask questions (why ketamine AND propofol for the baby, but not for the 5 y/o? ---- I do know the answer to that one now....)."

3) Did you prefer to be assigned to a specific attending or room for an entire day? Or to have flexibility to move

around? “Nice to be assigned the first 1-2 weeks to meet people and get a feel for the rotation, then it was great to be able to pick and choose (this one probably depends on the peds resident, including what year they are).”
“I heard that some residents would place PIVs and then leave - and I think this has given some attendings the wrong impression of our residents (so embarrassed - sorry!). I would maybe say right up front that this is not meant to be a grueling rotation, but staying to watch extubation and emergence delirium have a lot of value - and mention that the attendings are usually understanding that a 4 hour case loses its teaching value over time, but they do sort of need to know that visiting residents are interested enough to stay for at least a portion of it - and stay for the wake-up in shorter cases. This might accomplish the goal of deterring those who are just looking for an "easy" few weeks – and might punt them to vascular access if their only goal is to do
PIVs.”

4) What can one do to prepare for the rotation? Was the reading packet helpful? Which sections were most useful?
“The reading packet was perfect- not too long or overwhelming, but a good primer for the rotation. I remember a nice section on the basics of peds anesthesia.” “Let people know about the syllabus early on - and mention
that there is a great PEDS section at the end - but the rest of it has the physiology that we always wonder about - and is pretty applicable to adults and children alike.”

Anesthesia Competency-based Goals and Objectives

Goal 1. Recognize and manage upper airway obstruction and desaturation.

Resident Objectives:	Instructional Strategies	Assessment of Competency	ACGME Competency Goals
Identify conditions that result in upper airway obstruction.	Attending discussion Readings	• Direct observation • Medhub evaluation	*MK* *PC*
State indications for and demonstrate use of oropharyngeal airway vs. nasal trumpet.	Attending discussion Readings	• Direct observation • Medhub evaluation	MK PC
Discuss routine care of a tracheostomy and know how to recognize tracheostomy obstruction; demonstrate proficiency in replacement of a tracheostomy tube.	Attending discussion Readings	• Direct observation • Medhub evaluation	MK PC
Recognize desaturation that requires intervention and describe the indications for use of appropriate oxygen delivery devices (e.g., simple nasal cannula, simple O2 mask, Venturi mask, partial rebreather and non-rebreather masks).	Review percentages of FIO2 delivered for various oxygen delivery devices. Set-up oxygen delivery equipment and oxygen saturation monitoring and participate in troubleshooting malfunctioning equipment.	• Direct observation • Medhub evaluation	MK PC

Goal 2. Participate in the care and management of pediatric patients requiring general and local anesthesia.

Resident Objectives:	Instructional Strategies	Assessment of Competency	ACGME Competency Goals
Assist the anesthesiologist or surgeon in addressing issues related to pre-anesthesia evaluation, risk assessment and preparation.	• Review pre-op evaluations/history/physical/labs and anesthetic risk for all cases in which one is participant. • Assess airway anesthetic risk in all cases • Review cases requiring refererral for cardiac assessment	• Direct Observation • Medhub	SBP MK PC P

List specific pre-anesthetic considerations for children with the following conditions: recent upper respiratory infection, reactive airway disease, upper airway obstruction (croup, epiglottitis, airway foreign body), congenital heart disease, neonatal apnea, obstructive sleep apnea, diabetes, seizure disorder.	Readings Anesthesia cases	• Direct Observation • Medhub	MK
List specific anesthetic considerations for children with the following conditions: genetic disorders, musculoskeletal disorders and conditions requiring emergency surgery.	Readings Anesthesia cases	• Direct Observation • Medhub	MK
State NPO guidelines for LPCH and rationale for these.	Review NPO status for cases. Review LPCH guidelines.	• Direct Observation • Medhub	MK SBP
Assist in the psychosocial preparation of the child and parents for anesthesia and practice different techniques based on age.	Observe Attending/Fellow introductions and strategies for alleviating anxiety. Reflect on most effective strategies.	• Direct Observation • Medhub	ICS P
Recognize the importance of and describe in general terms the complication of malignant hyperthermia.	Readings	• Direct Observation • Medhub	MK
Demonstrate understanding of the following principles of intraoperative anesthetic management: 1. IV access and fluid management during anesthesia 2. Non-invasive monitoring of blood pressure, heart rate, oximetry and capnography 3. Temperature control in the peri-anesthetic period	Calculate ETT size, cuff versus uncuffed, leak, length, and confirm ETT placement. Apply monitoring equipment Place IVs Demonstrate suctioning Provide PPV with varying types of bag mask devices	• Direct Observation • Medhub • Procedure log	MK PBLI

4. Anesthetic equipment 5. Bag mask ventilation devices (self-inflating bag, anesthesia bag) 6. Airway devices (oral/nasal airways, endotracheal tubes, laryngeal mask airways) 7. Laryngoscopes 8. Use of physical examination and monitoring methods for early detection of airway obstruction 9. Airway suction devices 10. Oxygen supplementation devices 11. Anesthetic induction and reversal techniques, including basic pharmacology of inhalation anesthetic agents, intravenous anesthetic agents, muscle relaxants, local anesthetics, narcotic analgesics, and agents to reverse muscle relaxation			
Understand the basic pharmacology of commonly used agents for local anesthesia and their side effects.	Readings Attending discussion Anesthesia conferences	• Direct Observation • Medhub	PC MK
Describe post-anesthesia management of: - Nausea and vomiting - Post-surgical pain - Reestablish PO post-anesthesia - Discharge criteria	Follow-up on patients course in PACU and during inpatient hospitalization Attending discussion Anesthesia conferences	• Direct Observation • Medhub	PC

Goal 3. Develop understanding of and basic approach to common diagnostic and therapeutic procedures.			
Resident Objectives:	Instructional Strategies	Assessment of Competency	ACGME Competency Goals
Define and perform (unless observation noted) the following procedures; list indications, contraindications, and possible complications: - Anesthesia/analgesia: local/topical - Anesthesia/analgesia: pain management - Intravenous line placement - Seldinger technique (observe) - Endotracheal intubation - Suction nares, oral pharynx, tracheostomy - Bag-mask ventilation - Initiate mechanical ventilation - Interpret and respond to blood gases - EKG / cardiac monitoring - Pulse oximeter placement and monitoring - Capnometry monitoring	• Perform all of the specified procedures on multiple occasions	• Direct Observation • Medhub • Procedure Log	MK PC P PBLI

Modified from Kittredge, D. Baldwin C.D., Bar-on, M.E., Beach, P.S., Trimm, R.F. (Eds.). (2004). APA Educational Guidelines for Pediatric Residency. Ambulatory Pediatric Association Website.

PBLI = practice based learning and improvement
ICS = interpersonal and communication skills
P= professionalism
MK= medical knowledge
PC= patient care
SBP = systems based practice