PROPOSAL FOR PEDIATRIC CARDIOLOGY BOOT CAMP

Intended Audience: Forty future first year cardiology fellows from throughout the United States starting their ACGME approved pediatric cardiology fellowship in July 2017 will be included in Boot Camp. The pilot program in 2015 included Stanford cardiology fellows while the program last year included fellows from throughout the Western United States and Canada. The goal in 2017 is to open the program up nationally.

Organizing Faculty/Course Directors:

1.) Scott R. Ceresnak, MD
   Assistant Professor of Pediatrics, Pediatric Cardiology
   Associate Program Director, Pediatric Cardiology Fellowship

2.) Catherine Krawczeski, MD
   Associate Professor of Pediatrics, Pediatric Cardiology
   Program Director, Pediatric Cardiology Fellowship

3.) David Axelrod, MD
   Clinical Assistant Professor of Pediatrics, Pediatric Cardiology

4.) Kara Motonaga, MD
   Clinical Assistant Professor of Pediatrics, Pediatric Cardiology

5.) Loren Sacks, MD
   Clinical Assistant Professor of Pediatrics, Pediatric Cardiology

Summary: 2 ½ day intensive course taught prior to the start of pediatric cardiology fellowship (Spring 2017) designed to provide future fellows an introduction to clinical cardiology, technical aspects of cardiology that are not taught as part of the residency curriculum, and cardiac emergencies that may be encountered as a cardiology fellow. The boot camp is designed to help give incoming fellows a hands-on introduction to clinical cardiology.

Areas of Instruction: Clinical cardiology, electrophysiology, echocardiography, cardiovascular intensive care, cardiac catheterization, cardiac anatomy, pediatric heart failure and transplantation, pulmonary hypertension, cardiac surgery for congenital heart disease.

Course framework: A combination of didactic instruction, hands-on workshops, group learning, and simulation experiences taught by some of the leaders in the field of pediatric cardiology. New for the 2017 Boot Camp will be the introduction of flipped classroom modules in the subspecialty areas of pediatric cardiology that are to be completed by participants prior to boot camp and also a virtual reality anatomy station at the boot camp training course.
**Overall Outline**

Technical workshops with some group instruction with experts in the field would occur at the Li Ka Shing Center for Immersive and Simulation Based Learning at Stanford and include:

- Anatomy – hands on sessions with heart specimens, dissection of animal hearts
- Auscultation – basics of auscultation with “Harvey” simulation model
- Echocardiography – learning how to use the echo machine, learning basics of the echo machine and probes, practicing obtaining some basic echo views, identifying/interpreting the 5 basic ECHO views, checking for function and effusion.
- Electrophysiology – working and using a temporary pacing box commonly used after cardiac surgery, interrogating a pacer/ICD, how to navigate the telemetry system.
- Cardiac catheterization – how to get access, basics of sheaths/wires/catheters, implantable devices
- Pulmonary hypertension – pathophysiology of PH, pharmacotherapy of PH (including Nitric Oxide), treatment of pulmonary hypertensive crisis
- VAD experience - look at Berlins, Heartware devices and controllers and hand pumps.
- Cardiac surgery – basics of bypass, Frank Hanley going through a typical cardiac surgical case
- Cardiovascular Intensive care: basics of cardiac monitoring, simulation of CPR, mechanical circulatory support
- Simulation – simulation lab with arrhythmias and clinical scenarios

**Detailed Schedule**

**Day #1**

7:15 – 7:40 am: Registration / Breakfast
7:40 – 8:00 am: **Introduction to the Course** (Ceresnak)

8:00 – 8:45: **Cath / Hemodynamics Lecture** (LK005) (Feinstein, Peng)

8:45 – 9:00: **Seldinger Technique Review** (Krawczeski)

9:15 – 11:45: Workshop Set 1a (8 groups, 5 people per group)
* 35 minutes per station x4 rotations
  Groups 1-4 = **Anatomy stations** (4 tables in LK005)
  Station 1 – RV/LV, coronaries (Daniel Murphy MD)
  Station 2 – RA/LA, other (Norman Silverman MD)
  Station 3 - Great vessels, systemic and pulmonary venous return (Dan Bernstein, MD)
  Station 4 – Surgical consideration (Kats Maeda MD)
Groups 5-8 = **Access Workshops** (2 in OR, 2 in 3-bay)
Station 1 - Fem Line (3-bay) (Sacks, Reddy)
Station 2 - IJ Line (3-bay) (Axelrod, Asija)
Station 3 - Pericardiocentesis (OR) (Krawczeski, Kwiatkowski)
Station 4 - Movat (LK013) (Ceresnak/Motonaga)

11:45 – 12:30: **Lunch - Cardiology Jeopardy** (Ceresnak)

12:45 – 3:15: Workshop Set 1b (8 groups, 5 people per group)
  * 35 minutes per station x 4 rotations

  Groups 5-8 = **Anatomy stations** (4 tables in LK005)
  Station 1 – RV/LV, coronaries (Daniel Murphy MD)
  Station 2 – RA/LA, other (Norman Silverman MD)
  Station 3 - Great vessels, systemic and pulmonary venous return (Dan Bernstein, MD)
  Station 4 – Surgical consideration (Kats Maeda MD)

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Station 4 - Movat (LK013) (Ceresnak, Motonaga)

3:15 – 3:30: BREAK

3:30 – 6:00: Workshop Set 2a (8 groups, 5 people per group)

  * 37min/station x 4 rotations

  Groups 1-4 = **ECHO, Auscultation, Virtual Reality**
  Station 1 - VR (LK060) (Axelrod)
  Station 2 - Echo (OR) (Arunamata, Tacy)
  Station 3 - Echo Interp (LK063) (Balasubramanian)
  Station 4 – Auscultation - Harvey (3-bay) (Olson, Kipps)

Groups 5-8 = **ECG Basics and Cath/Fluro Simulation**
Station 1 - ECG Setup (LK005)[How to do an ECG/atrial ecg, tele station] (Mit, Axelrod)
Station 2 - Zoll Defibrillator, Lifevest (LK005) (Krawczeski, Sacks)
Station 3 - SVT Lab (LK005) [Interactive arrhythmia Lab, mini-sim] (Motonaga/Dubin)
Station 4 - Cath Fluoro Sim (LK005) (Ceresnak)
6:00 – 6:10pm – Wrap-up for the Day (Ceresnak)

6:15pm – Group DINNER (LKSC Lawn)
- VR set up during dinner to allow participants to “play” at their leisure

**Day #2**

7:15-7:30: Introduction to the Day and Breakfast (Ceresnak)
7:30 – 8:30: Cardiac Surgery / CPB Lecture (LK005) (Hanley)

8:30 – 10:30: Workshop Set 3a
*30min, 4 stations
Groups 1-4 = Cardiac Pacing/ EP stations (30min / station)
Station 1 - How to read ECGs (Motonaga)
Station 2 - Pacemaker/ICD interrogation and Programming (Dubin, Avasarala)
Station 3 - PM Temp (Krawczeski)
Station 4 - 3D mapping and Pacemaker placement simulators (Ceresnak)

10:30 – 12:30: Workshop 3a
Lecture: Pediatric Heart Failure, VADs, ECMO (Yarlagadda, Chen) – 1 hour
Groups 1-4 = VAD /ECMO (rotate 30min per station 2 groups (1&2/ 3&4)
Station 1- Berlin Heart (Hollander, Almond)
Station 2 - Heartware/Mate (Chen, Murray)

**8:30 – 12:30: SIM Session 1 (3-Bay and LK063) (Sacks, Axelrod, Reddy)
Groups 5 – 8 = 20 people, 4 scenarios, 5 people per “team”

12:30 – 1:15: Lunch/Networking

1:15 – 2:15: Pulmonary Hypertension (LK005) (Feinstein, Ramfh)

2:15 – 3:00: ECG Interpretation Game (LK005) (Dubin, Motonaga)

3:15 – 3:30: Break

3:30 – 6:00: Workshop Set 2b (8 groups, 5 people per group)
* 37min/station x 4 rotations
Groups 5-8 = ECHO, Auscultation, Virtual Reality
Station 1 - VR (LK060) (Axelrod)
Station 2 - Echo (LL011) (Arunamata, Tacy)
Station 3 - Echo Interp (LK063) (Balasubramanian)
Station 4 – Auscultation - Harvey (3-bay) (Olson, Kipps)
Groups 1-4 = ECG Basics and Cath/Fluro Simulation
Station 1 - ECG Setup (LK005) [How to do ECG/atrialecg, tele] (Mit, Dax)
Station 2 - Zoll Defibrillator, Lifevest (LK005) (Krawczeski, Sacks)
  Station 3 - SVT Lab (LK005) [Interactive, minisim] (Moton/Dubin)
Station 4 - Cath Fluoro Sim (LK005) (Ceresnak)

6:00: **DINNER** (CSSR Atrium)
- VR set up during dinner to allow participants to “play”

**Day #3**

7:30 – 8:00: **Introduction to the Day**, Breakfast (Ceresnak)

8:00 – 10:00: Workshop Set 3b
  *30min, 4 stations
  Groups 5-8 = Cardiac Pacing/EP stations (30min / station)
  Station 1 - How to read ECGs (Motonaga)
  Station 2 - Pacemaker/ICD interrogation and Programming (Dubin, Avasarala)
  Station 3 - PM Temp (Krawczeski)
  Station 4 - 3D mapping and Pacemaker placement simulators (Ceresnak)

10:00 – 12:00: Workshop 3a
  Lecture: **Pediatric Heart Failure, VADs, ECMO** (Yarlagadda, Chen) – 1 hour
  Groups 5-8 = VAD/ECMO (rotate 30min per station 2 groups (1&2/3&4)
  Station 1- Berlin Heart (Hollander, Almond)
  Station 2 - Heartware/Mate (Chen, Murray)

**8:00 – 12:00: SIM Session 2** (3-Bay and LK063) (Sacks, Axelrod, Reddy)
  Groups 1 – 4 = 20 people, 4 scenarios, 5 people per “team”

12:00 – 1:00 = Lunch, Post-Test, Survey and Wrap Up (Ceresnak et al)
Faculty
Scott Ceresnak, MD – Assistant Prof. of Pediatrics (Peds Cardiology) - EP
Catherine Krawczeski, MD – Associate Prof. of Pediatrics (Peds Cardiology) - CVICU
David Axelrod, MD – Clinical Assistant Prof. of Pediatrics (Peds Cardiology) – CVICU
Loren Sacks, MD – Clinical Assistant Prof. of Pediatrics (Peds Cardiology) – CVICU
David Kwiatkowski, MD - Clinical Assistant Prof. of Pediatrics (Peds Cardiology) – CVICU
Sushma Reddy, MD - Assistant Prof. of Pediatrics (Peds Cardiology) – CVICU
Ritu Asija, MD - Clinical Assistant Prof. of Pediatrics (Peds Cardiology) – CVICU
Sowmya Balasubramanian - Clinical Assistant Prof. of Pediatrics (Peds Cardiology) – ECHO
Kara Motonaga, MD – Clinical Assistant Prof. of Pediatrics (Peds Cardiology) - EP
Frank Hanley, MD - Prof. of Surgery – Pediatric CT Surgery
Kats Maeda, MD – Assistant Prof. of Surgery – Pediatric CT Surgery
Anne Dubin, MD – Professor of Pediatrics (Peds Cardiology) - EP
Teri Tacy, MD - Associate Prof. of Pediatrics (Peds Cardiology) - ECHO
Alisa Arunamata, MD – Advanced Clinical Fellow (Peds Cardiology) – ECHO
Alaina Kipps, MD - Clinical Assistant Prof. of Pediatrics (Peds Cardiology) - ECHO
Inger Olsen, MD - Clinical Associate Prof. of Pediatrics (Peds Cardiology) - ECHO
Norman Silverman, MD - Professor of Pediatrics (Peds Cardiology) - ECHO
Sushma Reddy, MD - Assistant Prof. of Pediatrics (Peds Cardiology) - CVICU
Seth Hollander MD - Clinical Assistant Prof. of Pediatrics (Peds Cardiology) – Heart Failure
Doff McElhinney, MD - Prof. of Surgery – Pediatric CT Surgery
Lynn Peng, MD - Clinical Assistant Prof. of Pediatrics (Peds Cardiology) – CATH
Dan Murphy, MD - Professor of Pediatrics (Peds Cardiology) – ECHO
Dave Peng, MD – Advanced Clinical Fellow (Peds Cardiology) – Heart Failure
Renee Rodriguez, MD – Clinical Fellow (Peds Cardiology) – Chief Fellow
Mithras Maurille – Director of Non-Invasive Pediatric Cardiology Laboratory
Jeff Feinstein, MD - Professor of Pediatrics (Peds Cardiology) – Pulmonary Hypertension
Michele Ogawa, NP – Pulmonary Hypertension
Sharon Chen, MD - Clinical Assistant Prof. of Pediatrics (Peds Cardiology) – Heart Failure
Chris Almond - Associate Prof. of Pediatrics (Peds Cardiology) – Heart Failure
Vami Yarlagadda - Clinical Assistant Prof. of Pediatrics (Peds Cardiology) – CVICU
Dan Bernstein – Professor of Pediatrics (Peds Cardiology) – Heart Failure
Christina Litzner, RN – CVICU
Krista Jett, RN – CVICU
Jenna Murray, PNP – Heart Failure