

# Results of the PACES COVID-19 Survey

## Survey Conducted: March 2020



*the* Pediatric & Congenital  
Electrophysiology Society

# Gentle Reminder

- These are not PACES Guidelines
- Survey results presented have been edited to minimize duplicate responses
- Survey results should not be used in part or whole for publications, presentations or general dissemination without permission
- For questions or comments, contacts: Maully Shah at [shahm@email.chop.edu](mailto:shahm@email.chop.edu)

# 1.COVID-19 and Arrhythmias in PACES Community

- No suspected or confirmed pediatric COVID -19 cases with arrhythmias as of survey date
- Overall, none or very few COVID -19 children encountered in hospitals
- One COVID-19 confirmed pediatric heart patient (4 mo, with TAPVR repair and pneumonia. Did well and was discharged after 3 days) reported in survey
- Probably unrelated to COVID 19 (as per survey responders)
  - 7 year old with myocarditis with slow VT and myocardial dysfunction (not tested for COVID 19)
  - Fetal Torsades de Pointes with LQTS 2 Mother (healthy)
  - SCD, n=1
  - Asystole/cardiac arrest, n=1
  - Infant SVT with intercurrent illness on propranolol presented with bradycardic arrest (Autopsy COVID 19 testing performed due to CXR lung findings -negative, MSSA in lungs +)

## 2. Outpatient Clinic Visits (URGENT): Highlights (i.e. common responses)

### ARRHYTHMIAS +/-SYMPTOMS:

- Aborted SCA
- complex CHD
- VT (especially new onset)
- symptomatic bradycardia
- intractable/incessant/refractory SVT
- New channelopathy
- New significant arrhythmia
- symptomatic WPW
- cardiomyopathy

### BABIES/INFANTS:

- new arrhythmia
- medication titration
- on “major” antiarrhythmics

### DEVICES/Leads:

- End of service
- failure
- Infection
- lead fracture if PM dependent
- PM ERI in 12 months
- loss of CRT in a fragile patient
- ICD shocks
- Concerning device remote transmissions including warnings, device alarms

### FETAL:

- Fetal referral with suspected severe LQTS or TdP
- unexplained hydrops
- Fetal arrhythmias

### SYNCOPE:

- atypical
- recurrent
- exertional
- CHD/ACHD
- WPW
- Cardiomyopathy
- Abnormal EKG
- Device patient

### POST OP CHECKS:

- Requires testing
- Wound concerns

### PROVIDER'S DECISION:

- anything that cannot safely wait > 1 month as per provider



## 2. Outpatient Visits (URGENT) All Responses (edited)

- Breakthrough arrhythmias while on maintenance medical therapy
- Concerning device remote transmissions including warnings, device alarms
- Devices that are end of service
- Exertional syncope or chest pain
- Recurrent syncope
- Atypical syncope
- Symptomatic patients requiring urgent testing
- Need for active up-titration for arrhythmia therapy
- Inappropriate or appropriate ICD shocks
- New arrhythmias especially VT
- New channelopathy
- Infant needing antiarrhythmic med adjustment (ECG for class I, III AA)
- Provider's decision
- Babies with SVT
- Babies with arrhythmias on significant antiarrhythmic therapy
- New high grade AV block or high grade AV block with symptoms
- hard to think of anything that absolutely needs to be seen for an arrhythmia visit that wouldn't need to come in more acutely to the ER
- Non paced 3<sup>rd</sup> degree AV block
- All new consults, arrhythmogenic syndrome patients with new symptoms / no ICD
- High tachycardia burden with associated risk of cardiomyopathy or symptoms
- Fetal referral with suspected severe LQTS or TdP, unexplained hydrops
- Intractable arrhythmia
- device failure/infection
- Aborted SCD
- Incessant SVT
- Syncope in CHD/ACHD
- Syncope in channelopathy
- Syncope in cardiomyopathy
- Syncope in WPW
- Syncope with abnormal EKG
- PM dependent with lead fracture
- Arrhythmia with ventricular dysfunction
- Complex CHD with arrhythmia issues
- Patients with imminent chance of morbidity/mortality within the next 1-2 months
- Some Post op patients
- Recent hospital discharges who are high risk
- Incision concerns
- Cardiomyopathy with new palpitations
- Symptomatic Bradycardia
- New/acquired CHB
- PM-ERI in 12 month
- Syncope, QTc > 480 ms
- Ones who MUST come in for CXR/echo/wound check
- Symptoms after recent device implant
- Pacemakers with increasing thresholds
- Device malfunction affecting hemodynamics e.g. loss of CRT in a fragile patient
- nontrivial risk of either ED visit or life threatening event in the coming weeks/months
- symptoms with major QoL impact in the coming weeks/months
- New diagnosis SVT
- New symptomatic WPW
- patients with active symptoms and/or need of change of medications
- Life threatening arrhythmias
- Anything that I believe postponing a month could reasonably put their health in jeopardy
- VT in ACHD, ICD shocks , intractable SVT only
- Electrical storm

### 3. Outpatient Visits (ELECTIVE)

- Visits that can be accomplished by Telemedicine
- Clearances
- Routine follow ups
- Any encounter that can be handled over the phone
- Non-pacemaker dependent follow ups
- Routine Post ablation follow ups
- Established channelopathies
- All device patients who are compliant with remote transmissions and there are no new device/lead warnings
- Family's decision
- Routine follow up that can be deferred until June 1 (i.e. 6m - 12m follow up)
- device visits that can be done by remote transmission
- POTS
- Fetal SVT, Stable fetal AVB, ectopy
- New SVT
- Medication adjustments
- Patients that can wait > 3 months
- Wound check with no parental or patient concerns
- Primary prevention devices
- CRT devices
- No active arrhythmia
- well functioning device
- no anti-arrhythmic medication side effects
- Patients who are typically seen every 6-12 months
- Asymptomatic WPW
- actual clinical issue where physical examination or face to face discussion is needed
- Vasovagal syncope
- Non exertional chest pain
- Known arrhythmias that are stable

# 4.URGENT PROCEDURES HIGHLIGHTS (common responses)

## **CATHETER ABLATION:**

- Tachycardia induced cardiomyopathy
- Medically refractory arrhythmia
- hemodynamically significant arrhythmia especially in CHD/ACHD
- Symptomatic VT
- Symptomatic WPW
- WPW/Preexcited AF
- VT ablation for ICD storm

## **DEVICES:**

- secondary prevention ICD
- VT/likely arrhythmogenic syncope in CHD/ACHD
- nearing ERI
- lead extraction for infection
- lead extraction/replacement for PM dependent patient
- device infection
- symptomatic heart block
- select ILR
- CRT in symptomatic CHF

## **SURGERY/ICU:**

- arrhythmia surgery concomitant with congenital heart surgery that cannot wait
- EP procedures needed before non-elective surgery
- arrhythmia needing ECMO

## **Miscellaneous:**

- urgent DC Cardioversion
- Temporary pacing

## 4. Urgent Procedures -All responses(edited)

- PM, ICD implants, revisions
- symptomatic VT
- symptomatic WPW
- hemodynamically significant arrhythmia (VT or SVT)
- that can't be managed medically
- Medically refractory SVT
- lead fracture,
- device at ERI, device ERI in 12 months
- refractory arrhythmias
- Delay would cause patient harm
- VT ablation
- Secondary prevention ICD
- Symptomatic CHB
- pacemaker and ICD implants
- WPW with syncope
- VT with syncope
- Some ILR (e.g. concerning syncope)
- procedures needed before non-elective surgery
- WPW
- lead extraction for CIED infection
- primary prevention ICD implants,
- secondary prevention ICD implants,
- catheter ablation of WPW,
- rare VTs,
- pacemaker implantation for significant bradycardia and AV blocks,
- unstable arrhythmia (e.g. atrial flutter in ACHD patient not adequately controlled with medications)
- Device/lead malfunction or imminent malfunction
- Device >1.5 months post ERI
- inpatient device, WPW w/syncope
- extreme parental anxiety
- Ablation for incessant arrhythmia
- TIC
- Urgent cardioversions
- Device failure/infection
- Temporary pacing
- arrhythmia surgery concomitant with congenital heart surgery that cannot wait
- < 1month
- Symptomatic WPW (or known preexcited atrial fibrillation)
- Arrhythmias on ECMO



## Urgent Procedures-all responses (cont.)

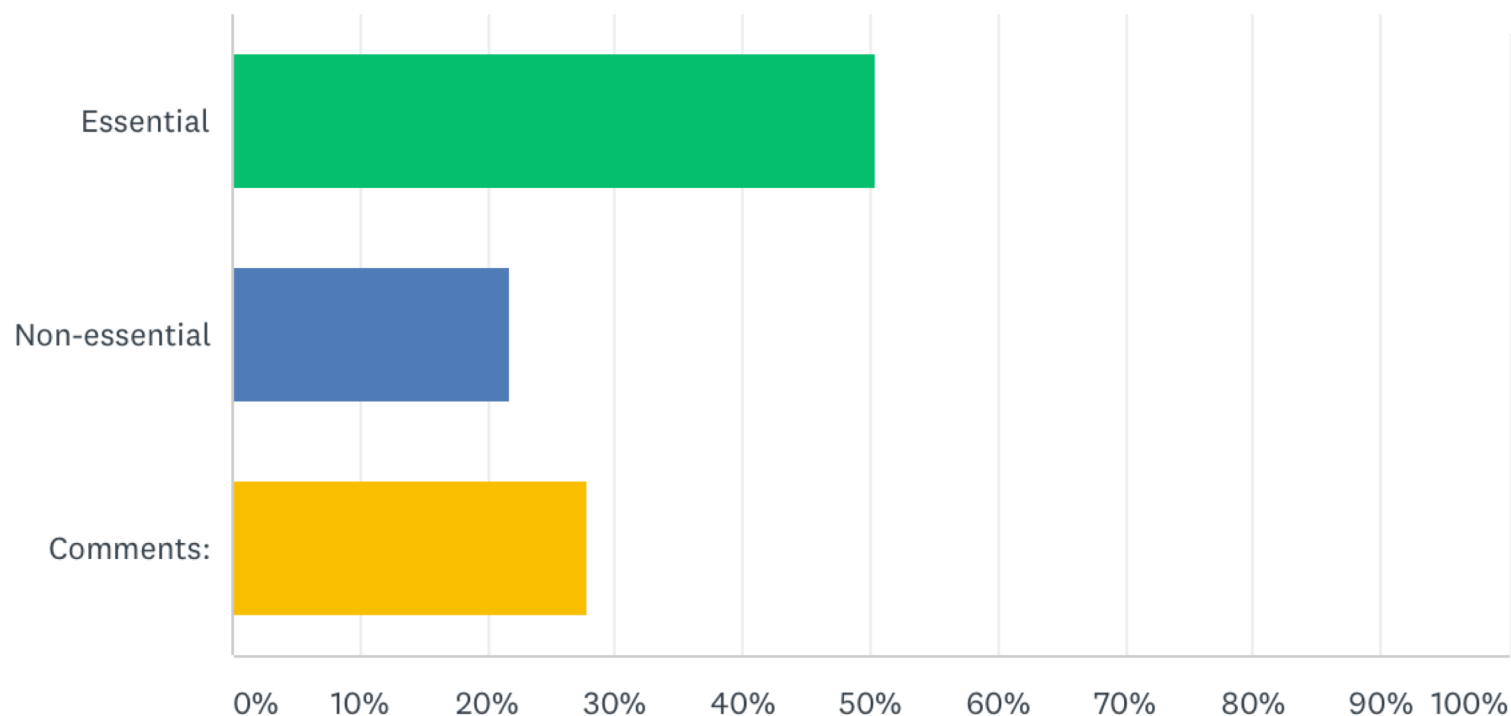
- Risk of deterioration in the coming weeks versus risk of exposure to decide
- Depends on patient's risk with arrhythmia and COVID. If their arrhythmia would severely compromise COVID course (such as some of my Fontan and ACHD pts) then they should be ablated more urgently so they can hopefully be fixed before they get COVID
- pacemaker or ICD generator replacement for those with < 1 month till EOL or EOL.
- Any procedure in which delay for >30 days would be thought to result in increased morbidity or mortality is considered urgent.
- ablations for symptomatic chronic arrhythmias despite medical therapy or significant medication side effects
- CRT In symptomatic CHF
- device at ERI intolerant of Fixed VVI
- VT ablation for ICD storms
- Pacing for CHB with wide qrs
- ablations for arrhythmia requiring hospitalization
- Prognosis altering procedures
- Risk stratification of WPW
- ASCD with focus amenable to ablation
- Inpatients/Transfers for arrhythmia management that require EP procedure
- AT/IART ablation in patients with heart failure,
- EPS in ACHD patients with nsVT, Syncope
- in major symptoms that cannot be controlled with meds, OR major risk of clinical decompensation / hospitalization
- nontrivial sudden death risk (eg WPW with preexcited AF or syncope,
- hereditary arrhythmia/myopathy with ultra high-risk features (the ones we would offer WCD while waiting)
- Aflutter with LV Dysfunction that does not respond to cardioversion
- ICD in CHD patient for VT
- Class I and IIA indication of PM implantation
- Class I device implants

# 5. Elective Procedures

- Standard SVT
- asymptomatic PVCs
- Routine ablations
- elective generator changes
- generator replacement in nondependent patients
- patient having a procedure for long term benefit but is doing well in the short term
- SVT, with or without WPW on meds and stable
- Ablations for arrhythmias without hemodynamic consequences such as syncope
- Primary prevention ICD
- non-urgent pacemaker
- > 3 -6 months
- EPS
- Asymptomatic wpw
- RVOT , posterior fascicular VT ablation
- HUT
- EST
- Pacemaker for SND
- pacing in absence of presyncope or syncope
- Low risk accessory pathways
- ILR
- Non WPW SVT ablation
- arrhythmias controlled with meds
- asymptomatic WPW
- WPW+palpitations
- most primary prevention ICDs,
- most pacemakers
- AT/AF-ablation in pt after repair of CHD who are currently stable on antiarrhythmics or tolerate arrhythmia well (individual consideration)
- SVT ablation in pt with structurally normal hearts and normal LV-function,
- risk stratification in pt with ventricular arrhythmias
- Routine CIED generator replacement (non-dependent patients, estimated longevity at least 2-3 months)
- routine catheter ablation of idiopathic VT
- A fib ablation
- CRT

# How has your administration viewed the EP service/specialty during the COVID 19 pandemic?

Answered: 101 Skipped: 1



## Comments

Largely non-essential with rare exceptions

probably important but not essential

Mostly non-essential, as in not needed to be in the hospital but accessible at all normal times.

Like EP any other day. We become indispensable as soon as we're perceived to be needed.

neither. essential but use discretion, do not come in unless absolutely needed,

Essential, but nonessential work conducted from home

Not clear but we all do general and ICU service which is essential

We are left to self-define what part of our work is essential

No specific position so far.

Identified as specific group, but do not need to be present in person unless EP procedure dictates

mostly non-essential but of course sometimes very significant as usual.

EP service remains essential, EP procedures have been reviewed and classified at the EP attending's discretion

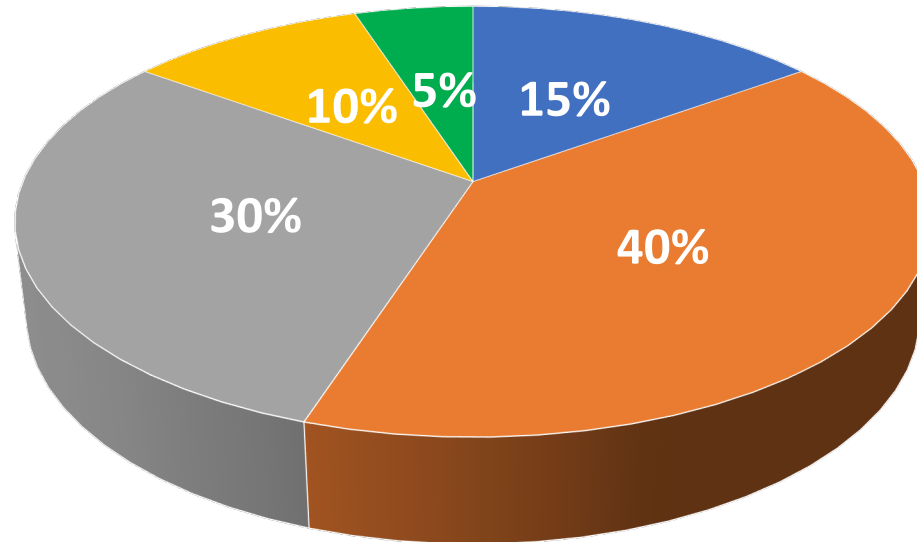
Not sure what this even means.

Paediatric ICU and beds converted for adult Covid use



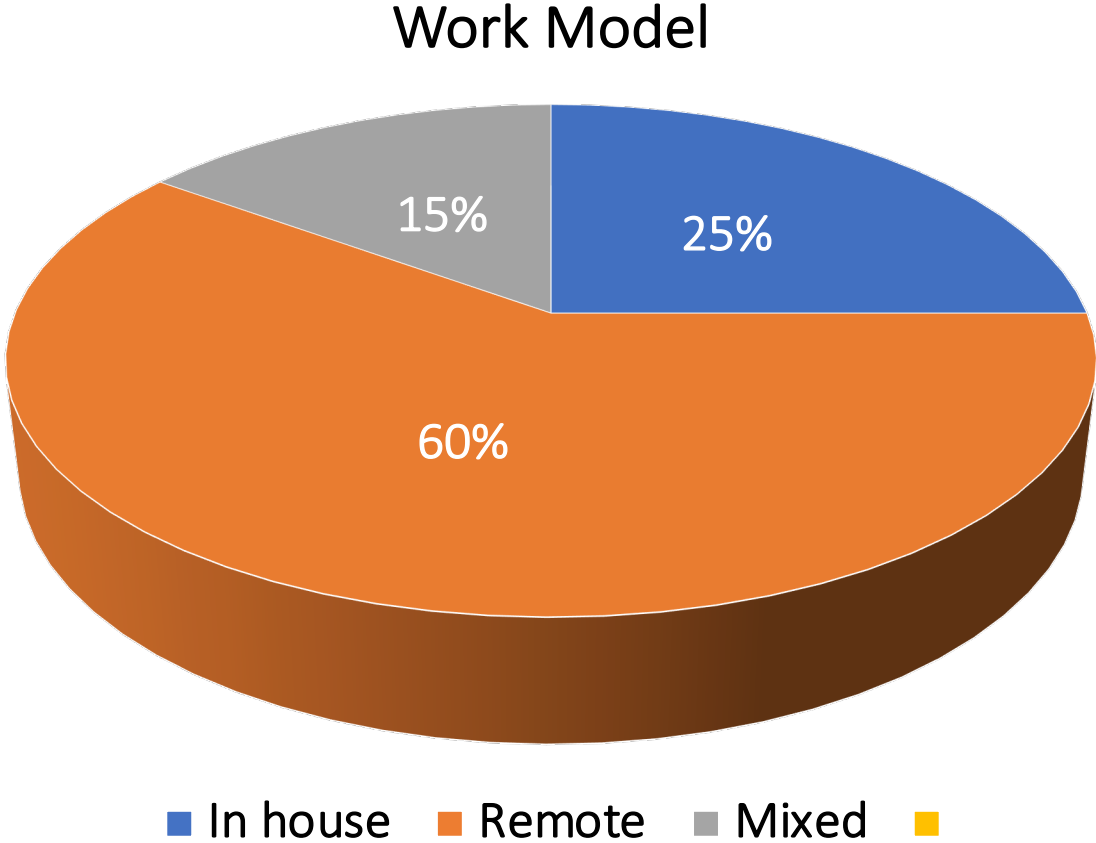
# EP Physician Staffing Models

Work Models



- Mixed
- In house as needed
- Cardiology Team system (with reserve)
- In House EP service attending
- Remote

# AP Staffing Models



# Most Frequently Asked Questions by Families

- People who have SVT, WPW, LQT, CPVT, Brugada, Timothy Syndrome, pacemakers or ICDs, CHD, POTS, CHB-does this make them more susceptible to the corona virus ?
- Are children more likely to be carriers even though they do not have symptoms as parents may have chronic conditions?
- Is it safe for patients or parents to work at jobs considered to be essential?
- Can they have a note not to work?
- If parents still have to work outside of the home, what are the chances that they are bringing it home to the kids?
- Can they give their children Ibuprofen and or chloroquine ? (This came up after SADS webinar)
- Can I continue to take Enalapril ? (ACE inhibitor )
- Can COVID-19 make my arrhythmias worse?
- What can I do to keep myself /my child from getting COVID-19?
- Is it safe to wait for my (elective) procedure in light of COVID-19?
- What should I do (from EP standpoint) if I develop COVID-19 symptoms or am diagnosed with COVID-19?
- Can I leave early after the ablation instead of staying in recovery to avoid exposure in the hospital?
- Can I get multiple prescriptions in case my pharmacy closes ? What if I run out medications?
- Should I cancel my clinic visit? Is it safe to wait till later?

# PACES Community Comments (selected with highlights of international perspectives)

- In my hospital where we test for COVID-19 3 times a day and with a turn around time of 4-5 hours, we have only had a couple of positive cases in children - one was on Diamond Princess cruise. So in general, there are very few children being infected in **Hong Kong**. This number is likely to rise significantly when the overseas students return to Hong Kong from all other countries in the next few weeks.
- **Greece** in contrast to **Italy and Spain** (countries with many similarities in terms of climate, location and population habits) the pandemic spread is (until now) withheld due to early preventive measures as early lock-down, quarantine for affected individuals and early cancellation of elective procedures in order to save health resources.
- Have seen several pediatric ECGs for chest pain with ST segment elevation. One patient had fever and cMRI evidence for myopericarditis. Did not qualify for testing based on ISDH criteria. Others ECGs have been from outside ERs, so no clinical data avail. I am unaware of any data on pediatric myo/pericarditis with COVID, but wondering if others are seeing this
- At the moment we haven't seen children with COVID in my hospital, it seems it is not a serious disease in children (no mortality in the pediatric population at the moment). Obviously I think it could be a potential problem in CHD with pulmonary overflow, but no experiences at the moment Alfredo Di Pino Centro Cardiologico del Mediterraneo Taormina **Italy**
- am working in **Turkey**. In my country all elective procedures(including EP) delayed until further notice. We only accept pace dependent patients or patients with acute complications (i.e. ICD related)
- Rapid development of telemedicine system was required
- **NYC** is in crisis mode. All visits and procedures are canceled for 2 weeks unless emergencies. Staff are being retrained for adult care. They are starting with the cardiac intensivists.
- Working in **Finland**, where we are behind from most of the world, but getting there...

# PACES Community Comments (Cont.)

- Thank you for canceling PACES events during HRS, and showing our community that we take COVID-19 seriously, not to mention that patient care and helping our ER/ICUs is more important right now.
- COVID 19 is a very contagious virus. How to protect doctors and patients from avoiding the infection is very important. Developing medical APPs and the remote medical system may be useful to the patient care.
- All decisions regarding clinic visits and procedures demand consideration of specific case. A phone call or formal telemedicine visit can often replace an unnecessary visit or aid in deciding whether a procedure can be delayed. 2) our decisions affect not only us and the patient, but their families, our families, and all of the staff we depend upon.
- Need to be rapidly alert to arrhythmias and cardiomyopathy related to COVID, which apparently seen quite frequently in adults. Also if trials of chloroquine - proarrhythmic effects, as well as effects of other novel therapies
- I think it is critically important that the physician community be relentlessly positive and concrete in our communication at large. The larger community is looking to us for leadership and calm. Much like leading a code - if the code leader shows fear the whole team functions poorly. Amongst ourselves we should absolutely bounce around ideas and flag things that are not going well. But to the community we need to keep it positive and calm.
- Protocol for urgent/non-urgent EP procedures officially from PACES may help individual members if they face a difficult decision and pressure from individual departments/divisions.
- I think the SADS homepage is reassuring for parents, though I cannot "send" my other arrhythmia patients there, some very general, reassuring information on PACES would be great
- Our 3D printer lab is going to look at printing swabs and masks for the hospital. Get Telehealth CPT codes and templates put into your EMR. Mail Holter/Bardy/CardioKey (etc.) monitors out instead of come to hospital/clinic. ACHD patients go to the adult hospital ER.



# Thank You for Taking the Survey

Be Safe

Be Well

Be Kind