APHRS NEWSLETTER

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Dear Colleagues,

First, I would like to wish everyone and their love ones a happy and healthy new year for 2021. I did wish everyone a happy and healthy new year for 2020 as well, unbeknownst to me at the time that being healthy would be very, very important for 2020. Not that health it’s not always important, one of the reasons why we are all in healthcare professions.

Again, I would like to thank all the Board Members, Nomination Subcommittee and our members who re-elected me again to be the President of APHRS for 2021. This were despite the fact that during my first term, we need to change the venue of our Annual Scientific Meeting due to a riot, cancel our Summit due to a volcano eruption and cancel our Annual Scientific Meeting due to a pandemic.

The COVID-19 pandemic had impacted everyone in the world. Many things were put on a halt but, as one of our vision is to spread the knowledge to our members and healthcare professionals in Asia Pacific region to care for patients with cardiac arrhythmia, we initiated online education programs from our subcommittees as well as partnering with industries. As a commitment to education for our region, we held the “APHRS Virtual Congress 2020” instead of our Annual Scientific Meeting. There were about 3600 delegates, more registration than usual when compared to our previous meetings. Despite the pandemic, there was more opportunities to a more accessible education. Hopefully the COVID-19 pandemic would be discontinued this year.

Our collaborations continue among our members countries and international societies, from conducting registries, document writings, online sessions, to in-person training, whenever the situation allows. I would like to take this opportunity to thank HRS and EHRA, both societies has been very supportive of APHRS in all the aspects over the years and I’m certain of the continuity of our collaboration in the future.

2020 went by relatively reasonable thanks to all the guidance and support of the APHRS Board Members, Past Presidents, members and administrative support from our office. For 2021, we are going to continue with our commitment in collaborations as we did for 2020. We look forward to more educational series to come. We also look forward to more collaborations with other societies, national and international, to help with the commitment on education from APHRS. As of today, our Annual Scientific Meeting, APHRS 2021 is scheduled for 28-31 October 2021 in Shanghai. The meeting is likely to be a hybrid: mainly online with face-to-face meeting if the situation permits, please keep an eye out for an update information.

Again, please be careful and continue to stay healthy everyone. I look forward to seeing everyone in person again soon.
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Phan Dinh Phong *

* Country Representative to be confirmed.
KEY STATISTICS FROM THE APHRS VIRTUAL CONGRESS 2020

**WHEN?** 30 October - 1 November 2020


### Number of Sessions

<table>
<thead>
<tr>
<th>Date</th>
<th>Number of Sessions</th>
</tr>
</thead>
<tbody>
<tr>
<td>30 October 2020 (Friday)</td>
<td>14</td>
</tr>
<tr>
<td>31 October 2020 (Saturday)</td>
<td>20</td>
</tr>
<tr>
<td>1 November 2020 (Sunday)</td>
<td>9</td>
</tr>
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<td><strong>Total</strong></td>
<td><strong>43</strong></td>
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### Invited Faculty

193 Invited Faculty Members from 29 Countries/Regions

<table>
<thead>
<tr>
<th>Country/Region</th>
<th>Invited Faculty</th>
</tr>
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<tbody>
<tr>
<td>Australia</td>
<td>20</td>
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<tr>
<td>Austria</td>
<td>1</td>
</tr>
<tr>
<td>Belgium</td>
<td>3</td>
</tr>
<tr>
<td>Brunei Darussalam</td>
<td>1</td>
</tr>
<tr>
<td>China</td>
<td>15</td>
</tr>
<tr>
<td>Czech Republic</td>
<td>1</td>
</tr>
<tr>
<td>France</td>
<td>1</td>
</tr>
<tr>
<td>Germany</td>
<td>4</td>
</tr>
<tr>
<td>Hong Kong</td>
<td>14</td>
</tr>
<tr>
<td>India</td>
<td>21</td>
</tr>
<tr>
<td>Indonesia</td>
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<tr>
<td>Italy</td>
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<tr>
<td>Japan</td>
<td>18</td>
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<tr>
<td>Korea</td>
<td>9</td>
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<tr>
<td>Malaysia</td>
<td>7</td>
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<td>Mongolia</td>
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<tr>
<td>Myanmar</td>
<td>1</td>
</tr>
<tr>
<td>Netherlands</td>
<td>3</td>
</tr>
<tr>
<td>New Zealand</td>
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<tr>
<td>Pakistan</td>
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<tr>
<td>Philippines</td>
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<td>Singapore</td>
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<td>Spain</td>
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<tr>
<td>Sri Lanka</td>
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<td>Switzerland</td>
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<td>Taiwan</td>
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<tr>
<td>Thailand</td>
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<tr>
<td>UK</td>
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<td>USA</td>
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### Registration and Attendance

Registration and Attendance (Breakdown by Continent)

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<thead>
<tr>
<th>Continent</th>
<th>Registered</th>
<th>Attended</th>
</tr>
</thead>
<tbody>
<tr>
<td>Africa</td>
<td>12 (0.3%)</td>
<td>6 (0.3%)</td>
</tr>
<tr>
<td>Asia</td>
<td>3120 (85.2%)</td>
<td>1901 (89%)</td>
</tr>
<tr>
<td>Europe</td>
<td>97 (2.7%)</td>
<td>55 (2.6%)</td>
</tr>
<tr>
<td>North America</td>
<td>179 (4.9%)</td>
<td>55 (2.6%)</td>
</tr>
<tr>
<td>Oceania</td>
<td>245 (6.7%)</td>
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</tr>
<tr>
<td>South America</td>
<td>9 (0.2%)</td>
<td>3 (0.1%)</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>3662</strong></td>
<td><strong>2135</strong></td>
</tr>
</tbody>
</table>

Registration and Attendance (Breakdown by Professional Category)

<table>
<thead>
<tr>
<th>Category</th>
<th>Registered</th>
<th>Attended</th>
</tr>
</thead>
<tbody>
<tr>
<td>Allied Professional</td>
<td>751 (20.5%)</td>
<td>452 (21.2%)</td>
</tr>
<tr>
<td>Basic Scientist</td>
<td>75 (2.1%)</td>
<td>39 (1.8%)</td>
</tr>
<tr>
<td>Exhibitor</td>
<td>805 (22%)</td>
<td>505 (23.7%)</td>
</tr>
<tr>
<td>Medical Student</td>
<td>137 (3.7%)</td>
<td>88 (4.1%)</td>
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<tr>
<td>Physician</td>
<td>1656 (45.2%)</td>
<td>926 (43.4%)</td>
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<tr>
<td>Resident Fellow</td>
<td>238 (6.5%)</td>
<td>125 (5.8%)</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>3662</strong></td>
<td><strong>2135</strong></td>
</tr>
</tbody>
</table>

**TOTAL:**

- Registered: 3662
- Attended: 2135
# Session Performance

## Peak Concurrent Viewers – Day 1 (30 October 2020, Friday)

<table>
<thead>
<tr>
<th>Session Time</th>
<th>Room 1</th>
<th>Room 2</th>
<th>Room 3</th>
<th>Room 4</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>0900 – 1030</td>
<td>342</td>
<td>193</td>
<td>161</td>
<td>-</td>
<td>696</td>
</tr>
<tr>
<td>1050 – 1220</td>
<td>474</td>
<td>-</td>
<td>395</td>
<td>-</td>
<td>869</td>
</tr>
<tr>
<td>1240 – 1410</td>
<td>697</td>
<td>304</td>
<td>244</td>
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<td>1245</td>
</tr>
<tr>
<td>1430 – 1600</td>
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<td>-</td>
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<tr>
<td>1620 – 1750</td>
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<td>124</td>
<td>127</td>
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<td>449</td>
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## Peak Concurrent Viewers – Day 2 (31 October 2020, Saturday)

<table>
<thead>
<tr>
<th>Session Time</th>
<th>Room 1</th>
<th>Room 2</th>
<th>Room 3</th>
<th>Room 4</th>
<th>TOTAL</th>
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<tr>
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<td>257</td>
<td>204</td>
<td>247</td>
<td>142</td>
<td>850</td>
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<tr>
<td>1050 – 1220</td>
<td>348</td>
<td>435</td>
<td>299</td>
<td>180</td>
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<tr>
<td>1240 – 1410</td>
<td>389</td>
<td>375</td>
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<td>312</td>
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<td>1430 – 1600</td>
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<td>432</td>
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<td>414</td>
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## Peak Concurrent Viewers – Day 3 (1 November 2020, Sunday)

<table>
<thead>
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<th>Session Time</th>
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<th>Room 3</th>
<th>Room 4</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>0900 – 1030</td>
<td>282</td>
<td>222</td>
<td>262</td>
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<td>1050 – 1220</td>
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<td>310</td>
<td>267</td>
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<td>830</td>
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<tr>
<td>1240 – 1410</td>
<td>330</td>
<td>177</td>
<td>187</td>
<td>-</td>
<td>694</td>
</tr>
<tr>
<td>1430 – 1600</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>1620 – 1750</td>
<td>-</td>
<td>-</td>
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</table>
LEFT BUNDLE BRANCH PACING

Introduction

Chronic Right Ventricular (RV) pacing has been shown to produce electrical and mechanical dyssynchrony resulting left ventricular dysfunction, atrial arrhythmias and recurrent heart failure\(^1\). Physiological pacing evolved as an alternative strategy to overcome the limitations of chronic RV pacing\(^2,3\). Deshmukh et al\(^4\) first demonstrated the feasibility and efficacy of His bundle pacing (HBP) in patients with atrial fibrillation and heart failure. Though HBP is considered as the most physiological form of pacing, it is fraught with high capture threshold, lead dislodgment and early battery depletion. Huang\(^5\) suggested direct capture of left bundle branch by deep septal pacing to overcome the limitations of HBP.

Left Bundle Branch Pacing

Left Bundle Branch Pacing (LBBP) is defined as direct of capture of left bundle or one of its fascicles along with septal myocardium at low output (<1V at 0.5ms pulse-width)\(^6,7\). Typically, a 4.1F 3830 Selectsecure\(^\text{tm}\) lead (Medtronic Inc, Minneapolis, MN) is placed deep inside the proximal interventricular septum 1-1.5 cm below the distal his bundle. Apart from demonstrating right bundle branch delay pattern (qR/rSR in lead V1) at least one of the following criteria must be fulfilled to confirm the capture of Left Bundle (LB)

(a) Demonstration of Left Bundle potential

(b) Demonstration of non-selective to selective capture of LB or non-selective to LV septal capture

(c) Short and constant peak left ventricular activation time (pLVAT) as measured in lead V5 or V6

(d) Programmed deep septal stimulation to demonstrate the refractory period of LB
How to do?

Intracardiac electrograms and 12-lead electrocardiography (ECG) are continuously recorded using electrophysiology system. C315 sheath along with 3830 Selectsecure lead is placed in the proximal interventricular septum 1-1.5 cm below his bundle along an imaginary line connecting distal his signals to RV apex in RAO 30° view (Figure 1). Pacing at this site on the right side of the septum will show QRS morphology of “W” pattern in lead V1, positive in lead II, positive or biphasic in lead III and discordant complexes in aVR and aVL (Figure 2). If the paced QRS is negative in lead II, it is better to map superiorly in RAO 30° view to get a positive QRS before screwing the lead deep inside the septum. Rapid turns are given to drive the helix and body of the lead into the septum till it reaches the left ventricular sub-endocardium. Paced QRS morphology, unipolar pacing impedance and the current of injury (COI) on the lead electrogram are monitored continuously during the lead positioning. As the lead traverses the septum to reach the left bundle area, the notch on the nadir of QRS in lead V1 will gradually ascend up to form a ‘R’ wave along with gradual rise in unipolar pacing impedance before it drops by 100-200 ohms. The pLVAT as measured in lead V5 or V6 from the onset of pacing artefact to the peak of the R wave should be short and constant at high and low pacing output (10V and 2V) to confirm the capture of LB. Non-selective to selective capture transition can be demonstrated while performing pacing threshold test by appearance of distinct local ventricular electrogram separated from the pacing artefact during selective capture (Figure 3). Perforation into the LV cavity must be recognized by fall in unipolar impedance of <400 ohms, sudden rise in capture threshold and loss of COI. Lead has to be repositioned at a different site rather than simply withdrawing it if perforation is detected. Left Bundle Branch (LBB) potential can be demonstrated during native rhythm in all patients except infra-hisian AV block and complete Left Bundle Branch Block (LBBB). Dual lead technique can be utilized to show LBB potential in these patients by capturing the His bundle. Sometimes COI can mask the potential transiently with gradual resurgence and this concealed LBB potential must be considered before lead repositioning for a probable septal perforation.

Figure 2: RAO and LAO views showing the lead position for LBBP. Progressive change in QRS morphology as the lead traverses the septum from 'W' pattern in V1 to qR with narrow duration is shown. Note the left bundle potential (LB Po) on the lead tip electrogram.
We have demonstrated a novel method of performing LBBP by observing the Premature Ventricular Complexes (PVCs) generated during lead deployment. Rapid turns were given with careful monitoring of the PVCs with changing morphology. Rotations were stopped immediately on observing a PVC with RBB delay pattern (qR/rSR) with short LVAT and narrow QRS duration. PVC guided LBBP would help in reducing the procedure time and prevent lead perforation into the LV cavity. Electro-anatomical mapping system can be utilized to create the 3D geometry of right atrium, His signals and right ventricle to facilitate the lead placement in the left bundle area and reduce the radiation exposure.

Troubleshooting

The reported success rate of LBBP is between 80.5% to 97%. Delineation of distal his signals, perpendicular sheath-septal orientation and careful pace mapping to look for ‘W’ pattern in lead V1 with positive QRS in lead II would increase the probability of successful LBB capture. Both the gloves and lead must be dry to achieve rapid turns. If the lead could not be deployed at the proximal interventricular septum, the sheath can be positioned 2 cm below in the mid-septum to capture the Left Posterior Fascicles (LPF). Posterior fascicular pacing is characterized by purkinje potentials from LPF fibres, narrow paced QRS duration and anterior hemiblock pattern on surface ECG. Providing an adequate slack is important in avoiding the dislodgement of lead into the LV cavity. While programming the pulse-generator, the AV delay must be kept at 20-35 ms less than nominal values to allow for the impulse to travel from LBB to ventricular myocardium. RBB delay pattern due to LBB capture can be corrected by anodal capture and AV interval optimization to allow native AV fusion.

Complications:

Though LBBP is technically less challenging as compared to HBP, the long safety data is yet to be available. Iatrogenic right bundle branch injury, lead dislodgment into LV cavity and thromboembolic complications are potential complications to be considered. Injury to the coronary artery resulting in transient ST segment elevation is reported. Acute septal perforation into the LV must be recognized immediately by increase in capture threshold, fall in unipolar pacing impedance of <400 ohms and loss of COI. Post implantation echocardiography is warranted in all patients to look for depth of the lead inside the septum.
Clinical Implications of LBBP

Since there is a direct capture of cardiac conduction system, LBBP results in physiological activation of ventricles avoiding electrical and mechanical dyssynchrony.

(a) Bradyarrhythmias

In patients with symptomatic bradyarhythmia, LBBP provides physiological activation of the ventricle avoiding chronic RV pacing related complications. Li et al13 showed 90% acute procedural success rate for patients undergoing LBBP for AV conduction disease. Ponnusamy et al16 reported 91% success rate for patients with AV block (40 out of 44 attempted patients). Vijayaraman et al17 showed 63% success rate for HBP and 93% for LBBP in patients with conduction system disease after transcatheter aortic valve replacement.

(b) Cardiac Resynchronization Therapy

LBBP is emerging as an alternative to biventricular device therapy in CRT eligible patients (Figure 4). LBBP has the better chance of correcting wide QRS duration due to distal conduction system disease as compared to HBP. In patients with non-ischemic cardiomyopathy and LBBB, LBBP resulted in significant improvement in LV function with success rate of 97%.18 Ponnusamy et al16 showed 95% success rate for LBBP in patients requiring CRT. The QRS duration reduced from 158±31ms to 113±12ms after LBBP and LVEF increased from 34±7% to 48±9%. In a retrospective study involving 8 international centers Vijayaraman et al included 325 CRT eligible patients.19 LBBP was successful in 85% of patients with significant reduction in QRS duration from 152±32ms to 137±22ms and improvement in LVEF from 33±10% to 44±11%. Improvement in LV function was noted in both ischemic and non-ischemic cardiomyopathy and similarly in LBBB and non-LBBB patients.

Left bundle optimized CRT (LOT-CRT) can be considered in patients where there is only a partial correction of conduction system disease (Figure 5). Addition of coronary sinus lead to capture the postero-lateral wall of left ventricle along with LBBP would result in a better resynchronization for patients with partial correction by LBBP alone.

(c) AV Junction Ablation

The concept of ablate and pace strategy for refractory fast ventricular rate with permanent atrial fibrillation has witnessed a resurgence after the advent of physiological pacing. LBBP provides a safe margin for ablating the AV junction as compared to HBP as the lead is away from the site of ablation (Figure 6). Left bundle branch pacing is done first followed by ablation of AV junction during the same procedure. It is important to pace at higher rate for 3 months to avoid the risk of ventricular arrhythmias.
Conclusion:

Last decade has witnessed a tremendous growth in the field of physiological pacing. Further advances in the delivery sheath, lead design and pulse generator might improve the procedural success. LBBP is limited by lack of long-term follow-up data. Currently available lead extraction tools are not suitable for extracting this deeply placed lumenless leads. Further randomized multicenter trials are required to establish the safety of the LBBP before it could be widely adopted.
References


https://doi.org/10.1007/s10840-020-00899-4


A Happy New Year to one and all! The Indian Heart Rhythm Society (IHRS) conducted its annual conference between 2nd – 4th October, 2020; this time on a virtual platform www.virtualihrs2020.com. The ongoing COVID-19 pandemic dictated that the customary in-person annual conference in Mumbai was impossible. The executive committee led by IHRS President Dr Anil Saxena grasped this situation early, in the summer of 2020, and resolved to go digital! This experiment was going to be a novel experience, as in 2020 many national and international societies had either abbreviated their scientific meetings or simply cancelled their annual events. The IHRS, in fact, took a converse view and saw an opportunity in these trying circumstances, deciding to expand the usual construct of its annual scientific sessions. Both, the Scientific Committee (Chair: Dr Anil Saxena and Members: Drs Ajay Naik, Amit Vora, Ashish Nabar, Hygriv Rao and Yash Lokhandwala) and the Organizing Committee (President: Professor Dr Prafulla Kerkar, Secretary: Dr Ashish Nabar) stood up to the challenge and pursued their respective tasks meticulously, eventually yielding rich dividends. This can easily be judged from the fact that Virtual IHRS 2020 attracted more than 4000 national and in excess of 500 international delegate registrations. During the conference, at any given time more than 3000 delegates were logged-in and attended the sessions on-line. Thus the Virtual IHRS 2020, true to its tagline – Science, no Frontiers; became an educational magnum opus!

Registration for the Virtual IHRS 2020 was complimentary. The only obligation was to secure 3 days, free of all possible encumbrances, to attend the online event in its entirety! From Maharashtra on
the west coast to Assam on the east, from Jammu & Kashmir up north to Tamil Nadu down south, the event was widely attended by Indian Electrophysiologists (EPs), cardiologists, cardiologists-in-training and paramedical personnel. The meeting was perceived as educative by many Asia Pacific Heart Rhythm Society (APHRS) member countries with a good attendance from Vietnam (54), Malaysia (39), Bangladesh (32), Thailand (30), Indonesia (19) Australia (15) and Sri Lanka (9), to name a few countries. We are glad to report that the meeting enthused 92 delegates from North America and about 23 from South American countries. The reason behind this mass appeal was the unassuming participation of 111 national and 53 international faculty who deliberated in 4 parallel theatres for 3 days, providing an up-to-date educational content in arrhythmias and heart failure directed towards cardiac EPs and cardiologists (55 hours), cardiologists-in-training (15 hours) and catheterization laboratory technologists and nurses (5 hours). The digital experience in Theatre 1 & 2 was specially crafted for Cardiac EPs, however, topics that would also resonate with a clinical cardiologist – like clinical aspects of atrial fibrillation, ventricular arrhythmias and channelopathies were discussed. On 2nd & 3rd October, an Immersion program in Cardiac Implantable Electrical Devices (CIED) and EP for cardiologists-in-training was conducted in Theatre 3, wherein the IHRS faculty walked an extra mile to teach basic concepts; subsequently in this arena on 4th October, the IHRS faculty alongside instructors from the industry did a half-day Clinical Externship Program in CIED and EP hoping to improve the work experience of paramedics. In Theatre 4, IHRS partnered with the industry to create 9 focused sessions, 60-minute to elaborately discuss recent advances in arrhythmias and heart failure. For example, KODEX EPD imaging system, SGLT2 inhibitors and contact-force technology sessions were well received by the delegates. At the crux of the academic success of Virtual IHRS 2020 was the formula of streaming pre-recorded talks followed by at least 30 minutes of live panel discussion involving deliberations with the speaker faculty. In this way, the meeting was not monotonously didactic, the amply budgeted time allowing doubt-solving with key opinion leaders. Another measure of success was the case and study abstract presentations, conducted in 5 different sessions and judged live by eminent national and international faculty, whereafter awards were presented to the 1st and 2nd best papers in every session.

Figure 2: Virtual Theatre 1 providing an experience similar to that of attending the conference in-person, this time from the comfort of your home, hospital or on-the-go. A delegate can switch between 4 different theatres simply by using click buttons for the respective theatres placed at the bottom of the screen.
The scientific program on Day 1 started with an oration in the memory of our Guru, Professor Hein JJ Wellens. This was delivered by Professor Joep Smeets, the Netherlands wherein he traced the scientific achievements of Professor Wellens. On Day 3, we listened to Dr Seshadri Balaji, President PACES deliver the prestigious Dr Rajnish Juneja Memorial Oration. There were joint sessions strengthening our bonds with prestigious national [Mumbai chapter of Cardiological Society of India (CSI) and Pediatric Cardiology Society of India (PCSI)] and international [APHRS and Heart Rhythm Society (HRS)] societies. The joint sessions with international societies were co-chaired by Dr Tachapong Ngarmukos (President APHRS) and Dr Christine Albert (President HRS), and respectively contemporary issues in Atrial Fibrillation ablation and EP practice in the digital world were deliberated. Many interventions, like left atrial appendage occlusion and subcutaneous AICD; and controversial CIED indications, for Post-TAVR conduction disturbances or for Automated Implantable Cardioverter Defibrillator (AICD) implantation for secondary prevention early after acute coronary syndrome, that are at cross roads of EP and Interventional cardiology were showcased during two joint sessions with Mumbai CSI. For the very first time in an IHRS conference we had representatives of the Indian Pacing and Electrophysiology Journal in a joint session with the editorial board of JACC EP, the latter led by its Chief Editor Dr Kalyanam Shivkumar. Certainly, sessions on ventricular tachycardia ablation in structural heart disease and at challenging ventricular, sites must have provided necessary fodder for practice betterment to the Indian EP community.

CIEDs took a centre-stage in featured sessions involving leadless pacing, conduction system pacing and leads extraction procedure. Academics in EP are never complete without learning electroanatomy from the masters, Professor Robert Anderson and Dr Samuel Asirvatham led these discussions. The biggest draw must have been the 120 minute-long Unknown EP tracings session. Proudly we inaugurated the digital version of the book “Conventional Cardiac Electrophysiology: Deeper Learning by a Case-based Approach” edited by our current IHRS President Dr Yash Lokhandwala.

At this point in time uncertainties remain regarding the format of the upcoming annual IHRS conference - virtual, hybrid or in-person; we have ensured that the success of VIRTUAL IHRS 2020 can be savoured by reviewing the entire scientific content as video-on-demand on the official conference website www.virtualihrs2020.com, gratis for 1 year!
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