Results: A total of 164 robotic-enhanced PCI procedures were performed by 23 interventional cardiologists in 9 sites. Of these, 60 cases were part of the first 3 cases of each investigator (roll-ins). There were no differences between the roll-in and later cases in patient demographics, and clinical and anatomical characteristics. Procedure characteristics and outcomes are summarized in the Table. After the first 3 cases, there were no additional improvement in experience parameters or outcomes.

<table>
<thead>
<tr>
<th>Roll-in Cases</th>
<th>Late Cases</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>n = 60</td>
<td>n = 104</td>
<td></td>
</tr>
<tr>
<td>Conversion to manual</td>
<td>0</td>
<td>2 (1.9%)</td>
</tr>
<tr>
<td>Procedure Duration, min</td>
<td>51.1 ± 25.8</td>
<td>42.3 ± 16.4</td>
</tr>
<tr>
<td>PCI duration, min</td>
<td>42.0 ± 17.6</td>
<td>34.3 ± 14.1</td>
</tr>
<tr>
<td>Robotic duration, min</td>
<td>28.4 ± 15.5</td>
<td>22.2 ± 12.8</td>
</tr>
<tr>
<td>X-ray duration, min</td>
<td>12.8 ± 7.9</td>
<td>12.2 ± 4.8</td>
</tr>
<tr>
<td>Contrast volume, ml</td>
<td>138.3 ± 53.1</td>
<td>147.6 ± 78.8</td>
</tr>
<tr>
<td>Death</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Q-wave MI</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Non-Q MI</td>
<td>2 (3.3%)</td>
<td>2 (1.9%)</td>
</tr>
<tr>
<td>TVR</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>MACE</td>
<td>2 (3.3%)</td>
<td>2 (1.9%)</td>
</tr>
</tbody>
</table>

Conclusions: We observed a short learning curve in the performance of robotic-enhanced PCI in the multi-center PRECISE study. With experience of over 3 cases, interventional cardiologists were able to complete the robotic-enhanced PCI faster and with shorter duration of radiation without compromising safety.

TCT-332
Validation of Transapical Access Accuracy of Computed Tomographic Angiography-Fluoroscopy Fusion Guided Structural Heart Disease Interventions
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Background: Transapical (TA) access has been increasingly utilized for structural heart disease interventions and is most commonly obtained under fluoroscopic guidance. However, a major limitation of fluoroscopy is its ability to provide only 2D projections with inadequate spatial information. Computed tomographic angiography (CTA)-fluoroscopy fusion can offer the 3D information necessary for accurate planning and guidance for TA puncture. Although its utility and safety have been described, the accuracy of TA access by fusion guidance has not been previously validated.

Methods: We reviewed 15 consecutive patients (mean age 69.1±11.8 years, 60% male) presenting to our center from June 2011 to June 2012 who underwent percutaneous left ventricular (LV) puncture, and subsequent closure, using CTA-fluoroscopy fusion guidance, and who had post-procedural CTA. We used a prototype software, HeartNavigator (Philips, Best Netherlands), that allowed for landmark placement on the LV epicardial surface (planned puncture site-PPS) to guide needle entry. These landmarks were compared to the position of the TA closure device on the post-procedure CTA (actual puncture site-APS). ImageJ software was then used to calculate the difference between the PPS and APS. Each distance measurement was taken in three planes: lateral (X), antero-posterior (Y), and cranio-caudal (Z). Additional X and Y measurements were also obtained to assess the distance between the TA access and the left anterior descending artery (LAD).

Results: The mean LV puncture accuracy error in each of the X, Y, and Z planes was 7.49 mm, respectively. The mean error in puncture accuracy with respect to the left anterior descending artery (LAD) was 2.89 mm. Average distance from the APS to the LAD was 30.1±11.0 mm.

Conclusions: There is significant agreement between the locations of actual and planned transapical puncture sites using CTA-fluoroscopy fusion guidance. Moreover, fusion imaging can help maintain an adequate access distance from the LAD. When applied on a larger scale, fusion imaging can potentially be utilized for safe and accurate transapical access.

TCT-333
New Simulation System for Percutaneous Coronary Intervention Training (Rhythmically beating vascular model)
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Background: Percutaneous coronary intervention (PCI) is a well established therapy for coronary artery disease. However, training methods of PCI has yet to be established.

Methods: We reconstructed the whole body type PCI simulating vascular model from the imaging data of 64 raw MDCT, including coronary arteries with a significant stenosis. We combined a heart lung machine into the model and by using the current from the machine and the drop in negative pressure, while controlling the contraction and dilatation of the heart block by a sequencer and electromagnetic valve, we were able to make a rhythmical heart beat. Additionally, by putting the model under water, the X-ray of the silicon was less visible and thus closer to reality.

Results: We used this Rhythmically beating vascular model at the Kokura Live demonstration by inserting bifurcation lesions, tortuous lesions and CTO lesions. The bifurcation model lesion was needed to ligate stenting. The tortuous model lesion was needed mother and child technique for adequate stent delivery and deployment. The CTO model lesion was set so with the angulate approach the wire would enter a sub lumen and the operator was forced to switch to the retrograde approach. As the current inside the model was rhythmically beating, we were able to use this model in our usual cath lab and was not different at all to our usual day to day practices.

Conclusions: This new Rhythmically beating vascular model is more similar to actual patients and as many kinds of lesions can be made, it is a very adequate training tool for not only beginners but also advanced cardiologists.

TCT-334
Fusion of a fullscale patient simulator with an endovascular simulator to improve quality of human factors trainings with cathlab teams
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1Center for Cardiology and Angiology Bethanien, Frankfurt, Germany, 2Klinik für Kardiologie, Universitätsklinikum Rostock, Rostock, Germany, 3University of Applied Sciences Wiesbaden, Wiesbaden, Germany, 4Johann Wolfgang Goethe University Frankfurt, Frankfurt, Germany

Background: Interventional endovascular procedures are frequently associated with complications. The use of endovascular virtual reality simulators allows the training of procedural complications. Periprocedural complications can be only trained with additional use of a fullscale patient simulator. Until today no integration of an endovascular simulator into a fullscale patient simulator has been shown.

Methods: We invented and constructed a totally new fusion of two simulators to put the idea into action. The hardware of both the endovascular simulator and the patient simulator was modified. We integrated the endovascular simulator into the body of the patient simulator. The construction had to fulfill several safety and maintenance issues. The handling of the newly designed simulator was evaluated by Cardioskills-technicians and the clinical Cardioskills-Trainer Team that brings multi-year experience in simulator based trainings with cathlab teams.

Results: We were able to present a fully functioning new fusion of two formerly separate virtual reality simulators. Procedural and periprocedural complication management could be trained with high realism with cathlab teams. Initial technical problems of the implementation could be handled and no compromises had to be accepted.

Conclusions: Simulator based trainings of procedural and periprocedural complications in the cathlab should be trained with our new simulator set-up instead of the formerly used simulators alone as we were able to deliver a higher grade of realism and were able to present technical feasibility.

TCT-335
MITOS Multimodality Imaging Operating System
Andreas Melzer1, Luc Bidan2
1University of Dundee, Dundee, United Kingdom
2Institute of Biomedical Engineering, Dundee, United Kingdom

Background: A new Clinical Research Imaging Facility has been established with a unique combination of the MRI, PET/CT and an interconnecting Interventional Surgical Suite.

Methods: A novel layout provides access to a MRI suite, PET/CT and further connection into an interventional suite with standard image guidance. Interventional TAVI / cardiovascular probes can be placed under MR imaging, and EP ablation performed under MRI guidance. Alternatively, a procedure that initially starts with MR imaging - e.g., for planning purposes - may proceed into the ISS or under continued MR guidance to access...