**Background:** Radiation exposure is associated with increased risk of malignancies and cataract formation. Recent case series of predominantly left-sided brain malignancies in interventional cardiologists suggest an increased risk with long term exposure to occupational radiation. These data suggest that further measures to protect healthcare workers are needed. We aimed to evaluate the efficacy of two novel shields in reducing interventional cardiologists’ radiation exposure during angiographic procedures.

**Methods:** We conducted a prospective, randomized, controlled clinical trial with enrollment of 230 patients undergoing coronary angiography or percutaneous coronary intervention from November 2013 to May 2014. Patients were randomized to have their procedure performed with or without placement of a pelvic lead shield designed for either radiaor or lateral access, and designed to reduce radiation scatter. During all procedures, an interventional cardiologist was fitted with a novel, paper thin, non-leading surgical cap (No Brainer, RADPAD, weight 53 grams) to protect the brain from radiation exposure. The co-primary outcomes for the lead shield comparison was i) the difference between groups in operator dose divided by Air Kerma (mGy/µSv) for the cap comparison, the primary outcome was the difference between total radiation dose (µSv) as measured by two dosimeters at left temporal region of the head of the interventional cardiologist (one on the outside of the cap and the other one on the inside of it). Radiation dose was measured using Unofos Educational Direct Dosimeters (EDD-30).

**Results:** The full results of the study will be available at time of presentation.

**Conclusions:** The RADIATION PROTECT study will help determine the efficacy of a novel lead shield and a novel non-leading surgical cap for reducing operator radiation exposure during coronary angiography or intervention.

**TCT-146**

**Patient And Occupational Dose Reduction Enabled By A Novel X-ray Imaging Technology For Interventional Cardiology: First Results**

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**Background:** During interventional cardiology procedures patient and staff are exposed to X-ray radiation. Minimizing radiation dose is a crucial part of quality care. This study quantifies the radiation dose reduction for patient and staff enabled by a novel X-ray imaging technology using advanced real-time image noise reduction algorithms and an optimized acquisition chain (AlluraClarity, Philips Healthcare, The Netherlands). First results are reported.

**Methods:** Between March-May 2014, 48 patients referred for coronary angiography and angioplasty were prospectively included and randomized to room A (FD10 Monoplane with state of the art image processing and reference acquisition chain) or room B (FD2010 biplane system with the novel imaging technology) in a 1:2 ratio. Patients’ demographics and procedure characteristics were recorded; exposure parameters from all planes were logged via DICOM SCR. Scatter dose is quantified by a dosimeter placed on the C-arc. This fixed position, not affected by any shielding equipment during the period November 2013 to March 2014. Patients were allocated to each intervention from November 2013 to May 2014. Patients were randomized to have their procedure performed with or without placement of a pelvic lead shield designed for either radial or femoral access, and designed to reduce radiation scatter. During all procedures, an interventional cardiologist was fitted with a novel, paper thin, non-leading surgical cap (No Brainer, RADPAD, weight 53 grams) to protect the brain from radiation exposure. The co-primary outcomes for the lead shield comparison was i) the difference between groups in operator dose divided by Air Kerma (mGy/µSv) for the cap comparison, the primary outcome was the difference between total radiation dose (µSv) as measured by two dosimeters at left temporal region of the head of the interventional cardiologist (one on the outside of the cap and the other one on the inside of it). Radiation dose was measured using Unofos Educational Direct Dosimeters (EDD-30).

**Results:** The full results of the study will be available at time of presentation.

**Conclusions:** The RADIATION PROTECT study will help determine the efficacy of a novel lead shield and a novel non-leading surgical cap for reducing operator radiation exposure during coronary angiography or intervention.

**TCT-147**

**Patient radiation exposure with a novel X-ray imaging technology during coronary angiography and angioplasty**

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**Background:** A novel X-ray imaging technology (AlluraClarity, Philips Healthcare, Best, The Netherlands) enables patient radiation dose reduction by a combination of advanced image noise reduction algorithms with state-of-the-art hardware and an anatomy-specific optimized full acquisition chain. The main purpose of this analysis is to quantify patient radiation exposure during coronary angiography and intervention in using the novel ClarityIQ technology.

**Methods:** Retrospective data analysis for the entire cohort of patients admitted for coronary interventions with the Allura Xper or AlluraClarity in our institution during the period November 2013 to March 2014. Patients were allocated to each equipment according to availability, unrelated to patient characteristics and conditions. The primary endpoint was overall procedural patient dose, expressed in air kerma and dose area product (DAP).

**Results:** The analysis comprised 1215 consecutive patients undergoing coronary diagnostic and therapeutic interventions, 532 (44%) performed with AlluraClarity and 683 (56%) with the Allura Xper. Clinical characteristics were similar among both groups, including BMI and weight. Air Kerma in the Allura Xper and AlluraClarity group were 930 mGy (IQR 517-1686) and 591 mGy (IQR 319-1173), respectively (37% reduction with Clarity, 95%-CI 32 to 42%; p < 0.0001). DAP in the Xper and Clarity groups were 98859 mGy/cm² (IQR 52944-174757) and 5942 Gy/cm² (IQR 3838.5-106784.5), respectively (41% reduction with Clarity, 95%-CI 36 to 46%; p < 0.0001). Same radiation exposure reduction with Kerma and DAP were detected adjusting by radiation time. No significant differences were detected on radiation time (8.4 vs 8.3 minutes; p = 0.58) or contrast used adjusted by radiation time (13.6 vs 13.2 ml/min; p = 0.32) in the Xper and Clarity group, respectively.

**Conclusions:** A profound reduction in procedural patient radiation exposure was measured by comparing the AlluraClarity with the Allura Xper equipment for patients undergoing coronary interventions with no impact in the radiation time and contrast use. Reduction of patient and operator radiation exposure is one of the most important challenges of modern cathlabs.

**TCT-148**

**Feasibility of Complex Robotic Percutaneous Coronary Intervention**

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**Background:** The safety and feasibility of robotic-assisted percutaneous coronary intervention (PCI) with the CorPath 200 (Corindus, Boston, MA) in simple coronary lesions has been demonstrated. This is a single center registry report of all consecutive robotic assisted PCI procedures performed with the CorPath 200.

**Results:** We enrolled 19 patients (mean age 68.74% male) and demonstrate that 52% of the cases performed were for type C lesions, with 16 of 19 cases performed entirely robotically or with minimal manual manipulation. Procedural and clinical success for the series and contrast/fluoroscopy time used for the group are reported.

**Conclusions:** The CorPath 200 robotic system can be used to treat complex coronary lesions including type C lesions, saphenous vein graft lesions, chronic total occlusions, multivessel or multivessel disease, and with arterial access obtained via the radial approach.