gle cells, cluster and microvessels) were observed in organized thrombi compared with fresh thrombi (P<0.05). CD105+, K67+, or C-Ki+ ECs (active, proliferating cells) were present in all the stages, but significantly more in organized thrombi and mainly as clusters (P<0.05 for all). In contrast, CD139+ ECs (proliferative cells/EPCs) were found only sporadically in all groups.

**Conclusion:** Endothelial cells contribute to initiation and progression of thrombus organization after plaque rupture. The role of stem cells appears to be limited in this process.

**P5475 | BEDSIDE**

Is it useful to measure the toe-brachial index for diagnosing peripheral arterial disease?

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**Purpose:** The ankle-brachial index (ABI) is the primary non-invasive test for the diagnosis of peripheral arterial disease (PAD), but is less reliable in patients with stifferened/calculated arteries or proximal lesions and sufficient collateral. Our aim was to determine the accuracy and reliability of the toe-brachial index (TBI) in PAD associated with normal or low ABI values.

**Methods:** 82 patients with symptomatic PAD and normal or low ABI were studied using SYSTOE device. Our study excluded the patients with trophic lesions of the toe. The ABI was measured by determining the systolic pressure in both the dorsalis pedis and posterior tibial arteries. According the normal or low values of the two parameters the patients were divided in 3 groups. All patients with an ABI > 0.9 and/or a TBI < 0.7 performed angiography followed by a method of revascularization. The cardiovascular risk profile was also assessed. All revascularization, clinical evolution was followed-in-patients with trophic lesions.

**Results:** 1. The patients with normal ABI (27.0%) were clinically suspected of having PAD (atypical symptoms or intermittent claudication), confirmed by a low TBI and angiographical lesions of iliac or proximal femoral arteries (stenosis 69.2% vs segmental occlusion 31.8%); at least 1 risk factor (heavy smoker 79.3%, uncontrolled arterial hypertension 28.9%) or ≥ 1 risk factor (86%) were detected in this group. A small subgroup (13.9%) associated diabetes and distal gangrene/ulcers determined by infrapopliteal occlusion. 2. All patients (69.3%) with a low ABI have also a low TBI (< 0.6), but the timing for healing of trophic lesions was only related with TBI value (p=0.43, p<0.05). 3. In patients with a low ABI but normal TBI (13.67%), PAD was excluded by angiography.

**Conclusions:** TBI should be included in the initial evaluation of diabetic and elderly patients irrespective the ABI value, but also in patients with intermittent claudication and uncontrolled risk factors. The value of TBI seems to be predictable for the outcome after revascularization. Future long-term studies should evaluate the utility of the TBI as a method of screening for PAD.

**P5476 | BEDSIDE**

Acoustical detection of coronary stenosis: a double-blinded angiographic comparison in a clinically relevant cohort

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**Background:** Hemodynamically significant coronary stenosis generates local abnormalities in flow turbulence. In a prior study, we demonstrated feasibility of acoustical detection (AD) to identify this turbulence using a specialized microphone that detects acoustical pressure waves from the chest wall and analyzes signals using a modified form of fast Fourier transform (FFT). We have expanded our study to include analysis in the setting of clinically relevant variables including age, sex, body mass index (BMI), hemoglobin (Hgb), and left ventricular ejection fraction (EF). We hypothesize that this AD modality will remain validated in a clinically relevant cohort study of 1 year outcomes experienced by 106,857 patients undergoing a first non-emergency coronary angiography increased from 669 (8.7%) in 2001 to 1,945 (16.8%) in 2009. Among the elderly cohort, symptoms were more severe and disease more extensive, compared to patients (aged < 75). Elderly patients with CAD were less likely to proceed to revascularisation (adjusted OR 0.73, 95% CI 0.65–0.82, p<0.001), except in the presence of left main stem stenosis (adjusted OR 1.47, 95% CI 0.01–0.02, p<0.001). Per-procedural complications following isolated angiography were infrequent irrespective of age. Overall, 2.0% of elderly patients suffered complications, compared with 1.6% of young patients. Among those found to have no significant CAD, the figures were 1.9% and 1.1% respectively (p<0.001).

**Conclusions:** Coronary angiography is a safe procedure in the elderly. Nonetheless, the threshold for performing coronary angiography appears to be higher and, in spite of more severe symptoms and disease, they are less likely to progress to revascularisation.

**P5478 | BEDSIDE**

Occupational risks in cardiac catheterization laboratory workers

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**Purpose:** To evaluate the prevalence of health problems among Cardiac Catheterization Laboratory (CATH) staff in a large Italian university hospital. In this study, we aimed to assess the prevalence of health problems among cardiac catheterization laboratory (CATH) workers in a large Italian university hospital.

**Methods:** A web-based national survey was launched in collaboration with the Italian Society of Invasive Cardiology (GISE). The questionnaire included items on symptoms and diseases, radiological workload, and years of employment, and all other lifestyle confounding factors.

**Results:** A total number of 680 questionnaires were properly filled comprising 400 CATH Lab staff (247 males; 43% years). Cath Lab personnel included 171 interventional cardiologists (138 males; 46%; 9 years); 175 nurses (73 males; 42±7 years) and 54 technicians (36 males; 40±12 years) working in cardiac cath lab for 11.0±8.0 years (range 1–46 years). There was no difference in terms of gender, age and smoking habits between exposed and unexposed subjects. Cath Lab personnel had a significantly higher incidence of skin lesions (p<0.004), orthopaedic problems (p<0.000), lumps opacities/cataract (p<0.004), psychiatric/anxiety disorders (p=0.008), thyroid disease (p=0.000) and hypertension (p=0.001) when com-
pared to controls. Statistically significant differences were found in the rate of clinical effects across territories of years of work (see Figure).

**Conclusions:** Health problems of complex origin, from orthopedic strain to chronic stress to radiation exposure are more frequently observed in Cath Lab personnel than in unexposed controls, raising the need of innovations that increase safety of the staff.

**P5479 | BENCH**

**Better inflation time of stent balloon on stent expansion and apposition: an optical coherence tomography study**

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**Purpose:** Adequate stent expansion and apposition are important for maintaining good long-term outcomes after coronary intervention. We determined the effect of inflation time of the stent balloon on stent expansion and apposition using optical coherence tomography.

**Methods:** Subjects included 17 patients (18 de novo coronary artery lesions), in whom Resolute Integrity® (n=9) and Xience prime® (n=8) were deployed. The stents were inflated three times in all cases at the nominal inflation pressures (8.9±0.6 atm) by the stent delivery balloon with different inflation times of first, 15 seconds and 30 seconds. The first inflation time was determined by immediate deflation after confirming the full inflation of balloon. After each inflations, mean stent area, number of malapposed struts, depth of malapposed struts, malapposed stent area and malapposed stent volume were analyzed using optical coherence tomography.

**Results:** After the first, second and third inflation of stent balloon, stent area increased, 5.9±1.8 mm² vs. 7.0±1.8 mm², p=0.001 (Figure 1) and the number of malapposed struts (16.1±15.3 vs. 7.9±10.2, p=0.001), and the mean depth of malapposed struts (189.9±75.6 μm vs. 123.0±101.4 μm vs. 95.4±86.8 μm, p=0.001) decreased gradually (Table 1). Mean Malapposed stent area (0.95±0.32 mm² vs. 0.52±0.21 mm², p=0.05) and the malapposed stent volume decreased significantly after the additional inflation of 15 seconds than the first inflation (15.0±3.78 mm³ vs. 12.6±4.17 mm³, p<0.05). There was no edge dissection after the each stent balloon inflation.

**Table 1**

<table>
<thead>
<tr>
<th>Patients (n=17), lesion (n=18)</th>
<th>1st inflation</th>
<th>2nd inflation</th>
<th>3rd inflation</th>
<th>p-value</th>
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</thead>
<tbody>
<tr>
<td>Number of analyzed section, n</td>
<td>415</td>
<td>407</td>
<td>420</td>
<td></td>
</tr>
<tr>
<td>Number of analyzed struts, n</td>
<td>416</td>
<td>426</td>
<td>434</td>
<td></td>
</tr>
<tr>
<td>Depth of malapposed struts (μm)</td>
<td>189.9±75.6</td>
<td>123.0±101.4</td>
<td>95.4±86.8</td>
<td>0.001</td>
</tr>
<tr>
<td>Mean depth of malapposed struts (μm)</td>
<td>0.95±0.32</td>
<td>0.52±0.21</td>
<td>0.51±0.16</td>
<td>0.07</td>
</tr>
<tr>
<td>Malapposed stent area (mm²)</td>
<td>15.0±3.78</td>
<td>12.6±4.17</td>
<td>12.6±4.17</td>
<td>0.21</td>
</tr>
</tbody>
</table>

**Conclusions:** Repeated, additional 15s inflation time may allow better stent expansion and apposition even though the inflation pressure is nominal.

**P5480 | BEDSIDE**

**In-stent neatherosclerosis after implantation of drug-eluting and bare-metal stents: very late-phase observation by IVUS**

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Pathologic studies reported neatherosclerosis, including neointima-calification, could be accelerated in DES than BMS (JACC2011;57:1314). However, clinical features of neointima-calification remain unknown in vivo.

**Methods:** We assessed neointima-calification as a marker of neatherosclerosis in 233 patients after BMS and DES implantation over extended late phase (> 5 years) by IVUS. IVUS analysis was performed during the early phase (Early-p) (-12 months, n=119) and late phase (Late-p) (-5 years, n=114).

**Results:** In Early-p, the incidence of neointima-calification was significantly greater in BMS than DES (30% vs 17%). In Late-p, a higher proportion of patients with chronic heart failure (12.3±0.8%) and a higher proportion of diabetic patients (10.9% vs 12.7%) were referred for CAG compared to 2000-2001. Although the use of statins, anti-thrombotic therapy, ACE-inhibitors and, beta-blockers prior to angiography increased during the study period, prophylactic pharmacotherapy was still utilized in 2008-2009 (Figure). Odds ratios for the use of statins, ACE-inhibitors and, anti-thrombosis in 2008-2009 were 3.42 [2.37, 5.37], 1.86 [1.71, 1.93] and, 1.43 [1.37, 1.49] respectively (2000-2001 used as reference). Elective patients received more prophylactic pharmacotherapy than acute patients (p<0.0001).

**Figure 1**

**Conclusion:** During a 10 year period there was a substantial increase in CAG procedures, increased mean age and, increased proportion of females. Use of prophylactic drugs prior to angiography increased markedly, but treatment frequency may still be too low; however this remains to be further investigated.

**P5481 | BEDSIDE**

**Temporal changes in patient characteristics and prophylactic pharmacotherapy among 156,496 patients referred for coronary angiography between 2000 and 2009 - a nationwide study**

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**Background:** Coronary angiography (CAG) holds a central role in the diagnosis of coronary heart disease. We studied the temporal trends in patient characteristics in a nationwide cohort of patients referred for CAG between 2000 and 2009.

**Methods:** Patients undergoing their first CAG between 2000 and 2009 were identified in the nationwide Danish Heart Register. Trends in patient characteristics, pharmacological treatment and comorbidity prior to CAG were analyzed by logistic regression models.

**Results:** A marked increase in the number of acute (5,943 to 10,707) as well as elective (17,294 to 25,550) procedures was observed between 2000-2001 and 2008-2009. Further, mean age increased from 61.8 to 63.9 years (p for difference <0.0001) and proportion of females increased from 33% to 37% (p for difference 0.0001). In 2008-2009 a lower proportion of patients with chronic heart failure (12.3±0.8%) and a higher proportion of diabetic patients (10.9% vs 12.7%) were referred for CAG compared to 2000-2001. Although the use of statins, anti-thrombosis, ACE-inhibitors and, anti-thrombosis in 2008-2009 were 3.42 [2.37, 5.37], 1.86 [1.71, 1.93] and, 1.43 [1.37, 1.49] respectively (2000-2001 used as reference). Elective patients received more prophylactic pharmacotherapy than acute patients (p<0.0001).

**Conclusion:** The increased and the number of female patients referred for CAG increased significantly over time, from 2000 to 2009. Furthermore, the number of acute and elective procedures increased significantly. In contrast, mean age decreased. Also, the proportion of statins, ACE-inhibitors and, anti-thrombosis increased significantly over time. In women, the proportion of statins and intake of ACE-inhibitors increased significantly, whereas the proportion of anti-thrombosis remained stable. Additionally, in 2008-2009 a lower proportion of patients with chronic heart failure and a higher proportion of diabetic patients were referred for CAG. The increased proportion of statins, ACE-inhibitors and anti-thrombosis may be explained by increasing recognition of the importance of secondary prevention.