

From the Desk of the President

- 387 **“Think globally / Act locally”**
Brian Ghoshhajra

State-of-the-Art Review in Cardiovascular CT

- 388 **CT imaging with ultra-high-resolution: Opportunities for cardiovascular imaging in clinical practice**
Joanne D. Schuijf, João A.C. Lima, Kirsten L. Boedeker, Hidenobu Takagi, Ryoichi Tanaka, Kunihiro Yoshioka, Armin Arbab-Zadeh

Original Research

- 397 **Are risk factors necessary for pretest probability assessment of coronary artery disease? A patient similarity network analysis of the PROMISE trial**
Márton Kolossváry, Thomas Mayrhofer, Maros Ferencik, Júlia Karády, Neha J. Pagidipati, Svati H. Shah, Michael G. Nanna, Borek Foldyna, Pamela S. Douglas, Udo Hoffmann, Michael T. Lu

Despite their limited accuracies pretest probability (PTP) scores are commonly used in clinical practice to guide patient management of individuals presenting with stable chest pain. In this current analysis of the CT-arm of the PROMISE trial, we aimed to assess the theoretical possibility of clinical risk factors to predict CAD phenotypes and MACE outcomes. Using patient similarity network models, we show that individuals with similar risk profiles have diverse CAD phenotypes, and MACE outcomes. However, simply using calcium score outperformed contemporary PTP scores which incorporate risk factors and also calcium score to identify CAD phenotypes and predict MACE outcomes.

- 404 **Prospective evaluation of the learning curve and diagnostic accuracy for Pre-TAVI cardiac computed tomography analysis by cardiologists in training: The LEARN-CT study**
Pasquale Paolisso, Emanuele Gallinoro, Daniele Andreini, Niya Mileva, Giuseppe Esposito, Konstantinos Bermpeis, Dario Tino Bertolone, Daniel Munhoz, Marta Belmonte, Davide Fabbriatore, Jeroen Sonck, Carlos Collet, Martin Penicka, Bernard De Bruyne, Marc Vanderheyden, Emanuele Barbato

We prospectively investigated the learning curve for a cardiologist in training to acquire the skills to an accurate pre-TAVI cardiac-CT (CCT) analysis, using a semi-automatic software. Forty CCTs of patients scheduled for TAVI were evaluated twice by 5 readers (80 readings each, 400 in total): a certified TAVI-CT specialist served as reference reader (RR) and 4 cardiology fellows as readers. After 50 readings (25 cases repeated twice) cardiology fellows were able to select the appropriate valve size with 80% of accuracy compared to RR. These results provide valuable information for developing adequate training sessions for companies and cardiologists involved.

- 412 **From *a priori* to evidence and advocacy: The evolving paradigm of CCT competency for structural heart disease**
David J. Hur, Dee Dee Wang, Andrew D. Choi

- 415 Coronary CTA plaque volume severity stages according to invasive coronary angiography and FFR**
James K. Min, Hyuk-Jae Chang, Daniele Andreini, Gianluca Pontone, Marco Guglielmo, Jeroen J. Bax, Paul Knaapen, Subha V. Raman, Richard A. Chazal, Andrew M. Freeman, Tami Crabtree, James P. Earls
- 423 Systolic or diastolic CT image acquisition for transcatheter aortic valve replacement – An outcome analysis**
Julius Steffen, Markus Beckmann, Magda Haum, Julius Fischer, David Andreae, Mathias Orban, Konstantinos Rizas, Daniel Braun, Martin Orban, Adrian Curta, Christian Hagl, Hans D. Theiss, Julinda Mehilli, Steffen Massberg, Simon Deseive, Jörg Hausleiter
Computed Tomography imaging is routinely performed before transcatheter aortic valve replacement. This study aimed to compare systolic and diastolic image acquisition. In 1,954 patients (systolic, n=979, and diastolic, n=975) undergoing TAVR for aortic stenosis, rates of the Valve Academic Research Consortium-3 (VARC-3) endpoints technical failure and device failure at 30 days were similar. 30-day mortality rates were 3.6% for both, systolic and diastolic imaging (p=1.00), with a significantly increased long-term mortality rate with diastolic imaging (adjusted 3-year hazard ratio, 1.25 [1.07-1.46], p<0.01). In conclusion, long-term mortality was lower in patients with systolic imaging while VARC-3 short-term outcomes were comparable.
- 431 Geometric differences of the mitral valve apparatus in atrial and ventricular functional mitral regurgitation**
Anna Reid, Sagit Ben Zekry, Christopher Naoum, Hidenobou Takagi, Christopher Thompson, Marcelo Godoy, Malcolm Anastasius, Stephanie Tarazi, Mansi Turaga, Robert Boone, John Webb, Jonathon Leipsic, Philipp Blanke
- 442 Prognostic value of computed tomography derived fractional flow reserve for predicting cardiac events and mortality in kidney transplant candidates**
Jonathan N. Dahl, Marie B. Nielsen, Henrik Birn, Laust D. Rasmussen, Per Ivarsen, My Svensson, Sripal Bangalore, Morten Bøttcher, Simon Winther
Coronary computed tomography angiography (CCTA) is a validated cardiac screening modality before kidney transplantation. This study evaluated additional CT-derived fractional flow reserve (FFR_{CT}) as a predictor of major adverse cardiac events (MACE) and all-cause mortality. In 340 kidney transplant candidates, we found a higher MACE rate in patients with distal FFR_{CT} ≤ 0.75 compared to > 0.80. In patients with stenosis on CCTA, lesion specific FFR_{CT} ≤ 0.80 was associated with a substantial higher risk of MACE. Mortality was not increased in patients with low FFR_{CT} values. Hence, use of FFR_{CT} may improve cardiac evaluation prior to transplantation.
- 452 The challenge of cardiovascular risk assessment in Chronic Kidney Disease; is there a role for CTA and FFR_{CT}?**
Jonathan R. Weir-McCall, Mark J. Sarnak, Bjarne L. Nørgaard
- 454 Coronary artery calcium scoring vs. coronary CT angiography for the assessment of occupationally significant coronary artery disease**
Jennifer Holland, Leanne Eveson, David Holdsworth, Edward Nicol
For individuals that undertake high-hazard occupations, CTCA offers superior assessment of coronary artery disease and should be the predominant imaging modality when such individuals present with high risk for coronary disease.

Correspondence

- 460 Feasibility study of a mixed reality tool for real 3D visualization and planning of left atrial appendage occlusion**
M. Pasquali, L. Fusini, G. Italiano, A. Maltagliati, G. Tamborini, M. Penso, D. Andreini,
A. Redaelli, O. Pappalardo, M. Pepi

The Editor's Page

- 463 A word of thanks, a time of change**
Todd C. Villines

Case Report - Online Only

- e38 Severe tracheal stenosis secondary to brachiocephalic artery compression syndrome**
Mansi Verma, Niraj Nirmal Pandey, Jay Relan, Priya Jagia
- e40 Proximal tubular aortopulmonary window in an adult - A diagnostic dilemma solved by cardiac computed tomographic angiography**
Resham Singh, Vineeta Ojha, Sravan Nagulakonda, Amarinder Singh Malhi, Ankur Handa,
Sanjeev Kumar
- e42 Coconut heart in a child**
Avichala Taxak, Debanjan Nandi, Manish Shaw, Sanjeev Kumar