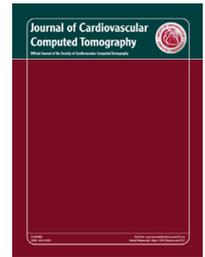


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## From the Desk of the President

# President's page: Implementation of coronary CT angiography to assess chest pain patients in the Emergency Department – A Call for Action!



Dear colleagues,

Efficient and accurate evaluation of patients presenting with chest pain to the Emergency Department (ED) remains a challenge not only in the United States, but also worldwide. Patients presenting with the chief complaint of acute chest pain remains one of the major causes of presentation to the ED, affecting more than 6 million patients per year in the United States alone.<sup>1</sup> While only less than 5% of patients present with ST-elevation myocardial infarct (STEMI) and are directly transferred to the catheterization laboratory,<sup>2</sup> the majority of patients require admission to an observation unit or chest pain center for further diagnostic work-up.<sup>3</sup>

The current standard of care (SOC) work-up, involving serial electrocardiograms and cardiac enzymes and later a variety of non-invasive testing, particularly stress testing with SPECT imaging, is time consuming and associated with high costs.<sup>4–6</sup> Recently, coronary computed tomography angiography (CCTA) has been shown in multiple single center-studies and large randomized trials to decrease the time to diagnosis, decrease the length of stay, reduce costs in the ED setting and provide similar clinical outcomes when compared to the SOC.

Four large randomized trials<sup>7–10</sup> (CT-STAT, ACRIN-PA, ROMICAT II and CT-COMPARE) have compared a coronary CTA strategy to current standard of care evaluations in over 3000 patients. These trials consistently demonstrate the safety of a negative coronary CT angiogram to identify patients for discharge from the emergency department with very low rates of major adverse cardiovascular events (<1%), at significantly lower cost, and greater efficiency in terms of time to discharge and length of stay. Together, these trials provide definitive evidence for the use of coronary CTA in the emergency department in patients with low to intermediate pre-test probability of coronary artery disease.

Data demonstrating successful translation of the randomized trial data to real-world settings increase confidence in coronary CTA as a robust technique for this application. Two recent large studies demonstrated “real-world”



experience of successful implementation of a coronary CTA program in the ED in a large University Hospital<sup>11</sup> and three Hospitals part of a large urban healthcare system.<sup>12</sup> Moreover, the later study confirm the data of prior randomized trials that if coronary CTA is implemented together with a dedicated chest pain algorithm protocol, it is possible to improve efficiency in care by reducing the length of stay in 50% using a quicker and safe strategy.<sup>12,13</sup>

There are some limitations to the currently available studies. Some studies had a low prevalence of ACS, such as the CT-STAT trial. Some may argue that no test at all would also be an option. Therefore, it is important to follow appropriate guidelines in the use of Coronary CTA in the Emergency Department and avoid its use in very low risk patients. Other potential limitation is the detection of stable CAD not related to patient's symptoms and the potential for over-treating these patients. Well-defined protocols need to be in place and intermediate lesions (50%–70%) should have functional assessment (SPECT or fractional flow reserve) to prove myocardial ischemia before intervention. It is important to mention that CCTA has relative contra-indications such as: patients with atrial fibrillation, renal dysfunction and contrast allergy among

others. CCTA has lower radiation exposure when compared to SPECT, but obviously has more radiation when compared to exercise treadmill test or stress echocardiogram. The remaining and probably most difficult challenges to overcome come down to availability of experienced readers to provide adequate coverage and improved collaboration among different specialties in order to enhance patient care.

In the meantime, CCTA is being incorporated in major guidelines to achieve standardization of its use. A recently published Guidelines by SCCT highlights the need of quality, training and education to provide accurate reads in a timely fashion.<sup>14</sup> Recently, CCTA has been granted **Level of Evidence A** by the new updated 2014 AHA/ACC Guidelines for the Management of patients with NSTEMI.<sup>15</sup> Specifically, in patients with possible ACS and a normal ECG, normal cardiac troponins, and no history of CAD, it is reasonable to initially perform (without serial ECGs and troponins) CCTA to assess coronary anatomy (*Level of Evidence: A*) or rest myocardial perfusion with a technetium-99m radiopharmaceutical to exclude myocardial ischemia (*Level of Evidence: B*).<sup>15</sup>

In conclusion, the use of CCTA to assess patients with chest pain in the ED has been extensively validated and now the major hurdles are how to effectively implement in clinical practice. Major guidelines have been incorporating the use of CCTA as appropriate, or even stronger, as a method of choice in assessing low to intermediate risk patients presenting with chest pain in the ED. Several hospitals and healthcare systems have effectively established successful CCTA programs in the emergency department. There are published recommendations describing step by step on how to establish a successful CCTA program in the ED<sup>16</sup>. Therefore, we need now a major “Call for Action” to propel this field. Now is the perfect time to effectively implement a pathway including CCTA to assess chest pain patients in the ED in order to achieve a major impact to patient care.

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Ricardo C. Cury, MD, FSCCT, FAHA, FACC\*  
Miami Cardiac and Vascular Institute  
Baptist Health of South Florida  
8900 North Kendall Drive  
Miami, FL 33176, USA

\* Corresponding author.

E-mail address: rcury@baptisthealth.net

Available online 12 March 2015

1934-5925/\$ – see front matter

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<http://dx.doi.org/10.1016/j.jcct.2015.03.002>