(Table 1). Dose can also be reduced using the step-and-shoot acquisition technique, which delivers a dose of 2.5±0.8 mSv (range 1.2 to 4.4). Using this technique for diagnosis of significant coronary stenoses, Scheffel et al [*Heart* 2008] found that the overall patient-based sensitivity, specificity, positive predictive value, and negative predictive value were 100%, 93%, 94%, and 100%, respectively.

Table 1. 16- and 64-Slice CTA Radiation Doses in Patients Scanned with Different Scanning Protocols.

	16-Slice CT			64-Slice CT		
	120 kV without Dose Modulation	120 kV with Dose Modulation	100 kV with Dose Modulation	120 kV without Dose Modulation	120 kV with Dose Modulation	100 kV with Dose Modulation
No. of patients	30	50	50	50	50	30
Male gender	20 (67)	33 (66)	34 (68)	34 (68)	36 (72)	21 (70)
BMI (kg/m^2)	26.9±3.2	27.5±4.5	26.4±2.9	26.2±3.2	26.6±4.7	25.6±2.3
Heart rate (bpm)	61.3±11.3	60.7±9.5	57.8±5.3	60.1±10.4	57.5±7.2	57.0±8.2
Scan length (mm)	128.2±11.8	125.9±9.2	124.0±7.7	125.9±12.5	123.9±11.8	122.0±17.7
Tube current (mA)	510.0±40.3	304.5±42.3*	387.6±18.9*	870.0±55.6	551.0±58.2**	537.8±50.7**
Pitch	0.18±0.01	0.18±0.01	0.21±0.02*	0.2±0	0.2±0	0.2±0
$CTDI_{vdi}$ (Gy)	42.1±3.6	25.2±2.9*	19.4±1.0*	58.8±6.3	38.3±3.1**	22.0±1.8**
Image noise (HU)	29.3±6.9	28.3±6.8	36.9±9.4*	39.2±10.2	37.7±8.6	50.0±10.4**
Contrast-to-noise ratio	7.3±3.1	8.1±3.4	8.8±2.9	6.4±2.1	6.7±2.3	7.0±1.9
Signal-to-noise ratio	11.1±3.9	11.9±4.3	11.9±3.7	8.9±2.5	9.2±2.8	9.2±2.5
Dose estimate (mSv)	10.6±1.2	6.4±0.9*	5.0±0.3*	14.8±1.8	9.4±1.0**	5.4±1.1**

Data are n (%) or mean±SD; *p<0.025 for comparison with 16-slice CT scanning protocol using 120 kV without ECG-dependent dose modulation; **p<0.025 for comparison with 16-slice CT scanning protocol using 120 kV without ECG-dependent dose modulation.

CT=computed tomography; CTDI=computed tomography dose index; ECG=electrocardiogram; HU=Hounsfield unit. Hausleiter J et al. *Circulation* 2006;113:1305-10.

Based on these data and other studies evaluating the accuracy and prognostic value of CTA, Dr. Boxt concluded that CTA is a rapid, safe, and efficient means of investigating patient complaints of chest pain. CTA is a highly sensitive indicator of the absence of coronary artery disease (CAD) and provides morphologic information for CAD risk assessment and clinical prognosis. The risks associated with CTA—namely CIN and radiation exposure—should be considered when determining which imaging procedure is best for a given patient.

Impacting the Cardiac Care of a Nation

Written by Toni Rizzo

W. Lowell Maughan, MD, Trinidad and Tobago Health Sciences Cardiovascular Initiative (TTHSI), Johns Hopkins Medicine International (JHMI), Baltimore, Maryland, USA, described the TTHSI partnership with Johns Hopkins Medicine International to improve cardiovascular (CV) care in Trinidad and Tobago. Cardiovascular disease (CVD) accounts for 37% of all deaths in Trinidad and Tobago. In an effort to reduce CV mortality and morbidity in Trinidad and Tobago, the local government contracted with JHMI to provide training, equipment, and expertise to develop CV services in the public sector. Resources provided by JHMI included weekly faculty and staff travel and teaching, equipment to support training and services, and program development expertise. Deployment of these resources was guided by leadership from all regions and a national workshop.

The initiative approach was to confirm needs and priorities with Trinidad and Tobago partners, and achieve consensus on the services that should be available in the public sector and where those services should be located. This process was achieved through a group of health system and education leaders, cardiovascular caregivers, and JHMI cardiology faculty.

The key recommendations for CV service distribution made by the National Workshop 2011 were that 1) each health center should provide basic CV services, such as electrocardiogram and preventive measures, and 2) each district health facility should manage acute myocardial infarction and provide echocardiography, stress testing, Holter monitoring, and anticoagulation clinics. In addition, regional hospitals should have a cardiologist on staff and a Coronary Care Unit. Larger hospitals should also have a catheterization laboratory and at least 1 hospital should offer comprehensive cardiac care and a cardiology fellowship. By 2012, many of the recommended programs had been implemented or were in the process of acquiring equipment or planning implementation. Currently, the program goals are on schedule to be achieved by February 2013.

Eighty-one JHMI cardiology faculty and staff have participated in the program, providing 275 faculty training weeks and 171 staff training weeks. More than 125,000 trainee hours have been provided. Primary care physician CV training has been attended by 982 physicians. More than 3000 physicians and staff have been trained in basic ECG interpretation. Eighty-eight inpatient nurses and more than 600 outpatient nurses have been trained. A new cardiology fellowship graduated 3 cardiologists, and 2 more will graduate in the coming year.

This program has demonstrated a unique approach to rapidly develop public sector CV services in a developing country. A successful program should have the following features: adequate financing to fund a visiting academic program, overlapping priorities and missions, in-country training to increase the chance of retention of expertise, intensive education and training over a defined short interval to sustain enthusiasm and commitment, an equipment budget that allows trained personnel to provide services, and partnerships with existing entities for a sustainable impact.