

# Electron Beam Computed Tomography (EBCT):

## A Critical Advance in Radiology & Preventive Cardiology

### **Noninvasive, accurate, sensitive and predictive**

*"EBCT represent the only currently available noninvasive method for the identification of subclinical atherosclerosis which has been clearly demonstrated to be a strong predictor of cardiac mortality and morbidity."*

Baumgart, et al. J AM Coll Card; 19197:30:57-64

## What is the Significance of Coronary Calcium?

### **Predictive of findings on nuclear studies and angiography: Study Results**

*"Coronary calcification is a predictor of unsuspected blockages in the coronary arteries of asymptomatic individuals demonstrated by coronary angiography."*

Guerci, et al.  
Am J Cardiol 1997;79:128-133

### **Predictive of Clinical Events**

*"... Coronary calcium is predictive of future cardiac events, presumably because coronary calcification is a marker for overall atherosclerotic plaque burden. A greater overall plaque volume...increases the likelihood of potentially unstable lesions."*

Mintz, et al.  
J Am Coll Cardiol 1997;29:268-74

### **Histopathologic correlations: Calcium as a marker for atherosclerosis**

*"...The total area of coronary artery calcification detected by EBCT correlates linearly with the total area of histologic plaque on a segmental, individual coronary artery and on a whole coronary artery system basis...identification of calcium by EBCT scanning demonstrated the "tip of the atherosclerotic iceberg."*

Rumberger, et al.  
Mayo Clinic Proceedings 1996; 71:369-377

### **CAC and Cardiac Events**

*The association between EBT CAC and cardiac events observed in this study of initially asymptomatic, middle-aged, low to intermediate-risk individuals presenting for screening suggests that in this group, knowledge of the presence of EBT CAC provides incremental information in addition to that defined by conventional CAD risk assessment.*

Kondos et al  
Circulation 2003

## The Primary Prevention of Coronary Disease: Shortcomings of Conventional Risk Factor Assessment

### **The patient with mild stenosis or angiographically "silent" disease**

*"Catastrophic cardiovascular complications are usually caused by vulnerable atherosclerotic plaques that often appear innocuous on coronary angiography...almost two-thirds of lesions responsible for unstable angina or infarction were less than 50% in severity during the days to weeks before they rapidly evolved an acute lesion that jeopardized the downstream myocardium."*

The New Paradigm for Coronary Artery Disease,  
O'Keefe, et al.  
Mayo Clinic Proceedings 1996;71: 957-965

### **The patient with and without conventional risk factors**

*"Progress is being made in identifying early clinical evidence of CAS in its asymptomatic state. Advances in noninvasive detection of subclinical CAD offer further promise for targeting risk reduction treatments with both greater sensitivity and greater specificity than current clinical approaches based on traditional risk factors alone."*

Greenland, Prev Cardiol.1998;1:8-15

### **The patient with average (or borderline) cholesterol**

*"Recent lipid intervention studies such as the AFCAPS/TexCAPS trial suggest that millions of Americans with average cholesterol levels can be substantially risk-reduced by statins. Subjecting all these people to the expense and potential hazards of medications is not realistic. Further risk stratification, so as to target those at unexpected peril, is the logical solution to this dilemma."*

Jame Erlich, MD  
Medical Director

## Clinical Use of EBCT Scanning

### **2006 AHA Scientific Statement**

*"...The majority of published studies have reported that the total amount of coronary calcium (usually expressed as the 'Agatston score') predicts coronary disease events beyond standard risk factors... These studies demonstrate that coronary artery calcified plaque is both independent of and incremental with respect to traditional risk factors in the prediction of cardiac events."*

*"...In clinically selected, intermediate-risk patients, it may be reasonable to measure the atherosclerosis burden using EBCT or MDCT to refine clinical risk prediction and to select patients for more aggressive target values for lipid-lowering therapies."*

AHA 2006 Scientific Statement: Assessment of Coronary Artery Disease by Cardiac Computed Tomography

### **CT Scanning Predicts Heart Attacks More Accurately Than Standard Risk Factors: St. Francis Heart Study**

*"As the largest, population-based study to date, the St. Francis Heart Study shows that CT scanning of coronary arteries can be used to refine the standard risk categories, known as the Framingham risk index. Our study creates a very strong argument for scanning all patients at intermediate risk according to the Framingham criteria."*

Alan D. Guerci, M.D., lead study author and President and Chief Executive Officer of St. Francis Hospital

### **Asymptomatic patients: Shortcomings of treadmill testing**

*"The majority of people destined to die suddenly will not have a positive exercise test. Such persons probably will not have ischemia before the fatal event; the likely reason that they will die suddenly is that only a mild non-flow-limiting coronary plaque will have been present before the sudden development of an occlusive thrombus."*

Epstein, et al  
N Eng J Med 1989; 321: 320-324