When Does Serendipity Become Screening? The Deliberate Search for Noncardiac Pathology on Electron-Beam Computed Tomography

To the Editor:

Horton and colleagues1 recently demonstrated that extra-cardiac pathology “requiring additional work up” is detectable by electron-beam computed tomography (EBCT) in almost 8% of patients undergoing investigation for assessment of coronary artery calcification. These findings are interpreted as offering a golden and currently wasted opportunity to treat subclinical disease, with the intention of alleviating future suffering and improving prognosis.

There are, however, considerable practical and ethical considerations dependent on this conclusion because the practice described by the authors becomes, in effect, a rudimentary screening program. Accordingly, a fundamental set of principles governing the use of any proposed screening tool must be applied. Wilson and Jungner2 were the first to promulgate these rules, and the rules have since been taken up and strengthened by most national screening organizations, including those of the United States and United Kingdom.3,4 These documents make interesting reading and illustrate the complexities of screening science. The UK National Screening Committee, for example, states that each of 19 criteria concerning the condition, test, treatment, and proposed screening program must be met before embarking on any such initiative.5

In the case of EBCT, are the noncardiac pathologies detected important health problems, and are their natural histories fully understood? Is EBCT safe, precise, and validated for this use? Are there agreed policies on further investigation and treatment in the event of positive findings? Does early detection and treatment lead to better outcomes than late treatment? Do the benefits of this approach outweigh any physical and psychological harm (caused by the test, diagnostic procedures, and treatment)? What do we know about the rate of false-negative results? Should we stop at the liver and lungs or scan the bowel, pelvis, and prostate too? It would be churlish to go on. It is also worth noting that even for the most popularized of national screening programs, such as that for breast cancer, debate still rages as to their true merits.6

The report by Horton and co-workers1 tells us that subclinical pathology, detectable by EBCT, in a middle-aged, predominantly male population of patients being investigated for coronary artery disease is relatively common. It also perhaps highlights the need for more considered consent for any investigation because of the repercussions associated with chance findings. However, deliberately looking for trouble outside the validated indications for a particular test cannot be justified without applying the rigorous criteria rightly expected of any screening program.

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Response

We appreciate the comments of Dr Bolger and certainly agree with his point that a strict set of principles must be applied before any screening test can be implemented. However, we are not proposing that cardiac electron-beam computed tomography studies be performed as a screening study for extra-cardiac pathology. The fact is that cardiac computed tomography (CT) studies are being performed with increasing frequency to detect calcification of the coronary arteries. Because the test consists of a limited CT scan through the mid-chest, portions of extracardiac structures (eg, lungs) are also imaged. This information is already in the field of view, does not require any additional scans, and simply requires review by a trained professional.

We would make the analogy to a clinician ordering a CT scan of the liver in a patient with suspected liver pathology. A CT scan of the liver will also include other extra-hepatic organs such as the kidneys, adrenals, pancreas, and bowel. A radiologist is absolutely obliged and legally responsible to review all information on the images, even in regions outside the clinical indication. At Johns Hopkins Hospital, all cardiac CT scans are reviewed by a board-certified radiologist, regardless of whether the calcium scoring was performed by a radiologist, technologist, or cardiologist. We feel that it is both our legal and moral responsibility. As reported in our article,1 significant extra-cardiac pathology, including lung cancer, will be missed if the entire study is not reviewed.

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