

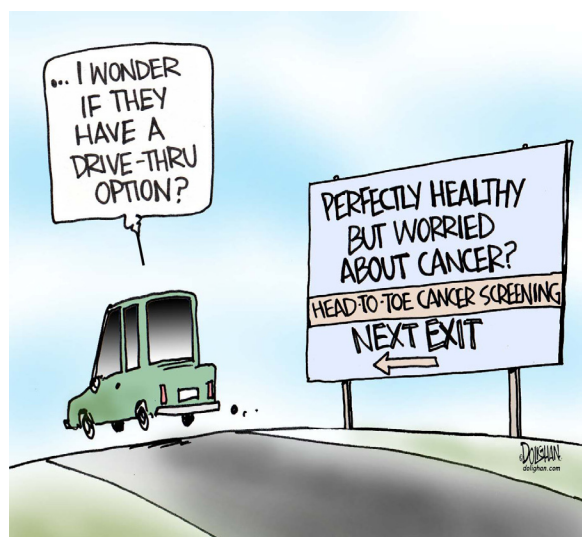
MYTH: WHOLE-BODY SCREENING IS AN EFFECTIVE WAY TO DETECT HIDDEN CANCERS

Whole-body screening is promoted as a one-stop shop for painlessly detecting hidden cancer and preventing cancer-related deaths. It is big business in the United States.ⁱ In Canada, private clinics have begun offering full-body diagnostic procedures for a fee.ⁱⁱ⁻ⁱⁱⁱ The tests and procedures are often marketed to healthy people as a way to scan for hidden abnormalities or cancers, affording people the peace of mind that they are in good health.ⁱⁱ⁻ⁱⁱⁱ When used in this manner, the evidence shows that whole-body cancer screening offers no proven health benefits and that it, in fact, exposes people to a number of unnecessary health risks.

SOUND SCREENING IS SENSITIVE AND SPECIFIC

Using Computerized Tomography (CT), Magnetic Resonance Imaging (MRI) technology or, at times, Positron Emission Tomography (PET), whole-body screening involves scanning the body from different depths and angles to compile an image that can be examined for abnormalities. When these tests are used to make, confirm or refine a diagnosis in patients with cancer symptoms, or to monitor patients undergoing cancer treatments, the benefits outweigh the risks.^{iv} Screening to detect abnormalities or possible cancers can lead to one of four outcomes:

- ▼ normal test result and no cancer (true negative)
- ▼ normal test result, but an undetected cancer (false negative)
- ▼ abnormal test result, but no cancer (false positive)
- ▼ abnormal test result and actual cancer (true positive).^v



False positives in particular often lead to a cascade of additional testing and biopsies, which can bring additional costs to the healthcare system as well as further risks to the patient, not the least of which are anxiety, worry and medical complications.^{vi} A good screening test is sensitive and specific, producing a low rate of false negatives and false positives. It should also reduce the number of deaths from the disease tested for, while not subjecting people to unacceptable harm.^{vii} Generally, recommended cancer screening tests – for example, a mammogram – meet these criteria. A mammography for women 50 to 69 years of age may decrease breast cancer deaths by up to 30%,^{viii} while a fecal occult blood test for individuals 50 to 74 years of age can decrease colon cancer deaths by 15%.^{ix} As well, since the introduction of Pap tests more than 25 years ago, cervical cancer mortality has declined by 60%.^x

In contrast, there is no evidence that whole-body screening of healthy people prevents cancer-related deaths. In fact, evidence shows that whole-body screening – which is neither sensitive nor specific – poses a number of serious risks to patients, including unnecessary examinations, overexposure to radiation, and high false positive and false negative rates.^{xi-xii-xiii} Whole-body screening also increases the rate of over-diagnosis – the diagnosis of diseases or ailments that would not have caused any problems in a person’s lifetime or for which therapy is not known to be effective.^{xiv}

RISKY BUSINESS

No screening test is free of risks, but some screening procedures are more harmful than others. It is estimated that whole-body CT screening, for example, uses 500 to 1,000 times the radiation levels of a routine chest x-ray.^{xii} Radiologists have expressed concerns about exposing patients to this level of radiation, given the unproven benefits of whole-body screening and the potentially life-threatening risk in causing radiation-induced cancer.^{xv} Concerns about exposing patients to unnecessary radiation have been raised related to PET scanning, too.^v

This is compared to an abnormal rate of 6% for a mammogram^{xviii} and 2% for a fecal occult blood test.^{ix}

The evidence suggests that whole-body screening is neither sensitive nor specific, and that it can lead to a high rate of false positives and negatives. A study that examined the abnormalities arising from whole-body screening, for example, found that the overwhelming majority – up to 97% – were benign and not clinically significant.^{xv} A 2006 study also showed that whole-body PET screening alone failed to spot 29% of cancers detected in a population of over 3,400 healthy individuals who were subjected to multiple screening procedures; in other words, it also had a significant rate of false negatives, indicating that those who have received a whole-body scan should not forego recommended screening tests.^{xix} The same study found that more conventional screening tests, like endoscopy, were successful in leading to correct cancer diagnoses.^{xix} A number of false positives were also reported in a small, pilot, randomized controlled trial on whole-body screening of healthy subjects conducted in the U.S.: 64% of the experimental (screened) group participants had an abnormal test result, but there were no confirmed cases of cancer.^{xx} In addition, the medical costs were

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Although MRI scanning doesn’t use ionizing radiation, it poses its own risks: its magnetic field can pull on or heat up metallic implants such as pacemakers or pins, causing soft-tissue tears or burning.^{xii}

Given the potential risks, assessments of the effectiveness of whole-body screening should be based on robust evidence. However, there are no randomized controlled trials of whole-body screening and only a handful of retrospective reviews.^{xvi-xvii} These report that the percentage of people who had an abnormal test result from a full-body scan ranged from 33% to 52%.^{xvi-xvii}

more than twice as high for participants in the experimental group than for those in the control (non-screened) group.

The cost-effectiveness of whole-body screening has been further called into question by a 2006 analysis of the potential effect of whole-body screening on health and healthcare costs. The analysis found that providing full-body screening to a group of 500,000 healthy people at age 50, would lead to an average gain in life expectancy of only six days in 26.3 years. The average cost per person was estimated at \$2,513, more than 30% of which was related to false-positive results.^{xxi}

CONCLUSION

Whole-body screening for healthy people offers the promise of early cancer detection and reduced cancer-related deaths. Despite the claims, such screening has not demonstrated any positive effects on life expectancy. Instead, it is tied to significant risks, costs and anxiety for clients, as well as to substantial costs and unnecessary service use on the healthcare system. Cancer screening

recommendations and decisions should be based on reliable data and careful weighing of all of the potential benefits and harms. ▽

This issue of *Mythbusters* is based on an article written by Ms. Kathleen Decker, recipient of the 2009 *Mythbusters* Award. Kathleen is a PhD candidate at the University of Manitoba and a research co-ordinator for the Manitoba Breast Screening Program at CancerCare Manitoba in Winnipeg.

REFERENCES

- i. Scandirectory.com. Updated July 12, 2007; Accessed 2009, July 8. www.scandirectory.com
- ii. EcuMedical. Accessed 2009, July 8. *What you need to know about full body scans.* www.ecumedical.com
- iii. Canada Diagnostic Centres. Accessed 2009, July 8. *How can preventative health scans help me?* <http://www.canadadiagnostics.ca/private/preventative-health-scans.php>
- iv. Schmidt GP. et al. 2007. "Whole-Body Magnetic Resonance Imaging and Positron Emission Tomography-Computed Tomography in Oncology." *Magnetic Resonance Imaging*; 18(3): 193-202.
- v. Schoder H. and Gonen M. 2007. "Screening for cancer with PET and PET/CT: Potential and limitations." *Journal of Nuclear Medicine*; 48(1):4-18s.
- vi. Rosenfeld EL. and Duggan AE. 2008. "Colorectal cancer screening; ensuring benefits outweigh the risks." *Medical Journal of Australia*; 188(4):196-197.
- vii. Wilson JM. and Jungner YG. 1968. "Principles and practice of mass screening for disease." *Bol Oficina Sanit Panam*; 65:281-393.
- viii. Gotzsche PC. and Nielsen M. 2006. "Screening for breast cancer with mammography." *Cochrane Database of Systematic Reviews*; 4:1-61.
- ix. Hewitson P. et al. 2007. "Screening for colorectal cancer using the faecal occult blood test, Hemoccult." *Cochrane Database of Systematic Reviews*; 1(Art. No.: CD001216):1-25.
- x. Canadian Cancer Society et al. 2007. *Canadian Cancer Statistics 2006.* www.cancer.ca
- xi. Cassels A., van Wiltenburg J. and Armstrong W. 2009. "What's in a scan? How well are consumers informed about the benefits and harms related to screening technology (ct and pet scans) in Canada?" *Canadian Centre for Policy Alternatives.* www.ccpa.ca
- xii. Health Canada and the Public Health Agency of Canada. 2004. "Whole-body screening using MRI or CT Technology. It's Your Health." www.hc-sc.gc.ca
- xiii. Salman RAS., Whiteley WN. and Warlow C. 2007. "Screening using whole-body magnetic resonance imaging scanning: who wants an incidentaloma?" *Journal of Medical Screening*; 14(1):2-4.
- xiv. Modic MT. and Obuchowski N. 2004. "Whole-body CT screening for cancer and coronary disease: does it pass the test?" *Cleveland Clinic Journal of Medicine*; 71(1):47-56.
- xv. Ghotbi N. et al. 2007. "Cancer screening with whole-body PET/CT for healthy asymptomatic people in Japan: re-evaluation of its test validity and radiation exposure." *Asian Pacific Journal of Cancer Prevention*; 8:93-97.
- xvi. Furtado CD. et al. 2005. "Whole-body CT screening: spectrum of findings and recommendations in 1192 patients." *Radiology*; 237:385-394.
- xvii. Obuchowski N. and Modic MT. 2006. "Total body screening: predicting actionable findings." *Academic Radiology*; 13:480-485.
- xviii. Decker K., Harrison M. and Watters K. 2007. "Manitoba Breast Screening Program Biennial Report 2004-2006." *Winnipeg, Manitoba: Cancer Care Manitoba.*
- xix. Ono K. et al. 2006. "The detection rates and tumor clinical/pathological stages of whole-body FDG-PET cancer screening." *Annals of Nuclear Medicine*; 21(1):65-72.
- xx. Obuchowski N. et al. 2007. "Total-body screening: preliminary results of a pilot randomized controlled trial." *Journal of the American College of Radiology*; 4:604-611.
- xxi. Beinfeld MT., Wittenberg E. and Gazelle GS. 2005. "Cost-effectiveness of whole-body CT screening." *Radiology*; 234:415-422.

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