

Whole-body computed tomography screening: looking for trouble?

The benefits of whole-body CT screening need to be carefully weighed against the risks

Whole-body computed tomography (CT) screening is currently marketed to asymptomatic individuals as a form of proactive and preventive healthcare. Commonly, the chest, abdomen and pelvis are scanned, but the head and neck are also included in the “five-region” scans offered by some commercial companies. In the United States, it has been estimated that, over the past 3 years, 15 million whole-body scans have been performed in about 400 centres.¹ In Australia, clinics in Brisbane and Sydney are offering whole-body CT screening. Despite the growth in demand for whole-body scans, there is no evidence that they are effective in detecting serious, treatable disease without undue cost or undesirable effects.

The value of many applications of imaging technology for diagnosing and monitoring disease and planning treatment is accepted. But sceptics of whole-body screening note the lack of evidence of benefit, the likelihood of clinically unimportant findings that may result in possibly needless further investigations, and the risks of radiation. There have been no published studies of the safety or efficacy of whole-body screening. In Australia, we identified only one ongoing study: researchers at the University of New South Wales are currently assessing 1500 people who have had whole-body CT scans, measuring significant pathological findings and their eventual outcomes (Fred Ehrlich, Professor of Public Health and Community Medicine, University of NSW, personal communication).

The prevalence of findings on whole-body CT is high. In a recent conference presentation, it was reported that, of 1200 whole-body CT scans, 87% showed at least one finding, and nearly a third of patients were advised to undergo further testing or follow-up.² In a study using CT to screen for lung cancer,³ 700 ancillary findings (not related to lung cancer) were noted in about 1520 screened individuals. Most were false-positive results, and the follow-up adversely affected the patients' quality of life and resulted in unnecessary diagnostic and interventional procedures.³

It has been estimated that, in healthy people, about 80% of abnormalities detected on CT screening studies may not be life-threatening;⁴ however, this estimate requires confirmation. Follow-up of non-significant findings has health, psychosocial and cost implications. In Australia, Medicare and private health insurance agencies do not cover the costs of a whole-body scan (currently over \$800), but may reimburse follow-up diagnostic evaluations.

What are the risks of whole-body screening? The radiation exposure has been estimated to be somewhere between 1 and 24 mSv per CT scan.^{5,6} However, owing to technical and anatomical factors, the dose can vary by a factor of 10 or more between patients.⁶ A 10 mSv radiation exposure is associated with an increased risk of fatal cancer of about 1 in 2000 (this can be compared with a lifetime risk of about 1 in 5).⁶ If screening were undertaken in Australia at 3-year intervals, the risk of radiation-related death would be an estimated 0.4%, 0.3% and 0.1% for men starting screening at 40, 50 and 60 years, respectively, and 0.6%, 0.4% and 0.2% for their female counterparts.⁷ Compared

with 10 other types of x-ray, CT scans are responsible for the largest number of radiation-induced cancers per year in nine cancer sites examined.⁸

In Australia, the Radiation Advisory Council and the NSW Environment Protection Authority concluded in 2003 that whole-body screening by CT is inappropriate for the general diagnosis of healthy individuals. Similarly, the Royal Australian and New Zealand College of Radiologists and the Radiation Health and Safety Advisory Council have each published statements indicating that there is insufficient scientific evidence to support whole-body CT screening in asymptomatic patients with no family history suggesting disease.^{9,10} In the United States, several professional groups, including the American College of Radiology and the American Association of Physicists in Medicine, do not recommend whole-body CT screening for asymptomatic healthy individuals.^{11,12}

In New South Wales, it has been illegal since 2003 to perform a whole-body CT scan without a written request from an independent medical practitioner. The radiation dose and health risks involved must be fully explained, individuals under the age of 50 must be told that they are more at risk of developing cancer as a result of the procedure, and written and informed consent must be obtained before the scan can be performed.¹³ Breaches of these new regulations may attract fines of up to \$27 500 for individuals, \$165 000 for corporations and/or a maximum of two years' imprisonment.¹³ This approach disallows self-referral.

We made enquiries to medical defence providers and professional organisations regarding the referral of asymptomatic patients for whole-body CT screening. One medical indemnity provider indicated that, in the event of an untoward incident, members would not be indemnified if they practised whole-body CT screening for asymptomatic patients or referred patients using particular referral formats supplied by commercial CT screening companies. We suggest that practitioners check with their own indemnity provider regarding their coverage under these circumstances.

The key question is whether whole-body CT screening will lead to detection of unsuspected diseases, resulting in earlier treatment and improved outcomes, or simply reveal abnormalities for which follow-up and treatment will result in no overall gain. This question can only be answered with well designed studies. In the interim, the community interest in whole-body CT screening is growing, and GPs, especially, may be put in a difficult position by patients requesting a referral for a whole-body scan. Some Internet sources of information on whole-body CT screening are listed in the Box.

Consumers and medical practitioners need to be wary of the many claims that are made in support of whole-body CT screening for early disease. Guidelines — based on the current evidence of benefits and risks of whole-body CT screening, assessed by reputable professional and consumer bodies — would be valuable to assist the decisions of both medical practitioners and consumers and to provide a better basis for informed consent.

Internet sources of information on whole-body computed tomography

Australian professional and government organisations

- Royal Australian and New Zealand College of Radiologists
www.ranzcr.edu.au/open/policies/diagnostic_imaging/pol2_2.htm
- Radiation Health and Safety Advisory Council
www.arpansa.gov.au/pubs/rhsac/st1_aug02.pdf
- NSW Environment Protection Authority
www.epa.nsw.gov.au/radiation/ctbodyscans.htm
- NSW Health
www.ppc.health.nsw.gov.au/news/2002/September/26-09-02ct.htm
www.health.nsw.gov.au/news/2003/June/08-06-03ct.htm
www.chs.health.nsw.gov.au/pubs/factsheet/pdf/body_scan_fs.pdf

International professional organisations

- US Food and Drug Administration
www.fda.gov/cdrh/ct
- American College of Radiology
www.acr.org/departments/pub_rel/press_releases/total-bodyCT.html
- Health Physics Society
hps.org/documents/CTPosStm.pdf

Other sources of information your patients may be using

- Life Span Medical Imaging
www.lifespanmedical.com.au
- Total Health Screening
www.totalhealthscreening.com.au
- Health Imaging CT
www.openmrimgt.com/healthscreen/index.htm
- Be Well Body Scan
www.bewellbodyscan.com
- Full Body Scanning
www.fullbodyscanning.com/sanfrancisco/full-body-scan.jsp
- The Oprah Winfrey Show
www.oprah.com/tows/pastshows/tows_2000/tows_past_20001002_b.jhtml
www.oprah.com/tows/pastshows/tows_2000/tows_past_20001002_c.jhtml

In conclusion, the current evidence suggests that patients should be advised that there is no proven benefit, and indeed possible detriment, from undertaking whole-body CT screening.

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- 1 Margo J. Full-body scans fail to reveal whole picture. *Australian Financial Review* 2003 Aug 14; 59.
- 2 Holtz A. Whole-body CT screening: scanning or scamming. *Oncol Times* 2003; 25: 5-11.
- 3 Swensen SJ. Screening for cancer with computed tomography. *BMJ* 2003; 326: 894-895.
- 4 Johns Hopkins Health After 50. A full body scan for everyone? 2002. Available at: www.hopkinsafter50.com/html/newsletter/2002/ha0402_Feature.php (accessed Jul 2004).
- 5 NSW Environment Protection Authority. Information on whole body scanning. 2003. Available at: www.epa.nsw.gov.au/radiation/ctbody-scans.htm (accessed Aug 2004).
- 6 US Food and Drug Administration. What are the radiation risks from CT? 2002. Available at: www.fda.gov/cdrh/ct/risks.html (accessed Jul 2004).
- 7 Wise KN. Solid cancer risks from radiation exposure for the Australian population. *Australas Phys Eng Sci Med* 2003; 26: 53-62.
- 8 Berrington de Gonzalez A, Darby S. Risk of cancer from diagnostic X-rays: estimates for the UK and 14 other countries. *Lancet* 2004; 363: 345-351.
- 9 Radiation Health and Safety Advisory Council. Council advice on the use of radiation in preventative medicine. 2002. Available at: www.arpansa.gov.au/pubs/rhsac/st1_aug02.pdf (accessed Jul 2004).
- 10 Royal Australian and New Zealand College of Radiologists. Total body CT screening. 2002. Available at: www.ranzcr.edu.au/open/policies/diagnostic_imaging/pol2_2.htm (accessed Jul 2004).
- 11 American College of Radiology. ACR Statement on CT screening exams. 2002. Available at: www.acr.org/dyna/?doc=departments/pub_rel/press_releases/total-bodyCT.html (accessed Jul 2004).
- 12 American Association of Physicists in Medicine. CT body scan not scientifically justified for asymptomatic patients. 2002. Available at: www.aapm.org/announcements/CT.html (accessed Jul 2004).
- 13 NSW Health. New penalties to control whole body CT scans. 2003. Available at: www.health.nsw.gov.au/news/2003/June/08-06-03ct.htm (accessed Jul 2004). □