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Australia and New Zealand Horizon Scanning Network

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National Horizon Scanning Unit
Horizon scanning prioritising summary

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ImageChecker CT-LN: A computer-aided system for the detection of lung cancer nodules.

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PRIORITISING SUMMARY

REGISTER ID: **0000064**

NAME OF TECHNOLOGY: **IMAGECHECKER CT-LN**

PURPOSE AND TARGET GROUP: **A COMPUTER-AIDED SYSTEM FOR THE DETECTION OF LUNG CANCER NODULES**

STAGE OF DEVELOPMENT (IN AUSTRALIA):

☐	Experimental	☐	Established
☐	Investigational	☐	Established *but* changed indication or modification of technique
☒	Nearly established	☐	Should be taken out of use

AUSTRALIAN THERAPEUTIC GOODS ADMINISTRATION APPROVAL

☐	Yes	ARTG number	
☒	No	☐	Not applicable

INTERNATIONAL UTILISATION:

COUNTRY	LEVEL OF USE		
	Trials Underway or Completed	Limited Use	Widely Diffused
Korea	✓		
Japan	✓		
United States	✓		

IMPACT SUMMARY:

R2 Technology Incorporated provides the ImageChecker CT LN and the R2 OmniCAD with the aim of using computer-aided detection computerised tomography (CAD CT) to detect lung cancer nodules at the early stage of their development, which otherwise might be missed. At present CT scans are reviewed and re-read by a radiologist for the presence of cancerous lung nodules. Using CAD algorithms, CT images that are difficult to detect due to their size are highlighted to the radiologist for their assessment. The system can identify images as small as 4 millimetres wide. The technology is designed as an evaluative tool for existing cancer patients and as a screening tool for those patients deemed at risk of developing lung cancer (smokers, ex-smokers, persons exposed to other carcinogenic particulate matter).

Cancer of the lung is the most common cause of cancer death in males and the fourth leading cause of cancer in Australia (AIHW 2003b). In 2001, 5278 males and 2782 females were newly diagnosed with cancer of the lung, bronchus or trachea (AIHW, 2003a). Mortality rates for lung cancer is high with approximately 90% of patients diagnosed with lung cancer succumbing to the disease. Five-year survival rates are also poor at about 10% (AIHW, 2003b). Despite claims of efficacy, there is a consensus that the evidence is not convincing that screening improves survival rates in those with lung cancer (Bepler et al, 2003; Dominioni and Strauss, 1999).

In published studies, results suggest that the use of CAD CT technology can improve the accuracy of detecting and identifying lung nodules and is especially helpful to residents and less experienced radiologists. In one case-series study, CAD CT was able to detect nodules that would otherwise have been missed by radiological examination (Goo et al, 2003). Of 26 total nodules of >5 millimetres in size, review and re-review of CT scans by two radiologists identified 23 nodules (sensitivity of 88%). While evaluation using CAD software only identified 17 nodules, it highlighted 3 nodules that were missed by the radiologists (sensitivity of 65%). This result reinforces the perception that CAD CT technology should be used as a supporting investigative tool rather than a replacement for traditional radiological examination.

Currently there is no costing information for the ImageChecker CT LN in Australia. CT technology is available throughout Australia.

CONCLUSION:

There is limited evidence available to assess the safety and effectiveness of the ImageChecker CT LN system.

HEALTHPACT ACTION:

It is therefore recommended that this technology be archived.

SOURCES OF FURTHER INFORMATION:

Achenbach, T., Vomweg, T. et al (2003). '[Computer aided diagnosis in chest radiology - current topics and techniques]', *Rofo Fortschr Geb Rontgenstr Neuen Bildgeb Verfahr,* 175 (11), 1471-1481.

Awai, K., Murao, K. et al (2004). 'Pulmonary nodules at chest CT: effect of computer-aided diagnosis on radiologists' detection performance', *Radiology,* 230 (2), 347-352.

Goo, J. M., Lee, J. W. et al (2003). 'Automated lung nodule detection at low-dose CT: preliminary experience', *Korean J Radiol,* 4 (4), 211-216.

Bepler, G.,Goodridge Carney, D.et al (2003). 'A systematic review and lessons learned from early lung cancer detection trials using low-dose computed tomography of the chest', *Cancer Control,* 10 (4), 306-314.

Kakeda, S., Moriya, J. et al (2004). 'Improved Detection of Lung Nodules on Chest Radiographs Using a Commercial Computer-Aided Diagnosis System', *AJR Am J Roentgenol,* 182 (2), 505-510.

MacMahon, H., Engelmann, R. et al (1999). 'Computer-aided diagnosis of pulmonary nodules: results of a large-scale observer test', *Radiology,* 213 (3), 723-726.

Shiraishi, J., Abe, H. et al (2003a). 'Computer-aided diagnosis to distinguish benign from malignant solitary pulmonary nodules on radiographs: ROC analysis of radiologists' performance-initial experience', *Radiology,* 227 (2), 469-474.

Shiraishi, J., Abe, H. et al (2003b). 'Effect of high sensitivity in a computerized scheme for detecting extremely subtle solitary pulmonary nodules in chest radiographs: observer performance study', *Acad Radiol,* 10 (11), 1302-1311.

Strauss, G. & Dominioni, L. (1999). 'Varese meeting report', *Lung Cancer,* 23 (2), 171-172.

SEARCH CRITERIA TO BE USED:

Diagnosis, Computer-Assisted/*methods

Image Processing, Computer-Assisted/methods
Radiography, Thoracic/*methods
Lung Diseases/*radiography
Lung Neoplasms/*radiography
Radiology/*standards
*Radiographic Image Enhancement
Software