Texture analysis of Radiological images (TexRAD) for lung cancer assessment

**TIMEFRAME: Estimated earliest commercial availability in the UK**

<table>
<thead>
<tr>
<th>Currently unclear</th>
<th>Now</th>
<th>6 months</th>
<th>1 year</th>
<th>18 months</th>
<th>2 years</th>
<th>Over 2 years</th>
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</thead>
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**TECHNOLOGY**

Texture analysis of Radiological images (TexRAD), developed by TexRAD Ltd. and distributed by Cambridge Computed Imaging Ltd. (part of Feedback Plc.), is an image processing software that analyses radiological scans to assist clinicians in assessing the prognosis of patients with lung cancer. TexRAD measures tumour complexity by the analysis of the diversity in lesion composition and is intended to supplement computed tomography (CT) imaging.

A single CT slice that displays the largest cross-section of the tumour is exported to the TexRAD software where a tumour region of interest (ROI) is drawn. The software then filters the image with the ROI to highlight image features of a specific size. TexRAD uses an innovative algorithm to measure the distribution of pixel values within a tumour. This identifies coarser features and uses histogram analysis to quantify and assess the distribution of grey-levels, coarseness and regularity within the lesion.

This image processing software is intended for use in patients with lung cancer undergoing radiological assessment with CT and could assist in further risk-stratification of patients with non-small cell lung cancer (NSCLC). The company claim that TexRAD could also be used to assess the prognosis of patients with colorectal, breast and oesophageal cancer.

The company anticipates CE marking by Q1 2016 and clinical use in the NHS by Q2 2017.

**POTENTIAL FOR IMPACT**

Lung cancer is the second most common cancer in the UK, accounting for more than 1 in 5 cancer deaths. Diagnostic imaging, especially CT and positron emission tomography (PET), are essential to determine the stage of many cancers. However, diagnostic imaging systems...
focus on enhanced fine detail (i.e. high spatial frequency information) and do not routinely enable quantitative textural analysis of heterogeneity in the images. As claimed by the company, TexRAD allows this heterogeneity to be assessed using different spatial scales and presented as ‘texture ratios’. This enables quantitative assessment of imaging biomarkers within a tumour which can then be used to stratify for risk, prognosis and treatment response.

The company also claim that CT texture analysis (CTTA) is the first quantitative imaging marker of disease status in cancer that is based on measurements of tumour attenuation values at a single time-point, as opposed to size. The extra data it provides can help clinicians in determining the level of follow up required after treatment such as the suitability for adjuvant treatment after surgery as for chemotherapy in advanced disease. The company claim that these benefits can be achieved at minimal cost and with minimal training of the operators such as radiographers and radiologists.

The technology is predicted to have an impact on the following domain(s) of the NHS Outcomes Framework (www.england.nhs.uk/resources/resources-for-ccgs/out-frwrk):

Domain 1 Preventing people from dying prematurely.

**EVIDENCE**

**PUBLISHED PAPERS AND ABSTRACTS**


**INFORMATION FROM**

This Alert is based on information from the company and a time-limited internet search.

**Lay summary**

*TexRAD* is software which helps doctors in the diagnosis of lung cancer. It analyses the texture of X-ray pictures taken during a CT scan. The developer says that this will give the doctor more information to decide if someone has cancer, what treatment they would benefit from and whether the treatment they have received has worked.