Hospital Efficiency Impact of Spectral CT Versus Conventional CT in Diagnosis of Patients Suspected of Occult Cancer in the UK

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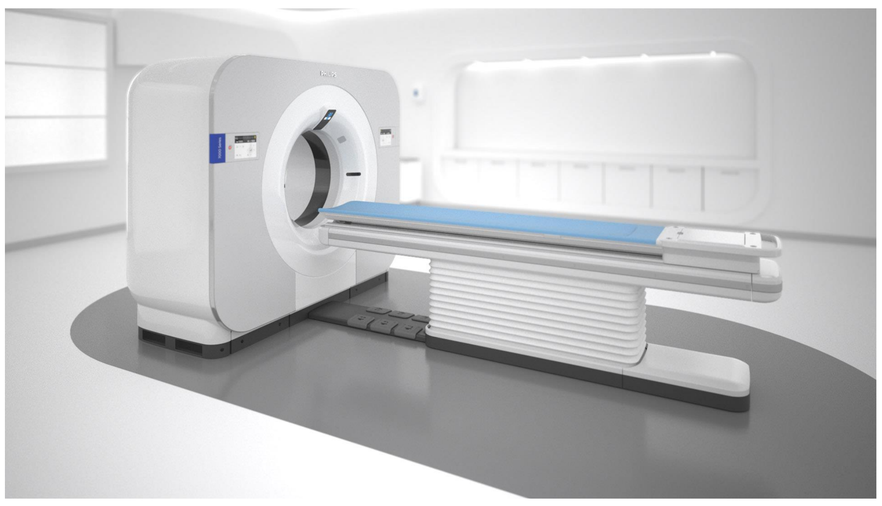
Introduction

Diagnosing cancer can be challenging, especially in those with vague symptoms, who have a longer time to diagnosis and higher mortality rate due to delayed intervention as a result. Spectral CT uses two layers of detectors to simultaneously collect low-and high-energy data.

It delivers insights such as improved tissue characterization and visualization for confident disease management. Based on prior studies spectral CT has shown a higher sensitivity for malignant lesions than conventional CT.

Purpose

With growing waiting list times and follow-up appointments in the UK, this study examined the potential impact on follow-up diagnostic appointments when spectral CT is used in place of conventional CT.



Methods

Spectral CT outcomes data was derived from Andersen M et al, 2021; this study calculated the economic impact of spectral body imaging in a Danish setting[4].

This was then applied to UK healthcare data which was obtained from Healthcare Episode Statistics (HES) on a trust-by-trust basis. HES data on liver, kidney, pancreas, lung, and prostate was obtained and subsequently, follow-up diagnostic procedural data relating to ultrasound, CT and MRI.

HES data was also retrieved for waiting list times (13+ weeks) on each diagnostic procedure to determine the burden of disease.

HES data was run looking at a 1-year period from April to March 2022. Patients were tracked over a 90-day period. Patients were filtered by treatment specialty (Genitourinary Medicine, Hepatology, Nephrology, Respiratory Medicine (Also Known As Thoracic Medicine) and Urology).

Baseline patients: Patients undergoing CT scan

Follow-up patients (within 90 days): CT scan, MRI or ultrasound

Results

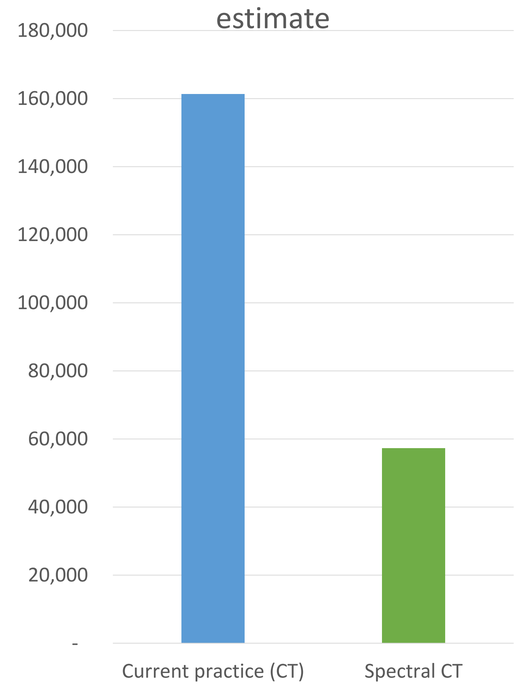
The reduction in follow-up procedures with Spectral CT (Andersen *et al*, Insights into imaging, 2021):

Ultrasound, CT and MRI **64.50%**

Follow-up in ultrasound, CT and MRI procedures within 90 days

Time period: 1 year

National Hospital Episode Statistics data



Conventional CT	Spectral CT
161,310	57,265

-104,045 procedures

(estimate based on 64.5% reduction)

NHS Waiting times: ultrasound, CT and MRI

12 weeks or less	More than 12 weeks
33%	67%
53,232	108,078

Conclusion

The results show that Spectral CT can reduce the number of follow-ups (104,045 in this case) and therefore reduce the burden on the NHS. Hospital Episode Statistics also shows that waiting times for diagnostic procedures is high, with many patients waiting beyond 12 weeks.

One of the major limitations of the study was the robustness of the data in relation to factoring in 'suspected' oncology patients.

References

1. Analysis by SNUH, Seoul, South Korea.

2. Analysis by CARTI Cancer Center, Little Rock, AR, USA

3. Analysis by LSU, New Orleans, LA, USA.

4. Andersen MB, Ebbesen D, Thygesen J, Kruis M, Gu Q, Dharaiya E, Rasmussen F. Economic impact of spectral body imaging in diagnosis of patients suspected for occult cancer. Insights Imaging. 2021 Dec 20;12(1):190. doi: 10.1186/s13244-021-01116-0. PMID: 34928439; PMCID: PMC8688640.

Disclosure information

Sanjay Verma and Gareth Kennedy are both employed by Philips