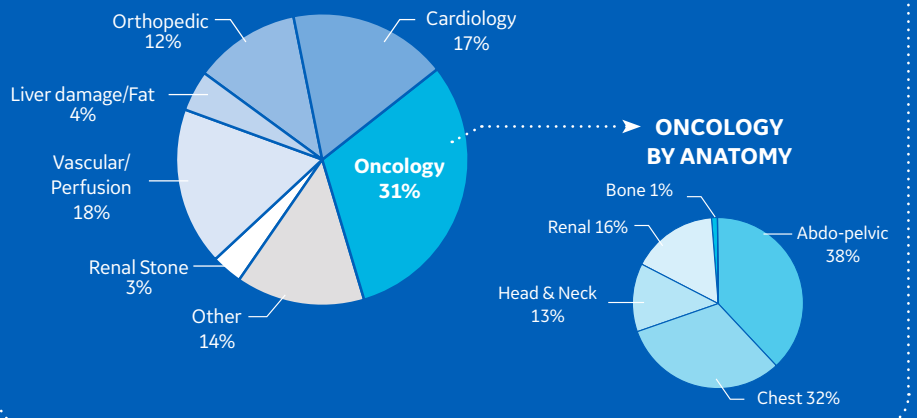
Evidence for Spectral Imaging CT is mounting...

Incredible breadth of research on GSI

300+ Journal publications 2010-2017

33% Avg. yearly growth in # of publications 2011-2017

BY CLINICAL APPLICATION



Professional society consensus statements on DECT clinical utility for[3]:

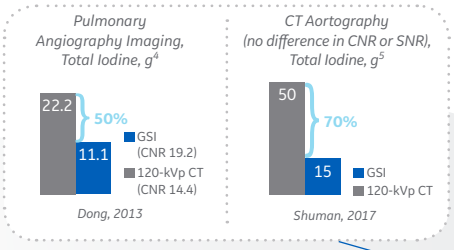
- Quantitative assessment of ***fatty liver*** and contrast uptake in focal ***hepatic lesions***
- ***Renal masses*** and ***urothelial tumors***
- ***Improved iodine sensitivity*** from DECT angiography
- Reduced artifacts in patients with ***orthopedic metallic implants***
- Known or suspected ***pancreas neoplasms***
- Routine clinical use for ***carotid/cerebral and extremity CTA***
- Routine ***pulmonary CTA***
- ***Renal stones*** to discriminate uric acid stones
- ***Radiation doses*** are reliably comparable to SECT

GSI: DELIVERING VALUE BASED CARE

*Example findings from peer reviewed GSI publications**

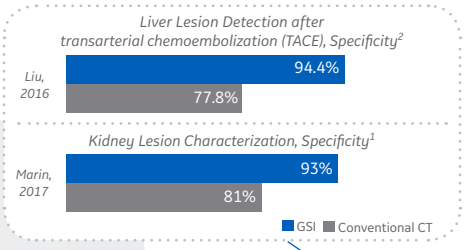
ANGIOGRAPHY

Low keV images can reduce iodine load by at least 50% > benefitting patients with compromised renal function[3,4,5]



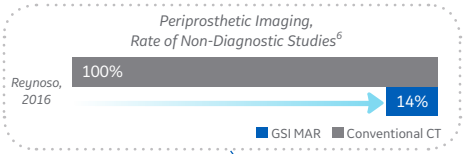
ABDOMEN – ONCOLOGY

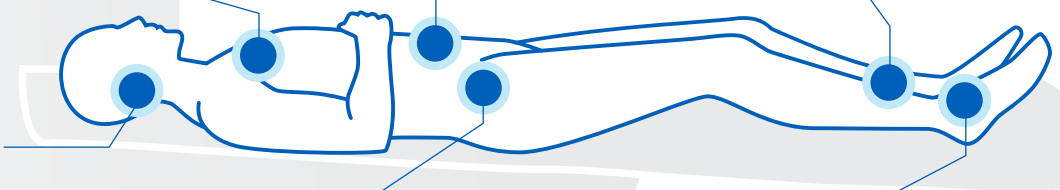
Improves liver lesion detection 17% and kidney lesion characterization 12% > reducing unnecessary follow-ups[1,2]



ORTHOPEDICS – REDUCED METAL ARTIFACT

6x reduction in non-diagnostic scans with GSI MAR > enhancing evaluation of metal implants and adjacent bone or tissue[6,7]





HEAD AND NECK TUMOR VISIBILITY

2.3x higher average tumor attenuation > for increased tumor conspicuity and improve tumor evaluation[12]

RENAL STONE CHARACTERIZATION

100% Sensitivity and 99.7% Specificity for uric acid stones[9] and atomic number for stone composition > for faster and simplified diagnosis workflow

GOUT

100% detection by uric acid (calcium) mapping > for non-invasive diagnosis[11]

*The example findings cited are limited to the referenced studies only and may not be broadly applicable to your clinical practice.

STUDY	# OF PATIENTS	ARTICLE CONCLUSION
Marin[1], 2017	136	The results of our study demonstrate that analysis of contrast-enhanced dual-energy material attenuation significantly improves the specificity for characterization of small (1–4 cm) renal lesions compared with that of conventional attenuation measurements. This improvement in specificity may decrease the frequency of unnecessary work-up for small indeterminate renal lesions.
Liu[2], 2016	30	Compared with conventional CT, GSI could significantly improve the detection of small and multiple lesions without increasing the radiation dose. Based on spectrum features, GSI could assess tumor homogeneity and more accurately identify residual tumors and recurrent or metastatic lesions during efficacy evaluation and follow-up in HCC after TACE treatment.
Dong[4], 2013	86	Low-contrast agent dose DECT monochromatic imaging in pulmonary angiography accommodates superior intravascular enhancement and contrast in pulmonary arteries, and improves diagnostic confidence with compatible radiation dose.
Shuman[5], 2017	21	70% reduced iodine DECT aortography may result in similar aortic attenuation, CNR, SNR, and lower although acceptable subjective image scores when compared to standard iodine SECT aortography in the same patient.
Reynoso[6], 2016	80	GSI-MARS technology demonstrated the ability to reduce periprosthetic artifacts, improving image quality and diagnostic interpretability particularly when associated with virtual monochromatic spectral images at high energy levels.
Pessis[7], 2013	Review clinical experience	The ability to obtain VMS images gives dual-energy CT potential advantages over conventional CT in reducing metal artifacts and improving image quality and diagnostic value. Evaluation of metal implants and adjacent bone or tissue is enhanced with VMS images reconstructed from dual-energy CT datasets. However, understanding principles of dual-energy CT data processing and image generation is necessary to derive maximum benefit from the dual-energy CT datasets.
Li[11], 2014	31	Dual-energy spectral CT can detect gout tophi within the peripheral joints of the patients. The quantitative measurement of the tophi concentration provides a new imaging method for quantitatively monitoring clinical outcomes of tophi.
Forghani[12], 2017	120	Using multiple lines of evidence, our results suggest that 40 keV VMIs objectively improve tumor visibility compared with SECT and, furthermore despite the increased noise levels, are preferred for targeted tumor evaluation subjectively. These conclusions seem suitable both for specialized centers as well as in general practice settings where head and neck cancer imaging is performed.

References

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Imagination at work

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