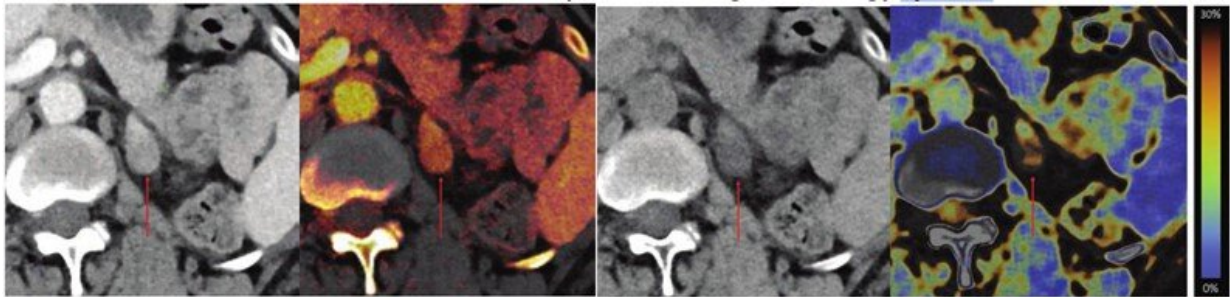


Dual-energy CT metrics for differentiating adrenal adenomas

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Left to right: Axial conventional portal-venous phase postcontrast image, iodine overlay image, virtual noncontrast attenuation image, and fat-fraction map show left adrenal mass (arrow). Based on mean values of two readers, mass has conventional portal-venous phase attenuation of 68.9 HU, virtual noncontrast attenuation of 15.7 HU, fat fraction of 26.2%, iodine density of 2.2 mg/mL, normalized iodine density of 0.42, ratio of normalized iodine density to virtual noncontrast attenuation of 0.027, and relative enhancement ratio of 339%. Mass was diagnosed as adenoma based on two criteria applied in present investigation, assessed using noncontrast CT performed 7 years earlier (attenuation ≤ 10 HU on noncontrast images, and >1 -year size stability). Credit: ARRS/AJR

According to a study published in the *American Journal of Roentgenology (AJR)*, for adrenal lesions evaluated by single-phase dual-energy CT (DECT), fat fraction had higher sensitivity than virtual noncontrast attenuation at both the clinically optimal threshold and at the traditional ≤ 10 HU threshold.

"DECT-based three-material decomposition algorithms can help definitively characterize adrenal lesions detected on routine abdominal imaging as adenomas, thereby reducing downstream follow-up testing," wrote first author Anne-Sophie T. Loonis, MD from Brigham and Women's Hospital in Boston, MA.

In this *AJR* accepted manuscript, 128 patients (82 women, 46 men; mean age, 64 years) who underwent portal-venous phase abdominopelvic CT between January 2016 and December 2019 showed a total of 139 adrenal lesions with a reference standard based on imaging, clinical, and pathologic records: 87 adenomas, 52 nonadenomas (48 metastases, 2 adrenal cortical carcinomas, 1 ganglioneuroma, 1 hematoma).

Two radiologists located ROIs to determine virtual noncontrast attenuation, fat fraction, iodine density normalized to [portal vein](#), and relative enhancement ratio—for masses with virtual noncontrast attenuation >10 HU.

Ultimately, for adrenal masses assessed by single-phase portal-venous phase DECT, when maintaining 100% specificity, sensitivity for adenoma was significantly higher for fat fraction [59% (95% CI: 48-69%)] than for virtual noncontrast attenuation at clinically optimal [threshold](#) [39% (95% CI: 29-50%)] or at traditional ≤ 10 HU threshold [28% (95% CI: 19-38%)].

"The use of DECT-derived metrics to definitively diagnose incidental adrenal lesions as adenomas could help avoid the costs, [radiation exposure](#), contrast media exposure, and [patient anxiety](#) associated with downstream imaging that may otherwise be performed for further lesion characterization," the authors clarified.

More information: Anne-Sophie T. Loonis et al, Dual Energy–Derived Metrics for Differentiating Adrenal Adenomas From

Nonadenomas on Single-Phase Contrast-Enhanced CT, *American Journal of Roentgenology* (2022). [DOI: 10.2214/AJR.22.28323](https://doi.org/10.2214/AJR.22.28323)

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