

Aquilion ONE Clinical Evidence: Subtraction

[Contrast Enhancement Boost Technique at Aortic Computed Tomography Angiography: Added Value for the Evaluation of Type II Endoleaks After Endovascular Aortic Aneurysm Repair](#)

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Acad Radiol. 2019, doi: 10.1016/j.acra.2019.01.009

- The CE-boost images showed the best endoleak visibility and least image noise. Thus, these images provided superior objective and subjective image quality without degrading the image texture. The authors describe the similarity of CE Boost by SCT images to low keV imaging by DECT

SURE^{Subtraction Lung}

[Imaging of pulmonary perfusion using subtraction CT angiography is feasible in clinical practice](#)

Dagmar Grob, Luuk J. Oostveen, Mathias Prokop, Cornelia M. Schaefer-Prokop, Ioannis Sechopoulos, Monique Brink

European Radiology (2019) 29:1408–1414

- Subtraction computed tomography (SCT) has been implemented in clinical practice for the evaluation of lung perfusion in CT pulmonary angiography (CTPA) in patients with suspicion of acute and chronic pulmonary embolism, with acceptable radiation dose

[Diagnostic accuracy of lung subtraction iodine mapping CT for the evaluation of pulmonary perfusion in patients with chronic thromboembolic pulmonary hypertension: Correlation with perfusion SPECT/CT](#)

Masashi Tamura, Yoshitake Yamada, Takashi Kawakami, Masaharu Kataoka, Yu Iwabuchi, Hiroaki Sugiura, Masahiro Hashimoto, Tadaki Nakahara, Shigeo Okuda, Seishi Nakatsuka, Fumiya Sano, Takayuki Abe, Yuichiro Maekawa, Keiichi Fukuda, Masahiro Jinzaki

International Journal of Cardiology, 2017, Volume 243, Pages 538–543

- This study compares SURE^{Subtraction Lung} Iodine Mapping and CT Pulmonary Angiography with lung perfusion scintigraphy (SPECT) and showed that iodine mapping had 95% accuracy compared to 65% with CT pulmonary angiography to detect perfusion defects in patients with chronic thromboembolic pulmonary hypertension. The combination of CTPA and iodine mapping provide both morphological and functional information in a single examination to evaluate patients with chronic embolic pulmonary hypertension

[Xenon-enhanced CT using subtraction CT: Basic and preliminary clinical studies for comparison of its efficacy with that of dual-energy CT and ventilation SPECT/CT to assess regional ventilation and pulmonary functional loss in smokers](#)

Ohno Y, Yoshikawa T, Takenaka D, Fujisawa Y, Sugihara N, Kishida Y, Seki S, Koyama H, Sugimura K.

Eur J Radiol. 2017 Jan;86:41-51

- Xenon-enhanced CT obtained by Subtraction-CT can be considered at least as efficacious as that obtained by DE-CT and SPECT/CT for assessment of ventilation abnormality and pulmonary functional loss in smokers.

SURE Subtraction Angio

[Novel developments in non-invasive imaging of peripheral arterial disease with CT: experience with state-of-the-art, ultra-high-resolution CT and subtraction imaging.](#)

Tanaka R, Yoshioka K, Takagi H, Schuijff JD, Arakita K.

Clin Radiol. 2019 Jan;74(1):51-58

- UHRCT has significant advantages in evaluating small arterial vasculature due to the increased spatial resolution. Subtraction CTA can provide fine luminal imaging even in patients with severe arterial calcification.

[Subtraction CTA: An Alternative Imaging Option for the Follow-Up of Flow-Diverter-Treated Aneurysms?](#)

Duarte Conde MP1, de Korte AM2, Meijer FJA3, Aquarius R1,4, Boogaarts HD1, Bartels RHMA1, de Vries J1.

AJNR Am J Neuroradiol. 2018 Nov;39(11):2051-2056

- Subtraction CTA with SEMAR is effective in the reduction of metal artifacts of Flow Diverters and might, therefore, be a viable alternative in the assessment of IA occlusion after FD treatment. This is the first study in which an alternative imaging technique has been shown to be comparable with DSA after FD treatment.

[Diagnosis and Treatment of Intracranial Aneurysms with 320-Detector Row Volumetric Computed Tomography Angiography.](#)

Chen W, Xing W, Peng Y, He Z, Wang C, Wang Q.

World Neurosurg. 2016 Jul;91:347-56.

- The 320-detector row subtracted CTA technique is an effective, first-line diagnostic imaging modality for surgical and endovascular treatment of aneurysms. The non-subtracted CTA was less accurate than the subtracted CTA, especially for intracranial aneurysms adjoining bone tissue

[Cerebral Aneurysms: Accuracy of 320-Detector Row Nonsubtracted and Subtracted Volumetric CT Angiography for Diagnosis.](#)

Chen W, Xing W, Peng Y, He Z, Wang C, Wang Q.

Radiology. 2016 Oct;281(1):326

- An excellent comparison of subtracted vs non subtracted CTA for the detection of cerebral aneurysms with comparison to DSA. The difference in accuracy between subtracted and DSA was not significant, however DSA was significantly better than unsubtracted CTA

[320-detector row CT angiography for detection and evaluation of intracranial aneurysms: comparison with conventional digital subtraction angiography.](#)

Wang H, Li W, He H, Luo L, Chen C, Guo Y.

Clin Radiol. 2013 Jan;68(1):e15-20

- 3D CTA is a highly sensitive, specific, and non-invasive imaging method for diagnosis and evaluation of intracranial aneurysms. It also allows for precise depiction of aneurysm morphology. Therefore, 320-detector row CTA may be used as an alternative to DSA as a first-line imaging technique in patients with Subarachnoid Hemorrhage.

Comparison of standard- and low-tube voltage 320-detector row volume CT angiography in detection of intracranial aneurysms with digital subtraction angiography as gold standard.

Sun G, Ding J, Lu Y, Li M, Li L, Li GY, Zhang XP.

Acad Radiol. 2012 Mar;19(3):281-8

- CTA with subtraction can be just as effective as DSA for detection of aneurysms. 80kV provides same detectability and less dose as 120kV. CTA with subtraction can reduce time and offer a less invasive procedure for clinicians, but with results just as good as the "Gold Standard" DSA

Developmental venous anomalies: appearance on whole-brain CT digital subtraction angiography and CT perfusion.

Hanson EH, Roach CJ, Ringdahl EN, Wynn BL, DeChancie SM, Mann ND, Diamond AS, Orrison WW Jr.

Neuroradiology. 2011 May;53(5):331-41.

- Comprehensive DVA analysis requires whole-brain imaging for visualization of peripheral or superior cerebral cortices and posterior fossa. Radiation dose for study was 4.4mSv.

SURE Subtraction Iodine Mapping

Usefulness of new subtraction algorithm in estimating degree of liver fibrosis by calculating extracellular volume fraction obtained from routine liver CT protocol equilibrium phase data: Preliminary experience.

Shinagawa Y, Sakamoto K, Sato K, Ito E, Urakawa H, Yoshimitsu K.

Eur J Radiol. 2018 Jun;103:99-104

- With the usage of 240 s equilibrium phase and high quality subtraction algorithm, degree of liver fibrosis can be assessed within the routine clinical diagnostic CT examination without adding any extra scan time or radiation, which would benefit patients with chronic liver diseases.
- perfusion defects in patients with chronic thromboembolic pulmonary hypertension. The combination of CTPA and iodine mapping provide both morphological and functional information in a single examination to evaluate patients with chronic embolic pulmonary hypertension