Objectives: To perform CT pulmonary angiography (CTPA) using a minimal amount of iodinated contrast media.

Methods: 47 patients (25 females) with mean age 69 years (range 41-82 years) referred for contrast-enhanced chest CT were prospectively included in this Phase IV clinical drug trial. All participants underwent a study specific CTPA in addition to the chest CT. The participants received 80 mg I/kg body weight Iohexol contrast media using a preparatory saline bolus, a dual flow contrast/saline bolus and a saline flush, and a scanner protocol with 80 kVp dual source high-pitch mode. Three readers independently assessed the image quality on the 3-point scale non-diagnostic, adequate or good-excellent image quality. Additionally, the pulmonary arterial contrast opacification was measured.

Results: On average, the patients received 16.8 ml Iohexol 350 mg I/mL (range 12-20 ml). Mean patient weight was 71 kg (range 50-85 kg). Identically for all readers, pulmonary embolism (PE) was detected in 1/47 participants. The median number of examinations visually scored concerning pulmonary embolism as good-excellent was 47/47 (range 44-47); adequate 0/47 (0-3) and non-diagnostic 0/47 (range 0-0). The proportion adequate or better examinations was for all readers 47/47, 100% [95% confidence interval 92-100%]. The mean attenuation ± standard deviation in the pulmonary trunk was 325 ± 72 Hounsfield unit (range 165-531 Hounsfield unit).

Conclusions: Diagnostic CTPA with 17 ml contrast media is possible in non-obese patients using low kVp, high pitch and carefully designed contrast media administration.

Advances in knowledge: By combining several procedures in a CTPA protocol, the contrast media dose can be minimized.

Full text available: Alobeidi H, Alshamari M, Widell J, Eriksson T, Lidén M. Minimizing contrast media dose in CT pulmonary angiography with high-pitch technique. Br J Radiol 2020; 93: 20190995.