
Standardising CTA for PE Diagnosis



Accurate and timely diagnosis of acute pulmonary embolism (PE) is essential for initiating appropriate treatment and improving patient outcomes. Computed tomography angiography (CTA) has become the preferred imaging modality for PE when it cannot be excluded by clinical evaluation and D-dimer testing. Beyond detection, CTA provides vital prognostic information, identifies alternative diagnoses and informs advanced treatment planning. However, standardisation in CTA reporting remains lacking. To address this, leading societies in cardiovascular imaging and pulmonary care collaborated on a consensus statement outlining best practices for performing and reporting CTA in suspected PE.

Optimising CTA Acquisition Techniques

Modern CTA for PE relies on advanced single-energy CT technology and evolving scanning protocols to achieve high image quality while minimising radiation exposure. Key technical parameters include low tube voltage imaging, high temporal resolution and iterative or deep learning-based reconstruction techniques. These improve contrast opacification and reduce motion artefacts. Weight-based or automatic voltage selection is recommended, particularly in patients with higher body mass index. Additionally, careful management of contrast injection flow rate, volume and iodine concentration ensures homogeneous opacification of pulmonary arteries.

For pregnant patients, protocols are adapted to reduce radiation exposure and enhance image quality. This includes low-kilovoltage settings, adjusted breathing instructions and optimised contrast delivery. Special consideration is given to avoid common artefacts such as transient interruption of contrast caused by deep inspiration or shunting. Table-based parameters standardise practices across institutions, improving reliability and diagnostic value.

Must Read: [Detecting Pulmonary Embolism with Non-Contrast Imaging](#)

Reporting Structure and Key CTA Findings

To harmonise reporting and enhance clinical utility, the consensus defines a core set of CTA findings based on their prognostic value. A modified Delphi process identified eight “must-have” and three “nice-to-have” findings to be routinely included in CTA reports. These include clot location (central or subsegmental), signs of right ventricular (RV) overload such as the RV/left ventricular ratio, pulmonary artery trunk diameter, septum deviation, RV hypertrophy and bronchial artery dilatation. Findings such as intravascular webs, organised mural thrombi and pulmonary artery retraction help identify chronic thromboembolic pulmonary hypertension.

The consensus also offers standardised nomenclature to describe various types of filling defects and emboli. Structured reports incorporating this vocabulary improve interobserver consistency and support decision-making across care teams. A visual image atlas was developed to aid assessment, complemented by a lay-language version to enhance patient understanding.

Advanced Imaging Technologies and Limitations

CTA techniques have expanded with the integration of dual-energy CT (DECT) and photon-counting detector CT (PCD CT). These approaches enhance tissue differentiation and allow for perfusion imaging, which improves detection of peripheral clots and provides additional functional data. Subtraction imaging, which compares pre- and post-contrast scans, further refines pulmonary perfusion mapping. These innovations contribute to higher diagnostic accuracy, especially in complex or ambiguous cases.

Despite these advancements, CTA may occasionally be nondiagnostic. Causes include motion artefacts, poor contrast enhancement and patient-related factors such as obesity or dyspnoea. The consensus provides troubleshooting strategies tailored to common issues, including contrast timing adjustments, modified breathing instructions and catheter selection. It also outlines when repeat imaging is warranted. In cases

involving extracorporeal support, temporary flow reduction is advised to ensure adequate arterial filling.

Artificial intelligence tools are emerging to assist in PE detection and risk stratification. While still under development, these algorithms may help reduce time to diagnosis and improve consistency in busy clinical environments.

The consensus on performing and reporting CTA for suspected acute PE represents a collaborative effort to standardise imaging practices and reporting criteria. By defining optimal scanning protocols and a core set of actionable findings, the document aims to support more accurate diagnoses, informed treatment decisions and improved patient outcomes. Adoption of these guidelines across clinical settings is expected to reduce variability, enhance communication among providers and ultimately benefit both physicians and patients managing this potentially life-threatening condition.

Source: [Radiology](#)

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