RSNA Press Release

New Framework Launches to Improve Pulmonary Embolism Patient Care

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OAK BROOK, Ill. – The Pulmonary Embolism Reporting and Data Systems (PE-RADS^{TM}) framework for diagnosing and classifying acute pulmonary embolism using CT and magnetic resonance (MR) angiography was published today in *Radiology*, a journal of the Radiological Society of North America (RSNA). Developed by the American College of Radiology (ACR) in collaboration with representatives from six other leading medical groups, PE-RADS aims to streamline communication and patient care for the potentially life-threatening condition.

Timely and accurate assessment of acute pulmonary embolism is essential. It is a sudden blockage in the blood vessels of the lungs that reduces blood flow, may strain the heart and can be fatal if untreated. Common symptoms include shortness of breath, chest pain and low blood pressure.

"The goal of PE-RADS is to improve communication between healthcare providers who care for patients with acute pulmonary embolism," said Lynne M. Koweek, M.D., professor of radiology and associate professor of medicine at Duke University School of Medicine in Durham, North Carolina, and chair of the ACR PE-RADS committee. "As the first standardized lexicon and structured reporting system for pulmonary embolism imaging, PE-RADS v2026 is designed to provide a framework for reporting CT and MR angiographic findings in a clear, consistent manner to guide next steps patient care."

CT pulmonary angiography is the gold standard for diagnosing pulmonary embolism. MR angiography is another noninvasive, highly accurate test that can be used for diagnosis.

"These are commonly performed exams that can be challenging to interpret, and imaging findings are critical to patient management," Dr. Koweek said. "Standard terminology reduces variability in reporting and understanding the radiology report. We hope that all radiologists will use PE-RADS to enable clear communication and coordination with care teams."

PE-RADS v2026 provides a simple, 0-4 grading scale and hierarchical framework to classify clot location combined with right heart imaging features, supporting risk stratification and guiding patient management across multidisciplinary teams. The system also includes modifiers to indicate limitations in diagnosis due to image quality and non-pulmonary embolism causes of disease in the pulmonary arteries.

PE-RADS was developed by imaging specialists and clinicians who care for patients with suspected or diagnosed pulmonary embolism. Half of the specialists were selected by the ACR, and the other half were nominated by the American College of Emergency Physicians, American College of Chest Physicians, Pulmonary Embolism Response Team Consortium, Society of Thoracic Radiology, Society for Cardiovascular Angiography and Interventions, and Society of Interventional Radiology.

The new framework is aligned with existing pulmonary embolism guidelines and designed for easy adoption and future expansion and refinement as data assessing its impact on outcomes and resource utilization emerge.

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"Consistent terminology and reporting not only fosters effective communication between healthcare providers, it also creates a stronger foundation for studying outcomes, resource utilization and future improvements in pulmonary embolism care," Dr. Koweek said. "PE-RADS provides a structured framework to standardize reports today and evolve as treatments and evidence advance."

The ACR RADS program originated in 1992 to provide standardized frameworks for the interpretation and reporting of disease-oriented medical imaging results and facilitate effective communication between radiologists and referring physicians.

"Pulmonary Embolism Reporting and Data Systems (PE-RADS™) v2026 for the Diagnosis of Acute Pulmonary Embolism on CT and MR Angiography." Collaborating with Dr. Koweek were Prachi Agarwal, M.D., Shari Brosnahan, M.D., Sanjeev Bhalla, M.D., Vivian Bishay, M.D., Paul Cronin, M.D., Christopher J. Francois, M.D., Jay Giri, M.D., M.P.H., Diana Litmanovich, M.D., Ann N. Leung, M.D., Frances Mae West, M.D., and Stefan Zimmerman, M.D.

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For patient-friendly information on CT and MR angiography, visit *RadiologyInfo.org*.

Images (JPG, TIF):

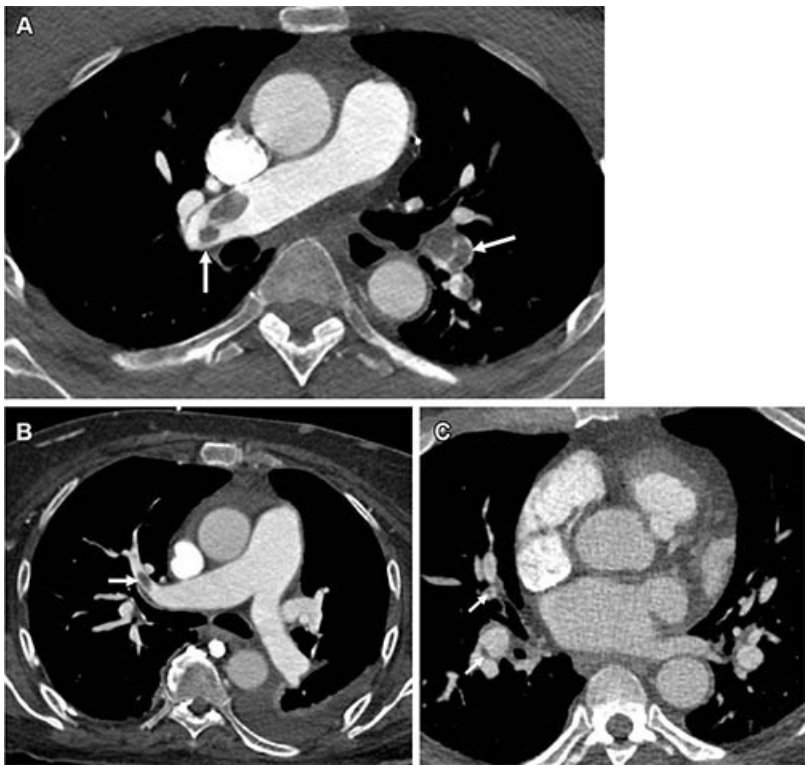

Figure 1. Stages of thromboembolism. **(A)** Pulmonary embolism (PE) chest axial CT angiography image demonstrating acute pulmonary embolus (arrows). **(B)** PE chest axial CT angiography image demonstrating subacute pulmonary embolus (arrow). **(C)** PE chest axial CT angiography image demonstrating webs/scarring from prior pulmonary embolus (arrows).

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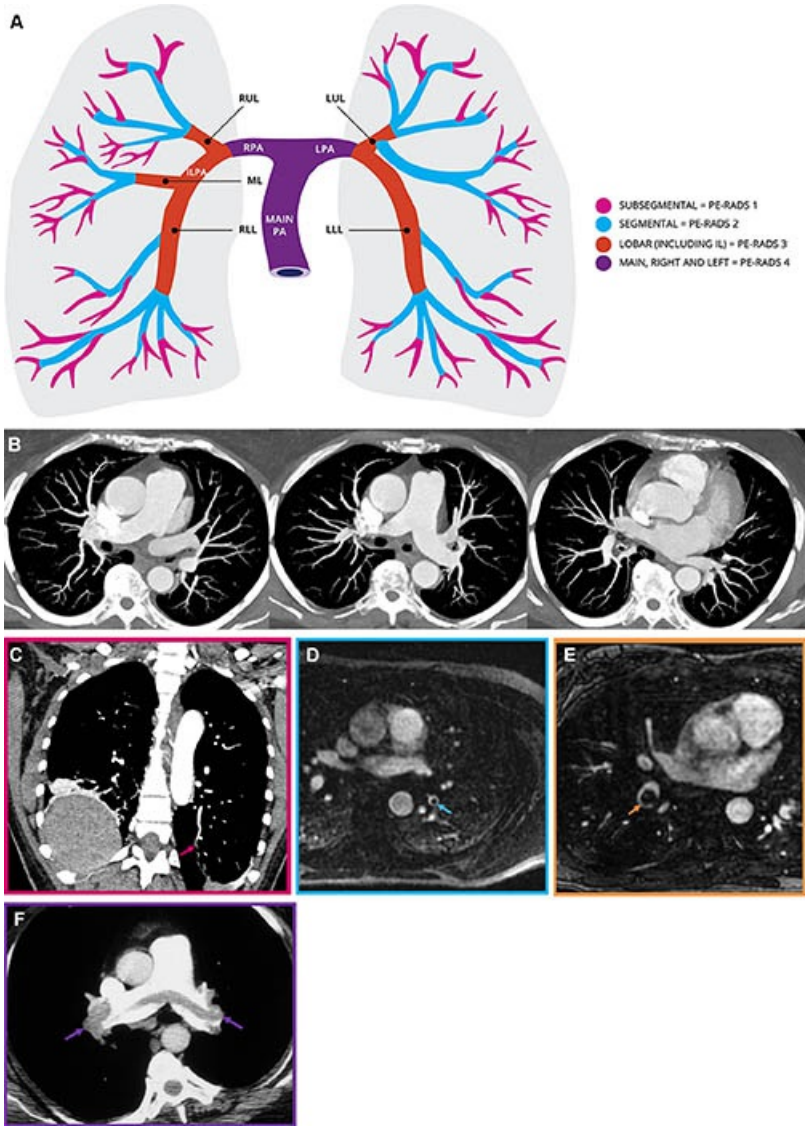

Figure 2. Ordinal scoring of acute thromboembolism for the Pulmonary Embolism Reporting and Data System (PE-RADS). **(A)** Anatomic depiction of pulmonary arterial vasculature for ordinal scoring of thrombus for PE-RADS 0–4. IL = interlobar, LLL = left lower lobe, LPA = left main PA, LUL = left upper lobe, ML = middle lobe, PA = pulmonary artery, RLL = right lower lobe, RPA = right PA, RUL = right upper lobe. **(B)** Pulmonary embolism (PE) chest axial CT angiography images demonstrate the absence of PE, PE-RADS 0. **(C)** PE chest coronal CT angiography image demonstrates acute thrombus in the right lower lobe subsegmental pulmonary artery as the most proximal location of the pulmonary embolus (arrow), PE-RADS 1. **(D)** PE chest axial MR angiography image demonstrates acute thrombus in the left lower lobe segmental pulmonary artery as the most proximal location of the pulmonary embolus (arrow), PE-RADS 2. **(E)** PE chest axial MR angiography image demonstrates thrombus in the right lower lobar pulmonary artery as the most proximal location of the pulmonary embolus (arrow), PE-RADS 3. **(F)** PE chest axial CT angiography image demonstrates thrombus in the main, left, and right pulmonary arteries as the most central location of the pulmonary embolus (arrows), PE-RADS 4

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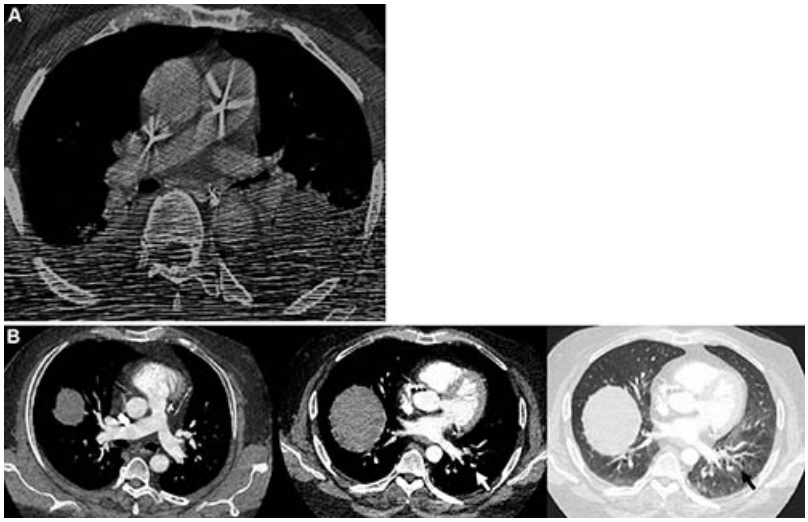

Figure 3. Image quality modifications. **(A)** Non-diagnostic axial CT angriography image quality with inability to exclude presence of acute pulmonary embolus in the central vessels, Pulmonary Embolism Reporting and Data System (PE-RADS) N. **(B)** Limited axial CT angiography image quality, no acute pulmonary embolism identified in the central vessels with incomplete assessment of segmental and/or subsegmental vessels due to motion artifact (arrows), PE-RADS 0L.

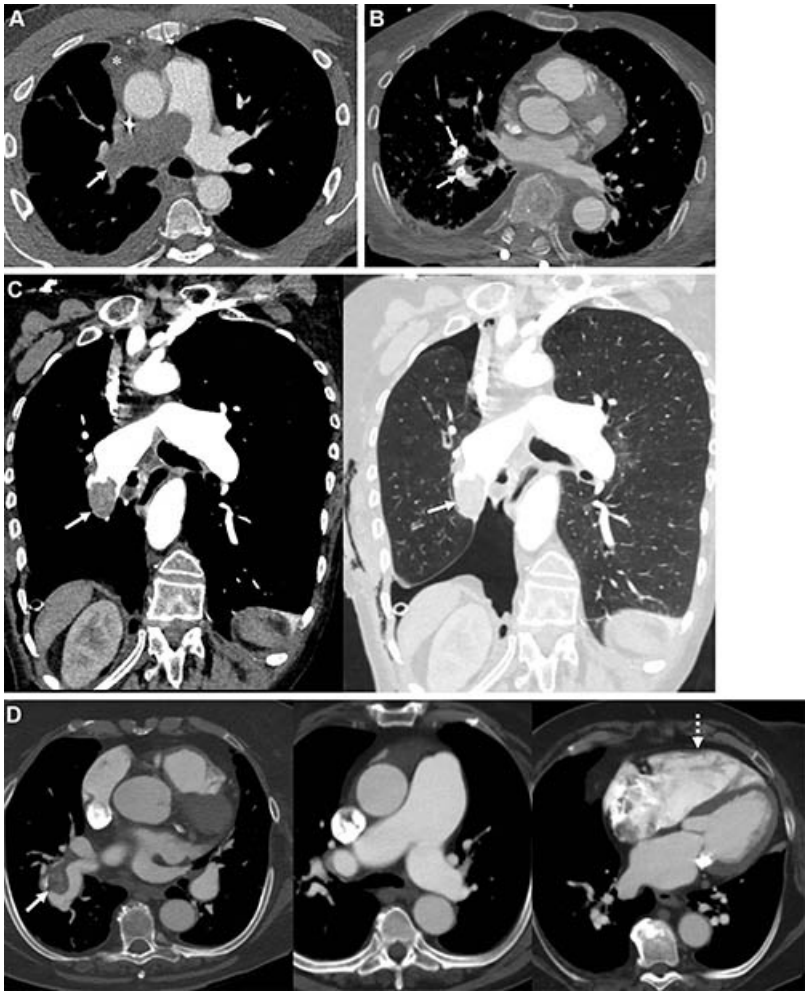

Figure 4. Non-acute thromboembolic filling defects in the pulmonary arterial system. Pulmonary Embolism Reporting and Data System (PE-RADS) E. **(A)** Pulmonary embolism (PE) chest axial CT angiography image demonstrates an expansile mass in the right artery (arrow) and mediastinal lymphadenopathy (*) consistent with

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pulmonary artery angiosarcoma. **(B)** PE chest axial CT angiography image demonstrates cement emboli in the pulmonary arteries (arrows). **(C)** PE chest coronal CT angiography images demonstrate thrombus in situ in the right pulmonary artery after right lung partial resection (arrows). **(D)** Chronic thromboembolic pulmonary hypertension PE chest axial CT angiography images demonstrate sequalae of prior thromboembolism (solid arrow) with findings of pulmonary arterial hypertension with right ventricular enlargement (dotted arrow).

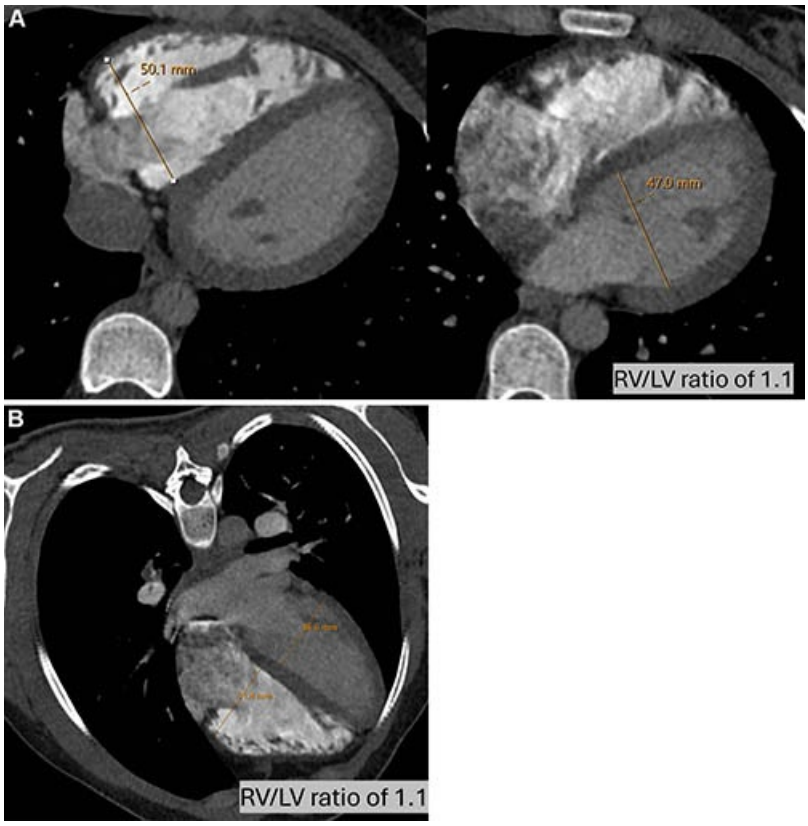

Figure 5. Assessment of right heart enlargement on pulmonary CT angiography/MR angiography examinations. **(A)** Measurement of right ventricle (RV) and left ventricle (LV) diameters and calculation of the RV/LV ratio on axial CT angiography image reconstruction. RV/LV ratio is >1.0, above the threshold for classification of RV enlargement in the Pulmonary Embolism Reporting and Data System (PE-RADS). **(B)** Measurement of RV and LV diameters and calculation of the RV/LV ratio on four-chamber CT angiography image reconstruction. The RV/LV ratio is >1.0, above the threshold for classification of RV enlargement in PE-RADS.

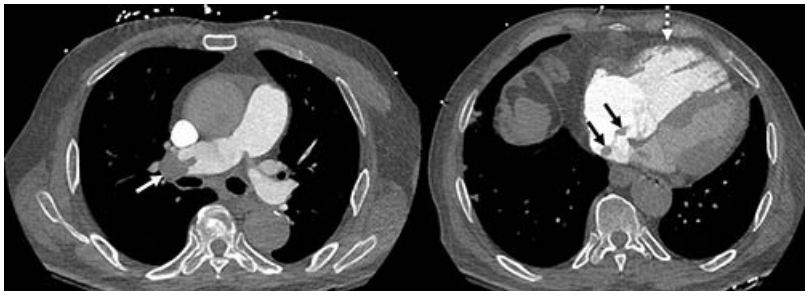

Figure 6. Acute pulmonary embolism (PE) with right ventricle (RV) enlargement and clot-in-transit. PE chest axial CT angiography images demonstrate pulmonary embolus in the right pulmonary artery (white solid arrow), an enlarged RV (dotted arrow), and thrombus transiting through the right atrium (black arrows), Pulmonary Embolism Reporting and Data System (PE-RADS) 4/RV+/T+. The "4" refers to the PE-RADS ordinal category for the most proximal clot location (central arteries). "RV+" indicates RV enlargement (RV to left ventricle ratio ≥ 1.0). "T+" indicates definitive thrombus identified in the right atrium and/or RV.

Resources:

Abstract link

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