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Best practice guidelines, the acute chest

The following discussion is the third in a series to guide clinicians in selecting the most appropriate diagnostic test for their patients. This is designed to help understand the advantages and limitations of specific tests and to help the clinician formulate cost-effective imaging strategies. This article focuses on imaging of the chest in the acute setting.

In selecting the most appropriate imaging test of the chest in the acute care setting, standard chest x-ray (CXR) is still the most valuable player. It is sensitive at detecting abnormal opacities obscuring the normal heart or lung borders. It can identify pulmonary infiltrates, edema, effusions, lung or mediastinal masses, and cardiomegaly. Small pneumothoraces and pneumoperitoneum are detected on upright films. For most findings on CXR, sensitivity of detection is high, specificity is reasonable and the overall radiation dose to the patient is minimal. Often only a single view is required, limiting radiation dose even further. CXR is a rapid test, available almost everywhere and at any time making this a great first step in most diagnostic scenarios.

Computed Tomography of the chest (CT) can add significant specificity in the workup of abnormal chest x-ray findings. Tumors can be staged, pneumonias better delineated and interstitial disease further characterized. CT is far more sensitive at detecting adenopathy than CXR. SVC syndrome, aortic aneurysm, penetrating aortic ulcers, and dissections are well depicted. In addition, CT is very

valuable in the evaluation of the pulmonary vasculature of the chest.

In the workup of pulmonary embolism, CT pulmonary angiography (CTPA) is the gold standard. While ventilation perfusion scanning (VQ) is slightly cheaper, CTPA generally offers more diagnostic utility. CTPA has a nearly 100% positive predictive value. It also has a very high negative predictive value for significant PE (those which lead to increased morbidity and are clinically significant). It also depicts alternative diagnoses as causes of symptomatology. CTPA affords slightly less radiation dose than VQ and is generally recommended for pregnant patients if required. VQ still has a role as a portable study in the unstable patient or in patients with renal insufficiency.

In summary, chest x-ray is a great first imaging step, most of the time. It is inexpensive and often diagnostic. CT of the chest offers more specificity, better delineation and further characterization of abnormal findings. CTPA is accurate in the detection of pulmonary embolism. VQ still has a role in the unstable or renal-impaired patient.