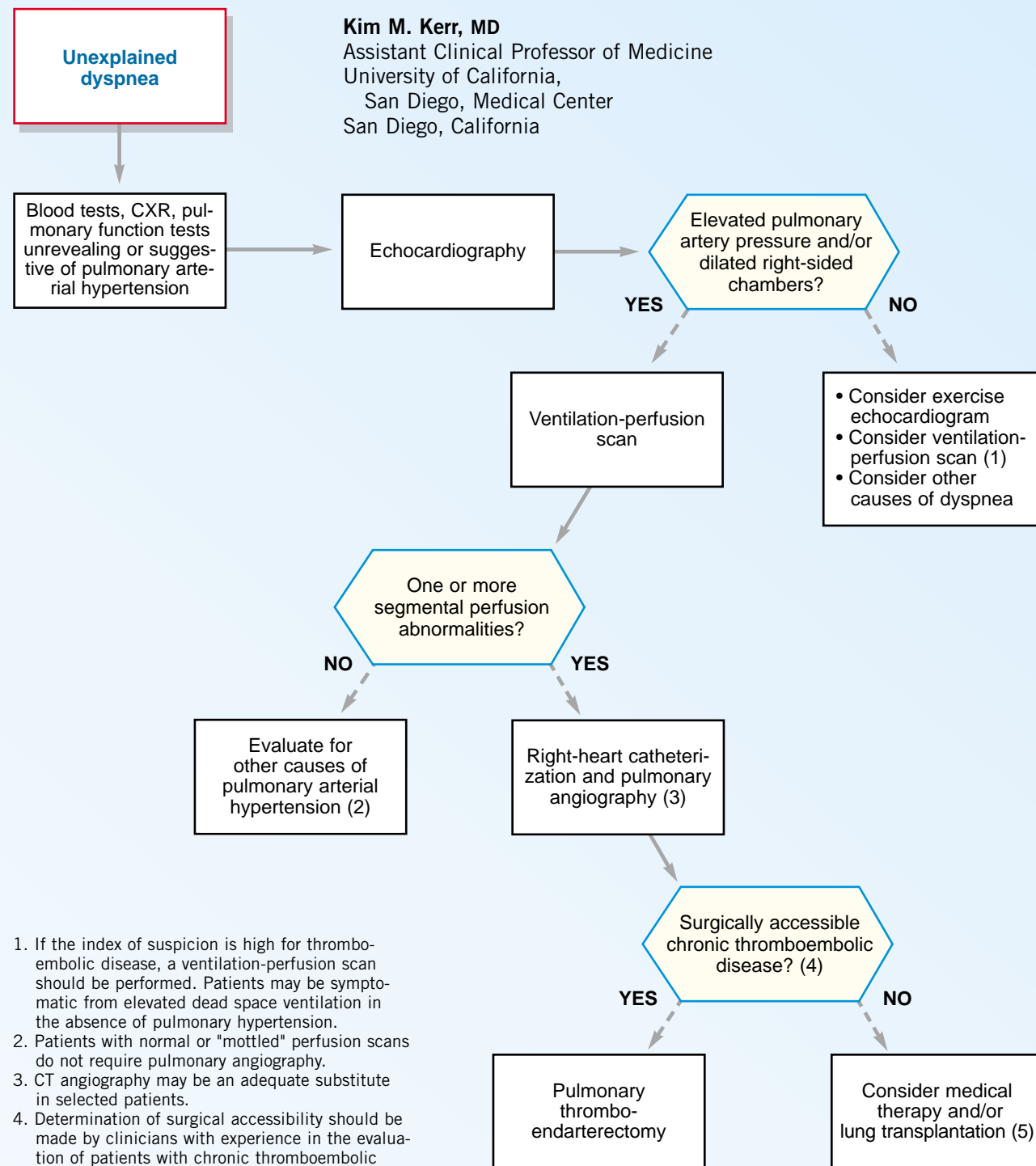


Clinical Algorithm

Evaluation of Chronic Thromboembolic Pulmonary Hypertension

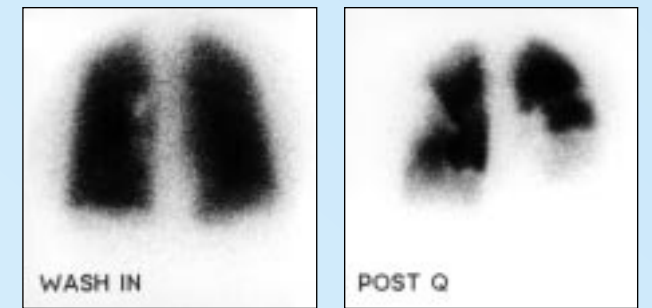
Kim M. Kerr, MD
 Assistant Clinical Professor of Medicine
 University of California,
 San Diego, Medical Center
 San Diego, California



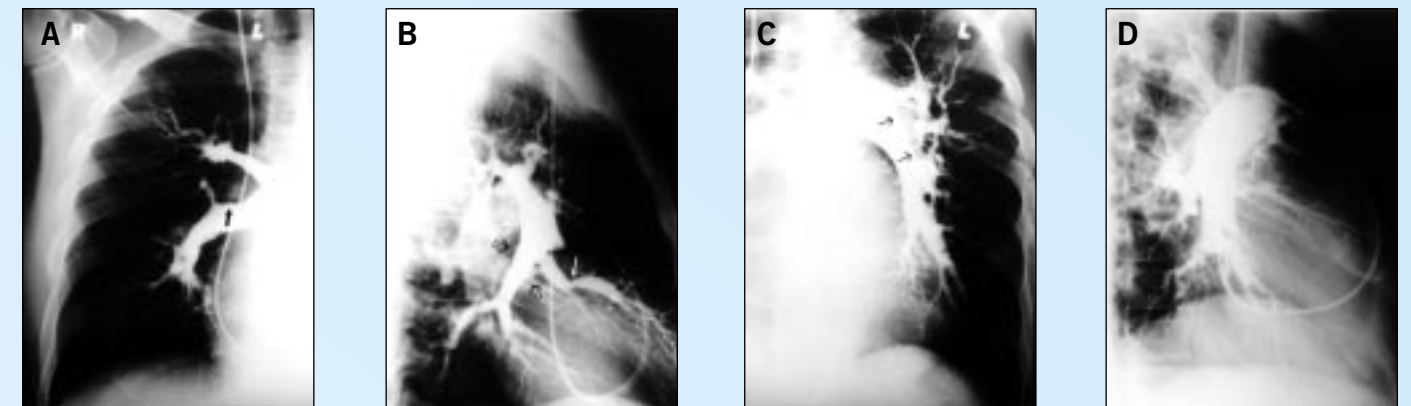
1. If the index of suspicion is high for thromboembolic disease, a ventilation-perfusion scan should be performed. Patients may be symptomatic from elevated dead space ventilation in the absence of pulmonary hypertension.
2. Patients with normal or "mottled" perfusion scans do not require pulmonary angiography.
3. CT angiography may be an adequate substitute in selected patients.
4. Determination of surgical accessibility should be made by clinicians with experience in the evaluation of patients with chronic thromboembolic disease.
5. Anticoagulation is indicated in all patients. Epoprostenol has been beneficial in some patients. The role of bosentan, treprostinil, and investigational agents has yet to be determined.

Evaluation of Patient With CTEPH

Fifty-six-year-old man with a history of recurrent DVT/pulmonary embolism starting 18 years prior to admission. The preoperative ventilation-perfusion scan demonstrated multiple unmatched perfusion defects. Right heart catheterization revealed pulmonary artery pressure of 82/35 (mean 54) mmHg with a cardiac output 4.5 L/min. Pulmonary angiography was consistent with surgically accessible chronic thromboembolic disease. Pulmonary thromboendarterectomy resulted in significant symptomatic and hemodynamic improvement; postoperative pulmonary artery pressure was 48/18 (mean 20) mmHg with a cardiac output of 6.8 L/minute.



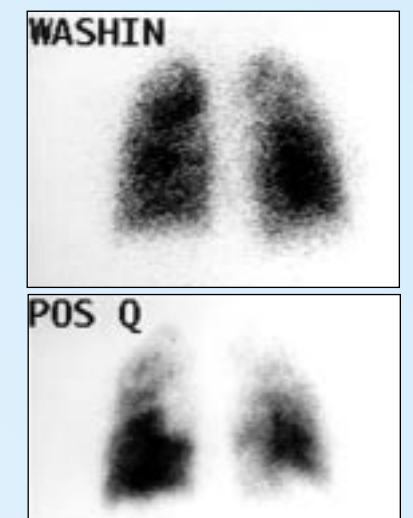
Preoperative ventilation-perfusion scan: the ventilation scan (left) is normal. The perfusion scan (right) demonstrates absence of perfusion to the right lower lobe and segmental defects in the right middle lobe, lingula, and left lower lobe.



Preoperative pulmonary angiogram: Note the intimal irregularities of the interlobar (solid black arrow) and descending pulmonary arteries on the the right anterior-posterior view (A). Occlusion of several segments of the right lower lobe at their origin (open black arrows) as well as a web in the right middle lobe (white arrow) are seen on the lateral view of the right lung (B). A large filling defect (black arrows) is present in the left descending pulmonary artery (C). Note how the anatomy is better defined on the right (B) and left (D) lateral views compared with the anterior posterior views (A, C).



Surgical specimen: A large amount of chronic thromboembolic material was removed from both the right and left lungs at the time of pulmonary thromboendarterectomy. The ruler is 15 cm in length.



Ventilation-perfusion scan obtained one week following surgery demonstrates significant improvement in perfusion to both lower lobes. Lung perfusion will continue to redistribute and become more homogenous during the year following surgery.