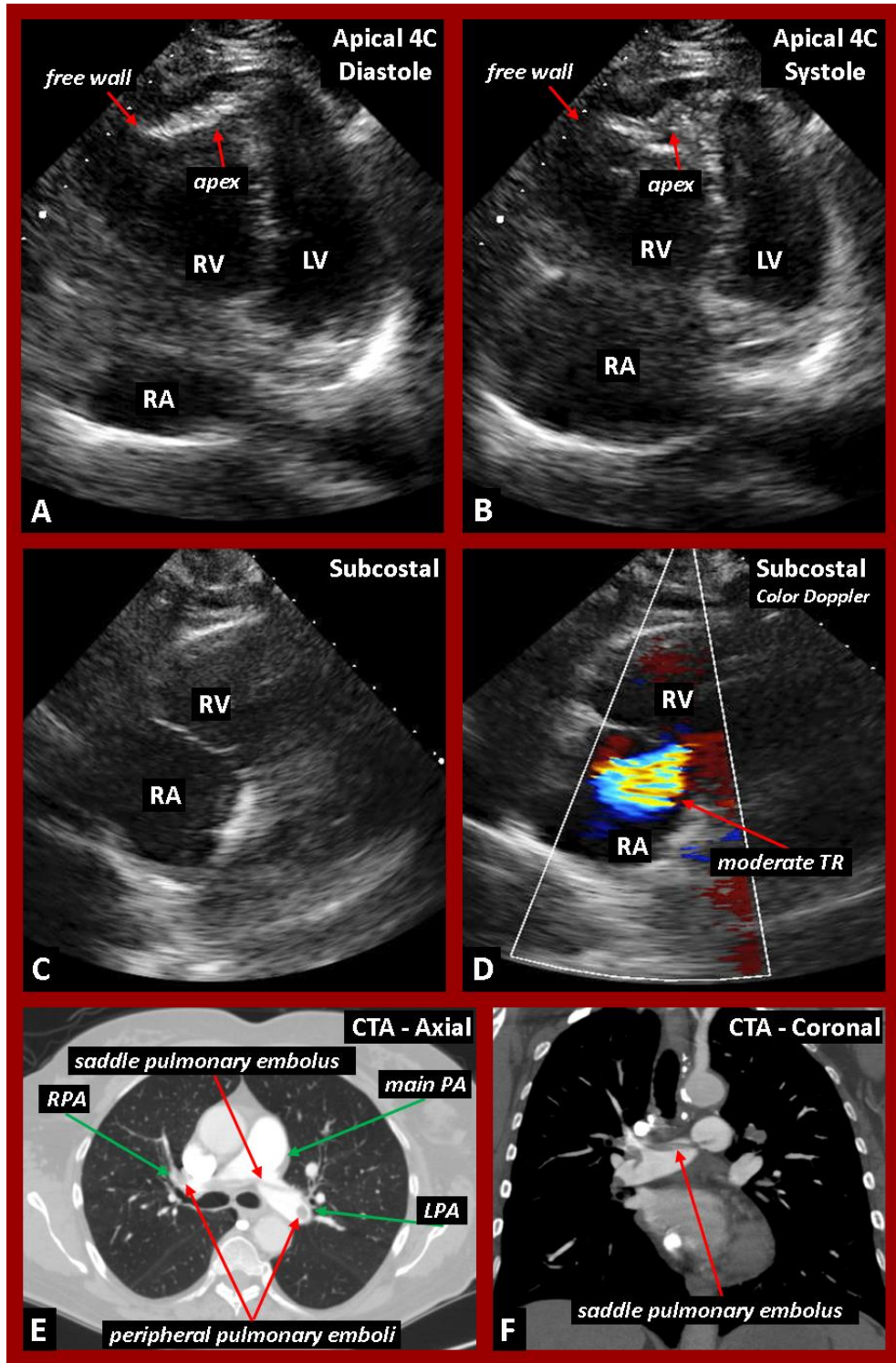


### McConnell's Sign.. *RV Strain in Acute Pulmonary Embolism!*

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## **Description**

The figure above shows 2-D echocardiographic images (A-D) and computed tomographic angiography (CTA) images (E & F) associated with massive pulmonary embolism. In Figure A, apical 4-chamber (4C) image in diastole reveals a massively dilated right ventricle (RV) and right atrium (RA) compared to a small, relatively underfilled left ventricle (LV). In Figure B, apical 4C image in systole reveals indentation of the RV apex indicative of normal to hyperdynamic function, while there is near akinesis of the RV free wall; this differential regional wall motion abnormality is a sign of acute RV strain consistent with McConnell's sign. In Figure C, 2-D subcostal image reveals dilatation of the right heart chambers and the tricuspid valve annulus; which causes moderate tricuspid regurgitation (TR) as seen in Figure D. The CT angiographic images in the Axial plane (Figure E) and the Coronal plane (Figure F) reveal a massive saddle pulmonary embolus, with peripheral emboli, as the cause of the observed RV strain and McConnell's sign.

## **Discussion**

Pulmonary embolism is a fatal disease which requires prompt diagnosis and treatment [1]. The presence and extent of right ventricular strain correlate with the severity of the pulmonary embolism and portend poorer prognosis; this should therefore be evaluated early to determine the need for rapid intervention [2].

McConnell's sign is a well-described echocardiographic finding associated with acute pulmonary embolism. It is defined as regional right ventricular dysfunction, with akinesis of the mid free wall but normal motion at the apex [3]. McConnell's sign identified on echocardiogram is a highly specific, although not very sensitive finding in acute pulmonary embolism. A meta-analysis of the use of transthoracic echocardiography in diagnosing pulmonary embolism found it to have a sensitivity of 22% and specificity of 97% [4]. Rarely, McConnell's sign may be seen in alternative etiologies including malignancy [5]. Echocardiography can

yield important prognostic information for high-risk patients who cannot otherwise be evaluated with contrasted chest tomography or pulmonary V/Q scan in a timely manner including but not limited to the following: renal dysfunction, pregnancy, allergy to intravenous contrast agents, and body habitus limitations [4].

Management of acute pulmonary embolism varies and often depends on the severity of the presentation [6]. Systemic thrombolytic agents have long been successfully used in the treatment of thromboembolism [7], with interventional and surgical approaches or hybrid techniques employed in severe cases associated with circulatory shock [8].

Echocardiography has evolved as a valuable tool to help in the diagnosis and assess the prognosis of pulmonary embolism, and to guide acute treatment and long term follow-up [9].

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**KEYWORDS:** Pulmonary Embolism; Echocardiography; Right Ventricular Strain

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