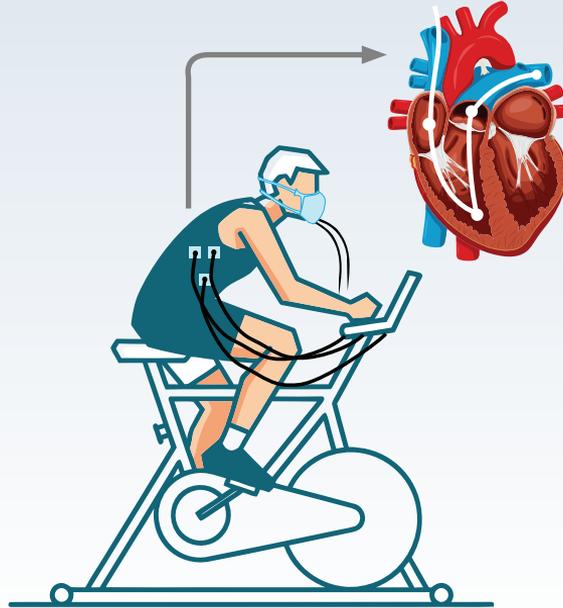# Noninvasive Markers to Uncover Exercise Pulmonary Hypertension in Patients With Chronic Thromboembolic Pulmonary Disease

STUDY DESIGN

- 92 patients with chronic thromboembolic pulmonary disease prospectively followed by performing cardiopulmonary exercise testing and exercise right heart catheterization with echocardiography

- Independent predictors of exercise pulmonary hypertension (PH) were identified

RESULTS

Patients with exercise PH had:

- Lower oxygen consumption, arterial saturation, and partial pressure of end-tidal CO_2 (PET_{CO_2}) at first ventilatory threshold (VT1)

- Higher tricuspid regurgitation peak velocity (TRPV) and lower tricuspid annular plane systolic excursion (TAPSE)/pulmonary arterial systolic pressure (PASP)

2 weighted risk scores were developed that identified patients at low vs high risk of exercise PH.

- Risk scores included age, PET_{CO_2} at VT1, and TRPV or peak TAPSE/PASP

This study suggests that in patients who are symptomatic with chronic thromboembolic pulmonary disease, there are noninvasive characteristics found in cardiopulmonary exercise testing and echocardiography that can help risk stratify evidence of exercise PH.