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**Title:** Peak oxygen consumption improves in inoperable, but not operable, chronic thromboembolic pulmonary hypertension after treatment with pulmonary arterial hypertension drugs

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**Body:** Background: The effect of therapies for pulmonary arterial hypertension (PAH) on the exercise capacity of patients with chronic thromboembolic pulmonary hypertension (CTEPH) is variable. Aims and objectives: We tested the hypothesis that patients with inoperable CTEPH (CTEPH-INOP) were more likely to respond well to PAH drugs, displaying a more PAH-like physiology, than those with operable CTEPH (CTEPH-OP), by using cardiopulmonary exercise testing (CPX). Methods: We analyzed CPX data of all patients diagnosed with CTEPH at a single PH centre between February 2009 and March 2013, who were treated with PAH drugs and had undergone at least two incremental CPX, one before and at least one after starting on treatment. Suitability for pulmonary endarterectomy (PEA) was decided by a multidisciplinary team at a PEA expert centre. Results: The CTEPH-INOP group included 14 and the CTEPH-OP 26 patients. There was no difference in demographics and baseline haemodynamics. Unlike CTEPH-OP, CTEPH-INOP had a significantly higher peak VO<sub>2</sub> (increased by 12 %, p=0.001) and workload (p=0.002) post-treatment. CTEPH-INOP increased their PaCO<sub>2</sub> (p=0.04), lactate (p=0.01) and oxygen pulse (p=0.05) post-treatment. Unlike CTEPH-OP, CTEPH-INOP increased respiratory exchange ratio (p=0.008) and displayed a trend towards lower heart rate reserve (p=0.09) post-treatment. Conclusions: 1. CTEPH-INOP are more likely to respond to PAH therapy than CTEPH-OP, 2. Following treatment, CTEPH-OP remained limited by ventilatory factors, unlike CTEPH-INOP in whom the better response to treatment seems to be related to amelioration of heart failure syndrome.