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**Title:** Cardiopulmonary exercise testing and critical care use after high risk elective surgery for patients with chronic obstructive pulmonary disease

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**Body:** Introduction Aintree University Hospital is a regional centre for hepatobiliary (HPB), upper and lower gastrointestinal (UGI, LGI) surgery serving a population with significant morbidity from chronic obstructive pulmonary disease (COPD). Cardiopulmonary exercise testing (CPET) informs peri-operative risk and elective critical care (ICU) use. Methods 142 sequential patients undergoing surgery were analysed to assess the prevalence of COPD, severity and use of critical care. Smoking history was not available. Results Seventy-eight patients had COPD (FEV1/FVC <0.7), 21 had moderate COPD, (FEV1 50-80% predicted), 3 had severe COPD (FEV1 <50% predicted). COPD subjects had lower anaerobic threshold (AT) (10.8 vs 11.8 ml/kg/min), peak VO<sub>2</sub>, O<sub>2</sub> pulse and higher VE/VCO<sub>2</sub>. Allcomers with COPD admitted to ICU had no difference in age, FEV1, AT (10.9 vs 10.6 ml/kg/min), or other CPET variables compared with those managed on surgical wards. HPB and UGI surgery is routinely admitted to ICU. Twenty patients with COPD underwent LGI surgery after which ICU is decided on an individual basis. Ten were admitted to ICU and 10 received ward care. Those admitted to ICU had non-significantly lower values for AT (10.3 vs 11.2 ml/kg/min) whilst FEV1 was no different. All were alive 6 months after surgery. Conclusions The prevalence of significant COPD was lower than expected. All surgical candidates undergo multidisciplinary assessment. It is unlikely patients are excluded from surgery due to a diagnosis of COPD alone. ICU use is mainly based on type of surgery performed. As no post-operative care unit exists distinct from ICU it is felt an effective use of resources.