

Graphical Abstract

Derangements in tissue oxygenation (O₂ delivery) and local metabolic capacity (O₂ utilisation) limit the 'rate change' of oxygen uptake (VO₂) during onset and recovery from submaximal exercise (**red arrows, panel A**). Respiratory gas analysis can objectively reveal patients with prolonged VO₂ kinetics (**red line, panel B**), adapted from Kemps *et al.*¹¹ Before CRT, a prolonged duration to increase VO₂ to peak levels and normalise to baseline levels (τ VO₂ onset and recovery, respectively) are associated with non-response to CRT (**panel C**). Legend: CRT, cardiac resynchronization therapy; LVESV, left ventricular end-systolic volume.

