An inpatient lifestyle-change programme improves heart rate recovery in overweight and obese children and adolescents (LOGIC Trial).

Abstract:
Impaired heart rate recovery (HRR) is a strong predictor of overall mortality and cardio-metabolic risk. This study aimed at investigating (1) the effect of participation in a lifestyle-change programme for weight loss on HRR in overweight and obese children and (2) potential associations between the changes in one minute HRR (HRR1) and fitness, weight loss and cardio-metabolic risk. The analysis included 429 individuals (169 boys) aged 13.9 ± 2.3 years who participated in an inpatient weight loss programme for four to six weeks. At baseline and the end of the programme clinical investigations were performed, including blood analyses, blood pressure, anthropometry and maximal cycle ergometer exercise testing with continuous heart rate (HR) monitoring. HRR was calculated as the difference between the highest exercising HR and HR at one, three and five minutes post-exercise. Average body weight decreased from 90.7 ± 22.5 kg to 81.9 ± 20.0 kg and peak exercise capacity increased from 1.66 ± 0.38 W/kg to 2.05 ± 0.45 W/kg (p< 0.001).
Cardio-metabolic risk factors improved (waist circumference, LDL-cholesterol, HOMA insulin ratio, blood pressure; p< 0.05). HDL-cholesterol and triglyceride levels remained unchanged. Compared with baseline, at follow-up the decline in HR was more pronounced (+32%, +18% and +11% for HRR1, HRR3 and HRR5; p<
Improvements in HRR1 were weakly correlated with changes in exercise capacity (p< 0.05; r< 0.13), but not with changes in body weight and cardio-metabolic risk factors. HRR considerably improved after an inpatient weight loss programme in overweight and obese children. This was not associated with improvements in body weight and cardio-metabolic risk; hence HRR would be a valuable addition to cardiovascular risk assessment in this group.