**Does exercise training improve cardio-pulmonary fitness and daily physical activity in children and young adults with corrected tetralogy of Fallot or Fontan circulation?**

**A randomized controlled trial.**

**CONCLUSION:**
Aerobic exercise training improved cardio-pulmonary fitness in patients with tetralogy of Fallot but not in patients with a Fontan circulation.

Exercise training did not significantly change daily physical activity.

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**Background:**
Current public-health guidelines suggest >60 minutes of moderate-to-vigorous daily physical activity for adolescents. Many adolescents with congenital heart disease do not meet these guidelines. We hypothesized that exercise training would increase cardio-pulmonary fitness and daily physical activity.

**Objective:**
To assess if aerobic exercise training

- improves exercise capacity
- improves daily physical activity

**Methods:**
- Multicentre randomized controlled trial
- Patients: Corrected tetralogy of Fallot (ToF) Fontan circulation (Fontan) age range 10-25 years Tests before (V1) and after (V2) 12 weeks: cardiopulmonary exercise tests Activity measurements by accelerometer MRI (stroke volume: rest / low-dose dobutamine stress) Intervention group: supervised aerobic exercise training 3 one-hour sessions per week 60-70% of heart rate reserve Control group did not change their lifestyle

**Results:**
- Total participants 93; drop-out 3 (exercise-group)
  - Exercise n = 53; male 40; age 15 ± 3 years
  - Control n = 37; male 26; age 16 ± 3 years
  - ToF n = 47 (27 exercise; n = 20 control)
  - Fontan n = 43 (26 exercise; n = 17 control)
- Daily activity results: no change in either group
  - Exercise capacity:
    - ToF change in peakVO2 and peak load
    - Fontan no change in peakVO2 and peak load
  - Stroke volume:
    - ToF change rest to stress; Fontan no change

**Discussion:**
- Fontan patients did not increase cardio-pulmonary fitness
  - At baseline relative high peakVO2
  - Stroke volume did not increase with (stimulated) stress
  
  Speculation: unchanged stroke volume with stress, resulting in inability to increase cardiac output, which reduces the potential to increase peakVO2 and thus cardio-pulmonary fitness.