## Supplemental Table 1: Search terms

<table>
<thead>
<tr>
<th>Quality of life</th>
<th>OR</th>
</tr>
</thead>
<tbody>
<tr>
<td>EuroQoL-5 Dimensions-5 Levels (EQ-5D-5L)</td>
<td>OR</td>
</tr>
<tr>
<td>Minnesota Living with Heart Failure (MLHF)</td>
<td>OR</td>
</tr>
<tr>
<td>Kansas City Cardiomyopathy Questionnaire (KCCQ)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Exercise</th>
<th>OR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Six minute walk test</td>
<td>OR</td>
</tr>
<tr>
<td>Six-minute walk test</td>
<td>OR</td>
</tr>
<tr>
<td>Peak oxygen uptake</td>
<td>OR</td>
</tr>
<tr>
<td>Exercise capacity</td>
<td>OR</td>
</tr>
<tr>
<td>Peak oxygen consumption</td>
<td>OR</td>
</tr>
<tr>
<td>Exercise training</td>
<td>OR</td>
</tr>
<tr>
<td>Cardiac rehabilitation</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Ventricular assist device</th>
<th>OR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Continuous-flow Left ventricular assist device</td>
<td></td>
</tr>
</tbody>
</table>
### Supplemental table 2: Predictors table

#### QOL (with or without FC)

<table>
<thead>
<tr>
<th>Study</th>
<th>QOL:</th>
<th>FC:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hayes et al. 2012</td>
<td>Exercise intervention did not cause a greater increase in QOL.</td>
<td>Exercise intervention did not cause a greater increase in FC.</td>
</tr>
<tr>
<td>Kerrigan et al. 2013</td>
<td>QOL: 1. VO2 values correlated with KCCQ clin summary score (P=0.045).</td>
<td>No predictors found (6MWT did not predict VO2).</td>
</tr>
<tr>
<td></td>
<td>2. Muscular strengths (torque, peak) associated with KCCQ (P=0.019).</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Of note: 6MWT, LVEF, age: P&gt;5%.</td>
<td></td>
</tr>
<tr>
<td>Jakovljevic et al. 2014</td>
<td>QOL: NA but recommended: strategies targeting low levels of physical activity should now be explored to improve recovery of LVADs.</td>
<td></td>
</tr>
<tr>
<td>Kerrigan et al. 2014</td>
<td>QOL: Changes in the KCCQ score associated with changes in the treadmill time (P=0.047).</td>
<td>VO2-change was associated with change in 6MWD (p=0.03), ventilatory-derived anaerobic threshold (P&lt;0.001)</td>
</tr>
</tbody>
</table>
and treadmill time (P<0.001).

Modica et al. 2015  QOL predicted by:
1. Characteristics of device
2. Experience of disease during wait for HTX
3. Nature of device
4. Quality of doctor-patient communication
5. Possibility of experience sharing between implanted patients
6. Psychological character of recipient.

FC: NA

Kiernan et al. 2016  QOL: Nonresponse associated with:
1. History of diabetes
2. Lower mean Pulmonary Artery Pressure
3. HMII Right Ventricular Risk Score>2.

FC: Nonresponse associated with:
1. History of Chronic Obstructive Pulmonary Disease
2. History of diabetes

Jung et al. 2016  QOL: See below
CFR 2020-15R1

**FC:**
1. ProBNP not associated with pVO2
2. Lower QOL correlated with increasing proBNP
3. Increasing pVO2 and duration of work were associated with better QOL (MLWHF-P), p<5%.

Cowger et al 2018

Higher preoperative hemoglobin
Younger age
Better baseline QOL and functional capacity

**FC only**

Dimopoulos et al. 2011
- Chronotropic incompetence

Jakovljevic et al. 2011
- Weak positive association between peak cardiac power output and pVO₂ (P<0.05).

Jacquet et al. 2011
1. Spontaneous increase of pump flow (at constant pump speed)
2. Increase of the native cardiac output contribute to total flow elevation.

Hasin et al. 2012
1. Diabetes mellitus (P=0.003)
2. Elevated 1-month right atrial pressure (p=0.003)

Noor et al 2012
- LVEF (P=0.03).

Karapolat et al. 2013
- QOL: Improvement in exercise capacity.
FC: Eight weeks of supervised CR increased pVO$_2$ from BL to FU: P<0.05.

Grosman-Rimon et al. 2013

Chronotropic incompetence (HR<80%).

Study also suggests that exercise capacity in cf-LVADs may be associated with inflammation.

Martina et al. 2013

FC: Lower VO$_2$ for age>50 than for age<50 years: 14.5 ± 3.0 vs 20.0 ± 6.7 ml/kg/min, P<0.01.

Trends: increased blood pressure rise in men during exercise than in women: MAP 102 ± 15 vs 88 ± 12 mmHg, P<0.01.

Camboni et al. 2014

Study suggests: An open aortic valve strategy leads to impaired exercise capacity and haemodynamics.

Imamura et al. 2015

Native aortic valve (AV) opening during exercise at 3 months (although native AV closed during rest) associated with better exercise tolerability compared to patients with closed AV during exercise.

Imamura et al. 2015

Better pVO$_2$ at 3 months association with:

1. Lower readmission rates
2. Persistently normal preoperative serum albumin association with lowest preoperative CRP and better VO$_2$
3. Persistently-low perioperative s-albumin associated with highest CRP and worse exercise tolerance at 3 months.

Marko et al. 2015

Exercise training for LVAD patient as part of a multidisciplinary rehabilitation program is effective and safe.
Kerrigan et al. 2016  %HRR in non-paced LVADs was a good predictor of %VO₂Reserve.

Jung et al. 2017  Pump speed +800 rpm

Fresiello et al. 2016  1. Pump speed +200 rpm (NS)
2. Suggestion: VAD power may be a useful parameter to monitor patients during exercise.

Vignati et al. 2017  Increased pump speed leading to increased CO and increased pVO₂.

Marko et al. 2017  1. Cardiac rehabilitation program (starting 39 ± 18 days after LVAD implantation) improved 6MWD and pVO₂.

Lim et al. 2017  1. Heart rate response during exercise
2. Reduction in right atrial pressure in the first 6 months post-implant.

Lairez et al. 2018  RVEF<40% was associated with lower exercise capacity.

Apostolo et al. 2018  Short term speed increase from 2 to 3 increased VO₂ during constant workload.

Schmidt et al. 2018  1. Age
2. Haemoglobin
3. Low baseline walking distance led to longer cardiac rehabilitation.
4. Lower baseline walking distance led to greater increase (greater delta walking distance)
5. Peak-watt correlated with peak VO₂.

Mezzani et al. 2018  Explanatory: LVAD exercise gas exchange is characterised by alveolar wasted ventilation, i.e. hypoperfusion of ventilated alveoli, similar to that of advanced HFrEF patients and related to surrogates of right ventriculo-arterial coupling and circulating effective volume.
Rosenbaum et al. 2018
1. HMII PI: R=0.48, P=0.003
2. HMII power: R=-0.4, P=0.009
3. HMII pump flow: R=-0.4, P=0.008
4. Pump speed: R=-0.32, P=0.04
5. Peak-HR: R=0.41, P=0.004
Not positive: LVEF, ΔLVEDD, RV function (R=0.22, P=0.28), PAPi, RVSWI, AV opening (P=0.57), septal positioning, AI, MI, RHC, medications at time of CPET, (data not shown).

Racca et al. 2018
1. 6MWTD increment associated with baseline CRP and Albumin.
2. Suggestion: 6MWTD increment may be associated with severely reduced levels of IGF-I (P>5%).

Cowger et al. 2018
1. Patients with severe adverse events showed less improvements in 6MWTD than those without severe adverse events.

Schmidt et al. 2019
1. Negative linear correlation between weight gain post implantation (P < 0.05).

Gross et al. 2019
1. Peak workload (P=0.0002)
2. Chronotropic response (P=0.001)
3. Aortic valve opening (P=0.02)
4. Age (P=0.006).

Koshy et al. 2019
VAD group only: Resting pulmonary arterial wedge and pulmonary arterial mean pressures were independently related to pVO₂ (both P < 0.05).
Chronotropic incompetence was associated with lower exercise capacity (pVO$_2$).

1. Atrial fibrillation
2. Age
3. New York Heart Association IV
4. INTERMACS profile 1–2.

RVEF did not predict VO$_2$. 

6MWT: 6-minute walk test
6MWTD/6MWD: 6-minute walk test distance
LVEF: Left ventricular ejection fraction
RVEF: Right ventricular ejection fraction
VAD: Ventricular assist device
CR: Cardiac rehabilitation