PURPOSE: To estimate acceleration values corresponding to light and moderate to vigorous intensity physical activity (PA) in people with heart failure via calibration with oxygen consumption (VO2).

METHODS: 21 adults with heart failure undertook a range of typical lifestyle activities (including laying down, and walking at different speeds) whilst wearing three accelerometers (each wrist and the left hip) and a portable gas analyser. Resting metabolic rate (RMR) was established and participants also undertook an incremental shuttle walk test (ISWT) to estimate fitness. Location specific activity intensity thresholds were established via Receiver Operator Characteristic (ROC) curve analysis.

RESULTS: Participants had an average age of 71.1±14.3 years, the majority were male (24% female) and average BMI was 28.2±4.4 kg/m². Average distance walked during the ISWT was 279±192 m, and average RMR was 0.76±0.19 METS. The measured metabolic cost of slow paced walking (average pace 2.6 kph) was 4.09±1.08 METS - higher than estimates based on standard methods i.e. VO2/3.5 ml/kg/min (3.0±0.63 METS) or the Compendium of PA (2.0 METS). Similarly, moderate paced walking (average pace 3.5 kph) averaged 4.65±1.08 METS using measured RMR compared to 3.4±0.7 METS via the standard methods and 2.8 METS via the Compendium. ROC curve analysis was used to estimate acceleration values corresponding to light and moderate to vigorous intensity PA.

CONCLUSIONS: Using single accelerometer values for estimating PA intensity assumes energy expenditure is the same for specific activities irrespective of fitness level, which risks underestimating the PA levels for low fit populations such as people with heart failure. It may also risk prescribing PA intensities that are too high for this population. Results of this study indicate that the measured metabolic cost of activities such as walking at a light pace are much higher than estimated METs reported in the PA compendium. Population specific accelerometer thresholds for estimating light and moderate to vigorous intensity PA will permit more precise measures of the prevalence of PA in people with heart failure.

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PURPOSE: To study the effect of a comprehensive lifestyle intervention (nutrition, physical activity, pharmacy, and behavioral counseling) on health related outcomes in 42 stage 3 & 4 (eGFRs 15-59 ml/min/1.73m²) CKD patients (age 60.2±9.2, BMI 34.5±7.8).

METHODS: Patients were assigned randomly to a treatment (T, n=27) or usual care (UC, n=15) group, and asked to attend four test sessions: baseline (BL), month 1 (M1), month 3 (M3) and month 6 (M6). Anthropometrics, medication use, three day nutritional intake, central (cSBP/cDBP) & brachial blood pressures (bSBP/bDBP), augmentation index (AIx@75), Short Physical Performance Battery (SPPB) test, the six-minute walk test (6MWT), leg strength & power, self-efficacy to adhere to diet and physical activity (PA) recommendations, and the KDQOL were assessed at each visit. PA levels and inflammatory markers (IL-6 & hsCRP) were assessed at BL and M6. Patients in T received individual counseling at BL, M1, & M3 with biweekly follow-up phone contact. Patients in UC were asked to follow the instructions of their nephrologist.

RESULTS: All data are presented as means ± SD. Primary outcome variables were analyzed by 2 x 2 mixed factor ANOVAs. See table for some of the findings:

<table>
<thead>
<tr>
<th>Variable</th>
<th>BL T</th>
<th>M3 T</th>
<th>M6 T</th>
<th>UC T</th>
<th>UC UC</th>
</tr>
</thead>
<tbody>
<tr>
<td>bSBP mm Hg T, n=22, UC n=13</td>
<td>137.4±14.3</td>
<td>116.2±2.6</td>
<td>102.1±4.4</td>
<td>98.2±13.9</td>
<td>*88.9±14.1</td>
</tr>
<tr>
<td>cSBP mm Hg T, n=22, UC n=13</td>
<td>87.9±10.1</td>
<td>77.7±9.7</td>
<td>92.3±2.3</td>
<td>84.2±17.3</td>
<td>*91.5±14.6</td>
</tr>
<tr>
<td>cDBP mm Hg T, n=22, UC n=13</td>
<td>84.2±17.3</td>
<td>84.2±17.3</td>
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</tr>
</tbody>
</table>

CONCLUSION: In conclusion, this program led to reductions in bSBP, cSBP and cDBP at M3 which were attenuated at M6. Patients in T felt less restricted by their disease than the UC group. This home-based program resulted in no improvements in functional outcomes (SPPB or 6MWT). Supervised, in-center programs are preferred when working with CKD patients.