**Supplementary Information**

Table S1: Branched model results to estimate EE

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| **Branch model** | **1-min prediction model, kcal/min** | **RMSE kcal (%)** |
| Sit | EE = 1.92 +0.015∙***Weight*** – 0.61∙***log(BMI)*** +1.52∙10-3∙***Sensmed(zc)*** +0.59∙ ***Acc2zc***+2.05∙10-3∙***Acc1std*** +0.50∙***Acc1zc*** – 5.33∙10-4∙***Acc2std*** | 45.8 (1.4) |
| Stand | EE = 3.23+2.64∙10-2∙ ***Weight ­***– 1.38∙ ***log(BMI)*** +1.69∙10-3∙ ***Sensmed(zc)***+ 4.29∙10-3∙ ***Acc1std*** +1.83∙ ***Acc1zc*** | 68.7 (8.1) |
| Walk | EE = –2.46 + 7.21∙10-2∙***Weight*** – 0.72∙***log(BMI)*** + 41.9∙ ***Sensmed(std)***  + 10.5∙ ***Acc3zc***+ 2.08∙10-3∙ ***Acc2std*** | 76.9 (2.5) |
| Cycle | EE = 5.47 + 2.13∙10-2∙***Weight*** – 1.54∙***log(BMI)*** + 36.7∙ ***Sensmed(std)***+3.92∙ ***Acc2zc*** | 71.8 (8.8) |
| Average |  | **29.6 (6.2)** |

Metrics: ***zc*** – number of zero crossings; ***std*** – standard deviation of a signal: ***med(metric)*** is the median metric from all pressure sensors (1 value).