**Supplementary Digital Content 1.** LOOCV performance when single sensors are used

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|  |  |  | **Sitting** | **Lying** | **Standing** | **Slow walk** | **Fast walk** | **Run** |
| Thigh Sensor | Adult | Sensitivity | 93.6 | 64.1 | 99.5 | 99.0 | 99.6 | 100 |
| Specificity | 86.5 | 96.5 | 99.8 | 99.9 | 100 | 100 |
| Balanced accuracy | 90.0 | 80.3 | 99.6 | 99.5 | 99.8 | 100 |
| Child | Sensitivity | 90.0 | 62.0 | 99.1 | 95.1 | 92.2 | 95.7 |
| Specificity | 85.5 | 94.4 | 99.7 | 99.5 | 99.6 | 100 |
| Balanced accuracy | 87.8 | 78.2 | 99.4 | 97.3 | 95.9 | 97.8 |
| Back Sensor | Adult | Sensitivity | 84.0 | 99.6 | 61.5 | 92.8 | 97.3 | 100 |
| Specificity | 86.8 | 98.7 | 92.3 | 99.8 | 99.6 | 100 |
| Balanced accuracy | 85.4 | 99.1 | 76.9 | 96.3 | 98.4 | 100 |
| Child | Sensitivity | 84.7 | 91.6 | 52.4 | 90.5 | 91.4 | 97.8 |
| Specificity | 80.7 | 97.6 | 93.3 | 99.6 | 99.5 | 99.8 |
| Balanced accuracy | 82.7 | 94.6 | 72.9 | 95.0 | 95.5 | 98.8 |

Note: Sensitivity, specificity and balanced accuracy are presented as a percentage (%).