**Jones GD, James DC, Thacker M, Perry R, Green DA.** Gait-Initiation Onset Estimation During Sit-to-Walk: Recommended Methods Suitable for Healthy Individuals and Ambulatory Community-Dwelling Stroke Survivors**. PLOSOne**

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File Description

Data from: Gait-Initiation Onset Estimation During Sit-to-Walk: Recommended Methods Suitable for Healthy Individuals and Ambulatory Community-Dwelling Stroke Survivors

Tab 1: All Data

These data consist of measured variables derived from Visual 3D software (C-Motion Inc., Germantown, USA) for all trials undertaken by 20 stroke subjects and 21 gender and age-matched healthy subjects performing 2 tasks (sit-to-walk [STW] and sit-to-stand [STS]) 5 times. Subjects began walking with their affected lower extremity (stroke group) or their non-dominant lower extremity (NonDom; healthy group). Column header abbreviations listed below.

Tab 2: All Data Healthy

These data consist of measured variables derived from Visual 3D software (C-Motion Inc., Germantown, USA) for all trials undertaken by 21 gender and age-matched healthy subjects performing 2 tasks (sit-to-walk [STW] and sit-to-stand [STS]) 5 times. Subjects began walking with their non-dominant lower extremity. Column header abbreviations listed below.

Tab 3: All Data Stroke

These data consist of measured variables derived from Visual 3D software (C-Motion Inc., Germantown, USA) for all trials undertaken by 20 stroke subjects performing 2 tasks (sit-to-walk [STW] and sit-to-stand [STS]) 5 times. Subjects began walking with their affected lower extremity. Column header abbreviations listed below.

Tab 4: Subject Characteristics

These data consist of anonymised subject characteristics.

AMT – Abbreviated Mental Test Score [1]

NEALDS – Nottingham Extended Activities of Daily Living Scale [2]

Rivermead - Rivermead Mobility Index [3]

Temporal Variable Abbreviations

|  |  |  |
| --- | --- | --- |
| **Variable** | **Descriptor** | **Details** |
| T0 | Light On | Instance of light-on |
| T1 | Trunk Movt Onset | Instance of whole-body-centre-of-mass (BCoM) velocity breaching resting threshold |
| T2 | BCoM Max Horiz Vel | Instance of whole-body-centre-of-mass (BCoM) peak horizontal velocity |
| T3 | Seat\_Off | Instance of seat-off |
| T4 | Sum\_GRFmax | Instance of peak vertical ground reaction force (GRF) |
| T5 | BCoM Max Vert Vel | Instance of whole-body-centre-of-mass (BCoM) peak vertical velocity |
| T6 | Upright | Instance of first time whole-body-centre-of-mass (BCoM) reaches upright at peak vertical displacement |
| T7a | xGRFthresh | GI-Onset estimation method 1:  Instance when summated force plates mediolateral (x-component, away from swing limb) GRF signal (%BW) breaches the group xGRF Threshold |
| T7b | maxSWINGvGRF | GI-Onset estimation method 2:  Instance of maximum in swing limb force plate vertical (z-component) GRF signal (N) occurring between Movement-Onset and 1st Heel-Off events |
| T7c | xGRFmax | GI-Onset estimation method 3:  Instance of local maximum summated mediolateral (x-component, toward the stance limb) GRF signal (N) occurring between Movement-Onset and 1st Heel-Off event |
| T7d | firstHEELoff | GI-Onset estimation method 4:  Instance when swing limb calcaneal marker vertical velocity signal (m.s-1) breaches >0.0 for ≥8frames (133ms) after Seat-Off event |
| T7x | xGRFthresh\_Individual | Alternative GI-Onset estimation method 1:  Instance when summated force plates mediolateral (x-component, away from swing limb) GRF signal (%BW) breaches the individual xGRF Threshold |
| T7y | Max\_Sum\_vGRF | Alternative GI-Onset estimation method 2:  Instance of local maximum summated vertical (z-component) GRF signal (N) occurring between Movement-Onset and 1st Heel-Off event |
| T7z | FIRSTtoeOFF (Unload) | Alternative GI-Onset estimation method 3:  Instance when swing limb vertical (z-component) GRF signal (N) <20N for ≥8frames (133ms) after Seat-Off event |

Other Abbreviations Used

| **Column(s)** | **Abbreviation** | **Details** | **Units** |
| --- | --- | --- | --- |
| W | SumxGRFmax\_MovOnset-Upright\_%BW | The maximum mediolateral GRF (xGRF) derived from the sum of the two force plates recorded between the movement-onset and Upright movement events as a percentage of body-weight (BW) in Newtons  Used for calculating the individual and group xGRF thresholds | (%BW) |
| X | SumxGRFmax\_MovOnset-HO1\_%BW | The maximum mediolateral GRF (xGRF) derived from the sum of the two force plates recorded between the movement-onset and first heel-off (HO1) movement events as a percentage of body-weight (BW) in Newtons  Used for calculating GI-onset using the xGRFmax method | (%BW) |
| Y | xGRFthresh\_Threshold\_Ind | The threshold value used for calculating GI-onset using the xGRFthresh\_Individual method | (N) |
| Z | xGRFthresh\_Threshold\_Group | The threshold value used for calculating GI-onset using the xGRFthresh method | (N) |
| AA | TransTime\_xGRFthresh | Transition time using GI-onset estimation method 1 (xGRFthresh) | (s) |
| AB | TransTime\_ maxSWINGvGRF | Transition time using GI-onset estimation method 2 (maxSWINGvGRF) | (s) |
| AC | TransTime\_ xGRFmax | Transition time using GI-onset estimation method 3 (xGRFmax) | (s) |
| AD | TransTime\_ firstHEELoff | Transition time using GI-onset estimation method 4 (firstHEELoff) | (s) |
| AE | Time\_FlexMom | Time between Movement-Onset and Seat-off (Flexion momentum phase time ) | (s) |
| AF | Time\_MovtOnset to S3 | Time between Movement-Onset and 3rd heel-contact (Step 3) | (s) |
| AG | Time\_Response | Time between Light-on and Movement-Onset (Response phase time) | (s) |
| AH | Time\_RisePhase | Time between Movement-Onset and Upright (Rise phase time) | (s) |
| AI | Max\_BCoM\_Mom\_Lat | Maximal whole-body-centre-of-mass (BCoM) momentum, mediolateral component (absolute value) during rising | (kg.m/s) |
| AJ | Max\_BCoM\_Mom\_Horiz | Maximal whole-body-centre-of-mass (BCoM) momentum, horizontal component (forward) during rising | (kg.m/s) |
| AK | Max\_BCoM\_Mom\_Vert | Maximal whole-body-centre-of-mass (BCoM) momentum, vertical component (absolute value) during rising | (kg.m/s) |
| AL  AM  AN | Max\_CoP\_xCoM dist\_S3  Max\_CoP\_xCoM dist\_S2  Max\_CoP\_xCoM dist\_S1 | Maximal horizontal distance between the centre-of-pressure (CoP) and the extrapolated-centre-of-mass (xCoM) during the 3rd step (S3), 2nd step (S2), and the 1st step (S1) | (m) |
| AO  AP  AQ | CoP\_xCoM\_Dist\_SeatOff  CoP\_xCoM\_Dist\_TO1  CoP\_xCoM\_Dist\_Upright | The horizontal distance between the centre-of-pressure (CoP) and the extrapolated-centre-of-mass (xCoM) at Seat-Off, 1st Toe-Off (TO1), and Upright | (m) |
| AR  AS  AT  AU | S0\_StepWidth  S1\_StepWidth  S2\_StepWidth  S3\_StepWidth | Step width (mediolateral distance between left and right calcaneal marker) at 1st Heel-Off (S0), 1st Initial-Contact (S1), 2nd Initial-Contact (S2), 3rd Initial-Contact (S3) | (m) |
| AV  AW  AX | S1\_StepLength  S2\_StepLength  S3\_StepLength | Step length (anteroposterior distance between left and right calcaneal marker) at 1st Initial-Contact (S1), 2ndt Initial-Contact (S2), 3rd Initial-Contact (S3) | (m) |
| AY  AZ  BA | S1\_Velocity  S2\_Velocity  S3\_Velocity | Average whole-body-centre-of-mass (BCoM) velocity in anterioposterior direction (forward) during step 1 (S1; 1st Heel-Off to 1st Initial Contact), step 2 (S2; 1st Initial Contact to 2nd Initial Contact), step 3 (S3; 2nd Initial Contact to 3rd Initial Contact) | (m/s) |
| BB | S1-3\_Velocity | Average whole-body-centre-of-mass (BCoM) velocity in anterioposterior direction (forward) during steps 1 through 3 (1st Heel-Off to 3rd Initial Contact) | (m/s) |

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