Supplement S1: Accelerometer Data Processing Information and Rationale

Accelerometer Considerations	Decision	Rationale
Wear location	Non-dominant wrist (Fairclough et al., 2016)	Improved compliance, improved data capture of all 24-h MB, no evidence to suggest dominant or non-dominant wrist is more accurate
Activity cut-points	*Hildebrand (2014, 2017)* cut points based on the ENMO (mg per 1s).	Frequently utilised in 24-h MB adolescent studies, aligns with the research shift in utilising raw device-agnostic data.
Sleep algorithms	*van Hees (2015)* heuristic sleep algorithm based on changes in the arm (angle z)	Sleep-wake detection without sleep diaries aids compliance issues in adolescents, aligns with the research shift in utilising raw device-agnostic data.
Non-wear time	*van Hees (2013)* non-wear algorithm based on the standard deviation and range of each axis.	Frequently utilised in 24-h MB adolescent studies, outperforms epoch-based algorithm to detect non-wear time, aligns with the research shift in utilising raw device-agnostic data.
Valid day	≥10 hours/day (≥600 minutes/day)	Frequently utilised in 24-h MB adolescent studies.
Valid week	≥4 days valid week including ≥3 valid weekdays and ≥1 valid weekend day (Fairclough et al., 2023)	More representative of typical weekly behaviours which can

		vary substantially on weekdays and weekends.
Sampling frequency	80Hz	High frequency that also accommodates for device battery life for 2-weeks of 24-hour wear.
Epoch length	Not Applicable	Not strictly required for raw acceleration metrics such as ENMO; a 1-second epoch is commonly applied to align with Hildebrand cut-points.
Axis analysed	Three	Required to compute the ENMO metric $(x^2 + y^2 + z^2)^{½} – 1)$

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