*Appendix 3: Explanatory notes on interpreting changes in an individual’s velocity-based testing data using confidence intervals, thresholds of practical importance and statistical tests.*

**Assumptions**

* Test outcome measure should generally be interval or ratio level data (i.e. continuous). This is the case for mean concentric velocity and power, for example.
* The within-athlete standard error should be approximately equal across all timepoints of comparison.
* The distribution of observed performance and change in performance between two time points should be approximately normal.

**Defining and calculating parameters**

* If performing a short-term test-retest study to estimate the within-athlete standard error, use a reasonable sample of athletes,\* tested and re-tested understand standardized conditions when the outcome measure (e.g., bar velocity) is theoretically not expected to demonstrate a substantial change.
  + \*For calculation of confidence limits degrees of freedom > 20 (i.e., 21 athletes tested twice) has little impact on the precision.
* The test-retest duration should also be similar to the duration that subsequent decisions about changes will be made (e.g. day-to-day, week-to-week).
* If using a previously published or known value of the within-athlete standard error, estimated from a short-term test-retest study, ensure all the above as well as similarity in the athlete characteristic and contextual information versus your cohort. Equally, the outcome measures should have been obtained from the same equipment and methodology, or at least with acceptable agreement.
* When using an individual’s data to estimate the within-athlete standard error via regression, ensure that at least 10 consecutive repeated tests are made under ‘usual’ or ‘controlled’ conditions, when the outcome measure is theoretically not expected to demonstrate a substantial change.
* Gain clear and justified consensus on threshold values for practical importance. As well as finding/ conducting better prognostic- or validity-type studies, discussions with colleagues (both coaches and academics) can be invaluable.

**Interpretation**

* Use effective data visualisation to determine change patterns and trends along with their uncertainty and practical relevance.
* Avoid dichotomy and definitive statements (“the athlete *has/hasn’t* changed”, “the change was/was not significant”) and ensure to retain uncertainty in the decision-making process.
* Avoid making or rebutting decisions based solely on the statistical outcomes. Consider the context and other sources of information.