

Assessment of hydration – body mass measurement

Day-to-day fluctuations of $\leq 1\%$ body mass represent normal variation [1], with a limit of 2% body mass loss recognised as a dehydration threshold for physical and cognitive impairment [2]. Minimising body mass loss to less than 2% across the work shift is therefore, a suitable target for medical responders.

Body mass assessment requires pre- and post-shift weigh-ins on a set of body mass scales (preferably digital with resolution to 0.1kg). Weigh ins should occur in minimal clothing, with the pre- to post-shift difference used to determine body mass loss for comparison against the 2% threshold limit of the table below. Based on their score, responders can determine the adequacy of their hydration during the given shift.

Acceptable change in body mass during a work shift	
Body Mass (kg)	Acceptable Body Mass Loss (kg)
50	1.0
60	1.2
70	1.4
80	1.6
90	1.8
100	2.0
110	2.2
120	2.4

Dehydration can also be calculated according to the following equation: **Dehydration = ((Body Mass) / (Pre Shift Body Mass))*100**

Note that while measurement of body mass prior to and following each work shift is considered a simple and accurate measure of hydration status [1,3], this method assumes that workers are in energy balance through each work shift, does not account for fluid consumption, sweating or respiratory fluid losses. As a result, body mass measurements may result in some error estimating dehydration [4] that can be minimised by serial day to day measurements.

References

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3. Armstrong LE Assessing hydration status: the elusive gold standard. *J Am Coll Nutr*. 26(5 Suppl):575S-584S, 2007
4. Maughan RJ, Shirreffs SM, Leiper JB. Errors in the estimation of hydration status from changes in body mass. *J Sports Sci*. 25(7):797-804, 2007