



## EDITORIAL

### How much weight today doctor? Overconfidence or zeal excess<sup>☆</sup>



### ¿Cuánto peso hoy doctor? Exceso de celo o exceso de confianza

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In this number of the journal, Dr. García-Martínez et al. present the results of a survey on the quality of body weight and height measurements in critically ill patients admitted to the Intensive Care Unit (ICU). The authors interview a representative sample of intensivists and nurses in the ICU with the aim of: (a) determining whether they have equipment for measuring patient weight and height; (b) evaluating the use made of such equipment; and (c) assessing the perceived importance of measuring these parameters. The study shows that the ICU professionals make little use of instruments for measuring body weight and height. In effect, such instruments are only employed occasionally, and the values are generally estimated on a subjective basis—even though these professionals admit that the availability of real rather than estimated values has an impact upon patient safety.<sup>1</sup> The study shows that the clinicians consider it sufficient to know the approximate weight and height, in a limited number of patients, and in certain clinical situations. On the other hand, the nurses in the ICU do not consider it essential to systematically obtain reliable and precise measurements of patient weight and height.

As pointed out by the authors and by other work groups in Spain, from the theoretical perspective the obtainment

of real measurements rather than estimates of weight and height should be standard practice upon patient admission and during stay in the ICU.<sup>2</sup> Knowing adult patient weight and height is considered to be crucial for the prescription of drugs with a narrow therapeutic window, for the use of mechanical ventilation, for calculating nutritional needs, and for assessing water balance.<sup>3</sup> However, only a limited number of longitudinal studies have evaluated the true impact of the lack of precision and accuracy in estimating weight and height—a fact that helps explain the scant interest shown by the professionals in this survey. Three factors may contribute to this situation: (a) the available measurement instruments are imprecise and/or expensive; (b) the clinical impact of recording these parameters is less important than suggested from the theoretical perspective; and (c) the professionals are overconfident in relation to their own capacity.

Measuring body weight and height in a bedridden patient in the ICU represents an additional work burden and is difficult to carry out. In fact, measuring the height of a bedridden patient intrinsically implies measurement error, while estimating these parameters from measures or formulas is imprecise.<sup>4</sup> Regardless of the method involved, the alternative to measuring weight and height is to estimate the parameters subjectively, question the patient and/or relatives, or use different inferential techniques. The use of formulas for estimating body height from the length and width of the hand, or the length of the leg or foot, is no better than using a flexible metric tape with the patient lying face up in the horizontal position.<sup>5</sup> Bed scales in turn are expensive, their precision is subject to debate, and

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they do not appear to offer more advantages than the measurement of water balance.<sup>6</sup> Routine practice often consists of questioning the patient and relatives about usual weight and height, and this has also been shown to be reliable.<sup>7</sup>

Although there is evidence of the important risk posed by estimating rather than measuring body weight and height when administering drugs with a narrow therapeutic window or margin, alternatives are available, such as the determination of plasma drug levels or evaluation of the effects of treatment, in the case of anticoagulants. There are no specific recommendations referred to the use of ideal weight for mechanical ventilation, though some analyses of the ARDSNet study reveal an important lack of precision in calculating tidal volume when using body height to determine ideal weight.<sup>8</sup> With regard to the recommendations of the scientific societies dedicated to patient nutrition, all of them—including the SEMICYUC—advise body weight and height obtained by questioning the patient and/or relatives. If this is not possible, subjective calculation is recommended.<sup>9</sup>

Lastly, mention must be made of the overconfidence shown by the professionals in the survey. Clinicians are often overconfident in the clinical data obtained at the patient bedside—a practice that can give rise to scantily reliable estimations. Among the many data reflected on a nursing sheet or in an electronic registry, we tend to take information such as patient gender, weight and height as being valid. However, such excess confidence may also at least partly reflect certainty that simply estimating patient weight and height suffices in routine clinical practice. The theoretical rigor that could be demanded is not endorsed in the scientific literature by clear evidence of the potential adverse effects for patients of using estimations or subjective calculations of these parameters. Moreover, a review of the literature yields no large longitudinal studies supporting the purported risk of only estimating body weight and height in critical patients in the ICU. In my opinion, the weight and height of patients admitted to the ICU should be recorded by questioning the patients or their relatives, from the time of admission. The weight gain associated to positive balances and drug dose adjustments can be made by assessing the effect of the drug (e.g., catecholamines), or from pharmacokinetic data. Until

large longitudinal studies become available in this field, the acquisition of bed scales or the use of often complicated calculation formulas cannot be expected to offer relevant clinical improvements.

## References

1. García-Martínez MA, Cherednichenko T, Catalá Espinosa AI, Arrascaeta Llanes A, Acosta Escribano A. Calidad de la medición antropométrica en las Unidades de Medicina Intensiva españolas (Estudio CAMIES). *Med Intensiva*. 2017; <http://dx.doi.org/10.1016/j.medin.2017.09.008>.
2. García del Moral Martín R, Morales Laborias ME, Fernández López I, Rodríguez, Delgado E, Díaz Castellanos MA. Subjective estimation of patient weight and height in the ICU non-advisable measures. *Med Intensiva*. 2013;37:50–2.
3. Flentje K, Knight C, Stromfeldt I, Chakrabarti A, Friedman ND. Recording patient body weight in hospitals: are we doing well enough? *Intern Med J*. 2017; <http://dx.doi.org/10.1111/imj.13519>. Epub ahead of print.
4. L'her E, Martin-Babau J, Lellouche F. Accuracy of height estimation and tidal volume setting using anthropometric formulas in an ICU Caucasian population. *Ann Intensive Care*. 2016;1:55; <http://dx.doi.org/10.1186/s13613-016-0154-4>.
5. Bojmehrani A, Bergeron-Duchesne M, Bouchard C, Simard S, Bouchard PA, Vanderschuren A, et al. Comparison of usual and alternative methods to measure height in mechanically ventilated patients: potential impact on protective ventilation. *Respir Care*. 2014;59:1025–33.
6. Schneider AG, Thorpe C, Dellbridge K, Matalanis G, Bellomo R. Electronic bed weighing vs daily fluid balance changes after cardiac surgery. *J Crit Care*. 2013;28:1113; <http://dx.doi.org/10.1016/j.jcrc.2013.07.056>.
7. Yoong SL, Carey ML, D'Este C, Sanson-Fisher RW. Agreement between self-reported and measured weight and height collected in general practice patients: a prospective study. *BMC Med Res Methodol*. 2013;13:38; <http://dx.doi.org/10.1186/1471-2288-13-38>.
8. O'Brien ID, Shacklock E, Middleditch A, Bigham C. Inaccuracies in calculating predicted body weight and its impact on safe ventilator settings. *J Intensive Care Soc*. 2016;17:191–5.
9. Bonet Saris A, Márquez Vácaro JA, Serón Arbeola C. Recomendaciones para el soporte nutricional y metabólico especializado del paciente crítico. Actualización. Consenso SEMICYUC-SENPE: Requerimientos de macronutrientes y micronutrientes. *Med Intensiva*. 2011;35 Suppl. 1:S17–21.