WEIGHING IMMOBILE PATIENTS:

The Risks of an Inaccurate Weight

"An assessment of body weight is required for calculations of drug doses, tidal volumes in ventilated patients, patient safety (such as equipment load limits), estimation of renal function and nutritional status."[1]

However, in some cases a direct measure of body weight can be difficult because of immobility, trauma or burns. A number of studies have found estimation of body weight to be inaccurate.

According to Breuer et al, patients who have suffered a Stroke "are frequently incapable to communicate their correct body weight. Thus, dosing is often based on body weight estimate, which may lead to dosing errors."[2]

In intensive care units (ICU), "weight and height are rarely available when patients are admitted to the ICU. Since critically ill patients frequently arrive unconscious or otherwise incapacitated, accurate measurements of weight and height are often difficult to obtain."

According to a study by Maskin et al, "Attending physicians and nurses were asked to estimate patient's actual weight, predicted weight and height. The average percent errors in estimation of actual and predicted weight were 11.4 and 14.6%, respectively. Errors greater than 20% in patient's actual and predicted weight were observed in 15 and 24% of cases, respectively.

"Estimated body weight of critically ill patients has implications for drug and respiratory therapy and should be used with caution."[3]

A PROFESSIONAL WHITE PAPER SPONSORED BY

Health o meter®
Professional

1) https://academic.oup.com/qjmed/article/105/8/769/1565050
2) https://www.ahajournals.org/doi/abs/10.1161/strokeaha.110.578062
3) https://search.proquest.com/openview/46f1f9ada801c46084abe7ac568534f8/1?pq-origsite=gscholar&cbl=37547

What are the implications of an incorrect weight?

Drug dosages and infusion rates in adults are usually based on body weight.

To make the situation even more challenging, drugs commonly used in ICU such as heparin, thrombolytics, drotrecogin alpha and recombinant factor VII have a narrow therapeutic window.

If weight is overestimated, it can lead to drug overdosing and subsequently toxicity and costs. An underestimation of weight can result in suboptimal therapeutic effects.

A survey of ICUs in the United Kingdom confirmed that visual estimation of patient weight was frequently performed without confirmatory measurement.[4]

Darnis et al state, "Inaccurate measures of body weight may have potentially adverse consequences for dosing of many drug classes, and a number of studies have reported substantial estimation errors for height and weight in paediatric patients, operating room patients, emergency departments and intensive care units."[5]

Why is there a lack of weight recordings in patients being administered antibiotics?

A 2012 study by Charani et al of three West London hospitals found that in 46% of cases patient weight was not recorded.

In 39% of cases where a narrow therapeutic antibiotic was prescribed, a patient weight was not recorded. When it came to prescribing the intravenous vancomycin antibiotic. 44% of patients did not have their weight recorded.

The study concluded, "Despite the clinical importance of body weight measurement it is poorly recorded in hospitalised patients, due to interruptions to the workflow and heavy staff workloads. In antibiotics a correct, recent patient weight is required for accurate dosing and to keep drugs within the narrow therapeutic index, to ensure efficiency of prescribing and reducing toxicity."[6]

4) https://search.proquest.com/openview/46f1f9ada801c46084abe7ac568534f8/1?pq-origsite=gscholar&cbl=37547

5) https://academic.oup.com/qjmed/article/105/8/769/1565050

6) https://bmjopen.bmj.com/content/5/4/e006092

Why is approximating the weight of unresponsive stroke patients an issue?

Issues with recording body weight also occurs with patients who have suffered a Stroke. A study of 242 people who had a Stroke received a recombinant tissue plasminogen activator (rIPA) dose based on weight. 19.7% of these received an inappropriate dose, according to Pharmacy Times.

According to Lorenz, "Many stroke patients are unable to communicate their body weight, and there is often neither the means nor the time to weigh the patient. Instead, weight is estimated visually by the attending physician, but this is known to be inaccurate."

In acute medical care, numerous pharmacologic therapies require the correct dosage and rely on knowledge of the patient's exact body weight. Many emergency patients are unable to communicate their body weight.

Safety and effectiveness of stroke treatment depends on both early application and exact dosage. However, "very often the attending physician has neither the time nor the means of weighing the patient. Consequently he/she has to make a visual estimation."

During the ECASS II trial, one of the largest trials on systemic thrombolysis in acute stroke, only a minority of patients were weighed.[7]

Current methods and issues for weighing immobile patients

Conventional weighing scales are unsuitable for certain patients, such as those who have suffered from sepsis or Stroke. Typically, hospitals have used bed scales or hoist scales for these patients.

However these methods are time-consuming to set up. Weighing a patient via hoist, for example can take more than twenty minutes.

Hoist scales also cause issues with patient dignity. Moving a patient into a sling and hoisted for weighing can also be uncomfortable and stressful for the patient.[8]

There is a clear relationship between door-to-needle time and mortality. McNamara et al said:

"In-hospital mortality was lower with shorter door-to-needle time. 2.9% for under 30 minutes; 4.1% for 31-45 minutes and 6.2% for 45 minutes plus."[9]

Mohendano et al added: "Researchers have shown that the number needed to treat to obtain an optimal functional outcome (scores on the modified Rankin Scale of 0 to 1) increases by 1 for every 20 minutes elapsed from symptom onset to treatment administration. Therefore thrombolytic treatment should be administered as early as possible, avoiding unnecessary delays. Every minute may be decisive for the patient's functional outcome."

"Reducing these times depends not only on a trained, coordinated multidisciplinary team for stroke care, but often on technical and administrative improvements in hospital as well."[10]

7) https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2095625/

8) https://www.marsden-weighing.co.uk/index.php/blog/2018/10/19/why-the-patient-transfer-scale-is-easier-than-using-a-bed-scale-or-hoist-scale/

9) https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2715362/

10) https://www.sciencedirect.com/science/article/pii/S2173580816300682

How should an immobile patient be weighed?

Weighing a patient at the earliest opportunity can often be critical to treatment, however existing methods may not weigh patients quickly enough.

A weighing scale should be used that is set up and ready to use, to reduce time and also staff costs.

Health o meter® Professional's Patient Transfer Scale is a transfer board with built-in weighing scale which can be used as part of existing processes as the patient is moved from stretcher to bed, and bed to bed.

The PTS rests on hooks on the wall of a hospital ward, so takes up little space but is also convenient and accessible when required. It is very easy to use and requires minimal staff training.

Essentially the Patient Transfer Scale means staff can administer treatment on the critical care path - reducing the door-to-needle time.

The Nursing Times magazine published an article about the PTS, with people across the medical sector reacting to the launch.

Jordan Hammond said, "The Patient Transfer Scale can ensure greater dignity in comparison to a hoist."

Gemma Louise Manning added, "The PTS is less traumatic than using a hoist."

Ev Adams said, "Everyone can be weighed. No matter what."

About the Sponsors

Health o meter® Professional

Multiple studies have shown that Health o meter® Professional Scales is the U.S. Market Leader and fastest growing brand in Medical Scales. Created in 1919, the heritage of the Health o meter brand includes the honor of being the first to develop an at-home scale and the first to develop the classic "doctor's" beam scale. Continuing the tradition as a market pioneer, Health o meter® Professional has the distinction of having several other innovations in the market including the first medical scale manufacturer to receive ISO-13485:2016 certification, the first to offer EMR capable scales, and the first to develop wireless connectivity that is also compatible with the hundreds of thousands of Health o meter® Professional scales already in use in the market.