Correspondence

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Assessing the consistency of bladder filling using an ultrasonic Bladderscan® device

The Editor,

Hynds et al [1] assessed the daily consistency of bladder filling using a BVI 6400 Bladderscan® (Verathon Medical UK, Sandford, UK). This device is marketed to help in the diagnosis of urinary retention as an aid in prevention of unnecessary catheterisation and is widely and successfully used for this purpose. However, the device may not be suitable for the accurate measurement of bladder volume for other purposes. The manufacturers quote an accuracy of $\pm 15\%$, ± 15 ml when used to measure a phantom; they do not guarantee an accuracy in humans owing to variations in anatomy and pathology, so we may expect less accurate measurements in clinical practice.

A fundamental element of this paper is the validation of bladder volume measurements by comparison with the CT planning scan. The authors state that validity of the volume measurement was confirmed and provide a Bland–Altman plot together with a Pearson's correlation coefficient of 0.91. Bland and Altman [2] stated that the correlation coefficient measures the degree of association between two quantities, not how closely they agree. The Bland–Altman plot shows large differences within pairs of CT and ultrasound measurements; it appears that about half of the measurements differ by $>15\%$. This is reflected in the limits of agreement shown on the plot of almost ± 100 ml (this is the 95% confidence limit on any measurement).

The authors also stated that larger volumes demonstrate a greater difference; in fact there is no relation between bladder volume and the magnitude of the difference, although the differences are both positive and negative at lower volumes and mainly positive at higher volumes (giving an apparent weak correlation).

Given the size of these differences, the value of any further analysis is questionable. The conclusion that a hand-held bladder ultrasound scanner is effective in this application is not supported by any good evidence.

Yours etc.,

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