**Introduction:**
Accurate measurement of a patient’s intravascular volume status remains an unsolved clinical problem in the ICU setting. In particular, septic and cardio-renal patients often receive volume challenges or diuresis, respectively, with little appreciation of baseline BV or the resulting response. This can lead to volume overload and/or depletion and associated increases in morbidity, mortality and hospital length of stay.

**Methods:**
We tested the performance of a novel, rapid, minimally invasive technique capable of measuring PV, BV and glomerular filtration rate (mGFR) in 32 human subjects. The method consists of a single IV injection of a large (150 kDa) carboxymethyl dextran conjugated to a rhodamine-derived dye and a small (5 kDa) carboxymethyl dextran conjugated to fluorescein. Plasma and blood volumes were quantified 15 minutes following the injection of the dye based on the indicator-dilution principle.

**Results:**
This phase 2b study included 16 normal subjects, 8 chronic kidney disease (CKD) stage III and 8 CKD stage IV subjects. PV and BV varied according to weight and body surface area, with PV ranging from 2115 to 6234 mls, and both were stable for greater than six hours with repeated measurements. There was excellent agreement (Figure 1) with Nadler’s formula for PV in normal subjects. A 24 hour repeat dose measurement in 8 healthy subjects showed PV variability of less than +/- 5%. Following an intravenous bolus of 350 ml 5% albumin solution the mean +/- (SD) measured increase in PV was 326.8 ml +/- 49.9 ml post infusion (Figure 2).

**Conclusion:**
This novel bedside approach allowed for rapid and accurate determination of PV, BV, mGFR (data not shown) and dynamic monitoring following clinical maneuvers such as fluid administration, with a high level of safety, accuracy and reproducibility. This approach should assist the Intensivist especially with volume administration and removal in septic and cardiorenal patients.
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