

PERIPHERAL BLOOD HEMATOCRIT IS A POOR SURROGATE FOR RED BLOOD CELL VOLUME IN PATIENTS WITH VOLUME EXCESS OR DEPLETION. Luana Pillon *¹ and Timothy

Manzone, ² ¹Division of Nephrology, New York University School of Medicine and ²Section of Nuclear Medicine, Christiana Care Health System, DE.

We hypothesize that peripheral hematocrit (pHct) is a good proxy for red blood cell volume (RBCV) in all states of hydration. Methods: We enrolled 978 (469 F, 509 M) pts, ages (19-95, median 67.9 yrs), many race/ethnicities and BMIs. Included were pts with critical illness, renal, cardiovascular, and hematological diagnosis, referred for tagged blood volume assessment (BVA), who had simultaneous pHct analyzed. Pts pregnant, nursing or with iodine allergy were excluded. Blinded measurements were made and interpreted by 2 independent physicians. Correlations were made between pHct and tagged isotope volumes.

Results: Table 1. Blood Volume Data

BVA Volume Status	Avg pHct % (30-36)	Avg nHct	Avg Dev of nHct from pHCT (%)	Range of Dev of nHct from pHCT (%)	Avg RBCV Dev from Ideal, ml (Normal \pm 10%)	Avg Plasma Volume Dev from Ideal, ml (Normal \pm 8%)
Hypovolemic (213 pts)	34.21	28.28	5.93 (18%)	1.6-26.0 (-7% -57%)	-587 ml (-32.3%)	-239 ml (-8.6%)
Euvolemic (393 pts)	37.41	37.25	0.16 (0.4%)	0.05-4.48 (+0.14% - +7.9%)	-238 ml (-12.1%)	211 ml (6.84%)
Hypervolemic (372 pts)	37.45	45.44	7.99 (21%)	2.2-43.7 (+8% - +76%)	108 ml (+5.9%)	955 ml (30.95%)

Avg=Average; Dev=Deviation Conclusions: By comparing tagged measurements of RBCV to pHct, we found that pHct is a poor surrogate for RBCV in all but euvolemic patients. pHct may falsely indicate: a low RBCV in states of excess fluid and high RBCV when PV is low. Normalized hematocrit (nHct) which adjusts pHct for volume abnormality may better assess anemia in patients with uncertain volume status.