Does point of care ultrasound improve resuscitation markers in emergency department patients with undifferentiated hypotension? The first Sonography in Hypotension and Cardiac Arrest in the Emergency Department (SHOC-ED 1) Study; an international randomized controlled trial.

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Background:
Point of Care Ultrasound (PoCUS) protocols are commonly used to guide resuscitation for emergency department (ED) patients with undifferentiated non-traumatic hypotension. While PoCUS has been shown to improve early diagnosis, there is a paucity of evidence for any outcome benefit. We undertook an international multicenter randomized controlled trial (RCT) to assess the impact of a PoCUS protocol on key resuscitation markers in this group. We have reported diagnostic impact and mortality elsewhere.

Methods:
The SHoC-ED1 study compared the addition of PoCUS to standard care in the treatment of adult patients presenting with undifferentiated hypotension (SBP<100mmHg or a Shock Index > 1.0) with a control group that did not receive PoCUS. There were 4 North American and 3 South African sites partaking in the study. Resuscitation outcomes analyzed include volume of fluid administered, changes in shock index (SI), MEWS score, and venous acid-base balance and lactate, collected at one and four hours. Comparisons utilized a T-test as well as stratified binomial log-regression to assess for any significant improvement in resuscitation amount the outcomes.

Results:
273 patients were enrolled and randomized with complete follow up prior to analysis. There was no significant difference in amount of fluid received between the control (mean: 1658ml; 95%CI 1365-1950) and PoCUS groups (mean: 1609ml; 1385-1832; p=0.79). Significant improvements were seen in SI, MEWS, lactate and bicarbonate with resuscitation in both the PoCUS and control groups, however there was no difference between groups.

Conclusion:
SHOC-ED1 is the first RCT to compare PoCUS to standard of care in hypotensive ED patients. No significant difference in fluid used, or markers of resuscitation was found when comparing the use of a PoCUS protocol to that of standard of care in the resuscitation of hypotensive patients.