Uscom – Devices the experts use

Fluid Management

Administration of fluids is a routine treatment for hypotension or tachycardia, and is conceived to increase intravascular volume and improve stroke volume. Despite being a common intervention, fluid guidance remains one of the most challenging of clinical interventions, particularly in septic shock when the physiologic needs are changing rapidly with the evolution of the disease, and inappropriate use of fluid can have dire outcomes.

Clinical Background

- Excess fluid administration is unnecessary, and associated with increased morbidity and mortality.
- BP, CVP, vital signs, and clinical examination have proven unreliable in guiding fluid therapy.
- Approximately 50% of all fluids are mechanically ineffective and may be associated with heart failure, while in atrial fibrillation this incidence rises to 65%.[1]

"With the USCOM 1A we are able to cut down on fluids that would otherwise have been given, and to rationalise the fluid regime using CO."

Dr Shanti Ratnam, Head of Intensive Care Unit, Department of Anaesthesiology and Intensive Care, Hospital Sungai Buloh, Kuala Lumpur, Malaysia

USCOM 1A Solution and Evidence

- USCOM 1A measures SV noninvasively, simply and with high fidelity.
- Increases in SV induced by Passive Leg Raise (PLR) significantly predicts fluid responsiveness compared with the non-responders.[1]
- USCOM 1A provides objective hemodynamic measurements, particularly of the SV, to guide fluid therapy.[2]
- This study shows that FTc measured with USCOM is a good indicator of fluid responsiveness during fluid restricted hepatectomy.[3]
- Patients showed a favourable response to fluid if the Smith Madigan Inotropy Index (SMII – Novel USCOM parameter) exceeded 1.1 W/m^2; values below this were associated with a poor response to fluid therapy alone. SMII therefore reliably predicts fluid responsiveness.[6]

USCOM 1A provides early and accurate, non-invasive, hemodynamic assessment to guide fluid therapy. USCOM 1A is the only hemodynamic monitor with the Smith Madigan Inotropy Index which predicts if the heart is able to increase Stroke Volume in response to fluid administration.

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USCOM 1A – The Fluid Solution

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1. Steven W Thiel, Marin H Kollef and Warren Isakow Non-invasive stroke volume measurement and passive leg raising predict volume responsiveness in medical ICU patients: an observational cohort study. Critical Care 2009, 13:R111 (doi:10.1186/cc7955). Details | **2.** Chan SS, Agarwal N, Narain S, Tse MM, Chan CP, Ho GY, Graham CA, Rainer TH. Noninvasive Doppler ultrasound cardiac output monitor for the differential diagnosis of shock. Am J Emerg Med. 2012 May;30(4):629-30. doi: 10.1016/j.ajem.2011.12.039. Epub 2012 Mar 3. Details | **3.** B.-C. Su, C.-F. Luo, W.-Y. Chang, W.-C. Lee, and C.-C. Lin Corrected Flow Time Is a Good Indicator for Preload Responsiveness During Living Donor Liver Donation Transplantation Proceedings, 46, 672e674 (2014). Details | **4.** Akash Deep, Chulananda D. A. Goonasekera, Yanzhong Wang, Joe Brierley Evolution of haemodynamics and outcome of fluid-refractory septic shock in children Intensive Care Med (2013) 39:1602–1609 DOI 10.1007/s00134-013-3003-z. Details