VARIABILITY IN CRYSTALLOID PERFUSION DURING ABDOMINAL SURGERY – HOW ANESTHESIA INFORMATION MANAGEMENT SYSTEMS (AIMS) HELP TO ASSESS FLUID ADMINISTRATION IN AN ACADEMIC MEDICAL CENTER

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Background: Restrictive crystalloid infusion associated with colloid goal directed therapy has been reported to be an effective balanced fluid strategy\(^1\) during abdominal surgery\(^2-\)\(^3\). Standardization of care with an approved protocol has the proven ability to decrease morbidity and mortality and decrease hospital length of stay\(^4\). Using the anesthesia information management system we explored, without applying a standardized fluid management protocol, how much variability in crystalloid infusion delivery existed during abdominal surgery at our academic medical center.

Methods: This study is a monocentric retrospective analysis. We extracted related clinical data from cases involving general anesthesia for abdominal procedures performed at UC Irvine medical center from January 2009 to December 2011 from the AIMS (SIS™; Surgical Information Systems, Alpharetta, GA). Data was grouped per anesthesiologist in order to examine the variability among the specific providers. Exclusion criteria included estimated blood loss over 500ml, blood transfusion during anesthesia, and less than 6 cases per anesthesiologist during that period. Prostatectomies were also excluded from provider analysis because of the specific resuscitation guidelines for those procedures. We corrected the crystalloid infusion for urine output, blood loss, and colloid using the following formula: crystalloid + colloid - estimated blood loss - urine production. Results are expressed in mL/kg/hour. Data are presented as median [interquartile range]. Statistical analysis was performed with Excel 2007 and SPSS 19.

Results: A total of 2251 appropriate cases were found in the AIMS based on procedure. After exclusion criteria were applied, 1303 cases performed by 76 anesthesiology providers were analyzed. (Graph 1) The average median corrected crystalloid infusion across all providers was 6.7 [4.5-10.0]mL/kg/h. The smallest anesthesiologist interquartile range was [4.6-6.0]mL/kg/h (with 7 cases), the highest anesthesiologist interquartile range was [3.8-13.6]mL/kg/h with (6 cases). When grouped by surgical procedure, 1292 cases (appendectomy, colectomy, hysterectomy, nephrectomy or cholecystectomy-pancreatectomy) were analyzed. We included the 280 prostatectomy cases with the same case exclusion criteria for comparison (Graph2). The average median corrected crystalloid infusion across all surgeries was 6.6 [4.5-
9.3 mL/kg/h. The smallest surgery interquartile range was for prostatectomies [3.9-6.2] mL/kg/h with 280 cases, and the highest one was for appendectomies [4.2-10.2] mL/kg/h with 243 cases.

**Conclusion:** Despite numerous literature recommendations in fluid management for abdominal surgeries, we find a large case-to-case variability among providers in crystalloid infusion during abdominal surgery. The AIMS allowed for retrospectives analysis to assess the current practice and to further develop protocol for standardization in fluid management during abdominal anesthesia.
References: