Hemorrhage Control and Resuscitation

Massive Transfusion Protocol (MTP) Smartphone Application: A Clinical Trial

Because massive transfusions are resource-intensive and expensive, they require quick and accurate decision-making. In fiscal year 2014 (FY14), researchers at the Surgical Critical Care Initiative (SC2i) at Uniformed Services University of the Health Sciences (USUHS) began work on a MTP Smartphone application (Figure 1) to prospectively evaluate accuracy in predicting the need for massive transfusion in critically injured patients. As such, this clinical scenario is uniquely suited for a Clinical Decision Support Tool (CDST), since accuracy and efficiency can result in improved patient outcomes and cost/logistical savings to the institution. The MTP Smartphone application allows for the accurate prediction of who may require a massive transfusion based on a sophisticated statistical model created using admission variables readily available to the clinician at the bedside. The coordination of a MTP is a complex and multi-disciplinary effort that requires both significant oversight as well as the use of a large amount of human and blood bank resources. The MTP Smartphone application has the potential to make this process less complex and more accurate, thereby improving outcomes for Service Members and reducing logistical burdens by eliminating the need for massive transfusion by approximately 15 percent.[1] MTPs, as part of a damage control resuscitation paradigm, have been shown in multiple military and civilian series to improve patient outcomes. This protocol could prospectively evaluate accuracy in predicting the need for a massive transfusion in critically injured patients, thereby reducing both the risk of over-transfusions and the need for blood products (e.g., logistical savings). In FY14, the SC2i supported the development and deployment of a Smartphone application to prospectively evaluate accuracy in predicting the need for massive transfusion in critically injured patients. With funding from SC2i, Emory University's Department of Surgery has deployed SC2i's MTP Smartphone application at Grady Memorial Hospital, a Level I trauma center certified by the Georgia Department of Public Health, to treat patients from the Atlanta metropolitan region and to date has enrolled over 350 patients in the MTP clinical trial. Future work includes additional analysis of the initial findings, incorporation of blood bank data, and calibration of the model for clinical use.

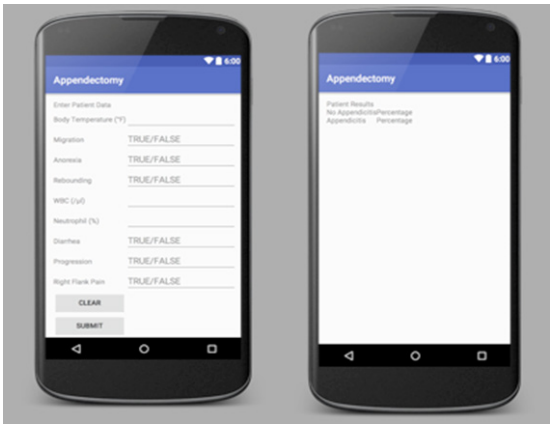

FIGURE 1: Mobile application predicting the need for a massive transfusion

1 Surgical Critical Care Initiative. (2015b). Operational Savings from SC2i MTP Project. Retrieved from http:// www.sc2i.org/site/assets/files/1040/operational_ savings_from_sc2i_mtp_-_report_-_may_2015.pdf