Research Study

Static Holdup Volume of Reservoirs

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Methodology
We used bovine blood from a local butcher for our experimental trials. We allowed some of the blood to clot overnight and the rest we anticoagulated with Anticoagulant Citrate Dextrose. To simulate "dirty blood" we added the same weight of clots to the same volume of blood for each trial. We ran 15 trials for each of the four groups we were comparing. We used the Stockert S1 roller head pump to add blood into each reservoir. Using one roller head, the dirty blood was taken from a measuring cup and sent to the HEMAsavR. Then using a second roller head, the blood was taken from the HEMAsavR and added to a graduated cylinder. A third reservoir took the blood from the graduated cylinder and added it to the Medtronic reservoirs. The blood would be emptied out of the Medtronic reservoir into the graduated cylinder for final volume measurements. A fourth roller head was used to recirculate the bovine blood within a bucket to prevent stasis. The four groups were as follows:

Group A: The dirty blood sample was run through the HEMAsavR before being ran through the Medtronic 120 μm blood collection reservoir EL Series.

Group B: The dirty blood sample was only run through the Medtronic 120 μm blood collection reservoir EL Series as a control for comparison.

Group C: The dirty blood sample was run through the HEMAsavR before being ran through the Medtronic 40 μm blood collection reservoir EL Series.

Group D: The dirty blood sample was only run through the Medtronic 40 μm blood collection reservoir EL Series as a control for comparison.

We compared the starting volume to the ending volume for each reservoir to calculate the static hold up volume. We also compared the starting and ending hematocrit for each sample as a reference point for each sample quality. For statistical analysis, Group A and B were compared and Group C and D were compared using independent T-tests.

Conclusions
All of the hematocrits measured were the same indicating the sample quality was consistent for each trial. The T-tests for both comparison groups resulted in p-values less than 0.05. This means that the hold up volume was significantly decreased for both Medtronic reservoirs when the HEMAsavR was used to collect the blood beforehand.