



HEMAFUSE™ Case Summary

Sisu Global Health

The HEMAFUSE™ System is a simple intraoperative autologous blood transfusion device that is an alternative to donor blood for cases of internal bleeding. It can be used in emergency situations as well as in scheduled procedures to give a patient back their own blood during surgery and recovery. The HEMAFUSE™ System can be used in cases such as ruptured ectopic pregnancies, myomectomies, total hip replacement, and trauma surgeries.

Autologous blood has several benefits as compared to allogenic blood. Allogenic blood is an increasingly scarce and expensive resource and subject to degradation in storage, which affects the physical structure of donor red blood cells (RBCs). Intraoperative autologous blood is not stored, and thus has better oxygen carrying capacity. (Salaria, Osman N, et al.).

The HEMAFUSE™ System was successfully used at several hospitals in Kenya over ~100 days including a Level 5 Public Hospital and multiple Mission Hospitals in Nairobi. The HEMAFUSE™ System salvaged and filtered multiple units of blood from a surgical site, which was immediately re-transfused back to the patient. The cases presented here are a subset of the total cases in Kenya to date.

In these cases, the HEMAFUSE™ System provided blood when patients had rare blood types and where the hospital did not have enough donor blood readily available. The HEMAFUSE™ reduced the time of surgery in cases where donor blood was delayed due to cross-matching or transportation, to the extent that surgeries

were completed before the donor blood had arrived. When the donor blood arrived and was no longer needed, it was sent back to the lab to become available for another patient.

In each case, the HEMAFUSE™ System resulted in hemodynamic stability without the need for allogenic blood. No postoperative complications were observed. The amount of blood recovered by the HEMAFUSE™ System ranged from 250mL-800mL. In these cases, autologous blood transfusion reduced the total amount of blood needed for transfusion and ensured that no allogenic blood was required. A subset of cases was presented at a premier blood conference in Berlin, where Sisu Global was awarded Second Place for Best Poster.

In addition to assisting patients in urgent need of blood, the HEMAFUSE™ System is also valuable in cases of lower blood loss and higher hemoglobin levels. In cases of both planned and emergency surgeries, surgical teams were able to recover at minimum a unit of blood from patients with a Hb levels ≥ 9 and blood loss $\leq 1L$, preserving blood in those operations as well.

Using the HEMAFUSE™ System makes blood available in time-critical situations where delayed supply can result in negative outcomes, improves the efficiency of operating theatre and physician time, and provides more, higher quality blood for the hospitals who use the HEMAFUSE™ System.

“This patient would typically receive over 2 units of donor blood, but with Hemafuse we only needed to give a single unit... It takes time to get O+ donor blood, and the patient in this case would have needed more blood than the hospital had available. Hemafuse saves time as well as blood resources” - MO at a Mission Hospital in Nairobi

Case	Hb	Blood Type	Blood Loss(mL)	Blood Recovered(mL)	Use Time (min)
1	6.5	N/A	2500	400	8
2	7	O-	1000	800	21
3	9	N/A	1000	400	10
4	N/A	O+	2500	750	17
5	8	AB+	700	250	10



Figure 1: Stored donor blood (left) vs. Fresh whole blood recovered with The HEMAFUSE™ System (right). Note the storage effects on the donor blood, primarily the layers and the color of the donor blood

Works Cited

Salaria, Osman N., et al. “Impaired red blood cell deformability after transfusion of stored allogenic blood but not autologous salvaged blood in cardiac surgery patients.” Anesthesia and analgesia 118.6 (2014): 1179.