

Set-up and Perform Dialysis Using the Manual Single Lumen Alternating Micro-Batch Hemodiafiltration (mSLAMB) System

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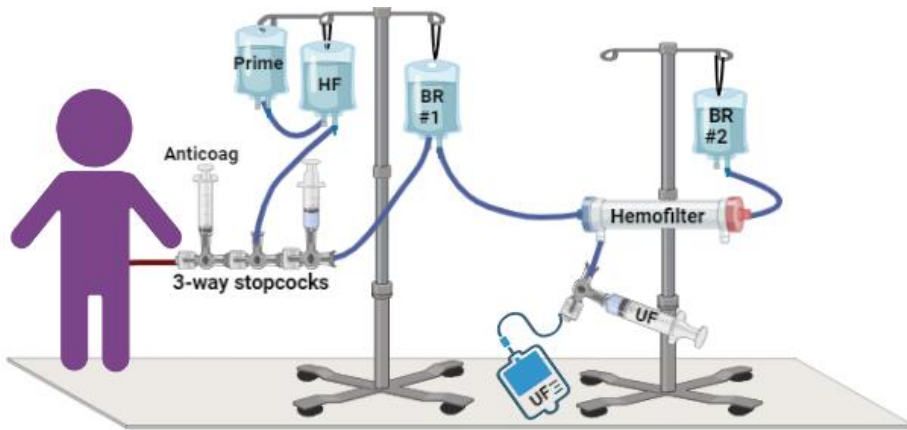
Purpose: The mSLAMB system is a novel sterile and closed-loop dialysis system designed to provide kidney support in emergency situations (e.g., fluid overload, hyperkalemia, acidemia) where dialysis machines, peritoneal dialysis, and/or electricity are unavailable. mSLAMB circuits costs <\$50. We conducted *in vitro* experiments to determine the best training method, ease of set-up, and efficiency.

Methods: We describe supplies, set-up, and a single cycle of the mSLAMB procedure. **Supplies:** 1- disposable kit, 2- IV poles, 1 Liter prime solution (PS), Hemofiltration fluid (HF), 1 filter, 1 filter holder; 2- 50 mL syringes, 1- graduated cylinder, 2- hemostats. **Set-up:** staircase 2 IV poles (#1 closest to patient (pt) and higher than #2); hang PS on IV #1; hang HF bag and blood reservoir (BR) #1 bag to right of PS & attach 50 mL syringe to right of HF stopcock (SC); attach filter holder & filter to IV #2 & attach red luer lock from BR #1 to filter inlet; hang BR #2 on IV #2 & attach red luer lock to filter outlet; attach Hansen connector to one side of the filter & attach 50 mL syringe to SC; spike PS bag & begin gravity prime; discard PS. **Procedure:** attach bloodline to access & turn SC off to pt; open HF bag SC, pull 50 mL's & push plunger to fill BR #1; turn SC off to HF bag & open pt SC, pull 50 mL's of blood and push plunger to fill BR #1; close white clamp before BR #1 and begin dialysis (blood moves from BR #1 to filter to BR #2), pull 50 mL's of HF fluid from UF SC (increase removal to achieve negative fluid balance); raise BR #2 higher than BR #1 and gravity drain back to BR #1; begin pull/push to return dialyzed blood to pt.

Summary: mSLAMB procedural training was accomplished in 1 day. Instructional videos will be provided and a "training the trainer" approach will build a group of competent users who can teach others. mSLAMB can be prepared and ready for use in ~10 minutes. The procedure is easier using small batches (50- 100 mL) of blood and more efficient with 2 people but can be performed by 1 person.

Conclusion: mSLAMB is a simple, cost effective, and potentially life-saving alternative for low resource settings. Treatment requires good single lumen access (e.g., IV) but does not require a pump or special dialysis solution. Any sterile balanced solution (e.g., LR) will allow provision of sufficient dialysis until the patient can be relocated/ transferred.

A
Set-up and prime
phase



B
Treatment phase

