

BACKGROUND

- 70 percent of HIV cases reside in Sub-Saharan Africa (SSA), with many of those developing Opportunistic Infections (OIs).¹ Kaposi Sarcoma (KS) is an especially debilitating and stigmatizing OI for patients due to lower extremity cancerous lesions.
- US based research is underway to evaluate the effectiveness of a commercially available unna boot as adjunctive treatment for KS lesions, yet these products are not available or too expensive in SSA.
 - An unna boot is a special compression dressing (cotton) that contains a zinc oxide paste/impregnation process applied to the entire bandage.
 - The zinc oxide eases irritation, keeps the area moist, and exhibits anti-inflammatory and anti-bacterial properties, prompting its use in stasis ulcers, lower extremity surgical wound healing, and case reports of use in KS lesions.^{2,3,4}

Setting

- In Kenya, clinicians associated with the Academic Model Providing Access to Healthcare (AMPATH) and Purdue University have developed and are researching the effectiveness of a low-cost unna boot, along with its potential for sustainability and impact on standards of care for KS and other HIV-associated OIs.
 - AMPATH encompasses Moi University, Moi Teaching and Referral Hospital and a consortium of North American academic health centers led by Indiana University working in partnership with the Government of Kenya.
 - AMPATH's mission is to "lead with care" through research, training, and exceptional treatment. The consortium was founded in 1997 to address the HIV epidemic, and now has a broader focus on primary care, chronic disease management, and specialty care.

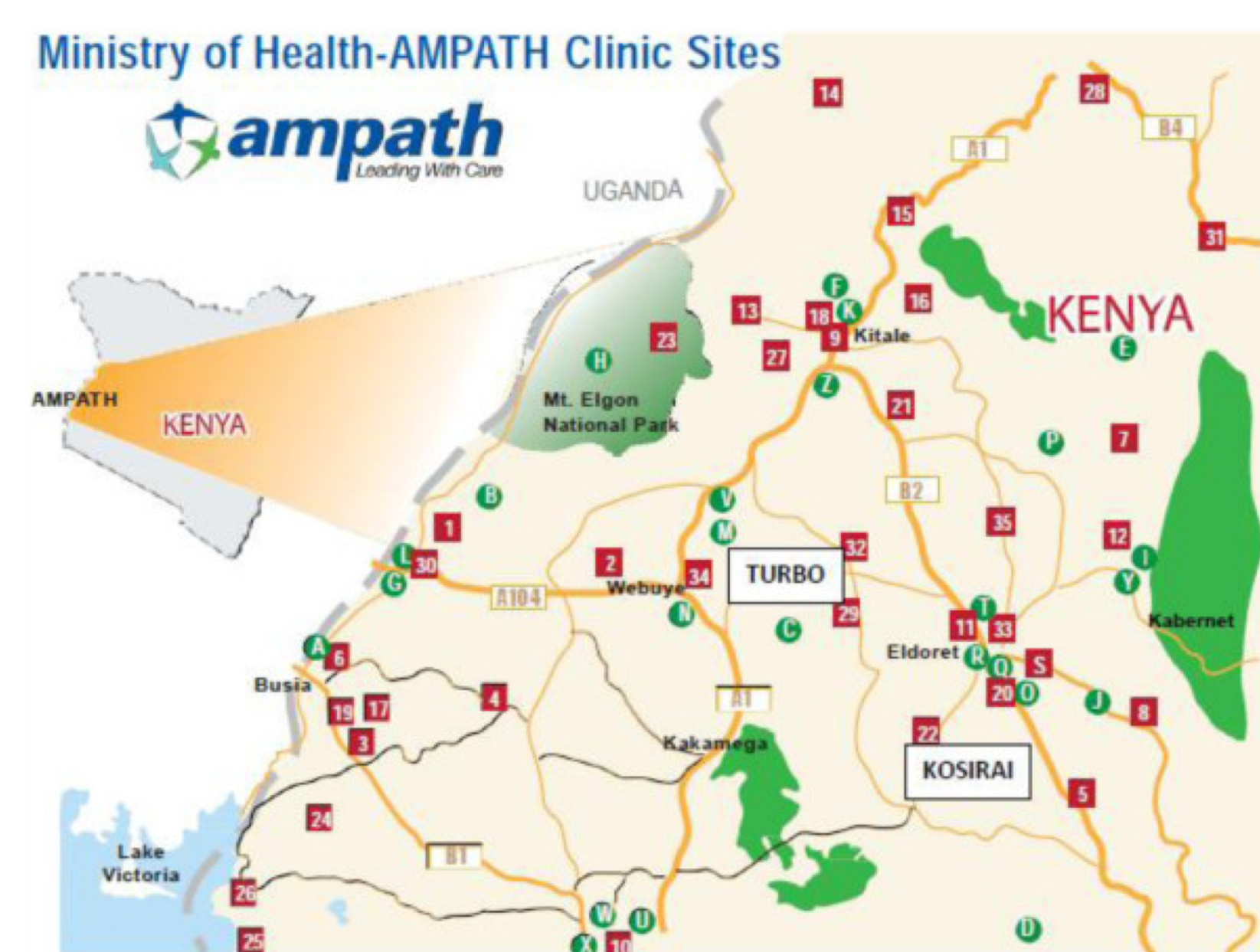


Figure 1. AMPATH clinic sites throughout Kenya.

OBJECTIVE

The purpose of this project was to develop a low-cost unna boot "kit" from local sources and assess its use in stasis ulcers for patients in AMPATH's rural and oncology clinics.

METHODS

- A literature review was conducted to understand and determine the utility of unna boots for leg ulcers in KS and stasis ulcers from other causes.
- Research of the underlying mechanism of an unna boot led to the acquisition of locally-sourced individual components and resulted in prototype development of an affordable alternative with piloting done to test ease of use, durability, and shelf life.
- This project and research is sustained by a Service Learning Grant from Purdue University's Office of Engagement.

RESULTS

Access and Availability of Materials

- Individual components (zinc oxide paste, cotton bandage, gloves, compression wrapping) were sourced through a local medical supply distributor in bulk to lower cost.
- 25 modified kits have been created and are currently being evaluated for effectiveness in treatment of stasis ulcers in a rural AMPATH clinic in Turbo, Kenya.
- To date, 7 patients have utilized the kits, with 3 being discharged from the service.

Training

- Training on the use of the kits was provided by a US-trained dermatologist.
- Assembly guides on instructions for use for providers were created to promote consistency in kit production and use.

Clinical Monitoring

- Monitoring forms were created and distributed with assembled kits to document changes in clinical status of wounds and quality of life.
- Additional forms have been created to assess patients with KS lymphedema and HIV status.

Modifications

- The gauze was cut in half to promote ease in wrapping.
- The application and use of the unna boot is challenging in the rainy season (becomes malodorous and wet), necessitating more frequent changes (every 3 vs. 7 days.)
- It was suggested to consider topical or crushed metronidazole to be used on ulcers to prevent anaerobic growth during compression.

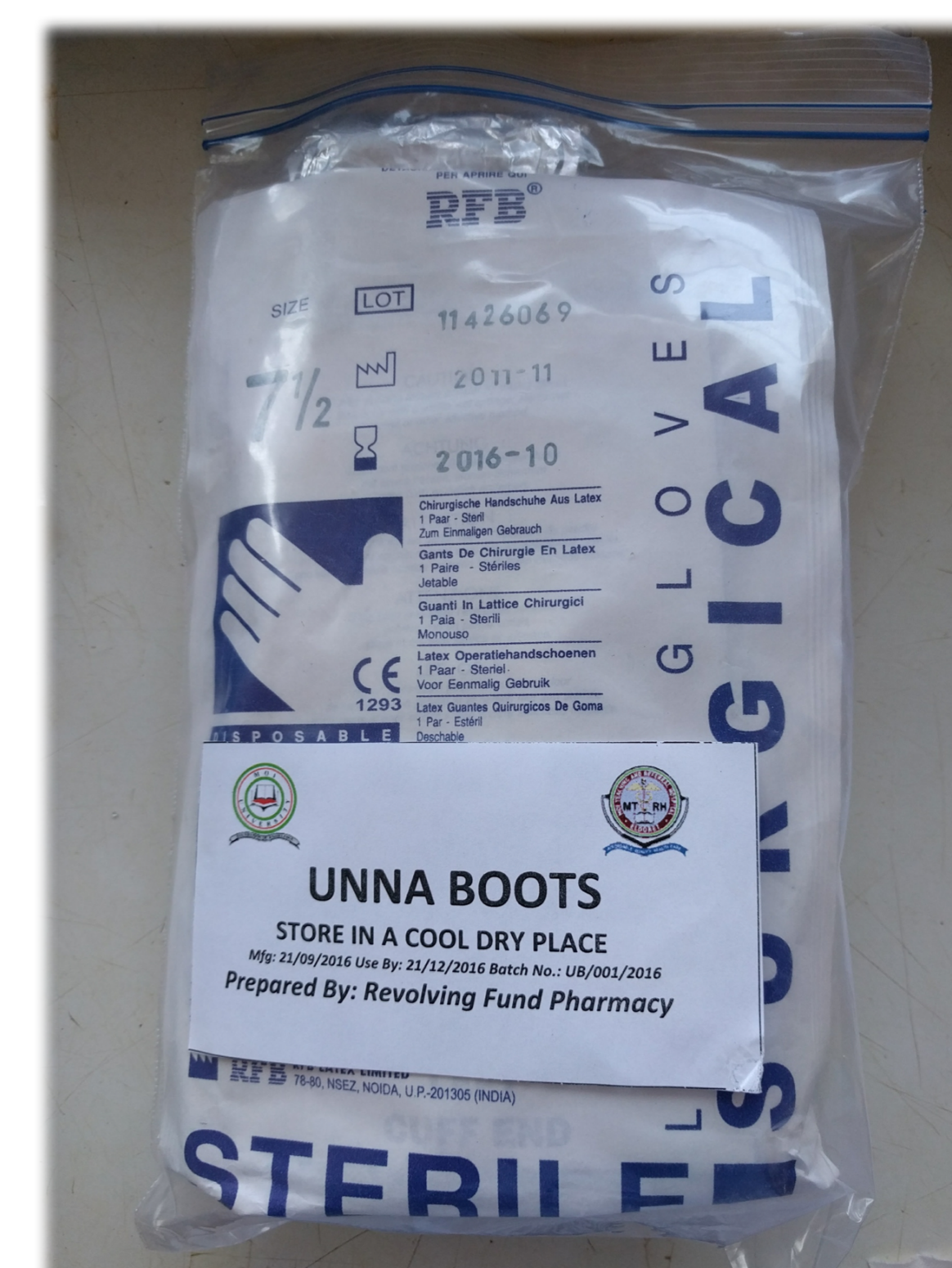
Patient Price and Components of Commercial Vs. "Kenyan" unna boot	
Commercial unna boot price (avg.)	Kenyan unna boot price (avg.)
\$10.33	\$2.00
Commercial unna boot components	Kenyan unna boot components
<ul style="list-style-type: none"> Compression dressing, cotton Zinc Oxide (commercial impregnation) Outer (protective) bandage, cotton/spandex 	<ul style="list-style-type: none"> Compression dressing, cotton <ul style="list-style-type: none"> Zinc Oxide paste Outer ("crepe spandex") bandage, cotton <ul style="list-style-type: none"> Zinc Oxide, straps
Commercial unna boot changing frequency	Kenyan unna boot changing frequency
Every 3-14 days	Up to every 7 days
Commercial unna boot contraindications	Kenyan unna boot contraindications
<ul style="list-style-type: none"> Arterial insufficiency <ul style="list-style-type: none"> Cellulitis Deep Vein Thrombosis 	<ul style="list-style-type: none"> Arterial insufficiency <ul style="list-style-type: none"> Cellulitis Deep Vein Thrombosis



Figure 2. Assembly of first unna boot prototype



Figure 3. First unna boot prototype on healthy leg

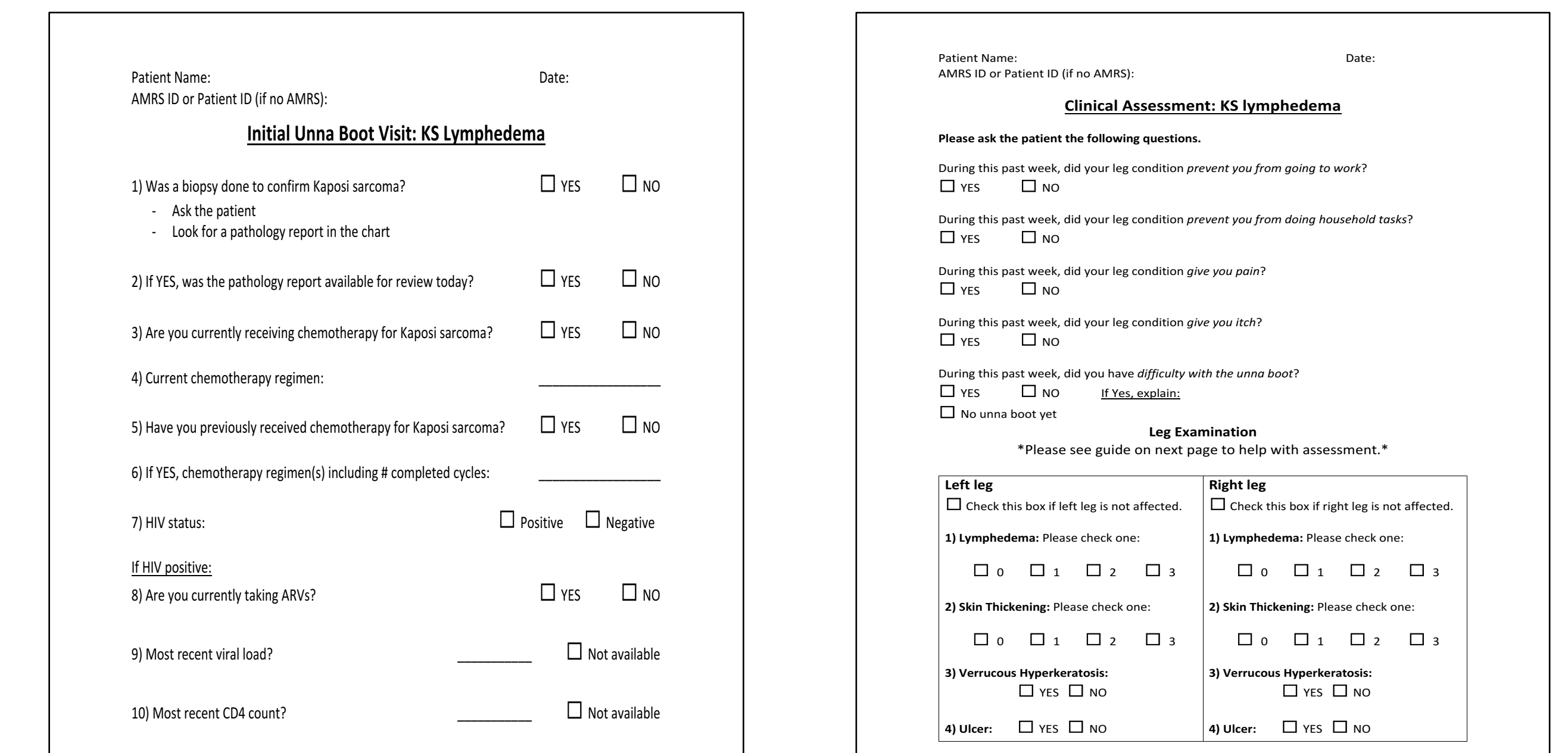


Figures 4 and 5. Updated unna boot kit (front and back)

RESULTS



Figure 6. unna boot application in Turbo Clinic, Kenya



Figures 7 and 8. Monitoring forms included with unna boot

CONCLUSION

- Assembly of locally-sourced, low-cost unna boot kits has led to use in one clinic with interest in upscaling throughout the AMPATH system.
- Further observation and data collection may show potential for this modified kit to undergo review to become a standard of care for patients living with HIV and KS.

FUTURE DIRECTION

- Evaluate clinical outcomes through a retrospective review via the monitoring forms.
- Reporting progress and impact of project to Purdue University Office of Engagement in the hopes of further showcasing its impact and renewal of the Service Learning grant.
- Abstract submission to American College of Clinical Pharmacy.
- Provide training to nurses and community health workers to meet patient demand.
- Provide training and support to family members to ease burden on patients (transportation to clinic, difficulty in ambulation, etc.)

REFERENCES

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- Gordon R, Grant L. Management of ulcerated AIDS-related Kaposi's sarcoma lesions. *J Wound Ostomy Continence Nurs*. 1996;23(2):115-8.

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