**Introduction**

Viral load (VL) quantification is an important tool in identifying when to initiate antiretroviral therapy (ART) and in determining when an ART regimen is failing. Testing in resource-limited settings may require sampling by fingerstick due to shortages in skilled phlebotomists and the expense of venipuncture supplies. The Northwestern Global Health Foundation is developing a point-of-care (POC) instrument and VL nucleic acid test (NAT). A minimum of 150 μl blood is required for a limit of quantification of 1,000 copies/ml plasma. If this volume can be obtained by fingerstick instead of venipuncture, the test could potentially become available in many clinics.

**Primary objectives:**
1. proportion of collection attempts that obtained 150 μl capillary blood
2. number of puncture sites required
3. study nurse compliance with fingerstick protocol
4. study nurse comparison of fingerstick vs. venipuncture
5. patient comparison of fingerstick vs. venipuncture.

**Materials and Methods**

Eligible patients were HIV-positive, currently receiving ART, and had previously been tested for CD4 and/or HIV viral load. Primary exclusion criteria included presence of heavy callouses, severe dehydration, poor finger circulation, or other illness or opportunistic infection.

Patients were recruited by the study nurse as they queued in the blood room. They were asked to participate after a phlebotomist administered venipuncture and collected the requested blood specimens. Each patient was asked to sign an informed consent waiver prior to receiving a fingerstick, receiving a fingerstick, patients were asked if they had a preference for fingerstick, venipuncture, or no preference.

Each fingerstick was administered using a BD Genie Lancet (depth = 2.0 mm, width = 1.5 mm) (Figure 1). The study nurse was blinded with respect to the fingerstick and blood collection protocol. Each step of the protocol was observed, and their completion or omission was recorded on a protocol template for every patient. A novel EDTA-treated blood collection device capable of holding 150 μl was used to discriminate between successful and unsuccessful collection attempts (Figure 2). The site of each fingerstick and the result of each collection attempt were recorded.

Following the collection attempt, every patient was asked again if they had a preference for fingerstick, venipuncture, or no preference. A verbal questionnaire was then administered. The study nurse was asked after the study if she had a preference for fingerstick, venipuncture, or no preference. Her years of experience, specific qualifications, and insights were recorded.

**Results**

- Ninety-eight percent of collection attempts were successful and 86% required only one fingerstick to successfully collect 150 μl blood (Figure 4).
- The compliance of the study nurse to the protocol template was summarized (Table 1). After completion of the study, the study nurse indicated no preference for performing either fingerstick or venipuncture.

**Conclusion**

- The findings from this study support the feasibility of collecting 150 μl capillary blood via fingerstick for POC HIV viral load testing in resource-limited settings.
- Omissions in many steps of the fingerstick protocol suggest that maintenance training, detailed written instructions for reference, and convenient placement of fingerstick materials may facilitate improved compliance.
- A patient-centered approach to viral load testing will include a transition from venipuncture to fingersticks for blood collection.

**References**

2. VolumeBloodCollected x (1 – HematocritMax) x SeparationEfficiency = 50 copies/ml, where SeparationEfficiency = 75% and HematocritMax = 55%.

**Acknowledgements**

This work was supported by a Global Health Initiative grant from the Center for Global Health at Northwestern University. I would like to thank my mentors Sally McFall and David Kelso for their invaluable guidance and expertise, and Kara Palamountain and Mark Fisher for their continued support. Finally, Lesley Scott, Natasha Gous, and study nurse Matilda Nduna from the Department of Molecular Medicine and Haematology at Wits Medical School in Johannesburg, South Africa deserve special thanks for their hospitality and willingness to dedicate the time and resources to make this study possible.