

## Use of Dried Blood Spots and the Gen-Probe Aptima HIV-1 RNA Qualitative Assay for the Diagnosis of Infants and Detection of Acute Infection from Pooled Samples

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### OBJECTIVE

To develop a cost-effective, sensitive method for diagnosing acute HIV infection and infant infection using dried blood spots (DBS) and the Gen-Probe Aptima HIV-1 RNA Qualitative Assay.

### METHODS

A PBS/detergent buffer was developed to elute the blood, including HIV-1 virions, from DBS. The limit of detection of the assay was tested using DBS made with spiked whole blood, DBS from HIV-1-infected and uninfected adults (n=33 and n=12, respectively), and DBS from infants (n=138). Optimal pooling strategies were determined and then used to assess the ability of the pooled DBS assay to detect HIV infection in adults and infants.

### RESULTS

Using spiked whole blood, the limit of detection was ~400 cp/ml. However, when DBS from HIV-1-infected patients were tested, the assay proved to be more sensitive. All specimens from infected adults with detectable viral loads in the Roche HIV RNA assay (n=25) (viral loads >50 cp/ml) and 28/29 specimens from infected infants were positive (viral loads >1000 cp/ml). In addition, 5 of 7 infected adults with viral loads <50 cp/ml were detected in the assay. The one false negative infant specimen was from a DBS that had been stored for 4 years at room temperature. All 120 specimens from uninfected adults and infants were negative (100% specificity). Pooling of up to 50 DBS with a single positive punch was reactive in the assay if the positive punch had a viral load of at least 10,000 cp/ml. Greater sensitivity was achieved with a smaller pool size.

### CONCLUSIONS

The Gen-Probe Aptima HIV-1 RNA Qualitative Assay was successfully adapted to work with DBS. This assay could be used as a sensitive, specific, cost-effective way to determine acute infection in populations such as infants, vaccine recipients, blood donors, pregnant women, or STD clients.