ACCELERATING ACCESS TO POINT-OF-CARE VIRAL LOAD TESTING FOR PREGNANT AND BREASTFEEDING WOMEN LIVING WITH HIV

Increased access to ART and treatment monitoring for pregnant and breastfeeding women living with HIV is a priority for promoting health during the pregnancy and post-partum periods, and to minimize the risk of vertical transmission of HIV to their infants. Evidence shows that maternal viral load (VL) is closely associated with the risk of vertical transmission, and the World Health Organization (WHO) therefore recommends urgently initiating HIV-positive women on antiretroviral therapy (ART) in order to reduce maternal VL. The impact of the successful scale up of prevention of mother-to-child transmission (PMTCT) programs to increase access to treatment for pregnant women living with HIV has been significant, resulting in more than 1.6 million new child infections averted since 2010.

Although access to VL testing has increased in many countries to allow for better monitoring of all patients on ART, laboratory-based conventional VL systems often face long result turnaround times and low result return rates, making it difficult to take timely clinical action when elevated VL is detected. Timely VL monitoring is particularly important for pregnant and breastfeeding women, as there is a limited window of time to identify women who have elevated VL (>1,000 copies/ml) and implement fast-acting interventions to promote re-suppression and prevent transmission. Interventions such as initiating enhanced adherence counseling, switching to an optimal ART regimen that rapidly reduces maternal VL, or providing enhanced infant prophylaxis can all reduce the risk of transmission in the context of elevated maternal VL.
**VL policies are not designed for pregnant and breastfeeding women**

In many countries, the current algorithm for VL monitoring for all people living with HIV (PLHIV) on ART is to test at 6 months and 12 months post ART initiation, then annually thereafter, consistent with WHO recommendations.\(^{15}\) For pregnant and breastfeeding women, this timeline may be inadequate as it may not align with the window of transmission risk during pregnancy and breastfeeding.\(^{16}\) A simulation study projected that 69 percent of pregnant women will not receive a VL test if current WHO guidelines for VL monitoring are followed, with the first VL only performed after 6 months on ART.\(^{17}\) Furthermore, current failure management protocols recommend three months of adherence counseling, followed by a second VL test to ascertain whether an elevated VL measurement is due to adherence challenges or drug resistance, prior to making a regimen switch decision. With result return times averaging 30 days,\(^{18}\) women who are tested may not receive their VL result before delivery, and these protocols – which take at least 3-months to confirm treatment failure – may be inadequate to manage pregnant and breastfeeding women and maximize rates of viral suppression. The misalignment between the testing algorithm and duration of the infant exposure period, combined with weaknesses within VL testing systems that delay result availability, have resulted in low VL coverage for pregnant and breastfeeding women (below 50% in some countries) and low viral suppression rates at delivery and postpartum (which vary, but have been reported as low as 30%).\(^{19,20,21,22}\)

In recognition that the WHO guidelines for VL monitoring do not reflect the unique needs of pregnant and breastfeeding women, some countries have adopted national guidelines with differentiated recommendations for providing VL during the pre- and post-partum exposure periods, including recommending earlier and/or more frequent VL monitoring [see Box 1]. VL monitoring guidelines tailored to pregnant and breastfeeding women include testing at the first antenatal care (ANC) visit regardless of when the last VL test was conducted, VL testing at three- or six-month intervals throughout pregnancy and breastfeeding (compared to annually), or a shorter time window between the first elevated VL result and follow up VL test (one month compared to three months). These modifications to the testing algorithm increase the likelihood that a woman with viremia during the infant exposure period will be identified promptly, and that action can be taken to reduce the risk of transmission.

### Box 1. Country Highlights: Differentiated national guidelines for VL monitoring for pregnant and breastfeeding women

<table>
<thead>
<tr>
<th>Country</th>
<th>Pregnant and breastfeeding women already on ART</th>
<th>Pregnant and breastfeeding women newly initiating ART</th>
<th>In the event of elevated VL</th>
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| Kenya\(^{27}\) | Obtain VL at first ANC visit irrespective of when prior VL was done, then every 6 months until cessation of breastfeeding. | Obtain VL 3 months after treatment initiation, and then every 6 months until cessation of breastfeeding. | • If VL > 1000: repeat VL after 3-months of intensified adherence support  
• If repeat VL >1000: Switch regimen  
• If repeat VL <1000 but detectable: consult regional or national TWG  
• If undetectable: Continue routine monitoring |
| South Africa\(^{28}\) | Obtain VL at first ANC visit irrespective of when prior VL was done, then at months 3, 6,12,18, and 24 throughout pregnancy and breastfeeding. | Obtain VL 3 months after treatment initiation, and then every 6 months throughout pregnancy and breastfeeding. | • If VL < 400: 6 monthly VL and routine adherence support  
• If VL 400 – 1000: assess adherence, consider another VL within 6 months, repeat VL at 6 months  
• If VL > 1000: adherence counseling and follow up VL 1 month later  
• If follow up VL, under or greater than 1 log decrease, maintain current regimen  
• If VL result unchanged or less than 1 log drop, switch to 2L  
• If 2L switch, provide intensive adherence counseling to ensure rapid VL suppression |
| Zimbabwe\(^{29,30}\) | Obtain VL at first ANC visit and review result within 2 weeks, then every 6 months throughout pregnancy and breastfeeding. | Initiate on ART on the same day as first ANC visit and obtain VL 3 months after starting ART, repeat VL every 6 months throughout pregnancy and breastfeeding period. | • If VL > 1000: commence adherence counseling and repeat follow up VL after 1 month  
• If repeat VL > 1000: prepare to switch regimen |
Point-of-care viral load testing can address systemic challenges and support PMTCT efforts

Point-of-care (POC) VL, which allows testing to be conducted at or near the point of patient care, has the potential to increase access to VL testing, reduce result return time and increase result return rates for pregnant and breastfeeding women. In combination with improved testing algorithm recommendations tailored for pregnant and breastfeeding women, the use of POC VL testing could facilitate faster clinical action and time to viral re-suppression. For example, POC VL could allow same day result return and same-day start of adherence counseling, same-day return of results to confirm treatment failure, and same-day switching to an optimal treatment regimen. Currently, there are three POC VL platforms available for use: Cepheid GeneXpert, Abbott mPima and DRW Samba II.

Emerging data demonstrate the feasibility and impact of POC VL for improved patient management. POC VL was shown to improve rates of viral suppression and retention in care for PLHIV newly initiating ART in a high-volume clinic in South Africa by 13.9 percent and decreased the median time that VL results were communicated to the patient from 28 days to same day. Similarly, pilots in Zimbabwe found that POC VL increased the proportion of results received by clients compared to referral-based VL, with 96 percent of clients with elevated VL receiving their result using POCVL compared to 48 percent of clients using centralized VL testing, and decreased the median time to result receipt back to clients from 26 days to next day. Although none of these studies were specific to pregnant and breastfeeding women, the outcomes of using POC VL are expected to be similar for this population, and in combination with timely counseling or regimen switch, is likely to reduce the risk of vertical transmission. In recognition of this potential impact, the PEPFAR 2019 Country Operational Plan Guidance endorsed the use of POC VL for pregnant and breastfeeding women [see Box 2]. Given the positive results experienced with POC VL in these early studies, consideration is being given to expand use of POC VL for other populations at high risk of viremia, such as pediatric and adolescent patients, and those with a history of elevated VL.

POC VL for pregnant and breastfeeding women is the future

Despite global success in reducing the number of new child infections and overall rate of vertical transmission over the last two decades, additional interventions are needed to promptly identify pregnant and breastfeeding women living with HIV, rapidly initiate them on effective treatment, retain them in care, and identify those with elevated VL to promote viral suppression to avert vertical transmission. Additional evidence is being generated to understand how POC VL can be used during the pregnancy and post-natal periods to ensure high rates of viral suppression at delivery and during breastfeeding. Targeted use of POC VL, in combination with VL policies tailored to the specific needs of pregnant and breastfeeding women, has the potential to bolster PMTCT programs to achieve the elimination of vertical HIV transmission.

Box 2. PEPFAR recommendation on the use of POC VL for pregnant and breastfeeding women

PEPFAR’s 2019 Country Operational Plan Guidance endorses the use of POC for pregnant and breastfeeding women:

“It is critical to ensure that diagnostic systems are in place for prompt identification of viremic women to promote re-suppression and avert vertical transmission and also to address elevated VL during pregnancy and breast-feeding. By utilizing POC for viral load monitoring with pregnant women, there is the ability to provide an intensified prophylaxis regimen for exposed infants whose mothers have elevated viral load at delivery…in light of this, and to optimize time-sensitive VL monitoring among PBFW [pregnant and breastfeeding women], PEPFAR programs should plan to use POC for VL testing among PBFW only.”

SAME DAY RESULT...

- Adherence Counselling
- Confirmation of Treatment Failure and Regimen Switch
- Initiation of Enhanced Infant Prophylaxis

...MEANS SAME-DAY INTERVENTIONS TO REDUCE RISK OF HIV TRANSMISSION
References


5. WHO. Consolidated guidelines on the use of antiretroviral drugs for treating and preventing HIV infection: recommendations for a public health approach, 2016. Pg. 120


26. CHAI and MOHCC in Zimbabwe, unpublished study; and RAPID-VL study in Uganda. clinicaltrials.gov ID: NCT03553693


