**Clinical Decision Support Requirements**

## Background and Description

We are currently rolling out a Bahmni based electronic medical record system to automate point of care processes in all facilities offering HIV Care treatment services in the country. Among the major advantages that the automation is targeted to provide is the enforcement of standardized clinical processes supporting currently adopted HIV Care & Treatment guidelines. The key objectives for implementing the Bahmni based electronic point of care solution are:

**Objectives**

1. Capture and use high quality client level longitudinal data for improved patient outcomes
2. Identify and track clients within and across sites through the 95-95-95 HIV care cascade
3. Produce accurate and timely data to inform progress towards epidemic control target; 95-95-95 HIV care cascade

## Clinical Decision Use Case

In line with the overarching objectives of the implementation, there is a requirement for the system to support clinicians with relevant clinical decisions based on the currently adopted clinical treatment guidelines. This requirement is mainly meant to support the effective and efficient scale up of the 90-90-90 targets for testing, treatment and viral load suppression. There are several health programs/services that require CDS support within the system namely: HIV Testing Services, PMTCT, HEI, PNC, ANC, TB, Cervical Cancer and ART.

## CDS Requirements

1. **Targeted Testing (for HTS module)** – through an alert message, the provider at the point of care should be prompted to offer testing service to the under listed patients.
	1. All patient diagnosed and/or on treatment for TB – HTS module should ensure that all patients with diagnosis for TB are tested for HIV.
	2. All pregnant women – HTS module should ensure that all pregnant women are appropriately and completely tested in the system
	3. All new infants – HTS module should be able to capture early infant diagnosis
2. **On Treatment (for Care & Treatment module)** – Clinical and Adherence Monitoring

Clinical assessment is used as the primary tool for monitoring HIV patients throughout the HIV care continuum. Clinical and adherence assessments should be done 2 weeks, 1 month, 3 months, and 6 months after ART initiation and at least every 6-12 months thereafter. More frequent clinical monitoring should be conducted for patients presenting with advanced HIV disease, those with poor ART adherence and/or treatment failure, pregnant and breastfeeding women, and HIV-infected children and adolescents.

***Fig. 1: Typical monitoring schedule for Patients on Antiretroviral Therapy***



**System Alerts Required**

* 1. Alerts to remind clinician to draw blood for various tests (CD4, FBC, ALT, VL, Hb, Urine, Creatinine etc.) for ART clients as well as HEI based on guidance from the ART treatment guidelines (see Fig 1.)
	2. Alerts to remind clinician to screen for Cervical Cancer for eligible women based on guidance from the ART treatment guidelines
	3. Alerts to remind clinician to capture intake information (both counselor and clinician forms)
		1. Data quality and completeness of recording for clients already on ART.
1. **Viral Load Testing (for Care & Treatment module)**

Viral load monitoring is now the preferred lab test for monitoring the success of ART and evaluation of treatment failure. Viral load should be measured 6 and 12 months after ART initiation and annually thereafter (see Fig. 1 & Fig. 2). The viral load usually decreases to undetectable levels in the blood (< 40 copies/ml) within six months of 95-105% adherence to ART. The viral load measurement is the most accurate method for assessing treatment failure. Any viral load ≥ 1000 copies/ml must stimulate a thorough review.

**Schedule for VL Alerts:**

* VL should be tested 6 and 12 months after initiating ART and then annually thereafter to detect treatment failure
* Pregnant and breastfeeding women and children <5 years should continue to have their VL checked every 6 months due to their higher risk of treatment failure
* VL should be checked 6 and 12 months after switching a patient to second line or third line ART and annually thereafter
* Every VL ≥ 1000 copies/ml should be followed up with a repeat VL approximately 8-12 weeks after initiating enhanced adherence counselling

***Fig. 2: Viral Load Testing Algorithm***

## Business Process Approach

Ideally the alerts should fire based on the stage the client is on along the relevant business process (and role of Provider) as they are receiving services at point of care. All conditions including those dictated by the clinical guidelines should be used as inputs to the CDS rules engine. As outputs the CDS rules engine should respond with the latest active and relevant guidelines for treating the patient. The Bahmni system should use this response, the type of alert and the priority of the alert for displaying the alert appropriately to the provider i.e. Pop-up messages, color-coded list widget on the patient dashboard, icon based alerts on patient queue OR detailed message module having an entire list of alerts with descriptions for the client. Below is an example of a process for ART clients coming for a follow up and drug refill visit with alerts for different providers at each service point.

### Routine ARV Drug Refill – VL Alert

Recent initiation OR Treatment Switch/Subs: Alert/Remind Blood draw (VL) visit type every six months in 1st year, then annually after



Alert/Remind ART Nurse (Consultation Room) to check VL Test Results for recent VL Blood Draw

Alert/Remind Nurse (Phlebotomy) that VL Blood draw required

## Sample Alerts on Bahmni Point of Care Solution

Patient Queue Flags



Pop-Up on Clinical dashboard Screen

