

The following information on CD4 counts at the KARA Counseling clinic is your last supplement on the CD4 count situation in Lusaka. To summarize, there are two main facilities in Lusaka where CD4 counts are available to the public (UTH and CIDRZ Kalingalinga facility) and one available to non-civilian military personnel. A fourth machine is also accessible to the public at KARA Counseling, a small, well-operated public clinic headed by Dr. Steve Gerrish. The clinic first obtained a CD4 count machine 18 months ago (Becton-Dickinson FACSCount) on lease from the manufacturer with the intention of providing laboratory services to private clinics and using the revenues to provide free services to the poor. About a year ago, CIDRZ, before they opened the Kalingalinga facility, started to fully fund the KARA clinic in exchange for access to the CD4 machine. Since then, CIDRZ has obtained two CD4 machines and only uses the KARA machine when their machines require servicing, but continues to fund the KARA clinic. Currently the KARA clinic is still providing CD4 counts for private clinics and their patients, running roughly 30 samples per day (on 300/day capacity!), of which 10-15 are for the private clinics.

Some logistical and clinical thoughts that will hopefully be useful for your thought process:

- 1) There are pros and cons to running diagnostic tests at a central location like the CIDRZ Kalingalinga facility. A central location allows for tighter control over patient information and consistency of test procedures, while lowering overall cost because the lab is operating at full capacity all the time. However, the major problem with a central location is the transport of samples (here you go engineers!) and keeping patients linked with their samples (bar codes or RFID anyone?), plus the turn-around time is considerably longer. In the KARA facility, patients can receive their CD4 data the next day (only because KARA collects samples during the day and runs them all at once at night), where as it take 1-2 weeks to get the results from CIDRZ.
- 2) When deciding which type of CD4 count technology is right for a specific clinic (rural vs. urban, public vs. private) you must consider the following design constraints, along with the machine cost and cost per test:
 - Sample preparation – how long does it take to prepare a sample, does it require a trained lab technician, and how long can the sample sit (both refrigeration and non-refrigeration) before being tested (hours or days)
 - Personnel requirements - how many samples are run at your facility in a day and what is the overall involvement required by trained staff. For example, designs like Guava and Dynabead, although labor intensive, are better for rural situations if there is a trained lab technician available because they typically will have more time than technicians in urban centers.
- 3) There are also clinical considerations surrounding CD4 counts in Lusaka.
 - The Zambian government follows the WHO staging for HIV/AIDS and ART, but are typically a few years behind in their guidance documentation (The ART group or your instructors have the latest guidance from the National AIDS Council in

- Zambia). The KARA Clinic uses the most up-to-date WHO staging guidelines, including CD4 count in stages I-III for initiating ART. However, beyond using CD4 data for initiating ART, Dr. Gerrish thinks too much emphasis is put on monitoring patients on ART with CD4 counts, rather than clinical signs (i.e. changes in weight). For example, CD4 count can experience short term (hours) fluctuations of 10-15% in both healthy and HIV/AIDS patients, but yet patients and clinicians will often base progress/regression solely on changes in CD4 count. This source of variation, coupled with the variation associated with sample collection, preparation, and analysis can be significant and clinical signs should not be ignored.
- Even though CD4 count information has improved his clinical care of HIV/AIDS patients, Dr. Gerrish feels that 80-90% of his HIV/AIDS patients can still be managed properly without CD4 count data. It is the 10-20% of patients that do not present with late stage AIDS, but have low CD4 counts, that really benefit from the diagnostic technology. Otherwise, these patients would have most likely would have fallen through the cracks.

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