Section 13. Laboratory Considerations

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This section contains information on the laboratory procedures performed in MTN-020.

13.1 Overview and General Guidance

As transmission of HIV and other infectious agents can occur through contact with contaminated needles, blood, blood products, and vaginal secretions, all study staff must take appropriate precautions when collecting and handling biological specimens. Sites must have appropriate written safety procedures in place before study initiation. Guidance on universal

precautions available from the US Centers for Disease Control can be found at the following website:

http://www.cdc.gov/ncidod/dhqp/bp_universal_precautions.html

Section Appendix 13-1 provides an overview of the laboratory testing locations, specimens, and methods for MTN-020. Laboratory procedures will be performed in study site clinics or laboratories, approved commercial laboratories and in the MTN Laboratory Center (LC), including the MTN Pharmacology Core (at Johns Hopkins University) and MTN Virology Core (at the University of Pittsburgh). Regardless of testing location, all study staff performing testing must be trained on proper testing methods and associated quality control (QC) procedures prior to performing the tests for study purposes; training documentation should be available for inspection at any time.

All site laboratories will be monitored by the MTN LC which will utilize information from DAIDS monitoring groups (pSMILE, IQA, VQA, etc.) to monitor and certify laboratories for testing. Please refer all questions related to laboratory testing to the MTN LC using the following email address: mtnnetworklab@mtnstopshiv.org.

In addition to the specimen guidelines provided in Section Appendix 13-1, laboratory processing guidelines are provided in Section Appendix 13-2. Although specimen collection volumes may vary somewhat across sites, all sites must ensure that collection volumes collected do not exceed the specifications of their study informed consent forms. The MTN LC may request details of specimen collection containers and volumes for purposes of assisting sites in meeting this requirement.

Ideally, one method, type of test kit, and/or combination of test kits will be used for each protocol specified test throughout the duration of the study. If for any reason a new or alternative method or kit must be used after study initiation, site laboratory staff must perform a validation study of the new method or test prior to changing methods. The MTN LC must be notified before the change and can provide further guidance on validation requirements. Similarly, the MTN LC must be notified when normal ranges are changed.

Provided in the remainder of this section is information intended to standardize laboratory procedures across sites. Adherence to the specifications of this section is essential to ensure that data derived from laboratory testing will be considered acceptable to all regulatory authorities across study sites. It should be noted however that this section is not intended to serve as an exhaustive procedures manual for all laboratory testing. This section must be supplemented with site standard operating procedures (SOPs) for specimen management, processing, and testing.

Notify the MTN LC if you need to send samples to a backup laboratory. Specify to the backup lab the kits which are to be used.

13.2 Specimen Labeling

All containers into which specimens are initially collected will be labeled with SCHARP-provided participant ID (PTID) labels. SCHARP will provide pre-printed labels or a template that can be used to generate labels. The specimen collection date should also be included on the label. If the date is handwritten, it should be written in indelible ink (such as a Sharpie pen).

When specimens are tested at the local lab, any additional labeling required for on-site specimen management and chain of custody will be performed in accordance with site SOPs.

The following specimens, which are stored for later off-site testing, will be entered into the Laboratory Data and Management System (LDMS) and labeled with LDMS-generated labels:

- Vaginal fluid slides for Gram stain evaluation at the MTN LC
- Self-collected vaginal fluid swabs for PK and biomarker testing at the MTN LC
- Endocervical swabs for biomarker evaluation at the MTN LC
- Plasma for storage for HIV testing and testing of study drug levels at the MTN LC
- Intra vaginal rings for residual drug analysis
- Cell Pellets if retained beyond HIV determination for potential future testing on participants who consent to long term storage.

Specimens that are tested locally do not need to be logged into LDMS or labeled with LDMS-generated labels.

13.3 Procedures for Specimens That Cannot be Evaluated

Specimen collection will be repeated (whenever possible) if it is found that specimens cannot be evaluated per site SOPs. Site clinic and laboratory staff will monitor specimen collection, processing, and management as part of ongoing quality assurance (QA) procedures and take action as needed to address any issues or problems.

13.4 Use of LDMS (Laboratory Data Management System)

Frontier Science Foundation (FSTRF) supports the LDMS program which is used to track storage and shipping of laboratory specimens. LDMS must be used at all sites to track the collection, storage, and shipment of the types of specimens listed in Section 13.2. Section Appendix 13-3 provides a guide for logging MTN-020 specimens into LDMS. Detailed instructions for use of LDMS are provided at https://www.fstrf.org/ldms (may require a password-contact FTSRF for a password).

All sites are required to maintain the current version of LDMS and monitor updates relating to use of the LDMS. Sites should update LDMS within 3 weeks of the version being available unless there extenuating circumstances. It is crucial to be aware of proper label formats to ensure that specimens are correctly labeled. All sites must routinely back up their LDMS data locally (frequency determined by site) and export their data to FSTRF at least weekly.

Questions related to use of LDMS in MTN-020 may be directed to Edward Livant or LDMS Technical (User) Support. Usual business hours for LDMS User Support are 7:30 am - 6:00 pm (US ET) on Monday and Fridays and 7:30 am - 8:00 pm (US ET) on Tuesdays, Wednesdays, and Thursdays. During business hours, please contact LDMS User Support as follows:

Email: ldmshelp@fstrf.org
Phone: +001 716-834-0900, ext 7311
Fax: +001 716-898-7711

Each site must export its LDMS data to Frontier Science (FSTRF) on a weekly basis. Exported data are used by the MTN Statistical and Data Management Center (SDMC) to generate a monthly specimen repository report and to reconcile data entered in LDMS with data entered on study case report forms (CRFs), check for errors in LDMS codes, and ensure storage information is entered for archive specimens. Any issues identified during the

reconciliation are included in a monthly discrepancy report for each site. Sites are expected to resolve all issues within two weeks of receipt of the report. The MTN LC is responsible for reminding sites to adhere to the two week timeframe and for following up with sites that do not resolve discrepancies within two weeks.

The MTN SDMC reviews the reconciliation reports for critical samples (e.g., plasma needed for confirmatory HIV testing) that appear to be missing, and works with the LC and site staff to undertake appropriate corrective action. All corrective action should be documented in paper-based clinic and/or laboratory records as appropriate, and entered in the details section of LDMS. The LC and SDMC will discuss and document any items that, although resolved, appear 'irresolvable in LDMS'.

Sites are encouraged to have a weekly QC of LDMS data versus CRF data to correct discrepancies before they make it to the LDMS reconciliation reports.

Sites may use LDMS to track samples for local testing but these samples must be marked as "never store" in LDMS or they may appear on the LDMS reconciliation reports.

MTN-020 will require the use of the "Other Spec ID" field for plasma storage. See Section 13.7.6 and Appendix 13-3 for details.

13.5 Documentation

Each lab test must have a defined source document that is the first place the result is recorded or generated; this must be described in an SOP There must be quality control systems in place to ensure that results transcribed from source documents agree with reports going to clinics. Other laboratory records such as quality control results and calibrations should also be treated as source documents. Site labs will have a plan for the storage of these documents so that they are easily retrievable for auditors and network oversight visits.

In most cases, lab results will be recorded from source document to CRF without any unit conversion. If unit conversion is required from source document to CRF, this must be automated and cannot be done manually. Contact the management team at mtn020mgmt@mtnstopshiv.org if you have questions.

13.6 Urine Testing

The urine tests performed at each study visit will depend on the time point of the visit and the clinical presentation of the participant. In general, at study visits when urine testing is required, a single specimen will be collected and then aliquots will be made for each test when possible. When doing multiple tests from one specimen, an aliquot of urine should first be obtained for pregnancy testing and the remaining specimen should be reserved for chlamydia and gonorrhea testing. Collect urine specimens before collecting any pelvic specimens. Heavy menses may interfere with dipstick and pregnancy tests – sites should use discretion and contact the MTN LC if there are questions.

13.6.1 Specimen Collection

- The participant should not have urinated within one hour prior to urine collection.
- Provide the participant with a sterile, plastic, preservative-free screw-top urine collection cup labeled with a SCHARP-provided PTID label.
- Instruct the participant to:

- Not clean the labia prior to specimen collection.
- Collect the first 15 to 60 mL of voided urine (not mid-stream).
- Screw the lid tightly onto the cup after collection.

- Note: only in situations where there is no NAAT testing and a clinician suspects a urinary tract infection, specimens may be collected per local specifications such as mid-stream clean catch.
- At visits when pregnancy testing is required, aliquot 5 to 10 mL for these tests and store the remaining urine at 2°C to 8°C or transfer the urine immediately into the Urine Preservation Tube (UPT) for subsequent chlamydia and gonorrhea testing.

13.6.2 Pregnancy Testing

At visits when pregnancy testing is required, aliquot approximately 5 to 10 mL of urine from the specimen collection cup and pipette from this aliquot for pregnancy testing. If the urine pregnancy test cannot adequately be interpreted because of interfering factors, for example excess blood or extreme cloudiness due to amorphous material, the sample can be spun down and the urine supernatant can be used. If the test continues to have interferences such as gross hemolysis making the test difficult to read, then another urine sample will need to be collected.

Either the Quidel QuickVue One-Step urine hCG or Quidel Quick Vue Combo urine and serum hCG pregnancy test must be used at all sites. Perform the test according to site SOPs and the package insert. Do not perform any other urine pregnancy tests for confirmatory purposes.

The urine only kit and the combo kit are different kits and have different CAP method codes for EQA panels. If sites are running both kits, they must run CAP EQA panels on both kits. In most cases, the CAP results forms will only allow for entry of one kit. Sites can generally submit results to CAP for one kit and do a self-evaluation for the other kit. Consult SMILE, MTN LC or your PNL in case of questions regarding your EQA panels.

13.6.3 Chlamydia and Gonorrhea Testing

This testing will be done using the Becton Dickenson (BD) Probe Tec strand displacement assay (SDA) or other NAAT as approved by the MTN LC. Sites will perform the testing per site SOPs and the package insert.

BD Probe Tec Specimen Stability:

- Neat (unpreserved):
  - 2 to 30°C: 30 hours
  - 2 to 8°C: 7 days
  - ≤ -20°C: 2 months
- In Urine Preservation Tubes at 2-30°C:
  - 30 days (used generally when shipping required)
- Lysed Specimens:
  - 18 to 30°C: 6 hours
  - 2 to 8°C: 5 days (must re-vortex and re-lyse)
  - ≤ -20°C: 98 days (must be thawed to room temperature, re-vortexed and re-lysed)

Contact the MTN LC for approval to use alternative CG/CT NAAT methods.

13.6.4 Urine Culture

Perform urine culture per local standard of care if ordered by clinician for clinical indications.

13.7 Blood Testing

The blood tests performed at each study visit will depend on the time point of the visit and the clinical presentation of the participant. Perform all tests according to site SOPs and package inserts.

13.7.1 Specimen Collection and Initial Processing

Sites must have processes in place to avoid specimen labeling errors. The MTN strongly recommends that specimens not be labeled in advance of collection. Specimen labeling must occur immediately at the time of collection. Participant Identification must be re-established each time a specimen is collected.

Label all required tubes with a SCHARP-provided PTID label at the time of collection. After collection complete the following:

- Allow plain tubes (non-additive tubes or serum separator tubes are used) to clot, then centrifuge per site SOPs to yield serum. Serum may be used for tests such as chemistry or syphilis serology as defined in local testing SOP.
- Gently invert EDTA at least eight times after specimen collection to prevent clotting. If whole blood and plasma are to be taken from the same tube, the whole blood testing must be completed before the tube is centrifuged and plasma aliquots are made. If whole blood is to be used for multiple tests, ensure that the tube is well mixed before removing any specimen.

13.7.2 HIV Testing

Plasma, whole blood and/or serum will be tested for HIV using tests that have been validated at the study site. At all sites, HIV infection status will be assessed per the testing algorithms in protocol Appendices II and III; these algorithms are also provided in SSP Appendix 13-4. When performing Western blot (WB) testing, all sites must use the FDA-approved Genetic Systems WB test manufactured by Bio-Rad Laboratories.

All HIV tests will be performed according to test kit package inserts and site SOPs. All tests, and associated QC procedures, must be documented on local laboratory log sheets or other laboratory source documents. These documents must capture the start and end/read times of each test. A second independent clinic or laboratory staff member trained in proper HIV testing and result recording procedures must review, verify, and sign-off on test results within the specified timeframes and prior to disclosure of results to participants; this documentation must include the read time for the second checker.

Send all HIV testing queries and algorithm related notifications to mtnvirology@mtnstopshiv.org using the MTN Network Lab HIV Query Form (Appendix 13-5).

SCREENING/ENROLLMENT

Sites will use two rapid HIV tests at screening. At least one of the rapid tests must be FDA approved.

If both rapids are negative, the participant will be considered HIV-uninfected. If both are positive, the participant will be considered HIV-infected.

If the rapid tests are discordant, i.e., one rapid test is positive and one is negative, inform the MTN LC for follow up by submitting a query form (Appendix 13-5) to mtnvirology@mtnstopshiv.org . The participant will not be eligible for enrollment at this time.

FOLLOW UP

During follow up, sites will use two rapid HIV tests. At least one of the rapid tests must be FDA approved.

If the rapid tests are negative, the participant will be considered HIV-uninfected. If the rapid test(s) are positive, the Genetic Systems FDA-approved WB will be performed from a separate blood draw which is collected on the same day. With this sample, the site will also collect blood for CD4, RNA viral load and plasma storage. If the site is unable to collect the sample because the participant is unwilling or other reason, they should try to recall the participant as soon as possible.

SCHARP will send the LC monthly reports of discordant rapids encountered during follow up. The LC will monitor these reports and may request kit lot information from sites. The LC will provide technical guidance for discordant rapids as requested by the sites. Regardless, WB testing, CD4, and HIV RNA viral load at the local lab should proceed immediately upon identification of at least one positive rapid test result. Do not wait for MTN approval to proceed to WB, CD4, and HIV RNA viral load.

If the WB is positive, HIV infection is considered confirmed for study purposes per the algorithm.

If the WB is negative or indeterminate, use the results of the HIV RNA viral load to determine the need for further testing. A viral load result above the limit of detection will be considered positive and the Western Blot will be repeated on a new sample taken approximately 1 month later for confirmation. A viral load result below the limit of detection will be considered negative; based on this result, the participant will be considered HIV-uninfected.

When collecting blood to repeat Western Blots, even though seroconversion is not yet confirmed at this point, collect additional blood for post seroconversion sample testing (CD4, RNA and plasma storage) along with the repeat Western Blot. Testing for the RNA and CD4 should proceed immediately.

HIV DNA testing will only be used in circumstances where HIV infection status cannot be determined from WB and HIV RNA viral load results (for example, if WB is indeterminate with one major band such as p24, and HIV RNA viral load is undetectable). Consult MTN LC before collecting cell pellets for HIV DNA.

When a DNA and RNA are performed together:

- If the DNA is negative and the RNA is undetectable, the HIV status will be considered negative for the algorithm; based on this result, the participant will be considered HIV-uninfected
- If the DNA is positive and the RNA is above the level of detection, the Western Blot will be repeated after approximately 1 month.

- If the RNA and DNA are discordant, the Western Blot will be repeated after approximately 1 month.

Additional information on cell pellets:

- Sites can store the cell pellets for participants who have positive rapids in follow up before knowing if they will be needed for the algorithm. This is not a requirement but is suggested if it will not disrupt study processes.
- After the participant's serostatus is determined, the sample may only be retained if the participant has signed the long-term storage informed consent document. If the participant has not consented to long-term storage, the sample must be destroyed (or designated for destruction) once serostatus is determined. Sites will need to have a system to track IC status in place.
- HIV DNA testing will be done for the algorithm only as directed by the MTN LC.
- For participants who consent to long term storage, you may retain the samples past the end of the study. No additional testing can be done on these samples without proper authorizations from MTN and your in-country ethics committees.

Kit inventories should be monitored closely and re-supply orders placed at least 8-12 weeks in advance of actual need (or longer if needed per site procurement policies and procedures). Notify the MTN LC immediately if any kit inventory or quality control problems are identified, so that appropriate action can be taken.

13.7.3 Syphilis Testing

Syphilis testing will be performed using a rapid plasma reagin (RPR) screening test followed by a confirmatory microhemagglutinin assay for *Treponema pallidum* (MHA-TP) or *Treponema pallidum* haemagglutination assay (TPHA) for reactive samples.

Any RPR, MHA-TP, and TPHA test may be used at each study site; however, titers must be obtained and reported for all positive RPR tests. RPR tests may be performed on either serum or plasma. MHA-TP and TPHA tests must be performed on serum. All testing and QC procedures must be performed and documented in accordance with study site SOPs.

For reactive RPR tests observed during screening, a confirmatory test (MHA-TP or TPHA) result must be received and appropriate clinical management action taken prior to enrollment in the study (see SSP section 10.7.1). Clinical management should include repeat RPR tests semi-annually following syphilis diagnosis to confirm treatment effectiveness. If the RPR titer does not decrease four-fold or revert to sero-negative within six months after treatment, the PSRT should be consulted for further management and to determine if an Adverse Event has occurred (see SSP section 10.7.3). Please consult the MTN-020 Protocol Safety Review Team (PSRT) with any questions related to syphilis testing to confirm treatment effectiveness and/or interpretation of unusual test results. Questions related to result interpretation vis-à-vis eligibility and enrollment in the study should also be directed to the PSRT MTN020psrt@mtnstopshiv.org.

13.7.4 Hematology Testing

Complete blood counts with five-part differentials will be performed at all sites. Each of the following must be analyzed and reported:

- Hemoglobin
- Hematocrit
- Mean Corpuscular Volume
- Platelets

- White blood cell count with differential
  - Absolute neutrophil count
  - Absolute lymphocyte count
  - Absolute monocyte count
  - Absolute eosinophil count
  - Absolute basophil count

These tests will be performed on EDTA whole blood per local site SOPs.

13.7.5 Serum Chemistries

The following chemistry tests will be performed on serum per local SOPs:
- Aspartate aminotransferase (AST)
- Alanine transaminase (ALT)
- Creatinine

13.7.6 Plasma Storage

Note: in MTN-020, the term "plasma archive" will only be used for enrollment storage for endpoint determination.

For plasma storage, use whole blood collected in EDTA tubes. If the blood is held at room temperature, plasma must be processed and frozen within 4 hours of collection. If the blood is kept refrigerated or placed on ice, plasma must be processed and frozen within 24 hours of collection. Plasma should be stored frozen on site ≤ -70°C until requested for shipping and/or testing by the MTN LC.

There are three situations that require plasma specimen storage:

Table 13-1
Volume Guide for Plasma Storage

Plasma Specimen	Draw volume	Minimum Plasma Required
Enrollment archive; Routine storage (quarterly, semi-annual, annual, PUEV, Termination Visit)	~10 mL	4 mL
Follow-up HIV testing algorithm Storage	~15 mL	6 mL
Post-seroconversion Months 1, 3, 6 and every 6 months thereafter	~15 mL	6 mL

To simplify shipping procedures, MTN-020 will identify four types of specimen storage in LDMS in the "other SPEC ID" field. For sites using the LDMS tracking sheets (Appendix 13-6), this will identified on that form. For sites not using the LDMS tracking sheets, a mechanism will be required for the clinic to relay the type of archive to the LDMS laboratory.

The sites will enter "EPA" for Enrollment Plasma Archive, "RPS" for Routine Plasma Storage, "CON" for HIV Seroconversion Confirmation Plasma, and "SER" for Seroconverter Plasma. The "other SPEC ID" field is free text and the three letter codes will need to be entered exactly. This information will be tracked in the LDMS reconciliations and will show a discrepancy if the information in LDMS does not match the information recorded on the CRF. (See Appendix 13-3)

For all three types of plasma listed in Table 13-1:

- If the minimum volume specified in Table 13-1 is not obtained, notify the MTN LC.
- Use LDMS to label and track all aliquots.
- Store all aliquots frozen on site ≤ -70°C.
- The MTN LC will send instructions when shipping and/or testing is required.
- If samples are hemolysed, store the aliquots as per normal and enter comments in LDMS.

For routine plasma storage, standard processing per site SOPs should be performed.

Spin blood at room temperature in a centrifuge according to either one of these techniques:

- Single spun: Spin blood at 1200-1500 RCF (g-force) for 10 minutes, remove plasma.
- Double spun: Spin blood at 800 g for 10 minutes, place plasma in a tube to spin again at 800 g for 10 minutes, remove plasma.

Plasma must be stored in 1 ml aliquots. Prepare as many 1 mL aliquots as possible.

Plasma storage is allowable in the protocol at any visit after enrollment "as indicated". Any positive HIV test results after enrollment should be considered an indication for plasma storage. Sites are encouraged to store plasma for any post enrollment positive HIV result.

Short draws / missed collections:

- In these situations, if the sample is an enrollment, HIV endpoint related, or PUEV, the participant should be called back to obtain the required amount of plasma. Notify the LC but do not wait for a response to recall the participant.

- If routine quarterly plasma storage is missed, notify the LC and collect it at the next regularly scheduled visit. (Example: Month 3 collection is missed; sample is collected at Month 4.)

- If routine quarterly plasma storage is short but at least 1 mL stored, notify the LC and collect it at the next quarterly visit. (Example: Month 3 collection is 2 ml; sample is collected at Month 6.)

Leftover Specimens: Leftover specimens may be temporarily stored for site QA purposes and problem resolution for all participants. This process must be described in an SOP or on-site policy that indicates how long the samples will be stored. Local guidelines and regulations must be followed in these situations. Only specimens from participants who have consented to long-term storage may be stored longer for future research. Sites that save these specimens for long-term storage must have a plan to identify which participants have consented to this. Contact the management team for assistance as needed.

Procedures for plasma storage when a participant has discordant or positive rapids at a visit where routine plasma storage is also required (Quarterly, Semi-Annual, Annual, PUEV, and Termination Visits):

For sites conducting venipuncture for HIV rapid testing:
1. Store a minimum of 4 mL of plasma with the LDMS code "RPS" from the first collection where specimen was drawn for rapid HIV tests.
2. Once HIV rapid test results are available, collect and store an additional minimum of 6 mL of plasma with the LDMS code "CON". Use this specimen for HIV Western Blot, HIV viral load. CD4 testing is also done on whole blood from this draw.
3. The total minimum plasma stored in this situation is now 10 mL.

For sites conducting Fingerstick HIV rapid testing:

1. Once the fingerstick HIV rapid test results are available, collect and store 6 mL of plasma with the code "CON" in LDMS. Use this specimen for HIV Western Blot, HIV viral RNA. CD4 testing is also done on whole blood from this draw.
2. The total minimum plasma stored will remain 6 mL. You do not need to draw a separate tube for routine plasma storage.
3. On the SS-1 CRF, mark "not required" for item 3 and in the comments at the bottom add a note that item 3 not required due to HIV confirmatory plasma storage.

13.7.7 CD4+ T Cell Count

CD4+ T cell counts are only performed for participants in conjunction with the follow-up HIV testing algorithm and during post-seroconversion follow up, if applicable, per protocol Section 7.6.1.

Site laboratories will test EDTA whole blood by flow cytometry for absolute CD4+ T cell counts per local SOPs. Testing will be performed on FDA approved instruments per site SOPs and package inserts. Sites must participate in United Kingdom External Quality Assurance (UKNEQAS) programs and be approved by the Immunology Quality Assurance (IQA) group to perform this testing.

13.7.8 HIV RNA PCR

HIV RNA PCR (viral load) testing is only performed for participants in the follow-up HIV testing algorithm, and during post-seroconversion follow up, if applicable, per protocol Section 7.6.1.

All sites will participate in the Viral Quality Assurance (VQA) program. HIV RNA viral loads will be performed on EDTA plasma using methods approved by the MTN LC. All testing will be performed according to site SOPs and package inserts.

13.7.9 HIV DNA PCR

HIV DNA will only be used in circumstances where HIV infection status cannot be determined from WB and HIV RNA viral load results (for example, if WB is indeterminate with one major band such as p24, and HIV RNA viral load is undetectable). Consult MTN LC before collecting cell pellets for HIV DNA.

Additional information on cell pellets:

- Sites can store the pellets for participants who have positive rapids in follow up before knowing if they will be needed for the algorithm. This not a requirement but suggested if it will not disrupt study processes.
- After the participant's serostatus is determined the sample may only be retained if the participant has signed the long-term storage informed consent document. If the participant has not consented to long-term storage, the sample must be destroyed (or designated for destruction) once serostatus is determined. Sites will need to have a system to track IC status in place.
- HIV DNA testing will be done for the algorithm only as directed by the LC.

For participants who consent to long term storage, you may retain the samples past the end of the study. No additional testing can be done on these samples without proper authorizations from MTN and your in-country ethics committee.

13.8 Testing of Vaginal and Cervical Specimens

Collect urine specimens before pelvic specimens. Refer to the current Pelvic Exam checklist in Section 7 of this manual for further information on the required sequence of specimen collection and diagnostic procedures to be performed during scheduled pelvic exams.

13.8.1 Vaginal pH

Note that pH Indicator Strips (pH range 3.6 to 6.1) from Machery-Nagel (92130), Baker (4394-01), or SP/Cardinal Health (P1119-22) must be used unless other strips are approved by the MTN LC.

- During all scheduled pelvic examinations, vaginal fluids are collected via swab and then swabbed onto the pH strip. Avoid contact with cervical mucus, which has a higher pH.
- Match the resulting color of the indicator strip to the color scale provided with the strips to determine the pH value.
- Record the pH value directly onto the appropriate case report form or designated source document (per site SOPs). It is not necessary to record pH values onto laboratory log sheets prior to recording values onto the designated source document.

13.8.2 Wet Mount for Candidiasis and BV

Wet mount testing for candidiasis and BV is only done when clinically indicated.

Wet mount procedures for this study consist of two different preparations —saline prep and potassium hydroxide (KOH) prep —for diagnosis of bacterial vaginosis, and candidiasis. Trichomoniasis may also be observed on saline wet mounts.

Prior to site activation and throughout the study, MTN LC requires semi-annual wet mount proficiency testing and administers a web-based proficiency test approximately every six months. The MTN LC will post wet mount slides on the MTN website for this purpose every 6 months; results will be entered directly on the website (contact: Lorna Rabe: lrabe@mwri.magee.edu). The MTN LC will report results back to the Laboratory Manager and also specify any corrective action that may be needed based on the results. Contact the MTN LC for additional information and guidance on performing and documenting the proficiency testing. Also contact the MTN LC when new laboratory staff is hired, so that appropriate training can take place prior to such staff performing wet mounts for study purposes.

Wet mount results are recorded directly onto appropriate case report forms, laboratory log sheets or other laboratory source documents as specified in site SOPs.

Prepare wet mount slides according to study site SOPs as follows:

Non-immediate wet mount examination in laboratory:

- Immediately following collection of vaginal fluid from the lateral vaginal wall via swab, place the swab in a glass or plastic tube with approximately six drops (100 µL) sterile physiologic saline. Snap off the shaft of the swab and cap the tube.
- Deliver the tube to the laboratory for testing for immediate examination.
- Use a pencil to write the PTID and specimen collection date on one side of the frosted end of two microscope slides (one for KOH and one for clue cells). Affix a SCHARP-provided PTID label to the other side of the slides (on the frosted end, under the pencil

markings) and write the specimen collection date in indelible ink (e.g. Sharpie pen) on each label.

- Remove the swab from the saline and smear vaginal fluid specimens onto each slide.
- Apply one drop of 10% KOH to one slide and immediately perform whiff test for a "fishy" amine odor. Then apply cover slip and allow a couple minutes for the bacteria and epithelial cells to lyse before reading.
- Apply one drop of sterile physiologic saline to the second slide, emulsify with the vaginal fluid specimen, and then apply coverslip. Examine immediately at 10X magnification for epithelial cells, budding yeast, and pseudohyphae. Examine at 40X magnification to determine whether observed epithelial cells are clue cells and quantitate the cells. Clue cells are irregularly bordered squamous epithelial cells that are completely covered with bacteria (*Gardnerella vaginalis*). Clue cells must comprise at least 20% of the observed epithelial cells for the saline prep to be considered positive for clue cells.
- Examine the KOH slide at both 10X and 40X magnification for yeast and pseudohyphae.
- Note: if motile trichomonads are noted on the saline wet prep, these can be reported to the clinician. If Trichomonas vaginalis is seen on the wet mount but the OSOM Rapid Trichomonas test is negative, report as positive by wet mount only

13.8.3 Rapid Test for Trichomoniasis

This testing will be done using the OSOM Rapid Trichomonas test with vaginal swabs per site SOPs approved by the MTN LC. The kit provides Dacron swabs for this test.

- Affix a SCHARP-provided PTID label to a clean glass or plastic tube with a cap.
- Collect specimen using kit-provided swab from the lateral vaginal wall (fluids also may be collected from the posterior fornix; avoid collecting specimens from the cervix).
- Immediately place the swab in the labeled tube, break off the shaft of the swab, and cap the tube.
- Testing is expected to be performed during the participant visit. However, specimens may be stored at room temperature for 24 hours or refrigerated for 36 hours before testing.

13.8.4 Vaginal Gram Stain

Dried vaginal fluid smears will be prepared for Gram staining and assessment for bacterial vaginosis at the MTN LC. Two slides will be prepared at each required time point and both will be entered into LDMS. One will be shipped to the MTN LC and the other will be archived on site until written notification is received from the MTN SDMC that the slide may be discarded.

Gram stains are taken during screening. Samples from confirmed screening failures are to be destroyed without notification from the LC. These samples must not remain in LDMS after confirmation of screening failure and cannot be shipped.

Instructions for slide preparation and shipping are provided below.

- Use a pencil to write the PTID and specimen collection date on one side of the frosted end of one microscope slide. Affix a SCHARP-provided PTID label to the other side of the slides (on the frosted end, under the pencil markings) and write the specimen collection date in indelible ink (e.g. Sharpie pen) on each label.

- Immediately following specimen collection from the lateral vaginal wall via swab, roll the swab across each of the slide. Do not place the swab in saline, transport medium, or any transport container prior to slide preparation.

- Allow the specimens to air-dry on the slides. Do not heat-fix.

- Deliver the slides and an LDMS Specimen Tracking Sheet to the local LDMS laboratory.

- Using the LDMS Specimen Tracking Sheet, log the slides into LDMS (specimen type = VAG) and label the slides with LDMS labels. Place the LDMS label on the frosted end of the slide, on the opposite side of the slide from the SCHARP-provided label, on top of the pencil markings.

- Store both slides in the slide box locations assigned in LDMS at room temperature.

- Smears from the Chatsworth, Umkomaas, Botha's Hill, Verulam, Tongaat, and Isipingo, Cape Town, eThekwini, and WRHI sites will be read by the MRC Durban laboratory. A percentage of these slides will be sent to the MTN NL for quality assurance.

- The laboratory will be notified by either the Durban MRC lab or the MTN LC to ship one of the two slides collected for each participant and visit.

- The duplicate slide will be archived on site until written notification is received from the MTN SDMC that the slide may be discarded.

- When shipping slides, place some paper towels in the slide boxes to stabilize the slides. The slides should not move if you shake the box gently.

Instructions for shipping slides to MTN LC (Uganda, Zimbabwe, and Malawi sites only)
Prepare a LDMS shipping manifest.

Ship to:
Lorna Rabe
Magee-Womens Research Institute
204 Craft Ave, Room A530
Pittsburgh, PA, 15213
USA
Phone: 412-641-6042
e-mail address: lrabe@mwri.magee.edu

Instructions for shipping slides to the Durban MRC laboratory (eThekwini, Cape Town, WRHI, Chatsworth, Umkomaas, Botha's Hill, Verulam, Tongaat, and Isipingo sites only)

The MRC lab will contact the sites with instructions for transporting the slides and LDMS shipping manifest.

13.8.5 Papanicolaou (Pap) Test

Pap smears will be performed at all sites. At visits when Pap smears are required, ecto- and endocervical cells will be collected after all tissues have been visually inspected and all other required specimens have been collected. Specimen collection, slide preparation, slide interpretation, and QC procedures must be performed and documented in accordance with study site SOPs. There is no required external review of these procedures by the MTN.

At some study sites, Pap smear results may include notations of findings associated with certain STIs (e.g., trichomoniasis). Because Pap smear methods are not adequately sensitive and specific for STIs (including HPV), Pap smear findings associated with STIs should not be used to diagnose any STIs (see SSP section 10.7.2 for how to handle incidental findings of STI/RTIs on Pap smears).

13.8.6 Self-Administered Vaginal Swabs for PK and biomarker testing

At all scheduled follow-up visits, vaginal fluids are self-collected from the posterior fornix using a Dacron swab with a plastic shaft for analysis at the MTN LC. After approval of LoA#2, these swabs are also collected during the enrollment visit.

- Refer to the current version of Section 10 of the SSP for specimen collection procedures.
- Place the swab in an empty labeled cryovial with no preservative and cap the vial.
- Deliver the tube and an LDMS Specimen Tracking Sheet to the local LDMS laboratory.
- Using the LDMS Tracking Sheet, log the cryovial into LDMS (specimen type = VAG. See Section Appendix 13-3 for LDMS for additive codes) and label the vial with a LDMS label.
- Freeze at ≤ -70°C within 8 hours of collection.

13.8.7 Endocervical Swabs for Biomarker Analysis

At each scheduled pelvic exam, endocervical cells will be collected using a Dacron swab with plastic shaft for biomarker analysis at the MTN LC.

Endocervical swabs are taken during screening. Samples from confirmed screening failures are to be destroyed without notification from the LC. These samples must not remain in LDMS after confirmation of screening failure and cannot be shipped.

- Remove cervical mucus (if present) with a large swab to expose the cell layer (discard swab).
- Collect endocervical secretions by inserting a Dacron swab approximately 1 cm into the endocervical canal and rotating two full turns.
- Withdraw the swab, place it in a labeled cryovial containing 400 µL PBS (1X Concentration), break off swab shaft, and cap the vial.
- Deliver the tube and an LDMS Specimen Tracking Sheet to the local LDMS laboratory within 8 hours.
- Using the LDMS Tracking Sheet, log the cryovial into LDMS (specimen type = CXS. See Section Appendix 13-3 for LDMS for additive and derivative codes) and label the vial with a LDMS label.
- Freeze at ≤ -70°C within 8 hours of collection.

13.8.8 Intra-Vaginal Ring Storage

Once your site has full regulatory approval, all returned used rings will be stored in the laboratory.

The key outcome of this process is storing a dry ring to prevent microbial growth on the ring.

Procedure:

1. Retrieve the ring from the participant.
    a. The participant may submit the ring in a bag.
    b. The ring may be placed in a temporary bag if not being rinsed immediately.
    c. In any situation, the bag must be labeled with PTID and date. Care must be taken to not misidentify rings during processing.
    d. If a participant returns 2 rings at 1 study visit
        i. Store both rings
        ii. Affix the SCHARP label to each ring pouch, and record on the label the PTID, date and visit code from the visit when the rings were collected.
        iii. Also, if possible, label each ring with the visit month/code of the visit when the ring was expected to be returned, based on when it was inserted.
    e. Transport the ring at room temperature.

2. Rinse the ring in water.
    a. If not processing in a biological safety hood the person should wear protective eye wear, lab coat or gown, and gloves when rinsing. Do not rinse in a sink because the ring is covered with potentially infectious material.
    b. To prevent aerosols place the ring in a disposable container with tap water, swirl the ring gently, remove and blot dry with disposable paper towels.
    c. Discard the towels with other biohazardous material. Decontaminate the water used for rinsing before discarding per local guidelines for biohazard waste disposal. Decontaminate the area used to process the ring.
    d. Do not use any soaps, cleaners or chemicals to rinse the ring. Use only tap water.
3. Place the ring in a new unused bag.
4. Affix a SCHARP label to the bag with PTID, visit code and date.
5. Enter the ring in LDMS using the codes in Appendix 13-3.
    a. If a participant returns 2 rings at 1 study visit
        i. Enter both rings in LDMS. Note that two rings were returned at the visit in the specimen comments field in LDMS. For example, “Two rings were stored at this visit.” The comments will appear on the shipping manifest.
        ii. The Visit Month/Code should be entered in the other specimen ID field in LDMS. If the visit month of the additional ring(s) is unknown, enter “unknown” in the other specimen ID field.
6. Store the ring at room temperature.
7. The LC will provide shipping instructions at the time of shipping request.

13.8.9 Herpes Lesion Testing

When ordered by a clinician because of clinical indications perform herpes lesion testing per local standard of care. If Herpes lesion testing is not local standard of care, it is not required for the protocol.

Section Appendix 13-1
Overview of Laboratory Testing Locations, Specimens, and Methods for MTN-020

Assay	Testing Location	Specimen Type	Tube/Container	Kit/Method
Urine Pregnancy Test	Clinic/Local Lab	Urine	Plastic screw top cup	Quidel Quick Vue
Urine SDA for Gonorrhea and Chlamydia (neat method)	Local, Regional, or MTN Network Lab	Urine	Plastic screw top cup	BD Probetec or LC approved alternative method
Urine Culture	Local Lab	Urine	Plastic screw top cup	Not specified
HIV Rapid Tests	Clinic/Local Lab	Plasma, Whole Blood, Or Serum	EDTA or plain tube	At least one FDA approved test
HIV Western Blot	Local Lab	Plasma, Whole Blood, Or Serum	EDTA or plain tube	FDA approved Genetic Systems WB
Complete Blood Count	Local Lab	Whole Blood	EDTA tube	Not specified
Chemistries (AST, ALT, Creatinine)	Local Lab	Serum	Plain or serum separator tube	Not specified
Syphilis Serology	Local Lab	Serum or Plasma	EDTA, plain or serum separator tube	Not specified
CD4+ T Cell Count*	Local Lab	Whole Blood	EDTA tube	Not specified
HIV-1 RNA PCR*	Local Lab	Plasma	EDTA tube	Approved method
Plasma	Stored at Local Lab	Plasma	EDTA tube	N/A
Pap Smear	Local Lab	Ecto- and Endocervical Cells	Slides	Not specified
Vaginal pH	Clinic	Vaginal Fluid Swab	Swab	pH strips range 3.6 to 6.1
Vaginal wet preparation	Clinic/Local Lab	Vaginal Fluid Swab	sterile tube	Microscopy
Trichomonas Rapid Test	Clinic/Local Lab	Vaginal Fluid Swab	Plastic Tube	OSOM Rapid Test
Herpes Lesion Testing	Local Lab	Swab	Locally Defined	Locally Defined
Vaginal Gram Stain	Stored at Local Lab	Vaginal Fluid Swab	Slides	MTN LC procedure
Vaginal/Endocervical Swabs	Stored at Local Lab	Vaginal/Endocervical Swabs	Cryovial	MTN LC procedure
Residual Drug Analysis	Stored at Local Lab	Vaginal ring	Biohazard Bags	MTN LC procedure

***** These tests are only done for participants who have positive HIV rapid tests in the follow-up HIV testing algorithm and for post seroconversion follow up when applicable.

Section Appendix 13-2
MTN-020 LAB SPECIMEN PROCESSING GUIDELINES — PELVIC AND URINE SPECIMENS

Assay	Primary Specimen	Additive/Container	Minimum Volume	Testing Specifications	Handling Requirements
SDA for GC/CT	Urine	Sterile Urine Container- No additive	15 mL	Batched per local discretion	Specimen Stability: • Neat: o 2-30°C: 30 hours o 2-8°C: 7 days o ≤ -20°C: 2 months • Lysed Specimens: o 18-30°C: 6 hours o 2-8°C: 5 days (must re-vortex and re-lyse) o ≤ -20°C: 98 days (must be thawed to room temperature, re-vortexed and re-lysed) • UPT tubes: 30 days at 2-30°C
hCG	Urine	Urine Container- No additive	5 mL	Locally in real time	Room temp-test within 8 hours Refrigerate-test within 72 hours
Pap Smear	Cervical Cells	Slide	N/A	Locally in real time	Locally Defined
Vaginal pH	Vaginal Fluid	None-performed at bedside	N/A	Locally in real time	Done immediately at bedside
Wet Mount	Vaginal Fluid Swab	Saline if testing delayed	N/A	Locally in real time	Done immediately if a microscope is in the clinic or within 8 hours if the specimen must be transported to the lab.
Trichomonas Rapid Test	Vaginal Fluid Swab	Plastic Tube	N/A	Locally in real time	Test within24 hours at room temperature; 36 hours if refrigerated or frozen
Vaginal Gram Stain	Vaginal Fluid Swab	Slide	N/A	Stored locally for shipment	Room temperature
Vaginal Swabs	Vaginal Fluid Swab	Cryovial	N/A	Stored locally for shipment	Freeze within 8 hours
Endocervical swabs	Endocervical swabs	Cryovial with 400 µL PBS	N/A	Stored locally for shipment	Freeze within 8 hours
Herpes lesion testing	Swab	Locally defined	N/A	Locally defined	Locally defined
Vaginal Ring Residual Drug Analysis	Vaginal Ring	Specimen bag	N/A	Stored locally for shipment	Room Temperature (Freezing permissible)

Section Appendix 13-2

MTN-020 LAB SPECIMEN PROCESSING GUIDELINES — BLOOD SPECIMENS

Assay	Additive/Container	Minimum Volume	Testing Specifications	Handling Requirements
AST, ALT, and Creatinine	Plain Tube-No additive or SST	Locally defined	Locally in real time	Locally Defined
Syphilis Serology	Plain Tube-No additive or SST	Locally defined	Locally in real time	Locally Defined
Full Blood Count	EDTA Tube	Locally defined	Locally in real time	Locally Defined
HIV Rapid Tests and WB	EDTA or Plain Tube	Locally defined	Locally in real time	Locally Defined
CD4+ T Cell Count	EDTA Tube	Locally defined	Locally in real time	Locally Defined
HIV-1 RNA PCR	EDTA Tube	Locally defined	Locally in real time or shipped to the MTN LC	Locally Defined
Enrollment Archive; Routine Storage*	EDTA Tube	4 mL plasma	Stored and shipped for analysis in batches.	If at room temp, freeze within 4 hours. If refrigerated or on ice after collection, freeze within 24 hours.
Plasma Storage for Algorithm *		6 mL plasma		
Plasma Storage: Post seroconversion*		6 mL plasma		

*Refer to Section 13.6.7 for more information on plasma archive requirements.

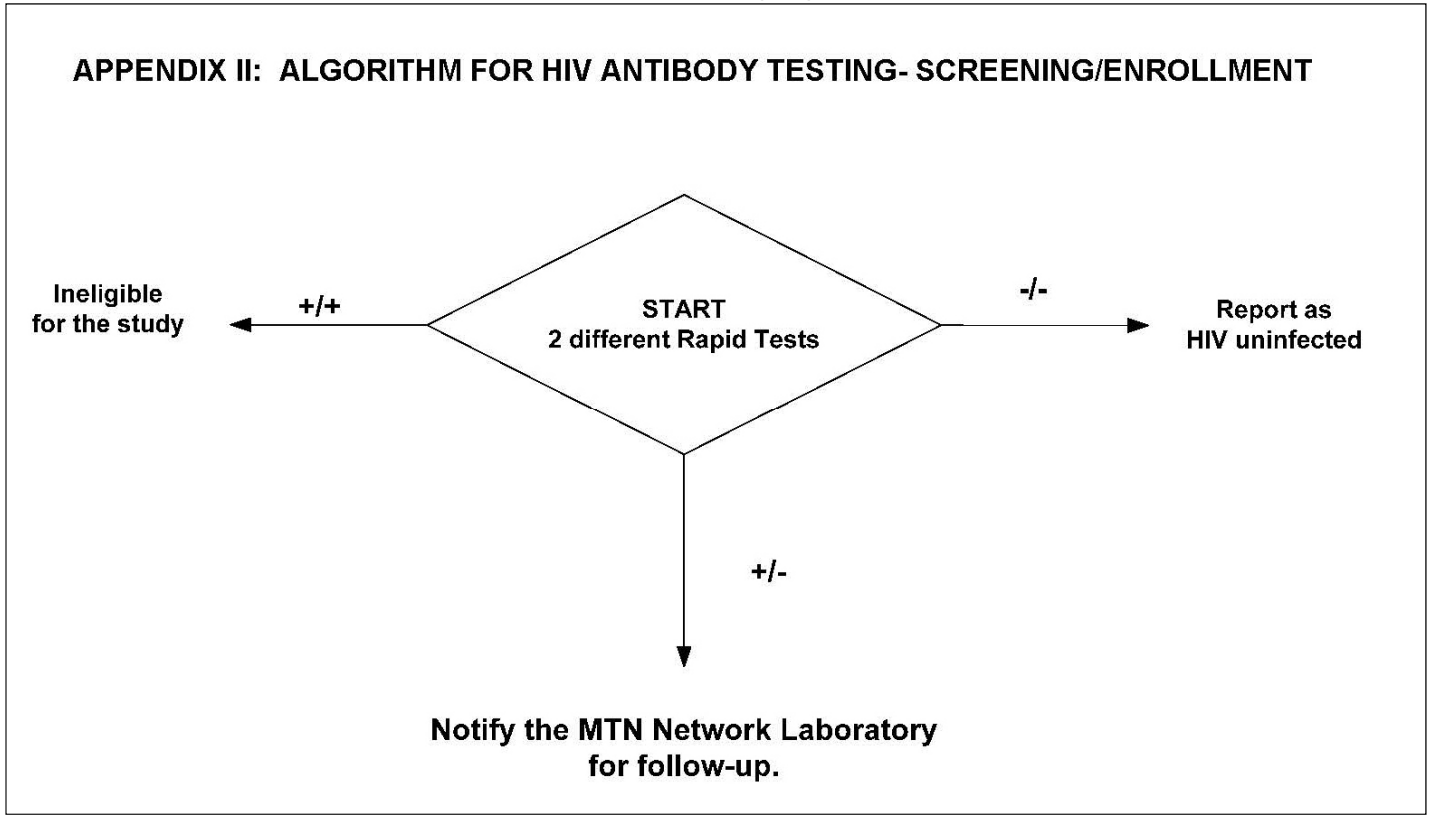
Section Appendix 13-3
LDMS Specimen Management Guide to Logging in MTN-020 Specimens

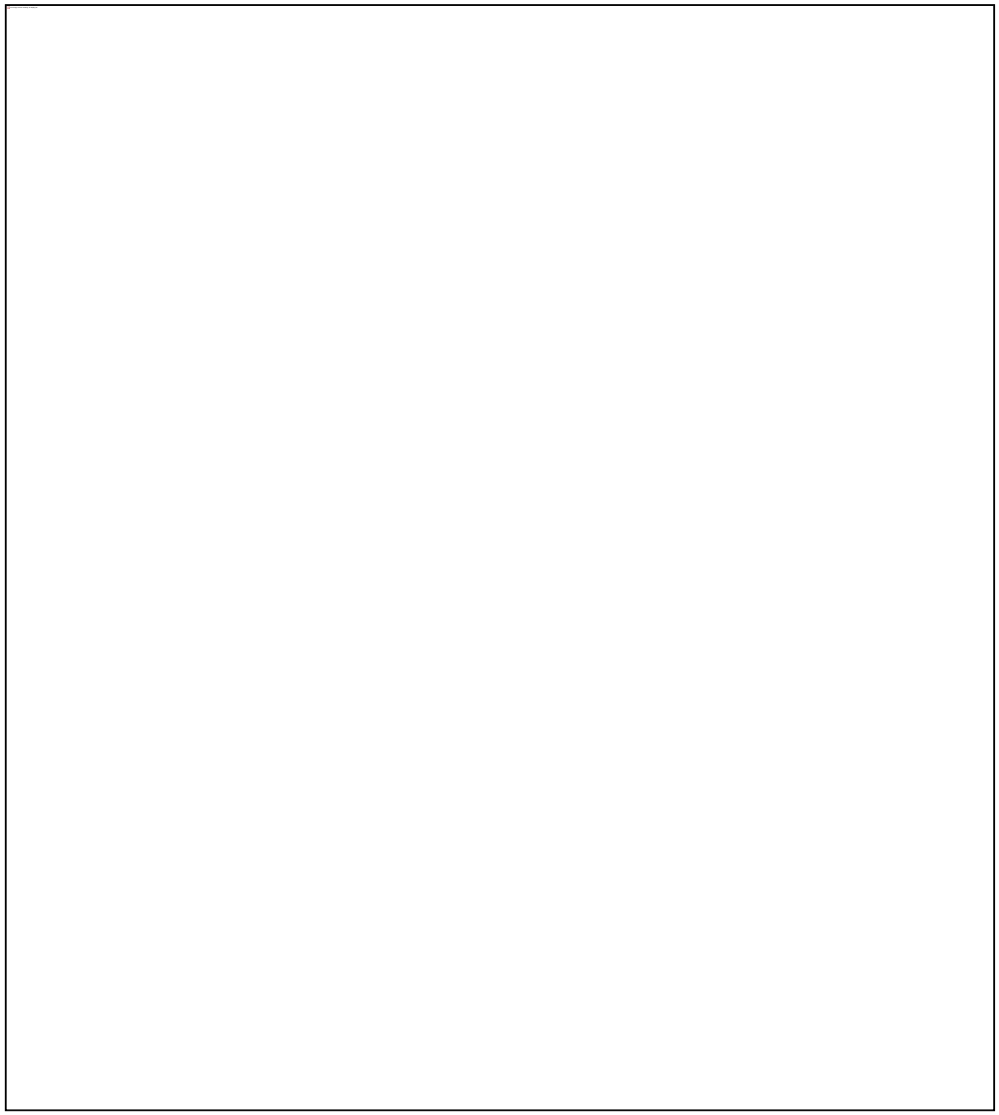
Test	Primary	Primary Additive	Primary Volume	Primary Units	Aliquot Derivative	Aliquot Sub Add/Derv	Aliquot Volume	Aliquot Units
Vaginal Swabs	VAG	NON	1	EA	SWB	N/A	1	EA
Endocervical Swabs	CXS	PBS	1	EA	CXS	N/A	1	EA
Vaginal Gram Stain Slides	VAG	NON	2	EA	SLD	GRS	1	EA
Plasma for Storage[1]	BLD	EDT	Variable	mL	PL 1/2	N/A	1-2	mL
Cell Pellet	BLD	EDT	Variable	mL	PER	N/A	5 $X10^6$	CEL
Ring for storage	IVR	NON	1	EA	IVR	NA	1	EA

1. In the “Other Spec ID” field of the aliquot line (between “Cond” and “Group ID”), specify the type of plasma storage to coincide with the LDMS tracking sheets. This field is free text and must be entered exactly as shown below.

LDMS Tracking Sheet-Plasma Storage Type	“Other Spec ID” Code
Enrollment Plasma Archive	EPA
Routine Plasma Storage	RPS
Plasma for HIV Seroconversion Confirmation	CON
Seroconverter Plasma Storage	SER

Section Appendix 13-4
MTN-020 HIV Testing Algorithms





Section Appendix 13-5
MTN Network Lab HIV Testing Query Form

MTN Network Lab HIV Testing Query Form

Study	MTN-020
PTID	###-#####-#
Site/Contact Person	
Query Date	
Close Date	

Test Results

Mark "X" if test not done or info not available. Extra rows provided for multiple visits if needed.

	HIV Rapid Test 1	HIV Rapid Test 2	HIV WB	HIV RNA	HIV DNA
Visit Code					
Testing Date					
Kit Name					
Kit Lot/Exp. (optional)					
Result					
Any other info/comment					
Visit Code					
Testing Date					
Kit Name					
Kit Lot/Exp. (optional)					
Result					
Any other info/comment					
Visit Code					
Testing Date					
Kit Name					
Kit Lot/Exp. (optional)					
Result					
Any other info/comment					
Visit Code					
Testing Date					
Kit Name					
Kit Lot/Exp. (optional)					
Result					
Any other info/comment					

Description of Site Query

NL Response

Participant Final Outcome

MTN-020 Screening Visit LDMS Specimen Tracking Sheet

For login of stored specimens into LDMS

Page 1 of 1

Participant ID ☐☐☐-☐☐☐☐☐-☐
Site Number Participant Number Chk

Visit Code 97.0

Specimen Collection Date ☐☐ ☐☐☐ ☐☐
dd MMM yy

# of TUBES or SPECIMENS	PRIMARY SPECIMEN	PRIMARY ADDITIVE	ALIQUOT DERIVATIVE	ALIQUOT SUB ADD/DER	INSTRUCTIONS FOR PROCESSING LAB
☐	Vaginal Smear for Gram Stain **(VAG)**	**NON**	**SLD**	**GRS**	Re-label with LDMS label. Make 2 slides. Ship one slide to MTN NL and store other slide on-site.
☐	Endocervical Swab **(CXS)**	**PBS** (400 µL)	**CXS**	**N/A**	Place tissue in a cryovial with 400 µL PBS and store at ≤-70°C within 8 hours.

Comments: _____

Initials: _____ _____ **LDMS Data Entry Date:** ☐☐ ☐☐☐ ☐☐ / _____
Sending Staff Receiving Staff *dd MMM yy* LDMS Staff

Version 2, 20-SEP-12

MTN-020 Enrollment Visit LDMS Specimen Tracking Sheet

For login of stored specimens into LDMS

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Participant ID ☐☐☐-☐☐☐☐-☐ (Site Number – Participant Number – Chk)

Visit Code 98.0

Specimen Collection Date ☐☐ ☐☐☐ ☐☐ (*dd MMM yy*)

# of TUBES or SPECIMENS	PRIMARY SPECIMEN	PRIMARY ADDITIVE	ALIQUOT DERIVATIVE	OTHER SPEC ID	INSTRUCTIONS FOR PROCESSING LAB
☐	Blood **(BLD)** *Enrollment Plasma Archive* Collection Time __ __ : __ __ *hour : min*	**EDT**	**PL1/2**	**EPA**	Prepare as many 1.0 mL aliquots as possible with a total volume of aliquots ≥ to 4mL. If sample is collected and held at room temp, freeze within 4 hours. If refrigerated after collection, freeze within 24 hours.
☐	Vaginal swab for PK/Biomarkers **(VAG)**	**NON**	**SWB**	**N/A**	Place Dacron swab in a labeled cryovial containing with no additive. Store sample tubes at ≤-70°C within 8 hours of analysis.

Comments: _____

Initials: _____ (Sending Staff) _____ (Receiving Staff) **LDMS Data Entry Date:** ☐☐ ☐☐☐ ☐☐ (*dd MMM yy*) / _____ (LDMS Staff)

Version 2, 20-SEP-12

MTN-020 Follow-up Visit LDMS Specimen Tracking Sheet

For login of stored specimens into LDMS

Participant ID ☐☐☐-☐☐☐☐☐-☐ (Site Number / Participant Number / Chk)

Visit Month/Code ☐☐.☐

Specimen Collection Date ☐☐ ☐☐☐ ☐☐ (*dd* *MMM* *yy*)

# of TUBES or SPECIMENS	PRIMARY SPECIMEN	PRIMARY ADDITIVE	ALIQUOT DERIVATIVE	ALIQUOT SUB ADD/DER	OTHER SPEC ID	INSTRUCTIONS FOR PROCESSING LAB/ PLASMA COLLECTION TIMES
	Blood **(BLD)** *Routine Plasma Storage*	**EDT**	**PL1/2**	**N/A**	**RPS**	**PLASMA COLLECTION TIME** Collection Time __ __ : __ __ hour : min
	Blood **(BLD)** *Plasma for HIV Seroconversion Confirmation*	**EDT**	**PL1/2**	**N/A**	**CON**	**PLASMA COLLECTION TIME** Collection Time __ __ : __ __ hour : min
	Blood **(BLD)** *Seroconverter Plasma Storage*	**EDT**	**PL1/2**	**N/A**	**SER**	**PLASMA COLLECTION TIME** Collection Time __ __ : __ __ hour : min
	Vaginal Smear for Gram Stain **(VAG)**	**NON**	**SLD**	**GRS**	**N/A**	Re-label with LDMS label. Make 2 slides. Ship one slide to MTN NL and store other slide on-site.
	Vaginal swab for PK/Biomarkers **(VAG)**	**NON**	**SWB**	**N/A**	**N/A**	Place Dacron swab in a labeled cryovial containing with no additive. Store sample tubes at ≤-70°C.
	Endocervical Swab **(CXS)**	**PBS** (400 µL)	**CXS**	**N/A**	**N/A**	Place tissue in a cryovial containing 400 µL PBS and store at ≤-70°C locally.
	Used vaginal ring **(IVR)**	**NON**	**IVR**	**NA**	**NA**	Store at room temperature

Comments: _____

Initials: _____ (Sending Staff) _____ (Receiving Staff) **LDMS Data Entry Date:** ☐☐ ☐☐☐ ☐☐ (*dd* *MMM* *yy*) / _____ (LDMS Staff)

Version 3, 10-JUL-13