	TITLE: Procedure for Collection and Shipment of Blood by Dried Blood Spot Testing		POLICY #: PHU 001-2019	
	UNIT: Public Health Unit		PROGRAM: HIV Program	
	SOURCE: Communicable Disease Control			
	APPROVED BY: Medical Health Officer		APPROVAL DATE: May 6, 2019	
	EFFECTIVE DATE: May 6, 2019		LAST REVIEWED: October 30, 2019	

Purpose

To ensure proper collection and shipment of blood specimens tested by the Dried Blood Spot (DBS) method for HIV, hepatitis B and hepatitis C and syphilis. The specimen will be collected in accordance with the current procedures recommended by the National Microbiology Laboratory (NML) which is also known as JC Wilt Infectious Disease Research Centre in Winnipeg, MB, and the Roy Romanow Provincial Laboratory (RRPL) in Regina, SK.

DBS as a testing method

DBS method of testing is most commonly known as the method used to test newborn babies for Phenylketonuria, a serious metabolic disorder. The test involves pricking the heels of the newborn.

DBS can be used to test for HIV, Hepatitis B, Hepatitis C, and Syphilis by poking a finger with a lancet and collecting the blood on a paper card which is then analyzed in a Laboratory similar to the way blood from phlebotomy is analyzed. DBS may be used to test children 18 months of age and older for Hepatitis C if they were born to mothers who are Hepatitis C positive.

The sensitivity and specificity are over 96% and 98% respectively (Mossner et al, 2016). DBS testing method has been used in the surveillance of STBBIs in Canada, since 2001 in the national Track studies.

Although DBS is used to test for syphilis, serology will still be performed for all positive screen results. Testing for chlamydia and gonorrhoea will continue to be performed through urine specimen. Although DBS can test Hepatitis B, it would only test for antigens (not antibody) and therefore does not inform about immunity. It is recommended by the NML and RRPL that Hepatitis B should not be routinely screened for using DBS, especially due to its low incidence in Saskatchewan.

A lab license is now required for DBS testing (as of July 2019) and application is available at <https://www.saskatchewan.ca/government/health-care-administration-and-provider-resources/licensing-for-health-care-practices-and-professionals/application-or-renewal-for-a-licence-to-operate-a-medical-laboratory>. NITHA will support communities in the application process.

Note that a lab license and the Transportation of Dangerous Goods (TDG) certificate is currently not required for DBS testing

Staff who may perform the testing

All staff providing the test must have training in pre and post test counselling, and DBS testing. DBS training is provided by the NML staff and /or local staff trained and proficient in DBS testing.

The person providing the test does not have to be a Registered Nurse or a Licensed Practical Nurse, but the actual execution of this will vary throughout the province. However, the person providing the result to the client should be a RN, LPN, NP or Physician.

If a memorandum of understanding is required by the communities on what information will or will not be used the National Microbiology Laboratory is willing to collaborate and provide details on that.

Procedure for DBS testing

Equipment/ Supplies needed

- Hand sanitizer
- Sharp container
- Disposable gloves
- Permanent marker
- DBS Cards
- Drying rack
- Desiccants
- Alcohol swabs
- Band-aids
- Humidity cards
- Lancets
- Cotton balls
- Plastic zip lock bags
- Postage satchels
- Cotton sheets to cover the testing surface
- Clients Charts (or some way of tracking clients tested)

- Requisitions

NML provides the DBS cards, drying racks, desiccants, humidity cards, and plastic zip lock bags. Other supplies are standard health centre supplies.

Locations where testing may occur

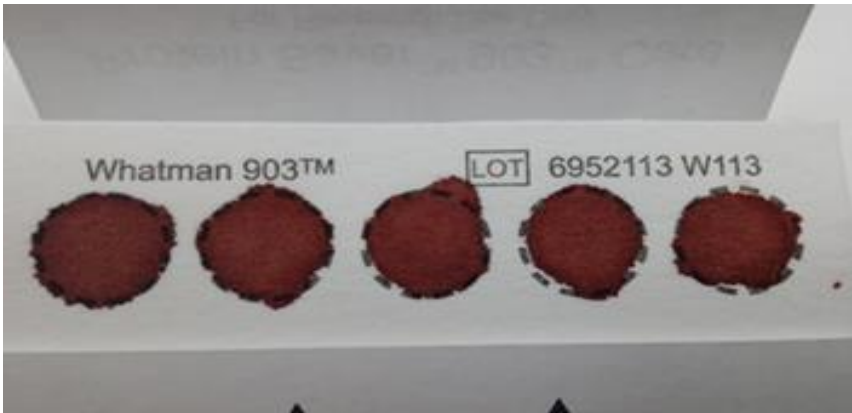
- Health centre
- Health Facility
- During Health Fairs and Treaty Days
- Homes
- Other locations deemed appropriate where testing already may or could occur.

Procedure:

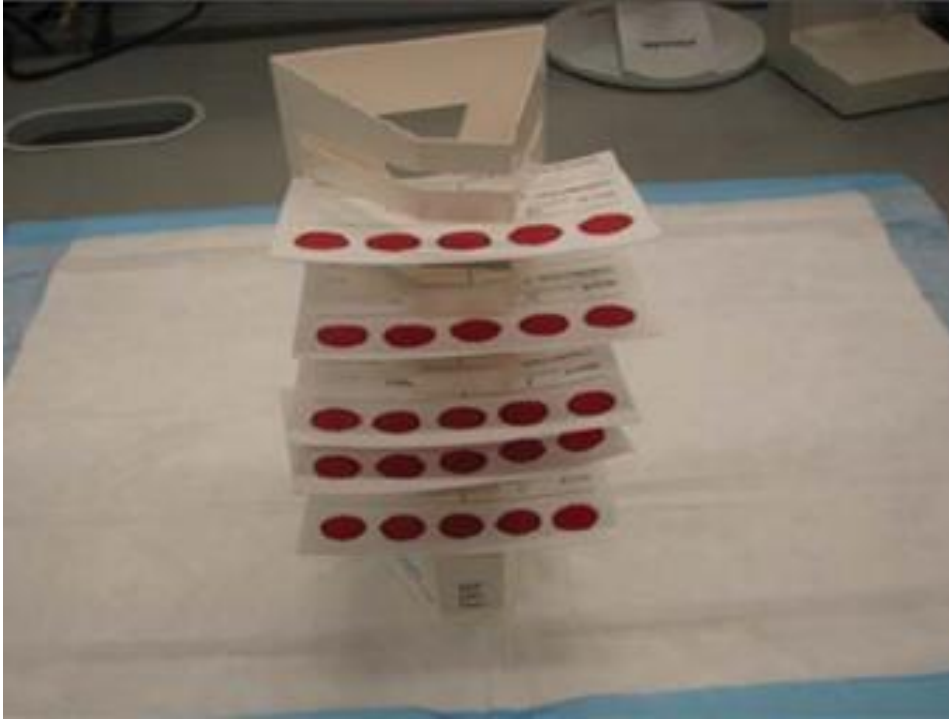
1. The room and the collection site should be as warm as possible.
2. Ensure client is comfortable.
3. Wash or disinfect hands with sanitizer and have the participant wash or disinfect their hand with sanitizer.
4. Provide pre-test counseling. Record client information.
5. Ensure that the participant hand is dry.
6. Hold the DBS card by the edges only. Do not touch the areas used to collect the blood. Print the date, client's name and date of birth on the DBS card. You may use a label if you have made one. A health card number may be added if you have it, but at least two identifiers need to be on the DBS card.
7. Prepare your work surface, cover the work surface with a cotton sheet. The cotton sheet may be cut to a smaller size. Use a new sheet for each client. Gather the supplies needed: hand sanitizer, disposal gloves, lancet, alcohol swab, DBS card, cotton ball, band-aid, sharps container, permanent marker or pen.



8. Don gloves. The best location for collecting finger prick samples is the outer edge of the middle finger or ring finger of the non-dominant hand. Never choose the thumb. Avoid the index finger (because it may be more sensitive or callused) as well as the pinkie finger and sides or top of fingers (because tissue depth is insufficient to prevent bone injury).
9. When choosing the site, start with the hand up, ensuring that when they turn their hand for the blood to drip, you can easily see the site.
10. Massage the finger you are collecting blood from, but do not over-massage.
11. Wipe the finger you will be pricking with the alcohol wipe. Allow briefly to air-dry because alcohol will interfere with the specimen.
12. Twist or pull off the protective tab of the lancet.
13. Place hand on a stable surface (e.g. Table). Position lancet firmly against the finger. The puncture should occur across the fingerprints, not parallel to them.
14. Press the lancet firmly against the finger until a click is heard.
15. Client to hold arm/hand downwards. Allow a large drop of blood to collect at the site. Be patient as this is an important step. Standing may assist blood flow.
16. Working quickly, when a full hanging drop of blood has formed, bring the card up and let it connect with the blood, gently touching the inside of the first circle. Allow a sufficient quantity of blood to soak through and completely fill or saturate a circle. Don't press the finger to the paper, rather you are bringing the paper to the finger. A completely saturated spot will contain approximately 100 micro-litres of blood.
17. Continue to apply drops of blood onto the DBS card, the second circle, and so on. Do not "milk" the finger as this may cause hemolysis and cause collection of tissue fluids with the specimen and adversely affect test results. Ideally you should collect five full circles of blood. **If you are having trouble getting enough blood, collect at least two full circles, rather than five small circles.** It is critical that the entire circle be uniformly saturated. The blood does not have to be in the circle. It does not matter which circle you start with. You may need to prick a second finger to ensure an adequate sample. In the event that you need to walk away from collection before it is complete, it is better when you return to begin collection with another finger and another card. Do not puncture at the same site as you just used. If five spots are not saturated, NML may call to ask priority tests. The test to prioritize can be decided based on clinical judgement of staff ordering the test.



18. Apply pressure to puncture site with cotton gauze or cotton ball and apply bandage when bleeding stops. Do not wipe puncture site with the alcohol swab again.
19. Discard of the cotton sheet. If saturated in blood, discard in biohazard bag or bin. If very minimal blood, it may be thrown in regular garbage. Dispose of all other used materials in the biohazard container. Disinfect the table top and wash hands.
20. Leave the DBS card to dry for approximately 3-4 hours in the drying rack provided at room temperature (time may be less than this: specimen just needs to be dry). Avoid direct sunlight and an open window as dust, flying insects etc. may contaminate the DBS. You can place the drying rack with the cards in it in another container and transport it back to an office to get it ready for shipment. Alternatively, you can have the card outside of the rack, folded on the table. The rack can be stood up, or be on its side. Incomplete drying will alter test results. Note, the blood will change from a bright red color to dark red as it dries. If the rack gets blood on it, throw it away, otherwise it can be used and re-used.



21. Complete the “Roy Romanow Provincial Laboratory” Chemistry & Immuno-serology Requisition form. Provide the following information:

- Ordering provider’s name (who can be a physician or nurse practitioner)
- Provider’s number name and return address.
- Specify if clients live in a First Nation community.
- Client’s name, address, HSN, birthdate, gender,
- Sending location phone number
- Study number (if applicable),
- Sample type, collection date and time
- Tests to be checked off may be HIV Screen, Hepatitis B surface antigen (but again, it is not recommended that we test Hepatitis B surface antigen on everyone), Hepatitis C antibody and Syphilis. Note that a person may be tested for all four tests, or just one or two.

22. Once dry, each card must be placed in a separate coin envelope. **The requisition form must never be placed inside of the envelope to reduce risk of contamination.** You may place 5-10 coin envelopes in the gas permeable ziploc bag, along with 3-5 desiccant packs and one humidity card (HI) card, facing out. Also place the corresponding requisitions in the ziploc bag.



Squeeze out all of the air in the plastic bag and seal, ensuring it is sealed completely. Specimens are stable at any temperature for several days, with most specimens being sent at room temperature, and freezing will not interfere with specimen integrity, but humidity will.



23. Send by registered mail or courier, or take to a local lab for them to send along with their specimens, within one week of collecting the specimen to RRPL (**Roy Romanow Provincial Laboratory Attn: Referrals**, 5 Research Drive, Regina SK., S4S 0A4) who then sends the specimen to the National HIV & Retrovirology Laboratory in Winnipeg for analysis.
24. The National Microbiology Lab punches out $\frac{1}{4}$ inch spots and these spots are placed into 96 well plates (EIA) or troughs (Western Blot). Buffer is added and the spots incubate overnight at 4 degrees Celsius. The spots are removed and the buffer is used for testing.

Results are reported as positive or negative. If the result is reactive, a viral load is also performed, and this acts as the confirmatory test. A parallel blood draw is not required. The NML time for analysis is 10 days once they receive specimens. Turnaround time for results may vary with testing location.

25. Clients are to be advised that it will take 2-3 weeks for them to obtain results, and negative results will be sent sooner. Results will be available on eHR viewer.

Management of Test Results:

Results are reported through RRPL using the same process as all other reportable diseases. All lab results (positive and negative) are sent to the testing provider, and all positive results are also copied to the MHO. The RN should deliver the result to the client, and should follow up on all positive results according to the guidelines and timelines specified in the provincial Communicable Disease Manual. Positive results do not need to be confirmed through a blood draw except for syphilis which will need to be followed up by a blood draw.

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