PHSA Laboratories

BCCDC Public Health Laboratory

A service of the Provincial Health Services Authority

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RE: Sexually Transmitted and Blood-Borne Infection testing performed on Dried Blood Spots

Dried blood spot (DBS) testing is a process whereby samples are obtained by spotting blood from a finger prick on to special filter paper. Samples can be stored at room temperature for up to 14 days and shipped at ambient temperature via a non-TDG courier. Screening and confirmatory testing for HIV, hepatitis C virus (HCV), and screening only for syphilis can currently be performed on DBS samples.

DBS samples have similar specificity but lower sensitivity to serum or plasma samples for sexually transmitted and bloodborne infections (STBBIs) tests since a lower volume of blood is tested [1,2]. This means that there is the potential for a false negative result on a DBS among people who have low antibody or virus levels, when compared with a venipuncture sample. However, DBS has the advantage of being more acceptable and accessible than venipuncture in certain scenarios:

1. Individuals living in remote and/or isolated communities where access to laboratory facilities may not be available or, if available, may have limited capacity for the processing and transportation of EDTA plasma or serum;
2. Individuals who may be unable or unwilling to provide a venous-collected sample

Currently in BC, STBBI testing using DBS is in a pilot phase
STBBI testing on DBS samples is a referred out test to the Nataional Microbiology Lab (NML) in Winnipeg; it is not performed on the BC platforms used for testing on serum or plasma samples obtained through venipuncture:

TEST ORDERED	SCREEN ON DBS;	IF POSITIVE, REFLEXES ON DBS TO;
HIV	HIV 1 Total antibody enzyme linked immunoassay (AVIOQ HIV 1 Microelisa)	HIV-1 quantitative/qualitative nucleic acid amplification test (NAT) (Aptima HIV Quant Dx)
HCV	HCV IgG antibody enzyme linked immunoassay (Ortho anti-HCV ELISA)	HCV RNA quantitative/qualitative nucleic acid amplification test (NAT) (Aptima HCV Quant Dx)
TPE	Syphilis Total antibody enzyme linked immunoassay (BioRad Syphilis Total Ab ELISA)	No reflex/confirmatory TPE testing on DBS available

During this pilot phase, DBS samples are first sent to the BCCDC Public Health Laboratory (PHL) for accessioning, and then sent to the NML for testing. The NML sends results back to BCCDC to be entered into the Lab Information System for reporting back to the ordering provider. All STBBI test results from DBS can be viewed in CareConnect, Excelleris or Sunset.

Interpreting results from STBBI tests performed on DBS

Only detectable HIV NAT (HIV RNA) and detectable HCV NAT (HCV RNA) test results on DBS are considered to be confirmed positive results. Syphilis confirmatory testing is not available on DBS at this time, therefore reactive TPE screen is not considered a confirmed positive. A serum sample will have to be collected for confirmatory syphilis testing. Only confirmed positive STBBI test results on DBS are reported to public health through established processes.

As DBS tests are slightly less sensitive when compared to venous sample testing, if clinical suspicion for a STBBI infection is high, healthcare providers should consider collecting a venipuncture serum or plasma sample for testing to confirm the DBS results.

Sincerely,

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References

1. Public Health Ontario(2020). Hepatitis C Virus (HCV) RNA detection using Dried Blood Spots (DBS) – Update. https://www.publichealthontario.ca/-/media/documents/lab/lab-sd-123-hcv-rna-detection-dbs.pdf?la=en.
2. Lange, B., et al. (2017). "Diagnostic accuracy of serological diagnosis of hepatitis C and B using dried blood spot samples (DBS): two systematic reviews and meta-analyses." BMC Infect Dis **17**(1): 700.