Memorandum

Date: November 5, 2018

To: Calgary Zone Physicians

From: Section of Microbiology, Calgary Laboratory Services

Re: **Malaria Testing Algorithm Changes**

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Key Messages:

- **Effective immediately**, Calgary Laboratory Services (CLS) is modifying the malaria testing algorithm.
- All specimens submitted for malaria will be screened using nucleic acid amplification technology (NAT).
- Sample negative by NAT testing will be reported as negative for malaria (final report).
- Only positive tests by NAT screening will undergo further testing using standard thick and thin film microscopy.
- **If** blood parasites other than Malaria are suspected, testing for these must be ordered separately.

Importance/Impact:

- Malaria testing will now rely on a NAT screen for malaria.
- NAT screening will be performed ideally within two hours of collection and reported as final negative if indicated.
- No repeat testing is required when the NAT screen is negative due to the excellent sensitivity (97-100%) of the NAT and negative predictive value (99-100%).[1-4]
- This will result in faster results to the clinician in ~95% of cases which are negative in returning travelers.
- Positive NAT screen tests will still require microscopy for speciation and quantification and follow up testing to monitor parasite levels while on treatment as clinically indicated.

Background:

- Historically, malaria testing required 3 consecutive thick and thick film examinations spaced 6-8 hours apart to rule out malaria.
- Repeat testing was due to the lack of sensitivity of microscopy to detect very low level infections.
- New NATs are able to detect malaria parasite levels at or below 1 parasite per μL, over 100 to 1000-fold more sensitive than microscopy or other rapid antigen tests.

Action Required:

- **Do not send repeat specimens when malaria NAT screen is negative unless clinically indicated.**

This memorandum has been reviewed and approved by:

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References:

1. Marti H, *et al*. Diagnostic accuracy of a LAMP kit for diagnosis of imported malaria in Switzerland. *Travel medicine and infectious disease* 2015; 13(2): 167-71.
2. Ponce C*, et al*. Diagnostic accuracy of loop-mediated isothermal amplification (LAMP) for screening patients with imported malaria in a non-endemic setting. *Parasite* 2017; 24: 53
3. Rypien C, *et al*. Detection of Plasmodium Infection by the Illumigene Malaria Assay Compared to Reference Microscopy and Real-Time PCR. *Journal of clinical microbiology* 2017; 55(10): 3037-45.
4. Cheaveau J, *et al*. Clinical validation of a commercial LAMP test for ruling out malaria in returning travelers: A prospective diagnostic trial. *Open Forum Infectious Diseases* https://doi.org/10.1093/ofid/ofy260, Oct 2018.