BC Centre for Disease Control
Provincial Health Services Authority

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Dear Medical Microbiology colleagues,

**Re: Update on Clinical Findings, Differential Diagnosis and Testing Recommendations for Measles, BCCDC Public Health Laboratory**

Recently, we have been consulted on several occasions for suspected acute measles infections from acute care facilities, and would like to share with you our review of the sentinel clinical features of measles and testing currently available at the BCCDC Public Health Laboratory (PHL). Feel free to use the information in this memo for further distribution within your community of practice.

The World Health Organization (WHO) has reported a 79% increase in the number of measles cases worldwide in 2023.[1] Canada is already seeing higher case numbers compared to 2023, with 40 cases reported as of Mar 29, 2024.[2] In BC, there has been one confirmed case so far this year without secondary transmission. Although the risk of contracting measles in BC remains very low, cases can occur especially in unvaccinated or under-vaccinated individuals, particularly those who have traveled to or lived in a region where measles is circulating.

If an acute measles infection is suspected at your facility, please be reminded to inform your local public health communicable disease unit immediately.[3] It is recommended that your microbiology team, in collaboration with your health authority MHO team, assess for urgency of diagnosis, and support follow-up. If expedited or after-hour testing is required, contact the BCCDC Microbiologist on call (604-661-7033, or BCCDC_MicroOncall@bccdc.ca).

For comprehensive infection prevention and control (IPAC) advice, please refer to PICNet Measles page[4] and your local IPAC resources.

## Clinical presentation

Measles is a highly contagious airborne viral infection with up to 90% infectivity in exposed, non-immune individuals. The incubation period for measles ranges from 7 to 21 days, and the clinical presentation typically presents in the following phases:

1. **Viral prodrome:** Fever and malaise, followed by cough, coryza (runny nose) and conjunctivitis.
2. **Mucosal rash:** 2-3 days after symptom onset, an enanthem (mucosal rash) characterized by Koplik spots, white/gray elevations with an erythematous base on the

buccal mucosa or palate, can be seen. This enanthem is typical but not unique to measles, and can be seen with other respiratory viruses.

3. **Skin rash:** 3-5 days after prodrome onset, the exanthem (skin rash) of measles typically appears. This is characterized by an erythematous, maculopapular rash beginning on the face and spreading to the neck, back and trunk, and subsequently extremities.

The **differential diagnosis** of measles includes common respiratory viruses of childhood such as influenza, respiratory syncytial virus, adenovirus and parainfluenza; as well as other viral causes of rash in children including enterovirus, human herpesvirus 6, parvovirus B19, and rubella. Notably, coxsackievirus and other enteroviruses that cause hand foot and mouth disease can also present with maculopapular rash with mucosal involvement.

**Whom to test for measles**

The diagnosis of measles should be considered in patients presenting with a febrile rash illness and clinically compatible symptoms (cough, coryza, conjunctivitis), in the setting of potential exposure or travel to an area of high measles prevalence, and particularly in the absence of measles immunity. People at highest risk for measles include children too young to be vaccinated, those who have not been fully vaccinated (two doses of measles vaccine), and those who have failed to mount a protective immune response to two doses of vaccine.

**Measles testing**

Routine measles NAT testing is performed at the BCCDC Public Health Laboratory 6 days per week and turnaround time (TAT) is generally 1-2 days after specimens are received. Routine measles serology is tested Monday to Friday, with a TAT of 3-5 days. The diagnostic work-up of acute measles should include both viral detection by nucleic acid testing (NAT) as well as serology[5]:

- **Measles NAT (provide both specimens whenever possible):**
  - Nasopharyngeal or throat swab (COPAN red cap container preferred)
  - Urine sample (sterile container)
- **Serology (measles IgM and IgG):**
  - Blood sample (gold top tube) for measles IgM and IgG

Depending on clinical presentation, testing for other viral diagnoses with a respiratory viral NAT panel should also be considered and can either be performed from the same nasopharyngeal swab sample, or from a separate swab sent to a local laboratory based on expected turnaround time and at the discretion of the local microbiology team. Enterovirus NAT testing can be performed from a skin swab for individuals presenting with vesicular or pustular skin lesions.

**References and further information**

1. Geneva Press Briefing: ICRC, UNDP, UNHCR, WHO | UN Web TV
2. Measles update March 27 – Stat
3. BC MHO on call number by health authority
4. Measles | PICNet
5. eLab Handbook

Please do not hesitate to contact us should you have any further question or need for clarification.

Sincerely,

Linda Hoang, on behalf of the BCCDC PHL team

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*I respectfully acknowledge that I live, work and play on the unceded traditional territories of the Sḵwx̱wú7mesh, Sel̓íl̓witulh, and xʷməθkʷəy̓əm Nations.*