

CYTOMEGALOVIRUS SURVEILLANCE PROTOCOL FOR ONTARIO HOSPITALS

Developed by the Ontario Hospital Association and
the Ontario Medical Association
Joint Communicable Diseases Surveillance Protocols Committee

Approved by
The OHA and the OMA Board of Directors
The Ministry of Health and Long-Term Care –
The Minister of Health and Long-Term Care

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This protocol was developed jointly by the Ontario Hospital Association and the Ontario Medical Association to meet the requirements of the *Public Hospitals Act 1990*, Revised Statutes of Ontario, Regulation 965. This regulation requires each hospital to have by-laws that establish and provide for the operation of a health surveillance program including a communicable disease surveillance program in respect of all persons carrying on activities in the hospital. The communicable disease program is to include the tests and examinations set out in any applicable communicable disease surveillance protocol. The regulation states that the communicable disease surveillance protocols that hospitals must adopt are those "published jointly by the Ontario Hospital Association (OHA) and the Ontario Medical Association (OMA) and approved by the Minister (of Health and Long-Term Care)."

This Protocol has been reviewed since the previous version; changes have been highlighted in yellow for easy identification. Protocols are reviewed on a regular basis, every two years or as required.

The protocol reflects clinical knowledge, current data and experience, and a desire to ensure maximum cost effectiveness of programs, while protecting health care workers and patients. It is intended as a minimum standard that is practical to apply in most Ontario hospital settings. It does not preclude hospitals from adopting additional strategies that may be indicated by local conditions.

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Rationale for Cytomegalovirus Surveillance Protocol

This rationale briefly summarizes current medical knowledge about cytomegalovirus (CMV) to address the need for information and reassure health care workers (HCWs) that CMV is not an occupational health and safety risk if Routine Practices are followed. For more detailed information, refer to the references.

The Virus

CMV is a widespread virus in the herpes virus family that infects a large portion of the world's population. CMV infects the majority of persons at some time during their lives, usually asymptotically, resulting in positive CMV serology. If infection is first acquired as an adult, the individual may exhibit transient "flu-like" symptoms. As with other herpes viruses, once a person is infected (primary infection), the virus remains latent in the body and may spontaneously reactivate at random intervals. Reactivation can occur in healthy people, and is common during pregnancy and in immunocompromised people. During reactivation, the person will usually be asymptomatic, but the virus will be present in various body fluids: blood, urine, saliva, cervical secretions, semen, breast milk, respiratory secretions.

Acute infection will result in the development of CMV IgM antibodies, followed by development of IgG antibodies. CMV IgG antibody indicates prior infection. In North America, CMV IgG is detectable in 50% to 60% of adults.^{1,2} In Canada, 40 to 50% of pregnant women are positive for CMV IgG antibodies.³⁻⁵ In the United States, >90% of healthy adults have become infected with CMV by the age of 80 years. Worldwide, CMV is a universally distributed pathogen with approximately 40-100% of the world's population having CMV antibody present in blood as evidence of infection, the highest prevalence being in countries in the developing world.⁶ However, CMV IgG does not confer lifelong immunity; reinfection and reactivation can occur in individuals with detectable CMV IgG antibodies.

Transmission

Transmission occurs through parenteral exposure, intimate mucosal contact, or *in utero*. Transmission of CMV from person to person requires direct or intimate contact with excretions, secretions, or body fluids of an infected person. This most frequently happens by sexual contact, but the virus can also be transmitted by blood transfusions, organ transplantation and by transplacental transfer of virus from mother to fetus.^{6,7}

Asymptomatic excretion of CMV in saliva and urine of children is common, and can result in transmission to other children, their parents and daycare workers. CMV is excreted in the urine or saliva of 5% of normal healthy infants, 13% of premature infants, up to 50% of older infants, and up to 60% of children from 1-5 years old in day

care centres.⁸ Therefore, HCWs caring for infants or children will regularly come in contact with patients excreting CMV in their body fluids.

Transmission in healthcare settings can occur, but the overall risk of infection for HCWs, including pregnant HCWs, is low. HCWs, regardless of the type of patient they work with, do not have an increased risk of developing CMV infection compared with the general population.⁹⁻¹³ The annual rate of seroconversion (primary infection) among HCWs in several studies was 2.3%, compared with 2.1% among pregnant women in the community.^{5,9} Adults including HCWs are at a much higher risk of acquiring CMV from children living in the same household and shedding CMV (up to 30% annual seroconversion rate) than from an occupational exposure.⁹ Women who have children in day care centres are far more likely to be exposed to CMV from their own children than from their occupation.

The Risks

In 2012, three cases of congenital CMV were reported in Ontario, corresponding to an incidence rate of 2.1 cases per 100,000 live births.¹⁴ From 2003 to 2012, a total of 67 cases of congenital CMV were reported in Ontario, for an average of 6.7 cases per year over this period.¹⁴ No comparable national data are available, as congenital CMV infections are not nationally notifiable.¹⁴ The greatest risk associated with CMV infection is the possibility of congenital infection in the newborn. Congenital infection can occur if the mother has a primary infection or reactivation during pregnancy, and occurs in 1 to 1.5% of all live births.^{3,15,16} Infection is transmitted to the fetus at a higher rate with primary infection during pregnancy (estimated rate: 30-40%)¹⁶⁻¹⁸ than with reactivation (estimated rate: <1.5%).¹⁶ However, most congenital CMV infections are thought to result from reactivation of the virus in the mother, rather than from primary infection of the mother, because most adults have already had their primary infection and reactivation is common during pregnancy.¹⁹

Ten to 15% of infants born with congenital CMV infection will be symptomatic.¹⁶ The small percentage born *with* symptoms may have physical and/or neurologic defects, the most common being deafness. Symptoms are more likely to be severe and long lasting with primary maternal infection (vs. reactivation), and with maternal infection during the first half of pregnancy.²⁰

Prevention: Routine Practices

To prevent transmission of CMV in a health care setting, workers must practice careful hand hygiene after all patient and patient environment contact, and use Routine Practices for all patient interactions. Staff must wear gloves if they expect to contact body secretions or excretions (including urine and saliva) or mucous membranes and must practice careful hand hygiene after removing gloves. Because patients who are excreting CMV are usually asymptomatic and cannot be readily identified, workers must take these precautions with **all** patients. Kissing or cuddling infants and children brings the mucous membranes of the mouth, nose and eyes into proximity of the oral and

respiratory secretions of the infant, which may contain CMV; this practice by HCWs caring for infants and children must therefore be prohibited.

Serologic evaluation to determine the CMV antibody status of women who work in hospitals is not recommended.²¹ Women who are seropositive during pregnancy may still be at risk of having infants congenitally infected from maternal reactivation.

Pregnant women are at no increased risk of primary CMV infection compared with non-pregnant women. There is no prevention for reactivation of the virus during pregnancy in previously infected individuals. **Because of the potential risk to the fetus, and the wide prevalence of this virus in patients' body fluids, pregnant HCWs must scrupulously and consistently adhere to routine infection prevention and control practices, including hand hygiene, with *all* patients.**

This protocol is only one component of an infection prevention and control program; HCWs must consistently adhere to Routine Practices.

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I. Purpose

The purpose of this protocol is to provide direction to hospitals to prevent the transmission of cytomegalovirus (CMV) among health care workers (HCWs) and patients. This protocol provides the minimum standard required under the Ontario Public Hospitals Act, Regulation 965.

II. Applicability

This protocol applies to **all persons carrying on activities in the hospital**, including but not limited to employees, physicians, nurses, contract workers, students, post-graduate medical trainees, researchers and volunteers. The term health care worker (HCW) is used in this protocol to describe these individuals. This protocol does not apply to patients or residents of the facility or to visitors.

When training students or hiring contract workers, the hospital must inform the school/supplying agency that the school/agency is responsible for ensuring that their students/contractors are managed according to this protocol.

This protocol is for the use of the Occupational Health Service (OHS) in hospitals. It is expected that OHS collaborate with Infection Prevention and Control and other departments, as appropriate.

III. Pre-placement

Screening for susceptibility or immunity to CMV in persons carrying on activities in the hospital is neither required nor recommended. If screening has been done, results do not affect HCW placement.

IV. Continuing Surveillance

No routine screening for susceptibility or immunity to CMV in persons carrying on activities in the hospital is required.

V. Exposure

The principal reservoirs of CMV in the hospital are infants, children and immunocompromised patients. The virus can be shed in urine, saliva, respiratory secretions, breast milk, semen and cervical secretions.

Most persons infected with CMV are asymptomatic; therefore, only a minority of infected patients are identified.

All HCWs may be potentially exposed to CMV and must observe routine infection prevention and control practices including hand hygiene before and after *all* patient and patient environment contact. Contact with the secretions of *all* patients should be prevented by use of appropriate barriers as indicated by Routine Practices. HCWs should avoid kissing or cuddling hospitalized infants and children.

VI. Acute Disease

Infection with CMV is common; it is often asymptomatic or presents as a febrile illness without specific characteristics.

To reduce the risk of transmission of CMV infection to patients or others, HCWs must practice routine IPAC practices, including careful hand hygiene, and exercise care to prevent their body fluids from contacting other persons.

Pregnant HCWs who develop symptoms consistent with acute CMV infection should be referred to their personal physician for assessment, counseling and follow-up. Guidelines for management and follow up are available from the Society of Obstetricians and Gynaecologists of Canada.²¹

Work Restrictions

Because symptoms of acute CMV can be similar to 'flu-like' illness it is important to follow the usual work restrictions for acute respiratory infection (i.e. not to come to work with fever $\geq 38^{\circ}\text{C}$ and new onset cough).

Since there is no evidence of increased risk of infection among HCWs working with infants, children or immunocompromised patients, **HCWs (including pregnant women) need not be reassigned to other units.**

VII. Reporting

CMV is not a reportable disease as per Ontario Regulation 135/18 and amendments under the Health Protection and Promotion Act.

In accordance with the Occupational Health and Safety Act and its regulations, an employer must provide written notice within 4 days of being advised that a worker has an occupational illness, including an occupationally-acquired infection, and/or a Workplace Safety and Insurance Board (WSIB) claim has been filed by or on behalf of the worker with respect to an occupational illness, including an occupational infection, to the:

- Ministry of Labour,
- Joint Health and Safety Committee (or health and safety representative), and
- trade union, if any.

Occupationally-acquired infections and illnesses are reportable to the WSIB.

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