GROUP A STREPTOCOCCAL (GAS) DISEASE 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 Group A Streptococcal (GAS) Disease Surveillance Protocol

Group A streptococcus (GAS) or *Streptococcus pyogenes* is a bacterium commonly found in the throat and on the skin. Group A streptococci can be present in the throat or on the skin and cause no symptoms, but they may also cause disease that ranges from mild to severe and can be life-threatening.

GAS is an important cause of morbidity and mortality. The most frequently encountered illnesses are streptococcal pharyngitis (strep throat) and skin infections (impetigo or pyoderma).[1] GAS can also cause scarlet fever, rheumatic fever, glomerulonephritis and severe invasive diseases including necrotizing fasciitis and toxic shock syndrome.[2] Since the 1980s there has been a resurgence of invasive GAS (iGAS) infection.[2,3] This may be due to a highly virulent clone of a specific strain or host factors that determine the severity of infection.[2] The annual incidence of iGAS cases in Ontario has been gradually increasing since 2005.[4]

Few people who come in contact with a virulent strain of GAS will develop iGAS disease; some may develop sore throat or localized skin infection, and most remain asymptomatic. Although healthy people can develop iGAS disease, the elderly, pregnant women, postpartum women, those with chronic illnesses such as HIV, cancer, diabetes, heart disease, lung disease, injection drug users, and those on steroid medications or who abuse alcohol are at higher risk.[2,5-7] In addition, breaks in the skin, such as cuts, wounds, or chickenpox lesions may provide an opportunity for GAS to enter the body.[2]

Group A streptococci are spread by direct, indirect or droplet contact with secretions from the nose and throat of infected or colonized persons or by contact with infected wounds or skin lesions.[1] The risk of spreading the infection is highest when a person is ill, e.g., with "strep throat" or an infected wound.[8] Persons who carry the bacteria but have no symptoms are generally considered to be less contagious, but are still contagious, especially with close contact. Treatment of infected persons with an effective antibiotic for 24 hours or longer generally eliminates their ability to spread the bacteria.[1]

The incubation period is short, usually from 1 to 3 days, rarely longer.[1] The period of communicability is from 7 days before the onset of GAS disease, until 24 hours after the start of effective antibiotic treatment.[9]

Transmission of GAS to patients and health care workers (HCWs) can occur by large respiratory droplets or by direct contact with infected patients or carriers.[10-12] Casual contact rarely leads to disease. HCWs, including surgeons, obstetricians, anaesthetists, midwives and nurses, have been epidemiologically and microbiologically linked to patient cases in several outbreaks.[1,11,13,14] These HCWs were typically asymptomatic.[13,14] The pharynx, vagina, rectum, or skin of the HCWs was found to be the site(s) of colonization or infection.[10,13,15] The reservoir of the infection for some HCWs has been household contacts.[15]

Improving infection prevention and control practices and identifying and treating HCWs who are symptomatic may prevent the transmission of GAS in hospitals.[12,16] HCWs can reduce the risk of infection by the consistent use of Routine Practices e.g., wearing a surgical mask and eye protection / face shield when performing a procedure where contamination with droplets from the oropharynx is possible.

Antimicrobial prophylaxis is not indicated for most HCWs who have been in contact with an infected patient. If fluid from the nose, mouth or wound of the infected case did not contact a HCW's mucous membranes or non-intact skin, that HCW was not exposed and does not need prophylactic antibiotics.[9] Antimicrobial prophylaxis is recommended for HCWs who have had a defined occupational exposure to a case of iGAS including necrotizing fasciitis, toxic shock syndrome, meningitis, or any other form of severe iGAS (see Glossary).[17] Pneumonia is no longer considered to be a sole indicator of severity.[18]

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

Group A Streptococcal (GAS) Disease Surveillance Protocol for Ontario Hospitals

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I. Purpose

The purpose of this protocol is to provide direction to hospitals to prevent the transmission of group A streptococcus (GAS) among Health Care Workers (HCWs) and patients.

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 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 student/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 will collaborate with Infection Prevention and Control (IPAC) and other departments, as appropriate.

III. Pre-placement

There is no need for pre-placement screening for GAS.

IV. Continuing Surveillance

There is no need for routine screening for GAS of any person carrying on activities in the hospital.

It is expected that all HCWs routinely use Routine Practices in all direct patient care activities. Personal protective equipment (e.g., surgical mask and eye protection or face shield) should be worn for procedures where respiratory

secretions may contact the mucous membranes of the HCW (e.g., suctioning) or using disposable gloves when the HCW's skin may contact the patient's non-intact skin.

HCWs not epidemiologically linked to iGAS cases who are incidentally found to be colonized with GAS should not be excluded from work, and should not be treated with antibiotics.[9,13]

V. Exposure

An occupational exposure of a HCW is defined as secretions from the nose, mouth, wound or skin infection of the infected patient coming into contact with the mucous membranes or non-intact skin of the HCW within 7 days of the onset of GAS until 24 hours after the start of effective therapy.[9] Treatment of the infected patient with an effective antibiotic for 24 hours generally eliminates their ability to spread the bacteria.[1]

If fluid from the nose, mouth, wound or skin infection of the infected case did not contact an HCW's mucous membranes or non-intact skin, that HCW was not exposed and does not need preventive antibiotics.

If appropriate personal protective equipment (e.g., surgical mask and eye protection or face shield, gloves) has been worn, there is no exposure.[9]

Antimicrobial Prophylaxis

Antimicrobial prophylaxis is not indicated for most HCWs who have been in contact with a patient infected with GAS.

If an HCW has an occupational exposure as defined above to a patient with a severe case of iGAS (see Glossary), chemoprophylaxis **should be offered.**[9,17] If indicated, antimicrobial prophylaxis should be given as soon as possible, preferably within 24 hours and up to 7 days after the last contact with an infected case.[9]

All exposed HCWs should be advised of the signs and symptoms of GAS disease and to seek medical attention immediately if fever or other signs or symptoms develop within 30 days of exposure, and notify OHS regardless of whether prophylactic therapy is given.[9]

Work Restrictions

Exposed asymptomatic HCWs should not be excluded from work.

VI. Acute Disease

HCWs who develop GAS disease, including streptococcal pharyngitis (strep throat), must be excluded from work until 24 hours after the start of effective antibiotic therapy.[9] The OHS must be notified immediately.[13]

VII. Reporting

Suspect or confirmed iGAS (as per Ontario Regs 135/18 and amendments under the Health Protection and Promotion Act) must be reported to the local Medical Officer of Health.

In accordance with the Occupational Health and Safety Act and its regulations, an employer must provide written notice within four days of being advised that a worker has an occupational illness, including an occupationally-acquired infection, and/or 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.

VIII. Outbreaks

Screening HCWs Linked to Nosocomial iGAS Cases

In collaboration with the Infection Prevention and Control service, the OHS should ensure that specimens for culture (throat, rectum, vagina and skin lesions) are obtained from HCWs epidemiologically linked to nosocomial iGAS cases in patients (see Glossary).[9]

Epidemiologically linked patient and HCW isolates of GAS should be sent for bacterial typing.

Work Restrictions

HCWs epidemiologically linked to nosocomial iGAS cases(s) in patients, and who are culture positive for GAS, must be excluded from patient care duties until 24 hours after the start of treatment with effective antibiotics.[9,13] (Refer to Appendix A for the recommended management for HCWs colonized with GAS).

IX. Glossary

Group A Streptococcal Disease, invasive (iGAS) Confirmed Case Definition [9,17,18]

- Isolation of group A streptococcus (*Streptococcus pyogenes*) or DNA detection by nucleic acid amplification test (NAAT) from a normally sterile site (e.g., blood, cerebrospinal fluid, joint, pleural, pericardial fluid) with or without clinical evidence of severity

  OR
- Isolation of group A streptococcus from a non-sterile site (e.g., skin) with clinical evidence of severity

  Any of the following is considered clinical evidence of severity:
  - Streptococcal toxic- shock syndrome (STSS) which is characterised by hypotension (systolic B.P. < 90mm Hg in adults or < 5th percentile for age for children) and at least two (2) of the following signs:
    - renal impairment (creatinine > 177 µmol/L for adults);
    - coagulopathy (platelet count ≤100,000 mm^3 or disseminated intravascular coagulation**);**
    - liver function abnormality (AST(SGOT), ALT(SGPT) or total bilirubin ≥2x upper limit of normal for age);
    - adult respiratory distress syndrome (ARDS);
    - generalized erythematous macular rash that may desquamate

  OR
  - Soft-tissue necrosis*, including necrotizing fasciitis or myositis or gangrene

  OR
  - Meningitis

  OR
  - Death **

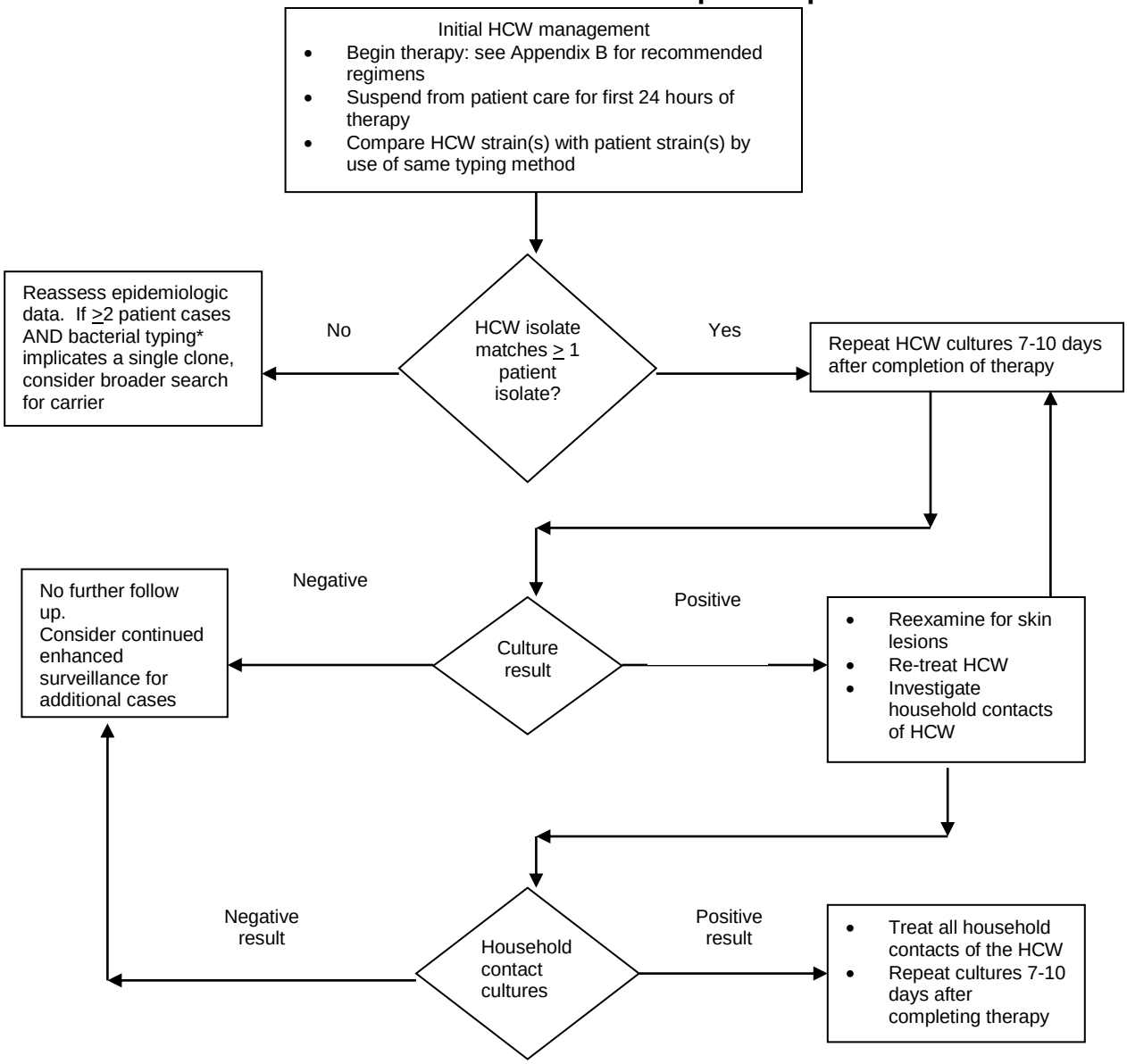
  OR
  - A combination of any of these conditions.

*Soft-tissue necrosis should not include chronic soft-tissue necrosis/gangrene, or acute or chronic cellulitis. Soft-tissue necrosis should be acute in nature and deeper than the skin (e.g., necrotizing fasciitis, myositis and gangrene as determined by the clinician).

**PHO recommends that for the purpose of public health management, a determination of of whether or not iGAS disease was a cause of death should be made only if an iGAS case dies within seven days of diagnosis.[18]

Appendix A[5]

Recommended Management for Health Care Workers (HCW) Epidemiologically Linked to Patient Cases and Colonized with Group A Streptococcus



*bacterial typing: pulsed-field gel electrophoresis (PFGE), emm typing

Reference: Prevention of Invasive Group A Streptococcal Disease among Household Contacts of Case Patients and Among Postpartum and Postsurgical Patients: Recommendations from the Centers for Disease Control and Prevention, p. 957.[5]

Appendix B[9]

Suggested regimens for chemoprophylaxis for group A streptococcus exposure [9,17]

Table 6. Recommended Chemoprophylaxis Regimens for Close Contacts

Drug	Dosage	Comments
First-generation cephalosporins: cephalexin, cephadroxil, cephradine	**First line.** Children and adults: 25 to 50 mg/kg daily, to a maximum of 1 g/day in 2 to 4 divided doses × 10 days	Recommended drug for pregnant and lactating women. Should be used with caution in patients with allergy to penicillin. Use of cephalosporins with nephrotoxic drugs (e.g. aminoglycosides, vancomycin) may increase the risk of cephalosporin-induced nephrotoxicity.
Erythromycin	**Second line.** Children: 5 to 7.5 mg/kg every 6 hours or 10 to 15 mg/kg every 12 hours (base) × 10 days (not to exceed maximum of adult dose) Adults: 500 mg every 12 hours (base) × 10 days	Erythromycin estolate is contraindicated in persons with pre-existing liver disease or dysfunction and during pregnancy. Sensitivity testing is recommended in areas where macrolide resistance is unknown or known to be ≥ 10%.
Clarithromycin	**Second line.** Children: 15 mg/kg daily in divided doses every 12 hours, to a maximum of 250 mg po bid × 10 days Adults: 250 mg po bid × 10 days	Contraindicated in pregnancy. Sensitivity testing is recommended in areas where macrolide resistance is unknown or known to be ≥ 10%.
Clindamycin	**Second line.** Children: 8 to 16 mg/kg daily divided into 3 or 4 equal doses × 10 days (not to exceed maximum of adult dose) Adults: 150 mg every 6 hours × 10 days	Alternative for persons who are unable to tolerate beta-lactam antibiotics.

References

1. Heymann, DL. Control of Communicable Diseases Manual. 20th ed. Washington: American Public Health Association; 2015: 581-589.

2. Baxter F, McChesney J. Severe group A streptococcal infection and streptococcal toxic shock syndrome. Can J Anesth 2000;47:1129-40.

3. Daneman N, Green KA, Low DE, Simor AE, Willey B, Schwartz B, et al. Surveillance for hospital outbreaks of invasive group A streptococcal infections in Ontario, Canada, 1992 to 2000. Ann Intern Med 2007;147:234-41.

4. Public Health Ontario. Reportable Disease Trends in Ontario, 2018. Group A streptococcal disease, invasive. Available online at: https://www.publichealthontario.ca/en/dataandanalytics/pages/rdto.aspx

5. The Prevention of Invasive Group A Streptococcal Infections Workshop Participants. Prevention of invasive group A streptococcal disease among household contacts of case patients and among postpartum and postsurgical patients: Recommendations from the Centers for Disease Control and Prevention. Clin Infect Dis 2002;35:950-9.

6. Deutscher M, Lewis M, Zell ER et al, for the Active Bacterial Core Surveillance Team. Incidence and severity of invasive *Streptococcus pneumoniae*, group A streptococcus, and group B streptococcus infections among pregnant and postpartum women. Clin Infect Dis 2011;53:114-23.

7. Hamilton SM, Stevens DL, Bryant AE. Pregnancy-related group A streptococcal infections: temporal relationships between bacterial acquisition, infection onset, clinical findings, and outcome. Clin Infect Dis 2013;57:870-6.

8. The Working Group on Prevention of Invasive Group A Streptococcal Infections. Prevention of invasive group A streptococcal disease among household contacts of case-patients: Is prophylaxis warranted? JAMA. 1998 15;279:1206-10.

9. Public Health Agency of Canada. Guidelines for the prevention and control of invasive group A streptococcal disease. CCDR [Internet]. 2006;32S2:1-26. Available online (archived) at: http://www.phac-aspc.gc.ca/publicat/ccdr-rmtc/06vol32/32s2/index-eng.php

10. Bolyard EA, Tablan OC, Williams WW, Pearson ML, Shapiro CN, Deitchman SD, and the Hospital Infection Control Practices Advisory Committee. Guidelines for infection control in health care personnel. Am J Infect Control 1998;26:289-354. Available online at: http://www.cdc.gov/hicpac/pdf/infectcontrol98.pdf

11. Kakis A, Gibbs L, Eguia J, et al. An outbreak of group A streptococcal infection among health care workers. Clin Infect Dis. 2002;35:1353-9.

12. Lacy MD, Horn K. Nosocomial transmission of invasive group A streptococcus from patient to health care worker. Clin Infect Dis 2009;49:354-7.

13. Health Canada. Infection control guidelines: Prevention and control of occupational infections in health care. CCDR [Internet] 2002; 28S1:1-264. Available online at: http://publications.gc.ca/site/archivee-archived.html?url=http://publications.gc.ca/collections/Collection/H12-21-3-28-1E.pdf Click on "Continue to PDF" link.

14. Daneman N, McGeer A, Low DE, et al. Hospital-acquired invasive group A streptococcal infections in Ontario, Canada, 1992-2000. Clin Infect Dis 2005:41:334-42.

15. Rutala WA, Weber D. Management of healthcare workers with pharyngitis or suspected streptococcal infections. Infect Cont Hosp Epid 1996;17:753-61.

16. Ontario Agency for Health Protection and Promotion, Provincial Infectious Diseases Advisory Committee. Routine Practices and Additional Precautions in All Health Care Settings. 3rd edition. Toronto, ON: Queen's Printer for Ontario; November 2012. Available online at: http://www.publichealthontario.ca/en/eRepository/RPAP_All_HealthCare_Settings_Eng2012.pdf

17. Ministry of Health and Long-Term Care. Ontario Public Health Standards. Infectious Diseases Protocol, Appendix A: Disease Specific Chapters and Appendix B: Provincial Case Definitions for Reportable Diseases. Disease: Group A Streptococcal Disease, invasive (iGAS). Revised March 2017. Available online at: http://www.health.gov.on.ca/en/pro/programs/publichealth/oph_standards/infdispro.aspx#g

18. Ontario Agency for Health Protection and Promotion (Public Health Ontario), Provincial Infectious Diseases Advisory Committee. Recommendations on Public Health Management of Invasive Group A Streptococcal (iGAS) Disease in Ontario. Toronto, ON: Queen's Printer for Ontario, 2014. Available online at: http://www.publichealthontario.ca/en/eRepository/iGAS_Recommendations_on_Public_Health_Management.pdf