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| **CHARACTERISTICS** |
| Morphology | Aerobic, gram-positive, non-motile, non-sporing cocci, extracellular bacterium. It has a β-hemolytic growth pattern on blood agar. |
| Disease | Group A (β-hemolytic) streptocci (GAS), streptococcal sore throat, strep throat, pharyngitis, scarlet fever, impetigo, erysipelas, puerperal fever, necrotizing fasciitis, toxic shock syndrome, septicaemia, acute rheumatic fever, acute post-streptococcal glomerulonephritis, gas gangrene. |
| Zoonosis | Cows infected by humans are intermediate hosts and can pass the bacterium in their milk, which, if consumed unpasteurized, can infect other humans. |

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| **HEALTH HAZARDS** |
| Host Range | Humans are primary reservoir for this bacterium, although cattle can also act as a reservoir. |
| Modes of Transmission | Transmission via respiratory droplets, hand contact with nasal discharge and skin contact with impetigo lesions. |
| Signs and Symptoms | Respiratory and gastrointestinal illness. |
| Infectious Dose | Unknown. |
| Incubation Period | Generally 1-3 days. |

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| **MEDICAL PRECAUTIONS/TREATMENT** |
| Prophylaxis | Administering penicillin to carriers has been shown to reduce the number of people infected during an outbreak of streptococcal sore throat. |
| Vaccines | None. |
| Treatment | Penicillin is used for respiratory tract infections (pharyngitis) and macrolides or lincosamides are used if there are allergies. Clindamycin may be used in cases of necrotizing fasciitis and surgical debridement of the affected area is necessary. |
| Surveillance | Monitor for symptoms. |
| MSU Requirements | Report any exposures. |

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| **LABORATORY HAZARDS** |
| Laboratory Acquired Infections (LAIs)  | 78 documented cases since 1999. |
| Sources | Respiratory specimens, skin lesions, blood, sputum and wound exudates. Cultures, frozen stocks, other samples described in IBC protocol. |

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| **RISK GROUP & CONTAINMENT REQUIREMENTS** |
| Risk Group 2 | Agents that are associated with human disease which is rarely serious and for which preventive or therapeutic interventions are often available. |
| BSL2 | For all procedures involving suspected or known infectious specimen or cultures. |
| ABSL2 | For all procedures utilizing infected animals. |

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| **VIABILITY** |
| Disinfection | 1% sodium hypochlorite, 4% formaldehyde, 2% glutaraldehyde, 70% ethanol, 70% propanol, 2% peracetic acid, 3-6% hydrogen peroxide and 0.16% iodine |
| Inactivation | Inactivated by moist heat (60 minutes at 121oC) and dry heat (1 hour at 160-170oC). |
| Survival Outside Host | The bacterium can survive on a dry surface for 3 days to 6.5 months. It has been found to survive in ice cream (18 days), raw and pasteurized milk at 15-37 ºC (96 hrs), room temperature butter (48 hrs), and neutralized butter (12-17 days). GAS has been found to last several days in cold salads at room temperature. |

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| **SUPPLEMENTAL REFERENCES** |
| BMBL | <https://www.cdc.gov/labs/BMBL.html>  |
| NIH Guidelines | <https://osp.od.nih.gov/wp-content/uploads/NIH_Guidelines.pdf>  |
| Canada PSDS | <https://www.canada.ca/en/public-health/services/laboratory-biosafety-biosecurity/pathogen-safety-data-sheets-risk-assessment/streptococcus-pyogenes.html> |

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| **SPILL PROCEDURES** |
| Small | Notify others working in the lab. Remove PPE and don new PPE. Cover area of the spill with absorbent material and add fresh 1:10 bleach:water. Allow 20 minutes (or as directed) of contact time. After 20 minutes, cleanup and dispose of materials. |
| Large | * Immediately notify all personnel in the lab and clear all personnel from the area. Remove any contaminated PPE/clothing and leave the lab.
* Secure the area by locking doors, posting signage and guarding the area to keep people out of the space.

For assistance, contact MSU's Biosafety Officer (406-994-6733) or Safety and Risk Management (406-994-2711). |

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| **EXPOSURE PROCEDURES** |
| Mucous membrane | Flush eyes, mouth, or nose for 5 minutes at eyewash station. |
| Other Exposures | Wash area with soap and water for 5 minutes. |
| Reporting | Immediately report incident to supervisor, complete a [First Report of Injury](https://firstreportinjury.mus.edu/) form, and submit to Safety and Risk Management. |
| Medical Follow-up | **During business hours:**Bridger Occupational Health 3400 Laramie Drive Weekdays 8am -6pm. Weekends 9am-5pm406-577-7674**After business hours:**Bozeman Deaconess Hospital Emergency Room915 Highland Blvd |

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| **PERSONAL PROTECTIVE EQUIPMENT (PPE)** |
| Minimum PPE Requirements | Lab coat, disposable gloves, safety glasses, closed toed shoes, long pants |
| Additional Precautions | Additional PPE may be required depending on lab specific SOPs and IBC Protocol. |