**Streptococcus pyogenes**

### Characteristics

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Description</th>
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<tbody>
<tr>
<td><strong>Morphology</strong></td>
<td>Aerobic, gram-positive, non-motile, non-sporing cocci, extracellular bacterium. It has a β-hemolytic growth pattern on blood agar</td>
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<tr>
<td><strong>Disease</strong></td>
<td>Group A (β-hemolytic) streptoccci (GAS), streptococcal sore throat, strep throat, pharyngitis, scarlet fever, impetigo, erysipelas, puerperal fever, necrotizing fasciitis, toxic shock syndrome, sepsicaemia, acute rheumatic fever, acute post-streptococcal glomerulonephritis, gas gangrene</td>
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<tr>
<td><strong>Zoonosis</strong></td>
<td>Cows infected by humans are intermediate hosts and can pass the bacteria in their milk, which, if consumed unpasteurized, can infect other humans</td>
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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.

### 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
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 penicillin allergy for respiratory tract infections.

#### Treatment
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#### Surveillance
Monitor for symptoms of infection.

#### MSU Requirements
Report any exposures.

### 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.

### Supplemental References

- **BMBL:** [https://www.cdc.gov/labs/BMBL.html](https://www.cdc.gov/labs/BMBL.html)
- **CDC:** [https://www.cdc.gov/groupastrep/diseases-hcp/index.html](https://www.cdc.gov/groupastrep/diseases-hcp/index.html)

### 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.

### Spill Procedures

#### Small
- 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).

#### Large
- 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 bleachwater. Allow 20 minutes (or as directed) of contact time. After 20 minutes, cleanup and dispose of materials.

### 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 form, and submit to Safety and Risk Management.

#### During business hours:
Bridger Occupational Health 3406 Laramie Drive Weekdays 8am - 6pm. Weekends 9am-5pm

#### After business hours:
Bozeman Deaconess Hospital Emergency Room 915 Highland Blvd

### 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 (15 minutes at 121 °C) and dry heat (1 hour at 170 °C).

#### 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 °C (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.

### Personal Protective Equipment (PPE)

**Minimum PPE Requirements**
- Lab coat, disposable gloves, safety glasses, closed toe shoes, long pants.

**Additional Precautions**
- Additional PPE may be required depending on lab specific SOPs and IBC Protocol.