ENTEROCOCCUS FAECALIS - ENTEROCOCCUS FAECIUM

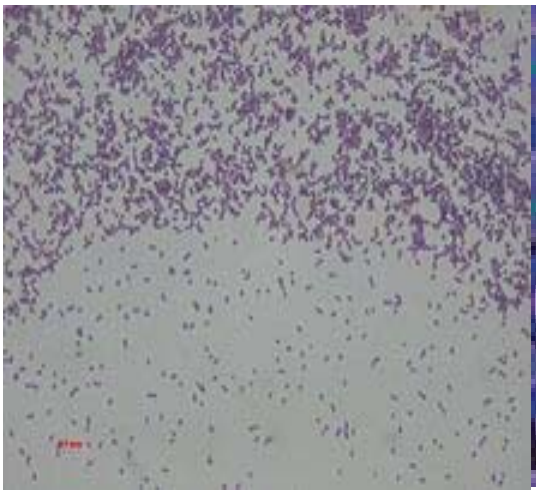
PATHOGEN SAFETY DATA SHEET - INFECTIOUS SUBSTANCES

INFECTIOUS AGENT

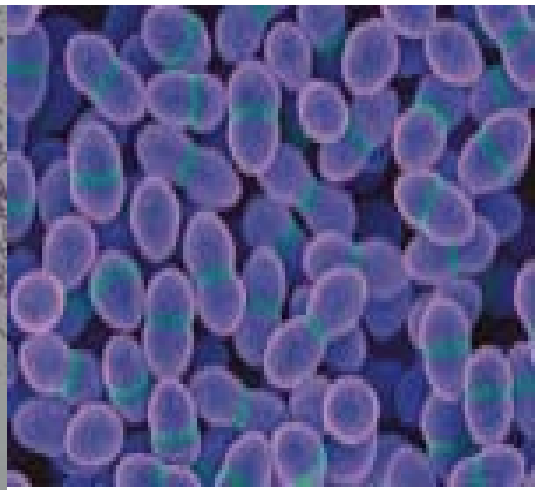
NAME: *Enterococcus faecalis* and *Enterococcus faecium*

SYNONYM OR CROSS REFERENCE: Nonhemolytic streptococci, gamma hemolytic streptococci, enterococcus, group D streptococci, vancomycin-resistant enterococcus (VRE). Formerly known as *Streptococcus faecalis* and *Streptococcus faecium*.

CHARACTERISTICS: *Enterococcus* spp. are facultatively anaerobic, catalase-negative Gram-positive cocci, arranged individually, in pairs, or short chains. Optimal temperature for growth of *E. faecalis* and *E. faecium* is 35°C. *E. faecalis* and *E. faecium* are normal inhabitants of the intestinal tract, female genital tract, and (less commonly) oral cavity.



Enterococcus faecalis, gram-stained[1)]



Enterococcus faecalis cell division[2)]

HAZARD IDENTIFICATION

PATHOGENICITY/TOXICITY: Enterococci can cause urinary tract, wound, and soft tissue infections. They are also associated with bacteremia which can lead to endocarditis in previously damaged cardiac valves. *E. faecalis* is the most frequent species isolated from human intestine samples (80-90%), *E. faecium* accounts for 5-10% of isolates.

EPIDEMIOLOGY: Worldwide distribution. Enterococci are opportunistic pathogens which affect elderly patients with underlying disease and other immunocompromised patients who have been hospitalized for long periods, treated with invasive devices, or received broad-spectrum antibiotics. Enterococci are common nosocomial pathogens, accounting for 10% of hospital-acquired infections in the USA (nosocomial infections are infections that are acquired in hospitals and other healthcare facilities). Enterococci are consistently the second or third most common agent in urinary tract infections, wound infections, and bacteremia in hospitals. They are responsible for about 16% of nosocomial urinary tract infections.

HOST RANGE: Humans, pets and livestock.

INFECTIOUS DOSE: Unknown.

MODE OF TRANSMISSION: Nosocomial and person-to-person transmission; can also be transmitted on food products.

INCUBATION PERIOD: Unknown.

COMMUNICABILITY: Yes, can be transmitted from person-to-person.

DISSEMINATION

RESERVOIR: Gastrointestinal tract of humans and animals including mammals, birds, insects, and reptiles.

ZOONOSIS: Very likely that *Enterococcus* can be transmitted from animals to humans.

VECTORS: None.

STABILITY AND VIABILITY

DRUG SUSCEPTIBILITY: Most strains remain susceptible to penicillin, ampicillin, and vancomycin.

DRUG RESISTANCE: Strains resistant to β-lactams, aminoglycosides and, increasingly, vancomycin have been described. Strains have also been identified which carry genetic elements conferring resistance to chloramphenicol, tetracyclines, macrolides, lincosamides, quinolones, and streptogramins.

SUSCEPTIBILITY/RESISTANCE TO DISINFECTANTS: Susceptible to 70% isopropyl alcohol, 70% ethanol, 5.25% sodium hypochlorite, phenolic and quaternary ammonia compounds, and glutaraldehyde. Resistant to 3% hydrogen peroxide.

PHYSICAL INACTIVATION: Enterococci are killed by temperatures in excess of 80°C.

SURVIVAL OUTSIDE HOST: Enterococci can grow and survive in harsh environments, and can persist almost anywhere including soil, plants, water, and food. Can survive 5 days to 4 months on dry inanimate surfaces.

FIST AID / MEDICAL

SURVEILLANCE: Monitor for symptoms. Diagnosis is via isolation of enterococci from clinical specimens.

FIRST AID/TREATMENT: Treatment with penicillin or ampicillin for infections such as urinary tract infection, peritonitis, and wound infections. Combination therapy of a cell wall-active agent (penicillin, ampicillin or vancomycin) and an aminoglycoside is required for the treatment of endocarditis and possibly meningitis.

IMMUNISATION: None.

PROPHYLAXIS: None.

LABORATORY HAZARDS

LABORATORY-ACQUIRED INFECTIONS: No cases have been reported.

SOURCES/SPECIMENS: Blood, urine, wound samples, and feces.

PRIMARY HAZARDS: Accidental parenteral inoculation or ingestion.

SPECIAL HAZARDS: None.

EXPOSURE CONTROLS / PERSONAL PROTECTION

RISK GROUP CLASSIFICATION: Risk Group 2.

CONTAINMENT REQUIREMENTS: Containment Level 2 facilities, equipment, and operational practices for work involving infectious or potentially infectious materials, animals, or cultures.

PROTECTIVE CLOTHING: Lab coat. Gloves when direct skin contact with infected materials or animals is unavoidable. Eye protection must be used where there is a known or potential risk to splashes.

OTHER PRECAUTIONS: All procedures that may produce aerosols, or involve high concentrations or large volumes should be conducted in a biological safety cabinet (BSC). The use of needles, syringes, and other sharp objects should be strictly limited. Additional precautions should be considered with work involving animals or large scale activities.

HANDLING AND STORAGE

SPILLS: Allow aerosols to settle. Wearing protective clothing, gently cover spill with paper towels and apply an appropriate disinfectant, starting at perimeter and working towards the centre. Allow sufficient contact time before clean up.

DISPOSAL: Decontaminate before disposal - steam sterilization, incineration, chemical disinfection.

STORAGE: In sealed containers that are appropriately labeled.

REFERENCE

Pathogen Safety Data Sheet (PSDS) for *Enterococcus faecalis* and *Enterococcus faecium* has been modified from the ones produced by the Public Health Agency of Canada as educational and informational resources for laboratory personnel working with infectious substances.

1) Picture from Wikipedia
2) Picture from *Environ Health Perspect* 119:a489-a489 (2011)