

SALMONELLA TYPHI

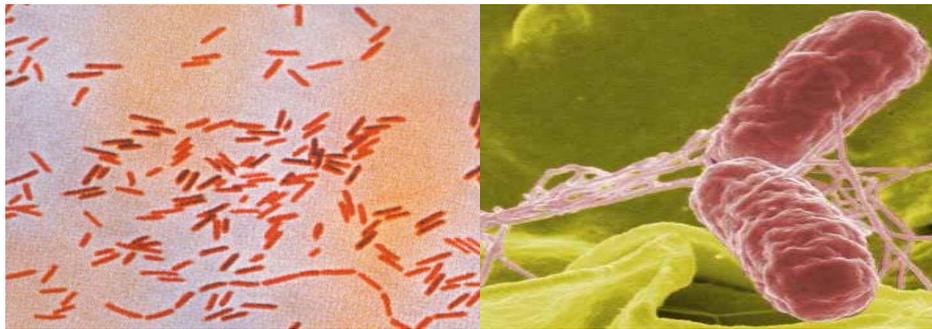
PATHOGEN SAFETY DATA SHEET / INFECTIOUS SUBSTANCES

INFECTIOUS AGENT

NAME: *Salmonella typhi*

SYNONYM OR CROSS REFERENCE: Typhoid fever, Enteric fever, Typhus abdominalis, *Salmonella choleraesuis* serotype typhi, *Salmonella enterica* serotype typhi

CHARACTERISTICS: Family Enterobacteriaceae; Gram negative rod; motile, aerobic and facultatively anaerobic; serological identification of somatic, flagellar and Vi antigens.



Salmonella typhi, gram-stained¹⁾

Salmonella typhi cells²⁾

HAZARD IDENTIFICATION

PATHOGENICITY: Generalized systemic enteric fever, headache, malaise, anorexia, enlarged spleen, and constipation followed by more severe abdominal symptoms. Common enterocolitis may result without enteric fever; characterized by headache, abdominal pain, nausea, vomiting, diarrhea, dehydration may result; case fatality of 16% reduced to 1% with antibiotic therapy; mild and atypical infections occur.

EPIDEMIOLOGY: Worldwide; sporadic cases in North America; most cases represent importation from endemic areas; multi-drug resistant strains have appeared in several areas of world.

HOST RANGE: Humans

INFECTIOUS DOSE: 100,000 organisms - ingestion; variable with gastric acidity and size of inoculum.

MODE OF TRANSMISSION: Person-to-person; by contaminated food or water; by food contaminated by hands of carriers; flies can infect foods in which the organisms may multiply to achieve an infective dose.

INCUBATION PERIOD: Depends on size of infecting dose; usually 1-3 weeks.

COMMUNICABILITY: Communicable as long as typhoid bacilli appear in excreta; usually 1st week throughout convalescence; 10% of patients discharge bacilli for 3 months after onset; 2-5% become chronic carriers and may shed bacteria for years.

DISSEMINATION

RESERVOIR: Humans - patients with acute illness and chronic carriers.

ZOONOSIS: None

VECTORS: Possibly flies (mechanical only).

STABILITY AND VIABILITY

DRUG SUSCEPTIBILITY: Susceptible to chloramphenicol, ampicillin, amoxicillin, Trimethoprim/sulfamethoxazole (TMP-SMX), fluoroquinolones; Multi-drug resistant (MDR) strains are on the rise; drug susceptibility testing is required.

SUSCEPTIBILITY TO DISINFECTANTS: Susceptible to many disinfectants - 1% sodium hypochlorite, 70% ethanol, 2% glutaraldehyde, iodines, phenolics, formaldehyde.

PHYSICAL INACTIVATION: Sensitive to moist heat (121° C for at least 15 min) and dry heat (160-170°C for at least 1 hour).

SURVIVAL OUTSIDE HOST: Ashes - 130 days; rabbit carcass - 17 days; dust - up to 30 days; feces - up to 62 days; linoleum floor - 10 hours; ice - 240 days; skin - 10-20 min.

FIRST AID / MEDICAL

SURVEILLANCE: Monitor for symptoms; bacteriological examination of blood, excreta; serology not effective.

FIRST AID/TREATMENT: Antibiotic therapy for enteric fever; determine appropriate antibiotic with drug susceptibility testing.

IMMUNIZATION: Typhoid vaccines: injectable or oral; vaccine administered for occupational exposure or travel to endemic areas for longer than 4 weeks; does not offer complete protection, immunity may be overwhelmed by large inoculum; oral vaccine is contraindicated in immunocompromised and pregnant individuals.

PROPHYLAXIS: Antibiotic prophylaxis

LABORATORY HAZARDS

LABORATORY-ACQUIRED INFECTIONS: Typhoid is the second most commonly reported laboratory infection with some deaths.

SOURCES/SPECIMENS: Feces, urine, bile, blood.

PRIMARY HAZARDS: Ingestion, parenteral inoculation; importance of aerosol exposure not known.

SPECIAL HAZARDS: None

EXPOSURE CONTROLS /PERSONAL PROTECTION

RISK GROUP CLASSIFICATION: Risk group 2.

CONTAINMENT REQUIREMENTS: Biosafety level 2 practices, containment equipment, and facilities for all activities utilizing known or potentially infectious clinical materials and cultures.

PROTECTIVE CLOTHING: Laboratory coat; gloves when contact with infected materials is unavoidable.

OTHER PRECAUTIONS: Good personal hygiene and frequent hand washing; vaccination for those regularly working with *S. typhi* cultures or clinical materials.

HANDLING AND STORAGE

SPILLS: Allow aerosols to settle; wearing protective clothing; gently cover spill with paper towels and apply 1% sodium hypochlorite, starting at perimeter and working towards the centre; allow sufficient contact time (30 min) before clean up.

DISPOSAL: Decontaminate before disposal; steam sterilization, chemical disinfection.

STORAGE: In sealed containers that are appropriately labeled

REFERENCE

Pathogen Safety Data Sheet (PSDS) for *Salmonella typhi* 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 Todar's Online Textbook of Bacteriology
- 2) Picture from www.bimcbali.com