ESCHERICHIA COLI, ENTEROINVASIVE - MATERIAL SAFETY DATA SHEETS (MSDS)

MATERIAL SAFETY DATA SHEET - INFECTIOUS SUBSTANCES

SECTION I - INFECTIOUS AGENT

NAME: Escherichia coli, enteroinvasive

SYNONYM OR CROSS REFERENCE: EIEC, bacillary dysentery

CHARACTERISTICS: Gram negative rod; motile, aerobic; serotyping

SECTION II - HEALTH HAZARD

PATHOGENICITY: Disease localized primarily in the colon (invasion of epithelial cells of colon, similar to dysentery; shigella-like disease); fever; mucoid, occasionally bloody diarrhea; generally self-limiting; most severe form may result in hypotension with severe toxemia; sometimes associated with food poisoning

EPIDEMIOLOGY: Usually sporadic, particularly in under-developed countries; may cause common source outbreaks

HOST RANGE: Human

INFECTIOUS DOSE: Appears to have low infectious dose, may be similar to that of Shigella spp.,10 organisms by ingestion

MODE OF TRANSMISSION: Fecal-oral route; fecal contamination of water, food or fomites; poor sanitation and hygiene

INCUBATION PERIOD: 12-72 hours

COMMUNICABILITY: Communicable during duration of fecal excretion (several weeks)

SECTION III - DISSEMINATION

RESERVOIR: Infected persons

ZOONOSIS: No

VECTORS: None

SECTION IV - VIABILITY

DRUG SUSCEPTIBILITY: Sensitive to ampicillin

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

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

SURVIVAL OUTSIDE HOST: Survives well in contaminated feces, food, soil or water
SECTION V - MEDICAL

SURVEILLANCE: Monitor for symptoms; confirm by examination of stool specimens; demonstration of invasiveness of isolates in tissue culture

FIRST AID/TREATMENT: Therapy generally not necessary as illness is short-lived; electrolyte fluid therapy if excessive diarrhea; antibiotic therapy in severe cases

IMMUNIZATION: None

PROPHYLAXIS: Not usually administered

SECTION VI - LABORATORY HAZARDS

LABORATORY-ACQUIRED INFECTIONS: 3 reported cases of laboratory infections with *E. coli*

SOURCES/SPECIMENS: Feces; contaminated food, water, fomites

PRIMARY HAZARDS: Ingestion

SPECIAL HAZARDS: None

SECTION VII - RECOMMENDED PRECAUTIONS

CONTAINMENT REQUIREMENTS: Biosafety level 2 practices containment equipment and facilities for activities involving cultures and infected clinical materials

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

OTHER PRECAUTIONS: Good personal hygiene and frequent handwashing

SECTION VIII - HANDLING INFORMATION

SPILLS: Allow aerosols to settle; wearing protective clothing, gently cover spill with absorbent paper towel 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 labelled

SECTION IX - MISCELLANEOUS INFORMATION

Date prepared: January, 2000

Prepared by: Office of Laboratory Security, PHAC

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ESCHERICHIA COLI, ENTEROPATHOGENIC - MATERIAL SAFETY DATA SHEETS (MSDS)

MATERIAL SAFETY DATA SHEET - INFECTIOUS SUBSTANCES

SECTION I - INFECTIOUS AGENT

NAME: Escherichia coli, enteropathogenic
SYNONYM OR CROSS REFERENCE: EPEC, attaching and effacing E. coli (AEEC), enteroadherent E. coli (EAEC), acute diarrhea, infantile diarrheal disease
CHARACTERISTICS: Gram negative rod; motile, aerobic; non-enterotoxin producing and non-enteroinvasive; serogroups possess an antigenic adherence factor (bundle-forming pilus BFP); serotyping to determine somatic and flagellar antigens

SECTION II - HEALTH HAZARD

PATHOGENICITY: Intestinal disease accompanied by watery diarrhea, fever, cramps and vomiting; bloody stool in some cases; serious disease in infants
EPIDEMIOLOGY: Associated with outbreaks of acute diarrheal disease in newborn nurseries; occurs sporadically as well; EPEC no longer an important cause of infant diarrhea in North America and Europe; major agent of infant diarrhea in many developing countries (South America, South Africa, Asia), infants < 1 year old
HOST RANGE: Humans, especially infants < 2 years, most mammals (livestock)
INFECTION DOSE: highly infectious for infants, does unknown, presumably low; Adults by ingestion - 100,000,000 organisms to 10,000,000,000 organisms (10^8 to 10^10)
MODE OF TRANSMISSION: Fecal contamination of food, water or fomites; fecal-oral spread; may be spread to infants during delivery or by contaminated hands; poor hygiene and poor sanitation
INCUBATION PERIOD: 12-72 hours (9-12 hrs in adult volunteer studies)
COMMUNICABILITY: Communicable period not known, but presumably for the duration of fecal excretion, which may be prolonged several weeks

SECTION III - DISSEMINATION

RESERVOIR: Infected persons, often asymptomatic; animals
ZOOONOSIS: Yes - direct or indirect contact with infected animals and wastes
VECTORS: None

SECTION IV - VIABILITY

DRUG SUSCEPTIBILITY: Susceptible to ampicillin, TMP-SMX
SUSCEPTIBILITY TO DISINFECTANTS: Susceptible to many disinfectants - 1% sodium hypochlorite, 70% ethanol, iodines, phenolics; glutaraldehyde, formaldehyde
PHYSICAL INACTIVATION: Inactivated by moist heat (121°C for at least 15 min) and dry heat 160-170°C for at least 1 hour

SURVIVAL OUTSIDE HOST: Dust 4 to 27 days; feces - up to 84 days; fingertip - 45 min; soil - up to 84 days

SECTION V - MEDICAL

SURVEILLANCE: Monitor for symptoms; confirm bacteriologically, serologically
FIRST AID/TREATMENT: Electrolyte fluid therapy (oral or IV); antibiotics may be administered in very severe cases
IMMUNIZATION: None
PROPHYLAXIS: Not usually administered

SECTION VI - LABORATORY HAZARDS

LABORATORY-ACQUIRED INFECTIONS: 2 reported cases of laboratory infections with *E. coli*

SOURCES/SPECIMENS: Feces

PRIMARY HAZARDS: Ingestion

SPECIAL HAZARDS: None

SECTION VII - RECOMMENDED PRECAUTIONS

CONTAINMENT REQUIREMENTS: Biosafety level 2 practices, containment equipment and facilities for activities involving cultures and infected clinical materials

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

OTHER PRECAUTIONS: Good personal hygiene and frequent handwashing

SECTION VIII - HANDLING INFORMATION

SPILLS: Allow aerosols to settle; wearing protective clothing, gently cover spill with absorbent paper towel 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 labelled

SECTION IX - MISCELLANEOUS INFORMATION

Date prepared: January, 2001

Prepared by: Office of Laboratory Security, PHAC

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Date Modified: 2001-09-27
ESCHERICHIA COLI, ENTEROTOXIGENIC - MATERIAL SAFETY DATA SHEETS (MSDS)

MATERIAL SAFETY DATA SHEET - INFECTIOUS SUBSTANCES

SECTION I - INFECTIOUS AGENT

NAME: *Escherichia coli*, enterotoxigenic

SYNONYM OR CROSS REFERENCE: ETEC, traveller's diarrhea, gastroenteritis

CHARACTERISTICS: Gram negative rod; motile, aerobic; produces a heat labile enterotoxin (LT) and a heat stable enterotoxin (ST)

SECTION II - HEALTH HAZARD

PATHOGENICITY: Self-limiting cholera-like disease in infants and adults; profuse watery diarrhea without blood or mucus; abdominal cramping, vomiting, acidosis, prostration, malaise and dehydration can occur; fever may or may not be present; symptoms usually lasts fewer than 5 days

EPIDEMIOLOGY: Usually sporadic, particularly in underdeveloped countries; may cause common source outbreaks; one of two major leading causes of diarrhea in children in developing countries; has become the leading bacterial cause of gastroenteritis outbreaks on cruise ships; accounts for 40-60% of all cases of traveller's diarrhea

HOST RANGE: Humans, livestock, most mammals; species specific, no known non-human hosts for human ETEC

INFECTION DOSE: 100,000,000 organisms to 10,000,000,000 organisms ($10^8$ to $10^{10}$) by ingestion

MODE OF TRANSMISSION: Fecal-oral route; poor sanitation; fecal contamination of food, water or fomites; poor personal hygiene

INCUBATION PERIOD: 24-72 hours

COMMUNICABILITY: Communicable for duration of fecal excretion (several weeks)

SECTION III - DISSEMINATION

RESERVOIR: Humans, animals; ETEC infections are largely species specific; humans constitute the reservoir for strains causing diarrhea in humans

ZOONOSIS: No

VECTORS: None

SECTION IV - VIABILITY

DRUG SUSCEPTIBILITY: Sensitive to wide spectrum of antibiotics; quinolines first choice treatment worldwide

DRUG RESISTANCE: tetracyclines, trimethoprim-sulfamethoxazole approximately 40%

SUSCEPTIBILITY TO DISINFECTANTS: Susceptible to many disinfectants - 1% sodium


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hypochlorite, 70% ethanol, glutaraldehyde, iodines, phenolics, formaldehyde

**PHYSICAL INACTIVATION:** Inactivated by moist heat (121°C for at least 15 min) and dry heat (160-170°C for at least 1 hour)

**SURVIVAL OUTSIDE HOST:** Dust 4 to 27 days; feces - up to 84 days; fingertip - 45 min; soil - up to 84 days

**SECTION V - MEDICAL**

**SURVEILLANCE:** Monitor for symptoms; confirm bacteriologically

**FIRST AID/TREATMENT:** Electrolyte fluid therapy (oral or IV); antibiotics may be administered in very severe cases

**IMMUNIZATION:** Oral vaccine under development

**PROPHYLAXIS:** Short term antibiotic therapy with TMP-SMX or doxycycline for travellers going to high-risk areas with no safe food or water

**SECTION VI - LABORATORY HAZARDS**

**LABORATORY-ACQUIRED INFECTIONS:** 2 reported cases of laboratory infections with *E. coli*

**SOURCES/SPECIMENS:** Feces; contaminated food, water, fomites

**PRIMARY HAZARDS:** Ingestion

**SPECIAL HAZARDS:** None

**SECTION VII - RECOMMENDED PRECAUTIONS**

**CONTAINMENT REQUIREMENTS:** Biosafety level 2 practices, containment equipment and facilities for activities involving cultures and infected clinical materials

**PROTECTIVE CLOTHING:** Laboratory coat; gloves when contact with infectious materials is unavoidable

**OTHER PRECAUTIONS:** Good personal hygiene and frequent handwashing

**SECTION VIII - HANDLING INFORMATION**

**SPILLS:** Allow aerosols to settle; wearing protective clothing, gently cover spill with absorbent paper towel 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 labelled

**SECTION IX - MISCELLANEOUS INFORMATION**

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