

E. Coli

Exposure Medical Response Guidance for the University of Wisconsin

Instructions: Information in this guidance is meant to inform both laboratory staff and health professionals about the risks and treatment of infectious agent exposures. In developing this guidance, please consider that multiple routes of exposure may occur in a lab and that organism strains will sometimes be genetically modified to incorporate traits such as antimicrobial resistance. Research protocols and other available guidance such as Health Canada material safety data sheets will be provided as supporting information when available. It should be assumed that when exposures do occur, that the healthcare provider will be provided information about the specific strain involved, route of exposure, inoculum concentration, and victim vaccination and serological status, when available. If there are any questions about this document, please contact Jim Morrison, UW Occupational Health Officer at 263-2177 or jmorrison@fpm.wisc.edu.

Signs and Symptoms of Infection- Describe signs and symptoms associated with the agent.

Overview of Diseases caused by E. coli:

Illness depends on the strain of E. coli and the route of exposure:

i) E coli K 12 is typically non pathogenic

ii) Other E. coli strains typically results in a diarrheal illness. They may cause bloody stools. The bacteria can get into the blood stream and result in sepsis.

iii) A special note regarding Verotoxin producing E coli (these are also known as Shiga toxin producing E. coli or else STEC E. coli. These are of two broad categories E. coli O 157 and E. coli non 0157). A small percentage (5-10%) of people with diarrheal illness (especially bloody diarrhea) from these strains can go on to develop kidney dysfunction, destruction of red blood cells and platelets in the blood. This condition is called Hemolytic Uremic Syndrome (HUS).

Signs and Symptoms of Infection:

Illness due to Ingestion: Typically causes a diarrheal illness. This is usually associated with abdominal cramping. The diarrhea can be watery. This may go on to cause bloody diarrhea (also called dysentery). **Bloody diarrhea requires medical attention.** In rare cases (as mentioned earlier), the bloody diarrhea can go on to produce kidney dysfunction, destruction of red blood cells and platelets. Clues that a person is developing HUS include decreased frequency of urination, feeling very tired, and losing pink color in cheeks and inside the lower eyelids

Illness due to Needle stick: May cause a local reaction- redness, warmth, tenderness and possibly pus formation at the site of the needle stick. Rarely, the bacteria may enter the blood stream and cause sepsis. This results in fevers, feeling generally tired, weak and unwell.

Infection due to Aerosol/Inhalation: This route typically does not cause disease though it can theoretically cause inflammation in the lung. This manifests as cough, fevers and may lead to shortness of breath as well as feeling tired and weak.

Infection due to Mucosal exposure of the Eye: This can cause inflammation of the cornea and conjunctiva. This presents as redness, watering and discomfort in the affected eye. This typically starts a few hours to a few days after the exposure

Infectivity- Describe infective dose, relevant exposure routes (considering laboratory use), incubation period and potential severity of infection.

Verotoxin producing E coli are highly infective. Small quantities of bacteria – 10 to 100, are sufficient to cause disease via ingestion. Higher numbers ($> 10^5$) are needed for other E. coli strains to cause disease.

Most common route of exposure is due to Ingestion. This occurs due to poor hand hygiene. Other possible routes include needle stick injury and mucosal exposure of the eye. Aerosol inhalation as a source of infection is rare.

Incubation period is typically 3-5 days. (It can be as early as 1 day and as late as 10 days)

Severity of Illness: Most illness due to E coli is a mild diarrheal illness that subsides in 5-7 days. A small percentage can develop bloody diarrhea (dysentery). 5- 10 % of those developing illness due to Verotoxin producing strains will go on to develop HUS which is a serious illness. (Please see Overview of Disease caused by E. coli above).

Returning to Work:

Those who develop diarrheal symptoms shed the bacteria and are infective to others till the diarrhea subsides. They should refrain from coming back to work till 24 – 48hrs after diarrhea subsides. Patients with documented Verotoxin producing E. coli infection resulting in diarrhea may require additional stool testing to ensure clearance before returning to work.

Description of First Aid - Provide an overview of first aid treatment of exposures considering that multiple routes of exposure could occur (needle stick, aerosol, eye, skin and ingestion).

Needle stick exposure: Wash site with antibacterial soap and water. Watch for signs of infection that may develop at the site of the needle stick as detailed above. Other standard

practices post needle stick injury apply.

Eye exposure: Rinse eye well for 10 - 15 minutes with sterile saline or water in an effort to flush out any organisms. Monitor thereafter for symptoms and signs of eye infection as detailed above.

Inhalation exposure: No specific first aid. Watch for symptoms as listed above.

Ingestion: No specific first aid is available after ingestion of E coli strains. Routine hand hygiene is of paramount importance in preventing ingestion. There is no role for prophylactic antibiotics. Watch for diarrheal symptoms as listed above.

Urgency of Medical Care- Describe how soon medical attention should be sought, i.e. is an ER visit necessary, visit to University Health, or simply schedule a visit with a personal physician.

Urgency of Medical Care depends upon the severity of symptoms.

For illness following ingestion:

Mild diarrhea may be managed at home. It is important to maintain hydration to replace fluid that is lost via the stools. One needs to replenish electrolytes that are lost as well. Oral rehydration solutions or else drinks such as Gatorade help replace lost electrolytes.

If the diarrhea is severe, if there is vomiting and you are not able to take fluids - do not delay in seeking medical attention. You need to be seen either in University Health Services or else at an Urgent care/ ER.

If there is blood in the stools – do not wait – seek medical attention. You need to be seen either in University Health Services or else Urgent care/ ER.

In cases of Verotoxin producing E coli exposures: **DO NOT** treat yourself with antibiotics or else anti diarrheal agents such as Lomotil. These may increase the risk of developing HUS.

For eye complaints following mucosal exposure to the eye:

Contact the Ophthalmology clinic at U Station 608 263 7171 during work hours (M- F: 8am -5pm). After hours you will need to be seen in Urgent Care/ ER.

For local reaction following Needle stick exposure:

Contact University Health Services during daytime hours. During afterhours you will need to be seen in Urgent Care/ ER.

Description of Medical Response- Provide an overview for clinical treatment of exposures to the agent considering that multiple routes of exposure could occur (needlestick, aerosol, eye, skin and ingestion) and that strains of agents will vary and sometimes include antimicrobial resistance.

Medical response depends on the illness that develops.

Diarrheal illness:

Typically involves rehydration .This may be via oral intake. If the diarrhea is severe; then intravenous fluids may be required. Depending on the amount of rehydration, this may require a few hours in Urgent Care/ER or else a short admission in the Hospital. HUS requires admission to the hospital to be treated. Usually blood and stool samples are tested. The treating physician will then decide on need for antibiotics.

Local infection due to Needle stick Injury:

Depending on the severity one might require antibiotics.

Infection due to mucosal exposure to the Eye:

A visit to the Ophthalmologist usually leads to instillation of eye drops and subsequent follow up visit to ensure the eye is improving. Additional treatment depends on the severity of the eye infection.

Description of Medical Surveillance- Describe the advisability of medical surveillance strategies (in particular baseline and annual serology) for those working with the agent. If doing so would likely improve the identification, diagnosis or treatment of exposures, please indicate so.

There is no role for surveillance for E. coli infection.

It is useful to know about resistance patterns of the E coli that are being used, if available.

Completed By:

Department:

Phone:

eMail:

Date: