E to person contact2. the infectious dose for

ethird form of the disease is gastrointestinal anthrax which is obtained fromingesting uncooked meat that is infected with spores from cattle and otherherbivore animals. Typically, symptoms appear 1-7 days after the exposure. Gastrointestinalsymptoms include sore throat, bloody vomiting, stomach pain, severe, bloodydiarrhea, swelling of the abdomen, fainting, and red eyes2. Onceinside the body, the spores can reach the blood stream, making the mortalityrate around 50%6.

Lastly, the more recent form is injection anthrax, which is only found in Europe and associated with heroin drug users2. Injection of anthrax can cause fever, groups of small blisters from theinjection, swelling around the sore, and abscesses that are deep under the skinnear and around the injection site2. Cutaneous and injection anthraxdisplay similar symptoms but the injection anthrax can be more dangerous sinceit spreads faster and it more difficult to treat2. Thereare a variety of treatments for the anthrax disease depending on the type ofillness. The first for cutaneous anthrax includes a skin testing from a fluidsample of a lesion or small tissue sample8.

A blood sample will alsobe taken and tested in a special lab8. After the identification ofanthrax, the patient begins a 60-day antibiotic course using ciprofloxacin, etc. 8. When a person is suspected of being exposed to the spores, they are put on a post- exposure prophylaxis before symptoms are even shown inorder to prevent the progression of disease2. The sooner theinfected person receives medical treatment, the increased chance of a betterrecovery9. The spread of activated spores throughout the body isresponsible for the produced toxins and poisons that cause illness9.

Once the toxins have spread throughout the body; the only treatment is anantitoxin9. While the spores cause great harm to the body, especially if left untreated, it is not contagious, meaning it can’t be passedfrom person to person contact2. Theinfectious dose for inhalation anthrax is very high due to the clearing ofmicrobes from the various mechanisms of respiratory deposition. The averageinfective dose is estimated to be between 8, 000-50, 000 spores6. Fromcurrent search by the Department of defense, in order to make an aerosolcapable of causing inhalation anthrax, 2, 500-55, 000 spores are needed for thelethal dose6. The infectious dose for cutaneous anthrax is currentlyunknown6.

Portals ofentry include the respiratory, gastrointestinal tracts, mucous membranes, andthe skin. Epidemiology and transmission: Thebacteria were first made known through the work from Robert Koch who discoveredthe spores and benefits that are provided to the bacteria in survival3. He was able to grow and isolate a pure culture of the bacteria and thenproceeded to inject it into an animal3. Through his research, hedeveloped the research that described the relationship between the anthraxdisease and bacillus anthracisbacterium.

This research method became known as Koch’s postulates3. Afterstudying the research of Koch, Louis Pasteur worked to develop a vaccine fromhis own research of injecting the vaccine and then exposing the animals to thebacterium and recording the results3. The effects of the vaccinehelped lower the rate of infection in United States, specifically thevaccination of animals to prevent transmission to humans. After developing avaccine for animals, the 1950s saw the first human vaccine that created 92. 5%

effectiverate in preventing cutaneous anthrax3. This vaccine was thenreplaced with the current one that is given to military personal from a limitedsupply3.

A majority of the cases of anthrax has come from people whoare handling animal skins such as drum makers. The ability to spread thebacillus spores through inhalation has created the potential to become abiological weapon. In a recent attack, 2001, letters were sent to U. S. Senators' offices and media agencies that contained Bacillus Anthracis spores3. The route of transmission, inhalation, allowed it to spread before being identified, a total of 22 people got sickfrom the bacteria and 43 people tested positive from being exposed to thespores3. The Ames strain of the spores was used and it highlightedthe ability of the pathogen to be used as a biological weapon1.

TheBritish in the 1940s worked to develop a type of bomb that could release anaerosol of Bacillus Anthracis sporesand they tested it on islands near Scotland1. They also worked toproduce cattle cakes that were infected with the spores in order to decreasethe meat supply in Germany during the war1. Thebacterium and the disease it causes are more common in larger, warmeragricultural areas such as Africa, southern Asia, southern Europe, and CentralAmerica2.

Other outbreaks occur sporadically in other parts of theworld with only a few in the last couple decades in the United States. Sincethe 1960's in the United States, there have been less than 10 cases of anthraxreported each year, with 95% of them being the cutaneous form and the other 5%being inhalation6. The majority of cases are naturally causing fromagricultural

workers and a couple from laboratory infections. In previousresearch, strains have been isolated from dead animals after reports of themconsuming other infected animals6. The prevalence in the UnitedStates is extremely small, only limited to periodic outbreaks in areas ofcattle6. People who work in these areas and agricultural workers areat an increased risk of coming in contact with the bacteria throughoccupational exposure2. The risk of contracting the bacteria anddevelop the disease also increases when contacting products from infectedanimals2.

Themain modes of transmission revolve around contact with infected animals orproducts. Exposures such as contact with infected tissues of dead animals, consumption of contaminated uncooked meat, contact with hides, or wool frominfected animals, and consumption of illegal drugs that have been contaminatedwith the bacterium increase an individual’s risk of becoming infected with thepathogen in one of the four different forms6. The main reservoirs ofthe bacterium are farm and herbivorous animals. Some examples include cattle, deer, sheep, and even goats. The main hosts include humans and mammals7.