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MYCOBACTERIUM TUBERCULOSIS: An In-depth Discussion for Embalmers Part 3

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CONTINUED: Even in the United States, the number of mini and microepidemics is startling. In Bath, Maine in 1989, one shipyard worker infected over 400 of his co-workers during 8 months of misdiagnosis. In 1992, a Minneapolis homeless man that frequented a neighborhood bar infected 39 regulars at the bar and 6 family members of the regulars who never went to the bar. In 1993, a Maryland college student infected over 80 classmates and 4 children of family members of classmates. In New Jersey, an outbreak in a church was traced to a member of the choir, who infected other choir members while singing. In Melbourne, Australia one office worker infected 1/4th of his 210 co-workers.

Airplanes are a documented source of tuberculosis transmittal with several reports of passenger to passenger infection and flight attendant to passenger infections. These reports exist despite the use by most airlines of HEPA style filters with high ventilation rates of recirculated air. There is more than one documented case of transmission during mouth-to-mouth resuscitation. There are numerous documented cases of patient to nurse and patient to doctor T.B. transmittals. This is the reason for the exceptional precautions that are taken in hospitals when an active T.B. case is present (including use of HEPA masks, negative pressure rooms and ultraviolet irradiation of recirculated air and isolation). Transmissions during operations in morgues and accidental autopsy inoculations are also documented. Inoculations have occurred during surgery and autopsy harvesting of transplants including skin and bone marrow harvesting. Nursing needlesticks have also resulted in transmissions during normal nursing care procedures and bone scrapes during standard autopsy procedures have also occurred. Despite the high tech nature of modern society in the United States, there is a small but definite chance for infection with T.B. under certain high risk situations.

EMBALMING DANGERS: Concerning the possibility of infection during embalming and pre-embalming the general concensus in the profession is that tuberculosis, full-blown, fulminant, coupled with AIDS or dormant,

is no different than any other typically infectious body that is normally found in embalming scenarios. No special precautions or equipment other than government mandated universal precautions is necessary. I strongly disagree with this opinion. In active tuberculosis cases, precautions above and beyond standard universal precautions is required to insure a higher level of safety during embalming.

The danger of aerosolization and airborne infection during removal, transfers, pre-embalming and embalming is real and a definite safety consideration. Despite drug therapy, many cases are still considered infectious, otherwise, there would be no need for the extraordinary measures taken in hospitals to avoid infection, including HEPA masks, isolation, negative pressure ventilation and UV irradiation. How can a body that was classified as highly infectious moments before death suddenly be classified as a standard risk the moment it is reclassified as a corpse? The numerous movements required to effect removal, transfer and embalming can easily result in purge, aerosolization and evacuation of body fluids during and prior to embalming. Blood, lymph and body fluids are a definite danger during embalming and pre-embalming. The inhalation danger is not extreme, but neither is it not existent and the chances of the T.B. case you are dealing with having an MDR strain is significant. Both of these factors demand that maximum protection be advocated. A typical tuberculosis case will also be coupled with other hard to treat exotic infections if the body is immune compromised or suffering from AIDS as the cause of death. There are too many examples of transmissions during autopsies and normal nursing practices to take this situation lightly.

Obviously, at least universal precautions are required with the continual wearing of disposable HEPA masks, which are readily available and can be conveniently disposed of at the completion of embalming. Cheap paper masks or plastic face shields will not prevent the inhalation of potentially infectious aerosols. Maximum sanitation should be a goal during embalming with the use of glutaraldehyde/phenol based or at least glutaraldehyde/phenol fortified arterial and cavity fluids recommended for embalming. Body surfaces and orifices sanitation should be a priority with the use of a registered and approved medium level disinfectant (MLD) spray such as Metriguard. Weak formaldehyde/alcohol sprays are not registered or approved and are of dubious value anyway for sanitation or disinfection. They are a myth in modern embalming and a left over from the old days and very few still even exist. Do not depend on them for disinfection. Nitrile gloves are, of course, the modern accepted standard for embalming with both bloodborne pathogen barrier protection and effective protection from embalming chemicals such as formaldehyde, glutaraldehyde, phenol, alcohols and other chemicals used in embalming. Formaldehyde has a particular problem with breakthrough times with latex gloves and they are not recommended for formaldehyde protection or other embalming chemicals unless they are very thick and bulky.

For decontamination of the embalming room, a thorough precleaning with a MLD type chemical is recommended such as UNIPHENE-SE (which is a phenol based disinfectant/cleanser). A follow-up with a MLD spray or a general wiping with a HLD (high-level disinfectant) such as Metricide 28, which is glutaraldehyde-based, is recommended. The phenolics are especially effective against Mycobacteria and glutaraldehydes are, also, at slightly higher than normal contact times for typical bacteria. Alcohol/ super Quats, such as Metriguard Spray are also very effective at 10-30 minutes contact time on clean surfaces. Instruments should be precleaned with UNIPHENE-SE or other MLD spray or soak and then followed by a standard glutaraldehyde soak for

maximum disinfection (Metricide 28). The body is safe for viewing and presents no health hazard if properly embalmed. If possible, consider the use of ultraviolet irradiation (UV) as a very effective and not costly adjunct to your disinfection procedures. A simple irradiation of the embalming room with a portable tanning lamp can be very beneficial in drastically reducing the infectivity.

SUMMARY: Tuberculosis is here to stay. Despite our best efforts, M. tuberculosis fights back and has actually become more difficult to treat than ever. The number of cases, stubbornly, refuses to decrease significantly. The future for the world is bleak, with explosion of T.B. likely in undeveloped and Third -world areas. The probability is that in the United States, it will only be more difficult to control and confine than in the past. More MDR strains will develop and as the population ages and susceptibility increases, the total number of cases is expected to rise. Extraordinary precautions will still have to be taken by hospital and nursing staff to prevent transmission in hospitals and nursing home situations. The embalming dangers are real and precautions above and beyond universal precautions is required. There is a low, but definite, danger of transmission during pre-embalming and embalming procedures. A few extra, but simple, precautions can drastically increase the safety during these types of embalmings.

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