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FORMALDEHYDE/WOOD DUST EXPOSURE DANGERS OF AUTOPSY/HARDENING COMPOUNDS: A Report for Embalmers Part 2

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WOOD DUST AND CANCER: The relationship between wood dust exposure and cancer has been extensively studied. IARC classifies wood dust as a Group 1 human carcinogen. Wood dust has been implicated in increased sinonasal cancers and paranasal cancers in exposed workers. In addition, there have also been findings of increased risk for lung cancers, stomach cancers and laryngeal cancers in wood workers. Total mortality increases, total malignancies increase, lung cancers of all types increase and quite unexpectedly, prostate cancers increases were found in various samplings of wood workers and workers in wood related professions. There was also a twofold increase in brain cancer risk within the exposed worker groups. Formaldehyde as a co-factor was also demonstrated in formaldehyde/wood dust exposures that resulted in elevated risks for lung cancers. NIOSH has classified wood dust as a human carcinogen and posts appropriate warnings concerning its usage. ACGIH classifies hardwoods and hardwoods/softwoods dusts mixes as carcinogenic with an A1 classification.

Adenocarcinomas in Europe and particularly Germany, are treated as occupational diseases and affected and exposed woodworkers are compensated when they are diagnosed with this form of cancer. Fortunately, the total incidence of adenocarcinomas in Europe is on the decline due to improved worker protection. Wood workers in Europe had a one hundred times increase risk to these cancers than non-exposed individuals. Wood dust exposures resulted in increased cylindrocellular hperplasias in the nasal mucosa of wood workers and formaldehyde was found to be associated with increased squamous metaplasias in addition to being proven genotoxic. Wood workers in the United States and particularly in the furniture industry region of North Carolina have a four times increase in sinonasal cancer risk compared to unexposed individuals.

Non-malignant respiratory disease is also higher in wood workers in general and wood workers exposed to formaldehyde in addition to wood dust show an increase in this non-malignant respiratory type syndrome. Some studies also demonstrate an apparent elevated risk of Hodgkins disease in wood workers (particularly carpenters) and other secondary wood workers.

EMBALMING PROBLEMS: From the above discussion it is apparent where the exposure dangers in embalming are focused with the use of autopsy and hardening compounds. Continued usage of old-fashioned autopsy/ hardening compounds that are dusty and powdery and use paraformaldehyde or formaldehyde soaked particulates as the source of preservation are a clear danger. In addition, these old style compounds utilize silicates, plasters in fine powdered form and other powders as additives to the wood dust absorbent that is the basis of formulation.

In these compounds, the percentage of RSP's (respirable suspended particles) is high and they are coated with formaldehyde which adds an additional element of exposure and danger. RSP's are basically the dust particles that you can see hovering or floating in the air — and it is these particulates that are not captured by the cilia and mucosal lining of the respiratory tract and are literally sucked into the deep recesses of the lungs, clogging the delicate lung tissues and forming adhesions and scar tissue in these regions of the lungs. To make matters worse, the formaldehyde attached to these inhaled particles or paraformaldehyde powder particles themselves are carried into the deeper regions of the lungs and leach formaldehyde after deposition. This opens up an additional and very insidious mechanism for formaldehyde exposure during embalming operations.

Protection from these types of exposures in embalming is usually non-existent or poor. Most embalmers, if they use any protection at all, will don an inexpensive disposable paper filter mask. These cheap masks are ill-fitting and not designed for effective protection against fine or suspended particulates. They are suitable only for short-time exposures against nuisance dusts that do not pose a serious health hazard.

Ventilation is only partially effective in the control of particulates in embalming rooms. Ventilation systems will eliminate some, but not all, particulates by evacuation and sometimes contribute to the creation of airborne channeling and creation of swirl patterning during their use. Ventilation systems for embalming rooms were designed for effective fumes removal and not for the effective control and evacuation of respirable suspended particles and particulates in general.

EMBALMING SOLUTIONS: The solution for the elimination of these serious exposure dangers during the use of compounds is to utilize the new modern formulated alternative compounds that are found in the embalming profession. These new high-tech compound formulations eliminate formaldehyde in all it's forms in the formulation and substitute a coarse granular wood product in place of the conventional wood dust used in the past. Wood absorbents are still the best for embalming purposes — being effective and biodegradable and incinerable. By the use of the coarser granular wood formulations the airborne particulates are virtually eliminated. The wetted-type formulation allows plaster of paris (in a coarser form) to still be used for hardening and firming results without airborne particulates as an exposure hazard.

These newer compounds utilize glutaraldehyde as the preferred aldehyde for preservative action. Glutaraldehyde, of course, is a liquid at room temperature and consequently contributes very little to overall airborne exposure and keeps the particulates in the compound wetted while still providing adequate absorption properties. Deodorizing and usability is higher as no formaldehyde is present in the formulation to create offensive fumes and the compounds are overall more pleasant to use.

Increase your protection by the wearing of tighter-fitting filter masks that conform to the facial contours and more effectively filter particulates. Even better is the wearing of disposable HEPA-type masks to eliminate the small amount of particulates that might be present, even with the newer formulations.

IN SUMMARY: Abandon the use of old-fashioned formaldehyde/wood dust autopsy/hardening compounds in embalming. The health hazards and exposure dangers of wood dust in conjunction with formaldehyde are serious, long term and insidious for the embalmer. The exposures and dangers involved in the use of these compounds do not justify their use in modern low-exposure embalming operations. Substitute the new high-tech low exposure compounds that are available to the embalming profession that are safer and more effective than the older formulations. In addition, select better quality, tighter fitting and contoured filter masks or HEPA-style masks for additional protection from inhalation of any particulates during embalming operations. With these recommendations, highly effective embalming with compounds is possible with very low exposure potential to the individual embalmer.

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