tions for their resolution. A survey was developed by the officers for use as an assessment tool. The survey was designed to track the infectious waste stream from point of generation to point of disposal. It also reviewed individual hospital infectious waste management plans, employee training and education programs, exposure control plans, and waste minimization efforts. The survey was used to assess the infectious waste management programs at 22% of the District's hospitals. As a result of the survey findings, training standards are being developed by the District Department of Health for all infectious waste handlers including medical facility housekeeping staff and medical spill response personnel. The standards require that training include the following topics: Occupational Hazards, Infection Control Procedures, Site Specific Exposure Control Plans, Chemical Hazards, Injury Prevention and PPE, Infectious Waste Spill Response Procedures, and Regulated Medical Waste Transportation Requirements. The District Department of Health may require compliance with the new training standards when it issues licenses to medical facilities. To make the training accessible to the District's hospitals, a train-the-trainer's course was developed for use by infectious waste management personnel. The course is entitled, "Infectious Waste Handler's Training," and consists of 8 hours of instruction covering the topics that will be required by the District standard. With regard to cradle to grave management of infectious waste, housekeeping staff are in an excellent position to work with administrators to promote facility compliance with regulated medical waste disposal regulations. For this reason, a standardized training program will provide a broad understanding of the responsibilities associated with the proper handling of medical and infectious waste.

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HEALTH CARE WORKERS' EXPOSURES TO NITRIC OXIDE, NITROGEN DIOXIDE, AND NITRIC ACID DURING INHALED NITRIC OXIDE THERAPY. L. Delaney, NIOSH, Atlanta, GA.

Background: In December 1999, the U.S. Food and Drug Administration approved the use of inhaled nitric oxide (INO) therapy to treat respiratory failure in infants and young children. Few studies have been conducted to evaluate the potential for exposure to nitric oxide (NO) in health care workers treating these patients. The drug consists of a mixture of 0.8% NO and 99.2% nitrogen (N2) and is stored as a compressed gas in an aluminum cylinder. It is administered via a delivery system, which attaches to an oxygen supplying ventilator. The delivery system is equipped with an in-line analyzer, which measures NO, nitrogen dioxide (NO2), and oxygen supplied to the patient. System set up requires respiratory therapists to first purge the high-pressure line in the cylinder to rid it of NO2 and then attach it to the ventilator. The dosage is set between 0 - 80 parts per million (ppm), with a typical dose averaging 20 ppm. Methods: Full-shift personal breathing zone (PBZ) samples were collected for NO, NO2, and nitric acid (HNO3) on employees caring for a child receiving INO treatment. Full-shift general area (GA) samples were also collected for NO, NO2 and HNO3 by the patient's bedside. Short-term PBZ samples for NO2 and HNO3 were collected during line purging in the NO cylinder storage closets. Samples were analyzed using both laboratory and direct reading instrumentation methods. Results and Conclusions: All of the PBZ and GA samples collected for NO, NO2 and HNO3 were well below the relevant evaluation criteria for occupational exposures. However, there was a potential for higher exposures during training sessions for health care workers. A need for ventilation was identified in a compressed gas storage closet. Emergency plans, controls, and warning systems were not in place in case of an N2 leak, which could displace oxygen in the ambient air.

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EFFECTIVE PLANNING, IMPLEMENTATION, AND EVALUATION OF INFECTION CONTROL TECHNIQUES DURING TOTAL RENOVATION OF IN-PATIENT SPACE FOR EXPANSION AND RETROFIT OF A TERTIARY CARE HOSPITAL IN HOUSTON, TEXAS. J. Koehn, Jan Koehn, Inc., Houston, TX; G. Yeager, G. Matejka, Texas Children's Hospital, Houston, TX.

During a five-year expansion project estimated at $345 million and retrofit of previous in-patient occupancy for a 425-bed academic tertiary care hospital, a proactive planning process for construction as well as standard infection control procedures was utilized. The nine-story building primarily scheduled for retrofit was known to have numerous asbestos-containing materials (ACM) and was connected on two sides by working hospitals. A combination of friable (i.e., sprayed-on fireproofing) and non-friable materials (e.g., floor tiles and black duct mastic) was documented from the hospital survey report. The potential presence of lead-based paint materials was also investigated. Other hospital areas were known to harbor spores of fungi potentially pathogenic to immunocompromised patients. A variety of infection control barrier techniques were identified for use during the planned construction phases to contain airborne particulate based on the level of disturbance, location of the hospital areas, and ability to exhaust negative pressure containment work areas to the outside ambient environment. Pre-planning for the retrofit began 24 months prior to initiation of work activities for the expansion and retrofit project. Development of anticipated project scope of work plans for abatement of ACM and other identified hazards was completed by an assembled team of personnel involving the disciplines of occupational health and safety, infection control, engineering, facilities, architects, and contractors. This planning procedure included review of all areas of ACM, lead-based paint, and microbials as well as phased-planning pertaining to priority equipment and personnel re-locations. A variety of evaluation techniques were designed for use during the construction work to insure efficacy of the infection control barriers. These methods included: routine observations and verification of effectiveness of negative pressure of containment work areas used by contractor personnel, documentation of routine particulate counts, and viable bioaerosol and/or mold spore sampling protocols.

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USING CARBON DIOXIDE SUBSTITUTION TO PREVENT EXPOSURE TO NITROUS OXIDE DURING CRYOSURGERY. J. Brazee, Duke University Health System, Durham, NC.

Cryosurgery is used in the treatment of many diseases. In gynecology, cryosurgery is primarily used in treating cervical lesions. At Duke University Health System (DUHS), most gynecologists use compressed nitrous oxide to cool a metal cryotip, which is used to freeze tissue. Without an appropriate scavenging system, nitrous oxide can leak from the cryosurgical unit during a procedure, creating a potential for employee exposure. The gas impairs judgment and may cause long-term reproductive effects. The ACGIH TLV for nitrous oxide is 50 ppm. The Occupational and Environmental Safety Office at DUHS investigated seven Clinics in an attempt to prevent employee overexposure to nitrous oxide. Our investigation included a cryosurgical unit inspection and quantitative area monitoring. The inspection of the cryosurgical unit was based on guidelines published by NIOSH. A cryosurgery unit consists of the gas cylinder, pressure gauge block, cryo probe, different cryotips, and a scavenging port and hose (for exhausting the waste gas). A scavenging system should exhaust the waste gas outdoors. Area monitoring was performed in six of the Clinics using a miniature infrared analyzer (MIRAN 1BX). High levels of nitrous oxide were recorded in all Clinics, directly attributed to leaks, faulty equipment (i.e., collapsible scavenging hose, broken hoses, leaking cryogun), or the absence of a scavenging system (i.e., no scavenging hose, inadequate ventilation). Where appropriate scavenging systems would be prohibitively expensive, we recommended substituting carbon dioxide (TLV of 5,000 ppm), as suggested by NIOSH in their cryosurgery publication. Although NIOSH believes that carbon dioxide may not be a medically viable option for all cryoprocedures, employees have reported only positive results using the cryogen during their procedures.

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WEB BASED ELECTRONIC COMPLIANCE ASSISTANCE TOOL FOR HOSPITALS. G. Lamson, OSHA Salt Lake Technical Center, Salt Lake City, UT.

The injury and illness rate in hospitals exceeds the general industry average. This has caused hospitals to come under greater scrutiny by worker's advocacy groups and regulatory agencies. This poster presents OSHA's Hospital electronic Compliance Assistance Tool (eCAT), an illustrated listing of the common safety and health hazards and controls anticipated in a hospital. By presenting current healthcare safety and health practices, advances and regulations in a centralized user-friendly medium OSHA anticipates reducing worker injuries and illnesses. The illustrated nature of the eCAT was designed to be friendly to users ranging from front line healthcare workers to the maintenance and housekeeping staff and to also serve as a reference source for safety and health professionals. Workers can access the web site to learn about the hazards that they may encounter in their workplace. Safety and health professionals can access up-to-date regulatory and industry standards by following hyperlinks deeper into the web site. These hyperlinks lead to OSHA regulations and compliance directives, industry standards and the latest in engineering controls in hospitals. The eCAT is organized by worksite within the hospital. Instead of the traditional listing of hazards by name within the hospital we list hazards, controls and regulations by areas where they would be found. We developed our content in conjunction with the OSHA Training Institute to give OSHA compliance officers an easily updated reference to accompany a newly developed hospital compliance course. The content provides guidance on OSHA regulations along with industry best practices. These best practices are in the spirit of OSHA programs like the Voluntary Protection Program and go above and beyond the minimal safety and health program requirements published in the Code of Federal Rgulations.

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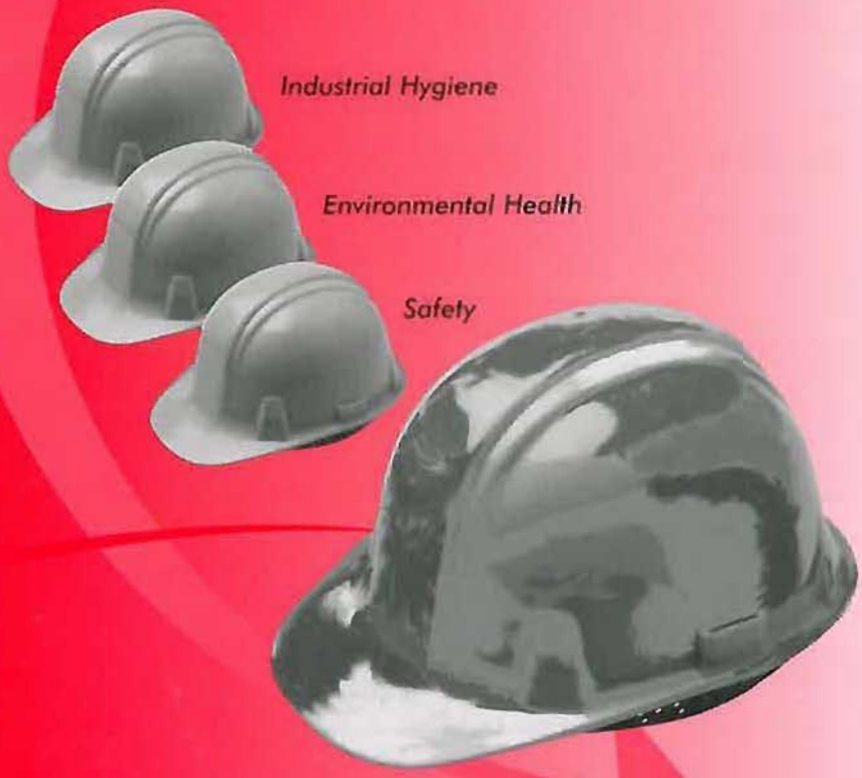

ABSTRACTS