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SR-119-02

Outpatient Costs of Hearing Loss in the U.S. Military: Direct Care and Paid Provider Care

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Objective: The goal of this research is to comprehensively determine the economic impact of hearing impairment and noise-induced hearing injury (HINHI) among active duty U.S. Service Members from the perspective of the DoD

Methods: This study is a retrospective review of data collected on active duty military service members (SMs) during the January 1, 2007 to December 31, 2012 timeframe. Clinical data on military SMs who were diagnosed with one or more of the identified ICD-9 codes (associated with HINHI) from the Medical Data Repository (MDR) was received by the Military Health System Management Analysis and Reporting Tool for our analysis. This research reports findings from two M2/MDR clinical data sets: Tricare Encounter Data-Noninstitutional (TED-NI) which provides data on care provided by civilian paid providers outside a military treatment facility (MTF) and Comprehensive Ambulatory Encounter Record (CAPER) which provides data on direct care provided by military providers in an MTF.

Results: We obtained 8,251,109 encounter records from CAPER, representing 1,865,676 distinct patients, and 1,865,965 encounters from TED-NI, representing 243,349 distinct patients. Tympanic membrane disorders, males, and medical centers have relatively higher mean costs for HINHI in both TED-NI and CAPER. In both databases, fiscal year, diagnosis code, and age were significantly related to RVU dollars. Compared to other disorders of ear, CAPER and TED-NI revealed that patients with tympanic membrane disorders had a higher cost than those with other diagnoses. Patients ≥ 65 years-old in TED-NI cost more than the other age groups. Cost differences between males and females were not significant in CAPER, but females cost significantly less than males by an average of 57.34 RVU dollars (p-value = 0.0078) in TED-NI. Pay grade and facility size were only significant in CAPER (p-values < 0.0001).

Conclusions: Our estimates are a valuable decision making tool for DoD policymakers. These cost estimates may identify high burden groups, enable proactive measures for concerted education and training, identify best practices, and develop return-to-duty programs following HINHI, all of which may contribute to the retention of skilled, experienced, and mission-ready military personnel.

CS-119-03

Assessment of Dermatitis Among Chair Sanders

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Situation/Problem: NIOSH received a Health Hazard Evaluation (HHE) request from management of a chair manufacturing facility. They were concerned about skin rashes among sanders

in the clean-up (or sanding) department. Two employees had severe skin reactions at work and could no longer work in the department. The employees performed repairs using epoxy resins, sanded rough areas on wooden frames, and cleaned the frames using different chemicals including acetone. The work was done on downdraft benches, raised platforms, or the floor, depending upon the size of the piece. The screws used in the chair frames had been changed to a larger size that required angled holes to provide additional strength. The holes had to be filled with epoxy resin which was mixed by hand to match the color of the frame. The company required employees to wear either nitrile or vinyl gloves. This area of the facility did not have general ventilation.

Resolution: Several recommendations were made: installing local exhaust ventilation for the hand sanders; adding a vacuum system instead of compressed air to remove dust; using an epoxy gun to apply epoxy; using polyvinyl gloves when working with epoxies; using goggles or safety glasses when working with epoxies and other chemicals; reporting skin rashes to management when they occur; and referring employees with persistent rashes to a dermatologist with occupational medicine experience.

Results: Wipe sampling showed that dust from epoxy resins was found throughout the cleaning department. Air sampling for volatile organic compounds showed no over-exposures. The downdraft tables were not effective in controlling dust levels due to the size of some of the chair frames. The amount of epoxy used in the cleaning department was greatly increased after the change in frame design. Confidential medical interviews with employees showed that 8 of 18 employees reported current or recent skin irritation. Review of medical records confirmed that one employee showed an allergic skin reaction to epoxy resins when tested by skin patch testing.

Lessons learned: Epoxy resins were suspected to be the cause of the skin rashes. Engineering controls, improved work practices, and the use of personal protective equipment were needed to reduce the exposure to epoxy resins.

CS-119-04

Total Exposure Health

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Situation/Problem: Through “total health” and Total Worker Health™, both private and public sector organizations have made strides toward achieving the President’s Precision Medicine Initiative. This initiative is an approach for disease prevention and treatment that takes into account an individual’s unique genes, environment, and lifestyles to provide personalized healthcare. However, they have overlooked one key factor that influences individual health risks: the exposure which drives both protective and clinical interventions.

Resolution: As industrial hygienists, we are positioned to effectively contribute to this fundamental change in our health care system as exposure scientists, linking our expertise not only to the occupational health of individuals but also to their overall well-being. Understanding that the impact of exposures are strongly related to sociocultural and economic status, occupational and environmental factors, and lifestyle choices, we created the Total Exposure Health (TEH) concept that incorporates workplace, environment with lifestyle exposure and provides a path to precision medicine.