SHEA Abstracts

The July through December issues of *Infection Control and Hospital Epidemiology* will include reprints of the poster and presentation abstracts from the 1992 SHEA Annual Scientific Meeting, April 12-14, 1992, held in Baltimore, Maryland.

ABSTRACT #S1

Evaluation of Therapeutic Antibiotic Substitution by Microcosting Using an Automated Hospital Data Base

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Randomized controlled trials are the gold standard for clinical research but have practical limitations that preclude their use for many important problems. Recently, epidemiologists have introduced the concept of "outcomes research" to re-emphasize the role of observational research in healthcare. Expanded-spectrum cephalosporins represent a type of drug therapy that may be amenable to outcomes research in view of the high costs and limited applicability of randomized trials. Several of these agents have similarly potent antimicrobial activity, high clinical efficacy, and similar side-effect profiles, and are widely regarded as therapeutically equivalent. We hypothesized that an outcomes trial focused on hospital costs could be an additional method to differentiate these closely related agents. Accordingly, 2 such agents (cefotaxime and ceftizoxime) were prospectively randomized for clinical use in a hospital-wide study that included 1,009 patients. Outcomes were monitored using an integrated hospital information system (the HELP system) that is linked to an allied financial data base that includes cost and charge data from more than 50 cost centers in the hospital. The total hospital costs in the study population were $10,356,296, of which pharmacy costs accounted for 10%, antibiotic costs for 3%, and microbiology services for 1%. Among cost entries that involved more than 80% of the study population, a significant difference was observed in pulmonary laboratory costs that was accounted for by differences in intensive care unit exposures in 2 therapeutic groups. We conclude that these 2 cephalosporin antibiotics appear to be therapeutically equivalent from a cost perspective and that cost outcomes should be included in evaluations of antimicrobial agents, recognizing that the drug costs themselves constitute a minor portion of total costs.

ABSTRACT #S2

Alteration of Mechanical Tests of Surgical Latex Gloves After Decontamination and Sterilization for Reuse

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In developing countries, surgical latex gloves are frequently reprocessed to decrease costs. We performed 4 decontamination procedures (water and soap, sodium hypochlorite 1% [NaHyp] for 30 minutes, NaHyp for 12 hours, and heat at 80°C for 1 hour), and 2 sterilization methods (ethylene oxide and steam) that are most commonly used for surgical latex glove reuse in Brazil. Four pieces of each surgical latex glove were analyzed by 3 mechanical tests: modulus 500%, tensile strength, and elongation F break. It was a blind experimental study. The control group consisted of new surgical latex gloves. We found a statistical difference in all groups, compared with controls, after a second exposure to decontamination and sterilization. There was mechanical damage in surgical latex gloves reprocessed by all methods used. Further studies are necessary to evaluate the clinical impact of reusing surgical latex gloves.

ABSTRACT #S3

Epidemiology of Antibiotic Use in a Neonatal Intensive Care Unit

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Epidemiologic data on antibiotic use in a neonatal intensive care unit were studied with 2 methods: analysis of a l-month cohort admitted to Yale-New Haven Hospital studied prospectively and 5 cross-sectional studies to determine point-prevalence rates

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of antibiotic use. Of 63 infants born at Yale-New Haven Hospital or transported to the neonatal intensive care unit at <48 hours of age, 75% had antibiotic treatment begun in the first 48 hours of life. The highest rate of antibiotic starts were in those with birthweights <1500 g; 92% received antibiotics in the first 48 hours of life. In subsequent days of life, the incidence of starting antibiotic treatment was low and sporadic, and prevalence of antibiotic treatment declined sharply between the third and fourth days of life. There were 4 culture-documented infections in the cohort. Point-prevalence rates of antibiotic use in 5 cross-sectional studies over 10 months was 27% to 43%. The rate was higher in the neonatal intensive care unit (mean = 58%) than the intermediate care unit (15%) and was higher in infants <72 hours of age (61%) than those >72 hours (27%). This study shows that despite a high incidence of antibiotic use in the neonatal intensive care unit, most treatments were short and started on the first day of a long hospitalization, resulting in a much lower cross-sectional rate.

ABSTRACT #S4

Effect of Chlorine Dioxide on* Bacillus subtilis *Spores Added to Clean and Regulated Medical Waste Using the Winfield Condor System

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Incineration or steam autoclaving usually is used for treatment of regulated medical waste. Alternative technologies are being evaluated. The Condor@ system combines conventional shredding technology with the use of chlorine dioxide (ClO_2). Mean inoculum (determined by making pour plates) of 8.33×10^9 colony-forming units (CFU) of *Bacillus subtilis* spores was added to clean waste or regulated medical waste containing approximately 25% human blood and processed through the system with or without ClO_2. At least 3 experiments were done with each test (ClO_2) and control (no ClO_2) system with either clean waste or regulated medical waste. Mean reduction of 1.35×10^5 and 2.12×10^2 CFU in both solid waste and tank fluid combined were demonstrated using a mean of 13 ppm and 28 ppm ClO_2 with clean waste and regulated medical waste, respectively. A significant reduction in CFU occurred with clean waste. Effectiveness of the disinfectant was reduced in the presence of regulated medical waste. Based on these results, modifications to the system to increase effectiveness of ClO_2 in the presence of regulated medical waste are being made.

ABSTRACT #S5

Incidence of Postoperative Infections in Patients Undergoing Abdominal Hysterectomies

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This was a retrospective study of 625 patients who had abdominal hysterectomies performed at Columbia Hospital for Women during 1990 to evaluate the incidence of postoperative infections. Twenty-one of the patients were deleted from the study due to the presence of community-acquired infections at the time of surgery. We hypothesised the that use of prophylactic antibiotics would reduce the incidence of postoperative infections in patients undergoing abdominal hysterectomies, thus decreasing length of stay and hospital costs. Using ICD-9 codes 68.3-68.4 and 68.6, the mainframe files were searched to identify total abdominal hysterectomies performed either as primary or secondary procedures. Infections at all sites were investigated. Forty of the 382 patients prophylaxed (10%) developed postoperative infections; 37 of the 222 patients not prophylaxed (17%) became infected (chi square = 4.85, $p<.05$). Length of stay ranged from 4 to 15 days for 77 infected patients (median = 6); length of stay ranged from 1 to 17 days for uninfected patients (median = 5, Kruskal-Wallis H = 11.523, $p<.001$). Mean hospital cost for patients with infections was $8,974 and $7,426 for patients without infections (difference = $1,548, Kruskal-Wallis H = 23.308, $p<.001$). Prophylactic antibiotics significantly lowered attack rates and resulted in significant reductions in length of stay and hospital costs.

ABSTRACT #S6

Body Temperature in Elderly Residents of Long-Term Care Facilities

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To interpret body temperature correctly during illness, it is essential to know the range of "normal." To assess normal temperatures in the institutionalized elderly, we repeatedly measured morning oral electronic and tympanic membrane temperatures in 625 residents of 10 long-term care facilities over 6 months. Matched axillary, oral mercury, and afternoon temperatures also were measured. Temperatures taken when residents were receiving antibiotics or had signs/symptoms of infection were excluded. The mean morning temperature of residents was 36.14°C oral electronic ($CI_{95} \pm 0.08$) and 37.15°C tympanic membrane (CI,, ± 0.04). Twenty-seven percent of residents had oral electronic temperatures below 36°C, and 8% had temperatures below 35.5°C. In contrast, only 2% of residents had tympanic membrane temperatures below 36.5°C. Variation in individual temperatures

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was large: the standard deviation was 0.58°C for oral electronic and 0.38°C for tympanic membrane temperatures. The mean and variance of oral mercury temperatures were not different from oral electronic temperatures; axillary temperatures were 0.46°C lower but no more variable. Univariate and multivariate analysis revealed that oral electronic and tympanic membrane temperatures varied with age: a 10-year increase in age was associated with a decrease of 0.1°C in oral electronic temperature and 0.02°C in tympanic membrane temperature. No association could be found between oral electronic or tympanic membrane temperature and functional status, state of dentition, mental status, medical diagnosis, or medication use. Definition of fever should take into account that oral electronic temperatures are significantly lower in this population than in younger adults. However, variation in individual resident temperatures is sufficiently large relative to population variation that a definition of fever based on individualized "normal" values is not more useful than a definition based on the population mean.

ABSTRACT #S7

Noninfectious Postoperative Complications Associated With Propofol Anesthesia

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Propofol has become a widely used anesthetic despite the high frequency of adverse reactions. In 1990, 84 cases (2 deaths) of postoperative side effects were reported, which included fever, blood pressure changes, and infections. The Centers for Disease Control, Food and Drug Administration, and the manufacturer concluded that these effects were due to extrinsic contamination caused by poor aseptic technique. This report presents evidence for a postoperative syndrome associated with propofol that does not involve infection. In May 1990, a cluster of 4 patients with postoperative febrile hypotension occurred in our facility; 3 of these patients received propofol by infusion pump and 1 by syringe only The 4 patients experienced a drop in blood pressure during induction, which was normal by recovery However, 3 to 8 hours postoperatively, all 4 patients had drops in mean arterial pressure ⩾25% but returned to normal by 48 hours. Symptoms also included a significant drop in calcium, phosphorous, and magnesium, with normal levels of sodium, chlorine, and potassium, elevated liver enzymes, and coagulation consumption, consistent with a chemical etiology. All blood and wound cultures were negative. Cultures and endotoxin analysis of all opened and unopened vials and syringes of propofol proved negative. The dose of propofol was significantly correlated with maximum drop in postop erative mean arterial pressure but not with maximum temperatures achieved. In a preliminary study of 28 patients who received propofol, 14 (50%) exhibited postoperative drops in mean arterial pressure of ⩾25%, and 28% had drops in mean arterial pressure of 10% to 24%. Two of these patients had a previous surgery without propofol and did not become hypotensive. Hypotension and fever are the most common side effects of propofol, although they may be independent effects. Case definitions have singled out infections, but infection may be 1 of many sequelae of propofol, secondary to the direct effects of the drug. The danger that these effects pose warrants further investigation.

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