

## Letters to the Editor

### Compliance With Hand Washing

#### To the Editor:

Gina Pugliese and Martin Favero<sup>1</sup> provided a summary of reviews associated with compliance with hand washing. Also, they noted that there were some concerns related to using gloves as an alternative to hand washing. These concerns are quite valid and require attention in many patient-care settings.

Our facility treats pediatric burns exclusively, and over the past 2 years we had observed a gradual rise in the nosocomial infection rate. Thus, we undertook several reviews to attempt to identify causal relationships. One observation was that our overall glove use also gradually seemed to increase beyond what would be expected for the number and types of burn injuries being treated. Therefore, one focus of our review concentrated on how gloves were being used and, in some cases, why they were used.

A combination of daily observations and environmental cultures quickly identified the following three potential risk areas:

- Gloves, in some cases, were being used as a substitute for hand washing.
- The surface areas around the openings to the glove boxes were being contaminated with organisms that were on the hands of personnel who reached into the box.
- Fingers, thumbs, and other areas of gloves, as they were removed from the boxes, were being contaminated with organisms that were on the hands of those removing gloves from the box.

The deposition of organisms on the glove box or on the gloves themselves was influenced by hand washing. The number and types of organisms deposited decreased if the hands were washed. However, since many personnel were using gloves as a substitute for hand washing, the organism deposition was elevated. Contact plates applied to areas of the openings of glove boxes indicated that as many as 278 colony-forming units (CFU)

were present on some half-full boxes. Most boxes, however, had less than 30 to 40 CFU per 57-mm contact plate.

The presence of organisms, especially gram-positive cocci, on fingers, thumbs, and other contacted surfaces of gloves has been observed by others.<sup>2</sup> During our initial study, coagulase-negative *Staphylococcus* (CNS) was observed on all of the 40 glove boxes from which cultures were obtained. Also, the following organisms were found: methicillin-sensitive *Staphylococcus aureus* (MSSA), 7%; methicillin-resistant *S aureus* (MRSA), 2%; *Micrococcus* species, 35%; *Bacillus* species, 45%; fungus species, 7%; non-hemolytic *Streptococcus*, 14%; and *Acinetobacter* species, 4%. Cultures of the gloves from 33 of the boxes demonstrated a similar flora: CNS, 94%; MSSA, 18%; MRSA, 6%; *Micrococcus* species, 36%; and *Bacillus* species, 39%. Cultures of control boxes of gloves did not yield any of these organisms on the gloves. Also, contact plate cultures of the "opening areas" of unopened boxes only rarely produced CNS, *Bacillus* species, and fungus species. No *S aureus* or other skin flora was observed.

While no data were obtained to prove that organisms on or in glove boxes were transferred to patients, the presence of these organisms suggested that it would be prudent to undertake some measure of control. Also, the transfer of organisms from the hands to the contacted surfaces of gloves was of sufficient concern that we felt it necessary to undertake measures to control this transfer. Several tests were conducted to attempt to reduce the organism transfer to the gloves, and it became quite apparent that the design of the glove box was a major problem. Thus, a somewhat drastic measure was implemented: the tops of all glove boxes used in all 14 of our acute patient rooms were removed.

The removal of the top of the box was done to allow patient-care staff to remove the gloves by the cuff end of the glove. Thus, no organisms would be transferred to the fingers, thumbs, or other patient-contact portions of the gloves. Initially, this was a somewhat cumbersome task and required care-

ful use of a shielded razor blade. However, the box top removal became very simple when we found a brand of nitrile gloves (NITRI-CARE nonlatex, 100% nitrile, powder-free examination gloves; Best Manufacturing Co, Menlo, GA) that had a flip-top box lid.

We began 100% usage of this new glove, with removal of the box top, in mid-January. Our 1999 infection rate has dropped to zero. While we have had only 3 months' experience, we feel that the box-top removal prevents the transfer of organisms to the patient-contact portion of the glove if the glove is removed by the cuff end.

We have revised our training programs to place renewed emphasis on hand washing and to demonstrate the importance of the glove box-top removal and the cuff-end removal of gloves from the box. Observations made by infection control personnel and patient-care supervisors have suggested a high rate of compliance with cuff-end removal of gloves from the box. These procedures also have helped address specific handwashing compliance issues or inappropriate glove use. Likewise, they have suggested to us that proper removal of gloves from the box may be a very important element in the overall reduction of organism transfer in a burn treatment facility.

#### REFERENCES

1. Pugliese G, Favero MS. Compliance with hand washing. *Infect Control Hosp Epidemiol* 1999;20:114.
2. Hannigan P, Shields JW. Handwashing and use of examination gloves. *Lancet* 1998; 351:571.

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### Cost of Nosocomial Infections in Wuhan No. 4 Hospital, China

#### To the Editor:

Nosocomial infection (NI) not only adds to patients' pain, prolongs their length of hospitalization, even

causes patients to die, but also increases the work load of doctors, affects the sickbed-turnover in the hospital, and increases the cost of care and the economic burden on patients.

From January 1997 to October 1998, 452 patients were discharged from the tumor faculty of Wuhan No. 4 Hospital; 75 (17%) had NI, as compared to 5% of nontumor patients. To estimate the effect of these NIs on costs, we compared 22 lung cancer patients with NI to 22 lung cancer patients without NI (Table).

It can be seen that there are remarkable differences between the two groups in costs, particularly for medicine and transfusion.

It should be pointed out that NIs also give rise to a great deal of indirect economic loss; for example, sufferers create less wealth for the country because they are absent or dead, and their relations visit, consuming resources. Therefore the actual loss is larger than this.

Controlling NI calls for prevention and countermeasures. First, we must increase the patients' own resistance. We give them a great deal of sustained treatment using combined Chinese and Western medicines. Second, we must use antibiotics with reason. Third, we must reduce invasive operations and treatment. Most importantly, we must build the perfect system of family sickbed service, so that doctors and nurses can cure them in their family. It not only saves a great number of costs but also avoids cross-infection. It fits our country's situation completely.

When I see the bad patient who emerge their life in their eyes, I really want to say: "We hope the life tree will always be green!"

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## Surgical-Site Complications Associated With a Morphine Nerve Paste Used for Postoperative Pain Control After Laminectomy

### To the Editor:

It was with interest that I read the

**TABLE**

COSTS (IN RMB) OF TREATMENT FOR LUNG CANCER PATIENTS WITH AND WITHOUT NOSOCOMIAL INFECTION (NI)

Item Costs	NI	No NI	Difference
Patients	22	22	
Medicine	230,680	208,602	22,078
Transfusion	2,226	580	1,646
Inspection	22,850	18,000	4,850
Radiology	2,558	2,210	348
Surgery	98,214	59,820	38,394
Oxygen therapy	5,028	8,936	-3,908
Bed-stay costs	36,106	26,586	9,518
Hospital-days	2,132	1,494	638

Abbreviations: NI, nosocomial infection; RMB, the unit of currency in China.

article by Kramer and colleagues<sup>1</sup> documenting their disappointment with morphine nerve paste and their suspicion for delayed wound healing with increased postoperative morbidity. We recently published the results of a prospective, double-blind, randomized trial evaluating a similar paste in patients undergoing lumbar decompressive surgery.<sup>2</sup> Our experience with the paste was much more positive. While three patients in the actively treated group had minor wound complications treated locally, none required debridement or re-exploration. The decrease in both inpatient and outpatient postoperative narcotic analgesic consumption was statistically significant for up to 6 weeks after surgery. In addition, McGill pain scores and the SF-36 General Health Perception questionnaire also were significantly better in the treated group to 6 weeks.

In an ongoing prospective, double-blind, follow-up study at the University of Calgary, over 100 patients have been randomized to active or placebo groups. We have experienced only 1 patient with a wound complication in this entire cohort and remain blinded to that patient's treatment status. These results echo those of the independent study initially reported by Needham.<sup>3</sup> Kramer and colleagues report an "epidemic" of wound complications; we certainly agree with their use of this term. However, their experience is not reproduced at any of three independent institutions (RJH, unpublished data, 1999).<sup>2,3</sup> Hence, the epidemic described by Kramer et al is more likely related to conditions specific to "hospital A" or differences in application technique.

We maintain, based on results of prospective, controlled, randomized trials with follow-up of up to 1 year, that the morphine paste as described by Needham can be used both safely and effectively. Proper watertight closure of the lumbodorsal fascia and irrigation of the subcutaneous compartment to remove residual paste compound are critical to proper application.<sup>2,3</sup> These steps are felt to be very important in reducing the potential for postoperative third spacing of extracellular fluid, possibly encouraged by the hyperosmolar properties of the paste.

### REFERENCES

1. Kramer MH, Mangram AJ, Pearson ML, Jarvis WR. Surgical-site complications with a morphine nerve paste used for postoperative pain control after laminectomy. *Infect Control Hosp Epidemiol* 1999;20:183-186.
2. Hurlbert RJ, Theodore N, Drabier JB, Magwood AM, Sonntag VK. A prospective randomized double-blind controlled trial to evaluate the efficacy of an analgesic epidural paste following lumbar decompressive surgery. *J Neurosurg* 1999;90(4 suppl):191-197.
3. Needham CW. Painless lumbar surgery: morphine nerve paste. *Conn Med* 1996; 60:141-143.

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### To the Editor:

Dr. Hurlbert was kind enough to provide me with a copy of his letter to you. I agree with Dr. Hurlbert.<sup>1,2</sup>

Approximately 1½ to 2 years ago, I received a call from an orthopedic surgeon who was having some wound healing problems after employing morphine nerve paste. I asked him if he was following the instructions set forth