

**PROSPECTIVE SURVEILLANCE OF
SURGICAL SITE INFECTIONS
AT A TERTIARY HOSPITAL IN VIET NAM
AND THE IMPACT OF A
BEDSIDE HAND SANITIZER PROGRAM**

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DECLARATION

I hereby certify that the work embodied in this thesis is the result of original research and has not been submitted for a higher degree to any other University or Institution.

(Signed).....

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THESIS PUBLICATIONS

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THESIS COMMUNICATIONS

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ABBREVIATIONS

SSI	Surgical site infection
HAI	Hospital acquired infection
AB	Antibiotic
CDC	Centre for Diseases Control and Prevention
APACHE II	Acute Physiology and Chronic Health Evaluation II
ASA	American Society of Anesthesiologists
NNIS	National Nosocomial Infections Surveillance
CSF	Cerebrospinal fluid
PNC	Penicillins
AP	Aminopenicillin
CP	Cephalosporins
AG	Aminoglycosides
PEI	Penicillin with enzyme inhibitors
SIR	Risk-adjusted standardized infection ratio
IRR	Incidence rate ratio
LOS	Length of stay
POLS	Post-operative length of stay
CFU	Colony forming unit
ICER	Incremental cost-effectiveness ratio

ABSTRACT

BACKGROUND. There have been few studies conducted in hospitalized patients in Viet nam on the epidemiology of surgical site infections (SSIs) and the impact of hand hygiene practices. This study aimed to assess the impact of a bedside hand sanitizer program on SSIs in orthopaedic and neurosurgical patients.

DESIGN. A prospective quasi-experimental study was conducted with an untreated control group design in neurosurgical patients and before-after design in orthopaedic patients. A cost analysis based on data derived from the results of this study was also performed.

SETTING. Cho Ray Hospital, a tertiary university hospital in Ho Chi Minh City, Viet nam.

PATIENTS. All patients admitted for operation between 11 July and 15 August 2000 (Before), and 14 July and 18 August 2001 (After) were included, except those who had undergone another operation within one month prior to admission or were admitted because of SSIs.

INTERVENTION. Bedside hand sanitizers were introduced into the Orthopaedic ward and one Neurosurgical ward (Ward A) from September 2000. Training on proper use was also provided to ward staff. Another Neurosurgical ward (Ward B) was used as a control group with no intervention conducted.

RESULTS. A total of 1368 patients were recruited into the study. After intervention, in Ward A of the neurosurgical department, the SSI rate between the two periods was reduced by 54% (8.3% to 3.8%; $p=0.09$). Superficial SSIs were eliminated after the intervention ($p=0.007$). Comparison between Ward A (intervention) and Ward B

(control) showed that, before the intervention, there was no difference in incidence of SSI between the two wards (Ward A: 8.3%, Ward B: 7.2%, $p=0.7$); however, after intervention, the incidence of SSI in Ward A was significantly lower than Ward B (3.8% and 9.2%, $p=0.04$). For orthopaedic patients, the SSI rate between the two periods was reduced by 34% (14.8% to 9.8%; $p=0.07$). SSI patients had a median post-operative length of stay of 19 days longer than patients without SSI ($p<0.001$).

Costs were 2.5 times higher in patients with in-hospital SSI compared to uninfected patients ($p<0.001$). Mean SSI-attributable costs were conservatively estimated at US\$368 in neurosurgical patients and US\$207 in the orthopaedic patients in the before period. SSIs were responsible for at least 14 percent of the annual budget before intervention. The savings per SSI prevented were estimated at US\$332 in neurosurgical patients and US\$157 in orthopaedic patients. Annual cost savings arising from the intervention were estimated at US\$11,112 in orthopaedic patients and US\$19,320 in neurosurgical patients.

CONCLUSIONS. The incidence of SSI in the hospital was high. The use of hand sanitizers reduced SSI rates, particularly impacting on the incidence of superficial SSIs. The hand sanitization program was found to be a dominant intervention being both more effective and cost saving as compared with no intervention in both study departments. The use of bedside hand sanitizers should be encouraged in the hospitals in Viet nam, where there often is a lack of other hand-washing facilities.