



Can a care bundle prevent surgical site infections?

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Background

The top four healthcare-associated infections sites (HAIs) in Taiwan were UTI, BSI, PNEU and SSI (figure 1). Taiwan has introduced the bundle care since 2011, which has significantly reduced the infection density of the CAUTI, CLBSI and VAP. In 2016, Joint Commission of Taiwan (JCT) and the Taiwan Centers for Disease Control (T-CDC) adopted published international strategies, and introduced the care bundle aiming to prevent SSIs.

Objectives

This study examined whether a care bundle can prevent SSIs. In addition, we wanted to understand the SSI rates in Taiwan, and explore the factors that should be considered when promoting the care bundle.

Table 1. The surgical site infection rate

	infection rate	
	partial adherence group	full adherence group
appendectomy	0.58%	0.00%
arthroplasty of the knee or hip	0.30%	0.00%
Cesarean section	0.40%	0.00%
colon-rectal surgery	1.34%	0.00%
coronary artery bypass graft	0.00%	0.00%
hysterectomy	0.47%	0.00%
overall	0.47%	0.00%

Methods

From July 2016, we introduced a care bundle consisting of 7 elements (fig. 2). We selected 6 types of surgical procedures: appendectomy, arthroplasty of the knee or hip, Cesarean section, colon-rectal surgery, coronary artery bypass graft, and hysterectomy. The participating hospitals trained the surgical teams, and reported monthly on the number of surgeries and infection cases and the compliance rate for the care bundle. We collected data from August 2016 to July 2017 but excluded surgeries with an American Society of Anesthesiologists (ASA) score of 3 or more to reduce the impact of patient factors. We used the Chi-square test to analyze the association between the bundle compliance rates and SSI rates.

Results

A total of 42 hospitals participated in this study, and 10,568 surgical data records were collected. During the introduction period (August 2016 to January 2017) and the implementation period (February 2017 to July 2017), there were no significantly difference in patients' characteristics. Appropriate use of the surgical antibiotic prophylaxis (91.2%) and applying aseptic techniques for wound care for 48 hours post-operatively (92.3%) were the elements with the highest compliance rates. Controlling blood glucose (21.8%) and avoiding hair removal (63.7%) were the lowest compliance rates ones (fig. 3). Based on the compliance rate for the care bundle, we divided the data into partial adherence and full adherence groups. The full adherence rate increased by 1.9 times from the introduction period to the implementation period of the study. Overall, the SSI rate was 0.00% for the full adherence group and 0.47% for the partial adherence group (table 1).

Discussion And Conclusion

The SSI rate for full adherence group was lower than that for the partial adherence group, and this finding is similar to those of other studies. The care bundle should be promoted continuously for the prevention of SSI. The limitation to show significance may due to the shorter study time of 12 months, which resulted in fewer cases being available for analysis. Moreover, the nation-wide SSI rate in Taiwan of 0.5% is much lower than other developed countries, leaving little room for improvement. However, relevant studies have also revealed that the low compliance rate has a limited effect on reducing the infection rate. Regarding individual elements, we recommend focusing on perioperative blood glucose monitoring. In addition to the payment of health insurance, the hospital may set up its own blood glucose monitoring protocol and use information systems to remind surgeons to enhance compliance.

Acknowledgement

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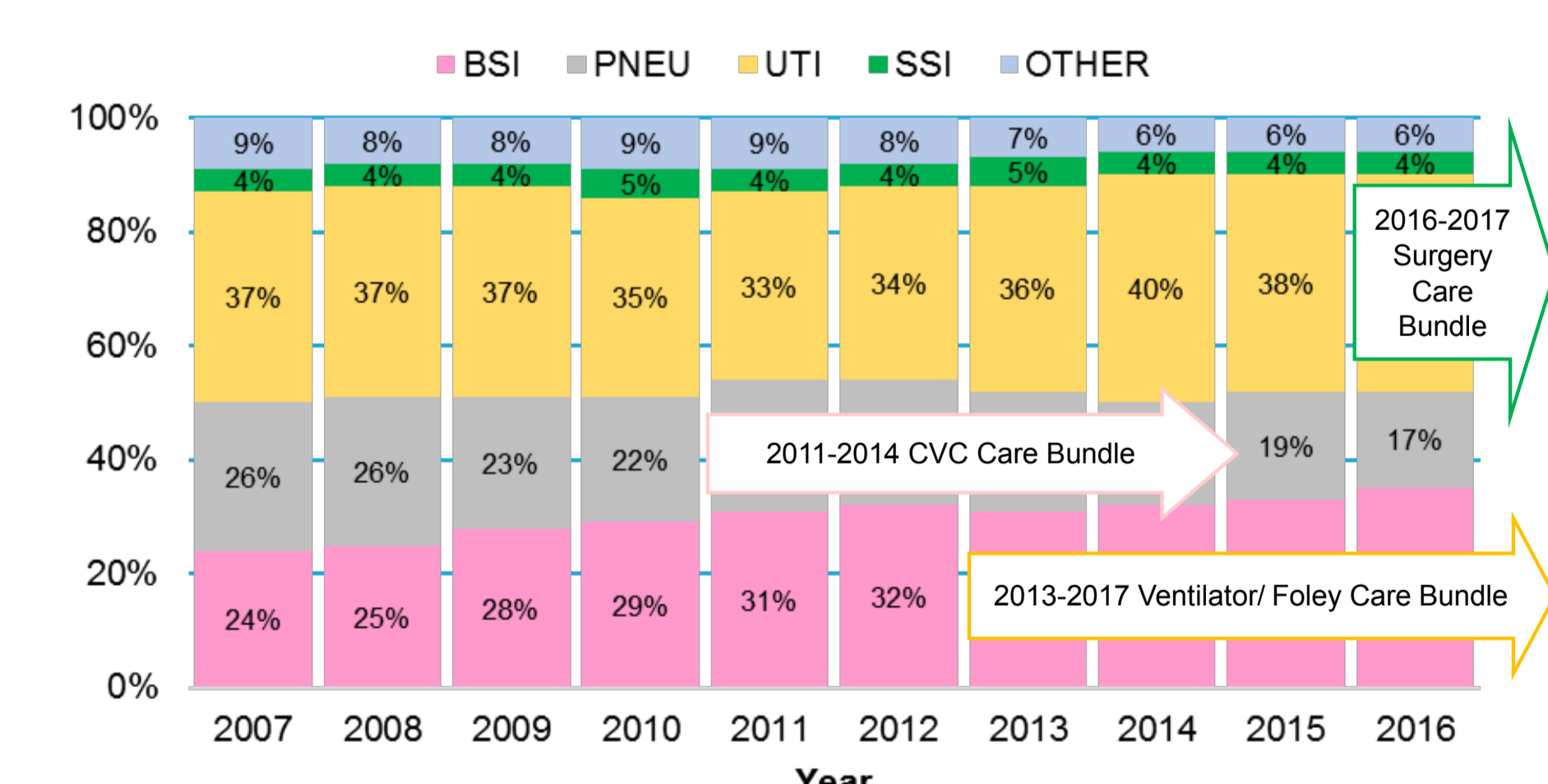


Fig.1 The distribution of site-specific HAIs and care bundle promotion in Taiwan

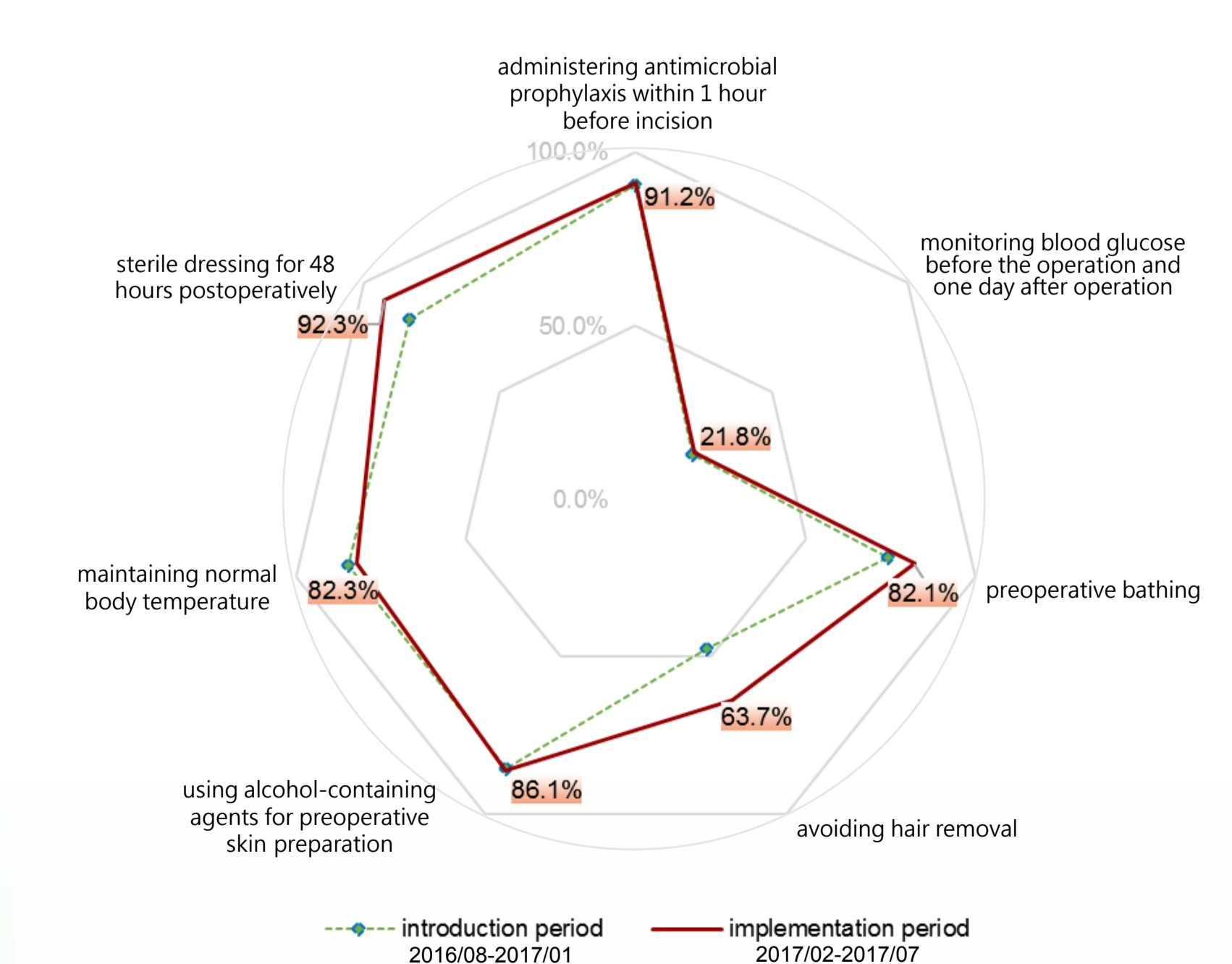


Fig.3 The compliance of the bundle elements



Fig.2 The bundle elements to prevent SSI