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PERSPECTIVES

National action plan to eliminate central line-associated bloodstream infections in Taiwan



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Received 25 March 2014; received in revised form 1 April 2014; accepted 3 April 2014

Available online 22 May 2014

The World Health Organization has proposed three major challenges¹ in patient safety: healthcare-associated infection (HAI); safe surgery saves lives; and antimicrobial resistance. The first priority for patient safety is to confront HAI, which obviously indicates that HAI has become an important issue in global public health.

HAI remains a current challenge in Taiwan. HAI is an important indicator that reflects healthcare quality and patient safety. Moreover, HAI significantly increases morbidity, mortality, and medical costs.² According to the published statistical data from the National Health Insurance (NHI) of Taiwan in 2011, the estimated extra medical costs of HAI cases are USD 0.92 billion (NTD 27.7 billion).³

A central line is an invasive medical device and invasive procedures are high-risk factors leading to infection. Based on global surveillance of patients with bloodstream infections, urinary tract infections, or pneumonia, approximately 50% of patients are implanted with an invasive medical device.⁴

According to the 2012 surveillance data, the rate of central line associated bloodstream infections (CLABSI) among intensive care units of medical centers and

regional hospitals in Taiwan is 5.5 and 3.5/1000 central line days, respectively.⁵ Hence, a government-lead force combined with professional organizations promoting central line care quality and creating patient safety is imperative; the Centers for Disease Control, Taiwan (Taiwan CDC) has started planning a national action plan to eliminate CLABSI in Taiwan—the central line care quality improvement project—since 2012.⁶ The phases of the central line care quality improvement project include a planning phase, an executive phase, and a policy evaluation phase.

Planning phase

The pilot project on the reduction of CLABSI involved applying bundle intervention of infection control from 2010 to 2011. This project consisted of a total of 29 ICU units from 14 hospitals with a variety of levels and sizes. The rate of CLABSI declined 11.2% from 5.81 to 5.16/1000 central line days during the pilot period. The results suggest that a coordinated, multi-institutional infection control initiative might be an effective approach to reducing CLABSI. After the pilot project, a national action plan—central line care quality improvement project—is planned for 2012–2015 (Fig. 1). This project is to utilize the medical development funds and collaborate with government, medical institutions, and professional organizations. Three major executive directions including effective intervention

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measures, financial incentives, and performance are annually planned and executed.

Effective intervention measures⁷

To implement the insertion bundle

The components of the insertion bundle include hand hygiene, maximum barrier precautions, use of chlorhexidine for skin cleaning, avoidance of femoral site for central line, and removal of unnecessary catheters.

To implement the maintenance bundle

The components of the maintenance bundle for CLABSI include daily evaluation of catheter removal, hand hygiene, changing aseptic dressings, scrub the hub, and changing the extension tube and infusion device.

Financial incentive

The financial incentive is provided through an allowance and incentive mechanism based on the following directions: training, promotion, collection of quality indicators, and pay for reporting. The establishment of an incentive system can be used to elevate executive effectiveness via the integration of government force and medical institutions.

Performance

The performance indicators are classified as process and outcome. Through the collection, analysis, feedback of performance indicators, implementation, and coordination, the effectiveness of the implemented strategy is

evaluated and provides medical institutions with a reference for future review.

Executive phase

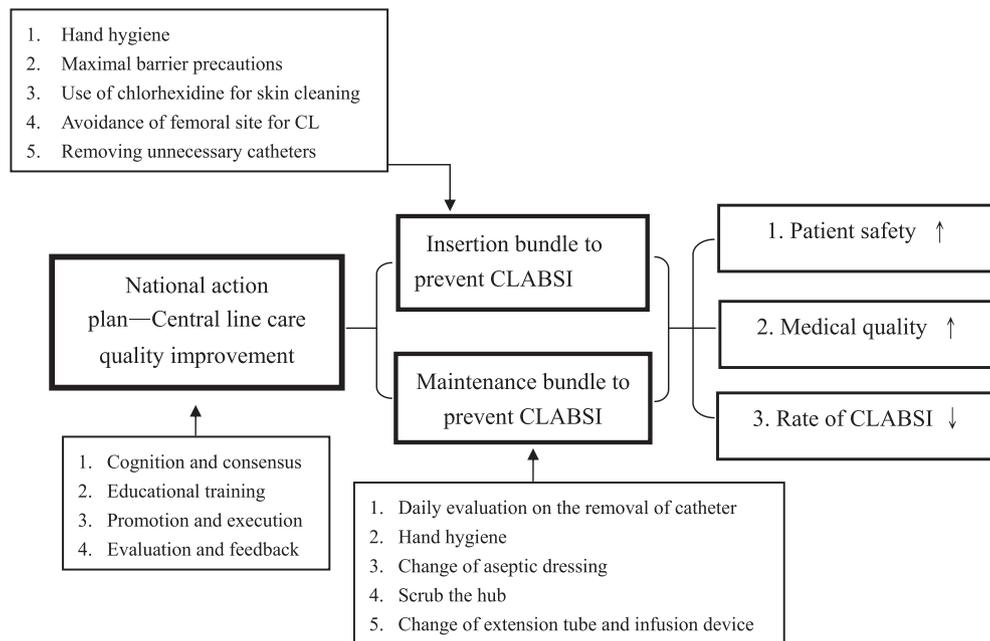
The role of this project includes the establishment of project management center, the establishment of model hospitals in different regions, and the assessment of participating hospitals in different regions. The four major promotional strategies include engagement, education, execution, and evaluation. The brief executive methods are summarized as following:

The establishment of a project management center

The professional organization is entrusted as a project management center and to establish a project team. The team is responsible for assisting hospitals to promote the central line care bundle measures, to conduct external audit work and give advice, to evaluate the incentives, and to improve the quality of healthcare personnel.

Regional development of model hospitals

A total of seven medical centers were selected to serve as the model hospitals. Besides the internal promotional activities, the model hospitals also have to serve as a standard for participants in the districts. The training of seed teachers, conference organization, field audits, benchmarking, sharing of activities, and the assistance of participating hospitals to promote the project are also conducted by them.



CLABSI = central line associated bloodstream infections.

Figure 1. Infrastructure of national action plan—central line care quality improvement project.

Regional assessment and screening of participating hospitals

A total of 57 hospitals are granted for promoting central line care bundle measures, these include related medical personnel training, the implementation and monitoring of care bundle measures, process and outcome indicators reporting.

Policy evaluation phase

The year 2015 is planned to be the policy evaluation phase for the central line care quality project. Except the evaluation and improvement, the success of the experiences in Taiwan are expected to be shared with others for reference. This is in order to achieve the combined use of the existing NHI mechanism, to encourage hospitals in the actual implementation of HAI control, to improve patient safety and healthcare quality as well as the reduction of national health expenses. The boost of the reward performance index, involvement of NHI, and other performance indexes for medical quality improvement plans are further expected.

Challenges of HAI in Taiwan

The 2003 Severe Acute Respiratory Syndrome outbreak marked a turning point in HAI control in Taiwan. Nevertheless, many challenges in HAI remain. The NHI system covers a wide range of outpatient and inpatient services and allows the people in Taiwan to have access to comprehensive medical care. However, the introduction of the system has also increased the numbers of bedridden patients with long-term use of invasive medical devices and procedures. This leads to an increased risk of acquiring HAI.^{8,9} Moreover, there are two other major challenges, including an increase in average life expectancy and the growth of the elderly population, putting the population at large at risk of infection. Furthermore, frequent international travel also facilitates HAI across national borders, posing a serious threat to the public. In the future, the Taiwan CDC will continue to work with stakeholders to promote and execute infection control strategies in order to achieve our ultimate goal of *zero tolerance* to HAI.¹⁰

Conflicts of interest

All contributing authors declare no conflicts of interest.

Acknowledgments

The Taiwan CDC would like to express our deep gratitude to the Taiwan Healthcare Infection Control Practices Advisory Committee (Taiwan HICPAC), the Infection Control Society of Taiwan (ICST), and the Infectious Diseases Society of Taiwan (IDST), which have provided valuable insight, information and contribution in the prevention and control of healthcare-associated infection. The Taiwan CDC especially thanks all who offered their time, expertise and support to assist the Taiwan CDC in formulating infection prevention and control policies. The Taiwan CDC also wants to thank all the dedicated hospitals and staff that contribute valuable effort to prevent and control healthcare-associated infections.

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