

# Improvements in process with a multimodal campaign to reduce urinary tract infections in hospitalised Australian patients

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**Abstract.** *Introduction:* In hospitalised patients, the majority of urinary tract infections (UTIs) can be attributed to the use of indwelling urinary catheters (IDCs). However, quality-care practices for catheterised hospitalised patients in Australia are largely unknown. The objective of this study was to evaluate the impact of an educational campaign on the quality of care of IDCs in hospitalised patients, and the proportion of hospitalised patients with UTI.

*Methods:* A multimodal strategy was developed in an Australian centre to educate regarding prevention of infection and to improve documentation regarding IDCs (June to October 2011). Point-prevalence audits of process measures were conducted at baseline and in early and late post-intervention periods. Administrative coding was used to quantify UTI infections in hospitalised patients.

*Results:* Documentation of clinical practice regarding IDC insertion and maintenance improved post-intervention and was sustained. Compliance with current best practice for managing IDCs improved in the early post-intervention period, but was not sustained. Administratively coded UTIs decreased by 13% following the intervention.

*Conclusions:* An organisation-wide multimodal strategy to improve processes concerning IDC care and documentation was successfully implemented, with an associated reduction in UTIs arising during hospital stay. To achieve sustainability, practices must be embedded into routine clinical care.

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## Introduction

Urinary tract infections (UTIs) are the most common healthcare-associated infection.<sup>1</sup> In hospitalised patients, these infections are mostly associated with indwelling urinary

catheters (IDCs).<sup>1</sup> Urinary tract infections in hospitalised patients result in morbidity, excess antibiotic exposure, increases in cost of care and prolonged length of hospital stay.

### Implications

- A multimodal approach to enhance clinical processes concerning indwelling urinary catheter management should be used to target key clinical staff within healthcare facilities and to reduce urinary tract infections.
- While documentation of practices regarding insertion and care of indwelling urinary catheters can be sustainably improved, continued compliance with best practice for indwelling urinary catheter management may require additional measures, and healthcare facilities planning to implement quality improvement strategies should anticipate this challenge.

Aside from small observational audits,<sup>2</sup> Australian quality-care practices for catheterised hospitalised patients are largely unknown, despite the availability of guidelines and recommendations.<sup>3</sup> A previous study in our ICU highlighted the need to improve hospital-wide processes regarding IDC care (unpublished work). Interventions that have previously been demonstrated to reduce risk of UTI in hospitalised patients include strategies to promote early removal of unnecessary IDCs,<sup>4</sup> education of clinical staff regarding best practice,<sup>5</sup> and improved documentation in clinical records concerning IDC insertion practices.<sup>6</sup> Multimodal prevention strategies ('bundles of care') have therefore been promoted.<sup>7</sup>

The objectives of this study were to evaluate the impact of an educational campaign at a large Australian centre on the quality of care of indwelling urinary catheters in hospitalised patients, and the prevalence of UTIs associated with hospitalisation.

### Methods

#### *Patient population*

Alfred Health is an 860-bed public health service, providing tertiary referral and state-wide services, including heart and lung transplantation, cystic fibrosis, burns, HIV/AIDS, trauma and bone-marrow transplantation. A 35-bed mixed ICU serves this population.

#### *Study design*

To establish baseline clinical practice and UTI rates, data for a 3-month period (March to May 2011) were analysed before the intervention ('pre-intervention period'). During this timeframe, a literature review was performed to identify evidence-based practices for implementation, and organisation-wide clinical practice was reviewed to enable components of the targeted intervention to be planned. Key measures to reduce risk for hospital-acquired UTI were then introduced in a stepwise manner between June and October 2011 ('intervention period'). Following the

intervention, further auditing of process and outcomes was performed between November 2011 and January 2012 ('early post-intervention period'). To evaluate sustainability of the intervention, a second audit was performed at 17 months ('late post-intervention period').

As a quality-improvement initiative that did not involve collection of patient-identifying information, ethics approval was not required for this study. The activities of the infection prevention unit are performed under the auspices of the institutional hospital-infection prevention committee.

Allocated resources included project nursing staff (1.0 full-time equivalent) for 9 months, supported by the hospital executive through the infection prevention unit.

#### *Intervention*

A multimodal strategy was developed to raise awareness of risks associated with use of IDCs, to educate staff regarding prevention of IDC-associated UTIs and to improve documentation in medical records concerning the insertion and care of IDCs.<sup>8</sup> These initiatives were implemented during an organisation-wide launch, supported by the hospital executive and a working committee of relevant stakeholders (ICU, emergency and trauma centre, general medicine, urology, continence services and nursing education). The institutional IDC insertion guideline was revised with stakeholder input.

The educational program included the following elements: (i) heightening awareness of hospital-acquired UTI risks associated with use of IDCs, (ii) training of clinical staff regarding IDC insertion and management, (iii) correct methods for collection of urine samples for microscopy, (iv) development of printed information brochures for staff and patients (v) identifying local clinical 'champions' to promote best practice, and (vi) development of an electronic learning package centred on management of patients with IDCs, and an educational podcast for the medical officer web-based learning management system. Workshops for training in IDC insertion for male patients were also initiated.

To promote the campaign, poster images were developed to communicate prevention strategies for IDC-associated UTIs. Themes included evaluation of the necessity of every IDC, considering alternatives to catheterisation, principles of IDC insertion and management, and encouraging prompt removal of IDCs if not clinically indicated. Content was also released electronically via a weekly hospital circular, as well as in the bi-monthly hospital newsletter. An adhesive label was developed to record the indication, date and time of IDC insertion, the name and role of the clinician who inserted the device, and the size and type of IDC. An IDC management and removal plan was developed to summarise key points in care and to schedule IDC removal.

Process measures were collected by organisation-wide point-prevalence audits of all patients with IDCs, including: documentation of the indication for IDC and planned removal, anchoring of IDC to leg, ensuring that tubing and collection bag were kept below the level of the bladder and off the floor at

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