

## A SYSTEMATIC REVIEW OF INTERVENTIONS TO MINIMISE THE INITIAL USE OF INDWELLING URINARY CATHETERS IN ACUTE CARE.

### Hypothesis / aims of study

Indwelling urinary catheters (IUCs) initially placed in hospital frequently remain in place to become long-term catheters once the patient had been discharged, thus increasing the potential for intractable incontinence<sup>(1)</sup>. The continued overuse of IUCs in acute care has been well reported<sup>(2)</sup>. A large-scale continence audit in the UK observed that 26% of patients aged 65+ with urinary incontinence were given an IUC for containment purposes, compared with only 10% in care homes<sup>(3)</sup>. Current research aimed at reducing the use of IUCs in acute care focuses on removing IUCs already in situ rather than minimising initial use. This paper aims to progress from existing work to critically evaluate attempts to minimise the initial placement of IUCs by providing a systematic review of the evidence of the effectiveness of interventions to minimise the initial use of IUCs in adults in acute care.

### Study design, materials and methods

A systematic review of research published up to July 2011 reporting on the impact of interventions to minimise the use of unnecessary IUCs to provide a synthesis of the evidence was undertaken. Studies incorporating an intervention to reduce the initial placement of IUCs in an acute care environment with patients aged 18 and over, reporting on any change in the incidence of IUC placement were eligible to be included in the review. The Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) checklist was used as a tool to guide the structure of the review. Three further tools were used: Cochrane Effective Practice and Organisation of Care Group data extraction checklist (2002), Cochrane Collaboration's tool for assessing risk of bias (2011), Standards for Quality Improvement Reporting Excellence (SQUIRE) checklist (2011). The data sources used were MEDLINE, CINAHL, National Health Service Centre for Review and Dissemination and Cochrane Library.

### Results

The titles of studies initially identified (N=2352) were scanned for eligibility. 2230 of these were excluded as being unrelated to the objectives of this review. Of the 122 studies where the full-text was assessed, 59 were rejected as the study was not related to the overuse of IUCs and 51 were rejected because, although related to the overuse of IUCs, changes in the level of initial placement of IUCs were not provided. Only 8 studies reported any change (increase or decrease) in the level of initial placement of IUCs as a result of an intervention in acute care. Of the eight studies, six were uncontrolled. Seven demonstrated a reduction in the initial use of IUCs post-intervention (relative risk 0.19 – 0.86). The only randomised controlled study, demonstrated an increase (relative risk 1.06). The studies are summarised in Table 1.

### Interpretation of results

Although it appears that the interventions implemented might improve clinical practice, it is impossible to draw any strong conclusions about the efficacy of individual interventions or combinations of interventions due to the study designs, the variation in clinical environments and the paucity of number of studies. Notably, the clinical indications to initially place an IUC that were deemed appropriate by the different studies varied greatly. These variations are highlighted in the summary given in Table 2.

### Concluding message

There is no robust evidence to support the use of any one intervention to minimise the inappropriate placement of IUCs in acute care and, while the inappropriate use of IUCs in acute care continues to cause unnecessary harm to patients, the need for methodologically rigorous studies is clear. Furthermore, there is a need for greater understanding of when the placement of an IUC is necessary and the development of consistent, evidence based, setting-appropriate, clinician-friendly indicators for the initial placement of an IUC.

Table 1 – Summary of studies

Reference	Study Design	Sample size	Setting	Intervention	Results
Danchaivijit r, 1992 Thailand	Randomised Controlled Trial	16959	13 hospitals Medical and surgical wards	1. Clinician Reminder	IUC use increased from 8.1% to 8.6% RR 1.06
Fakih et al 2010 USA	Uncontrolled Before/after intervention	2462	Teaching hospital Emergency Department	1. Indication Check list 2. Education for physicians 3. Physician "champion"	IUC use fell from 212 of 1421 (14.9%) to 110 of 1041 (10.6%) of patients admitted from ED RR 0.71

Reference	Study Design	Sample size	Setting	Intervention	Results
Gokula et al 2007 USA	Uncontrolled Before/after intervention	181488 (2002 + 2005)	Teaching hospital Emergency Department	1.MDT Education 2. Indication checklist 3. Guideline Change	IUC use fell from 2.38% to 0.45% of visitors to ED RR 0.19
Patrizzi et al 2009 USA (QIP)	Uncontrolled Before/after intervention	807	Teaching hospital Patients admitted to medical unit from ED	1. Catheter insertion kits removed from bedside 2. Bladder scanner 3. Education from CNS 4. Indication checklist 5. Audit/Feedback	IUC use fell from 11/149 (7.38%) to 3/163 (1.84%) of patients admitted RR 0.25
Slappendel and Weber 1999 Netherlands (QIP)	Uncontrolled Before/after intervention	4116	Specialist orthopaedic hospital Surgical unit	1.Bladder Scanner 2. IUC guidelines	IUC use fell from 602/1920 (31%) to 349/2196 (16%) RR 0.52
Stephan et al 2006 USA (QIP)	Controlled Before/after intervention	539	Teaching hospital Surgical unit	1.Educational sessions 2.Posters 3.Guideline change	IUC use fell from 99/280 (35.3%) to 79/259 (30.5%) RR 0.86
Topal et al 2005,USA (QIP)	Uncontrolled Before/after intervention	1777	Teaching Hospital Patients admitted to 4 General medical units	1.Handheld bladder scanners 2.MDT Education	IUC use fell from 1164/883 (19.7%) to 81/894 ( 9%) RR 0.46
Voss, 2009 USA (QIP)	Uncontrolled Before/after intervention	182	Community hospital Medical Unit Patients 65 and over	1.Education in appropriate use of catheters	IUC use fell from 32/97 (33%) to 13/85 (15.3%) RR 0.46

RR, relative risk

QIP – Quality Improvement Project

Table 2 - Summary of stated indications to place an IUC

Indication	Danchavijitr et al 1992	Fakih et al 2010	Gokula et al 2007	Patrizzi et al 2009	Slappendel and Weber 1999	Stephan et al 2006	Topal et al 2005	Voss 2009
Acute urinary retention (no use of bladder scanner specified)	x	x	x				x	
Acute urinary retention (with use of bladder scanner)				x	x			
Need for urinary output monitoring / haemodynamic instability	x	x	x	x			x	
General postoperative requirements							x	
Urinary incontinence and skin breakdown		x	x	x			x	x
End-of-life care		x	x				x	x
Aggressive treatment with diuretic medications or fluids								x
Pre-operative incontinence of urine						x		
A need to measure output accurately in an uncooperative patient (e.g. intoxication)			x					
Bladder irrigation	x		x					
Chronic urinary retention			x					x
Injury to urethra	x							
Uncleared spinal radiographs in female patients only				x				
Deep sedation				x				
Interventions with foreseen						x		

Indication	Danchaivijitr et al 1992	Fakih et al 2010	Gokula et al 2007	Patrizi et al 2009	Slappende l and Weber 1999	Stephan et al 2006	Topal et al 2005	Voss 2009
duration of surgery >5 hours								
Total hip replacement and age >75 years, an ASA class of 3 + or obesity						x		
Total knee and age >80 years or obese						x		

#### References

1. McNulty C. Reducing urinary catheter related infections in care homes: a review of the literature. J Infect Prevention 2009;10(2):70-75
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#### Disclosures

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