



# LINKS OF INTEREST DISCLOSURE

**Name of the speaker: Dr. Debra Adams**

**I have the following potential links of interest to report:**

- NICE (National Institute for Clinical Excellence) fellow.
- FIT (Forum for Injection Technique) Board member.
- Co-chair; Infection Prevention Society High Impact Intervention tool review 2017.
- In the last 5 years, honorariums received from BD, 3M.



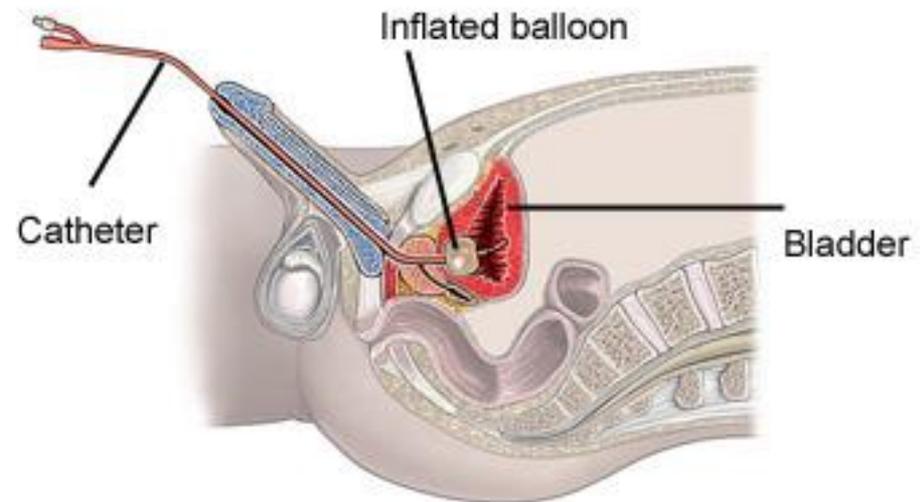
# HOUDINI. THE URINARY CATHETER DISAPPEARING ACT.

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**Dr. Debra Adams R.N. PhD.**  
**NICE Fellow**  
**Senior Infection Prevention Advisor**  
**NHS Improvement**

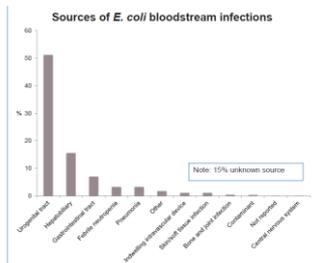
# Objectives

- Overview of some of the National drivers to prevent CAUTI (catheter associated urinary tract infection) in England.
- Discuss; Are Urinary Catheters an infection risk?
- Present: HOUDINI; a nurse led protocol.



# National IP Improvement Drivers in England

- 50% reduction in Gram negative HCA BSI by 2020.
- Over 5 years - an extra 6,000 deaths will be attributable to pan-resistant Gram-negative bloodstream infections (GNBSIs).
  - Extra NHS (National Health Service) costs to manage resistant infections: estimated to be £280 million.
  - Estimated cost of treating Gram-negative infection:
    - For a straightforward case = at least £3,000
    - For a highly resistant case = at least £6,000
    - Cost of £1m per resistant infections outbreak in a hospital.



Based on Abernathy, J et al (2017) Epidemiology of Escherichia coli bacteraemia in England: results of an enhanced sentinel surveillance programme. *Journal of Hospital Infection* 95 (4): 365-375

Public Health England 

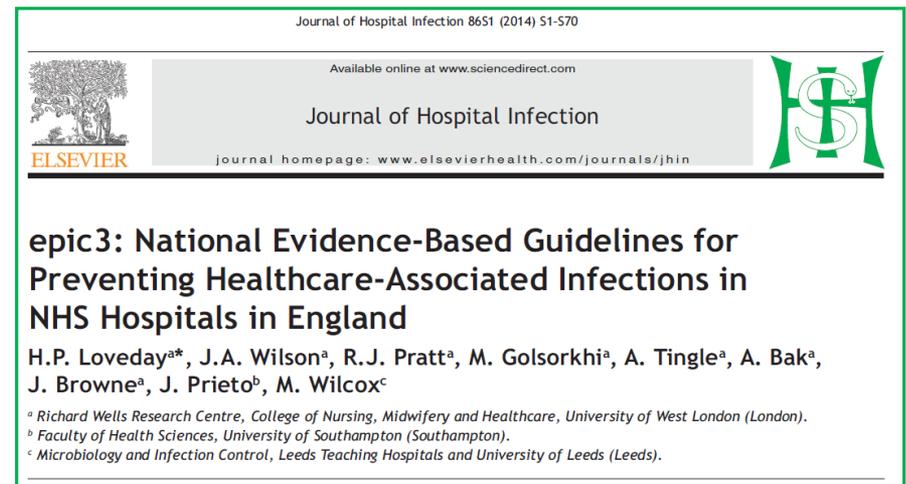
Preventing healthcare associated Gram-negative bloodstream infections: an improvement resource

May 2017

support collaborate challenge improve inspire

# National Guidelines

- NICE: Quality Standard QS61 and Clinical Guideline CG139... *“Reviewed regularly and the **urinary catheter removed as soon as possible**”.*
- EPIC 3: *Assess and record the reasons for catheterisation every day. **Remove the catheter when no longer clinically indicated.***



# Are Urinary Catheters a Risk?

- The Foley catheter was introduced in the 1930s and hasn't changed in its design!!
- DVD.....

# Context

- 15–25% of hospitalised patients have a UC inserted during their stay (EPIC 3).
- UTI are the most common HCAI in acute hospitals: 19% (HPA, 2012, Smythe et al; JHI 2008).
- The major predisposing factor for healthcare associated UTI is the presence of an indwelling UC (Tenke, Koves, Johansen. Curr Opin Infect Di. 2014; 27:102-107).
- In acute care facilities, the risk of developing bacteriuria increases 5% for each day of UC. (Saint. AJIC. 2000;28:68-75).

# Improvement Issue:

- To evaluate the effectiveness of a nurse led HOUDINI UC removal protocol in reducing the number of UCs used. Therefore, potentially reducing the associated risk of a catheter associated urinary tract infection (CAUTI).

# Method:

- **TEAM WORK!!**

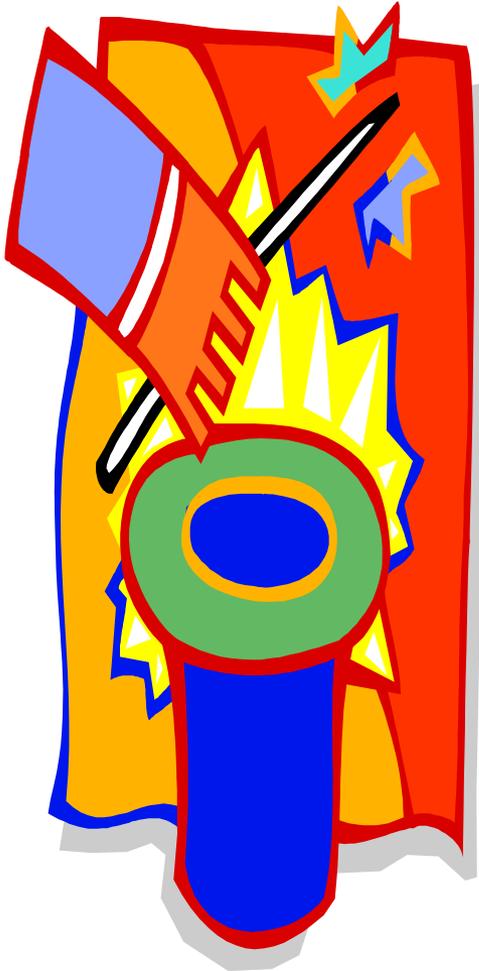
- The Infection Prevention Nurses, Continenence Nurse Specialist and Urology Nurse Practitioner implemented an adapted HOUDINI urinary catheter removal protocol.

- **Quality Improvement process:**

- A Plan Do Study Act (PDSA) cycle was utilized to evaluate to HOUDINI protocol; two months pre and two months post implementation.

# HOUDINI

## The Urinary Catheter Disappearing Act!!!



- **H**aematuria- visible?
- **O**bstruction- urinary?
- **U**rology surgery?
- **D**ecubitus Ulcer- open sacral or perineal wound in an incontinent patient?
- **I**nput/Output fluid monitoring?
- **N**ot for resus/Comfort care/(Physician required?)
- **I**mmobility due to physical constraints e.g. unstable fracture?

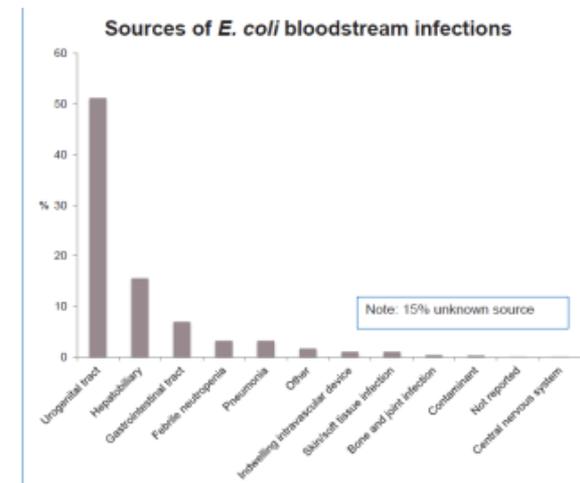
**If NO; then make that urinary catheter disappear!**

*Amended from:*

**Development of a Nurse-Driven Protocol to Remove Urinary Catheters** E Trovillion<sup>1</sup>, J Skyles, D Hopkins-Broyles, A Becktenwald, A Rogers, K Faulkner, H Babcock, KF Woeltje. Presented at; SHEA. 1-4 April 2011. Abstract 592.

# Key Performance Indicators. Chosen because;

- 8.5% of hospital acquired BSI may be associated with a CAUTI (Public Health Laboratory Service, 2002).
- *E. coli* is the most prevalent pathogen causing UTIs
- (Hidron *et al.*, 2008. Abernathy et al 2017).



Based on Abernathy, J et al (2017) Epidemiology of *Escherichia coli* bacteraemia in England, Results of an enhanced sentinel surveillance programme. *Journal of Hospital Infection* 95 (4): 365-375



## Data Collection:

### Monitored Two Months Pre and Post

### HOUDINI:

- UC usage was monitored utilizing a monthly point prevalence audit.
- Non-duplicated *Escherichia coli* laboratory confirmed urine samples were monitored (note we were not identifying UTI but laboratory confirmed diagnosis of *E-coli* present).
- Non-duplicated *E-coli* blood stream infection (BSI) on the pilot wards were monitored.

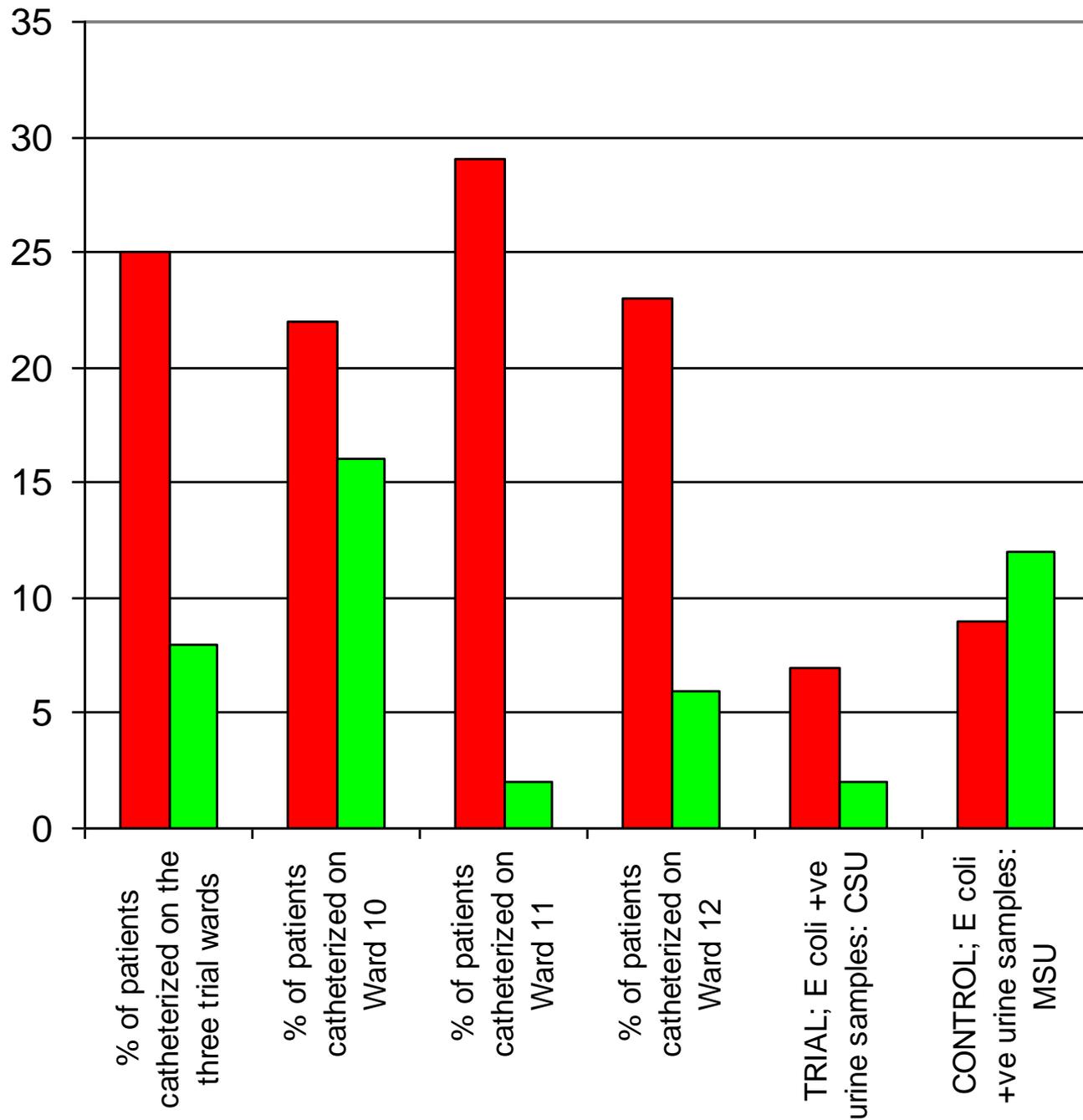
# Approach

- Keep it simple!
- Put posters where staff access them; ward round trollies, behind toilet doors.
- Develop credit card style HOUDINI cards.
- Win hearts and minds.
- Work with, and not do to.

Did it work????

# Evidence of Improvement:

- UC per patient population usage **decreased** by greater than 17% following the implementation of HOUDINI on the trial wards.
- Non-duplicated *E. coli* laboratory confirmed CSU **decreased** by 70% compared to the control group de-duplicated E-coli laboratory confirmed MSU which increased by 25%
- Non-duplicated *E. coli* BSI from patients with UC remained unchanged at 0%



■ 2 months pre HOUDINI  
■ 2 months post HOUDINI

# Recommended Future Steps:

- The implementation of HOUDINI demonstrated a **decrease** in both UC usage and *E. coli* UC associated positive urine samples.
- Therefore, an assumption may be made that implementing the HOUDINI protocol can reduce the risk for patients developing a CAUTI.
- Ref: **Adams D**, Bucior H, Day G, Rimmer J. HOUDINI: make that urinary catheter disappear; A nurse led protocol. *Journal of Infection Prevention*. 2012; 13(2):44-46 DOI:10.1177/1757177412436818.
- This data was presented at the Infection Prevention and Control Conference- Bournemouth 2011 and was awarded “Best Poster”.



## HOUDINI: make that urinary catheter disappear – nurse-led protocol

Debra Adams<sup>1</sup>, Helen Bucior, Qina Day, Jo-Anne Rimmer

Infection Prevention and Control Department, Mid Staffordshire NHS Foundation Trust, Weston Road, Stafford ST16 3SA, UK.  
Email: Debra.adams@midstaffs.nhs.uk  
<sup>1</sup>Corresponding author

Accepted for publication: 4 January 2012  
Key words: Urinary catheter, nurse led protocol, urinary tract infection

**Abstract**

**U**rinary tract infections (UTI) are the most common healthcare associated infection in acute hospitals. The risk of developing a catheter associated urinary tract infection (CAUTI) increases the longer a urinary catheter remains in situ. Although criteria for insertion and continuation are known, there are few tools to aid with removal decision making. This pilot study evaluated the effectiveness of a nurse-led HOUDINI urinary catheter removal protocol in reducing the number of days of urinary catheter usage, thus potentially reducing the associated risk of a CAUTI.

**Introduction**

The Hospital Infection Society/Infection Control Nurses Association (2007) indicated that 31.6% of all patients had a urinary catheter inserted during their stay in hospital. It has been well documented that one of the major predisposing factors for healthcare associated urinary tract infection (UTI) is the presence of an indwelling urethral catheter (Patt et al., 2007). Catheter associated urinary tract infection (CAUTI) is among the most frequently identified healthcare associated infections (HCAI). Twenty three per cent of all healthcare associated infections (HCAI) are urinary infections, of which 80% are related to the presence of an indwelling urinary catheter (UC) (NPSA, 2004). Furthermore, 5% of hospital acquired bacteraemias may be associated with a CAUTI (Nosocomial Infection National Surveillance Service/Public Health Laboratory Service, 2002).

Catheter associated urinary tract infections are linked with a range of micro-organisms, in particular the Gram-negative species. Among the urinary pathogens, coliforms are the most frequently identified, of which *Escherichia coli* is the most prevalent pathogen causing UTIs (Hilden et al., 2008). These pathogens may gain access to the urinary tract either via the extraluminal route (on UC insertion, contamination of the UC from the healthcare worker's hands, ascending contamination from the perineum, colonic or perineal flora) or the intraluminal route (reflux of bacteria from a contaminated urine drainage bag). The duration of catheterisation is associated with an increasing risk of infection (Patt et al., 2007). It is estimated that the average daily risk of acquiring a bacteriuria is approximately 3% to 8% for each day of catheterisation (Garbald et al., 1974, 1982). Therefore, UC should be removed as soon as they are no longer required (Patt et al., 2007).

The High Impact Action: Protection from Infections: Urinary Tract Infection Strategy, launched by the Chief Nursing Officer (CNO) for England, focuses on the essentials of care and advocates a care bundle approach to minimising the risk of CAUTI (CNO, 2010). Subsequent to monitoring the point prevalence data for patients with a UC in a small acute hospital in England, the infection prevention control nurses (IPCN) undertook an audit of the CAUTI rate for these patients and developed a strategy to reduce the risk of such infections.

**Methods**

The improvement strategy was informed by a poster presentation from the Society for Healthcare Epidemiology of America (SHEA) Annual Scientific Meeting 2011, which described a nurse led protocol for the timely removal of UC (Tovillson et al., 2011). The authors described the use of two protocols for the removal of UC, the Surgical Care Improvement Protocol for postoperative patients and HOUDINI for non-surgical patients. HOUDINI is an acronym used to list the indications for continued use of a UC:

- Haematuria
- Obstruction
- Urinary incontinence
- Decubitus ulcer
- Input and output measurement
- Nursing end of life care
- Immobility

Where none of these indications exist the catheter should be removed.

We undertook a pilot improvement study using a plan-do-study-act (PDSA) approach to evaluate HOUDINI, a nurse led protocol for the timely removal of UC in non-surgical patients.

Peer reviewed paper

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10.1177/1757177412436818

44 *Journal of Infection Prevention* March 2012, Volume 13(2) <http://jip.sagepub.com> DOI: 10.1177/1757177412436818

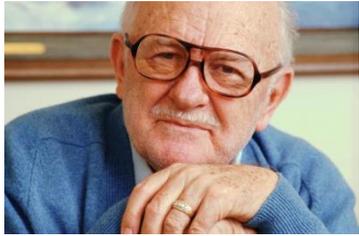
# Others Experiences: UHB NHSFT.

- HOUDINI was used as part of a series of interventions at The University Hospitals Birmingham NHS FT:
- Outcomes:
  - CAUTI decreased by >50%,
  - Prevalence of indwelling catheters reduced from 22% to 17%
  - E-coli BSI reduced from 17% to 10%.
    - Ref: Bradley, Flavell, Raybould et al., (2018) Reducing E-coli bacteraemia associated CAUTI in secondary care settings. Journal of Healthcare Infection; in press).

# Chesterfield NHS FT

- Utilized HOUDINI as part of a multi-modal strategy.
- Outcome:
  - A comparison of audit data between March 2013 and January 2015 showed:
    - a 30% reduction in the number of patients with a UC
    - a 71% reduction in the number of patients with a UC who developed a CAUTI

Ref: <https://www.gov.uk/government/case-studies/reducing-catheter-associated-uti-rates-in-hospital>



# A patient experience:

Professor Jennie Wilson.

Richard Wells Research Centre, University of West London

- *Mr. A was admitted to the ward with an indwelling catheter.*
- *He told us that the GP had inserted the catheter for a swollen abdomen some 18 months previously.*
- *Since that time Mr A said he had suffered a recurrent UTI whenever the catheter was changed.*
- *According to his wife having the catheter **"Ruined his life for the last 18 months. Indeed he spent Christmas at home as he was afraid the bag would leak"***
- *The IPC team and ward staff could find no record of a formal referral to the urology service and so the rationale behind the catheter was unclear. **Following HOUDINI principles the catheter was removed***
- *Mr A passed urine normally and was discharged without a urinary catheter.*

Finally.

Get the message across!

Sometimes its not that staff don't know,  
its that we haven't made the message  
simple.....

- <https://www.youtube.com/watch?v=Hzgzim5m7oU>  
(Power of Words)

Thank you!  
Merci!  
Grazie!  
Gracias!