UNIVERSITY OF WEST LONDON
College of Nursing, Midwifery and Healthcare

Evidence for Infection Prevention & Control – problems of design and implementation

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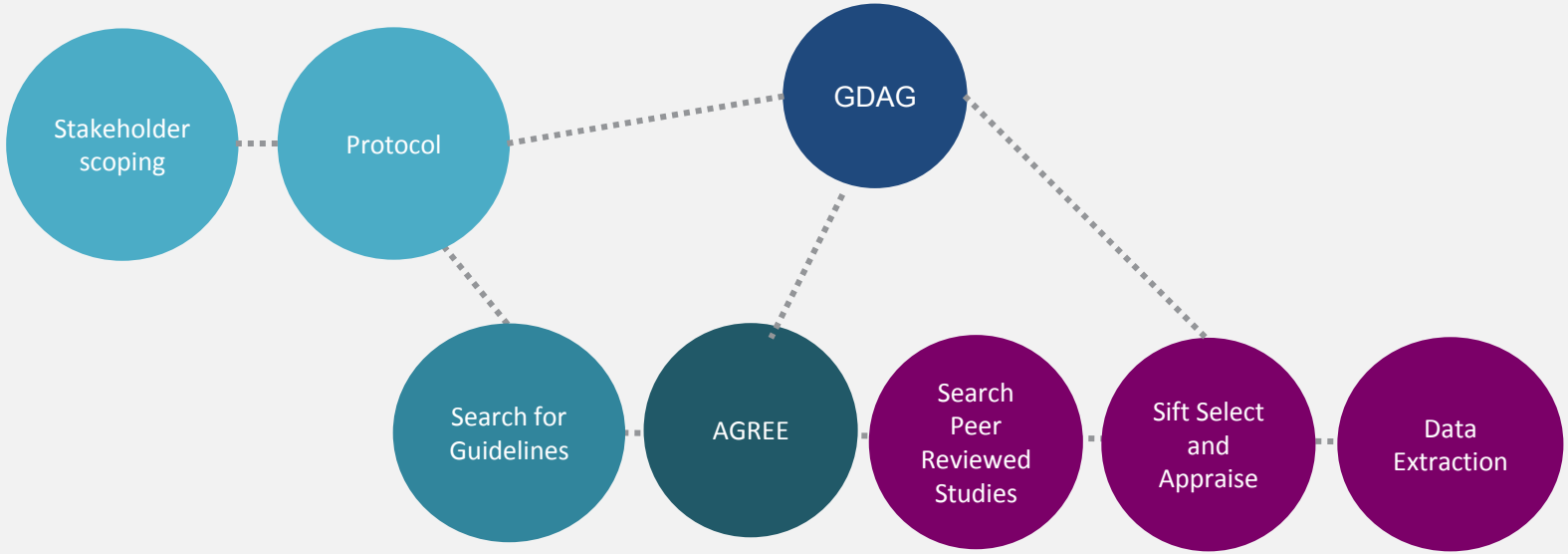
@loveebhc

Epic3 Guidelines

- Standard Principles
  - Hospital Hygiene
  - Hand Hygiene
  - Use of PPE
  - Use and Disposal of Sharps
  - Asepsis
- Short-term Indwelling Urethral Catheters
- Intravascular Access Devices
  - Central venous
  - Peripheral vascular

Evidence Identification & Quality Appraisal



SIGN Methodology

Included study designs

- Primary research
  - RCT, Cluster RCT, non-randomised trial, prospective cohort, interrupted time series, controlled before and after studies.
- Secondary research
  - Systematic reviews and meta-analysis

Levels of Evidence (Studies)

1++ High quality meta-analyses, systematic reviews of RCTs or RCTs with a very low risk of bias

1+ Well conducted meta-analyses, systematic reviews, or RCTs with a low risk of bias

2++ High quality systematic reviews of case control or cohort studies.

High quality case control or cohort studies with a very low risk of confounding or bias and a high probability that the relationship is causal.

2++ Interrupted time series with a control group (i) there is a clearly defined point in time when the intervention occurred and (ii) at least three data points before and three after the intervention.

2+ Well-conducted case control or cohort studies: low risk of confounding or bias and a moderate probability that the relationship is causal. Controlled before after studies with two or more intervention and control sites

4 Expert opinion, Legislation

Levels of Evidence (Studies)

1 - Meta-analyses, systematic reviews, or RCTs with a high risk of bias* ✗

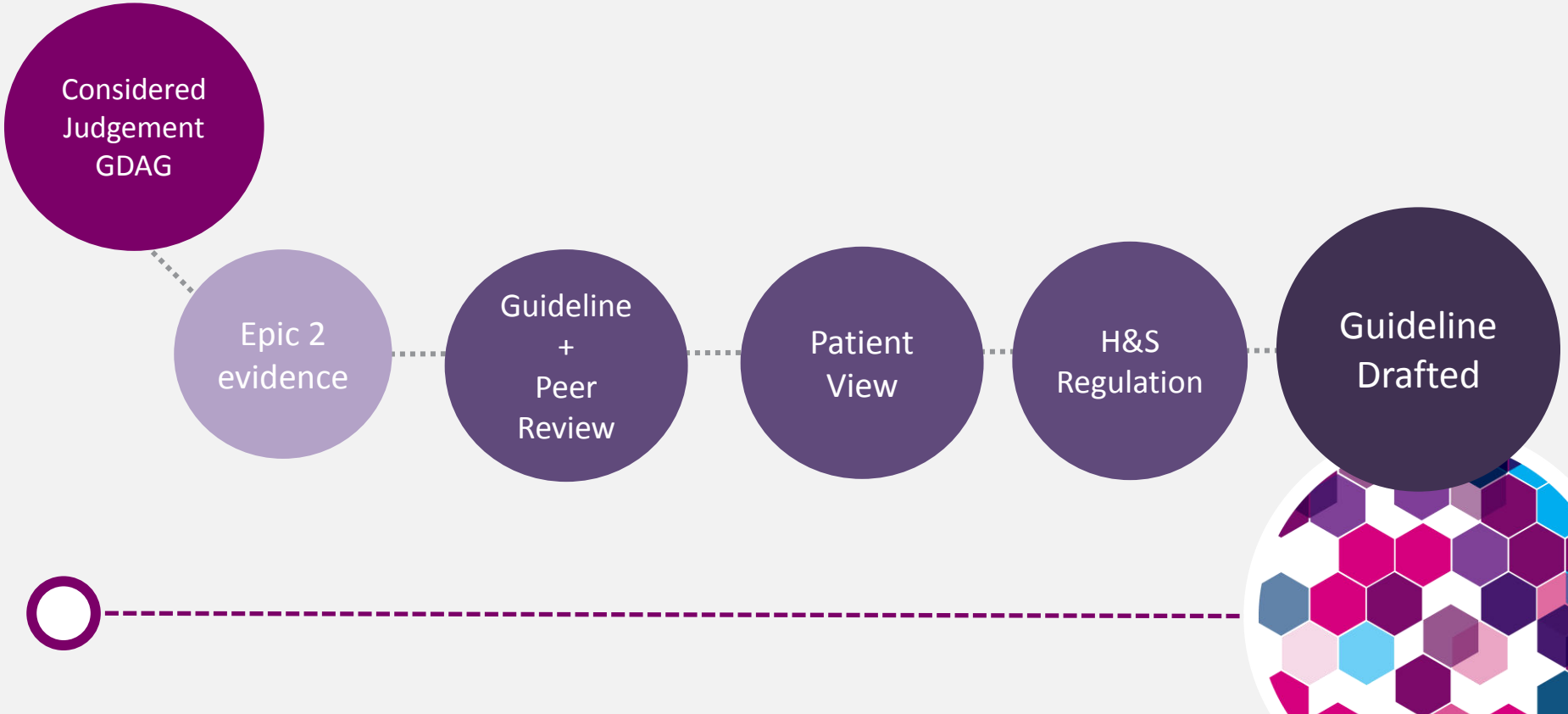
2 - Case control or cohort studies: high risk of confounding or bias and a significant risk that the relationship is not causal.

ITS without a parallel control group (i) there is a clearly defined point in time when the intervention occurred and (ii) at least three data points before and three after the intervention.

Controlled before after studies with one intervention and one control site. ✗

3 - Non-analytic studies, e.g., uncontrolled before-after studies, case reports, case series ✗

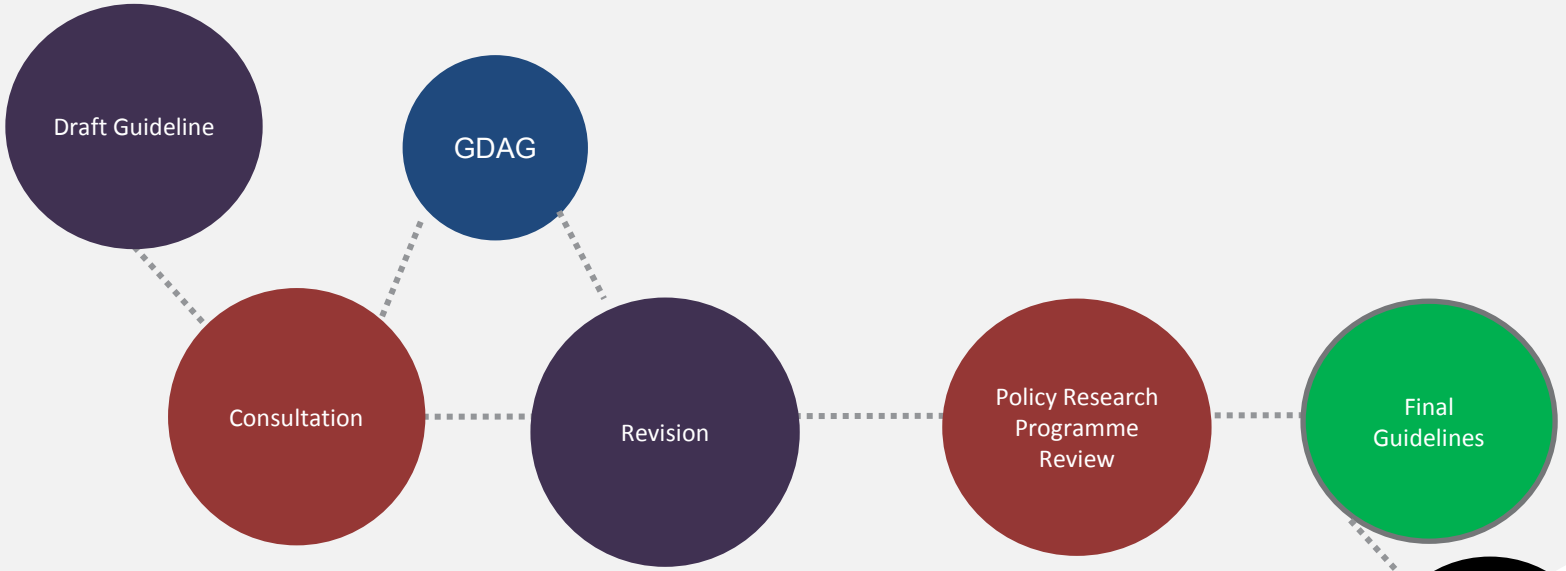
Guideline Development



SIGN – Recommendation Grades (2012)

A. At least one meta-analysis, systematic review, or randomized controlled trial (RCT) rated as 1++, and directly applicable to the target population; or A body of evidence consisting principally of studies rated as 1+, directly applicable to the target population, and demonstrating overall consistency of results
B. A body of evidence including studies rated as 2++, directly applicable to the target population, and demonstrating overall consistency of results; or
   Extrapolated evidence from studies rated as 1++ or 1+
C. A body of evidence including studies rated as 2+, directly applicable to the target population and demonstrating overall consistency of results; or
   Extrapolated evidence from studies rated as 2++
D. Evidence level 3 or 4; or
   Extrapolated evidence from studies rated as 2+

Guideline Consultation & Accreditation



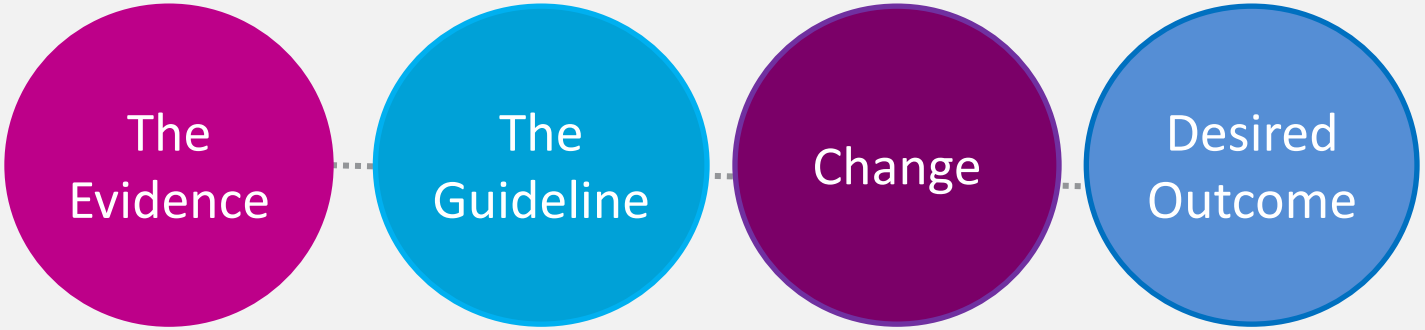
Issues for the quality of evidence

- Study design – often ‘convenience’ designs, single centre, before and after studies without control or in single centres ; interrupted time series with too few measures before and after interventions;
- Heterogeneity of study settings;
- Heterogeneity of interventions – not all CHG is the same 2% 4%; impregnated cloths, liquid (Hibiscrub);
- Confounding interventions e.g., other quality improvement measures/ bundles, types of catheter inserted, cutaneous antisepsis

Implementation studies

- Generally descriptive but often with inadequate description of the intervention and context;
- Baseline measurement is omitted (need more than one);
- Measurement is often focused on process not outcome;
- Multiple interventions rolled out at the same time.

Evidence translated?




World of Evidence
Implementation
World of Practice

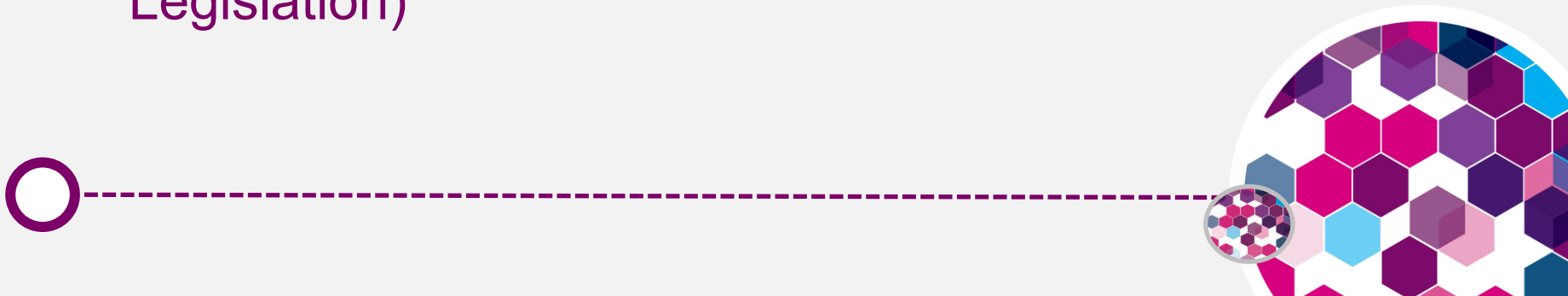
The problem

- Infection prevention and control is seen as an additional task
  - Not embedded in ‘the real task’ of patient care, seen by staff as a distraction or interruption. It slows down patient care.
  - Benefits not visible or immediate
  - Harms are distant and not associated with ‘individual’ ‘team’ or ‘system’ errors
- Staff develop work arounds or ‘shadow systems’ to achieve the ‘task’

Adapted from Alvarado C. Infection prevention and human factors and systems engineering – July 11 2012

Rationale for the use of clinical gloves

- Universal precautions (1987)
- Standard precautions (mid-1990s)
- Standard principles – epic Guidelines for the prevention of HCAI (2001; 2007 and 2014)
  - The evidence base is categorized as 4 (Expert opinion, Legislation)



Why does glove use matter?

- Compromises hand hygiene
  - HH audit data misleading as does not account for gloves use
  - Gloves used in place of hand gel
- Costs
  - £302,813 in 2013/14 in one 500 bed acute NHS Trust
- Environmental damage
  - disposed of as clinical waste when mostly not contaminated with BBF!

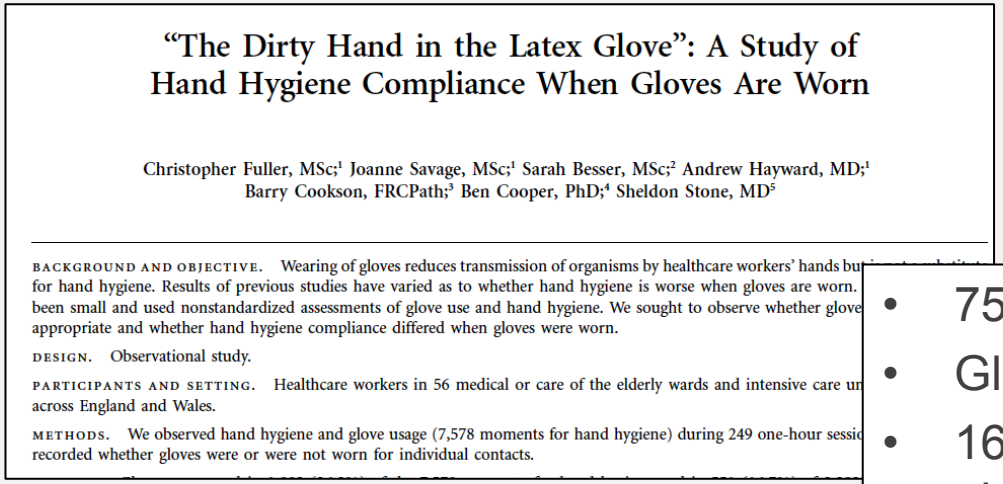
If gloves are worn…

Must be changed between patients

Must be changed between procedures

Decontaminate hands after removal

Gloves worn inappropriately and associated with less hand hygiene



"The Dirty Hand in the Latex Glove": A Study of Hand Hygiene Compliance When Gloves Are Worn

Christopher Fuller, MSc;[1] Joanne Savage, MSc;[1] Sarah Besser, MSc;[2] Andrew Hayward, MD;[1] Barry Cookson, FRCPath;[3] Ben Cooper, PhD;[4] Sheldon Stone, MD[5]

BACKGROUND AND OBJECTIVE. Wearing of gloves reduces transmission of organisms by healthcare workers' hands bu
for hand hygiene. Results of previous studies have varied as to whether hand hygiene is worse when gloves are worn.
been small and used nonstandardized assessments of glove use and hand hygiene. We sought to observe whether glove
appropriate and whether hand hygiene compliance differed when gloves were worn.

DESIGN. Observational study.

PARTICIPANTS AND SETTING. Healthcare workers in 56 medical or care of the elderly wards and intensive care un
across England and Wales.

METHODS. We observed hand hygiene and glove usage (7,578 moments for hand hygiene) during 249 one-hour sessio
recorded whether gloves were or were not worn for individual contacts.

- 7578 moments of HH
- Gloves worn for 26.7%
- 16.7% of moments when gloves were were low risk
- HH after glove use 40%; no glove use 50% ($p<0.01$)

Fuller et al 2011, ICHE

Gloves become contaminated with pathogens

Misuse of gloves: the foundation for poor compliance with hand hygiene and potential for microbial transmission?

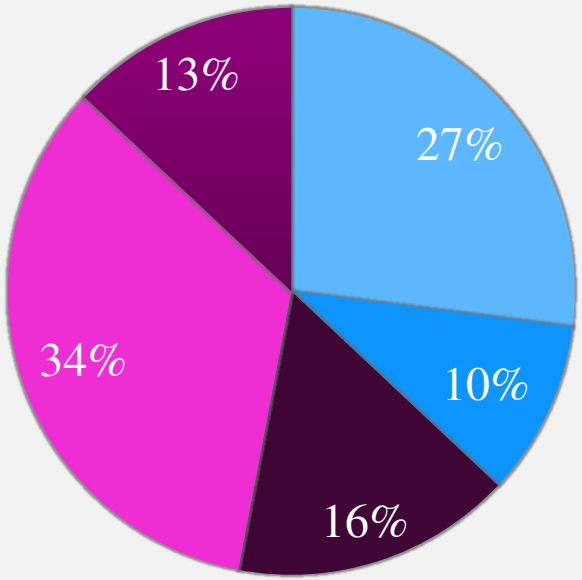
E. Girou[a,*], S.H.T. Chai[a], F. Oppein[a], P. Legrand[b], D. Ducellier[a], F. Cizeau[a], C. Brun-Buisson[a]

[a]*Infection Control Unit, Hôpital Henri Mondor, Assistance Publique–Hôpitaux de Paris, Créteil*
[b]*Microbiology Laboratory, Hôpital Henri Mondor, Assistance Publique–Hôpitaux de Paris, Crét*

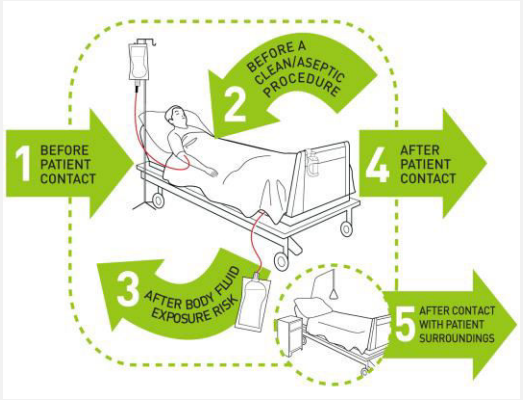
- Observed 120 HCW
- 64% gloves not changed, after contact
- 18.3% potential microbial transmission
- 22 gloves sampled: 100% grew bacteria, 86% grew pathogens; 59% same m'org as patient.

Girou et al 2004, JHI

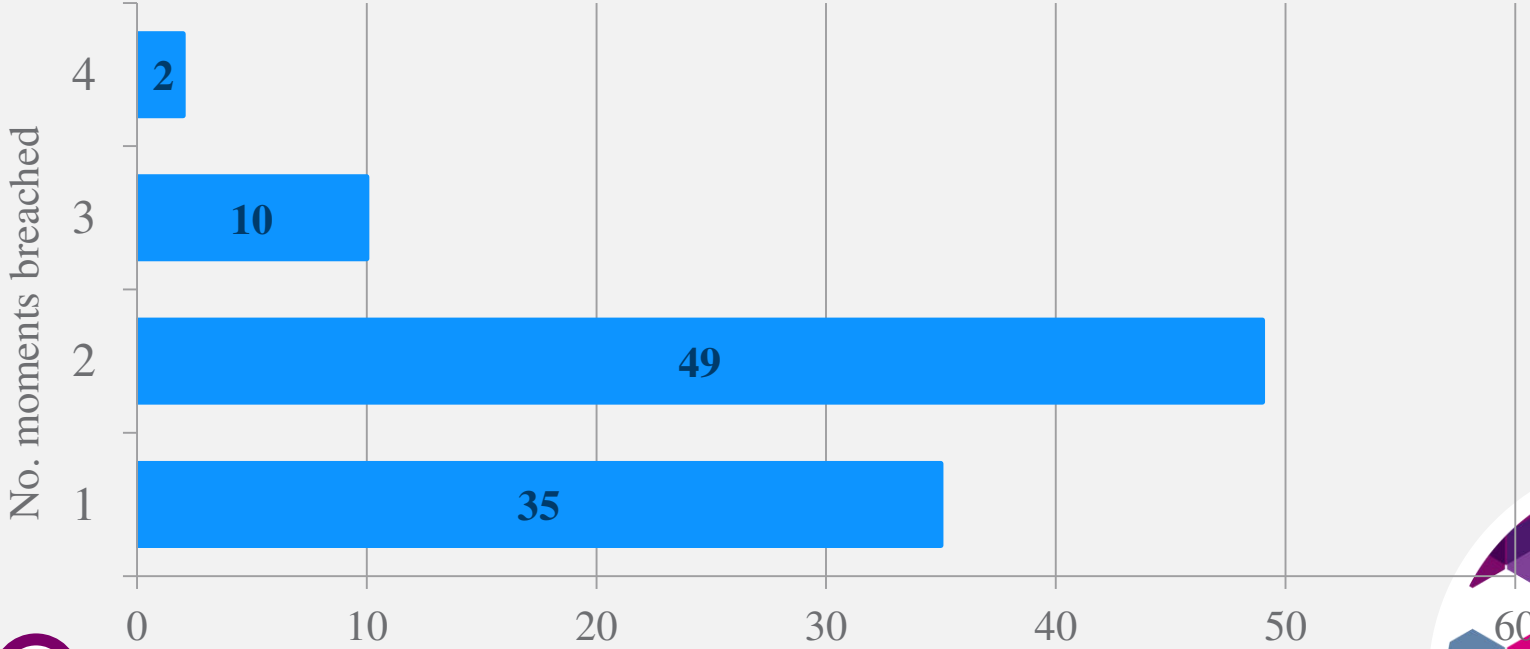
Moments of HH associated with cross-contamination



- Moment 1
- Moment 2
- Moment 3
- Moment 4
- Moment 5



‘Moments’ - breached



Episodes of glove use

IV drugs

- Prepare IV fluids in drug room
- Press button to open door
- Push door open
- Carry drug to bedside

Same gloves: more than one task

- NG feed flush
- Urine catheter
- ET suctioning

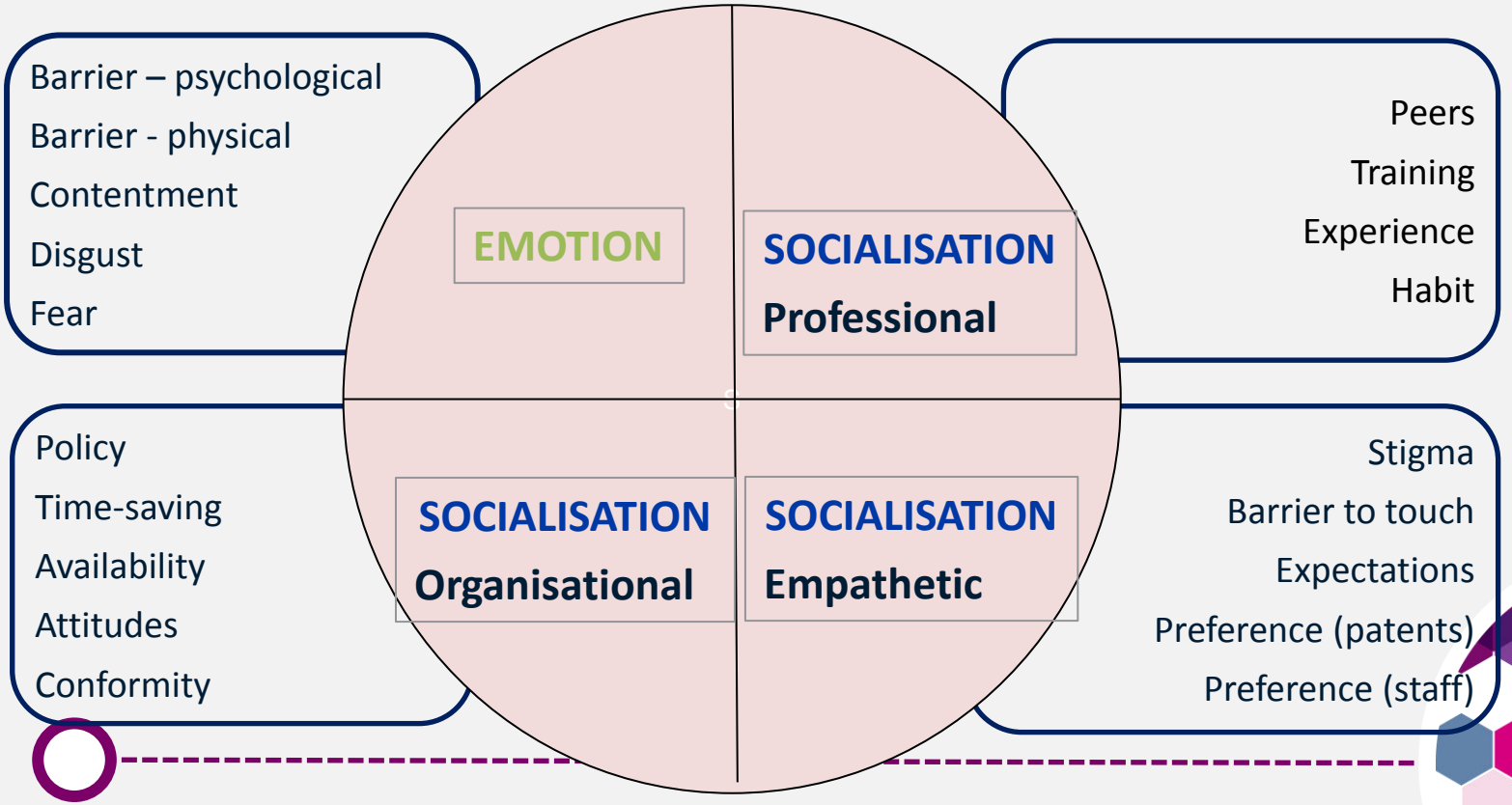
Central IV line flush and disconnection

1. Equipment trolley
2. Central line flush 
3. IV monitor
4. Central line 
5. IV infusion lines
6. Central line flush 
7. IV pump
8. IV lines discarded into waste bin
9. Bed controls
10. IV pump

Same gloves: more than one task

- Emptied catheter bag
- Gave patient mouth care
- Checked patients blood sugar

Main drivers of glove use – qualitative studies



What have we learnt?

- Multiple factors influence the decision to put on and take off gloves; evidence is not one of them!
- The emotional element of glove use behaviour might impact on the effectiveness of educational and other initiatives to improve appropriate glove use.
- Conflict between influencing factors may result in confusion among HCWs about what constitutes appropriate glove use.
- HCWs are influenced by their assumptions about patient expectations of glove use.

‘Matching Michigan’: a 2-year stepped interventional programme to minimise central venous catheter-blood stream infections in intensive care units in England

THE MATCHING MICHIGAN COLLABORATION & WRITING COMMITTEE

▸ Additional data are published online only. To view these files please visit the journal online (http://dx.doi.org/10.1136/bmjqs-2012-001325)

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ABSTRACT

Background: Bloodstream infections from central venous catheters (CVC-BSIs) increase morbidity and costs in intensive care units (ICUs). Substantial reductions in CVC-BSI rates have been reported using a combination of technical and non-technical interventions.

Methods: We conducted a 2-year, four-cluster, stepped non-randomised study of technical and non-technical (behavioural) interventions to prevent CVC-BSIs in adult and paediatric ICUs in England. Random-effects Poisson regression modelling was used to compare infection rates, A sample of ICUs participated in data verification.

Results: Of 223 ICUs in England, 215 (196 adult, 19 paediatric) submitted data on 2479 of 2787 possible months and 147 (66%) provided complete data. The exposure rate was 438 887 (404 252 adult and 34 635 paediatric) CVC-patient days. Over 20 months, 1092 CVC-BSIs were reported. Of these, 884 (81%) were ICU acquired, For adult ICUs, the mean CVC-BSI rate decreased over 20 months from 3.7 in the first cluster to 1.48 CVC-BSIs/1000 CVC-patient days (p<0.0001) for all clusters combined, and for paediatric ICUs from 5,65 to 2,89 (p=0,625), The trend for infection rate reduction did not accelerate following interventions training, CVC utilisation rates remained stable, Pre-ICU infections declined in parallel with ICU-acquired infections. Criterion-referenced case note review showed high agreement between adjudicators (κ 0,706) but wide variation in blood culture sampling rates and CVC utilisation, Generic infection control practices varied widely.

Conclusions: The marked reduction in CVC-BSI rates in English ICUs found in this study is likely part of a wider secular trend for a system-wide improvement in healthcare-associated infections. Opportunities exist for greater harmonisation of infection control practices. Future studies should investigate causal mechanisms and contextual factors influencing the impact of interventions directed at improving patient care.

INTRODUCTION

Blood stream infections (BSIs) from central venous catheters (CVCs) increase morbidity and are estimated to increase mortality risk by 25% and costs of care in the USA by US$16 550 on average per patient[1 2] (box 1). A substantial body of evidence suggests that rates of CVC-BSIs are modifiable.[3–13] The Michigan-Keystone project[13] in 103 intensive care units (ICUs) in the USA reported a major reduction in CVC-BSIs from 7.7 to 1.4 CVC-BSIs per 1000 CVC-patient days using a complex intervention targeting specific technical practices (box 2), combined with support for cultural, behavioural and systemic change.[14] A 3-year follow-up study reported sustained improvement[15] and accelerated the trend for a reduction in case mix-adjusted mortality rates.[16]

The NHS Next Stage Review in 2008[17] announced that the National Patient Safety Agency (NPSA) would run a ‘national patient safety initiative to tackle central line catheter-related blood stream infections, drawing lessons from a remarkably successful Michigan initiative’. This 2-year programme, known as *Matching Michigan*, ran in England from April 2009 to the end of March 2011. It aimed to minimise CVC-BSI rates in adult and paediatric ICUs in England to at least the mean level (1.4 per 1000 CVC-patient days) seen in the Michigan-Keystone project. It involved three components: technical interventions, which sought to ensure consistent use of evidence-based measures for reducing risks of CVC-BSIs; non-technical interventions, which sought to intervene in culture and systems; and establishment of a standardised national reporting system for CVC-BSIs. All participating sites were

Dixon-Woods *et al. Implementation Science* 2013, **8**:70
http://www.implementationscience.com/content/8/1/70

IMPLEMENTATION SCIENCE

RESEARCH Open Access

Explaining *Matching Michigan*: an ethnographic study of a patient safety program

Mary Dixon-Woods[1*], Myles Leslie[2], Carolyn Tarrant[1] and Julian Bion[3]

Abstract

Background: Quality and safety improvement initiatives in healthcare often display two disconcerting effects. The first is a failure to outperform the secular trend. The second is the decline effect, where an initially promising intervention appears not to deliver equally successful results when attempts are made to replicate it in new settings. *Matching Michigan*, a patient safety program aimed at decreasing central line infections in over 200 intensive care units (ICUs) in England, may be an example of both. We aimed to explain why these apparent effects may have occurred.

Methods: We conducted interviews with 98 staff and non-participant observation on 19 ICUs; 17 of these units were participating in *Matching Michigan*. We undertook further telephone interviews with 29 staff who attended program training events and we analyzed relevant documents.

Results: One *Matching Michigan* unit transformed its practices and culture in response to the program; five boosted existing efforts, and 11 made little change. *Matching Michigan*’s impact may have been limited by features of program design and execution; it was not an exact replica of the original project. Outer and inner contexts strongly modified the program’s effects. The outer context included previous efforts to tackle central line infections superimposed on national infection control policies that were perceived by some as top-down and punitive. This undermined engagement in the program and made it difficult to persuade participants that the program was necessary. Individual ICUs’ histories and local context were also highly consequential: their past experience of quality improvement, the extent to which they were able to develop high quality data collection and feedback systems, and the success of local leaders in developing consensus and coalition all influenced the program’s impact on local practices.

Conclusions: Improved implementation of procedural good practice may occur through many different routes, of which program participation is only one. The ‘phenotype’ of compliance may therefore arise through different ‘genotypes.’ When designing and delivering interventions to improve quality and safety, risks of decline effects and difficulties in demonstrating added value over the secular trend might be averted by improved understanding of program mechanisms and contexts of implementation.

Keywords: Patient safety, Improvement programs, Context, Ethnography, Healthcare-acquired infections

Background

Health systems worldwide face the frustration of a mass of evidence repeatedly showing problems in the quality and safety of patient care, but much less compelling evidence on how such problems can be tackled effectively [1-3]. The Michigan Keystone project [4] is one important exception. It was widely welcomed as a demonstration that improvement in patient safety could be secured through a large-scale interventional program, following its report of a dramatic reduction in rates of central venous catheter (central line) bloodstream infections (CVC-BSIs) in over 100 Michigan intensive care units (ICUs) [4]. The cohort study design used in evaluating the Keystone project could not establish a causal relationship between the program and the outcomes, but later research using controlled designs suggested that the effects were probably real. One retrospective analysis reported decreased in-hospital mortality in 95 of the Keystone hospitals compared with 364 control hospitals in the surrounding region [5],

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ORIGINAL ARTICLE

A Multicenter Qualitative Study on Preventing Hospital-Acquired Urinary Tract Infection in US Hospitals

Sanjay Saint, MD, MPH; Christine P. Kowalski, MPH; Jane Forman, ScD, MHS; Laura Damschroder, MS, MPH; Timothy P. Hofer, MD, MSc; Samuel R. Kaufman, MA; John W. Creswell, PhD; Sarah L. Krein, PhD, RN

OBJECTIVE. Although urinary tract infection (UTI) is the most common hospital-acquired infection, there is little information about why hospitals use or do not use a range of available preventive practices. We thus conducted a multicenter study to understand better how US hospitals approach the prevention of hospital-acquired UTI.

METHODS. This research is part of a larger study employing both quantitative and qualitative methods. The qualitative phase consisted of 38 semistructured phone interviews with key personnel at 14 purposefully sampled US hospitals and 39 in-person interviews at 5 of those 14 hospitals, to identify recurrent and unifying themes that characterize how hospitals have addressed hospital-acquired UTI.

RESULTS. Four recurrent themes emerged from our study data. First, although preventing hospital-acquired UTI was a low priority for most hospitals, there was substantial recognition of the value of early removal of a urinary catheter for patients. Second, those hospitals that made UTI prevention a high priority also focused on noninfectious complications and had committed advocates, or "champions," who facilitated prevention activities. Third, hospital-specific pilot studies were important in deciding whether or not to use devices such as antimicrobial-impregnated catheters. Finally, external forces, such as public reporting, influenced UTI surveillance and infection prevention activities.

CONCLUSIONS. Clinicians and policy makers can use our findings to develop initiatives that, for example, use a champion to promote the removal of unnecessary urinary catheters or exploit external forces, such public reporting, to enhance patient safety.

Infect Control Hosp Epidemiol 2008; 29:333-341

Infections acquired during hospitalization are common, costly, and associated with significant morbidity.[1,2] Urinary tract infection (UTI) is the most common hospital-acquired infection, accounting for about 40% of all nosocomial infections.[3,4] Many hospital-acquired UTIs are caused by the use of a urinary catheter, a commonly used device among hospitalized patients.[4,5] Hospital-acquired UTIs can be prevented by using indwelling catheters only when necessary, implementing reminder systems to get catheters removed as soon as possible, using antimicrobial-impregnated catheters in high-risk patients, and considering alternatives to Foley catheterization (such as condom catheters for men).[6-12]

While numerous reviews have been published evaluating UTI preventive practices and recommending which methods to use,[13-18] the use of these practices varies considerably across the United States.[19] What accounts for this variation? We conducted a multicenter study that employed both quantitative and qualitative methods to answer this question. In the qualitative phase of the study, we identified recurrent and unifying themes that characterize how US hospitals have addressed hospital-acquired UTI. We used qualitative methods because they are oriented toward understanding, rather than measuring, phenomena. Because data collection is open-ended—research participants are free to express themselves in their own words—qualitative studies involve a process of discovery. Through detailed, in-depth analysis of the resulting data, we can find out what takes place in complex healthcare environments. Therefore, qualitative studies are appropriate for describing how hospitals have addressed hospital-acquired UTI.

METHODS

Study Design and Sample

As part of a larger 3-phase sequential study employing both quantitative and qualitative methods,[20,21] we first collected and analyzed quantitative data on a national sample of hospitals to report what hospitals are doing to prevent hospital-acquired infections, including UTI. Details of this study are explained elsewhere.[18,21] Briefly, the quantitative phase of the

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A Program to Prevent Catheter-Associated Urinary Tract Infection in Acute Care

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ABSTRACT

BACKGROUND

Catheter-associated urinary tract infection (UTI) is a common device-associated infection in hospitals. Both technical factors — appropriate catheter use, aseptic insertion, and proper maintenance — and socioadaptive factors, such as cultural and behavioral changes in hospital units, are important in preventing catheter-associated UTI.

METHODS

The national Comprehensive Unit-based Safety Program, funded by the Agency for Healthcare Research and Quality, aimed to reduce catheter-associated UTI in intensive care units (ICUs) and non-ICUs. The main program features were dissemination of information to sponsor organizations and hospitals, data collection, and guidance on key technical and socioadaptive factors in the prevention of catheter-associated UTI. Data on catheter use and catheter-associated UTI rates were collected during three phases: baseline (3 months), implementation (2 months), and sustainability (12 months). Multilevel negative binomial models were used to assess changes in catheter use and catheter-associated UTI rates.

RESULTS

Data were obtained from 926 units (59.7% were non-ICUs, and 40.3% were ICUs) in 603 hospitals in 32 states, the District of Columbia, and Puerto Rico. The unadjusted catheter-associated UTI rate decreased overall from 2.82 to 2.19 infections per 1000 catheter-days. In an adjusted analysis, catheter-associated UTI rates decreased from 2.40 to 2.05 infections per 1000 catheter-days (incidence rate ratio, 0.86; 95% confidence interval [CI], 0.76 to 0.96; P=0.009). Among non-ICUs, catheter use decreased from 20.1% to 18.8% (incidence rate ratio, 0.93; 95% CI, 0.90 to 0.96; P<0.001) and catheter-associated UTI rates decreased from 2.28 to 1.54 infections per 1000 catheter-days (incidence rate ratio, 0.68; 95% CI, 0.56 to 0.82; P<0.001). Catheter use and catheter-associated UTI rates were largely unchanged in ICUs. Tests for heterogeneity (ICU vs. non-ICU) were significant for catheter use (P=0.004) and catheter-associated UTI rates (P=0.001).

CONCLUSIONS

A national prevention program appears to reduce catheter use and catheter-associated UTI rates in non-ICUs. (Funded by the Agency for Healthcare Research and Quality.)

From the Hospital Outcomes Program of Excellence, Veterans Affairs (VA) Ann Arbor Healthcare System (S.S., M.T.G., S.L.K., D.R., K.E.F.), the Department of Internal Medicine, University of Michigan (UM) Medical School (S.S., M.T.G., S.L.K., M.A.M.R.), and the VA/UM Patient Safety Enhancement Program (S.S., M.T.G., S.L.K., M.A.M.R., D.R., K.E.F.), Ann Arbor, the Michigan Health and Hospital Association, Okemos (S.R.W., B.M.-L., M.M.), and St. John Hospital and Medical Center, Detroit (M.G.F.) — all in Michigan; the Health Research and Educational Trust, Chicago (B.S.E., K.F.); the Centers for Disease Control and Prevention, Atlanta (C.V.G.); and the Agency for Healthcare Research and Quality, Rockville, MD (J.B.). Address reprint requests to Dr. Saint at the University of Michigan Department of Internal Medicine, 2800 Plymouth Rd., Bldg. 16, Rm. 430W, Ann Arbor, MI 48109-2800, or at saint@med.umich.edu.

N Engl J Med 2016;374:2111-9.
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The trouble with CHECKLISTS

An easy method that promised to save lives in hospitals worldwide may not be so simple after all.

BY EMILY ANTHES

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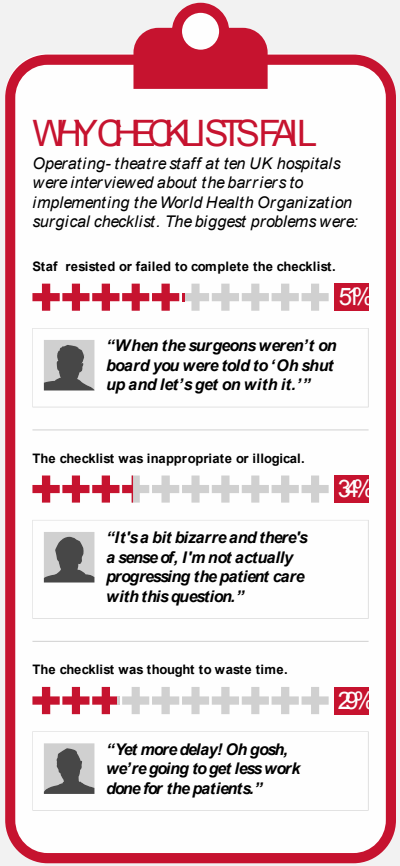
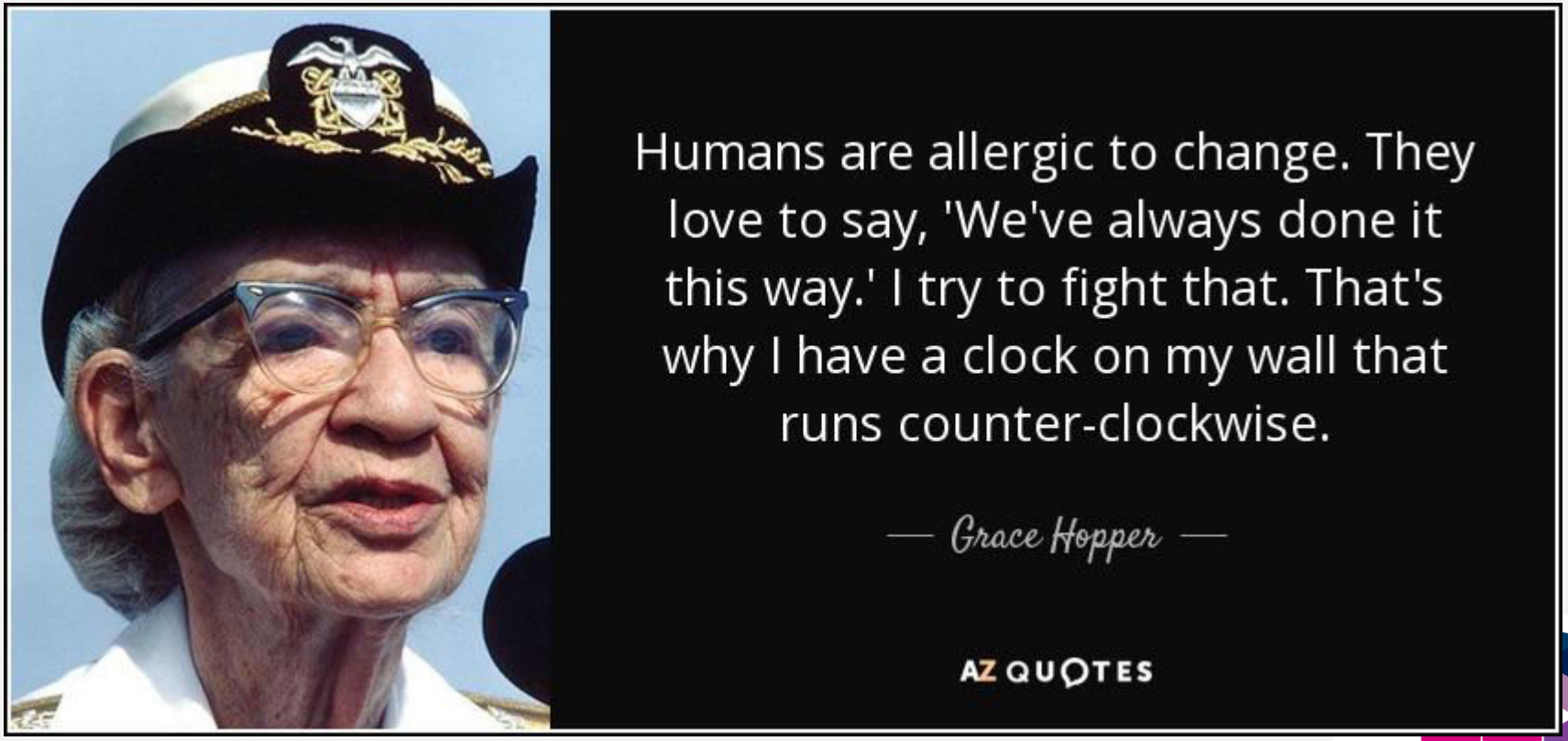


Original work: Russ, S. J. *et al. Ann. Surg.* **261,** 81–91 (2015).



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Rickard et al. BMC Medicine 2010, 8:53
http://www.biomedcentral.com/1741-7015/8/53

BMC Medicine

RESEARCH ARTICLE Open Access

Routine resite of peripheral intravenous devices every 3 days did not reduce complications compared with clinically indicated resite: a randomised controlled trial

Claire M Rickard[1*], Damhnat McCann[2], Jane Munnings[3], Matthew R McGrail[4]

Abstract

Background: Peripheral intravenous device (IVD) complications were traditionally thought to be reduced by limiting dwell time. Current recommendations are to resite IVDs by 96 hours with the exception of children and patients with poor veins. Recent evidence suggests routine resite is unnecessary, at least if devices are inserted by a specialised IV team. The aim of this study was to compare the impact of peripheral IVD 'routine resite' with 'removal on clinical indication' on IVD complications in a general hospital without an IV team.

Methods: A randomised, controlled trial was conducted in a regional teaching hospital. After ethics approval, 362 patients (603 IVDs) were randomised to have IVDs replaced on clinical indication (185 patients) or routine change every 3 days (177 patients). IVDs were inserted and managed by the general hospital medical and nursing staff; there was no IV team. The primary endpoint was a composite of IVD complications: phlebitis, infiltration, occlusion, accidental removal, local infection, and device-related bloodstream infection.

Results: IVD complication rates were 68 per 1,000 IVD days (clinically indicated) and 66 per 1,000 IVD days (routine replacement) ($P = 0.86$; HR 1.03; 95% CI, 0.74-1.43). Time to first complication per patient did not differ between groups (KM with log rank, $P = 0.53$). There were no local infections or IVD-related bloodstream infections in either group. IV therapy duration did not differ between groups ($P = 0.22$), but more ($P = 0.004$) IVDs were placed per patient in the routine replacement (mean, 1.8) than the clinical indication group (mean, 1.5), with significantly higher hospital costs per patient ($P < 0.001$).

Conclusions: Resite on clinical indication would allow one in two patients to have a single cannula per course of IV treatment, as opposed to one in five patients managed with routine resite; overall complication rates appear similar. Clinically indicated resite would achieve savings in equipment, staff time and patient discomfort. There is growing evidence to support the extended use of peripheral IVDs with removal only on clinical indication.

Registration number: Australian New Zealand Clinical Trials Registry (ANZCTR) Number ACTRN12608000421336.

Background

Peripheral intravenous device (IVD) insertion is the most commonly performed invasive procedure in hospitalised patients, with an estimated 150 million peripheral intravenous devices placed each year in North America alone [1]. IVDs are vital for delivery of hydration, medicines and nutrition but are not without complications. Serious adverse outcomes are fortunately rare, with IVD-related bloodstream infection reported in a recent meta-analysis of 110 studies to occur in 0.1% of devices and 0.5 per 1,000 device days [2]. IVD treatment is more frequently interrupted by phlebitis, an irritation of the vein characterised by pain, tenderness on palpation, erythema, warmth, swelling, induration or palpable cord (thrombosis) of the cannulated vein; diagnostic algorithms usually require two or more of these conditions [3-5]. Phlebitis is

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[Intervention Review]

Clinically-indicated replacement versus routine replacement of peripheral venous catheters

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ABSTRACT

Background

US Centers for Disease Control guidelines recommend replacement of peripheral intravenous (IV) catheters no more frequently than every 72 to 96 hours. Routine replacement is thought to reduce the risk of phlebitis and bloodstream infection. Catheter insertion is an unpleasant experience for patients and replacement may be unnecessary if the catheter remains functional and there are no signs of inflammation. Costs associated with routine replacement may be considerable. This is an update of a review first published in 2010.

Objectives

To assess the effects of removing peripheral IV catheters when clinically indicated compared with removing and re-siting the catheter routinely.

Search methods

For this update the Cochrane Vascular Trials Search Co-ordinator searched the Cochrane Vascular Specialised Register (March 2015) and CENTRAL (2015, Issue 3). We also searched clinical trials registries (April 2015).

Selection criteria

Randomised controlled trials that compared routine removal of peripheral IV catheters with removal only when clinically indicated in hospitalised or community dwelling patients receiving continuous or intermittent infusions.

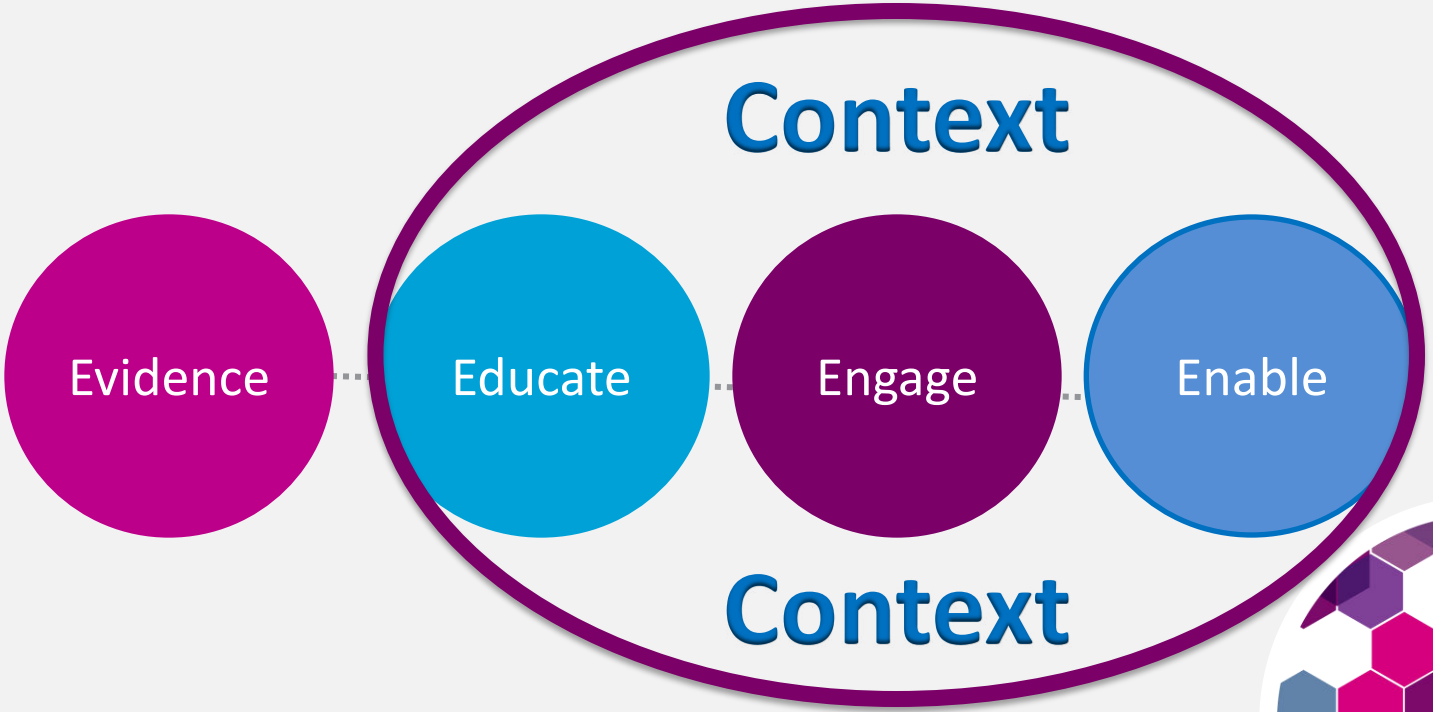
Data collection and analysis

Two review authors independently assessed trial quality and extracted data.

Main results

Seven trials with a total of 4895 patients were included in the review. The quality of the evidence was high for most outcomes but was downgraded to moderate for the outcome catheter-related bloodstream infection (CRBSI). The downgrade was due to wide confidence intervals, which created a high level of uncertainty around the effect estimate. CRBSI was assessed in five trials (4806 patients). There

Evidence translated?



Thank you for listening

The Epic3 Team