

AN EVIDENCE-BASED APPROACH TO PREVENTING HEALTHCARE-ASSOCIATED INFECTIONS IN THE ELDERLY – THE *EPIC* INITIATIVE IN ENGLAND

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SUMMARY

The prevalence of healthcare-associated infections (HAIs) in the NHS hospitals, community and primary care services continues unabated, increasing costs, morbidity and causing profound patient dissatisfaction. Following the introduction of healthcare governance in the NHS, the need to develop more clinically effective approaches to preventing infections has become urgent. National evidence-based guidelines are now being developed and implemented in NHS Trusts in England. The experience of developing and implementing these guidelines is described, along with other initiatives designed to enhance the evidence base for infection prevention and control.

INTRODUCTION

The *epic* (evidence-based practice in infection control) project is a long-term multi-faceted initiative designed to help clarify and establish the evidence-base for general infection prevention and control practice in acute, primary and community healthcare services in England. It was commissioned by the Department of Health (DoH) and the National Institute for Clinical Excellence (NICE) in response to the threat to health from the continuing high prevalence of HAIs and the concerns over the increasing danger from antimicrobial resistant microorganisms. Although the original aim of the *epic* initiative was to develop a series of national evidence-based guidelines for preventing HAI, over the last five years this project has broadened, and now incorporates a range of supporting research activities designed to produce further good-quality evidence in this arena.

WHY DO WE NEED NATIONAL EVIDENCE-BASED GUIDELINES?

We also believe that clinical practice guidelines are an essential component of an overall strategy designed to maintain a safe environment for care and recovery. However, we have all been using guidelines for many years to minimise the risk for infection but the prevalence of HAI and associated ill-effects has hardly declined in NHS hospitals in England over the last decade:

- affecting approximately 9% of all hospital in-patients annually;^{1,2}
- totalling an estimated 321,000 hospital infections each year;³

- costing the NHS an estimated one billion pounds every year;³
- adding an extra 11 days of hospitalisation to those infected;³ and
- causing further delays to those waiting for admission.

In addition, these infections directly cause the deaths of 5,000 patients and contribute to the deaths of a further 15,000 patients each year.^{4,5}

Although not all of these infections are avoidable, many are and it has been estimated (perhaps somewhat conservatively) that up to one-third could be prevented.⁶

Figures are not available to indicate how many of these infections have occurred in elderly patients, but anecdotally we feel that they are particularly vulnerable to infection during care.

There are, of course, many reasons for this poor state of affairs that concern us all. However, from a guideline and clinical effectiveness point of view, there are fairly obvious factors that help perpetuate this situation. There is a wide variation in the quality of both infection prevention practices and surveillance systems in different NHS Trusts throughout the country. This variation in quality is commonly reflected in local practice guidelines, many clearly out-of-date and developed without reference to best evidence for efficacy. This lack of evidence in guidelines may result in clinical practice based only on experience, ritual and inconsistency.

When patients are harmed as a result of our interventions or lack of effective preventative measures, they lose confidence in the ability of their health service to safely care for them. As society becomes more litigious, this loss of faith and sense of injury may drive them to seek redress in the courts.

A CASE

A case is currently in preparation in England where the family of an elderly patient who had a femoro-popliteal bypass graft to treat claudication of the right leg developed a Gram-negative bloodstream infection from his infected central venous catheter. His son and

The Marjorie Robertson Lecture was given at the Geriatric Medicine Symposium on Wednesday 28 May 2003 at the Royal College of Physicians of Edinburgh.

daughter were in constant attendance and became increasingly alarmed when observing several incidents where junior medical staff accessed his central venous catheter without first cleaning their hands, using gloves or disinfecting the catheter port. They also witnessed staff touching eye glasses, hair and, on one occasion, their nose before they manipulated the catheter hub. On the day after the catheter had been inserted, the gauze and tape dressing was partially removed to allow the doctor to inspect the CVC insertion site and then re-taped back in place. The patient and his relatives were concerned and anxious over the lack of what they felt to be common-sense hygiene measures to prevent any infection but they lacked the confidence to complain. This patient was fortunate to survive the multi-organ dysfunction syndrome that followed. He is now seeking an explanation, an apology and damages.

Like many adverse events, several things went wrong here and most of us probably feel this incident could have been avoided if staff had adhered to good standards of practice. The problem was that they clearly were unaware of those standards, while the local guidelines that were in place in that Trust, when examined, were outdated, inadequate and not referenced to evidence. Perhaps if the national evidence-based guidelines had been incorporated into local protocols and routine clinical practice, and this was backed up by a comprehensive education and audit strategy, the patient would have been spared this serious complication.

Visitors of patients in care of the elderly units have repeatedly complained of poor infection-prevention practice associated with caring for patients with urinary catheters, drainage bags being left on the floor, pointless routine bladder irrigations and washouts, inappropriate meatal cleansing and the bizarre practice of adding various antiseptic solutions to urinary drainage bags. Compounding all of this is the dissatisfaction patients and their relatives experience due to the poor state of hygiene in many of the wards where elderly patients are frequently cared for, and the obvious lack of good hand hygiene practised by all grades of healthcare personnel.

Our national guidelines, easily available to healthcare staff and patients, are posted on the DoH and NICE websites, and patient-friendly versions are now being made available to patients and their families. National Health Service Trusts need to ensure that national guidance issued by NICE is incorporated into their local protocols, that staff are trained to implement guidance and that this implementation is audited. If national guidance is not being followed, practitioners and their employers must justify this to their patients, their peers and external auditors, and, if harm is alleged over this failure, they are ultimately accountable in a court of law.

SPECIAL VULNERABILITY OF ELDERLY PATIENTS TO HAI

Many elderly patients are relatively immunocompromised in comparison with younger adults, and are therefore particularly vulnerable to HAI. They are frequently more prone to infection on exposure and more likely to experience adverse clinical outcomes as a result of acquiring an infection. Several factors increase their vulnerability to infection. Many are malnourished as a result of poverty, poor dentition, anorexia, memory deficits, confusion and an inability to prepare food for meals. Other common co-morbidities experienced by elderly people, such as diabetes mellitus, and cardiovascular and peripheral vascular disease, may also increase vulnerability to infection. Decreasing mobility increases the risk of pressure ulcers and urinary stasis which increase the risk of infection. The use of some medical devices, especially long-term urinary catheters, commonly used in the care of elderly men with prostate disease and in both elderly men and women who are incontinent, significantly increases their risk of infection.

In addition to all of the above factors, the need for an evidence-based approach to preventing HAIs is being driven by the continuing evolution of clinical governance within the NHS.

CLINICAL GOVERNANCE AND THE NEED FOR NATIONAL EVIDENCE-BASED GUIDELINES

With the advent of healthcare governance and the demands for clinical effectiveness, the NHS is undergoing radical change. Increasingly, healthcare interventions are required to be based on the best available research evidence. But ensuring that the right evidence is available at the right time in the right place is challenging. However, we believe that rigorously developed national evidence-based guidelines can help ensure that practitioners have the best current evidence available on which to make infection-prevention decisions.

What are national evidence-based guidelines?

National evidence-based guidelines are systematically developed broad statements (principles) of good practice that assist in decision-making.⁷ They are derived from practice, based on evidence and subject to multi-professional debate and timely and frequent review and modification. National guidelines are intended to inform the development of detailed operational protocols at local level and they can be used to ensure that these incorporate the most important principles for preventing HAI.

Because this evidence has been systematically retrieved and critically appraised, local guideline developers are saved the expense and time of conducting exhaustive systematic reviews, and can concentrate on adapting national guidelines to their own individual circumstances

and environment.

Who developed these guidelines?

These guidelines were developed by a nurse-led multiprofessional team of infection-prevention and control and infectious disease specialists, microbiologists and experts in systematic evidence retrieval and critical appraisal. Additionally, the guideline development team (and its Advisory Group) included representatives from patient organisations, the Infection Control Nurses Association (ICNA), Hospital Infection Society, Association of Medical Microbiologists, Public Health Laboratory Service, the British Society for Antimicrobial Chemotherapy and representatives of key Royal Colleges and professional organisations.

THE GUIDELINES

Two sets of guidelines have now been produced. The first were focused on developing the standard principles for preventing infections in hospitals, and preventing infections associated with the use of short-term indwelling urethral catheters and central venous catheters. Standard principles were developed as the foundation for all infection prevention measures and incorporated guidance in relation to hospital environmental hygiene, hand hygiene, the use of personal protective equipment and the safe use and disposal of sharps.

The second set of guidelines were developed under the auspices of NICE and focused on preventing infections in primary and community care settings. These guidelines also included a set of standard principles, along with recommendations for preventing infections associated with the use of long-term urinary catheters, long-term central venous catheters and enteral feeding devices.

The guideline development process

The guideline development process was both unique and rigorous. An analysis of data derived from a formal review of current guidelines, surveys, focus groups and expert opinion determined core themes and allowed us to develop search areas.⁸ These informed multiple systematic reviews that generated a wide variety of evidence, which was then appraised, for both its quality and relevance to current infection-prevention practice. Detailed reports of the appraised evidence were tabulated into evidence tables and uniquely, selected evidence-linked guidelines from other agencies were also subjected to an 'expert review' using a validated guideline-appraisal instrument (available online at: <http://www.agreecollaboration.org/>).⁹

The evidence tables and the reports from expert reviews were used by the guideline development team to draft the national guidelines. These were then subject to widespread consultation, which resulted in amendment and the production of the final guidelines

which were approved by the DoH or NICE and subsequently published and disseminated.

Consultation on guidelines in development

Consultation took place throughout every aspect of the development of these guidelines following the NICE format for ensuring adequate consultation with registered stakeholders and patient organisations. This included panels of specialist practitioners who advised on draft guidelines, as did focus groups held in different regions in England and composed of a wide variety of clinicians. The internet proved a valuable source of advice and as draft guidelines were posted on the web, we received comments from colleagues around the world.

Publication and dissemination

The publication and dissemination of the guidelines was quite straightforward. The guidelines for prevention of HAI in acute care settings were approved in the autumn of 2000 and published in a special supplement of the *Journal of Hospital Infection* in January 2001.¹⁰ At the same time, the Minister for Health (England) and the Chief Medical and Nursing Officers (DoH England) commended the guidelines to the Service and the DoH sent copies to all NHS acute care Trusts and other relevant organisations. Shortly thereafter, the guidelines were serialised in the mass-circulation *Nursing Times* and described in a variety of medical and nursing journals, and the associated technical reports were posted on the *epic* website and the guidelines themselves were made available for downloading from the DoH website (www.doh.gov.uk/HAI).

The guidelines for preventing HAI in community and primary care were approved in March 2003 and will be published by NICE and available on their website (<http://www.nice.org.uk>), with the full version available on the Thames Valley University website (<http://www.richarddwellsresearch.com>). They will be also be published in peer-reviewed journals in the autumn of 2003.

Since their publication, these guidelines have featured in many national and international conferences and have been extensively cited in other works. Comments and reviews have been very favourable and encouraging and the *epic* initiative has built solid partnerships with the key organisations in this field.

Value-added features

Developing these guidelines has been a challenge; they were very labour-intensive and extremely expensive – another reason why we commend national guidelines for incorporation into local protocols as it saves NHS Trusts an enormous amount of time and money. There were also several other value-added features associated with this initiative. We developed a useful and valid

method for the future development of evidence-based guidelines and extensive databases of evidence in this field, which are available to everyone online. We were, of course, well aware that we were often dealing with evidence of variable quality. This meant that we were ideally placed to influence the research agenda in the DoH in alerting them to areas where better-quality evidence was needed. We published our suggested research programme with each set of guidelines and I'm pleased to say that this featured prominently in the call for research in this area issued by the DoH last year.

SUPPORTING IMPLEMENTATION

Will these guidelines make any difference or will we, ten years from now, still be discussing the need to reduce the incidence of preventable HAIs? Guidelines alone, no matter how good they are will not solve this problem. We were well aware of the importance of offering support to NHS Trusts to implement national guidelines. There is good evidence to show that national guidelines can change clinical practice and may lead to improvements in patient outcomes.¹¹ However, there is little evidence to show that the passive dissemination of clinical guidelines alone results in practitioners changing their practice. It must be more than this. We also knew that there is good evidence to suggest that guidelines disseminated by active, multifaceted educational interventions are more likely to be effective. This is hardly surprising and is consistent with our experience of initiating and managing organisational change. Additionally, findings from other projects suggest that individualised implementation strategies need to be designed within the context of the local practice environment.

We are now leading various action-research-based national guideline implementation initiatives. Some are sponsored by commercial and professional organisations and are part of collaboration between the Infection Control Nurses Association and Thames, sponsored by an educational grant from BARD UK Ltd. We have also commenced a major DoH-funded implementation initiative in collaboration with the Clinical Governance Support Team, part of the NHS Modernisation Agency. Further details on this opportunity for NHS staff can be found online (<http://www.cgsupport.org/>). More than 1,000 NHS staff have been able to access this support during the last 12 months.

We are committed to these action-research-based models because we have used them extensively in the past in the UK and in other countries to successfully support changes in clinical practice.¹² We know from this experience that there are several valued-added features associated with this approach. First, staff become more used to using and adapting national guidelines in their own clinical practice. This in turn will increase the clinical effectiveness of that practice and

ensure that it is based on reliable evidence. All of this should help to meet control assurance targets and help them create a safer care environment.

ADDITIONAL PHASES OF THE EPIC INITIATIVE

Continuing phases of the *epic* initiative include updating the evidence base for all national guidelines. NICE requires that evidence be updated every two years and guidelines redeveloped, if necessary, every four years. Our update of the evidence for the guidelines focused on acute care already indicates major shifts in the evidence, which may drive changes in the original guideline recommendations. Examples include: new evidence associated with the use of alcohol gels and lotions for hand decontamination; the introduction of antimicrobial impregnated urinary catheters; evidence suggesting a lack of efficacy for the use of systemic anticoagulants and heparin flushes for preventing catheter-related bloodstream infections; and a lack of evidence demonstrating chemical incompatibility between central venous catheter materials and alcohol-based antiseptics.

DEVELOPING THE COMMUNITY AND PRIMARY CARE INFECTION PREVENTION SPECIALISTS

As part of the *epic* initiative, we were commissioned by the DoH to formally review the preparation, role and responsibilities of community-infection-control nurses and communicable-disease-control nurses. Our recently published report^{13, 14} makes recommendations to government for the future development and function of these critical specialists.

CONTINUING TO DEVELOP THE EVIDENCE BASE FOR INFECTION PREVENTION AND CONTROL

As part of the DoH (England) Programme of Research on Resistance to Antibiotics and other Antimicrobial Agents, we have been commissioned to conduct a three year multi-centre multi-method investigation into the use of process-variation feedback and structured diagnostic methods to reduce the incidence of hospital ward-acquired methicillin-resistant *Staphylococcus aureus* (MRSA) colonisation/infection. This is a research collaboration between Thames Valley University and the ICNA, and these trials will take place in 41 study centres throughout ICNA regions and, we hope, will define the efficacy of these methods to reduce the prevalence of MRSA colonisation/infection in particular, but more importantly, other HAI in general.

REVIEW OF INTERNATIONAL INFECTION PREVENTION AND CONTROL POLICY AND PRACTICE

The latest stage of the *epic* project is a comparative review of the prevalence and cost of HAI and infection-prevention and control policies and practices in countries in the EU, Australasia and North America. The focus of this review is to see if there are lessons we can learn from other the experiences and models of best

practice in other countries. The results of this review will form part of the second report on HAI to Parliament by the National Audit Office later this summer.

CONCLUSION

Rigorously developed evidence-based guidelines can be a critical resource to ensure that infection-prevention and control decisions are clinically effective. However, the provision of these guidelines alone will not fully achieve this aim. Following development, they must be creatively disseminated and imaginatively implemented. Staff need to be trained to incorporate these guidelines into routine clinical practice and their use needs to be audited.

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