

# Update 5

National Council for the Professional Development of Nursing and Midwifery

JANUARY 2011

## Introduction

In 2007, the Health Service Executive (HSE) launched its strategy *Say No to Infection* for prevention and control of healthcare-associated infections (HCAIs) (HSE 2007). This strategy set out a number of targets for the prevention and control of HCAIs, together with the actions the HSE would need to take to meet them. The targets were to reduce all HCAIs by 20%, MRSA infections by 30% and antibiotic consumption by 20%, all within five years. Two years later the Health Information and Quality Authority (HIQA) published *National Standards for the Prevention and Control of Healthcare-Associated Infections* (HIQA 2009), which highlight the importance of surveillance and monitoring of HCAIs in the prevention and control of these infections. In this update on the nursing and midwifery interventions project commenced by the National Council in 2005 (National Council 2006), clinical nurse specialists (CNSs) in infection control at Kerry General Hospital (KGH) describe how their interventions as nurses and as members of a multidisciplinary infection control team contribute to patient safety at the hospital. Guidance is given by the National Council on framing key performance indicators relevant to infection control.

## Infection Control at Kerry General Hospital

At Kerry General Hospital (KGH) in Tralee there are two CNSs in infection control, Eileen Hickey and Christine Barry, both of whom are members of the hospital's practice development team. In addition, they are members of the hospital's multidisciplinary infection control team and infection control committee. (This committee is chaired by Eileen McKenna, a divisional nurse manager at KGH, who also represents the hospital on a regional infection control committee.) Other team members of the infection control team include a part-time consultant microbiologist and a pharmacist specialising in antibiotic therapies. The CNSs' main objectives are to provide advice, education, training and support on infection control and related matters to all hospital staff in all departments, and they work with the nursing practice development co-ordinator, Helena Butler, to achieve these objectives: other aspects of their role are shown in Box 1. The infection control team at KGH closely monitor all methicillin-resistant *Staphylococcus aureus* (MRSA) bacteraemias and have recently introduced measures to reduce MRSA bacteraemia rates at KGH.

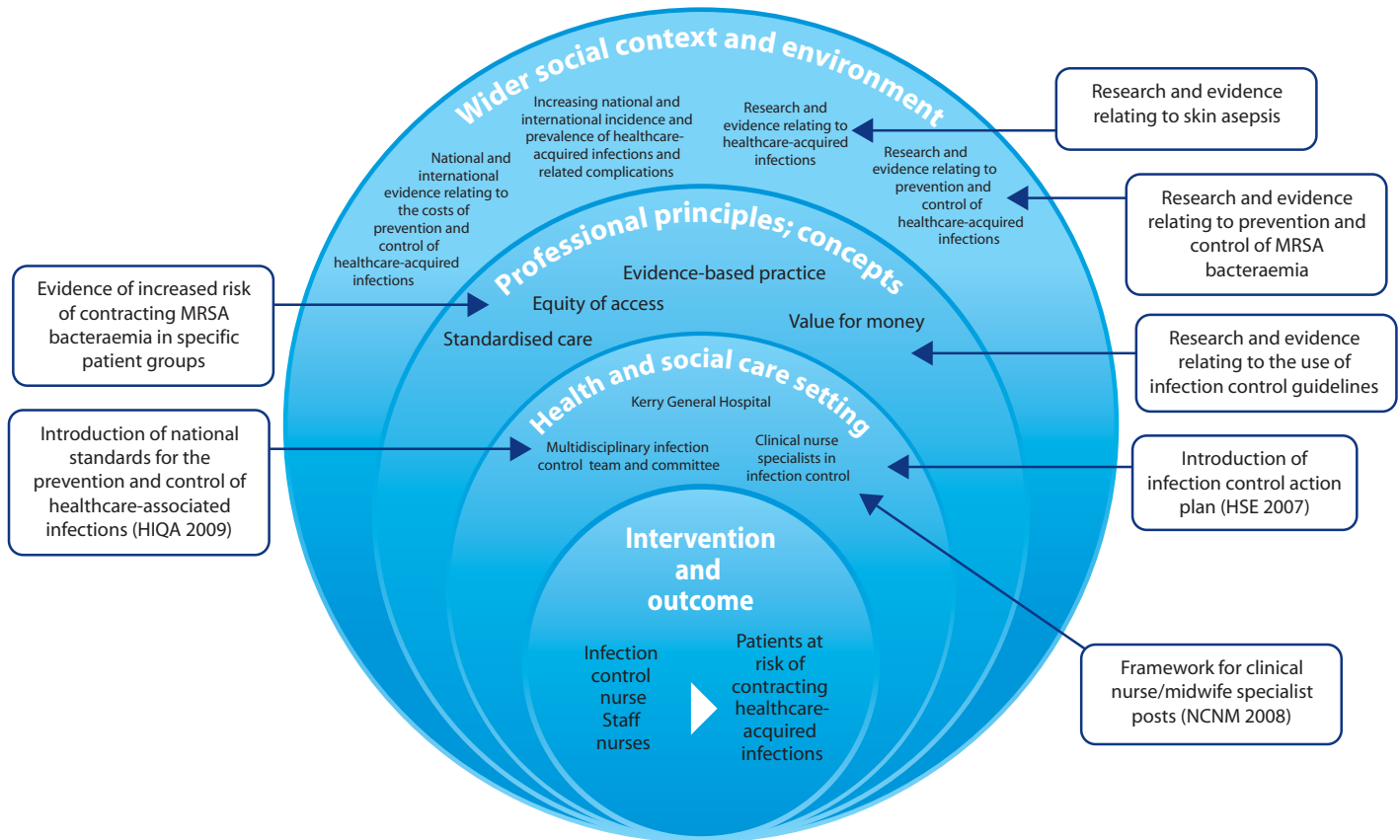
Patients identified as being at a higher risk of contracting a HCAI include those with large wounds following surgery, burns or a serious accident, those on an intravenous line for extended periods, and those with weakened immune systems. Figures shown in the *Say No to Infection* action plan indicate that 4.9% of inpatients had at least one HCAI, and of that group of inpatients, 10% had MRSA (0.5% of inpatients) (HSE 2007). MRSA bacteraemia is of particular concern to patients and hospital staff alike, primarily because it is a serious, potentially life-threatening infection. Furthermore, in the prevailing climate of cost containment, the costs of treating and managing

### Box 1. Roles and Functions of the Clinical Nurse Specialists in Infection Control at Kerry General Hospital.

The clinical nurse specialists in infection control are members of the hospital's multidisciplinary infection control team and its infection control committee. They also participate in the hospital's decontamination and hygiene standards committees. As such, they:

- provide specialist advice on infection control issues
- promote innovation and change in the hospital's approach to delivering care to patients delivery patient, particularly in relation to new research findings
- participate in the implementation and evaluation of interdisciplinary audit systems (e.g., hand hygiene) and tools to audit current practice in the interest of improving infection control outcomes
- educate all front-line clinical staff about new infection prevention and control standards
- provide an ongoing education and training programme for multidisciplinary staff on infection control
- provide education to the public and patients through attendance at health-promoting hospital events
- liaise between front-line clinical staff and laboratory staff
- advocate for patients and their families regarding infection control issues
- develop guidelines and policies for infection control in line with best practice.

Figure 1. The Complex Environment in which Interventions Relating to Infection Control Are Made and Clinical Outcomes Are Determined. Adapted from National Council (2010a, p3).



patients with MRSA must also be considered. The average cost per episode of MRSA bacteraemia can be as much as €14,000, due to the costs of treatment in intensive care units and to protracted hospital stays (Garau *et al* 2008). It has been estimated that MRSA infections in Irish hospitals cost in excess of €23 million annually (Pfizer Expert Group 2010).

## Selecting Infection Control Interventions

In its discussion paper *Clinical Outcomes*, the National Council attempts to describe the complex environment in which

nurses and midwives make interventions (National Council 2010a). This environment is depicted as having several layers, each of which affects nurses' and midwives' practice. The degree to which different factors in the environment affect this practice depend on their proximity and/or relevance to patients/clients and/or the care setting (National Council 2010a). Figure 1 in this update shows the complex environment in which a CNS in infection control might make decisions about and perform interventions appropriate to his/her remit.

Box 2 shows examples of typical, intended clinical outcomes and the interventions that the CNS in infection control makes to ensure these outcomes are achieved. The other associated

### Box 2. Examples of Typical Outcomes in Infection Control.

Examples of intended clinical outcomes	Examples of associated interventions by the CNS <sup>1</sup>	Examples of other associated outcomes
<ul style="list-style-type: none"> <li>• MRSA bacteraemia rates are reduced</li> <li>• Rates of contaminated blood cultures are reduced</li> <li>• A consistent approach is taken to obtaining blood for microbiological analysis</li> </ul>	<p>The CNS in infection control:</p> <ul style="list-style-type: none"> <li>• Develops evidence-based guidelines in blood culture techniques</li> <li>• Contributes to the development of guidelines for antibiotic therapy</li> <li>• Provides training in blood culture techniques to frontline clinical staff</li> <li>• Collects data on blood culture contamination rates</li> </ul>	<ul style="list-style-type: none"> <li>• Audits of documentation show adherence to best-practice guidelines in relation to taking specimens for blood culture</li> <li>• Patients are discharged in a timely manner</li> <li>• Costs of care are maintained within service performance indicators</li> <li>• Patients are satisfied with safety and quality of care received</li> </ul>

<sup>1</sup>These are examples only and are not intended as a template for infection control interventions.

outcomes shown in the right-hand column of Box 2 are those that the service provider, the multidisciplinary team and the CNS himself/herself might expect and these may be care-, patient- and/or performance-related (Kleinpell 2009).

Box 3 shows relevant national and organisational policies, strategies and other documents that might guide the CNS in infection control when structuring key performance indicators (KPIs) (see the National Council's discussion paper on KPIs for further information; National Council 2010b). By reviewing the relevant objectives set out in these documents, the CNS can devise KPIs that support specific strategic goals and are appropriate to his/her scope of practice and role. Box 4 (overleaf) illustrates how a CNS in infection control might construct a KPI and measure progress towards the stated outcomes.

One of the HSE's stated five-year objectives was to reduce MRSA infection rates by 30% (HSE 2007) and this provided

the impetus in 2008 for the KGH infection control team to consider interventions that would reduce MRSA bacteraemia rates at the hospital. Blood cultures are the "gold standard" for the diagnosis of bacteraemia (Chesnutt and Zamora 2008) and the risk of specimen contamination can be minimised by adherence to a uniform policy on collecting blood for culture and sensitivity (Martinez *et al* 2002, Tepus *et al* 2008). The team conducted a root cause analysis (RCA) of all MRSA bacteraemias occurring in one specific quarter of that year, and found that 60% of the patients within the sample had previously been colonised with MRSA and that some blood specimens had possibly been contaminated. The RCA also identified that there were notable variations in the process of obtaining blood for culture and sensitivity testing, particularly in relation to skin asepsis technique. It was found as well that there was a need for written guidelines on taking blood for culture and sensitivity. These findings, together with national policy and organisational objectives, formed the basis on

### Box 3. Identifying Sources for Key Performance Indicators for a Clinical Nurse Specialist in Infection Control.

Source	Factors to be considered in the development of the key performance indicator(s)
National Health Policy/Mission Statement	To improve the health and well-being of people in Ireland in a manner that promotes better health for everyone, fair access, responsive and appropriate care delivery, and high performance (DoHC (2008) <i>Statement of Strategy, 2008-2010</i> )
Mission Statement of Health Service Provider	To enable people to lead healthier and more fulfilled lives (HSE (2008) <i>HSE Corporate Plan, 2008-2011</i> )
Area of Concern to Individual CNS/CMS or ANP/AMP	Infection control
Relevant National Policy/Policies and other Guidance	<ul style="list-style-type: none"> <li>• HSE (2007) <i>Say No to Infection. Infection Control Action Plan</i></li> <li>• HSE (2010) <i>National Service Plan, 2010</i>. Key result area – CP 3 Health Protection. Healthcare-acquired infection (HCAI) – continued reduction in MRSA bacteraemia rates</li> <li>• SARI (2005) <i>The Control and Prevention of MRSA in hospitals and the Community</i></li> <li>• SARI (2009) <i>Infection Prevention and Control Building Guidelines for Acute Hospitals in Ireland</i></li> <li>• Health Information and Quality Authority (2009) <i>National Standards for the Prevention and Control of Healthcare-Associated Infections</i></li> <li>• HIQA (2010) <i>Draft National Standards for Safer Better Healthcare</i></li> <li>• HIQA (2010) <i>Guidance on Developing Key Performance Indicators and Minimum Data Sets to Monitor Healthcare Quality</i></li> </ul>
Health Service Provider's Relevant Policy/Policies and Guidelines	<ul style="list-style-type: none"> <li>• HSE (2007) <i>Say No to Infection. Infection Control Action Plan</i></li> <li>• HSE (2010) <i>National Service Plan, 2010</i>. Key result area – CP 3 Health Protection (p11). Healthcare-acquired infection (HCAI) – 5% reduction in MRSA bacteraemia rates (p72)</li> </ul>
Relevant Nursing/Midwifery Document(s)	<ul style="list-style-type: none"> <li>• CNS (Infection Control) job description</li> <li>• Other evidence-based guidelines</li> <li>• Relevant international and national research and other evidence</li> </ul>
National	National policy (see above)
Organisational	See health service provider policy and guidelines above
Local	CNS (Infection Control) job description
Other	<ul style="list-style-type: none"> <li>• International and national research</li> <li>• Office for Health Management (2004) <i>Management Competency User Pack for Nurse and Midwife Managers</i></li> </ul>
Health Service Provider's Relevant Key Result Area	HSE CP 3 Health Protection ( <i>HSE National Service Plan, 2010, p11</i> )
Health service provider's relevant performance indicator(s)	<ul style="list-style-type: none"> <li>• HSE (2007) <i>Say No to Infection. Infection Control Action Plan</i>.</li> <li>• HSE KPIs in relation to average length of stay and % occupancy rates</li> </ul>

**Box 4. Sample Key Performance Indicator for a Clinical Nurse Specialist in Infection Control.<sup>2</sup>**

<b>Nurse/Midwife Title and/or Clinical Speciality</b>	<i>CNS (Infection Control) working as a member of the multidisciplinary infection control team in an acute hospital</i>		
<b>Key Result Area or Intended Outcome</b>	Reduction in Morbidity		
<b>Sample indicator(s)</b>	Control of MRSA bacteraemias		
<b>Target</b>	To achieve a reduction in MRSA bacteraemias		
<b>Sample indicators relating to target</b>	(a) Minimal contamination of blood specimens (b) Adherence to evidence-based policy on collecting blood samples (c) Provision of targeted education and training programme		
<b>Metric</b>	Monthly audit of contamination rates Log of attendance at education and training sessions		
<b>Status</b>			
<i>Start date</i>			
<i>Follow-up date</i>			
<b>Action(s) to be taken</b>	Target met. Continue audit as above and conduct regular root cause analysis. Target not met. Continue audit as above and conduct regular root cause analysis.		
<b>Service Performance Measure (e.g., HealthStat, Health Protection Surveillance Centre data)</b>	<i>Tick appropriate box(es)</i>		
	Access <input type="checkbox"/>	Integration <input checked="" type="checkbox"/>	Resources <input checked="" type="checkbox"/>

which the infection control team would determine their specific interventions and the outcomes associated with those interventions.

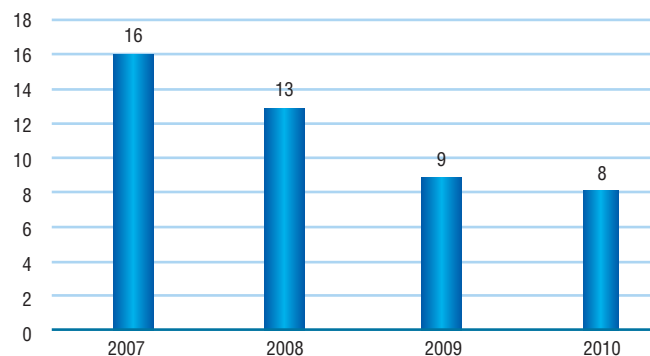
In an effort to reduce contamination of blood cultures during the sample collection stage, the team introduced the use of a rapid-acting, persistent, and broad-spectrum skin antiseptic containing 2% chlorhexidine gluconate and 70% isopropyl alcohol, which had been shown to be effective against various micro-organisms including Gram-positive and -negative bacteria, MRSA, Vancomycin-resistant *Enterococci*, *Clostridium difficile*, *Acineobacter*, and other viruses and fungi (Denton 2001, Chaiyakunapruk et al 2002, Pratt et al 2007). To facilitate best practice in skin asepsis, a new blood culture pack was developed containing the necessary sterile equipment, blood culture bottles and antiseptic solution.

In order to ensure a consistent approach and to consolidate existing good practice, the infection control team drew up a policy on collecting samples for blood culture and microbiological analysis. An education programme targeted at key stakeholders was deemed critical to the successful implementation of the policy (Qamruddin et al 2008). This programme consisted of education and training for nursing, medical and phlebotomy staff on the policy itself, aseptic technique and the use of the new blood culture pack. A film of correct blood collection procedures was made and this was made available on a DVD to all relevant staff. Positively evaluated by all participants, the programme is still provided at KGH for new medical staff.

As a result of these interventions, there has been an annual

reduction in the rates of MRSA bacteraemia since 2007 (see Table 1<sup>3</sup>). From mid 2008 until the end of that year a reduction of 19% in the rates of MRSA bacteraemias was achieved. In 2009 the rates of MRSA bacteraemias fell by a further 30%, indicating a total reduction of 44% between 2007 and 2009. This success continued in 2010.

**Table 1. MRSA Bacteraemias at Kerry General Hospital**



The infection control team continues to conduct root cause analyses on all MRSA bacteraemias and reports the findings to the hospital's infection control committee. The use of the agreed antiseptic solution in tandem with improved aseptic techniques have considerably reduced blood culture contamination rates at KGH.<sup>4</sup> The challenge now for the CNSs and the rest of the infection control team is to maintain compliance with the blood culture policy at a time when there are constraints on staffing levels and high standards of care are required.

<sup>2</sup>This is an example only and is not intended as a template for key performance indicators relating to infection control.

<sup>3</sup>Data included in Table 1 was published in a national report on *Staphylococcus aureus* bloodstream isolates published by the Health Protection Surveillance Centre ([www.hpsc.ie](http://www.hpsc.ie)). Additional information for 2010 was provided by Kerry General Hospital.

<sup>4</sup>National rates of MRSA bacteraemias have also decreased by 40% (Health Protection Surveillance Centre 2010).



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