Reducing MRSA bacteraemias associated with wounds

Tackling healthcare-associated infections (HAIs) such as meticillin-resistant *Staphylococcus aureus* (MRSA) continues to be a key safety issue. As a result of surveillance, it was reported that the author's trust, a secondary care provider, had a poor rating for MRSA bacteraemias. From April 2008 to March 2009, 12 patients developed a bacteraemia that through root cause analysis was found to be associated with their wound. This article describes the strategic and educational plan developed to address this trust-wide issue and its impact in reducing wound-associated MRSA bacteraemias. It also acknowledges the resulting changes in clinical practice.

Heather Newton

KEY WORDS
Reducing MRSA bacteraemias
Strategic plan
Wounds
Audit

In 2003, the Department of Health (DH) set out a clear direction for NHS organisations on the necessary actions required to reduce hospital-associated infections (HAIs) and to curb the proliferation of antibiotic-resistant organisms (DH, 2003). By 2008, HAIs were identified as a key priority for the NHS and are part of the NHS operating framework document for 2008/2009 (DH, 2008).

The DH publish meticillin-resistant *Staphylococcus aureus* (MRSA) surveillance data every six months (Health Protection Agency, 2005). However, there have been concerns relating to interpretation of results and accuracy of data. For example, MRSA bacteraemias reported by an acute trust were not necessarily acquired in that trust. If a patient was transferred between hospitals and then returned to the originating hospital, MRSA may have been imported from other hospitals or from the community (Health Protection Agency, 2005).

Last year, the NHS met the MRSA target to halve the number of bloodstream infections across the NHS. The new goal for MRSA is to eliminate all preventable MRSA bloodstream infections in the NHS.

Last year, the NHS met the MRSA target to halve the number of bloodstream infections across the NHS. The new goal for MRSA is to eliminate all preventable MRSA bloodstream infections in the NHS (National Audit Office, 2009).

The National Quality Board, an independent, multi-stakeholder body, has been set up 'to champion quality and ensure alignment in quality throughout the NHS' (www.dh.gov.uk/en/Healthcare/Highqualitycareforall/NationalQualityBoard/index.htm), by providing leadership for the quality agenda across the NHS system and joining up health and social care services. As part of this role, they will advise ministers on the objective to achieve further reductions in MRSA bloodstream infections and progress in efforts to tackle significant variations in performance between NHS organisations (DH, 2009).

In the author's trust, a secondary care health provider, there has been a significant reduction in MRSA bacteraemias relating to peripheral and central line sites over the last few years. From April 2007 to March 2008 23 cases were reported. In this same time period for 2008 to 2009, eight cases were reported with one case from April 2009 to date. However, in 2008 concerns were raised about the high level of MRSA bacteraemias caused by wounds (Royal Cornwall Hospital, 2008) (*Figure 1*), the majority of whom had an underlying medical condition which affected both their immune system and their ability to heal. As described in *Saving Lives* (DH, 2007), the risk of infection in all wound types is increased by:

- Severity of the wound
- Age and health status of the patient
- Patient's nutritional status
- Medications
- Local perfusion to the wound
- The ability of the patient to maintain an immune response.

Heather Newton is a Tissue Viability Nurse Consultant at the Royal Cornwall Hospitals NHS Trust and won the Innovations in a Reduction in Wound Infection award sponsored by Smith & Nephew at the 2009 Wounds UK Awards ceremony for the work presented in this paper

MRSA and wounds

MRSA belongs to the *Staphylococcus* family of bacteria, one of a number of commensals found in healthy individuals. It can colonise a number of body sites, namely; skin, nose, axillae and groin. However, if transferred to vulnerable sites, i.e. wounds, it has the ability to cause infection and in some cases lead to bacteraemia (Royal College of Nursing [RCN], 2000). Some strains of *Staphylococcus aureus* have developed resistance to a range of antibiotics such as meticillin, a penicillin derivative. 'Meticillin' replaces the more familiar 'methicillin' in accordance with the World Health Organization guidelines (WHO, 2005).

MRSA was relatively uncommon through the 1960s and 1970s, but the problem exploded in the mid-1990s when particular 'epidemic' strains of MRSA became established in hospitals throughout the UK (DH, 2005).

MRSA can enter the normally sterile blood stream from a local site of infection, such as a wound, causing a blood stream infection known as bacteraemia. Symptoms include high temperatures, rigors, raised white cell count, disturbance of blood clotting and failure of vital organs. This is the type of MRSA infection that has the highest death rate (DH, 2005).

It has to be recognised that although many patients become colonised with MRSA, not all go on to develop an infection — hence the rationale for screening patients before admission to hospital, especially if they are to undergo a planned surgical procedure. Vulnerable patients include; the elderly or very young, those with underlying disease such as diabetes, and those who are immunocompromised or acutely ill. If these patients then develop a wound, the complications are more serious particularly if they develop an MRSA wound infection, as the treatment choices are limited. The main problem is that first-line antibiotics in standard hospital formularies are not MRSA effective, so by the time the MRSA result is received (depending on the rapidity of laboratory methodology used), time has elapsed to allow the infection to become more advanced before anti-MRSA antibiotics can be prescribed.

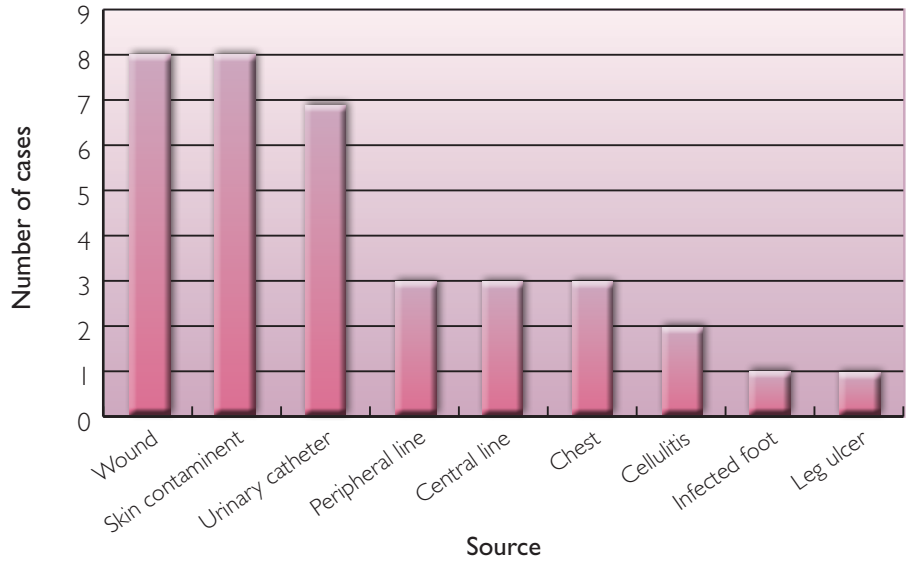

Figure 1. MRSA bacteraemia cases in 2008 in the author's trust.

In 2006 detailed analysis of MRSA cases indicated that around 10% of MRSA bacteraemias were likely to be attributable to chronic wound infection. (DH, 2006).

Thomas (2004) suggests that MRSA can be isolated from wounds that appear to be healing normally and, as such, represents a serious risk of cross-infection if appropriate infection control techniques are not employed at all times by practitioners. Experience confirms that the spread of MRSA can be reduced through attention to regular hand washing and simple hygiene procedures.

For the strategic plan at the author's trust to reduce the number of MRSA bacteraemias to succeed, it was important that all relevant healthcare professionals worked collaboratively to achieve success.

Strategic plan

The tissue viability team were made aware of the increased incidence of MRSA bacteraemias associated with wounds across the health community in Cornwall through involvement in

Table 1

Summary of wound types

Type of wound	Associated factors	Total number of patients
Chronic leg ulcer	Renal disease, diabetes	6
Surgical wound	Cardiac surgery	1
Chronic leg ulcer	Blistering skin condition	1
Foot ulcer	Diabetes	1
Abscess	Renal disease	1
Cellulitis		2
Total		*12*

Royal Cornwall Hospitals NHS
NHS Trust

The following flow chart is to be used to identify effective screening for MRSA in patients with wounds and to ensure appropriate wound management for MRSA positive patients.

MRSA screen

All wounds should be included in the MRSA screen.
If the dressing is easy to change and the wound needs a review please swab as part of the full MRSA screen.
If the wounds are not causing a clinical concern and are dressed, i.e. venous leg ulcers in intact compression bandages *(which are not due to be changed on the day of the screening)*, please leave bandages in situ and swab at next dressing change.

↓

Use red swabs — request form to indicate that swabs are being sent for MRSA screening.

Suppression treatment of an MRSA positive patient with wounds

MRSA positive result indicates need for active wound treatment of all wounds even if they were not swabbed at initial screening.

↓

Ward to contact equipment library for Acticoat/Acticoat Absorbent dressing, depending on level of exudate.

↓

Acticoat/Acticoat Absorbent is sent to the ward *(wards will be cross charged for all Acticoat/Acticoat Absorbent dressings)*.

↓

Acticoat/Acticoat Absorbent is used on the wounds as part of suppression therapy and renewed every three days *(unless strikethrough indicates an increase in the number of dressing changes)*.

↓

Review wounds and discontinue Acticoat dressings after five days.

If symptoms of increased bacterial colonisation such as odour, increased exudate and erythema of wound margins persist, continue Acticoat/Acticoat Absorbent dressings for a maximum of two weeks or obtain advice from the tissue viability team.

Figure 2a. MRSA screening, wound swabbing and suppression treatment of patients with wounds flow chart

Identification of the need to take a wound swab

Patient presents with signs and symptoms of wound infection *(inflammatory response, increased exudate production, purulent exudate, odour, pain, wound deterioration, bleeding granulation tissue)*.

↓

Sample obtained using a black swab, indicate the reason for the swab and signs of infection identified on the microbiology form.

↓

Consider whether treatment should commence before the swab result is obtained, where necessary obtain advice from the medical/surgical or tissue viability teams.

Treatment of patients with positive wound infection

Positive swab result indicates need for active treatment of the affected wound.

↓

Ward to contact equipment library for Acticoat/Acticoat Absorbent dressing, depending on level of exudate.

↓

Acticoat/Acticoat Absorbent is sent to the ward *(wards will be cross charged for all Acticoat/Acticoat Absorbent dressings)*.

↓

Apply Acticoat/Acticoat Absorbent.
If systemic signs of infection or spreading cellulitis persist, refer to the antibiotic prescribing policy and/or discuss the use of relevant oral/IV antibiotics with the consultant microbiologists.

↓

Review wound every three days *(or more frequently if strikethrough occurs)*
and discontinue use of Acticoat/Acticoat Absorbent when healing recommences up to a maximum of two weeks.

Figure 2b. Flowchart for swabbing and management of patients with suspected wound infection.

the root cause analysis and trust-wide reporting processes.

Routine screening of elective admission patients had been introduced in March 2009 as part of the national programme, with a plan to screen all admissions to hospital by March 2011. However, the patients in the high risk wound groups (*Table 1*) would not have been identified on admission because they were emergency admissions and so were not routinely screened. The patient who had cardiac surgery was a transfer from another hospital and, as such, was also not part of the screening programme. The presence of MRSA, therefore, was not detected in this group of patients until there were clinical indications, or if the medical team felt a patient's risk factors were high and swabs were obtained. This resulted in wounds not being treated if they had MRSA until the clinical signs and symptoms were present, thus increasing the risk of bacteraemia. This was evident through the tissue viability team's review of the wounds following patient referral.

The local wound formulary recommended the use of antimicrobial dressings for infected wounds, however, there appeared to be a lack of adherence to the formulary at this stage. This may have been through a lack of education and/or knowledge of the local formulary. A wound audit in November 2008 on the Royal Cornwall hospital site identified that there were 191 patients with wounds, which accounted for 31% of the total inpatient numbers at this time. Of these, 43 patients were at a higher risk of developing invasive MRSA due to their underlying clinical condition (Royal Cornwall Hospital, 2008).

Patients who were found to be colonised with MRSA on routine swabbing were given chlorhexidine washes and mupirocin nasal ointment to reduce the levels of bacteria and risk of cross-infection.

The author met with senior nurses, members of the infection control team and the community tissue viability lead to discuss the specific issues and develop a strategic plan to address the problem.

The strategic plan addressed the following elements:

- Screening and swabbing of patients with wounds
- Dressing selection and access to silver dressings
- Education and training on the treatment pathway and dressing application
- Aseptic non-touch technique (ANTT)
- Monitoring the impact of the plan.

Screening and swabbing of patients with wounds

A collaborative approach led by the author was taken involving the tissue viability team, infection control team, senior nurses and microbiologists to explore the process for screening and managing patients with MRSA and wounds. The practice of swabbing wounds routinely on admission to hospital had stopped many years ago and staff had been educated only to swab wounds which showed signs of clinical infection.

Having undertaken root cause analysis it became clear that patients with wounds were not being identified as being at risk of MRSA bacteraemia, therefore, an all-wound screening policy was introduced. Initially, one pathway was developed to map the screening process for patients admitted with wounds that had no clinical signs of infection as well as those admitted with infected wounds. Patients with infected wounds required a second wound swab to be taken to identify other bacteria that may have been present in the wound and causing the infection, particularly if MRSA was not detected. However, following consultation, it was decided by the author and senior nursing staff to simplify the pathways and develop two separate ones in order to avoid confusion and to aid clarity of information. The pathway guides staff through the process of initial swabbing of patients, including the wounds, through to the management plan (*Figures 2a* and *b*).

Once agreed by the multiprofessional team this was disseminated to all wards and departments and was presented to the tissue viability and infection control link practitioners to ensure the information was cascaded at ward level.

Dressing selection and distribution

The emergence of antibiotic-resistant strains of bacteria has led to a proliferation of antimicrobial wound dressings such as silver, iodine, honey and polyhexamethylene biguanide (PHMB). They offer many benefits; ease of use, availability, cost less than a corresponding course of antibiotics and can be administered without a prescription (DH, 2008). Antimicrobial dressings differ from antibiotics in that they are generally active against a broader spectrum of organisms, including aerobic and anaerobic bacteria and aerobic fungi. This means that they are less likely to mount an effective defence and survive as resistant strains (Gilbert, 2006).

As clinicians we still have to be aware that there is a paucity of evidence surrounding the toxicity of some antimicrobial products, and thus these dressings should only be used where there are appropriate indications and for limited periods of time (World Union of Wound Healing Societies [WUWHS], 2008).

Silver has antiseptic, antimicrobial and anti-inflammatory properties. It works by blocking cellular respiration and disrupts the function of the cell membranes causing cell death. Silver also denatures cell DNA and RNA, thus inhibiting cell replication (Lansdown, 2002).

Iodine comes in two forms, povidone and cadexomer. It is a powerful oxidising agent working within the bacterial cell and as a result is bactericidal and bacteriostatic and is effective against a number of pathogens (White et al, 2006).

Honey is an antimicrobial agent and is bacteriostatic. It also produces hydrogen peroxide at varying levels depending on the type of honey which can affect bacterial growth (Dunford et al, 2000). All of the above products were available for use on the county-wide formulary.

PHMB is relatively new to wound care but has been safely used in industry, such as contact lens cleaning solution, for many years. It is active against a number of bacterial pathogens, including MRSA, and works by binding the positive charge on the molecule to bacteria which disrupts the cell membrane causing the cell contents to leak out (Gilbert, 2006). To date, PHMB has not been used within the author's trust.

Before selecting the dressing products to use for the project, the author discussed with tissue viability colleagues the evidence to support best practice in the use of antimicrobial dressings. Silver dressings had been used in the author's trust for a number of years to support first-line treatment for infected wounds, together with oral or intravenous antibiotics. There was good evidence to support its effectiveness against MRSA (Fong and Wood, 2006), and there was a range of dressings and sizes available. Silver has the advantage of having broad antimicrobial activities against Gram-negative and Gram-positive bacteria with a low side-effect profile (Ip et al, 2006), and was therefore considered to be an appropriate antimicrobial wound dressing to meet patients' clinical needs. Iodine and honey dressings were also available on the formulary for those patients who were intolerant of silver dressings and to provide patients with choice. Acticoat™ (Smith & Nephew) was the silver dressing on the county-wide formulary and therefore was the recommended dressing for this project. Acticoat is a nanocrystalline silver-coated dressing that provides a rapid and sustained release of silver ions within the dressing and to the wound bed for 3–7 days, depending on the characteristics of the wound and the type of Acticoat dressing selected (Thomas, 2004). In some cases, however, the author recommended a sequential approach changing the type of antimicrobial dressings where longer term therapy was required. These patients would have silver dressings for two weeks and then a break of between two and four weeks before starting silver treatment again. In other cases, patients would have an alternative dressing such as iodine or honey after the initial two-week treatment, depending on the patient's tolerance of the dressings particularly in relation to pain. This would reduce the theoretical risk of bacterial resistance to silver and increase the spectrum of activity.

Best practice guidance in the trust policy recommended two weeks' use of silver dressings for infected wounds and one week's use on wounds of MRSA colonised patients as part of the decolonisation regimen. Staff using antimicrobial dressings should be mindful of this when selecting appropriate dressings to reduce the bacterial load in wounds.

A system for accessing and monitoring the use of the silver dressings in patients known to have MRSA or to have suspected wound infection was introduced. There was debate about whether all wards should keep stocks of silver dressings as there would be a cost increase to the trust initially, and a potential for waste if all areas were required to stock the product, 'just in case'. However, it was decided at executive level that to monitor stock levels and costs, this service should be centralised. If used appropriately, silver dressings should be cost-effective as encouraging rapid wound healing helps lower the risk of MRSA infections and reduce the risk of cross-infection.

If a patient was assessed as needing silver dressings, the healthcare professional would contact the equipment library staff detailing the specific type of dressing required and for what indication. Out-of-hours staff have access to the equipment library and are asked to record what dressings have been taken. This is not always completed and therefore accurate information is not always available.

For colonised wounds silver was to be used for one week as part of the decolonisation regimen, and for those wounds showing signs of clinical infection it was to be used for a maximum of two weeks unless clinically indicated to continue. Dressing costs were charged to the individual wards on a monthly basis. If patients were unable to tolerate silver dressings, iodine was recommended as an alternative. However, staff were made aware of the potential risks of iodine sensitivity.

It is felt by the author that this is a good way of monitoring usage and maintaining control of high-cost dressings, although additional administrative work is involved.

Education and training on the treatment pathway

As with any changes in practice, education and training on both the pathway and the use of the dressings required planning and collaboration. On discussion with the manufacturer of the silver dressings, a shared approach was taken to support this activity. Once trust staff had agreed the pathway, the company representatives distributed laminated information sheets and product information to the wards while educating staff on the correct use of the silver dressings. This was supported by the tissue viability and infection control teams who were actively involved in promoting best practice in wound care. Both speciality services have link practitioners who were also involved in the dissemination of information.

A successful study day 'The ABC of Infection' has been held seven months after the project started with over 150 delegates and national and local speakers. This provided an opportunity to share best practice and outcomes of the local work to date, as well as provide an update for multiprofessional staff on key aspects of infection control and wound management.

Dressing technique

The wound dressing technique used by staff was reviewed and a decision was made that an aseptic non-touch technique (ANTT) would be the one of choice for chronic wounds. First dressing changes for surgical wounds would continue to be undertaken using an aseptic technique.

ANTT is supported by evidence and highlights the key components involved in maintaining asepsis and aims to standardise practice (Rowley, 2001).

Much of the research around the use of ANTT has focused on intravenous therapy (Rowley, 2004). However, as long as the process is mapped against the ANTT principles, such as strict handwashing, maintaining an aseptic field without contaminating key items of equipment and taking appropriate infective precautions, it can be used for other procedures such as wound care. Rowley (2004) also suggests that in hospitals where ANTT has been implemented, it has improved compliance with the core components of aseptic technique, such as handwashing and choice of aseptic field.

The trust had already embedded the principles of ANTT into the clinical skills and self-directed learning packs, so staff were not new to this procedure. The infection control and tissue viability teams held workshops and road shows promoting the technique for wound management.

It has to be acknowledged that this technique is used in association with all other standard precautions and environmental awareness to avoid cross-contamination. Reducing the number of inappropriate dressing changes also plays a roll in lessening this risk, and it is important that staff and patient advocates challenge practice when dressings are removed too frequently.

Measuring outcomes

To monitor the impact of the use of appropriate dressings an audit programme was introduced. With the support of the microbiology team the author has been collating data on patients with MRSA positive wound swabs and reviewing their management plan. Using information on the silver dressing usage and contacting the wards direct on receipt of the swab result, the author has been able to determine if staff have followed the pathway correctly.

Initially it was suggested that 30 patients were included in the audit, however, the author is keen to continue monitoring the impact longer term.

Early data suggests that patients are receiving appropriate treatment, although in some cases the silver dressings are not being started early enough. The author has found it useful to receive the swab data in order to initiate relevant treatment and to guide staff in the most appropriate treatment pathway for patients.

Some patients who have tested MRSA positive have had their wounds managed with topical negative pressure (TNP) therapy. In these cases it has been appropriate to continue with TNP to aid removal of bacteria, and the fact that the wounds are occluded reduces the risk of cross-contamination. This is also the case when using other types of wound dressings, such as adhesive foam dressings or hydrocolloids, where occluding the wound can prevent ingress of bacteria.

Another clinical issue relates to those patients who are admitted with wounds that have already been treated with silver dressings in primary care, yet, when swabbed on admission, still present with MRSA. A decision has been made by the tissue viability team to treat these wounds with antimicrobial dressings if they have clinical signs of infection.

Antibiotic guidelines state that they should only be given when clinical signs of MRSA infection are present. Mere MRSA colonisation in the absence of infection should not be treated as this increases the risk of selection for resistance. This is, however, an area that requires review by the multiprofessional team to determine a management plan for patients who are known carriers of MRSA who also have wounds while in hospital.

Some patients find antimicrobial dressings very painful and are reluctant to have them applied. Dressing options are offered as a first-line approach but in some cases patients have to be treated systemically.

The trust policy is not to re-swab patients who have been isolated and treated for MRSA as a routine practice. This is in line with all other swabbing policies where routine swabbing of wounds is not advocated unless there are clinical signs of wound infection. It does make it difficult therefore to determine the impact of the wound care interventions, however, if a wound starts to heal and the signs of infection reduce, this would be a good indicator of successful treatment.

Due to time restraints and these variations in practice, it may be more realistic in the future to undertake prevalence audits to assess the level of interventions when patients have MRSA positive swabs.

The author will continue to monitor through audit the impact of the strategic plan.

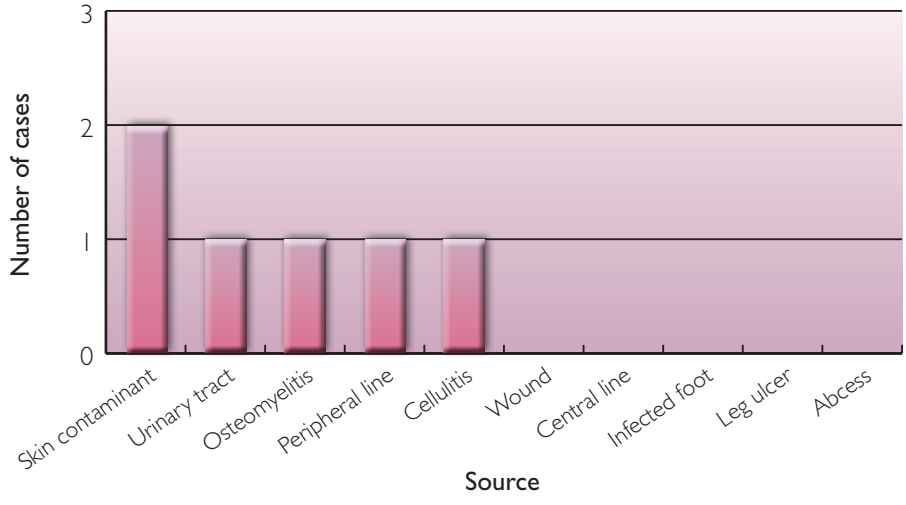

Figure 3. Source of MRSA bacteraemia at RCHT, April 2009–September 2009.

As projected, the silver dressing usage has increased to date. In 2007 the use of Acticoat and Acticoat absorbent for the first two months of the year was 18 pieces. In 2008 this had increased to 25 pieces over the same time period. Since the introduction of the strategy and the increased awareness of the need to use silver dressings for MRSA wounds, the usage for the same period has risen to 145 pieces.

The trust continues to monitor the number of patients presenting with MRSA bacteraemias. Since the introduction of the strategy at the beginning of 2009, there have been no further patients with MRSA bacteraemias associated with wounds (*Figure 3*). The work within primary care has also played a key role in this outcome, where a major drive to assess, treat and review patients with MRSA in their wounds has also been undertaken.

Summary

To date, the strategic vision of the tissue viability and infection control teams for reducing the number of patients with MRSA bacteraemias associated with wounds appears to be working.

It is clear that a multiprofessional approach has been key to the successful reduction of MRSA bacteraemias trust-wide and, indeed, county-wide. The use of silver dressings, together with education and training in ANTT, has increased awareness among staff and patients to reduce risks associated with MRSA-infected wounds. It has involved a great deal of hard work and commitment from all staff to achieve these results, and hopefully patient confidence in the trust has increased. WUK

Acknowledgements

The author would like to thank Julie Trudgian, Tissue Viability Lead Nurse and Nicci Kimpton, Community Tissue Viability Lead for their support with this work. The trust's divisional and senior nurses, the infection control team, consultant microbiologists and the link practitioners in both tissue viability and infection control have also played a key role in disseminating information and made this project a success.

References

Department of Health (2003) *Winning ways: working together to reduce healthcare associated infection in England*. DH, London. Avsilsble online at: www.dh.gov.uk/en/Publicationsandstatistics/Publications/PublicationsPolicyAndGuidance/DH_4064682

Department of Health (2005) *A simple guide to MRSA*. DH, London. Available onlline at: www.dh.gov.uk/en/publichealth/healthprotection/healthcareacquiredinfection/healthcareacquiredgeneralinformation/dh_4093113

Department of Health (2006) *Reducing the risk of chronic wound-related bloodstream infections. A summary of best practice*. DH, London

Department of Health (2007) *Saving Lives: reducing infection, delivering clean and safe care*. DH, London. Available online at: www.dh.gov.uk/en/Publicationsandstatistics/Publications/PublicationsPolicyAndGuidance/DH_078134

Department of Health (2008) *The NHS in England: The operating framework for 2008/9*. DH, London. Available online at: www.dh.gov.uk/en/Publicationsandstatistics/Publications/publicationspolicyandguidance/dh_081094

Department of Health (2009) *A new Objective for MRSA. National Quality Board stakeholder engagement*. National Quality Board and DH, London. Available online at: www.dh.gov.uk/en/Consultations/Liveconsultations/DH_100641

Dunford C, Cooper R, Molan P, White RJ (2000) The use of honey in wound management. *Nurs Standard* **15(11)**: 63–8

Fong J, Wood F (2006) Nanocrystalline silver dressings in wound management. *Int J Nanomed* **1(4)**: 441–9

Gilbert P (2006) Avoiding the resistance pitfall in infection control. *Ostomy Wound Manage* **52(10A Suppl)**: 1s–3s

Health Protection Agency, Communicable Disease Surveillance Centre (2005) *MRSA surveillance system: results*. DoH, London. Available online at: www.dh.gov.uk/en/Publicationsandstatistics/Publications/PublicationsStatistics/DH_4085951

Ip M, Lai Lui S, Poon VK, Lung I, Burd A. (2006) Antimicrobial activities of silver dressings: an in vitro comparison. *J Med Microbiol* **55**: 59–63

Lansdown A (2002) Silver 1: its antibacterial properties and mechanism of action. *J Wound Care* **11**: 125–13

National Audit Office (2009) Reducing Healthcare Associated Infections in Hospitals in England. A report by the controller and auditor general. 12th June. National Audit Office, London

Rowley S (2001) Aseptic non-touch technique. *Nurs Times* **97(7)**: 6

Rowley S (2004) Working towards an NHS standard for aseptic non-touch technique. *Nurs Times* **100(8)**: 50

Royal College of Nursing (2000) Methicillin Resistant *Staphylococcus Aureus* (MRSA) Guidance for Nurses. RCN, London

Royal Cornwall Hospital (2008) Surveillance of *Staph aureus* bacteraemia and *C. difficile*. Quarterly report. Royal Cornwall Hospitals NHS Trust, Cornwall

Royal Cornwall Hospital (2008) Wound Audit. Data on file. Royal Cornwall Hospitals NHS Trust, Cornwall.

Thomas S. (2004) MRSA and the use of silver dressings: overcoming bacterial resistance. World Wide Wounds. Available online at: www.worldwidewounds.com

White RJ, Cutting K, Kingsley A (2006) Topical antimicrobials in the control of wound bioburden. Part 2. *Ostomy Wound Manage* **52(8)**: 26–58

World Health Organization (2005) International Pharmacopoeia guidelines. WHO, Geneva

World Union of Wound Healing Societies (2008) *Principles of best practice: Wound infection in clinical practice. An international consensus*. MEP Ltd, London

Key points

- Reducing healthcare associated infections is a key priority for the NHS.
- MRSA has been an increasing problem since the mid-1990s with epidemic strains being established in hospitals across the UK.
- MRSA bacteraemias can be reduced if a multiprofessional approach is taken.
- Communication, education and clinical support is the key to achieving a successful outcome.