

# Key Recommendations of the NSW Expert Group on multiple resistant organisms (MROs)

July 2006



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# Foreword

In June 2005 in response to community and health system concerns about multiple antibiotic resistant organisms (MROs), the NSW Minister for Health established the NSW Expert Group on MROs.

Experts in the fields of microbiology, infection control, public health, clinical medicine (intensive care, surgery), clinical improvement, pharmacology and epidemiology met on seven occasions to identify strategies for controlling and preventing MROs in the NSW healthcare system.

The terms of reference for the Expert Group were to:

1. Provide advice to the NSW Government on all aspects of MRO response planning and management.
2. Work with the NSW Chief Health Officer to provide specific MRO clinical response advice to NSW Health as required.
3. Draft consensus guidelines on MRO prevention and management, including outbreak management.
4. Make recommendations on relevant education strategies to improve MRO prevention and management.
5. Liaise with the Department's Committee for Healthcare Associated Infections Prevention and Control.

After formulating its preliminary recommendations the Expert Group convened a stakeholder summit in October 2005 to obtain feedback and consensus on those recommendations.

Some of the key recommendations of the Expert Group have already been implemented. Others require implementation in the near future and over the long term to ensure that the important task of MRO control and prevention occurs systematically. An implementation plan for the recommendations that remain outstanding is being prepared.

The NSW Minister for Health has already indicated the Government's strong support for the Expert Group's recommendations by approving an allocation of \$1.6 million recurrently commencing 1 July 2006 as a contribution toward implementation by Area Health Services. Area Health Services should review their existing investment in infection control - particularly as it relates to MROs - with a view to ensuring that they meet their obligations to establish and maintain staff and structures which will enable them to effectively prevent and control MROs and enhance patient safety and quality of care.

It is essential that a high level of commitment and appropriate resources be devoted to the implementation for two major reasons. First, while not all MRO infections are preventable, methicillin-resistant *Staphylococcus aureus* (MRSA) is endemic in NSW healthcare facilities and contributes to a significant proportion of preventable healthcare associated morbidity. Therefore, MRSA is the principle focus of the Expert Group's recommendations, as strategies which contribute to its control and prevention will also lead to reduced incidence and prevalence of other MROs. Second, the emergence and presence of antibiotic resistance is an ongoing problem in healthcare systems worldwide and effective MRO control and prevention is an essential component of the framework for improving the quality and safety of the NSW health system.

As Chair of the NSW Expert Group on MROs, I would like to thank the many people who contributed to the process of supporting the Group and developing the recommendations contained in this report.



Professor Lyn Gilbert

July 2006

# Members of the NSW Expert Group on Multi-resistant Organisms

Members of the NSW Expert Group on Multi-resistant Organisms:

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Professor John Tapsall, Royal College of Pathologists Australasia

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# Summary of Recommendations

## 1 Implementation strategy

- 1.1 That the NSW Department of Health in consultation with the Expert Group finalise an implementation strategy and timetable for the Group's key recommendations and that the NSW Department of Health and Area Health Services devote the appropriate resources needed to implement the strategy.

## 2 MRO Infection Control Policy

- 2.1 That the NSW Department of Health review the literature on MRO management and develop a detailed MRO infection control policy directive which focuses on MRSA and includes recommendations regarding use of contact precautions and patient isolation strategies.
- 2.2 That all NSW healthcare facilities implement strategies for screening patients at risk of MRSA infection or colonisation on or before admission; and implement contact precautions and isolation whilst awaiting results and for those in whom screening is positive for MRSA.

## 3 MRO surveillance

- 3.1 Area Health Services must report all healthcare associated MRO blood stream infections (BSIs) for all healthcare facilities as prescribed for the Infection Control Quality Monitoring Program.
- 3.2 NSW laboratories report all *Staphylococcus aureus* BSIs. This should be implemented via the redevelopment of the Notifiable Diseases Database to facilitate electronic notification of infections and infectious diseases.
- 3.3 NSW Health MRO surveillance definitions should be revised to ensure that they are consistent with the recommendations of the Health Care Associated Infection Advisory Committee (HCAIAC) of the former National Quality and Safety Council.
- 3.4 ICU MRSA acquisition rates should be included in the mandatory Infection Control Quality Monitoring Program indicators.

## 4 MRO screening of patients and healthcare workers

- 4.1 Patients at high risk of MRSA infection or colonisation, as defined in the MRO Infection Control Policy, should be screened upon admission to hospital or if feasible prior to hospitalisation eg pre-op clinics.
- 4.2 Elective joint replacement units should be ring-fenced by using MRSA screening and other processes to ensure that MRSA positive patients are detected proactively and strictly isolated throughout the operative process and/or effectively decolonised prior to surgery.
- 4.3 All patients for whom cardiac and vascular surgery is planned should be screened for MRSA colonisation prior to admission to hospital, and patients who are found to be colonised should if possible have their surgery deferred until they have been decolonised. If admission cannot be delayed the patient should be isolated in accordance with the MRO Infection Control Policy. Patients undergoing emergency cardiac or vascular surgery should be screened for MRSA prior to surgery.
- 4.4 All intensive care patients should be screened for MRSA colonisation on admission, weekly during their length of stay in ICU and on separation/death from ICU.
- 4.5 MRSA screening of healthcare workers is recommended only in situations where transmission of MRSA in a unit continues despite adequate implementation of infection control measures or where epidemiological aspects of an outbreak suggest possible MRSA carriage by staff.

## 5 Clinical improvement program strategies for responding to MROs

- 5.1 All healthcare-associated MRO BSIs must be reviewed by the relevant Area Health Service Infection Control Committee as soon as possible after diagnosis, according to a standard format developed by the NSW Department of Health, to determine whether they are potentially preventable and to identify specific issues and circumstances that could be improved.
- 5.2 The NSW Department of Health should, in liaison with Quality and Safety Branch and the Clinical Excellence Commission, develop strategies for development and implementation of clinical improvement initiatives which will contribute to MRO control and prevention in NSW Health facilities.

## 6 Use of antibiotic prescribing software systems to reduce inappropriate antibiotic prescribing

- 6.1 The NSW Department of Health should, as matter of urgency, evaluate the available antibiotic prescribing systems with decision support, registration/authorisation and audit capacity; identify one or more that is suitable for use in NSW hospitals; and facilitate its/their introduction, as soon as possible, in all public acute care facilities.
- 6.2 The NSW Department of Health should ensure that the requirements to support appropriate prescription of antibiotics are prioritised during the development of an electronic prescribing system.
- 6.3 Area Health Service Drug Committees should ensure that protocols for antibiotic prescription are developed in consultation with infectious diseases experts and clinical microbiologists; that they are consistent with the current edition of Therapeutic Guidelines: Antibiotic; and that drug use performance indicators incorporate antibiotic usage rates consistent with Therapeutic Advisory Group (TAG) recommendations.

## 7 Laboratory, infection control and infectious diseases physician capacity

### Laboratory capacity

- 7.1 Selected laboratories should be adequately resourced to enable them to undertake routine MRO testing in NSW according to national guidelines and provide timely results of all tests relevant to the case to the treating clinician.
- 7.2 The NSW Department of Health should, in consultation with the public microbiology laboratory network, develop criteria for identifying laboratories to be specifically resourced to conduct routine MRO screening.
- 7.3 The NSW Department of Health should, in consultation with the public laboratory network, develop criteria for the establishment of MRO typing, including rapid testing, capacity in NSW.
- 7.4 The NSW Department of Health should, in consultation with the public laboratory network, identify research priorities for MRO testing and mechanisms for supporting the conduct of that research.
- 7.5 The NSW Department of Health should, as part of its strategic information technology program, ensure that the functionality of clinical information systems includes capacity to produce antibiograms and real time pathology results for clinical care units.

### Infection control capacity

- 7.6 Each Area Health Service should establish an Area Infection Control Committee which includes representatives with expertise in infectious diseases, infection control, microbiology, pharmacy, surgery, clinical governance and clinical improvement strategies, Area administration and other specialist expertise relevant to the management of Area and local infection control issues.
- 7.7 Area Health Service Infection Control committees should assume responsibility for implementation and monitoring of the implementation of the recommendations of the MRO Expert Group.

7.8 Each Area Health Service should establish a coordinating infection control position in addition to designated infection control positions for each healthcare facility.

#### **Specialist infectious diseases physician capacity**

7.9 Each Area Health Service should ensure that arrangements are in place for provision of specialist infectious disease physician support to healthcare facilities to guide the response to healthcare associated infections.

## **8 Environmental cleaning**

8.1 NSW Health should adopt the Victorian Department of Human Services uniform standards, guidelines and audit processes for environmental cleaning standards.

8.2 Area Health Services should report annually to the Director-General regarding environmental cleaning performance based on auditing.

8.3 Area Health Services should resource, review and ensure compliance with the environmental hygiene recommendations as prescribed in the NSW MRO Infection Control Policy and cleaning standards.

8.4 Area Health Services should ensure that the environmental cleaning workforce is sufficient to enable compliance with the uniform standards, guidelines and audit processes for cleaning standards.

8.5 The NSW Department of Health should develop education programs for environmental cleaners which support implementation of the recommended cleaning standards.

## **9 Consultation with healthcare consumers**

9.1 The NSW Department of Health should in collaboration with consumer representatives develop resources which include general information about MROs, current infection rates, and the ways in which consumers can contribute to their control and prevention.

9.2 The NSW Department of Health should explore opportunities for engaging consumers as community educators regarding MROs in healthcare settings.

## **10 Communication with and education of healthcare workers**

10.1 The NSW Department of Health should commission the development of a range of resources and workforce development initiatives for healthcare workers which address their information and skill development needs with regard to MRO control and prevention.

## **11 Area Health Service performance reporting**

11.1 The NSW Department of Health, in consultation with MRO Expert Group, should develop a set of mandatory KPIs for endorsement by the Senior Executive Advisory Board relating to MRO surveillance; establishment of an Area Infection Control Committee; development of local operational policy within the framework of the NSW MRO Infection Control Policy; implementation of screening recommendations for patients and healthcare workers; implementation of cleaning standards; standardised review of MRO BSIs; ring fencing of elective joint replacement units; and systems to monitor and ensure appropriate prescribing of antibiotics.

## **12 Evaluating the framework**

12.1 The MRO Expert Group should develop a protocol for detailed evaluation and monitoring of the implementation of these recommendations in at least one Area Health Service, including assessment of:

- barriers to implementation
- compliance with recommendations
- cost-benefit of measures recommended
- outcome measures
- issues or areas for which additional evidence is needed.

12.2 These recommendations and the MRO Infection Control Policy should be reviewed at regular intervals (at least every 3 years) to ensure that they remain appropriate and are effective in reducing the spread and incidence of MRO infections in NSW hospitals.

## Background

MROs can cause serious illness and avoidable deaths in hospital patients in Australia and other western countries. Reservoirs of MROs include patients and occasionally healthcare workers who are colonised or infected with them; and contaminated objects or surfaces in the hospital environment. MROs are often inadvertently transmitted on the hands of healthcare workers or rarely via droplet transmission eg from a patient with MRSA pneumonia. The reasons for the emergence and persistence of MROs include:

- widespread, potentially life-saving but sometimes inappropriate use of antibiotics over many years
- greater numbers of patients with serious or life-threatening injury or illness, who survive longer because of modern therapy, but are then at increased risk of infection because of it
- inadequate standards of hospital hygiene.

Many MRO infections are preventable. The key elements of prevention are:

- early identification and isolation of patients who are colonised or infected with MROs, to reduce the risk of transmission to others
- reduction in the inappropriate use of antimicrobial agents in order to reduce selective pressure on bacteria in patients' endogenous flora and the environment
- improved compliance with infection control and environmental cleaning protocols to minimise reservoirs and vehicles of transmission of MROs
- continuous surveillance of MRO infections to monitor their incidence and prevalence and evaluate the efficacy of control measures.

All of these elements are needed in an effective program to prevent healthcare-associated infections caused by MROs.

The benefits of reducing MRO infections include:

- a reduction in the number of cases of preventable illness and deaths from healthcare-associated infections among hospital patients.
- a reduction in the length of hospital stay due to avoidable healthcare-associated infection and correspondingly reduced costs of hospital care.
- greater accountability of healthcare professionals and administrators to their patients and the public.
- greater assurance for the community of protection from MRO infections when they encounter the healthcare system.

# 1. Implementation strategy for the key recommendations of the Expert Group on Multi-resistant Organisms

There are several challenges for the implementation of MRO control and prevention policies in NSW and these form the basis for the key recommendations in this report. NSW Health is currently developing an implementation strategy for those recommendations that remain outstanding. The implementation strategy will require a significant commitment of resources from NSW Health to address the current situation where MRSA is endemic in the NSW health system. The recommendations will also have benefits for the control and prevention of other MROs – including vancomycin resistant Enterococci (VRE) and *Acinetobacter baumannii* (MRAB) – which are periodically associated with either colonisation or infections in the healthcare setting and emerging MROs.

## Recommendation

- 1.1 That the NSW Department of Health in consultation with the Expert Group finalise an implementation strategy and timetable for the Group's key recommendations and that the NSW Department of Health and Area Health Services devote the appropriate resources needed to implement the strategy.

## 2. Policy framework for MRO control and prevention

At present guidance regarding the management of MROs in NSW healthcare facilities is limited to the provisions prescribed in *PD2005\_247 Infection Control Policy* which relate primarily to infection control practices and outbreak management. There is detailed literature on MRO management which can be used as the basis for development of a detailed policy specific to MRO infection control and prevention to complement PD2005\_247. The literature promotes the use of contact precautions and patient isolation strategies as key elements of MRO control and prevention.

### Recommendations

- 2.1 That the NSW Department of Health review the literature on MRO management and develop and implement a detailed MRO infection control policy directive which focuses on MRSA.
- 2.2 That all NSW healthcare facilities implement strategies for screening patients at risk of MRSA infection or colonisation on or before admission; and implement contact precautions and isolation whilst awaiting results and for those in whom screening is positive for MRSA.

# 3. MRO surveillance

Surveillance is an essential component and the only rational basis of any communicable disease control program. NSW has had, since 2003, a system of mandatory surveillance of MRO infection and colonisation within the public hospital system. The published results of this surveillance show that MRSA is endemic in many hospitals and vancomycin resistant *enterococci* (VRE), multi-resistant *Acinetobacter baumannii* (MRAB), other multi-resistant Gram negative bacteria (MR GNB) and vancomycin intermediate *Staphylococcus aureus* (VISA) occur sporadically in some but not all hospitals. While the data are preliminary – in that the collection commenced relatively recently – and probably incomplete, they demonstrate that the burden of disease is significant and should be reduced.

The goal of surveillance for MROs is to define and monitor the prevalence of colonisation, infection and the associated disease burden. The effects of control measures – including screening programs – should be monitored regularly and policies reviewed if surveillance indicates that infection and colonisation rates are not improving.

At present the surveillance definitions used for reporting MRO infections are inconsistently applied. The Clinical indicator definitions also allow for reporting of Infections in the same category as colonisations for non-sterile sites. The National Quality and Safety Council's Healthcare Infections Advisory Committee has, since the development of the NSW Health MRO surveillance definitions, released indicator definitions for reporting all blood stream and other significant MRO infections. NSW Health should also ensure that the way in which the definitions are applied captures all MRO infections, irrespective of whatever the patient has been previously reported as colonised, has had another infection with the same MRO or acquired the infection in hospital or in the community. NSW should also adopt nationally agreed definitions to enable valid comparison between jurisdictions. In addition all *Staphylococcus aureus* blood stream infections should be reported in order to monitor the proportion (in addition to numbers per 10,000 occupied bed days) attributable to MRSA.

## Recommendations

- 3.1 Area Health Services must report all healthcare associated MRO blood stream infections (BSIs) for all healthcare facilities as prescribed for the Infection Control Quality Monitoring Program.
- 3.2 NSW laboratories report all *Staphylococcus aureus* BSIs. This should be implemented via the redevelopment of the Notifiable Diseases Database to facilitate electronic notification of infections and infectious diseases.
- 3.3 NSW Health should contribute to the development of a nationally consistent approach to MRO surveillance by adopting the Health Care Associated Infection Advisory Committee (HCAIAC) of the former National Quality and Safety Council definitions.
- 3.4 ICU MRSA acquisition rates should be included in the mandatory Infection Control Quality Monitoring Program indicators.

## 4. MRO screening of patients and healthcare workers

At present there is no consistent approach in NSW healthcare facilities to identification of patients who are colonised with MRSA; and screening of staff is not generally performed. This means that it is not possible to either draw any conclusions regarding prevalence or the efficacy of current control and prevention measures from the existing data.

There are many complexities associated with patient screening programs for MRSA. Multiple swabs from different body sites and repeat positive tests are required to determine whether a patient is either colonised or an intermittent carrier of MRSA. Further, the more screening activity is carried out, the more likely it is that MRSA will be detected. However there is good evidence from European and North American studies that MRSA screening of selected patients is cost-effective in situations with low or high MRSA endemicity.<sup>1</sup> These analyses include the cost of microbiological testing – staff and materials – and contact infection control precautions (additional nursing time and consumables). Active surveillance for MRSA, for example, combined with use of contact precautions where MRSA is identified, has also been demonstrated to be cost-effective in both endemic and outbreak situations.<sup>2</sup>

Recently published guidelines from the United Kingdom,<sup>3</sup> a review of the evidence for interventions for the prevention and control of MRSA commissioned by the UK Department of Health,<sup>4</sup> and Guidelines for the control of Methicillin-resistant *Staphylococcus aureus* in New Zealand,<sup>5</sup> provide a useful framework for development of patient and healthcare worker screening recommendations for NSW. Those documents also provide the evidence base for screening.

In the NSW context, resources should be invested in programs which have the potential to produce the most benefit. It is therefore appropriate to focus on MRSA screening programs for high-risk units and patients – that is intensive care units (ICUs); and elective joint replacement and cardiac and vascular surgery where an infection of any kind, but particularly involving a MRO, can be catastrophic.

Screening of other vulnerable and high risk patients should be undertaken on the basis of local risk assessment and in accordance with the MRO Infection Control Policy which is under development.

To complement screening programs it is necessary to “ring fence” elective joint replacement units by admitting only patients who are found to be negative – either initially, or following successful decolonisation. Ring fencing may also be considered for other units where feasible and possible. Where physical ‘ring fencing’ is not possible in cardiac and vascular surgery units, contact infection control precautions should be used in combination with isolation rooms for patients in whom MRSA has been detected and for those whose status is unknown.

MRSA screening of healthcare workers is recommended only in situations where transmission of MRSA in a unit continues either despite acceptable implementation of all infection control measures or where epidemiological aspects of an outbreak are unusual or if there is evidence of persistent MRSA carriage by staff.

## Recommendations

- 4.1 Patients at high risk of MRSA infection or colonisation, as defined in the MRO Infection Control Policy, should be screened upon admission to hospital or if feasible prior to hospitalisation, eg pre-op clinics.
- 4.2 Elective joint replacement units should be ring-fenced by using MRSA screening and other processes to ensure that MRSA positive patients are detected proactively and strictly isolated throughout the operative process and/or effectively decolonised prior to surgery.
- 4.3 All patients for whom cardiac and vascular surgery is planned should be screened for MRSA colonisation prior to admission to hospital, and patients who are found to be colonised should if possible have their surgery deferred until they have been decolonised. If admission cannot be delayed the patient should be isolated in accordance with the MRO Infection Control Policy. Patients undergoing emergency cardiac or vascular surgery should be screened for MRSA prior to surgery.
- 4.4 All intensive care patients should be screened for MRSA colonisation on admission, weekly during their length of stay in ICU and on separation/ death from ICU.
- 4.5 MRSA screening of healthcare workers is recommended only in situations where transmission of MRSA in a unit continues despite adequate implementation of infection control measures or where epidemiological aspects of an outbreak suggest possible MRSA carriage by staff.

# 5. Clinical improvement program strategies for responding to MROs

NSW Health already has in place an overarching framework for managing the quality of health services in a systematic way. The framework incorporates the quality of clinical care, accountability for the quality of health care, principles for managing the quality of health services, organisational focus for quality activities and reporting, while recognising the essential role of health care professionals in quality improvement. The framework describes the infrastructure needed to facilitate the state-wide coordination, monitoring, evaluation, reporting and feedback on health care quality and establishes a means by which lessons learnt can be shared across the health system. A series of documents have also been produced which guide implementation of the NSW Patient Safety and Clinical Quality Program. Effective MRO control and prevention has already been identified in this document as a patient safety and clinical quality issue which should be addressed within the context of that Program.

## Recommendations

- 5.1 All healthcare-associated MRO BSIs must be reviewed by the relevant Area Health Service Infection Control Committee as soon as possible after diagnosis, according to a standard format developed by the NSW Department of Health, to determine whether they are potentially preventable and to identify specific issues and circumstances that could be improved.
- 5.2 The NSW Department of Health should, in liaison with Quality and Safety Branch and the Clinical Excellence Commission, develop strategies for development and implementation of clinical improvement initiatives which will contribute to MRO control and prevention in NSW Health facilities.

## 6. Use of antibiotic prescribing software systems to reduce inappropriate antibiotic prescribing

One of the main drivers of antibiotic resistance is the use of antibiotics. Although antibiotics are potentially life-saving, their use is sometimes inappropriate, especially in critical care units (intensive care, transplant, surgical), where:

- the majority of patients receive broad spectrum or multiple antibiotics
- antibiotic use is often prescribed without guidance from the laboratory (due to delayed and/or uninformative microbiological results)
- the risk of death from infection is high
- the risk of amplification and spread of MROs is high because isolation of colonised patients is difficult
- the sickest patients are most likely to be treated with antibiotics, to be moved between hospital wards and departments and to have the most diverse and intensive staff contact.

Medical intolerance of risk, fear of litigation, inexperience in managing infections and a poor understanding of the risks all contribute to inappropriate antibiotic use. The challenge is to ensure that all patients who need it receive appropriate antibiotic treatment – including the correct dose and duration – and that antibiotics are not given to patients who do not need them or for unnecessarily long periods. Currently we meet the challenge inadequately.

Antibiotic guidelines abound but are often not followed. Most hospitals have antibiotic prescribing policies that include a list of restricted antibiotics (broad spectrum, 'last resort', likely to induce resistance, expensive or toxic), which can be prescribed only for certain indications or with the specific approval of an infectious diseases physician or microbiologist. These policies are difficult to enforce because the approval process is often time-consuming and administratively and politically difficult – clinicians often resent apparent interference with their practice. Auditing of antibiotic

use is resource-intensive and therefore infrequent; when done, it often shows poor compliance with hospital policies.

In response to these problems, a number of electronic systems have been developed to facilitate on-line access to antibiotic guidelines, decision support systems, a process for authorisation of restricted antibiotics and a continuous auditing system which can identify indications for and frequency of use of individual antibiotics and monitor compliance with policies by individual prescribers. If appropriately implemented, the use of these systems can be associated with a reduction in, and increased appropriateness of, antibiotic use, decreased patient length of stay and a reduction

in associated costs. At least three locally developed systems are currently available in Australia which could be acquired for use in NSW hospitals and used as they are or easily adapted to local use. Such a strategy should be regarded as an interim solution while the NSW Department of Health develops a comprehensive electronic prescribing system for the state.

Even without electronic decision support systems some hospitals achieve good compliance with antibiotic prescribing guidelines overseen by relevant specialists and committees and regular audit and feedback systems.

Decision support systems depend on either relevant microbiological data, which are often not available for critically ill patients, or the use of empiric protocols, informed by surveillance data. It is therefore crucial to provide both high quality decision support and high quality data. Improvements are needed in the timeliness and targeting of data.

Antibiotic prescribing systems will complement, but should not replace, regular bedside consultations with an experienced clinical microbiologist or infectious diseases physician, especially in high dependency units.

## Recommendations

- 6.1 The NSW Department of Health should, as matter of urgency, evaluate the available antibiotic prescribing systems with decision support, registration/authorisation and audit capacity; identify one or more that is suitable for use in NSW hospitals; and facilitate its/their introduction, as soon as possible, in all public acute care facilities.
- 6.2 The NSW Department of Health should ensure that the requirements to support appropriate prescription of antibiotics are prioritised during the development of an electronic prescribing system.
- 6.3 Area Health Service Drug Committees should ensure that protocols for antibiotic prescription are developed in consultation with infectious diseases experts and clinical microbiologists; that they are consistent with the current edition of Therapeutic Guidelines: Antibiotic; and that drug use performance indicators incorporate antibiotic usage rates consistent with Therapeutic Advisory Group (TAG) recommendations.

# 7. Laboratory, infection control and infectious diseases capacity

Detection of MROs via laboratory testing of clinical and screening specimens is a central component of MRO control. The identification of a MRO enables clinical decisions regarding antibiotic use and infection control strategies. There are no dedicated resources allocated for MRO testing in Area Health Services at present, which creates a situation where such testing occurs at the discretion of clinicians from within either clinical or core laboratory funding. The lack of dedicated resources contributes to ad hoc arrangements for MRO testing and subsequently, to an ad hoc approach to the management of MROs. Active screening of selected high risk patients, as recommended above, has resource implications for laboratories – particularly with regard to turn around times for testing and microbiology service capacity. Both funding and expertise need to be addressed and dedicated funding, separate from clinical unit budgets, will be required to be allocated to Areas rather than relying on the discretion of clinical units for funds.

Further characterisation of MROs – such as via typing methods – assists with identification of isolates from a common source and emergence of new types of resistance. Typing is a relatively specialised laboratory activity for which limited dedicated resources are currently available in NSW. Limited access to typing services has been identified as a potential impediment to MRSA management in NSW – both in community and hospital settings. There is not however a consensus regarding either the number of laboratories which should have molecular typing expertise; or the specifications which would need to be applied to ensure that both clinical and epidemiological needs are met. Models which could be considered include either a single reference laboratory with a statewide role or designation of a small number of larger laboratories to support development of expertise and minimum turn around times for results. The existing laboratory network has a valuable role to play in contributing to the development of an appropriate model for the establishment of typing services, as well as standardising case definitions, testing and reporting methodologies.

The current arrangements also contribute to a situation where rapid turnaround of specimens – either via normal laboratory process or via use of technologies which enable rapid identification of the organisms in specimens referred for testing, is not widely available. In certain clinical situations and in outbreak situations timely advice regarding the MRO which is the cause of an infection contributes to more effective management of the patient or the outbreak.

There is also a case to be made for supporting the conduct of research into the development of new and improved screening tests and methods for detecting antimicrobial resistance and virulence factors. The mechanism by which research relevant to NSW can be supported requires further consideration, given the limited availability of resources.

## **Infection Control capacity**

There is good evidence that adequate nursing workforce – including staffing levels and infection control and relevant clinical expertise - is essential for effective responses to MRSA outbreaks.<sup>3,4</sup> There is also evidence that improving nursing staffing levels on wards affected by MRSA may enable improved compliance with infection control policies. In view of this evidence, Areas should ensure that both infection control capacity and nursing capacity generally is sufficient to support recommended MRSA control and prevention initiatives.

## **Specialist infectious diseases capacity**

Infectious diseases expertise is also essential to support appropriate clinical management of all patients for whom antibiotics are prescribed, and those patients who are identified as either infected or colonised with a MRO. It is understood that in rural Areas in particular and at facilities outside Peer Group 1 metropolitan hospitals, access to infectious diseases expertise is limited, thus having implications for clinical management.

## Recommendations

### Laboratory capacity

- 7.1 Selected laboratories should be adequately resourced to enable them to undertake routine MRO testing in NSW according to national guidelines and provide timely results of all tests relevant to the case to the treating clinician.
- 7.2 The NSW Department of Health should, in consultation with the public microbiology laboratory network, develop criteria for identifying laboratories to be specifically resourced to conduct routine MRO screening.
- 7.3 The NSW Department of Health should, in consultation with the public laboratory network, develop criteria for the establishment of MRO typing, including rapid testing, capacity in NSW.
- 7.4 The NSW Department of Health should, in consultation with the public laboratory network, identify research priorities for MRO testing and mechanisms for supporting the conduct of that research.
- 7.5 The NSW Department of Health should, as part of its strategic information technology program, ensure that the functionality of clinical information systems includes capacity to produce antibiograms and real time pathology results for clinical care units.

### Infection control capacity

- 7.6 Each Area Health Service should establish an Infection Control Committee which includes representatives with expertise in infectious diseases, infection control, microbiology, pharmacy, surgery, clinical governance and clinical improvement strategies, Area administration and other specialist expertise relevant to the management of local infection control issues.
- 7.7 Area Health Service Infection Control committees should assume responsibility for implementation and monitoring of the implementation of the recommendations of the MRO Expert Group.
- 7.8 Each Area Health Service should establish a coordinating infection control position in addition to designated infection control positions for each healthcare facility.

### Specialist infectious diseases capacity

- 7.9 Each Area Health Service should ensure that arrangements are in place for provision of specialist infectious disease physician support to healthcare facilities to guide the response to healthcare associated infections.

## 8. Environmental cleaning

There is evidence of transmission of MRSA and other MROs from environmental surfaces. However specific evidence regarding the role of environmental cleaning in minimising the transmission of MROs is variable – possibly because there are very few studies which are able to isolate the contribution of cleaning compared with other control strategies. Nevertheless, cleaning standards are frequently identified as contributors to infection control problems in healthcare settings, and intensive environmental cleaning is acknowledged as an important strategy to allow an area where MRO colonised or infected patients have been managed to be re-opened for admissions.

The current NSW Health Cleaning Standard was published in 1996, and therefore requires updating in a number of important areas. The Victorian Department of Human Services has recently issued *Uniform standards, guidelines and audit processes for cleaning standards*.<sup>6</sup> The Victorian Guidelines are based on environmental management and risk. Each area to be cleaned within a facility is broken down into generic functional areas which are then grouped according to the risks associated with inadequate cleaning in that area. The *Guidelines* also provide a system for auditing and reporting to local quality management programs. Audit results provide a numerical score which can be used as a performance indicator and benchmarked. Rather than investing in the development of a completely new standard for NSW the Victorian *Guidelines* can be adopted for use in NSW.

### Recommendations

- 8.1 NSW Health should adopt the Victorian Department of Human Services uniform standards, guidelines and audit processes for environmental cleaning standards.
- 8.2 Area Health Services should report annually to the Director-General regarding environmental cleaning performance based on auditing.
- 8.3 Area Health Services should resource, review and ensure compliance with the environmental hygiene recommendations as prescribed in the NSW MRO Infection Control Policy and cleaning standards.
- 8.4 Area Health Services should ensure that the environmental cleaning workforce is sufficient to enable compliance with the uniform standards, guidelines and audit processes for cleaning standards.
- 8.5 The NSW Department of Health should develop education programs for environmental cleaners which support implementation of the recommended cleaning standards.

# 9. Consultation with healthcare consumers

Healthcare consumer understanding of MRO infections and their management in the healthcare setting is critical to successful control and prevention. The provision of regular, accurate and timely information to consumers and engaging them in the response is therefore essential.

## Recommendations

- 9.1 The NSW Department of Health should in collaboration with consumer representatives develop resources which include general information about MROs, current infection rates, and the ways in which consumers can contribute to their control and prevention.
- 9.2 The NSW Department of Health should explore opportunities for engaging consumers as community educators re MROs in healthcare settings.

# 10. Communication with and education of healthcare workers

An informed and well resourced health workforce ensures an effective MRO control and prevention program. Information is currently provided to healthcare workers via policy directives issued by the NSW Department of Health and an ad hoc range of workforce development initiatives. A range of resources and a coordinated program of workforce development initiatives will be required to ensure that healthcare workers have the information and the skills to support implementation of the measures necessary to control and prevent MROs.

## Recommendations

10.1 The NSW Department of Health should commission the development of a range of resources and workforce development initiatives for healthcare workers which address their information and skill development needs with regard to MRO control and prevention.

# 11. Area Health Service performance reporting

The support and leadership of Area Chief Executives is essential to the successful implementation of strategies to control and prevent MROs. A set of mandatory key performance indicators (KPIs) against which Area Chief Executives report annually should be developed to monitor implementation of the recommended approach to MRO control and prevention. The KPIs should relate to MRO surveillance; establishment of an Area Infection Control Committee; development of local operational policy within the framework of the NSW MRO Control and Prevention Policy; implementation of screening recommendations for patients and healthcare workers; implementation of cleaning standards; standardised review of MRO BSIs; ring fencing of elective joint replacement units and cardiovascular surgery units; and systems to monitor and ensure appropriate prescribing of antibiotics.

## Recommendations

11.1 The NSW Department of Health, in consultation with MRO Expert Group should develop a set of mandatory KPIs for endorsement by the Senior Executive Advisory Board relating to MRO surveillance; establishment of an Area Infection Control Committee; development of local operational policy within the framework of the NSW MRO Infection Control Policy; implementation of screening recommendations for patients and healthcare workers; implementation of cleaning standards; standardised review of MRO BSIs; ring fencing of elective joint replacement units; and systems to monitor and ensure appropriate prescribing of antibiotics.

# 12. Evaluating the framework

In accordance with good practice with regard to program management and implementation and in view of the significance of the recommendations which have been made to guide the NSW response to MROs compared with current infrastructure and policy, the resource implications of these recommendations and the intended outcome of a reduction in MRO incidence and prevalence in NSW Health facilities, a detailed evaluation is essential.

## Recommendations

- 12.1 The MRO Expert Group should develop a protocol for detailed evaluation of the implementation of these recommendations in at least one Area Health Service, including assessment of:
  - barriers to implementation
  - compliance with recommendations;
  - cost-benefit of measures recommended
  - outcome measures
  - issues or areas for which additional evidence is needed.
- 12.2 These recommendations and the MRO Infection Control Policy should be reviewed at regular intervals (at least every three years) to ensure that they remain appropriate and are effective in reducing the spread and incidence of MRO infections in NSW hospitals.

# References

- <sup>1</sup> Wernitz, Keck, Swidinski et al, *Clin Microbiol Infect* 2005; 11:466-471.
- <sup>2</sup> Karchmer TB, et al, Cost-effectiveness of active surveillance cultures and contact/droplet precautions for control of methicillin-resistant *Staphylococcus aureus*, *Journal of Hospital Infection Control* (2002) 51:126-32.
- <sup>3</sup> Coia JE, Duckworth GJ, Edwards DI et al Guidelines for the control and prevention of methicillin resistant *Staphylococcus aureus* (MRSA) in healthcare facilities, *Journal of Hospital Infection Control* (2006) 63S, S1-S44
- <sup>4</sup> Loveday HP, Pellowe CM, Jones SRLJ and Pratt, RJ *A systematic review of the evidence for interventions for the prevention and control of methicillin-resistant Staphylococcus aureus (1996-2004): report to the Joint MRSA Working party (Subgroup A)*. *Journal of Hospital Infection Control* (2006) 63S, S45-S70.
- <sup>5</sup> Ministry of Health, *New Zealand Guidelines for the control of Methicillin-resistant Staphylococcus aureus in New Zealand* 2002.
- <sup>6</sup> *Cleaning standards for Victorian public hospitals 2000*. Revised February 2005 (<http://www.health.vic.gov.au/ideas/downloads/infcon/vicclean.pdf>).



