

# MRSA screening of nursing home residents admitted to hospital on the NSW Central Coast

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## Abstract

*Nursing home facilities have been reported as reservoirs for organisms with multiple resistance, the primary one being methicillin-resistant Staphylococcus aureus (MRSA). In view of this, Central Coast public hospitals adopted a policy requiring screening of all nursing home residents for MRSA upon admission to hospital. This prospective cohort study was conducted to assess the need for this routine screening regimen.*

*Admission screening of nursing home residents detected MRSA colonisation in 3 per cent of the final study group (n=100). Residents who were receiving antibiotics at the time of admission or prescribed antibiotics within 48 hours of admission were excluded from the final results. The results influenced a change in policy; nursing home residents are no longer routinely screened on admission.*

## Introduction

Methicillin-resistant *Staphylococcus aureus* (MRSA) is an organism which engenders varying degrees of controversy and debate among infection control observers and policy makers. Broadly speaking, two schools of thought exist. One is supportive of rigorous management measures to attempt to control the organism<sup>1,3</sup>, and the other suggests that a less stringent approach should be adopted<sup>4,6</sup>.

Most observers, however, agree that effective control of this organism requires active, targeted screening of groups at high risk for MRSA, together with the possibility of isolation during hospital admission<sup>7</sup>. High risk groups include those patients with a previous history of MRSA, patients transferred from tertiary teaching hospitals and patients from nursing homes.

Numerous studies, mainly conducted in the United Kingdom and United States, have concluded that nursing homes are reservoirs for MRSA, with colonisation and infection rates varying between 9 and 53 per cent<sup>8-11</sup>. A recent point

prevalence study of South Australian nursing homes showed that 10 per cent of residents were positive for MRSA<sup>12</sup>. Knowledge of the MRSA rate in local nursing homes may therefore be beneficial in the formulation of appropriate hospital policies relating to MRSA admission screening. It may also provide important information in relation to empirical therapy for people admitted to hospital from nursing homes.

Central Coast Health (CCH) consists of a large teaching hospital and three smaller 'group' hospitals, collectively serving as a catchment for patients from 17 nursing homes. CCH had identified patients with previous MRSA infection/colonisation as a high risk group requiring screening on admission to hospital<sup>13</sup>. In addition, patients admitted from tertiary referral hospitals and nursing homes within the Central Coast geographical area were also required by local policy to have 'screening' swabs of the nose, perineum and any wounds collected at the time of admission.

However, the prevalence of MRSA in the latter group was

unknown due to issues with policy compliance. This study was undertaken to determine whether nursing home residents should continue to remain classified as a high-risk group requiring MRSA screening.

The authors chose to study patients admitted to hospital from nursing homes as opposed to conducting a point prevalence study in nursing home facilities. It was considered that this approach would more accurately reflect the level of MRSA in nursing home residents with physical conditions that required hospitalisation. The results would assist in determining policy direction specific to the authors' acute hospital setting.

## Methods

A cohort study was conducted prospectively for a period of 19 months. Patients from nursing homes were identified via a daily computer print out obtained from the Admissions Department.

The majority of patients included in the study were admitted to the large teaching hospital of CCH during the study period. Patients known to be colonised with MRSA were excluded from the data collection. Those patients receiving antibiotics were also excluded due to the potential for antibiotic therapy to reduce detection of MRSA skin colonisation depending upon the type of antibiotic administered.

Informed consent was obtained from the patient prior to screening swabs being collected. Within 48 hours of admission, swabs from both nares, the perineum and any existing wounds were collected 'dry' and then placed in 1ml of Amies bacterial transport medium (Copan).

The sensitivity of screening both the nose and perineum to detect MRSA among known carriers has previously been identified as 93.4 per cent, surpassed only by the addition of a throat swab<sup>14</sup>. Culturing both nares provides a 7 per cent greater recovery yield than the culture of a single nare<sup>15</sup>.

The moistening of swabs has no documented recovery advantage over a dry swab but may be less irritating to the subject<sup>15</sup>. The authors considered that by requesting 'dry' swabs, greater compliance with the collection process would be achieved as it would be less time consuming. The collected specimens were processed in the CCH microbiology laboratory by standard technique.

Nursing staff allocated to care for patients meeting the criteria for MRSA screening were responsible for the collection of the screening swabs. Despite the procedure for specimen collection being accessible in the relevant procedure manual, the authors provided a careful explanation of the screening procedure to each staff member to improve the uniformity and accuracy of the collection process. An information leaflet outlining the technique for obtaining nose and perineal swabs was distributed as an adjunct to the verbal explanation provided to nursing staff.

Hospital MRSA rates and MRSA from patients in the general community were also assessed during the study period to place the screening results of nursing home residents into perspective and assist the development of a screening policy. Hospital MRSA rates were measured using the proportion of all hospital *Staphylococcus aureus* isolates demonstrating Methicillin resistance. Community MRSA rates were collected as incidence rates (determined by opportunistic cultures) of newly identified MRSA isolates in hospital admissions from the general community.

## Results

A total of 100 patients were screened in accordance with the above criteria (61 females and 36 males). Those patients who were screened twice were done so on separate admissions. The total number of individual swabs collected during the study period was 252.

Residents from 17 nursing home facilities were represented. All were greater than 65 years of age. All but one of the patients had previously been admitted to CCH. The length of time between the last discharge and current admission ranged from 1 month to 6 years.

Three patients (3 per cent) admitted from nursing homes had positive MRSA screens on admission to hospital. Details of the three patients, all of whom were female, are as follows:

- Patient 1 had a positive nasal swab only and had previously been admitted 5 months earlier for a period of 2 days for a blood transfusion.
- Patient 2 had a positive nasal swab only and had previously been admitted 3 months earlier for a period of 9 days for investigation of abdominal pain.
- Patient 3 had a positive urine culture, positive supra pubic catheter (SPC) site and positive perineal swab. The patient had previously been admitted 1 month earlier for a period of 21 days for orthopaedic surgery. Insertion of

the SPC was performed 2 days prior to screens being collected.

None of the three had been recently admitted to the ICU. Patients 1 and 2 had not received antibiotics on the previous admission while patient 3 had received prophylactic post-operative antibiotics for a period of 3 days. All three were admitted from different nursing homes.

MRSA comprised 25 per cent of all *Staphylococcus aureus* isolates in the Central Coast laboratory over the study period. The incidence of new MRSA colonisation/infection from general community admissions was 0.3 per cent.

## Discussion

Although a direct comparison cannot be made, the percentage of nursing home residents with MRSA on admission to CCH hospitals (3 per cent) is lower than the rate (10 per cent) noted in the prevalence study conducted in South Australian nursing homes. The MRSA rate among residents in this study was also lower than rates observed in the aforementioned American and British studies.

It was anticipated that the results of this study would have identified a higher number of MRSA cases in keeping with the available literature and warrant continuation of the screening regime. Instead, the results reflect local variation in MRSA prevalence among nursing home populations.

No attempt was made to determine whether the MRSA in the three patients described above was acquired in their nursing home residence or during a recent hospitalisation. In their study, Mulhausen *et al.*<sup>16</sup> identified hospitalisation within the prior 6 months as a risk factor for MRSA colonisation. Due to the timeframe between admissions for the three patients described above, it may be hypothesised that the organism was acquired during hospitalisation rather than in the nursing home.

## Conclusion

In view of the lower than expected level of MRSA identified in residents presenting for hospital admission from local nursing homes, members of this group are no longer routinely screened upon admission to Central Coast hospitals. It is considered a strong possibility that MRSA, if present, will be identified via other routine microbiological testing often performed during admission to facilitate clinical diagnosis.

However, having instigated this change in policy, it is the intention of the infection control department to periodically monitor nursing home residents admitted to hospital to determine whether a further review is required.

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