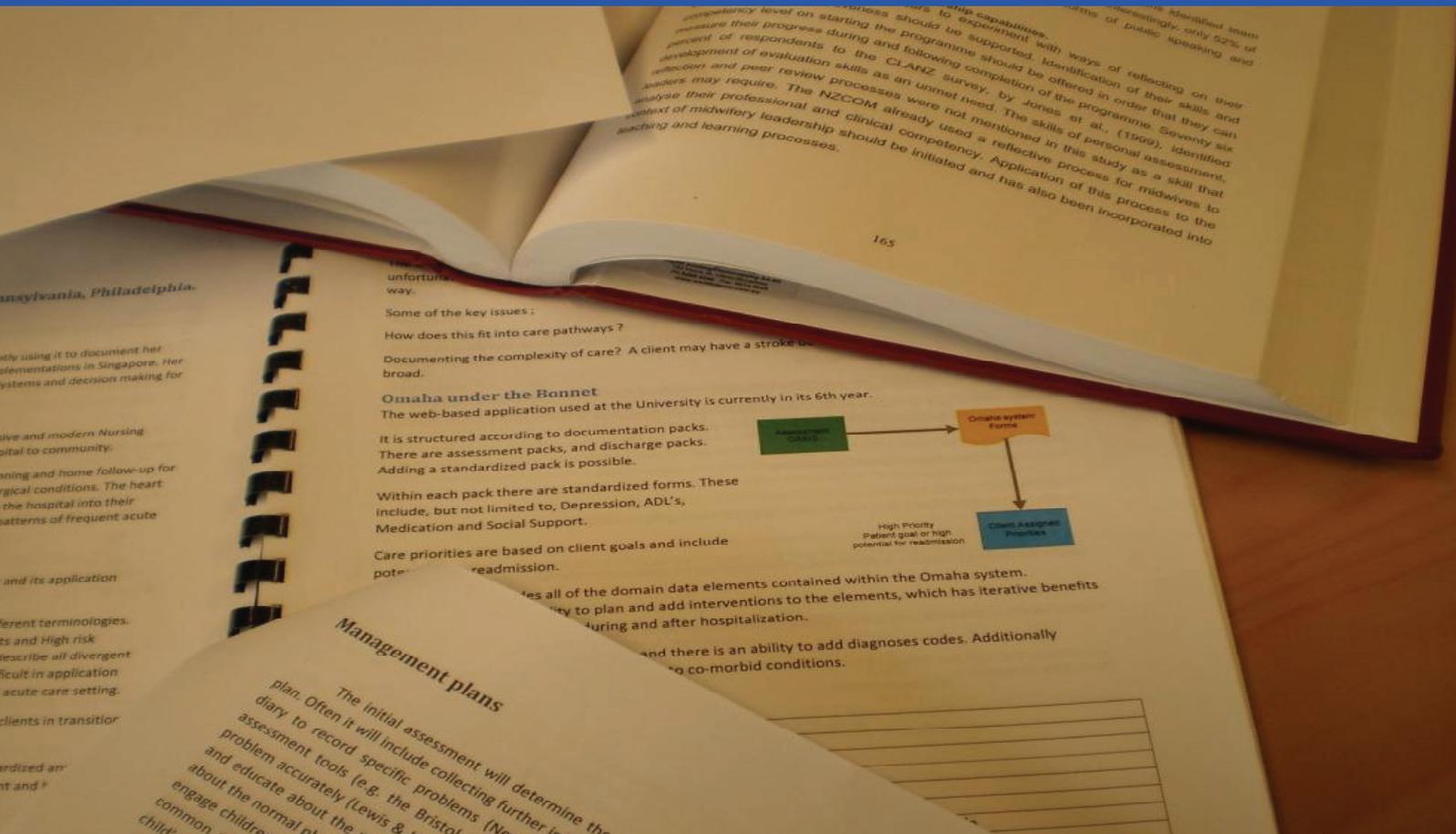


Clinical audit as a method of validating or refuting nurses' 'intuition' about the efficacy of care options for patients in the community with acute cellulitis



Clinical audit as a method of validating or refuting nurses' 'intuition' about the efficacy of care options for patients in the community with acute cellulitis

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Nurse Maude and the NZ Institute of Community Health Care

Nurse Maude, is a community based health service provider, located in Christchurch, New Zealand. The service was established more than 100 years ago as a district nursing service. In 2009, it has a staff of 218 nurses and 631 health care workers who offer extensive nursing and home care services throughout Canterbury. They receive about 1,200 referrals per month into their service from a variety of sources, including hospitals, medical specialists and general practitioners. These services are aimed at supporting people with either short term or long term health problems to stay in their homes during episodes of health care need. Nurse Maude also offers specialist nursing services, which include continence, stomal, diabetes, wound management, acute demand and palliative care. These services are provided either in the patient's home, on-site or for hospital in-patients.

In mid 2007, the Nurse Maude Foundation seeded funding for the establishment of a research centre, the New Zealand Institute of Community Health Care. The Institute was designed to provide advice and support for nurses interested in developing and completing clinical research with a focus on improving health outcomes for consumers of community health services. The Institute has a Director, Administrator and Research Nurse to provide research services for Nurse Maude staff. The centre has developed collaborative research partnerships with tertiary education providers and with external researchers. The Institute is also involved in consultancy work to support workforce and service development and professional development. These activities are designed to foster a centre of excellence for research and development projects that will lead to tangible improvements in community health care.

Foreword

Clinical intuition can be a great thing and nurses often pride themselves on 'just knowing' how to address a particular problem. This is a great asset when based on years of experience combined with a thorough and up to date knowledge of the best available evidence on which to base one's practice.

Unfortunately, on one hand, whether it is due to lack of time or inclination, some concepts held dear to the heart really do not have much evidence base at all, and on the other it is hard to demonstrate the rationale for what seems to be a successful intervention.

The NZ Institute of Community Health Care was founded with the intent of informing practice through evidence, and in their support of this analysis by Sandi Evans and Chris Hendry shows how research targeted at improving service provision really can change the accepted approach for the better.

At the Ministry of Health we are keen to support both innovatory and high quality practice and are pleased to be able to assist in dissemination of this report.

Dr Mark Jones
Chief Nurse

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Introduction

Nurse Maude, is a community based health service provider, located in Christchurch, New Zealand. The service was established more than 100 years ago as a district nursing service. It currently has a staff of 218 nurses and 631 health care workers who offer extensive nursing and home care services throughout Canterbury. They receive about 1,200 referrals per month into their service from a variety of sources, including hospitals, medical specialists and general practitioners. These services are aimed at supporting people with either short term or long term health problems to stay in their homes during episodes of health care need.

In mid 2007, the Nurse Maude Foundation seeded funding for the establishment of a research centre, the New Zealand Institute of Community Health Care, which was designed to provide advice and support for nurses interested in developing and completing clinical research with a focus on improving health outcomes for consumers of community health services. This paper describes the role of Nurse Maude registered nurses in initiating and conveying the outcomes of an audit into the treatment of patients in the community with acute cellulitis, which led to a change in nursing assessment and treatment. This project, supported by the Institute, ultimately led to more extensive research into the care and treatment in the community of patients with acute cellulitis.

Context of the service

Over the years, Nurse Maude has worked closely with the Canterbury District Health Board (CDHB) to explore strategies to minimise hospital admissions. When a review of Acute Demand and After Hours services was initiated in 2006, Nurse Maude was involved in advising on approaches to community based service delivery that had the potential to alleviate the continuing pressure on Christchurch Hospital Emergency Department (ED) and acute hospital services.

In mid 2007, Nurse Maude, in partnership with St John Ambulance Service and Pegasus Health (IPA) established the Acute Demand Service. This service provides medical and nursing care to patients who would otherwise have been admitted to hospital for treatment or presented to the ED for assessment. The aim of the service is to support general practice to safely manage people in the community during an acute episode, reduce inappropriate ED attendance, reduce hospital admissions, and support the transfer of patient care from the ED, the Acute Medical Assessment Unit and Surgical Assessment Review Area (SARA) in Christchurch Hospital.

St John coordinate all the referrals to Acute Demand Service, which have risen steadily since the service commenced, to about 1000-1200 per month after the first 12 months. While the majority of patients are seen and managed by their GPs, an average of 250 of these patients per month, are referred on to the acute community nursing team to be assessed and treated in the home. The service runs between 0700 to 2300, seven days a week, and monthly referrals to this team

are increasing as the service becomes more established and the nurses are developing trusting relationships with hospital clinicians and GPs.

One of the key services provided by the acute community nursing team is an intravenous antibiotic programme for patients with acute cellulitis that would normally require treatment in hospital.

Acute cellulitis in the community

From January – March 2008, of the 600 patients referred to the nursing team, 213 (35.5%) required IV antibiotic treatment for acute cellulitis. An observation made by nurses leading up to this period was that there seemed to be a pattern in the patients who responded better than others to treatment at home. They were particularly interested in the differences between the patients that were discharged from the service within 3 – 5 days and those requiring extended treatment. How could outcomes for more patients be improved and could the hospital admission rate be further reduced?

Two of the nurses approached the New Zealand Institute of Community Health Care for advice on how they could explore these issues. The service expected the duration of IV antibiotic treatment to last 3 – 5 days, with only some patients requiring treatment beyond 5 days. The nurses felt that patients who had an increased burden of self care (such as those living alone or the elderly) and obese patients were more likely to have poorer outcomes leading to admission. They also believed that for some patients an alteration in treatment regime could improve treatment and reduce lengthy treatment and hospitalisation.

In the community, cellulitis is thought to be relatively common, but there is little published data on the incidence (Kilburn, Featherstone, Higgins, Brindle & Severs, 2003). One study found the incidence ranged from 4 to 25 cases per 10,000 persons in the over 65 age group (Haan, 1997, cited in Kilburn et.al., 2003). Another study found the incidence across all age groups to be 199 per 100,000 persons (McNamara, et. al., 2006). While there are some seasonal fluctuations, cellulitis constituted just over a third of the acute care nurses caseload. What were some of the features of these cases? How could the nurses personalise treatment more effectively?

Protocol for treatment and review of patients with cellulitis

The Acute Demand Service receives referrals from general practitioners in Canterbury, to administer in the home IV antibiotics to patients with acute cellulitis who would otherwise be admitted to hospital for this treatment. The protocol for treatment guides the nurses' decision making on continuation of treatment and /or admission to hospital.

If the patient responds well at any point within the first 5 days, the patient is referred back to the GP by the nurse for oral antibiotics. If the patient is slow to respond, has little response or their condition worsens, the nurse refers to either the GP or the service's Medical Director for a review of treatment. In a small number of cases the patients' condition has led to an admission to hospital. If the patient is still on IV antibiotics a review of treatment takes place at 5 days. All patients continuing with treatment beyond 5 days require approval from the service's Medical Director. This is based on the patient's response to treatment.

Clinical audit process

Discussion with the nurses and with the clinical director of the service led to the decision that completion of a clinical audit on specific features of the client group and outcomes would provide the most useful evidence of the nurses' theories. The use of standardised assessment documentation and computerised data collection allowed a retrospective audit of cellulitis patients to be completed. Because the nurses wanted to follow a formalised research process and publish results of their findings, application was made to the Regional Ethics Committee, however, this was deemed as unnecessary, because the patients would be de-identified in the process.

To complete the audit, indicators needed to be identified that would allow the nurse's theory to be explored. Following a review of literature on cellulitis treatment and care outcomes and a review of data captured at point of care on these patients, the following indicators were chosen as a basis for the audit of patient records:

- Sex of the patient
- Age
- Weight
- Living situation (alone or with others)
- Medical co-morbidities
- Type of antibiotic treatment and length of treatment
- Service outcome (discharge or admission to hospital)

As the service had just commenced in July 2007, it was decided that the first 3 months of 2008 would be the best months for the retrospective audit. This involved identifying all the cellulitis patients who had been admitted to the Acute Demand Nursing Service for this period and retrieving their electronic and hard copy records. This was done by the two Nurse Maude nurses. In total 213 client records were eligible for the audit.

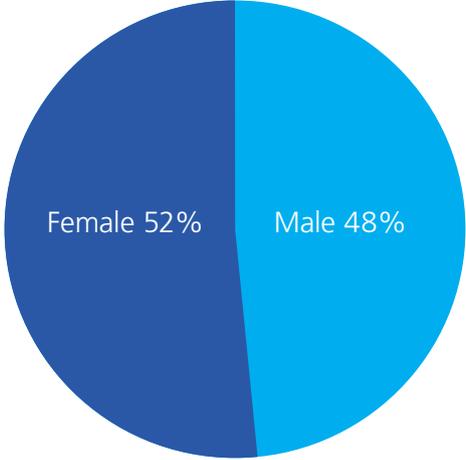
Audit Results

Patient profiles

1. Sex of patients

Of the 213 patients who were referred to the service, there were slightly more females than males.

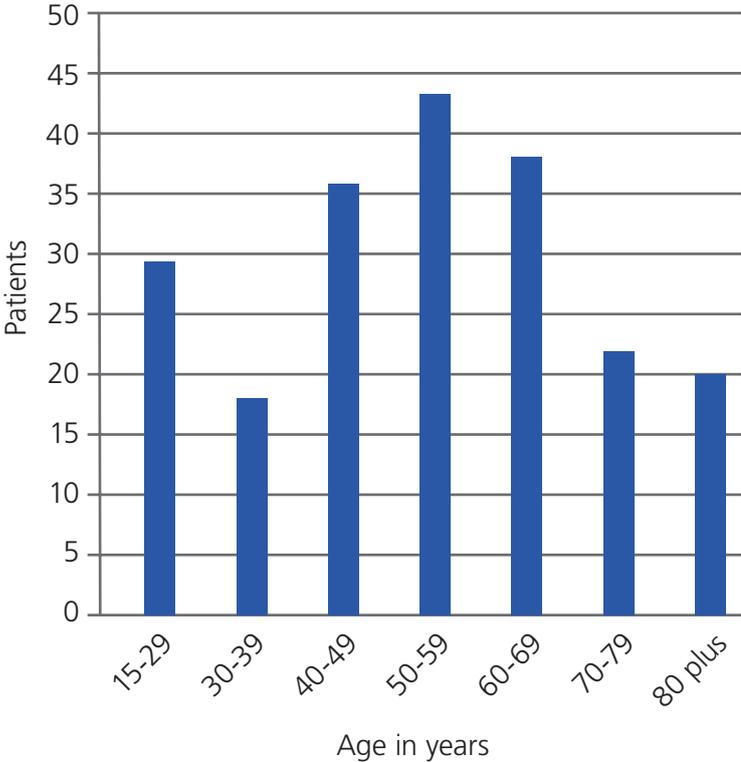
Figure 1. Sex of patients



2. Age in years

The average age was 52 years of age, with the majority of patients under 60 years of age (61.5%).

Figure 2. Patient age

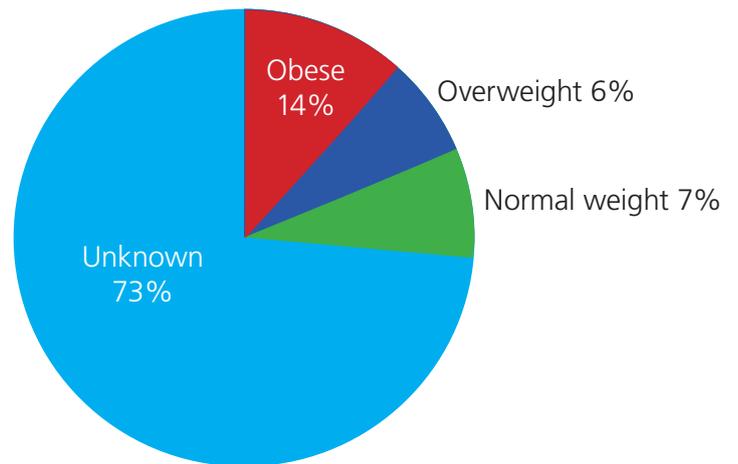


3. Patient weight

As only patients over the age of 65 years were weighed to calculate the drug dosage, almost three quarters of the patients have no weight recorded.

Of those who did, the majority were classified as overweight or obese.

Figure 3. Patient weight

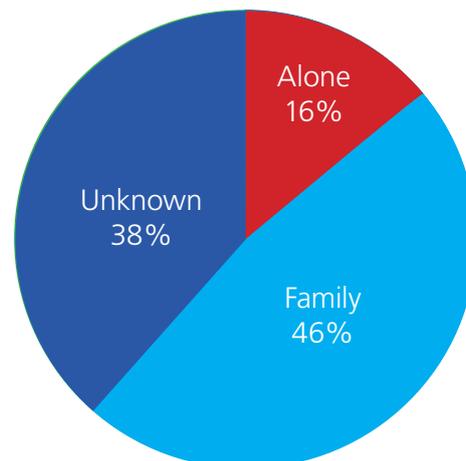


4. Living situation

There were also a number of patients who did not have their living situation noted.

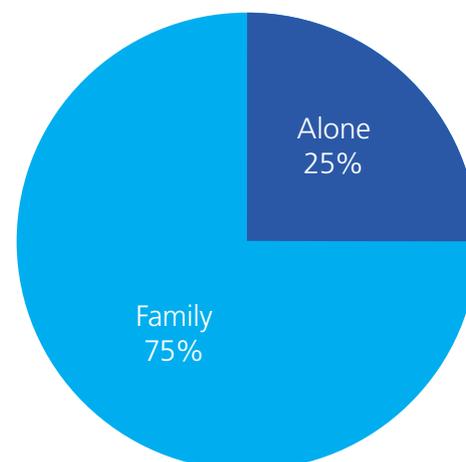
Of the total, the majority lived with family/others in the home.

Figure 4. Living situation



Of those who did have their living situation recorded, one quarter lived alone.

Figure 5. Living situation



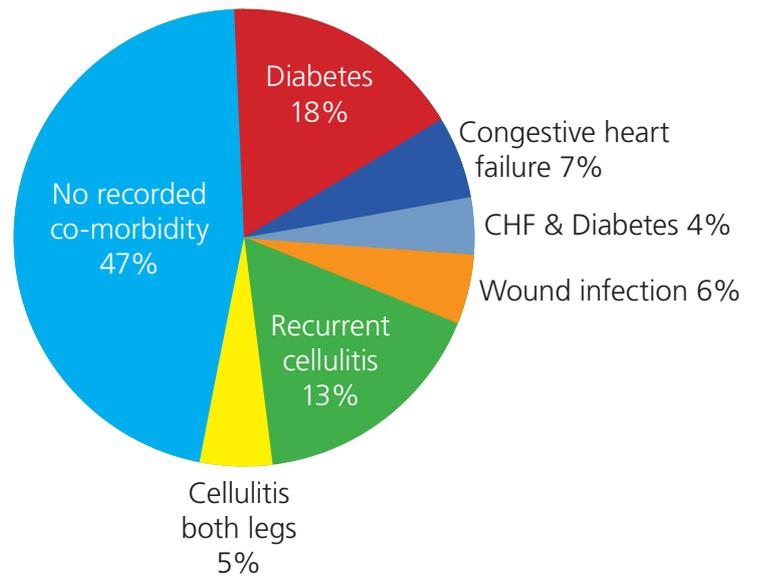
5. Medical co-morbidities

Almost half of all patients (100) had co-morbidities recorded.

Diabetes and recurrent cellulitis were the most common.

The incidence of diabetes in this audit (18%) was higher than the 9.1% of referrals with cellulitis and diabetes in the Counties Manukau region from 2003 - 2005 (Barker, Bryant & Aish, 2006).

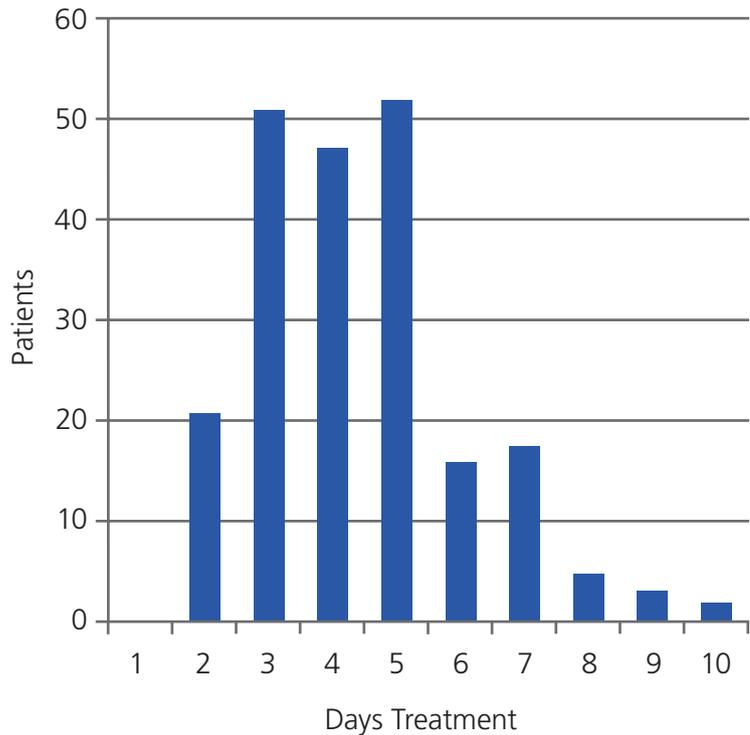
Figure 6. Co-morbidities



6. Number of days of IV antibiotic treatment

For patients with cellulitis the expected duration of IV antibiotics administered at home is 3-5 days. Treatment over five days or an admission to hospital is considered a negative outcome. Those who need treatment over five days are considered to be 'delayed healers'.

Figure 7. Number of days IV antibiotic treatment



7. Care outcomes

Of the 213 patients, IV antibiotic treatment length ranged from 3 - 5 days or from 5 - 10 days. 81.5% of the group required 3 - 5 days of antibiotic therapy, whilst 18.5% needed treatment for 5 - 10 days. Of the total cohort, 7 patients were eventually admitted to hospital for cellulitis related treatment.

Profile summary

Data captured on acute cellulitis patients receiving treatment at home who avoided hospitalisation, presented a profile of relatively equal numbers of males and females, living with others in the home. They had an average age of 52 years, with those over aged 65 years, likely to be above normal weight. Just under fifty percent of all cellulitis patients had some co-morbidity. They received IV antibiotic treatment at home for between 3 and 5 days. Eventually 7 required hospitalisation.

A review of the profile data available did pose a number of questions, such as:

- Were people living alone more likely to have been admitted to hospital rather than referred to the service for treatment in the home?
- Were men more likely to be admitted to hospital than women?
- What impact did some of these features profiled have on treatment lengths and care outcomes?

The data obtained at this preliminary 3 month audit did enable the last question to be explored further.

Patient profiles and care outcomes

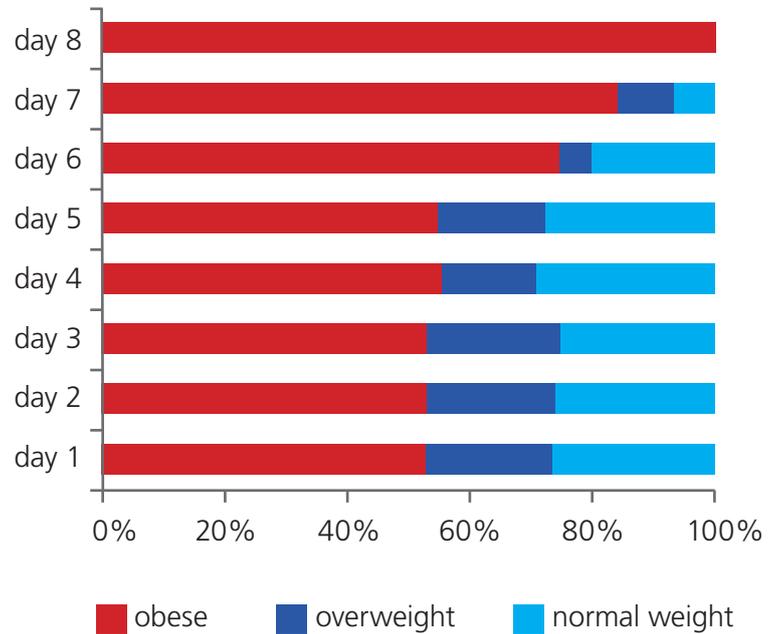
1. Patient's weight

Obesity is a known risk factor for cellulitis (Dupuy, et.al, 1999). At the time of the audit, the cellulitis protocol required patients over 65 years to be weighed to ensure the IV antibiotic dose was appropriate.

Of the 57 patients whose weight was recorded, patients classified as obese required treatment for the longest period of time, followed by the patients classified as overweight.

This audit flagged the need to weigh all patients as nurses' anecdotal experience indicated that other seemingly overweight patients under 65 years, also required longer treatment.

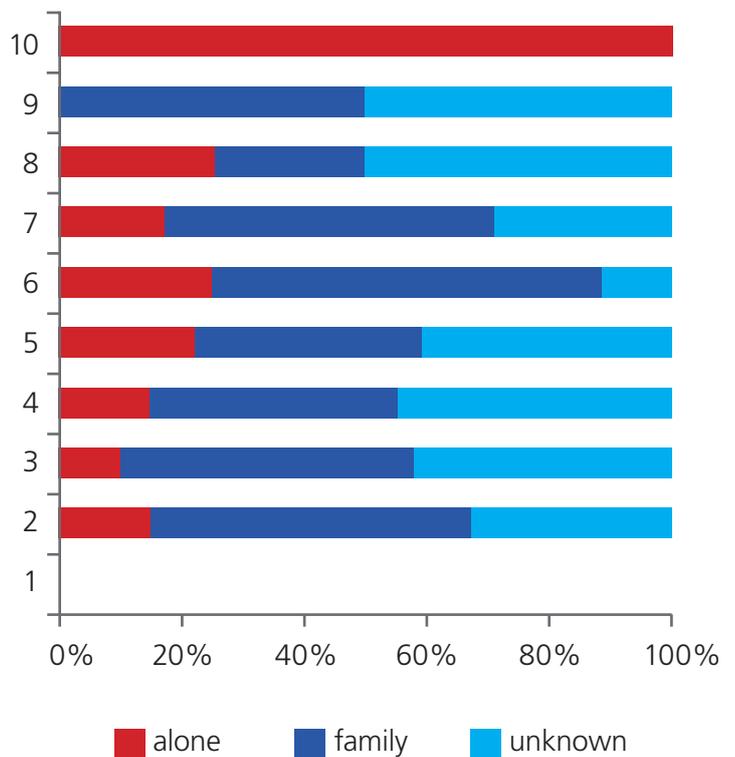
Figure 8. Comparing outcomes of known weights



2. Patient's living situation

Analysis of the living alone compared with other groups did not seem to indicate a difference in treatment length. This is likely due to the small number of patients who were reported as living alone (33 patients).

Figure 9. Days of treatment by living situation

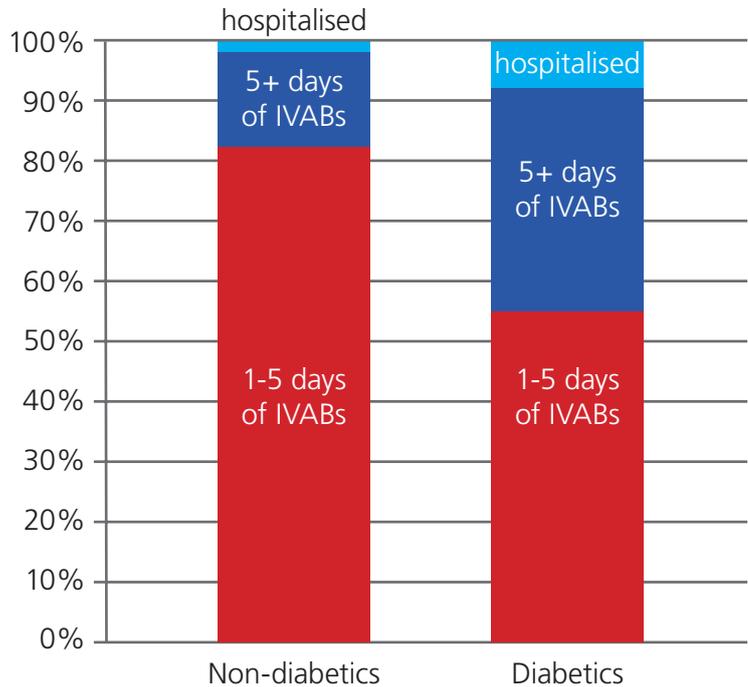


3. Patients with diabetes

There were 38 (18%) patients in the audit who were recorded as having diabetes.

When compared with the non-diabetic patients, the diabetics had longer treatment and made up most of those admitted to hospital.

Figure 10. Days of treatment for diabetic patients

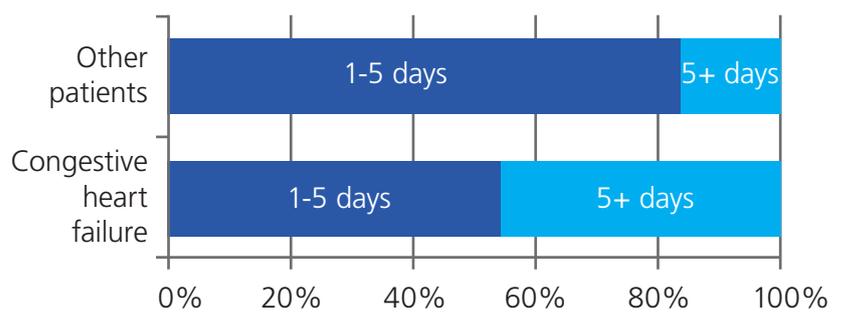


4. Patients with congestive heart failure

There were 24 patients who were reported as having congestive heart failure.

More of these patients received longer treatment, (44%), compared with those who were not reported as having congestive heart failure, of whom only 17% received more than 5 days IV antibiotic treatment in the home.

Figure 11. Days treatment for patients with CHF compared with others

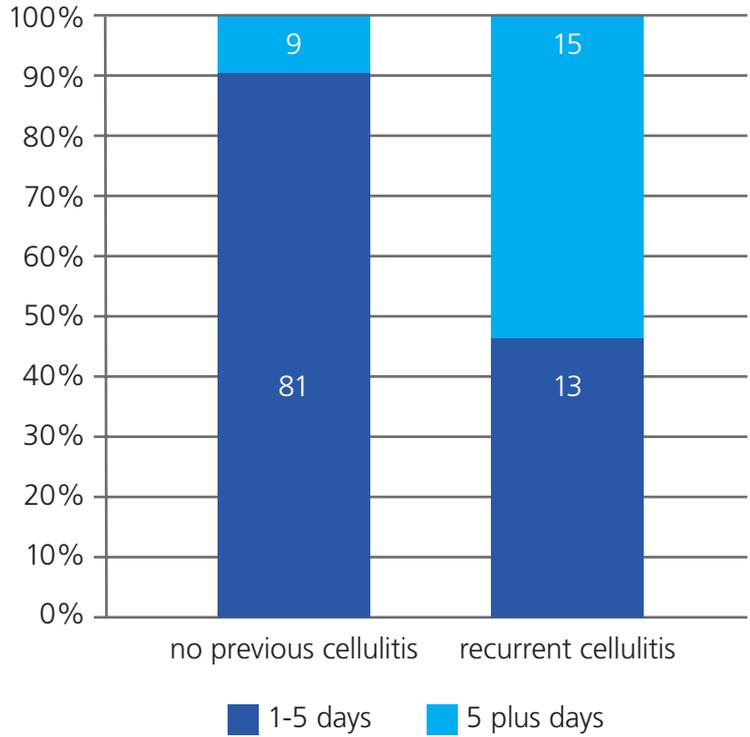


5. Patients with recurrent cellulitis

In total 28 patients had recurrent cellulitis and the audit demonstrated that these patients required longer IV antibiotic treatment.

While this group represented 13% of all acute cellulitis patients, they represented 54% of those requiring treatment for more than 5 days.

Figure 12. Days of treatment for patients with recurrent cellulitis

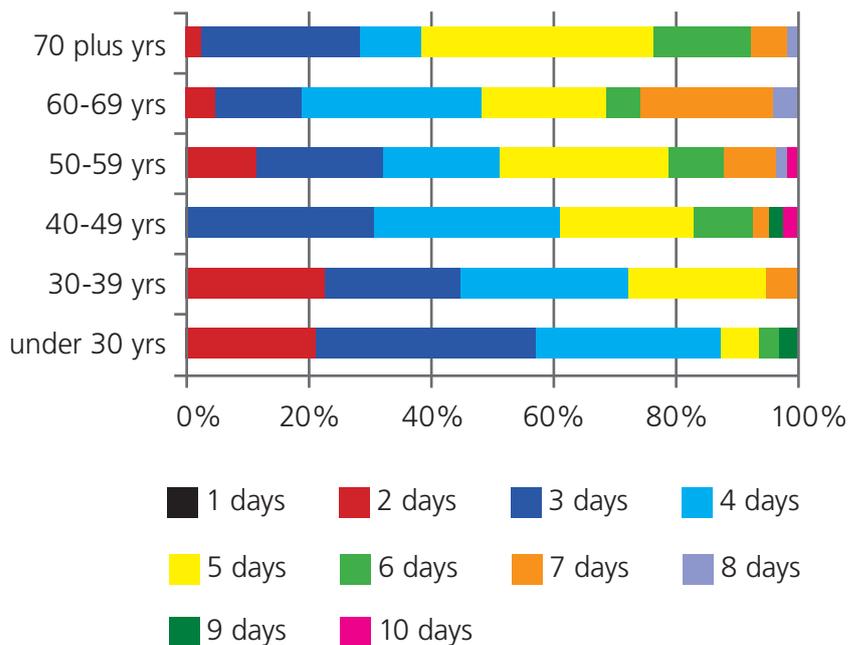


6. Length of treatment by age of patients

Figure 13 demonstrates an increase in length of treatment as the age of patients increase.

About half of patients aged under forty years received less than 4 days treatment.

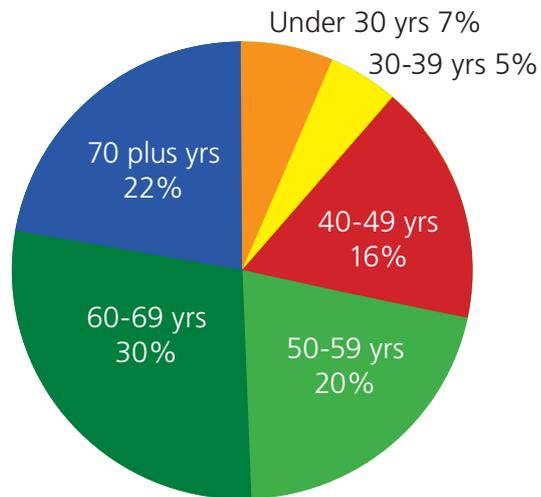
Figure 13. Days of treatment by patient's age



There appeared to be a steady increase in the proportion of patients requiring treatment of five or more days with IV antibiotics, as the patients' age increased.

Those over the age of 50 years, made up 72% of those requiring more than 5 days treatment.

Figure 14. patients requiring more than 5 days treatment



Patient profiles and care outcomes summary

This audit identified patient groups who were more likely to require longer or more intensive treatment for their cellulitis. These patients included those who:

- were overweight,
- had recurrent cellulitis
- had co-morbidities, such as diabetes and congestive heart failure
- were aged over 50 years.

This initial audit did not identify patients living alone as requiring more treatment, however, the numbers were small and 38% of the cohort did not have their living situation reported.

Impact of this audit on practice and service changes

Data capture

One of the most significant factors identified early in this audit, was the need to review and standardise information on patients within the service. The Acute Demand Service was an amalgamation of two services, with each using their own hard copy documents for referral to the service and to gather information on the patient at first assessment. The audit process identified the gaps in this process and fast tracked the development of jointly developed documentation that included a broader range of information on each patient (including living situation). Attempts had been made previously to come up with a suitable template, but the audit gave more traction to this process within a collaborative environment.

The assessments that nurses undertook in the home were informed by the referrals the service received. The audit revealed gaps in information from referrals which has subsequently been addressed.

Ultimately, the nursing assessment tool was strengthened to capture relevant data on: weight, height, co-morbidities, chronic leg ulcers, blood sugar level, deep vein thrombosis, recurrent cellulitis and risk factors for MRSA.

Patient assessment

The nurses who completed the audit realised the importance of specific co-morbidities on patient outcome, particularly diabetes. As a result, the nurses now complete a routine blood sugar on all patients referred to the service with cellulitis and have subsequently identified a number of previously undiagnosed diabetics.

The possible implication of weight on length of treatment, possibly related to the need for a higher dose of antibiotics, has prompted the nurses to include weight and height (to calculate body mass index) in assessment of all cellulitis patients.

Patient treatment

This audit highlighted that patients with cellulitis and significant other co-morbidities (i.e. diabetes and CHF) required longer treatment with IV antibiotics and a comprehensive nursing and medical management plan. These results were discussed with the Medical Director of the service. With input from Infectious Diseases consultants and the Pharmacology service at Christchurch Hospital, a revised guideline for IV antibiotic treatment was developed. Those patients with a higher risk of delayed healing (e.g. those with recurrent cellulitis; chronic wounds; diabetes; CHF or taking frusemide; or obesity) are now eligible for higher doses of IV antibiotics.

Further investigation of cellulitis patients in progress

This audit has now become a pilot study for a year-long research study of cellulitis case management supported by the Campbell Ballantyne Fellowship, administered through the Nurse Maude Foundation and the NZ Institute of Community Health Care. From March 2009 twelve months of data collected on acute cellulitis patients receiving IV antibiotics through this service are being collected, using the improved nursing assessment tool format. The data will be entered into SPSS and analysed with assistance of a biostatistician.

This project generated a great deal of interest among both the doctors and the nurses involved in the Acute Demand Service and the outcomes of this 12 month audit will be keenly followed. It is anticipated that this research will expand the evidence base and inform future health care around the treatment of cellulitis with IV antibiotics in the community.

Conclusion

Cellulitis is a common infection that can be treated with IV antibiotics successfully at home with nurses from a dedicated Acute Community Care team. This paper has described the role of Nurse Maude registered nurses in initiating and conveying the outcomes of an audit into the treatment of patients in the community with acute cellulitis, which led to a change in nursing assessment and treatment. The audit identified that patients with co-morbidities (e.g. diabetes, congestive heart failure, obesity) were more likely to need longer treatment regimes than those without. The audit results provided evidence that changes in service delivery and nursing assessment documentation to the services had the potential to improve outcomes for patients. This project, supported by the NZ Institute of Community Health Care, has led to more extensive research into the care and treatment in the community of patients with acute cellulitis.

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