

# NURSING SKILL MIX AND NURSING TIME: THE ROLES OF REGISTERED NURSES AND CLINICAL NURSE SPECIALISTS

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## ABSTRACT

### **Objective:**

The roles of clinical nurse specialists (CNS) and registered nurses, while similar, should also be quite different, with the CNS functioning as an advanced practice nurse. Differences in roles can be partially explained and understood by examining the use of their time. Adjustments to skill mix usually involve using more plentiful but less-skilled workers, and there is a growing body of overseas research in this field. In contrast, little research has examined and compared the use of nursing time for the RN and CNS role, particularly in an Australian context. Comparing work activities enables employers to begin to answer the question: Are skilled nursing personnel being used effectively and efficiently?

### **Design:**

A work-sampling study conducted over eight weeks. Data were analysed descriptively using SPSS, v.9.

### **Setting:**

Six wards in a large private not-for-profit hospital.

### **Main outcome measure:**

To determine whether there is a differentiation in the roles of CNS and RN by examining the percentage of time spent in 25 specific activities.

### **Results:**

In some activities it is not possible to distinguish differences in the amount of time spent by RNs and CNSs. In other activities such as clerical, meetings and

administration, CNSs are spending more time than anticipated. Consideration needs to be given to employing clerical staff to relieve the CNS of these non-clinical aspects.

### **Conclusion:**

The study extends the understanding of the roles of registered nurses and clinical nurse specialists and provides a basis on which to begin to understand similarities and differences in their roles.

## INTRODUCTION

In Australia, as in most industrialised countries, there is an acute shortage of skilled registered nurses (RN) and this is likely to be exacerbated by the looming shortage of medical staff. While there are many reasons for this, it is acknowledged that there will continue to be insufficient nurses to meet demand, with a projected shortfall of 40,000 to 44,520 nurses (Access Economics 2004; Karmel and Li 2002). It is opportune therefore to examine the activities in which nurses are involved. In particular, an examination of advanced practice roles such as clinical nurse specialists (CNS) is most timely, as medical staff shortages may expand their scope of practice. This in turn is likely to exacerbate nursing shortages, resulting in the replacement of skilled registered nurse and clinical nurse specialist positions with less qualified staff.

This paper presents findings from a work sampling study conducted in a large not-for-profit hospital in Sydney, New South Wales, Australia. Results are presented on selected activities undertaken by registered

nurses (RNs) and clinical nurse specialists (CNSs) in five medical-surgical units and an intensive care unit. The purpose of the study was to determine whether there were differences in their roles through analysis of the work activities in which they were involved. As well as outlining clearly the proportion of time spent in various work activities, the data also highlight the usefulness of this type of information in examining an institution's skill mix, a critical aspect of workforce planning and utilisation.

### Skill mix and the use of nursing time

It is quite likely that with increased acuity and shortened lengths of stay, the work undertaken by nurses has changed. More acutely ill patients requiring more complex interventions and treatment regimens in shorter periods of time are likely to have a significant impact on nurses' workloads, and furthermore, require more rather than less skilled employees (Aiken et al. 2002; Duffield and O'Brien-Pallas 2002). As yet there are no Australian data to support this contention. Given workforce shortages and financial constraints, it is timely to examine the activities in which nurses are involved and the best mix of staff to provide the safest care possible.

Adjustments to skill mix (sometimes referred to as staff mix) are a component of health human resource planning used to achieve the most flexible and cost effective use of health care personnel (Lookinland, Tiedeman, and Crosson 2005; Spilsbury and Meyer 2001; O'Brien-Pallas, Thomson et al. 2001; Needleman et al. 2002; Aiken, Clarke, Sloane, Sochalski et al. 2001; McGillis-Hall 1998, 1997). Skill mix models might comprise an all registered nurse (RN) staff, including clinical nurse specialists (CNSs), the focus of this paper. Another model is a combination of RNs, enrolled nurses (ENs) or other categories of unlicensed personnel such as ward assistants (WAs), assistants in nursing (AINs) or personal care assistants (PCAs).

There are several 'drivers' for adjusting skill mix, but the most prevalent influence has been financial. Registered nurses comprise the largest labour force in hospitals and, as such, are often perceived as costly rather than cost-effective (O'Brien-Pallas et al. 1997). This factor, combined with the shortage of qualified nurses and 'multiskilling', has shaped the debate around skill mix. Downsizing of organisations in the corporate world encouraged more skilled staff to expand their roles, providing opportunities for less skilled workers to take over routine tasks. Advocates of multiskilling in nursing argued it would release RNs to spend more time in direct care of patients, while less skilled workers such as AINs, WAs, and PCAs, functioning under the direction of an RN, perform not only basic activities such as routine nursing care (hygiene, changing dressings, ambulating patients, etc) but in some instances, more complex and responsible tasks when so instructed. Their scope of practice may now include tasks that were once the exclusive domain of qualified nursing staff, for example,

wound dressings, physiotherapy and the administration of medications (Fagin 2001; Wansbrough 1998; Bernreuter and Cardona 1997; Friesen 1996). As less skilled employees undertake more complex routine tasks, RNs are in theory released to spend more time in the direct care of patients, but in practice, all too often spend significant amounts of time in communication, conflict management and supervising the work of these employees (Lookinland, Tiedeman, and Crosson 2005).

In turn, the role of registered nurses has moved beyond that traditionally practised (O'Brien-Pallas, Baumann et al. 2001; Duffield and Franks 2001; Aiken, Clarke, Sloane, and Sochalski 2001). The 'flow-on' effect is that the role of clinical nurse specialists may also have changed during that time to reflect the advanced practice required for more complex and acute patients, but there is little evaluative evidence thus far. As more sophisticated technology, treatments and procedures are introduced, it is often the CNS who is called upon to become most familiar with these and to be the resource person for the ward, assisting the rest of the staff to upgrade their skills and knowledge.

The perception that replacing RNs with unregulated workers can provide cost savings remains contentious, with evidence emerging that there is a negative impact on patient and staff outcomes (Blegen, Goode, and Reed 1998; Buerhaus and Needleman 2000; Needleman et al. 2001; Aiken, Clarke, Sloane, Sochalski et al. 2001). A growing body of research from overseas highlights the nexus between registered nurses (number and skill level) and patient outcomes (Aiken, Clarke, Sloane, Sochalski et al. 2001; Needleman et al. 2002; Buerhaus and Needleman 2000; Bernreuter and Cardona 1997). These large scale multi-site and multinational projects have placed the issue not only on the research agenda, but have also raised the awareness of policy makers, consumers and registered nurses themselves about the impact of using fewer RNs. The long term shortage of RNs is now pressuring health care administrators to reconsider the viability of adjusting skill mix (using less skilled workers) as a means of decreasing costs given the negative consequences for nurses (inability to retain staff) and patients (increased adverse events) (Aiken, Clarke, Sloane, Sochalski et al. 2001; Buerhaus and Needleman 2000; Baumann et al. 2001; McClung 2000; McGillis-Hall et al. 2001; O'Brien-Pallas and Baumann 2000).

What has received less attention, particularly in Australia, is the use of nursing time. Nursing shortages stem in part from the ineffective and inefficient use of nursing personnel (Prescott et al. 1991). Kovner and Harrington (Kovner and Harrington 2002) found that for every hour emergency department nurses were involved in direct care, an equal amount of time was spent on paperwork. They questioned whether time spent documenting was competing with patient care. More recently in the United States, it has been reported that 34.3% of nurses were performing housekeeping duties,

42.5% delivered and retrieved food trays, and 45.7% transported patients (Institute of Medicine 2004). These are clearly activities in which less skilled employees could and should be involved. Furthermore, 27.9% reported leaving patient/family education undone and 12.7% left discharge planning undone, both significant activities in which nursing expertise is required to ensure patients return home quickly and safely. In another study, Tucker and Edmondson (Tucker and Edmondson 2002, 2003) reported that 33-minutes in every 8 hour shift were lost as a result of coping with work system failures. Of these, 39% caused on average a 90 minute delay in patient care from causes such as missing or incorrect information, missing or broken equipment, simultaneous demands on time, waiting for a human or material resource, and missing or incorrect supplies.

To date, there is no study reported in Australia that examines the work activities in which registered nurses and advanced practice nurses (CNS) are involved. Nor is there work examining the impact that skill mix has on patients, staff and organisations, although work is under way in NSW with results expected in 2006. With shortages of skilled nurses it is timely to consider the work undertaken by registered nurses and clinical nurse specialists.

### Work sampling

Work sampling is a validated method for measuring the activities of staff to determine what it is that various classifications of staff do in the work environment (Urden and Roode 1997; Hagerty, Chang and Spengler 1985). Its use involves the observation of multiple workers at random intervals by trained independent observers who record the observed activities into predetermined

categories during a sample of hours, shifts or days (Prescott et al. 1991). Work sampling is premised on the laws of probability: that a sample of observations of staff activities can be generalised into a larger snapshot of how staff spend their working days over a longer time frame, without these observed activities being underestimated by more mundane or repetitive activities (McNiven, Hodnett, and O'Brien-Pallas 1992; McNiven, O'Brien-Pallas and Hodnett 1993; Guarisco, Oddone and Simel 1994). The actual activity is recorded, not the time spent in activities (Urden and Roode 1997).

## STUDY AND METHOD

The study was conducted over eight weeks (two weeks of data collection per ward randomised over eight weeks). There were 19 data collectors provided by the study hospital, while university staff provided training in the use of the tool and determined inter-rater reliability. The instrument (Urden and Roode 1997 used with permission) and its validation in the Australian context, have been described elsewhere (Duffield et al. 2001). However, in summary, there are four major categories (McNiven, O'Brien-Pallas, and Hodnett 1993; Prescott et al. 1991; Urden and Roode 1997) in which 25 activities are measured at ten-minute intervals. Only one activity is recorded per staff member per observation, and that is the activity that brought the nurse to the patient's bedside. The staff member may well have been undertaking additional activities, but these are not recorded. The activities for each of the four categories: Direct Care, Indirect Care, Unit Related and Personal Time are shown in table 1. A specific activity schedule that outlined each of the 25 activities was given to each data collector.

**Table 1. Activity codes by category (direct care, indirect care, unit-related activities and personal time)**

DIRECT CARE	INDIRECT CARE	UNIT-RELATED	PERSONAL TIME
<ul style="list-style-type: none"> <li>• Admission/Assessment</li> <li>• Assisting with Procedures</li> <li>• Hygiene</li> <li>• Medication/IV Administration</li> <li>• Nutrition/Elimination</li> <li>• Patient Mobility</li> <li>• Patient/ Family Interaction</li> <li>• Procedures</li> <li>• Specimen Collection/ Testing</li> <li>• Transporting Patient</li> </ul>	<ul style="list-style-type: none"> <li>• Co-ordination of Care: Care Planning/Critical Pathways</li> <li>• Co-ordination of Care: Rounds, Team Meetings</li> <li>• Communication/ Information</li> <li>• Computer: Data Entry/ Retrieval</li> <li>• Medication/IV Preparation</li> <li>• Progress Notes/Discharge Notes</li> <li>• Room/ Equipment Setup/ Cleaning</li> <li>• Verbal Report/Handover</li> </ul>	<ul style="list-style-type: none"> <li>• Clerical</li> <li>• Errands Off-Unit</li> <li>• Environmental Cleaning</li> <li>• Meetings &amp; Administration</li> <li>• Supplies, Check, Re-stock</li> <li>• Teaching/In-service</li> </ul>	<ul style="list-style-type: none"> <li>• Personal Time</li> </ul>

Results reported here include: General Surgery; Cardiac; Orthopaedic; Urology; Haematology Oncology with a bone marrow transplant (BMT) unit within the ward; and an Intensive Care Unit (ICU). Staff working between 0700 and 1900, Monday to Friday, on randomly selected days were asked to participate. These days and times were chosen as they provided the most cost-effective data and represented most activity. At the time of this study, there were no enrolled nurses (ENs). Most RNs and CNSs consented to participate, the few exceptions being agency/casual staff. Data were collected at ten-minute intervals on each unit in two-hour blocks. There were 53,240 observations, which provided a robust sample for data analysis.

Data were analysed descriptively using the Statistical Package for the Social Sciences, version 9. The activities for each type of nurse are expressed as the percentage of the total number of observations of that staff type. When there is a large number of observations taken at repeated random intervals, the resulting data will have the same distribution as observations taken continuously (Urden & Roode 1997). Thus observations of specific activities, represented as percentages of specific activities represent percentages of time spent in actual activities. Selected activities are presented for discussion.

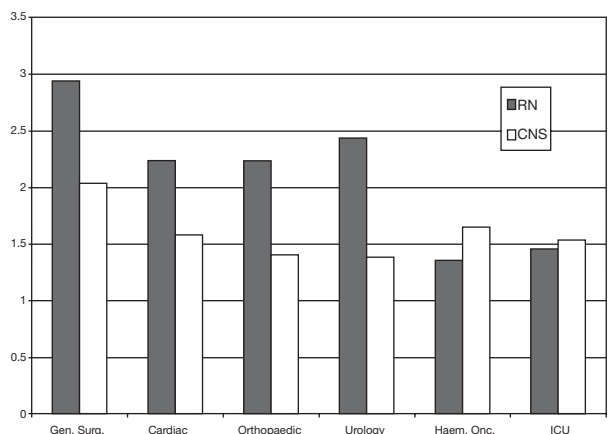
## RESULTS

A major activity in the Direct Care category is Admission and Assessment, which includes activities such as TPR, pulse oximetry, weight, monitoring equipment and alarms. The amount of time spent here by RNs ranged from 6.5% to just over 10%, and for CNSs, 5% to just over 10% of observed activities which is considerable. In a study several years ago only 1.88% of observations were recorded in this activity (Hovenga 1996). Differences in the current study may reflect the increased acuity, rapid turnover of patients with shortened lengths of stay and intensive post-surgical periods that have occurred in the intervening years as the demand for beds increases. The percentage of time spent is slightly less for the CNS than the RN, except on Haematology and ICU, which may be explained by the higher acuity of patients in these units requiring more ongoing monitoring. The CNSs in ICU and the Haematology/BMT unit may well be called upon to assist and teach RNs specific admission and assessment procedures, which may also account for the higher CNS involvement here.

Also in Direct Care is the Patient Hygiene category (activities such as baths or showering, oral care, dressing and shaving are included here). There were less observed activities across the majority of the wards, with the CNS role spending more time (1-5%) doing so on some wards than RNs (1-3%). There is less time in this activity in ICU, which probably reflects the staffing levels of 1:1. The percentage of time spent in hygiene activities is slightly less than previous results of 4.66% (Hovenga 1996). Haematology incorporates a BMT Unit (with

isolation rooms) which may account for the higher level of patient hygiene provided by the CNSs on this ward (5%). While it is the activity that took the nurse to the bedside that is recorded, once in the isolation room, a greater range of activities is likely to have been undertaken by the CNS in the interests of efficiency. For example, this time might have been used to good effect to communicate with the patient on issues such as their recovery process, educational needs and discharge/home support requirements.

Figure 1: Communication and Information

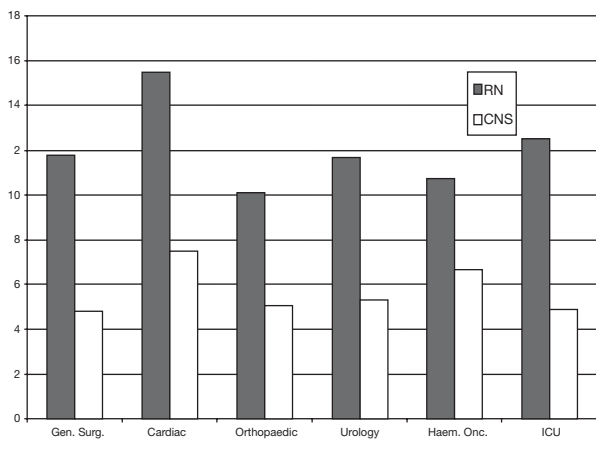


Communication and Information (Figure 1) in the Indirect Care category includes activities such as interaction with other departments related to coordination of patient care and patient advocacy, providing information and direction to support or ancillary staff with aspects of patient care, bed management and referencing written resource materials (eg. textbooks, phone lists, procedure manuals). Again, this activity does not consume a large part of the RN or CNS role, perhaps reflecting stability in staffing and bed management. Permanency in staffing means staff are more likely to be familiar with the patients, the work and hospital routines as does limited bed/room/ward changes for patients. However, the RNs were observed to be involved in this activity more frequently than were CNSs (except on Haematology and ICU where there was little difference), indicating perhaps more involvement in the patient management role than for CNSs.

The results may reflect a common practice of using the CNS role as the manager or shift coordinator in the absence of the Nursing Unit Manager, taking the CNS away from more direct patient care. The limited amount of time spent by CNSs in this activity is consistent with earlier work (Duffield, Donoghue, and Pelletier 1995). The CNS is more likely to engage in communication and information away from the patient's bedside, teaching less experienced staff in in-service sessions.

The Verbal Report and Patient Hand-Over activity (Figure 2) recorded one of the highest percentages of observed activities. It is undertaken more frequently by RNs than CNSs on every unit and in some cases, such as Cardiac, almost twice as often. This result compares with Hovenga's (1996) result of 19.75-minutes/patient day. There are two possible explanations. It may indicate that more patient care is provided by RNs than CNSs and as a consequence, they spend more time in this activity.

Figure 2: Verbal Report and Handover



Alternatively, as indicated earlier, CNSs act in charge in the absence of the Nursing Unit Manager and on evening shifts, which may not allow much time for CNS participation in the exchange of clinical information. The complexity of patients' care following Cardiac Artery Bypass Grafts (CAGs), particularly on day one and two after transfer from ICU, would account for the much higher time spent by RNs on Cardiac.

Nevertheless, it would be expected that the CNS role would be equally as involved in handover as RNs. The

interaction between clinical staff during this process is paramount if patients are to receive 'seamless care' and if accurate and timely information is to be communicated. This activity provides nursing staff with an avenue to discuss not only patient care requirements, but also provides an arena to interact professionally through sharing knowledge and experiences. The CNS should use this professional forum to educate other nurses and set standards for patient care using their expert knowledge (Duffield, Donoghue, and Pelletier 1995).

The activity Coordination of Care: Rounds and Team Meetings (Figure 3) includes communication with doctors, allied health workers and other nurses regarding care, including on the phone, planning for admission or discharge and debriefing. Again, as with the results in the verbal report/handover observations (Figure 2), more RNs were observed in this activity than were CNSs, particularly in ICU, and to a lesser extent in Orthopaedics. Again, this result most probably reflects the model of care where the nurse responsible for the patient attends the medical rounds for their patient and more RNs are involved in care than are CNSs. However, an argument could be made that all nurses should attend rounds in order to ensure patients' care is coordinated and continuous through meal breaks and other staff changes. The results might also reflect the amount of medical attention given to patients. More doctors are likely to spend more time with patients in ICU and because of the 1:1 nursing ratio, the RN would tend to be present when the doctor attended the patient. In fact, the RN may well initiate the doctor's visit following an observed change in the patient's condition. Interestingly, the Orthopaedic ward, along with ICU, indicates a higher time by both RNs and CNSs being spent in rounds and team meetings. This could be explained by the need to organise ongoing care for elderly orthopaedic patients who need follow up care, for example following a Total Hip Replacement (THR).

Figure 3: Rounds and Team Meetings

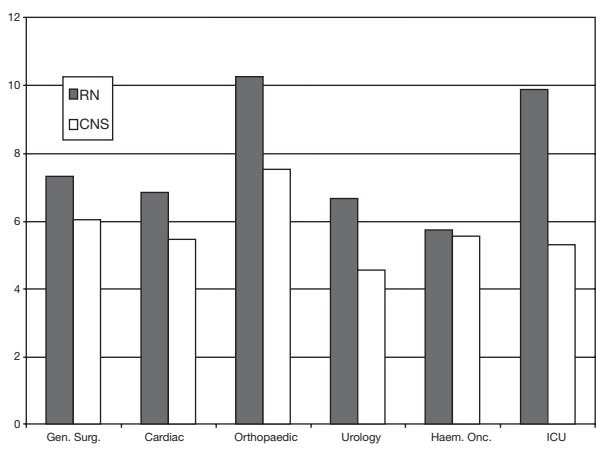
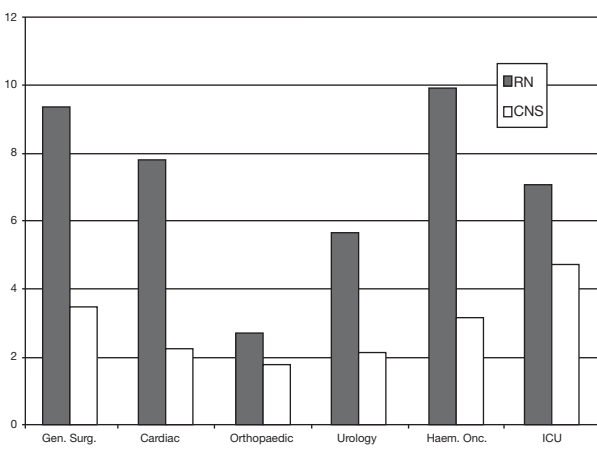


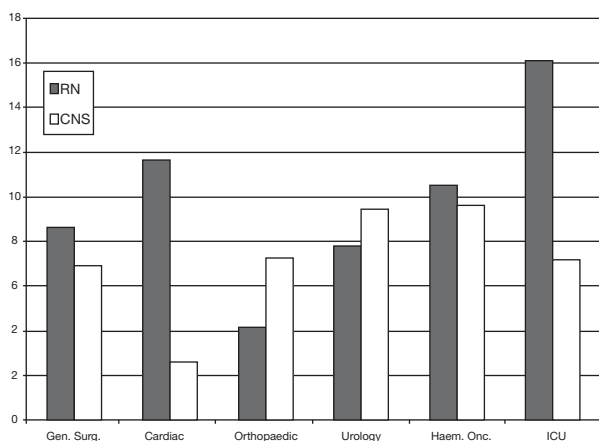
Figure 4: Care Planning and Critical Pathways



The activity of Coordination of Care: Care Planning and Critical Pathways (Figure 4) which includes evaluating care, completing, revising or changing patient care plans and other patient documents giving direction to the provision of care, involves more RN than CNS observed time. In fact, on Haematology, the RN undertook almost 10% of observed activities in this category. It would be expected that the role of an advanced practice nurse (CNS) should be more heavily involved in this activity than was evident. This is not to say that the amount of RN time spent in this activity is excessive, but that the amount of CNS time seems to be disproportionately low. Hovenga (1996) reported a total of 17.72 minutes/patient on this activity.

Interestingly, considerably less time for both RNs and CNSs was spent in this activity on Orthopaedic than elsewhere. An explanation for this result might relate to the use of established Critical Pathways on the ward. If there was little deviation in patient progress, less time would need to be spent in this activity.

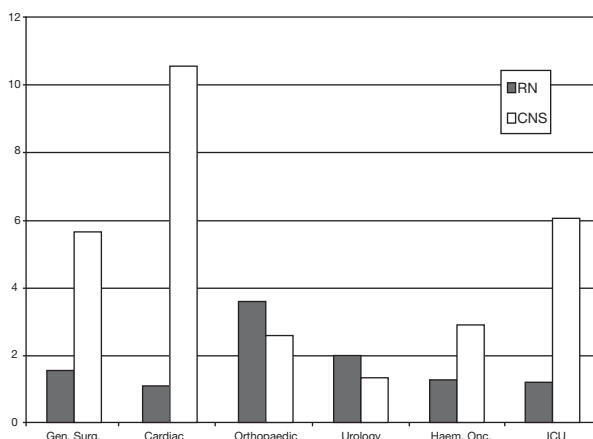
Figure 5: Teaching and In-service



Pleasingly, Teaching and In-service (Figure 5) was an activity in which a great deal of both RN and CNS time was observed. Activities here include participation in teaching and learning activities or acting as a resource to students, or orienting staff redeployed from other wards and other health professionals. Of interest is that more RN time was observed in this activity than CNS time in four of the six units, particularly in ICU and Cardiac. It would be expected that the CNS usually has a significant component of their role related to education, teaching and mentoring of staff and students, which is not reflected in the results, perhaps because the CNS role is often in-charge.

The results for Meetings and Administration (Figure 6), while surprising, are likely to reflect the role of the CNS, meant to be that of an expert clinician, as de facto unit manager. The CNSs on Cardiac spend over 10% of

Figure 6: Meetings and Administration



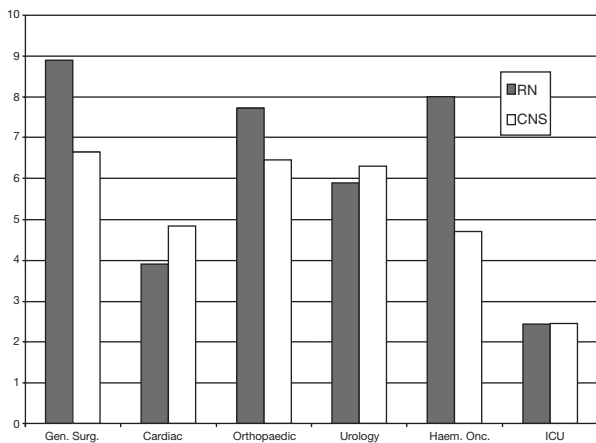
the observed activities in this category, which includes committee work, interviews, communication on non-patient related matters, rostering and quality activities, significantly more than the RN role. In fact, RNs on all units were observed less frequently in this activity. Only on Orthopaedics and Urology did the RN involvement exceed that of the CNS. Again, an explanation might relate to the role of the CNS in management. Additionally, there is limited after-hours medical coverage, thus requiring the CNS to expertly coordinate, administer and evaluate patient care needs and the needs of significant others. It is also possible that the CNSs are more involved in quality activities, which would be an appropriate aspect of their role. Nevertheless this is an area in which further examination of workload and work practices needs to be undertaken.

In a similar vein, the Clerical category of activities (Figure 7) (which includes answering telephones and delivering messages, filing and assembling charts) indicates both RNs and CNSs were observed undertaking this activity very frequently – close to 9% of all observed activities for RNs on General Surgery. One of the most time-consuming clerical activities required by all nurses engaged in patient care is following up medication orders. Phone orders need to be written up within 24 hours and medication and intravenous orders need to be documented accurately and clearly. An inordinate amount of time is spent in this activity. Interestingly the lowest observed activity level is in ICU where there is most often a medical officer available to write up orders. Also as each nurse provides care to only one patient, it is anticipated that less time would be spent in this activity than if the nurse were responsible for more patients.

## DISCUSSION

It would appear that the CNSs are spending significant amounts of time in functions not expected in the role, particularly in activities such as clerical, meetings and

Figure 7: Clerical



administration. As is customary in many institutions, the advanced practice nurse (CNS) is used as the nurse manager in the absence of the appointed manager – after hours and during periods of leave. Patient activity no longer occurs mainly from 0700-1500. Increasingly, surgical procedures and patients returning to the wards can occur over 24 hours, requiring a senior appointment to coordinate care and staff. However, nursing unit managers are usually employed only during business hours and there is no formal second-in-charge role. Employment of a CNS to undertake this activity may ensure that the standard of care provided during the day was also provided after hours and also overcomes what many in the hospital system see as a deficit in current ward staffing. However, is this best use of an expert clinician?

Nurses who wish to act in the role of advanced practitioners may not wish to be diverted into these managerial activities. There is growing acceptance that there needs to be a different career structure for a managerial position which provides strategic clinical leadership, with the position underpinned by clinical coordinators providing day-to-day coordination and leadership, including weekends and after-hours. Alternatively, the CNSs may be quite happy to undertake aspects of the managerial role, if they believe there are limited career opportunities in a clinical path. Also, expert clinicians are needed when other staff such as doctors, allied health and managers are not around – after hours and on weekends. Use of a CNS for after hours management therefore may well be appropriate and result in positive patient and nurse outcomes.

As indicated earlier, there is evidence from overseas that nurses are spending a great deal of time in non-nursing activities (Institute of Medicine 2004). With no comparative evidence in this country, it is not possible to determine whether scarce nursing time is being taken up by activities that do not ‘value-add’ to patient care. Using staff for tasks for which they are over-qualified is not

cost-effective and worse, leads to increased turnover. The results indicate that the CNS spends less time in handover than the RN. As expert clinicians, the CNS brings to handover invaluable expertise and knowledge about patients and their care. Not having these staff at the patient bedside and reporting their assessments at the formal handover could result in less than desirable outcomes for patients, other staff and the organisation.

In using these results to consider work redesign, it must be remembered that it is the activity that took staff to the patient’s bedside that was recorded, and other tasks could have been undertaken at the same time. Indeed it would be most unlikely that a nurse would perform only one activity when attending the patient. It should not be assumed therefore, that less skilled and cheaper staff than RNs and CNSs should be providing patient care. Nurse dissatisfaction and burnout increase as nurses’ capacity to provide the basic nursing care that patients require declines (Aiken, Clarke, Sloane, Sochalski et al. 2001). It is the capacity to be able to provide high quality care to patients that is most likely to result in high nurse retention rates. However, from the results presented here, there are some activities that could more cheaply and effectively be undertaken through the employment of additional clerical support staff, for example.

It is also important to remember that work sampling measures the activities undertaken, not the activities that nurses might have left undone. Future work should examine these two aspects in greater detail – nursing activities left undone and the activities in which nurses are involved that could and should be done by less skilled staff.

## CONCLUSION

These results provide some interesting baseline information about what it is that nurses do, but perhaps more importantly, provide a basis on which to begin to understand the roles of registered nurses and clinical nurse specialists, their similarities and differences. These data provide an avenue of discussion between participants about what it is that they do, what should they be doing, and if they are best placed to undertake these activities or should other categories of employee do so. The educational preparation for registered nurses is focused very much on meeting patient needs, the most basic of these are personal hygiene needs and other activities of daily living which from the results, it is clear they are doing. Less clear is whether the role of clinical nurse specialist is truly acting as an advanced practitioner.

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