

# Documentation in a PICU setting: Is a checklist tool effective?

## AUTHORS

### Kylie Boucher

RPN, MNSc, BEd  
RPN Austin Health, 551 Brunswick St, Fitzroy North,  
Victoria, Australia.  
kylie@andrewmaynard.com.au

### Eliza Griffiths

RN, MNSc, BBiomedSc  
RN Southern Health, 3/13 Nova St, Oakleigh Sth,  
Victoria, Australia.  
elizakgriffiths@gmail.com

### Danielle Sargent

RN, MNSc, BSc  
RN Southern Health, 5 Stephen Rd, Ferntree Gully,  
Victoria, Australia.  
Danielle.Sargent@southernhealth.org.au

### Nicole Mabothe

BSc  
Forensic Officer, 3 Marsden Crt, Kilsyth South, Victoria,  
Australia.  
nicolemabothe@hotmail.com

### Pauline George

RN, MNSc, MSc BEd  
RN Southern Health, 8 Biscay Court, Boronia, Victoria,  
Australia.  
pauli\_george@yahoo.com.au

### Dianne McKinley

RN, RM, MNurs, BAppSc  
Clinical Nurse Specialist, RCH Flemington Rd Parkville,  
Victoria, Australia.  
di.mckinley@rch.org.au

### Siriol Marks

MNSc, LMusA, BMus, DipEd  
RN Western Health, 3 Selsdon Terrace, Donvale,  
Victoria, Australia.  
siri\_marks@yahoo.com.au

## KEY WORDS

nursing documentation, documentation compliance, checklist, paediatric intensive care unit

## ABSTRACT

### Objective

To compare and contrast nursing compliance with, and completion of, two versions of a nursing care management form. The audit highlights areas and levels of compliance and non-compliance and provides the foundation for further document development.

### Design

A retrospective chart audit was undertaken comparing completion levels of a previous nursing checklist (form A) and a revised and updated checklist document (form B)

### Setting

A paediatric intensive care unit (PICU) at a major metropolitan paediatric hospital.

### Subjects

All available medical records containing the checklist of those patients discharged from PICU during the months of November 2009 and February 2010 were audited.

### Main outcome measures

Levels of completion of both versions of the form and individual items were low.

### Results

Compliance levels with document completion improved following the introduction of the form B, although poor completion remained a major issue. Up to 70% of nursing shifts recorded no information on the checklist document. Compliance levels were not affected by age, length of stay, or severity of illness.

### Conclusions

The checklist forms were largely left incomplete, although an improvement in completion was noted with the introduction of the new checklist (form B). This raises questions about the appropriateness of the forms and their applicability to clinical practice.

## INTRODUCTION

Paediatric intensive care units (PICUs) provide services for children requiring specialised medical care for complex health conditions. These units offer a broad range of treatment types requiring nursing staff to provide high level care across multiple specialised fields. As such, nursing duties within these units are challenging and complex. PICUs have been indicated as high-risk areas, where numerous errors may occur due to the complex nature of the environment (Manor-Shulman et al 2008; Simpson et al 2007; Bracco et al 2001). Thus nursing documentation becomes an important element of patient care, allowing communication between care teams and across nursing shifts, providing a legal record of care administered and acting as a tool to help manage patient care (Hales et al 2008; Mueller and Glennon 2007; Hewson and Burrell 2006). Studies have linked the quality and effectiveness of documentation with a reduction in patient mismanagement, demonstrating that nursing documentation is a vital tool in reducing mortality rates and adverse patient events (Clarke et al 2004; Pronovost et al 2003; Suresh 2003; Soto et al 2002).

The introduction of a new checklist-style nursing documentation tool in the PICU at a major metropolitan paediatric hospital in Australia provided an opportunity to assess the level of staff compliance with institutional documentation. Checklist documentation as a method for error reduction in nursing tasks has been investigated in the literature (Carroll 2008; DuBose et al 2008; Hales et al 2008; Simpson et al 2007; Hewson and Burrell 2006). Checklist tools allow duties to be systematically completed in highly complex and stressful environments (Hales et al 2008). The provision of optimal patient care depends in part, on the quality of nursing documentation and the relevance and appropriateness of nursing checklists (Donchin et al 2003; Martin et al 1999).

This audit was designed to generate outcome data regarding staff usage of the new checklist within a PICU environment. In particular, the study aimed to determine whether there were particular shifts in which compliance varied and whether individual elements of the new form were associated with low levels of completion. This retrospective chart audit aimed to inform hospital-based processes for auditing documentation compliance and to form the foundation for future research investigating documentation development. This audit facilitates improved insight into whether institutional documentation is meeting the needs of patients, nurses and medical and allied health.

## METHODOLOGY AND METHOD

### Aim

This study was designed to audit and compare the compliance and completion levels of two PICU nursing care management checklists, a trial document (form A) which had been in place for many years and a newly introduced form (form B) which was introduced in late January, 2010. Specific documentation for patients discharged during November 2009 (form A) and February 2010 (form B) were analysed and compared.

### Study population

A total of 134 records were accessed, covering a total of 476 patient days. Patient records were included if the patient was discharged from PICU during the month of November 2009, using the form A (n = 85) or February 2010, using the form B (n = 49). A convenience method of sampling was used. All accessible records were audited if the patient discharge fell into the inclusion date range, irrespective of severity of illness, length of stay and nature of admission. Patients being treated in the hospital at the time of audit, those in outpatient clinics, those with records required by the coroner's court and patient files whose form was missing were excluded from the audit as records were unable to be accessed by researchers. Patients with multiple PICU admissions within the data collection periods were allocated separate study numbers for each admission.

### Procedure

A data collection tool for each of the forms was developed. Each item required a specific response expressed as a coded number, dependent on the nurse's response representing NA, no, yes or left blank. The other side of each tool was designed to collect patient information including study number, age at admission, gender, length of stay in PICU, discharge destination and Paediatric Index of Mortality 2 (PIM2) score. The data collection tools were developed to maximise inter-researcher reliability and minimise human error.

A single data management file was created to link Unique Record (UR) numbers to assigned study numbers, ensuring that no identifying patient information was entered on either tool, and that patient confidentiality was maintained.

### Data collection

Data was collected from the PICU of a major paediatric hospital that caters for approximately 1300 patients per year. Patient records are held on site and all data collection occurred within the medical records department on hospital grounds.

A group of five researchers collected data over a three month period (January 2010 to March 2010). A set of data collection procedures was developed to ensure that each auditor was collecting and transcribing data in an identical manner. Researchers responsible for data entry were minimally involved in the physical collection of data to reduce potential preconceptions and bias. Ten per cent of all records were cross-audited by multiple researchers to ensure data or transcription errors were not occurring and to ensure data integrity.

### Statistical analyses

Data was coded and entered into a Microsoft Excel 2003 spreadsheet. Following data cleaning, data was exported to IBM SPSS Statistics 18 (Statistical Package for the Social Sciences, USA). Descriptive and correlation analyses were conducted with p values used to describe the significance of any relationships observed.

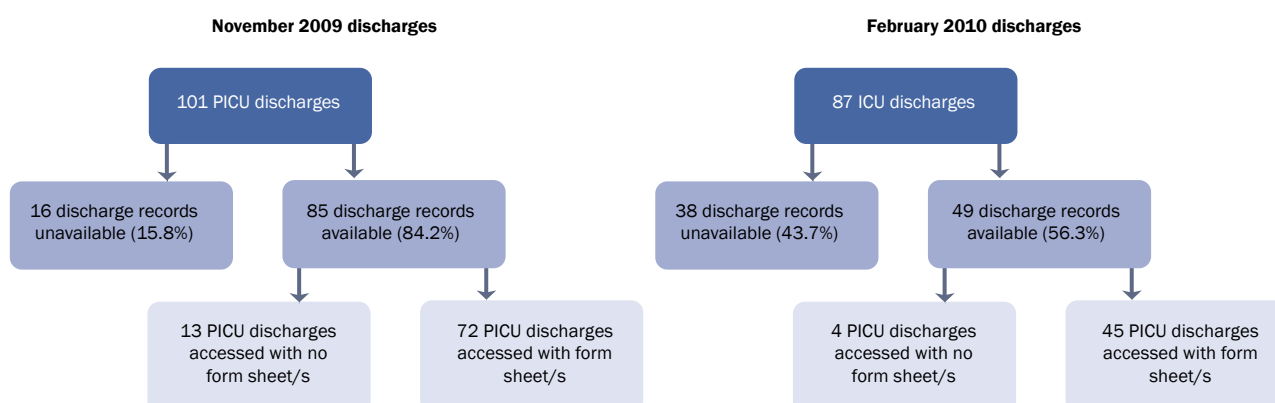
### Ethical considerations

Approval for the study was granted by the Human Research Ethics Committee at the institution.

## FINDINGS

Seventy-two records of the total 101 November PICU discharges met the inclusion criteria (72.7%) and contained the form A form. The February audit of patient records contained the new form B forms. In-house education was delivered before the introduction of the form B. Eighty-seven patients were discharged from PICU in February 2010, and forty-five (39.15%) records met the study inclusion criteria. Record accessibility is summarised in Figure 1.

**Figure 1: Discharges from PICU and audited records**



The demographics of the study population are summarised in Table 1.

**Table 1: Characteristics of PICU audit population**

<i><b>Patient characteristics</b></i>	<b>November 2009 (form A)</b>		<b>February 2010 (form B)</b>	
	<i><b>Accessed</b></i>	<i><b>Not accessed</b></i>	<i><b>Accessed</b></i>	<i><b>Not accessed</b></i>
Gender [number (%)]				
Female	36 (42)	4 (25)	18 (37)	16 (42)
Male	49 (58)	12 (75)	31 (63)	22 (58)
Age at admission to PICU in years [median(IQR)]	1.49 (5.36)	3.73 (7.62)	2.44 (9.35)	1.42 (12.53)
PIM2 Score [mean(SD)]	-3.86 (1.24)	-3.98 (1.60)	-3.96 (1.04)	-3.29 (1.25)
Length of PICU stay in days [median(IQR)]	2.00 (3.00)	1.50 (7.00)	1.00 (1.50)	3.00 (8.25)

### **Characteristics of form sheets**

Form A required nursing staff to document between 12 and 26 items per shift (completion requirements varied between shifts and certain tasks were only performed daily and therefore only affected one nursing shift). Form A was split into six columns, with each column representing a day. Task descriptions appeared in each daily column. In contrast, form B had 43 items to be completed regardless of shift time or previous task completion. It was divided by shifts rather than days, with 18 columns appearing on each form. Task listings appeared only once at the left edge of form B, as opposed to in each column.

### **Completion of individual items**

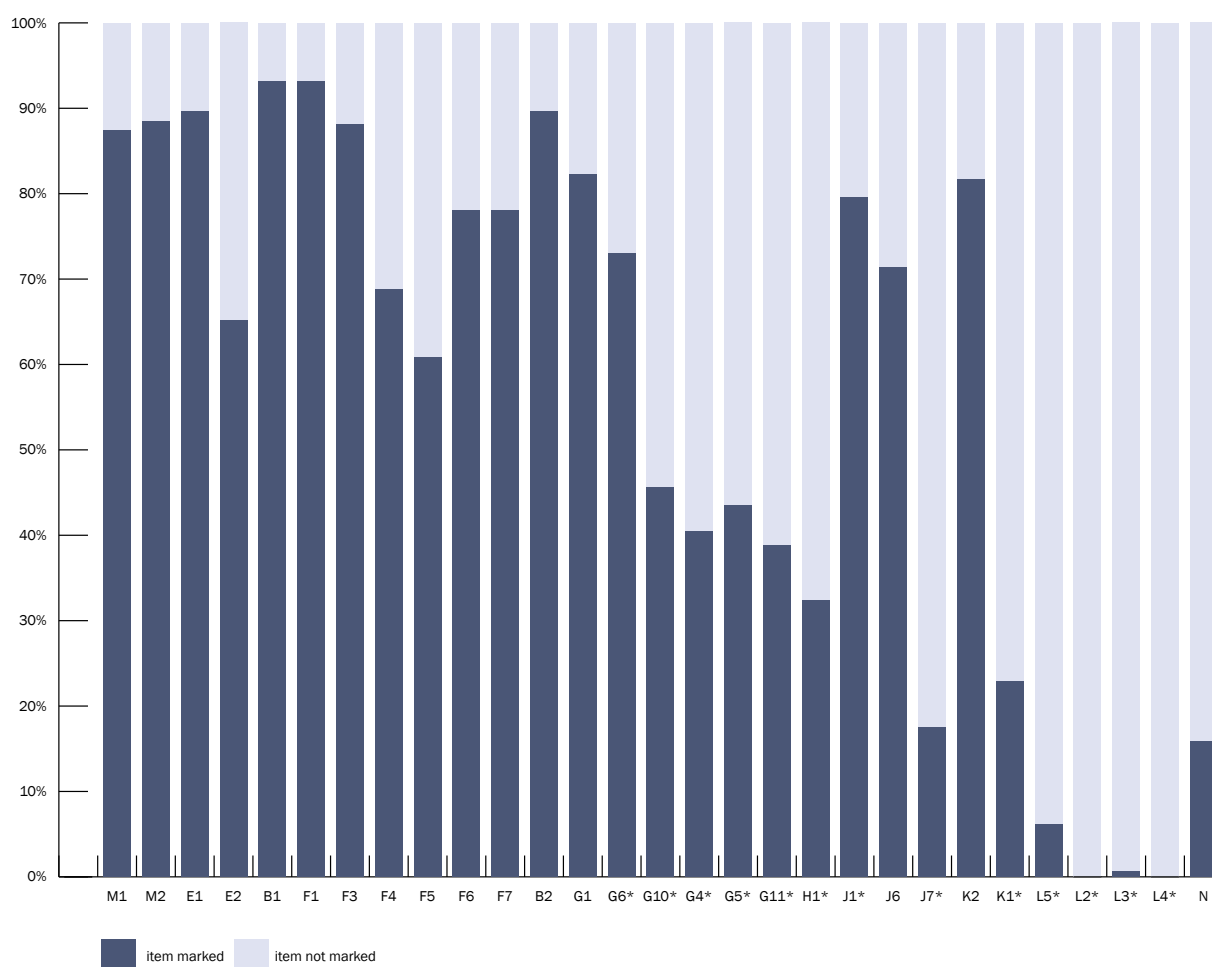
#### **Form A**

PICU nursing staff were required to complete form A each shift, however shift times and lengths vary within the unit. A standard shift is eight hours long, meaning that in one 24-hour period, three staffing changes would occur. However, staff members are permitted to work 12 hour shifts, meaning that a 24-hour period could potentially contain only two staffing changes. Thus, when auditing form A, it was not possible to discern whether blank shifts on the form were due to non-compliance or 12 hour shift loadings. As such, only completed shifts were analysed in the individual task item completion analysis. 331 days of data were collected from 72 patient records. In total, 70 day (AM) shifts, 54 evening (PM) shifts and 83 night (ND) shifts had completed checklists available for analysis.

Figure 2 details individual item compliance levels. Items marked with an asterisk are only performed once a day. All other entries are required to be completed each shift, with the exception of F6 and F7 which are specific to ND. Table 2 lists the entries as detailed on form A. Note that although some tasks are only required every 72 hours, a dash indicating non-applicable' should still have been made by nursing staff on form A.

**Table 2: Items as listed on form A. Codes in the right hand column were allocated by the research team and do not appear on the PICU checklist. \* refers to once daily entries**

Name / Signature	M1, M2
CNS	E1, E2
Respiratory	B1, F1, F3, F4, F5, F6, F7
CVS	B2, G1, G6*, G10*, G4*, G5*, G11*
Renal	H1*
Endo/GIT	J1*, J6, J7*
Derm	K2, K1*
Psycho Social	L5*, L2*, L3*, L4*
Other	N*

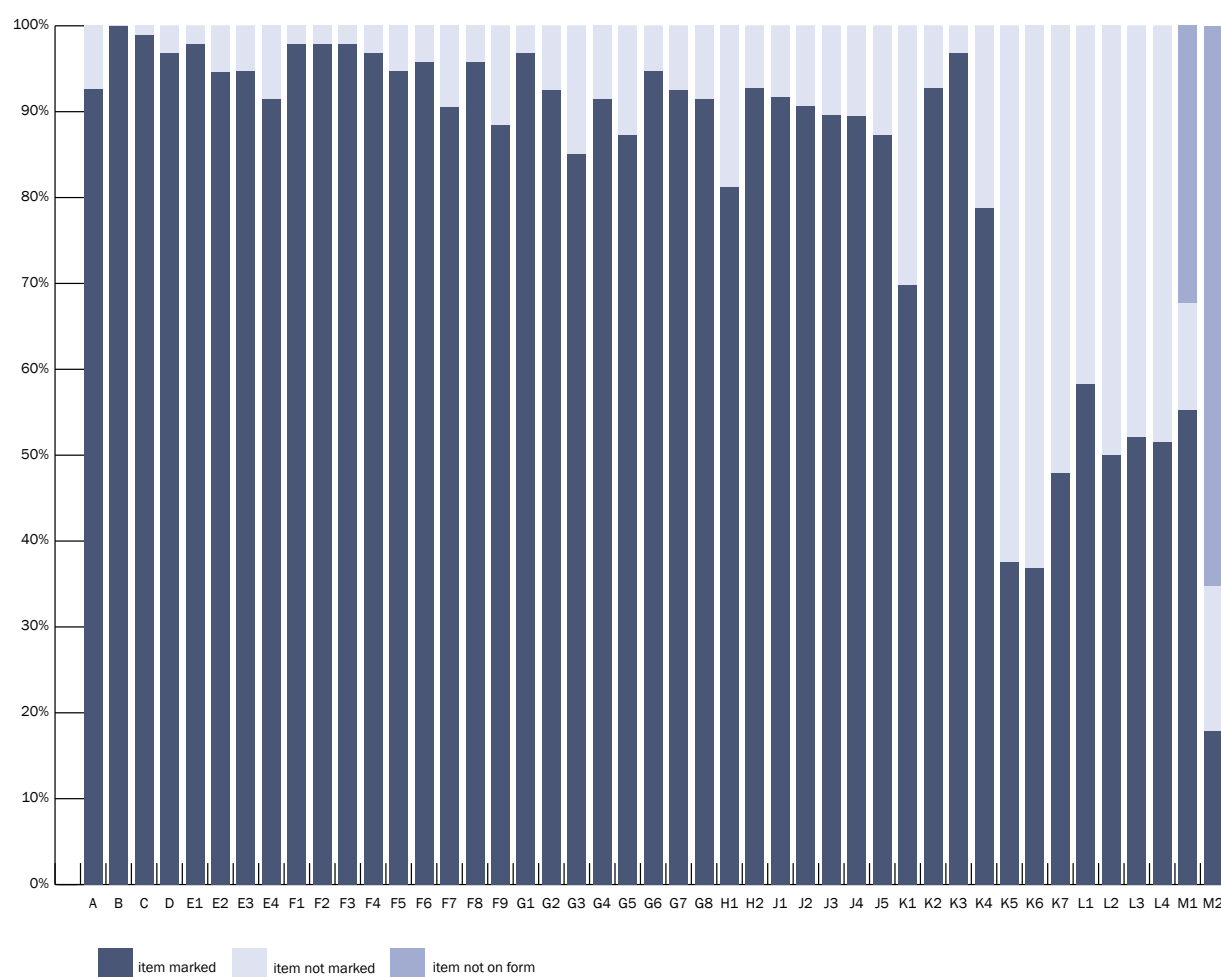
**Figure 2: Rates of completion of checklist items on form A****Form B**

Of the 45 records audited containing form B, 145 days worth of data were collected. A total of 43 AM shifts, 23 PM shifts and 30 ND shifts were documented by staff during these 145 days.

Figure 3 shows individual item completion levels on form B. A third category of completion, “item not on form” has been included for items M1 and M2 (signature and name), as poor photocopying of form B had, in some cases, removed this section from the document.

**Table 3: Items as listed on the form B. Codes as specified in the right column were allocated by the research team and do not appear on the PICU checklist**

ID label, alarms, assessment, infection control	A, B, C, D
CNS	E1, E2, E3, E4
Respiratory	F1, F2, F3, F4, F5, F6, F7, F8, F9
CVS	G1, G2, G3, G4, G5, G6, G7, G8
Renal	H1, H2
Endo/GIT	J1, J2, J3, J4, J5
Derm	K1, K2, K3, K4, K5, K6, K7
Psycho Social	L1, L2, L3, L4
Signature & Name	M2, M1

**Figure 3: Rates of completion of checklist items on form B****Completed shifts per day**

The collected data was further analysed to examine how many shifts were completed each day for both form A and B. Days of admission to, and discharge from, PICU could expect to have fewer shifts completed on the form, depending on the time of admission/discharge. Thus only whole days of admission were examined. Of the 134 records audited (both form A and form B), 60 patients had lengths of stay greater than one day. The 60 records yielded 203 full days of PICU stay (excluding admission and discharge days). All days should have had a minimum of two shifts completed. Table 4 details the number of shifts completed per day.

**Table 4: Number of shifts completed for full days of admission**

	Form A		Form B	
No. of days with zero shifts completed	67	(44%)	18	(36%)
No. of days with one shift completed	60	(39%)	17	(34%)
No. of days with two shifts completed	20	(13%)	10	(20%)
No. of days with three shifts completed	6	(4%)	5	(10%)
No. of full days	153	(100%)	50	(100%)

To these 60 patients a 'shift score' was allocated, calculated by dividing the number of completed shifts over these full days of admission by the total number of shifts during the same period (i.e. number of full days of admission multiplied by 3). This shift score was then analysed with regards to length of stay, age at admission

and PIM2 score. The relationship between shift score and each of length of stay, age at admission and PIM score were found not to be significant with  $p > 0.05$ , for each for the 60 relevant records analysed. There was no significant difference found between completion of shifts for form A compared to form B ( $p > 0.05$ ).

### Limitations

This study had a number of limitations. The population of records audited may not be representative, as a large number were unavailable to researchers. Compliance was difficult to assess as it was not possible to determine whether two or three shifts were worked in one day. Comparative analysis of individual item completion was not possible due to the difference in content of the form A and form B.

## DISCUSSION

The audit and comparison of both form A and form B show a low level of completion, both at an individual item level and at a daily shift level. There appear to be distinct patterns of non-completion of certain items on both forms. On form A, once-daily items (see asterisked entries, figure 2) generally had lower completion rates than shift specific items. Staff rarely documented psychosocial items, and cardiovascular system (CVS) items also showed low completion levels (see figure 2). Whilst many of these CVS tasks were not required to be physically performed by nursing staff every day, a dash must be entered on form A when the item is not applicable to the shift, in order to allow staff to keep track of when tasks have been performed and when they are next due. CVS entries not marked were assumed to be non-complete entries.

The introduction of form B saw completion levels rise (see figure 3). There was an improvement in all areas of the form, although the documentation of psychosocial items remained poor. A direct comparison of individual item completion between the two forms is not possible as the content, design and structure of each form varied so greatly. However a comparison of figures 2 and 3 shows that completion did improve significantly with the introduction of the form B. It must be noted that only shifts where information was actually documented by nurses were analysed by item. Table 4 highlights the number of full days in which the forms did not have the appropriate number of shifts filled in. 83% of full admission days for form A had less than the minimum possible number (two) of daily staff shifts filled in. Figures for form B were slightly improved with 70% of full admission days missing documented shifts. Although an overall improvement in form B completion was noted, there are still a large number of shifts in which staff did not document any information on form B at all, and the improvement was not found to be statistically significant ( $p > 0.05$ ).

The number of shifts documented was not found to change with patient demographics such as length of stay, age or severity of illness as represented by PIM2 score ( $p > 0.05$  for all three). Given that patient population type is not a determining factor in form non-completion, the question must be asked as to why completion levels are so low. Are these essential tasks as listed on the form actually not being performed or are they merely not documented? Information duplication within nursing documentation has been identified by previous studies as a major factor in repetitious and inefficient use of nursing care time (Cheevakasemsook et al 2006; Voutilainen et al 2004; Soto et al 2002). Multiple and overlapping charting and documentation duties are prevalent in acute care settings (Cheevakasemsook et al 2006) and have been shown to reduce time available for patient care by up to 50% (Irving et al 2006; Rolston-Blenman 2009). In an environment such as the PICU, in which patients require complex and demanding levels of care, it is possible (and indeed likely) that nurses are sacrificing accurate documentation on the forms in order to better care for their patients. While the forms are checklists, with tick-box style entries that can be completed quickly, it is possible that much of the information present in this form is already recorded in nursing notes and other required documentation. Whilst a review of the complete nursing documentation required within each shift was outside the scope of this audit, it is possible that nursing staff are overwhelmed by the competing demands of patient care and repetition within overlapping documenting duties.

## CONCLUSION

This study found a low level of compliance in the PICU setting when completing a documentation checklist tool. Items that were particularly poorly completed often related to daily nursing tasks.

This study provides insight into the level of compliance within this hospital's PICU setting and raises questions about both the usefulness of checklist documentation in the PICU setting and the potential impact of documentation non-compliance on patient outcomes. The improved compliance seen with the introduction of form B may be attributable to the education delivered at its inception and further research may evaluate whether compliance declines over time. Further research may also determine whether the nursing documentation load is too cumbersome or superfluous in its present form and whether the use of technology may reduce duplication or incomplete record keeping.

## RECOMMENDATIONS

It is hoped that this research will form the foundation for further studies into what type of documentation is optimal within the PICU setting, taking into account the requirements of the hospital and differing care teams, nursing workload and the legal and accurate charting of patient care and response. The end result must always be improved patient care and the creation of documentation that aids this objective rather than hinders it.

## REFERENCES

- Bracco, D., Favre, J., Bissonnette, B., Wasserfallen, J., Revellyu, P., Ravussin, P. and Chiolerio, R. 2001. Human errors in a multidisciplinary intensive care unit: a 1-year prospective study. *Intensive Care Medicine*, 27(1):137-145.
- Carroll, V.S. 2008. Make a list. Then check it! *Journal of Neuroscience Nursing*, 40(3):131-133.
- Cheevakasemsook, A., Chapman, Y. and Francis, K. 2006. The study of nursing documentation complexities. *International Journal of Nursing Practice*, 12(6):366-374.
- Clarke, E.B., Luce, J.M., Curtis, J.R., Danis, M., Levy, M., Nelson, J. and Solomon, M.Z. 2004. A content analysis of forms, guidelines, and other materials documenting end-of-life care. *Journal of Critical Care*, 19(2):108-117.
- Donchin, Y., D. Gopher, M. Olin, Y. Badihi, M. Biesky, C. L. Sprung, R. Pizov, and S. Cotev. 2003. A look into the nature and causes of human errors in the intensive care unit. *Quality and Safety in Health Care*, 12(2):143-147.
- DuBose, J.J., Inaba, K., Shiflett, A., Trankien, C., Teixeira, P.G.R., Salim, A., Rhee, P., Demetriades, D. and Belzberg, H. 2008. Measurable Outcomes of Quality Improvement in the Trauma Intensive Care Unit: The Impact of a Daily Quality Rounding Checklist. *Journal of Trauma*, 64(1):22-27.
- Hales, B., Terblanche, M., Fowler, R. and Sibbald, W. 2008. Development of medical checklists for improved quality of patient care. *International Journal for Quality in Health Care*, 20(1):22-30.
- Hewson, K.M. and Burrell, A.R. 2006. A pilot study to test the use of a checklist in a tertiary intensive care unit as a method of ensuring quality processes of care. *Anaesthesia and Intensive Care*, 34(4):322-328.
- Irving, K., Treacy, M., Scott, A., Hyde, A., Butler, M. and MacNeela, P. 2006. Discursive practices in the documentation of patient assessments. *Journal of Advanced Nursing*, 53(2):151-159.
- Manor-Shulman, O., Beyene, J., Frndova, H. and Parshuram, C.S. 2008. Quantifying the volume of documented clinical information in critical illness. *Journal of Critical Care*, 23(2):245-250.
- Martin, A., Hinds, C. and Felix, M. 1999. Documentation practices of nurses in long-term care. *Journal of Clinical Nursing*, 8(4):345-352.
- Mueller, P.S. and Glennon, C.A. 2007. A nurse-developed prechemotherapy education checklist. *Clinical Journal of Oncology Nursing*, 11(5):715-719.
- Pronovost, P., Berenholtz, S., Dorman, T., Lipsett, P.A., Simmonds, T. and Haraden, C. 2003. Improving Communication in the ICU Using Daily Goals. *Journal of Critical Care*, 18(2):71-75.
- Rolston-Blenman, B. 2009. Nurses roll up their sleeves at the bedside to improve patient care. *Nurse Leader*, 7(1):20-25.
- Simpson, S.Q., Peterson, D.A. and O'Brien-Ladner, A.R. 2007. Development and implementation of an ICU quality improvement checklist. *AACN Advanced Critical Care*, 18(2):183-189.
- Soto, C.M., Kleinman, K. and Simon, S.R. 2002. Quality and correlates of medical record documentation in the ambulatory care setting. *Bio Med Central Health Service Research*, 2(1):22-28.
- Suresh, G. 2003. Don't believe everything you read in the patient's chart. *Pediatrics*, 111(5):1108-1109.
- Voutilainen, P., Isola, A. and Muurinen, S. 2004. Nursing documentation in nursing homes - state-of-the-art and implications for quality improvement. *Scandinavian Journal of Caring Sciences*, 18(1):72-81.