

Improving communication of the daily care plan in a teaching hospital intensive care unit

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Patients admitted to the intensive care unit have complex care needs, multiple concurrent medical and nursing issues, and an inhospital mortality rate of about 10%.¹ ICU patients are cared for by staff members from different specialties, including doctors, nurses and allied health staff.

An essential component of coordinating care of ICU patients is communication and handover between staff, during both shift changes and ward rounds. The Australian Commission on Safety and Quality in Health Care has established 10 National Safety and Quality Health Service Standards. Standard 6 relates to clinical handover and is designed to "ensure there is timely, relevant and structured clinical handover that supports safe patient care".²

Several previous studies have aimed to improve ICU staff's understanding of the medical care plan in the ICU.³⁻⁶ In our teaching hospital ICU, the medical ward round occurs at least twice daily, and discharge planning for the subsequent day occurs during the evening consultant ward round when appropriate. We undertook a quality improvement project to improve the documentation method for the daily patient care plan and communication with bedside nursing staff caring for patients. We hypothesised that introduction of a standardised daily care plan form would improve nursing staff's understanding of the communicated daily care plan. To test this hypothesis, we surveyed ICU nurses' self-reported understanding of elements of the medical care plan before and after introduction of a daily care plan form.

Methods

Ethics considerations

Ethics approval for this study was obtained from the hospital research and ethics committee. Approval was obtained to introduce the new daily care plan form and to survey ICU nurses. Willingness to participate in the survey was taken as an indication of consent (ethics approval number: H2012/04570).

Study design and phases

This study was conducted in our ICU between February and November 2012. Provisional development of a pro forma for documenting the daily care plan commenced in December

ABSTRACT

Background: Patients admitted to intensive care units have complex care needs. Accordingly, communication and handover of the medical care plan is very important.

Objective: To assess changes in ICU nurses' understanding of the medical daily care plan after development and implementation of a pro forma to improve documentation and communication of the plan.

Design, setting and participants: The study was conducted between February and November 2012 in a mixed medical-surgical, 18-bed, closed ICU in a teaching hospital. Baseline and post-intervention surveys assessed ICU bedside nurses' self-reported understanding of elements of the daily care plan.

Intervention: After receiving input from bedside nurses and medical staff, we developed the daily care plan as a single-page pro forma for handwritten documentation of a clinical problems list, plan and interventions list, daily chest x-ray results, a modified FAST-HUG checklist, and discharge planning during the evening consultant ward round. The finalised pro forma was introduced on 25 July 2012.

Results: Introduction of the pro forma daily care plan was associated with marked and statistically significant improvements in nurses' self-reported understanding of a list of the patient's clinical problems, the management plan after the ward round, issues for discharge for the following day (all $P < 0.001$) and, to a lesser extent, the physiological targets and aims ($P = 0.003$) and interpretation of the daily chest x-ray ($P < 0.001$). In the post-intervention survey, only 4/118 free-text comments (3.4%) suggested that documentation of the plan was doctor-dependent, compared with 28/198 (14.1%) at baseline ($P = 0.002$).

Conclusions: Introduction of a single-page, handwritten, structured daily care plan produced marked improvements in ICU nurses' self-reported understanding of elements of the medical plan, and may have reduced practice variation in medical plan documentation. The effects of this intervention on patient outcomes remain untested.

2011 without the knowledge of nursing staff. The baseline survey was conducted during February and March 2012, and the provisional pro forma was modified based on feedback from nursing staff after survey completion. The pro forma was then introduced on 16 April 2012 and revised on two occasions before being finalised on 25 July 2012. Nursing staff were resurveyed about their perceptions of the daily care plan form during October and November 2012.

Study setting

Our adult ICU contains 18 beds and operates as a closed ICU, where only ICU medical staff can prescribe therapy. There are about 2200 admissions per year, including patients with decompensated liver disease, patients who have had cardiac surgery, neurosurgery or liver transplantation, and patients with acute spinal cord injuries. There are also admissions from multiple specialty medical and surgical units.

Care plan documentation at baseline

Before April 2012, the daily care plan was documented on a blank section of the patient medication chart. This page was unstructured and needed to accommodate care plans for up to 3 days (the number of permitted days of medication prescription). The care plan was completed by the on-duty consultant or registrar based on the perceived priorities and identified clinical and management issues for each patient. Junior medical staff also documented medical progress notes in an electronic format; a process that did not change throughout the study period.

Development of daily care plan form

All versions of the daily care plan form emphasised documentation of a clinical problems list, based on either a diagnostic issue (eg, hypotension, sepsis with unknown source) or a management problem (eg, variceal bleeding, respiratory weaning). All versions also contained a checklist based on the FAST-HUG⁷ mnemonic (feeding, analgesia, sedation, thromboembolic prophylaxis, head-of-bed elevation, stress ulcer prevention, and glucose control) but with expanded fields as agreed by the consultant group, and also contained a space for recording the findings of the morning chest x-ray (CXR).

Figure 1. Format of final version of pro forma daily care plan

The form is titled 'Department of Intensive Care Daily Care Plan' and features the Austin Health logo. It includes fields for patient identification (U.F. Number, Surname, Given Name(s), Date of Birth) and a space to 'AFFIX PATIENT LABEL HERE'. The main section is for the 'A.M round', with fields for Date, ICU Day, ICU Consultant, Time, and Doctor completing form. It is divided into 'Clinical Problem List' and 'Plan and Interventions'. Below this is a 'Fluid balance aim for day' section with a diagram of lungs labeled 'R' and 'L'. A checklist asks 'Can the patient be discharged to the ward' with options for Yes/No and various medical criteria. The 'P.M round / Change in medical care plan between ward rounds' section has similar 'Clinical problem(s)' and 'Plan and interventions' fields. The 'Plan for overnight / tomorrow' section includes a checklist for overnight needs like 'Is a morning CXR needed?' and 'List non-routine bloods'. A vertical label on the right side reads 'Inpatient Care - Clinical Notes M16.0'.

The original version was spread over two pages that summarised the morning ward round and inter-ward round changes on one side, with the evening ward round and overnight events on the reverse side. It also contained a dedicated space for documenting the physiological aims for the patient for the shift. In response to feedback from nursing and junior medical staff, two iterations occurred.

The final version of the daily care plan form captured an entire day's plan on a single page (Figure 1). It contained open spaces for a clinical problems list and a plan and interventions list. The section for documenting physiological aims was removed on the final version, remaining on the general ICU observation chart. The daily CXR interpretation and modified FAST-HUG checklist were located in the

Table 1. Nursing staff's comprehension of aspects of intensive care unit (ICU) daily care plan, before and after intervention

	Very difficult	Difficult	Easy	Very easy	Missing	P
Using the current method of documentation (or new daily care plan) in our ICU, how easy is it to understand:						
Physiological targets and aims						
Baseline	0	13 (11.6%)	72 (64.3%)	27 (24.1%)	0	
After intervention	3 (2.8%)	10 (9.3%)	48 (44.9%)	46 (43.0%)	0	0.003
List of patient's clinical problems						
Baseline	8 (7.1%)	39 (34.8%)	55 (49.1%)	8 (7.1%)	2	
After intervention	0	3 (2.8%)	47 (43.9%)	57 (53.3%)	0	<0.001
Interpretation of chest x-ray						
Baseline	29 (25.9%)	59 (52.7%)	20 (17.9%)	2 (1.8%)	2	
After intervention	2 (1.9%)	28 (26.2%)	56 (52.3%)	21 (19.6%)	0	<0.001
The management plan after the ward round						
Baseline	2 (1.8%)	12 (10.7%)	74 (66.1%)	23 (20.5%)	1	
After intervention	0	6 (5.6%)	50 (46.7%)	51 (47.7%)	0	<0.001
Issues for discharge planning after the evening ward round						
Baseline	16 (14.3%)	52 (46.4%)	33 (29.5%)	6 (5.4%)	5	
After intervention	1 (0.9%)	19 (17.8%)	60 (56.1%)	27 (25.2%)	0	<0.001
On average, how easy is it to read the management plan on the green drug chart (or new daily care plan)?						
Baseline	4 (3.6%)	21 (18.8%)	75 (67.0%)	6 (5.4%)	6	
After intervention	0	3 (2.8%)	68 (63.6%)	36 (33.6%)	0	<0.001

morning round section. The bottom of the page contained a section to list issues that needed to be addressed overnight for discharge planning. The page was printed on a blank progress note with appropriate barcode to permit filing in the patient record and subsequent scanning into the hospital's electronic medical record system.

The final version was used for about 3 months before conducting the follow-up survey.

Survey development and implementation

The survey contained an introductory question with five elements, each linked to a four-part Likert scale, to assess how easy it was for nursing staff to understand five aspects of daily care (Appendix and Table 1). A sixth question asked how easy it was to read the management plan. During the baseline survey, the introductory question asked: "Using the current methods of documentation in our ICU, how easy is it to understand [each aspect of care]?" After the daily care plan was introduced, the wording of the question was changed to: "Using the new daily care plan, how easy is it to understand [each aspect of care]?" Both versions of the survey also contained an open-ended question that asked: "How would you suggest we improve the daily management plan?"

Table 2. Summary of themes among 198 comments in baseline surveys

Theme	No. of comments
Plan needs to be itemised/in dot points/structured	28
Documentation of the plan is doctor-dependent	28
Doctors' handwriting poor/non-standardised abbreviations	27
A list of problems is not well done and/or updated	20
Need to have a structured form/more room	20
Chest x-ray interpretation not well documented	19
Physiological aims should be better documented	13
Discharge planning/evening round not well documented	10
The doctors should involve nurse in round	10
The plan should be electronically documented	6
The drug chart is a bad place to write the plan	6
There needs to be a checklist/completion of ancillary paperwork	5
Poor documentation of plan in evening round	2
Need to verbally communicate written plan	2
The drug chart is a good place to write the plan	2
Other	8

Table 3. Summary of themes among 113 comments in follow-up surveys

Theme	No. of comments
Need for neater handwriting/avoiding abbreviations	21
Variable/poor compliance with completing/ updating plan	19
Poor documentation of physiological targets	16
The new form is useful/other positive comment	13
Chest x-ray interpretation not done adequately	12
Need clear list of problems	11
Poor completion of evening round/discharge planning	8
Comments about format of form	6
Completion is doctor-dependent	4
Need to include time and date	2
Need more space for documentation	2
Plan should be typed	2
Need a section for limitations of medical therapy	2

The survey was administered during nursing shift handovers and included staff from day, evening and night shifts. To minimise interviewer bias, a standardised and scripted introduction was used before handing the survey out. Participation was voluntary and anonymous. During the baseline survey, detailed data were recorded on the number of nurses who were approached and who declined to complete the survey. For logistical reasons, this was not done in the follow-up survey.

Mechanism of data analysis

Data were manually entered into a Microsoft Excel spreadsheet by an investigator not otherwise involved in the study (EC) and then checked for accuracy by two other investigators (DJ, DK). In cases where data were missing or two boxes were ticked, the question was not included in the analysis. No assumptions were made about missing or ambiguous responses, and the overall number of complete responses is presented. Open-ended questions were grouped into themes, and the number of comments in each theme subsequently collated.

Statistical analysis

Descriptive statistics are reported as numbers and percentages. Data were analysed using PASW Statistics 18.0.0 (SPSS Inc). Comparisons of categorical data and proportions were made using the χ^2 test with Yates contingency correction for non-2 \times 2 tables. A *P* value < 0.05 was considered significant.

Results

Administered surveys and response rate

At baseline, 112 nurses completed the survey and no nurses declined (100% response rate). In the follow-up survey, 107 nurses completed the survey.

Baseline survey

When asked how easy it was to understand the physiological targets and aims using the blank page of the medication chart and the general observation chart, 64.3% of nursing staff stated that it was "easy", while 24.1% stated it was "very easy" (Table 1). Similarly, 66.1% of nurses stated that it was easy to understand the management plan at the end of the ward round, while 20.5% stated this was very easy.

In contrast, nurses indicated that it was harder to understand a list of the patient's clinical problems (34.8% "difficult", 7.1% "very difficult"), interpretation of the morning CXR (52.7% difficult, 25.9% very difficult), and issues to be addressed for discharge planning after the evening ward round (46.4% difficult, 14.3% very difficult).

There were 198 individual comments on the baseline surveys, with 206 points of view, which we classified into 17 themes (Table 2). The most common of these themes suggested that the daily care plan should be itemised and structured, and that documentation of the care plan was doctor-dependent. Some comments relating to the latter theme were:

- each doctor has a different technique of documentation, a uniform method may work better. e.g. write current problems, CXR results and management plan
- Have same approach for all consultants
- All consultants [should] write the same thing. Consistent approach.

The next most frequent theme related to the quality or legibility of doctors' handwriting and/or use of non-standardised abbreviations.

Follow-up survey

There were substantial and statistically significant improvements in nurses' reported understanding of all aspects of care after introduction of the daily care plan (Table 1). The areas of greatest improvement were understanding the list of the patient's clinical problems (53.3% very easy), the management plan after the ward round (47.7% very easy) and issues for discharge planning after the evening ward round (56.1% easy). There was a lesser degree of improvement in nurses' reported understanding of the physiological targets and aims, and the interpretation of the morning CXR (Table 1).

The follow-up surveys contained 113 comments with 118 points of view, which we classified into 13 themes (Table 3).

The most frequent themes were handwriting legibility and use of non-standardised abbreviations, as well as incomplete documentation of the physiological targets.

There were only 4/113 comments (3.5%) made about the plan being doctor-dependent in the follow-up survey, compared with 28/198 (14.1%) in the baseline survey ($P=0.002$).

Discussion

We conducted a quality improvement project to improve and standardise the documentation of the daily care plan in our ICU. Guided by a baseline survey of nurses, senior medical staff input, and iterative feedback from nursing and junior medical staff, we developed a single-page pro forma to document a complete daily care plan over two ward rounds and three nursing shifts. We found that introduction of this pro forma resulted in improvements in nurses' self-reported understanding of all measured elements of the daily care plan and appeared to reduce perceptions of variability in documentation practices between consultants, when compared with the baseline method of documentation.

Several other studies have aimed to improve ICU junior medical and/or nursing staff's understanding of the medical care plan. Pronovost et al conducted a prospective, single-centre, before-and-after survey in an oncological ICU and found that completion of a daily goals form improved ICU resident and nursing staff's self-reported understanding of the daily goals from 10% at baseline to more than 95% after the intervention.³ Limitations of the study included a failure to report the survey response rate and the possibility that staff were surveyed multiple times.

Siegele conducted a survey of ICU staff 3 months after introduction of a nursing-led daily goals tool and obtained a 46% response rate.⁴ Overall, 72% of respondents agreed or strongly agreed that the daily goals tool was beneficial to patient care, and 63% agreed or strongly agreed that the daily goals tool improved communication from nurse to nurse at handover.

In a 16-bed medical ICU, Narasimhan et al conducted surveys at baseline and 6 weeks and 9 months after introduction of a daily goals worksheet.⁵ They obtained a 100% response rate and found improved understanding of daily goals among both nurses and physicians, which was sustained at 9 months.

A study in a paediatric ICU showed improved nurses' understanding of elements of the medical care plan after introduction of a daily goals patient sheet.⁶

In contrast to these positive studies, Ainsworth et al reported that introduction of a daily communication card on the door of the patient's room did not improve goal

alignment with a multidisciplinary ICU ward round team.⁸ This negative result may be attributable to the short intervention period (1 month) and a lack of education about expected use of the card.

Strengths of the intervention in our study include its simplicity, low cost and the involvement of medical and nursing staff during refinement of the pro forma. Limitations of the study include its single-centre, before-and-after study design and lack of assessment of important patient-centred outcomes. However, the aim of this project was to improve the quality of communication and document the key aspects of the agreed management plan identified during the twice-daily medical ward round. A further limitation is that we did not formally collect data on refusals to participate in the follow-up survey, although we believe that this number was very small. We did not measure the actual frequency or quality of documentation in the baseline and intervention periods. It is possible that the introduction of the daily care plan led to an increase in the amount of documentation.

The Australian Commission on Safety and Quality in Health Care has recently emphasised the importance of clinical communication and handover by making it one of the National Safety and Quality Health Service Standards.² Using a relatively simple and inexpensive intervention, we showed marked improvement in self-reported understanding of all elements of the daily care plan by our nursing staff.

Despite these improvements, nurses still commented on the poor quality of doctors' handwriting, use of non-standardised abbreviations, and under-completion of aspects of the daily care plan. These variables will be the focus of ongoing quality improvement initiatives.

One of the unexpected findings of our study was the frequent comments about variability in the quality and nature of daily care plan documentation at baseline. Although it was not a specific aim or a measured outcome, introduction of the daily care plan may have reduced the degree of unwanted practice variation between consultants in this regard.

Whether this initial success can be sustained remains unknown. In a future study, it may be possible to ascertain whether the new form improved or increased task completion. In addition, the effects of this improved communication on important patient outcomes remain to be assessed. Finally, the beneficial effects of the daily care plan for medical and nursing clinical handover between shifts also remain unknown.

In conclusion, we found that development and introduction of a relatively simple and inexpensive handwritten daily care plan was associated with marked improvements in nurses' self-reported understanding of facets of the

daily care plan. The sustainability of this program and its effect on important patient outcomes remain undetermined.

Competing interests

None declared.

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Appendix. Survey administered to nursing staff at baseline

Survey number (research use only)

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Using the current methods of documentation in our ICU, how easy is it to understand

	very difficult	difficult	easy	very easy
1. The physiological targets and aims (e.g. SpO₂, MAP, CVP ...etc)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2. A list of the patient's clinical problems (e.g. pneumonia, renal failure ...etc)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3. Interpretation of the chest X-ray (e.g. collapse, fluid overload ...etc)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4. The management plan after the ward round	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5. Issues that need to be addressed for discharge planning of the next day following the evening ward round	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

On average, how easy is it to read the management plan on the green drug chart (M 86.0)

very difficult	difficult	easy	very easy
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

How would you suggest we improve the daily management plan ?

1.
2.
3.
4.