

Advanced Practice Registered Nurse–directed Care Coordination Interventions and Outreach After Critical Illness

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ABSTRACT

The purpose of this pilot study was to implement care collaboration measures into a critical care advanced practice. The intervention included an outreach algorithm and a standardized handoff tool during care transition. One hundred eight patients were enrolled; 5 (4%) experienced unplanned readmission. There was no significant association with transition time and the ability to complete the algorithm. Comorbidities of chronic obstructive pulmonary disease ($P < .005$), a PaO_2 ratio < 200 ($P < .003$), and pulmonary disease ($P < .027$) showed increased unplanned readmission within 48 hours of transition. Implementing critical care collaborating measures was not affected by transition time and unit care flow.

Keywords: care transitions, critical care, collaboration, intensive care, outreach

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Care transitions for complex critically ill patients are vital to patient recovery and ongoing resolution of critical illness and are necessary to optimize patients' care within the boundaries of available hospital resources.¹⁻³ Care transition also represents a vulnerable period in health care delivery when the most complex patients within the health care organization are transitioned to changes in medical and direct care providers, a new physical environment, and an altered level of care and supervision. Nationally, up to 1 in 10 patients discharged from the critical care unit will be readmitted to the critical care unit during the same hospitalization. Ramifications correlated with unplanned readmission to the critical care unit include significant increases in illness acuity and mortality, overall length of stay, and increased health care costs.^{2,4-7}

The scope of care support provided by critical care outreach models and activities using outreach teams is diverse. The majority of the models described in the literature were implemented using a designated team of critical care providers.^{1,3,8} Institutional space,

staffing, and financial constraints may limit the development and implementation of such transitional care programs. The purpose of this pilot study was to determine the feasibility of implementing care collaboration measures after transitions in care for complex critically ill patients at risk for unplanned readmission by including critical care outreach services and standardized handoff into clinical advanced practice in order to optimize patient outcomes.

METHODS

This was a quasi-experimental study design with a convenience sample population of patients transitioning from a single surgical critical care unit to the floor as conducted in a large urban teaching medical institution. The implementation team consisted of 11 certified acute care nurse practitioners overseeing patient care. Acute care nurse practitioner services are available to patients 24 hours a day, 7 days a week. Before implementation, this quality improvement project was reviewed and approved by the implementation location institutional review board.

The study population included adult participants who were transitioning to an inpatient surgical floor after admission to a surgical critical care unit and met high risk for unplanned readmission enrollment criteria. High-risk criteria included appraisal of the participants' baseline comorbidities and situational factors present during the participants' surgical critical care course. Multiple standardized instruments were used to identify unplanned readmission risk criteria (Table), including the Charlson Comorbidity Index,⁹ a comprehensive appraisal of critical care course factors associated with unplanned readmission during hospitalization and retrospective evaluation of all patients within our institution who experienced unplanned surgical critical care readmission during hospitalization. In order to be enrolled in the pilot study, the participant had to have 3 high-risk criteria present from either baseline comorbidities or critical care course factors and be transitioning from the surgical critical care unit to the surgical floor.

The intervention consisted of a standardized critical care handoff tool and a critical care outreach care algorithm (Figure). The standardized handoff tool consisted of an electronic note relaying all pertinent participant critical care course information, patient care goals, critical laboratory data for follow-up, medication adjustments, and caregiver information. The outreach algorithm consisted of timely distant and direct patient assessment, evaluation of hemodynamic parameters, ongoing need for electrolyte repletion, medication management, and antibiotic therapy continuation with receiving care team communication for the first 48 hours after transition. Every 12 hours after transition, the members of the advanced practice nursing team would perform a chart review, conduct direct patient status assessment, and communicate with the patient's surgical floor care team (bedside nursing staff and providers) to assess the participant's status after transition and address any care concerns/questions. The advanced practice nursing team provided ongoing evaluation of the patient's functional status and ongoing resolution of critical care needs and determined the patient's ability to be discharged from the algorithm. Participants who experienced significant alterations in functional ability and/or hemodynamic instability after transition who required

immediate readmission to the surgical critical care were cared for in accordance with the institutional rapid response team protocol. The care coordination intervention enrollment was for the 48 hours after transition.

Members of the advanced practice nursing team collected demographic data on all enrolled participants, including age, baseline comorbidities, and surgical critical care course information. Participant hospital admission and length of stay, vital signs before transition, and admission type (emergent vs elective) were documented. Several feasibility measures were also collected, including whether the advanced practice nurses were able to complete all components of the transition intervention and appropriately discharge patients from the intervention. If the participant did experience an unplanned readmission after transition, the timing and events surrounding the participant's readmission were also documented. All participant data were deidentified and recorded within SPSS statistical software (SPSS Inc, Chicago, IL) for analysis.

A total of 108 participants admitted to a surgical critical care unit over 112 days were enrolled in the transitional care intervention. Demographic data collected on all participants identified that they had an age range from 21 to 85 years (mean = 62 years, standard deviation = 14.231). The majority (n = 64, 59%) of the patients were admitted electively, and 5 (4%) of the patients experienced an unplanned readmission to the surgical critical care unit during hospitalization. This was noted to be comparable with national averages varying from 4% to 10%.³ Eighty-eight percent (n = 96) of the patients had 2 to 6 baseline comorbidities; the most frequently reported baseline comorbidities included critical care length of stay greater than 48 hours, transitioned with a positive fluid balance greater than 4 L, cancer, and advanced age.

Successful implementation was evaluated by collecting feasibility data on all components of the transitional care intervention in conjunction with individual patient characteristics associated with unplanned readmission. The data reflect that there was no significant association found between transition times, which implies differing staffing levels, patient care flow, and the ability to complete the

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