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Characteristics of Patients Receiving Complex Case Management in an Acute Care Hospital

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ABSTRACT

Background: Improving transitions in care is a major focus of health care planning. In the research team's prior intervention study, the length of stay (LOS) was reduced when patients at high risk for readmission were identified early in their acute care stay and received complex management.

Objective: This study will describe the characteristics of patients receiving complex case management in an urban acute care hospital.

Primary Practice Setting: Acute care hospital.

Methodology and Sample: This was a retrospective chart review of patients in a previous quality assurance study. A random selection of patients who previously underwent high-risk screening using the LACE (Length of stay; Acuity of the admission; Comorbidity of the patient; Emergency department use) index and received complex case management (the intervention group) were reviewed. The charts of a random selection of patients from the previous comparison group were also reviewed. Patient characteristics were collected and compared using descriptive statistics.

Results: In the intervention group, more patients had their family physicians (FPs) documented (93.1% [81/87] vs. 89.2% [66/74]). More patients in the intervention group (89.7% [77/87] vs. 85.1% [63/74]) lived at home prior to admission. More patients in the intervention group had a family caregiver involved (44.8% [39/87] vs. 41.9% [31/74]). At discharge, more patients in the intervention group (87.1% [74/85]) were discharged home compared with the comparison group (78.4% [58/74]).

Implications for Case Management Practice: (1) Having an identified FP, living at home, and having family caregiver(s) characterized those with lower LOS and discharged home. (2) Case management, risk screening, and discharge planning improve patient outcomes. (3) This study identified the importance of having a FP and engaged family caregivers in improving care outcomes.

Patients with complex care needs display high hospital utilization including emergency department (ED) services, length of stay (LOS), and readmissions due to multimorbidities, behavioral issues, and social challenges (Aminzadeh & Dalziel, 2002; Kuluski et al., 2017; Poitras et al., 2020). Many studies have examined the effectiveness of risk stratification tools, case management, and integrated care interventions in identifying patients at high risk for readmission and reducing health care use for patients with complex care needs. Such patients appear to benefit from a prediction model called the LACE index, which includes four variables, LOS, acuity of the admission, Charlson Comorbidity Index Score, and ED use, to identify patients at high risk for readmission and supporting them in transition from acute care to home (van Walraven et al., 2010).

Up to 20% percent of hospitalizations are due to readmissions within 30 days of discharge, often as

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a result of ineffective communication among the acute and primary health care team and with the patient (Lacker, 2011). There are numerous potential benefits that can arise from follow-up with patients after discharge from the hospital. For example, posthospital discharge follow-up helps to identify patients who might be at risk for an adverse event (D'Amore et al., 2011; Melton et al., 2012; Vernon et al., 2019). Discharge and transition initiatives, such as Path to Home, have been shown to lead to improvements in outcomes if interventions include family members and caregivers, focus on patient education, develop opportunities for interdisciplinary communication between health care professionals and family, and provide care planning and ongoing support after discharge (Backman et al., 2018; Coleman et al., 2004). Multicomponent interventions, including patient education, medication reconciliation, discharge planning, or post-discharge phone calls, have been effective (Boutwell & Hwu, 2009; Hansen et al., 2011; Kansagara et al., 2016; Kinard et al., 2024; Leppin et al., 2014).

The terms care coordination, care management, and case management are often confused (Williams, 2020). Williams defined care coordination as assistance to patients trying to navigate a fragmented and complex health care system; care management was defined as interventions to stabilize or restabilize a patient showing evidence of instability in a chronic condition to allow self-management; and case management was defined as the intervention needed to find effective support for those most fragile who are unable to self-manage their health burden without this support (Williams, 2020). Using a collaborative process, case management interventions involve assessing, implementing, coordinating, and monitoring care options for individualized patient needs (Williams, 2020). Care coordination, care management, and case management have been used to show the effectiveness of integrated care interventions in previous studies (Berntsen et al., 2019; Bui et al., 2019; Low et al., 2017; Titova et al., 2015).

In a previous study, the research team showed that using the LACE index in conjunction with complex case management and discharge planning reduced 90-day and 6-month hospital readmissions and interestingly found a reduction in hospital LOS of 4 days, without increasing short-term ED revisits and readmissions (Charles et al., 2020). The average LOS was shorter in the intervention group (12.7 days) than in the comparison group (16.6 days) (Charles et al., 2020). Complex case management consisted of risk stratification using the LACE index and discharge planning. For high-risk follow-ups, phone calls focused on medications, equipment, home care services and ensuring a consultation was booked with a primary care physician. While complex case management occurs through all admissions, this study explores that specific to this study and why the decreased LOS occurred. Thus, having the LACE score in the medical record during the inpatient admission was felt to be a catalyst for more aggressive discharge planning for those identified as high risk and bringing about decreased LOS. There is much uncertainty regarding what measures may reduce LOS (Siddique et al., 2021). Decreasing LOS is important to decrease adverse events for patients as well as improving system flow and health care costs (Mustafa et al., 2016; Sekijima et al., 2020). The research team wanted to explore the impact of case management versus other characteristics that may have brought about the decreased LOS.

The (original) study found that patients in the intervention group had decreased lengths of stay, lower 90-day readmissions, and lower 6-month readmissions.

Methods

This was a retrospective chart review of patients in a previous quality assurance study (Charles et al., 2020). The University of Alberta's Health Research Ethics Board deemed this study to be outside the board's mandate (Study ID No. Pro00106498).

The Original Study

In the original study (Charles et al., 2020), the intervention included the following: identification of those patients at risk for readmission by using a LACE score of 13 or greater and provision of complex case management to these high-risk patients. A transition coordinator provided the complex case management. There were 433 patients in the intervention group and 231 patients in the comparison group. For the intervention group, all patients admitted consecutively to medicine units, excluding those from facility living (long-term care), designated supportive living, and living outside of the region, at the Grey Nuns Community Hospital between September 2016 and May 2017 had a LACE score calculated within 3 days of admission. Those with a LACE score of 13 or higher were included in the intervention group with complex case management and discharge planning. For the comparison group, all patients admitted to medicine units at the Grey Nuns Community Hospital between June 2017 and

September 2017 had a LACE score calculated within 3 days of admission retrospectively after their discharge, thus did receive the intervention and did not have the LACE on their chart during the admission. There was thus a LACE score to act as a comparison for research purposes only, not clinically, during the inpatient stay. The patient outcomes for those with a LACE score of 13 or higher were tracked to provide a basis for comparison to the outcomes in the intervention group. A comparable group of high-risk patients who did not receive the intervention served as comparisons. The comparison and intervention groups were similar in terms of LACE scores (Charles et al., 2020). The study found that patients in the intervention group had decreased lengths of stay, lower 90-day readmissions, and lower 6-month readmissions.

Participants in the Current Study

The study included a random selection of patients from the original intervention group (n = 87) and the original comparison group (n = 74). Random selection was done using Excel (RAND function). The charts of these patients were reviewed.

Data Elements

The following data were extracted from the charts:

- living arrangement (e.g., home and assisted living),
- LACE score,
- Health care disciplines involved (e.g., physiotherapy/occupational therapy),
- team conference conducted (yes/no),
- rapid rounds conducted (yes/no),
- disposition (e.g., home and assisted living),
- equipment requested (yes/no),
- referred to home care(yes/no),
- system case manager involved (yes/no),
- family/caregiver involved (yes/no),
- goals of care documented (yes/no),
- family physician (FP) documented (yes/no),
- FP part of primary care network (yes/no).

Primary care networks provide team-based care with physicians working with health care professionals like nurses and mental health therapists to provide integrated care. A single author, a Care of the Elderly physician with research methods training, reviewed the charts.

Analysis

Descriptive statistics (frequencies and proportions) were used to analyze the results. Microsoft Excel 2019 was used in the analysis.

Having a caregiver, family physician and living at home appear to be important in facilitating a shorter length of stay in hospital and a discharge home. However, there is little literature identifying these as factors.

Results

In the intervention group, more patients had documented FPs, 93.1% (81/87) versus 89.2% (66/74) in the comparison group. More patients in the intervention group lived at home, 89.7% (78/87) versus 85.1 % (63/74) in the comparison group. Additionally, more patients in the intervention group were discharged home, 87.1% (74/85), compared with the comparison group, 78.4% (58/74). More patients in the intervention group had a systems case manager (an experienced homecare case manager who dealt with the most complex patients), 2.3% (2/87) versus 0% in the comparison group. The systems case manager was a new role at the time of this project; hence, the case manager's involvement was low in both groups. More patients in the intervention group had a caregiver involved, 44.8% (39/87) compared to 41.9% (31/74) in the comparison group. However, more patients in the comparison group had an FP belonging to a primary care network (77.0% [57/74] vs. 69.0% [60/87] in the intervention group), had goals of care documented (96.0% [71/74] vs. 93.1% [81/87] in the intervention group), had homecare involved (66.2% [49/74] vs. 65.5% [57/87] in the intervention group), and had equipment arranged prior to discharge (23.0% [17/74] vs. 18.4% [16/87] in the intervention group). Both groups had a median of three disciplines involved.

Team conferences and rapid rounds were not well documented in the medical chart. In both groups, the average team conference was 1.24% and rapid rounds 1.86% of the time. Rapid rounds occurred on a daily basis; all patients on the unit were discussed by the multidisciplinary team but were documented in the Medworxx clinical system, which looks at readiness for discharge and not the actual medical chart. Medworxx is a health information technology providing patient flow analytics. It monitors patient stay and care delays, assesses discharge readiness, and supports optimal care and standardized process across the health system.

In initial analyses, statistical tests using Stata 17 comparing both groups on eight variables listed in Table 1 were performed. However, none of the tests

TABLE 1
Characteristics of the Intervention and Comparison Groups

	Intervention Group *n/N* (%)	Comparison Group, *n/N* (%)	Total, *n* (%)
Family physician–documented	81/87 (93.10)	66/74 (89.19)	147/161 (91.30)
Family physician–part of primary care network	60/87 (68.97)	57/74 (77.03)	117/161 (72.67)
Goals of care documented	81/87 (93.10)	71/74 (95.95)	152/161 (94.41)
Home care	57/87 (65.52)	49/74 (66.22)	106/161 (65.84)
Equipment	16/87 (18.39)	17/74 (22.97)	33/161 (20.50)
Team conference conducted	1 (1.15)	1 (1.35)	2 (1.24)
Rapid rounds conducted	3 (3.45)	0 (0)	3 (1.86)
Family caregiver involved	39 (44.83)	31 (41.89)	70 (43.48)
Range of disciplines involved per patient	0–8 Disciplines	0–6 Disciplines	-
Median number of disciplines involved	3 Disciplines	3 Disciplines	-
Living arrangement, *n/N* (%)			
Home	78/87 (89.66%)	63/74 (85.14%)	-
Lodge	6/87 (6.90%)	8/74 (10.81%)	-
PAL	2/87 (2.30%)	-	-
Group home	1/87 (1.15%)	-	-
DSL/DAL	-	3/74 (4.05%)	-
Disposition, *n/N* (%)			
Home	74/85 (87.06%)	58/74 (78.38%)	-
Lodge	5/85 (5.88%)	8/74 (10.81%)	-
PAL	2/85 (2.35%)	-	-
Hospice	2/85 (2.35%)	-	-
Another hospital	1/85 (1.18%)	-	-
Group home	1/85 (1.18%)	-	-
Long-term care	-	2/74 (2.70%)	-
DAL	-	2/74 (2.70%)	-
Other	-	4/74 (5.40%)	-

Note. DAL = designated assisted living; DSL = designated supportive living; PAL = private assisted living.

were significant, and just the proportions were reported. Similar to the original study, while the differences were not statistically significant, they were clinically significant.

Discussion

The health care system is becoming increasingly difficult to navigate, especially for seniors. This is because seniors often have more complex medical problems, higher acute care use, and longer LOS, which may result in readmission if the discharge is not well supported. There is, thus, a need for patient-tailored complex case management and discharge planning, which involves many care team members, including the patient and family caregivers.

Primary Care and Family Caregivers

The study found more patients in the intervention group had a documented FP and lived at home, prior to admission. The intervention group had more family caregiver involvement, which also contributed to earlier discharge. It is well recognized that having a caregiver to support patients helps them stay home longer (May et al., 2014). Additionally, discharges show improved outcomes if caregivers are included (Backman et al., 2018; Coleman et al., 2004). Research has shown outpatient follow-up, home care, and FP follow-up are all associated with decreased readmission and resource utilization (Tak et al., 2021). Nearly 10% more patients in the intervention group were discharged home compared with the comparison group. Having a caregiver, FP, and living at home appear to be important in facilitating a shorter LOS in hospital and a discharge home. However, there is little literature identifying these as factors.

Complex Case Management

Complex case management and discharge planning are at the heart of patient-centered care. Berntsen et al.

The Path to Home goal is to provide patients, their families, and care team/service providers with a consistent experience via standardized processes, coordinated care, communication strategies, and supporting technologies. This aspect demonstrated impact in terms of the multidisciplinary care planning that is required for complex patients and the subsequent reduction in LOS. Rapid rounds and care coordination are key components of the Path to Home care and service delivery model.

implemented a similar integrated patient-centered proactive care intervention (Berntsen et al., 2019). The intervention consisted of identifying what mattered most to the patient, having the patient-centered team collaborate with the patient to make and deliver a person-centered, goal-oriented, and proactive multimorbidity care plan, providing continuous evaluations of both care planning and delivery of care, and work toward a gradual handoff of care delivery to self-management and usual care as soon as possible. The results indicated that the integrated patient-centered proactive care intervention reduced emergency room (ER) admission, ER bed stays, and ER readmission.

Other research has identified decreased LOS. Titova et al. (2015) completed a one-center controlled study to compare the effectiveness of an integrated care intervention with usual care for patients with chronic obstructive pulmonary disease (Titova et al., 2015). The integrated care intervention consisted of communication, coordination, and support from three specialist nurses, home care nurse education, interactive e-learning, individualized self-management plan, and home joint visits. It also found that there was a 48.3% reduction in hospital days for integrated care compared to no change for usual care.

However, proposed methods to decrease LOS comprising discharge planning, geriatric assessment, medication management, clinical pathways, interdisciplinary or multidisciplinary care, case management, hospitalist services, and telehealth are inconsistent (Siddique et al., 2021). The Path to Home initiative implemented in 2014 was an integral access and flow initiative to address acute care service delivery and proactive discharge planning with an integrated approach (Pendharkar et al., 2016).

Rapid Rounds

Rapid Rounds are structured interprofessional rounds that bring the team together to review the patients' plan of care daily. As the name suggests, they are rapid fire with 1 min per patient daily as opposed to weekly team conferencing where each patient may be discussed for 5–10 min. Both are multidisciplinary. Rapid Rounds' focus is "what is the care today, and what is the plan for the stay". Consistent daily communication is imperative for providing quality and safe patient care. The Rapid Rounds team reviews daily: where the patient is from, where they will return to, if any support services are currently in place or required, what the Anticipated Date of Discharge is and what each discipline is required to complete, to move the care plan forward. Rapid rounds do occur on a daily basis but are documented in the Medworxx system and not the actual medical chart. Thus, the 1.86% documented in the medical chart is not representative. It is felt by the attending teams that daily rapid rounds that replaced weekly team conferencing have played an important role in complex case management and discharge planning, leading to the decreased 4-day LOS in the study by Charles et al. (2020) Patel et al. conducted a quality improvement initiative that aimed to pilot and evaluate the impact of brief, team-based multidisciplinary rounds (MDRs) on discharge planning and efficiency of care, including increasing the proportion of early discharges before noon and reducing the overall LOS and 30-day readmission rates (Patel et al., 2019). The interventions included the implementation of team-based MDR, which included a case manager, a unit charge nurse, a pharmacist, a discharge planner, and a patient resident liaison. Subsequent interventions included a team huddle and lastly increasing the duration of physician continuity during admission. The proportion of patients with discharge before noon orders was 41.2% on pilot versus 29.6% on control teams. The LOS was 92.2 hr versus 97.2 hr, and the 30-day readmission rate was 16.0% versus 18.3% for the pilot versus control teams, respectively. While they were not well documented, multidisciplinary rapid rounds do occur and also likely contribute to the decreased LOS. This process should be integrated in terms of documentation with the move to electronic medical charting. Similar decreased LOS has been found in other studies where brief discharge rounds are utilized, but this was specific to trauma care (Dutton et al., 2003; Haan et al., 2007; Sen et al., 2009).

Having an identified family physician, living at home and having family caregiver(s) characterized those patients with lower length of stay and discharged home.

Risk Stratification

Having the risk stratification (LACE) on the chart prompted earlier discharge planning. Another study used the Early Screen for Discharge Planning tool to screen for patients at risk of complex discharge planning; this showed a trend toward decreased LOS (Grafton et al., 2023). Patel et al. conducted a quality improvement initiative that aimed to pilot and evaluate the impact of brief, team-based multidisciplinary rounds (MDRs) on discharge planning and efficiency of care, including increasing the proportion of early discharges before noon and reducing the overall LOS and 30-day readmission rates (Patel et al., 2019). The interventions included the implementation of team-based MDR, which included a case manager, a unit charge nurse, a pharmacist, a discharge planner, and a patient resident liaison. Subsequent interventions included a team huddle and lastly increasing the duration of physician continuity during admission. The proportion of patients with discharge before noon orders was 41.2% on pilot versus 29.6% on control teams. The LOS was 92.2 hr versus 97.2 hr, and the 30-day readmission rate was 16.0% versus 18.3% for the pilot versus control teams, respectively. While they were not well documented, multidisciplinary rapid rounds do occur and also likely contribute to the decreased LOS. This process should be integrated in terms of documentation with the move to electronic medical charting. Similar decreased LOS has been found in other studies where brief discharge rounds are utilized, but this was specific to trauma care (Dutton et al., 2003; Haan et al., 2007; Sen et al., 2009).

Prior studies reveal that integrated care that includes transitional care interventions effectively reduces health care use for patients with complex care needs (Bui et al., 2019; Low et al., 2017; Titova et al., 2015; Williams, 2020). Identifying those patients at high risk is key to utilizing case management, care management, and care coordination strategies more cost-effectively.

Implications for Case Management Practice

This study described the characteristics of patients receiving complex case management. Those patients with an identified FP, who live at home, and with family caregivers had lower LOS and were discharged home. Moreover, case management, risk screening, and discharge planning improved patient outcomes. This study highlights the importance of having a FP and engaged family caregivers in improving care outcomes.

Limitations

This study was based on a previous quality assurance study comparing patients receiving the intervention with a historical comparison group. Moreover, this study was a single site-based chart review and further limited by the information documented in the chart. Suboptimal documentation, e.g., documentation during rapid rounds, was a limitation.

Conclusion

Having an identified FP, living at home, and having family caregiver(s) characterized those patients with lower LOS and discharged home.

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