MODELS AND SYSTEMS OF GERIATRIC CARE

Improving Disposition Outcomes for Patients in a Geriatric Skilled Nursing Facility

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OBJECTIVES: To evaluate an intervention to improve discharge disposition from a skilled nursing unit (SNU).

DESIGN: Historical control comparison of discharge disposition before and after implementation.

SETTING: Fifty-bed SNU.

PARTICIPANTS: All patients admitted from acute care hospitals to a SNU between June 2008 and May 2010.

INTERVENTION: Physician admission procedures were standardized using a template, patients with three or more hospital admissions over the prior 6 months received palliative care consultations, and multidisciplinary root-cause analysis conferences for patients transferred back to the hospital acutely were conducted bimonthly to identify problems and improve processes of care.

MEASUREMENTS: Patients' discharge disposition (i.e., acute care, long-term care, home, or death) before and after implementation were compared.

RESULTS: Discharge dispositions were determined for all 1,725 patients admitted during the study; 862 patients before (June–May 2008) and 863 during (June 2009–May 2010) the intervention. Discharge dispositions were significantly differently distributed across the two periods (P = .03). Readmission to acute care declined (from 16.5% to 13.3%, a nearly 20% decline). Multivariable logistic regression, controlling for age, sex, and case-mix index and adjusting for clustering due to repeated admissions of individual patients, suggests that, during the intervention period, patients were more likely than during the baseline period to die on the unit in accordance with their wishes than to be transferred out to the hospital (odds ratio = 2.45, 95% confidence interval = 1.09–5.5).

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CONCLUSION: Interventions such as the ones implemented can lead to fewer hospital transfers for SNUs. J Am Geriatr Soc 2011.

Key words: rehospitalization; skilled nursing unit; palliative care; multidisciplinary team

One in five Medicare beneficiaries was rehospitalized within 30 days of hospital discharge in 2004, at an estimated cost of \$17.4 billion. Hospitalized patients admitted to a skilled nursing facility (SNF) have a high rate of early unplanned rehospitalization. In 2006, the national rate for patients discharged to a SNF who were rehospitalized directly from the SNF or within 2 days of discharge from the SNF was 23.5%. Two reasons to believe that a fair amount of these events are likely to be avoidable are the high prevalence of preventable diagnoses and significant geographic variation. For example, whereas patients in Utah discharged to SNF had a rehospitalization rate of 15.1%, patients in Louisiana had a rate of 28.2%.

Hospitals are currently required to report readmission rates, but few SNFs use repeat hospitalizations as a measure of quality of care. Because SNFs typically serve patients who are admitted to and discharged from multiple hospitals—and SNF administrators may not have access to these data—SNF administrators cannot generally determine the rate of readmission for their patients once they have been discharged to the community. SNFs do have access to Minimum Data Set (MDS) data to follow the number of patients they are sending out acutely to the hospital, but this is currently not a required quality indicator.

Many factors contribute to rehospitalization risk. Risk factors include prior recent hospitalization, specific diagnoses (e.g., congestive heart failure), and indices such as carbon dioxide levels for patients with chronic obstructive pulmonary disease, renal function, and other clinical parameters.^{4–8} Clinical instability, lack of medication reconciliation, depression, and multiple other factors also

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contribute to rehospitalization risk.⁹⁻¹⁷ Geriatric assessment, nurse practitioner involvement, and type of facility have been found to be associated with a lower rate of readmissions from SNFs.¹⁸⁻²¹

This project was a prospective quasi-experimental trial to change discharge dispositions for patients on a skilled nursing unit (recuperative services unit, RSU). The intervention included three elements: Physician admission procedures were standardized with a template, which included care guidelines for common geriatric syndromes, a template for medicine reconciliation, a standardized goals of care discussion, and a question of how many times the patient had been hospitalized over the past 6 months; patients with more than three hospital admissions over the prior 6 months received automatic palliative care consultation; and multidisciplinary conferences were conducted every 2 weeks examining the care of patients acutely transferred to the hospital to identify problems and improve processes of care. The distribution of discharge dispositions before the intervention and after initiation of the intervention were compared to evaluate the efficacy of the program.

METHODS

The Hebrew SeniorLife (HSL) institutional review board approved the project, and an advisory committee composed of nurses, secretarial staff, aides, therapists, nurse practitioners, doctors, administrators from HSL and an acute care hospital, and a daughter of a patient who had experienced repeat hospitalizations was convened and met before implementation of the intervention and biannually to guide the project. The main outcome of interest was the distribution of discharge dispositions, including, readmission, transfer to long-term care facility, discharge to home, and death. Readmission includes people directly transferred from the RSU to an acute care hospital or psychiatric unit, transferred to an acute care hospital or psychiatric unit at the time of a physician office visit during the time they are an RSU patient, and transferred to acute care or psychiatric unit from a dialysis unit during the time they are an RSU patient. The HSL medical care review committee reviewed all deaths and acute care transfers at HSL to ascertain potential errors and avoidable causes and to determine whether deaths were expected.

The baseline distribution of discharge dispositions, before initiation of the intervention, included data from all patients admitted to the RSU from June 2008 to May 2009. The intervention began in June 2009, and data for the first 12 months of the intervention were used for the current analyses. Specifically, the intervention period included final disposition data from all patients admitted to the RSU from June 2009 to May 2010. Administrative data were used to determine the discharge disposition for each person. In addition, initial information was collected from the MDS assessment, including age, sex, race, ethnicity, functional level (activity of daily living long-form scale), cognitive performance level (Cognitive Performance Scale), pain index, depression rating scale, and case-mix index (CMI). All patients were on Medicare Part A or managed care. The RSU is part of HSL, a nonprofit institution with a closed medical staff, and is located in a facility that also includes a 400-bed long-term care hospital. Doctors and nurse practitioners are on site until 6 p.m. Monday to Friday and for rounds on weekends and holidays, and physicians are oncall by telephone at other times.

In 2008, a standardized template was developed with input from all members of the HSL Department of Medicine and important nursing, administrative, and social service leaders. The American Medical Directors admission history and physical template was used, and care guidelines for common geriatric syndromes, medicine reconciliation, goals of care, and a question of how many times the patient had been hospitalized over the past 6 months were included (Appendix 1). The advance directives section included a discussion about whether the patient or healthcare proxy would want subsequent hospitalizations if the patient's condition deteriorated while on the SNF. To determine fidelity to this aspect of the intervention protocol, a random sample of 40 patients' charts was surveyed to determine whether the admitting attending used the template.

If a patient had had three or more hospitalizations (including the hospitalization immediately preceding the current SNF admission) in the past 6 months, a palliative care consultation was obtained with patient consent to identify realistic goals of care and address barriers to discharge home. The palliative care team was composed of a physician board certified in palliative care, a geriatric nurse, a geriatric social worker, and a chaplain. All members of the team were also encouraged to ask for a palliative care consultation if they believed there was discordance between the team, the family, and the patient's expectations for progress. The objective of the palliative care consultation was to determine whether rehospitalization was consistent with the patient's goals of care or if worsening symptoms would best be managed in the SNF, long-term care, or at home.

Team Improvement for the Patient and Safety (TIPS) conferences were held twice a month for 30 minutes, starting in June 2009, to examine the root causes of rehospitalization events. Nurses, nursing aids, physicians, therapists, social workers, and a nursing home administrator attended sessions. Meeting times were varied to ensure that night and evening staff were included, and aides were compensated for attending TIPS conferences after their shifts had ended.

At TIPS conferences, selected cases of rehospitalization that were deemed to have been potentially avoidable were reviewed to identify ways in which the team could have operated more effectively. Before the TIPS conference, physicians called the readmitting hospital and spoke with the hospital care team to gain insights into problems that might have been missed on the SNF. According to the specific causes identified, additional information would be sought, and additional staff or outside experts were invited to participate in the TIPS session. During the course of the year, representatives from security, maintenance, home care agencies, inpatient and outpatient pharmacies, information technology, psychiatry, recreation therapy, dietary, admissions, covering physicians, palliative care, respiratory therapy, families, and laboratory staff were included in the TIPS conference. Attendance was measured. An email list of all direct care staff was created, and a "lessons learned" email was shared after each meeting.

Components of the intervention are summarized in Table 1.

Table 1. Interventions

Physician history and physical template with goals-of-care discussion including code status, number recent admissions in past 6 months, and whether repeat hospitalization is consistent with patient's wishes

Palliative care consult with patient consent if more than three hospitalizations over past 6 months

Physician call to hospital on unplanned discharges to determine whether diagnosis missed in skilled nursing facility

Multidisciplinary conferences every 2 weeks to review cases of unplanned discharges to identify and fix system failures

Statistical Methods

The distribution of demographic and clinical characteristics of patients and the pattern of discharges were compared between the two study periods, and the hypothesis that the two samples represented random samples from the same population was tested using simple bivariate tests (analysis of variance, chi-square) (Table 2).^{22–25} Because some patients were represented multiple times in the data, with repeat RSU admissions, and straddled study periods, typical linear regression model assumptions of independence of observations are not consistent with these data. This was addressed, and the differences in the distribution of discharges across the two study periods were formally tested using multinomial logistic regression modeling with robust standard errors controlling for clustering on individual residents. For both study periods, 6% of patients were missing covariate data, because they did not have an MDS assessment before discharge. Missing data were handled with multiple imputation methods, using the discharge outcome as the predictor in the multiple imputation models. Regression models used standard methods for pooling results over multiple estimations.²⁶ Parameter estimates were obtained using Stata software (version 10.1, Stata Corp., College Station, TX).

Table 2. Patient Characteristics for the Hebrew SeniorLife Recuperative Services Unit

Characteristic	Before Start of Intervention (June 2008 to May 2009), n = 862	After Start of the Intervention (June 2009 to May 2010), n = 863	Significance Test
Age, mean \pm SD	82.7 ± 9.1	82.0 ± 9.8	F = 2.52; P = .11
Sex, n (%)			$\chi^2 = 2.30; P = .13$
Male	268 (33.1)	240 (29.6)	
Female	542 (66.9)	571 (70.4)	
Length of stay, days, mean \pm SD	14.9 \pm 12.2	14.6 \pm 12.9	F = 0.35; P = .55
Race or ethnicity, n (%)			$\chi^2 = 5.70; P = .13$
Asian or other Pacific Islander	0 (0.0)	3 (0.4)	
Black, not Hispanic	50 (6.2)	67 (8.3)	
White, not Hispanic	743 (92.0)	725 (89.6)	
Hispanic	15 (1.9)	14 (1.7)	
Activity of daily living Long-Form Scale score (range 0–27), mean \pm SD	14.7 ± 4.3	14.6 \pm 4.1	F = 0.04; P = .85
Cognitive Performance Scale score, n (%)			$\chi^2 = 5.40; P = .37$
Intact	486 (60.0)	461 (56.8)	
Borderline intact	140 (17.3)	143 (17.6)	
Mild impairment	84 (10.4)	97 (12.0)	
Moderate impairment	84 (10.4)	98 (12.1)	
Moderate to severe impairment	11 (1.4)	11 (1.4)	
Severe impairment	5 (0.6)	1 (0.1)	
Depression rating scale score, mean \pm SD	0.3 ± 0.7	0.2 ± 0.6	F = 5.34; P = .02
Pain index, n (%)			$\chi^2 = 15.40;$ $P = .002$
No pain	220 (27.2)	171 (21.1)	
Pain less than daily	221 (27.3)	280 (34.5)	
Daily mild to moderate	274 (33.8)	284 (35.0)	
Daily excruciating	95 (11.7)	76 (9.4)	
Case Mix Index, mean \pm SD	1.4 ± 0.3	1.4 ± 0.3	F = 2.61; P = .11
Discharge disposition, n (%)			$\chi^2 = 8.70; P = .03$
Community	591 (68.6)	630 (73.0)	χ^2 cont = 1.2
Died	10 (1.2)	19 (2.2)	χ^2 cont = 2.8
Another facility	119 (13.8)	99 (11.5)	χ^2 cont = 1.9
Hospitalization	142 (16.5)	115 (13.3)	χ^2 cont = 2.9

SD = standard deviation; χ^2 cont = contribution to overall chi-square for the row-wise comparison.

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RESULTS

Eight hundred sixty-two people were admitted to the RSU in the 12 months before the intervention, and 863 were admitted during the 12 months of the intervention. Patient age, sex, race, functional status, cognitive level at baseline, case-mix adjustment, and length of stay did not differ significantly between the control and intervention years (Table 2). In 2007, the latest year available, the CMI for the unit was 1.21, whereas the national average for hospital based facilities was 0.94 ± 0.19 .

In each year, 52 patients had incomplete MDS assessment (were discharged or died before MDS assessment). Seventy-nine percent of the patients had one admission to the RSU during the 2-year interval, 16% had two, and 5% had three or more (maximum of 6). Physicians used the standardized admission assessment template in 35 of 40 (87.5%) audited charts. All patients had physician orders documenting code status. There were 55 palliative care consultations in the control year and 116 in the intervention year.

During the course of the intervention period, 22 TIPS conferences were held; of staff on duty at the time of the conference, there was an average attendance rate at TIPS conferences of 81%.

Discharge dispositions differed significantly between years (P = .03), with the rate of rehospitalization declining from 16.5% to 13.3%, a drop of 19.4% (Table 3). Discharges to home increased from 68.6% to 73.0%, deaths on the RSU increased from 1.2% to 2.2%, and discharges to long-term care fell from 13.8% to 11.5%. The medical care review committee judged all deaths to be expected and consistent with patient wishes.

Multivariable logistic regression, controlling for age, sex, case-mix index, and repeated admissions of individual patients, indicated that patients were more likely to die on the unit than be transferred out to the hospital during the

intervention than during the baseline period (odds ratio = 2.45, 95% confidence interval = 1.09-5.5).

DISCUSSION

After implementing the three-pronged intervention, there was a change in discharge disposition from the SNF, with a decline in discharges to acute and long-term care and increases in discharges to home and palliative care deaths on the unit. Two components of the intervention—standardized admission assessments and multidisciplinary conferences discussing root-cause analysis for patients acutely transferred back to the hospital—were conducted with existing staff. Many SNFs could embed similar programs within their current care processes. Instituting this program may require additional resources such as time to institute the admission template, palliative care services, and staff time for TIPS conferences. Teams from hospice organizations that are already embedded in many long-term care facilities could aide organizations without a palliative care service.

The authors feel that the change in discharge disposition observed between the two periods reflects a true improvement in patient outcomes, although some caution is required when interpreting these results. Specifically, a lower acute transfer rate probably reflects better processes of care in the SNF, but there is no criterion standard to evaluate physician judgments regarding the appropriateness to transfer or not transfer patients to the hospital. In addition, all deaths on the unit were concordant with patient wishes, another important indicator that the observations reflect an improvement in patient care.

This model can be disseminated. Organizations considering projects to improve care transitions can compare their population with the current study population using a resource developed by the Shaping Long Term Care in America Project on their Web site http://www.ltcfocus.org.²⁷

Table 3. Discharge Status: Multivariable Multinomial Logistic Regression Modeling

		Odds Ratio			
Outcome	Community	Hospitalization	Facility	Died	
Adjusted for clustering on individual only					
Died	1.78	2.35*	2.28*	_	
Facility	0.78	1.03	_	0.44*	
Hospitalization	0.76	_	0.97	0.43*	
Community	_	1.32	1.28	0.56	
Adjusted for clustering on individual and covariates					
Died	1.91	2.45*	2.42*	_	
Facility	0.79	1.01	_	0.41*	
Hospitalization	0.78	_	0.99	0.41*	
Community	_	1.28	1.27	0.52	
Test time effect = 0 (χ^2 (degrees of freedom))				8.76 (3)*	
F-test $P > \chi^2$				0.033	

^{*} P < .05, test that individual level regression parameter is significantly different from the null. Covariates include age, sex, functional level (activity of daily living long-form scale), cognitive performance level (Cognitive Performance Scare), and case-mix index. Note on interpreting parameter estimates: 1.91 is the increase in the odds of dying versus being discharged to the community comparing persons visiting the recuperative services unit in the intervention period versus the baseline period holding other variables in the model constant. Significance tests in all models are estimated using robust standard errors adjusting for clustering on individual.

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Because the population in the current study was in the top 10% of acuity based on national CMI data, other SNFs with lower acuity may expect different results.

This study has several limitations that should be discussed. First, it was not possible to separate the effect of the three components of the intervention, partly because of limited details collected regarding the effect of each component of the intervention and the nature of the study design. For example, it is unknown whether the template improved the rate of guideline-concordant care for geriatric syndromes. Issues of transitions of care are multifactorial and need systematic response from the beginning to the end of the care process. The intervention was designed to promote the importance of patient's goals of care and to help staff see transitions of care as an important part of their work product. Attitudes of culture change are currently being studied, and the Agency for Healthcare Research and Quality Long-Term Care Patient Survey is being used to quantify these changes.²⁸ Further studies would be needed to delineate the relative contribution of each aspect of the intervention.

The second limitation to address is generalizability to other SNFs. Further studies, for example, would be needed to see how to adapt the intervention for facilities without an onsite medical staff. In addition, the baseline hospital readmission rate of 16.5% on the RSU is already particularly low. The average 30-day readmission rates for people who have been in a SNF in Massachusetts is approximately 22% for patients going from home to hospital to SNF and 28% for SNF patients who are hospitalized and discharged to a SNF.² It is likely that the low transfer rates at the RSU may reflect the ability of onsite medical staff to assess acute medical conditions quickly. Similar projects might have an even larger effect in facilities with higher baseline rates of acute transfers.

A third limitation of this study is that it was not a randomized trial. As an intervention that aimed to influence the interaction between staff and patients and to improve organizational attention to care transitions, randomization could not be done at the patient level because of the likelihood of contamination. Cluster randomization according to site of care was outside the scope of the current project but would be feasible with adequate funding. Despite the limitations of the quasi-experimental design, the fact that the case-mix index and other patient characteristics were unchanged from the baseline period to the intervention period are reasons to feel confident that the observed improvement in discharge dispositions reflects a true intervention effect.

A fourth limitation of this study is that data for what happens to people after they are transferred from the RSU were not available. Although complete data on discharge disposition were available, data on subsequent care transitions were not. People who are discharged to their homes may then be admitted to various hospitals or facilities, and there is no easy way to track these events. An important development would be for states to facilitate data collection and analysis of readmission rates to enable facilities to monitor the effectiveness of their discharge planning. Until facilities have access to such data, SNFs should be required to report risk-adjusted acute transfer rates.

A final limitation is that the fidelity of the intervention was not fully monitored. Of the 863 patient admissions that occurred in the intervention period, 40 were monitored, and evidence of adherence to the intervention was found in 87.5%. It is unclear how much additional benefit a higher rate of adoption of the intervention activities might have yielded.

The three components of the intervention—the standardized admissions template, palliative care consultations, and the TIPS conference—represent different types of activities that were designed to improve transitions of care. Order sets have been shown to promote quality of care in various settings but have not been evaluated in SNFs.²⁹⁻³¹ The template includes triggers to aid goals-of-care discussions and evaluation of the rehospitalization rate to trigger consultation by the palliative care team. The purpose of discussing goals of care and of having the palliative care team involved is to ensure that the care delivered is consistent with patients' wishes. Rehabilitation staff are frequently focused on restoring a patient's function and are not necessarily equipped to help families and patients recognize when there may be a permanent decline in function. The palliative care team not only educated families and patients, but also coached nursing and therapy staff for symptom management. Although these activities involved important members of the care team, the TIPS conference series was designed to include a broad representation of staff, allowing for ongoing organizational emphasis on the importance of transitions of care in a manner that highlighted opportunities for improvement.

During the intervention period, sick patients were kept on the unit if they did not wish to be rehospitalized. This potentially increased the cost of providing care. Because SNFs are not reimbursed for the extra care such patients require, it is easy to see why patients are routinely sent back to acute care settings simply for lack of staffing at the SNF. Financial incentives should promote avoidance of unneeded rehospitalizations. It is hoped that the bundled payment scheme of the Accountable Care Act will provide physicians and hospitals with adequate incentives to coordinate care for patients at SNFs.

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Author Contributions: Randi Berkowitz: primary investigator and designer of project and TIPS conferences and preparation of manuscript. Richard N. Jones: statistician and preparation of manuscript. Ron Reider: information technology consultant. Margaret Bryan: database manager.

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Robert Schreiber: helped with formulating project and with TIPS conferences. Sharon Verney: case reviews and TIPS conferences. Michael K Paasche-Orlow: analysis and interpretation of data and preparation of manuscript.

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APPENDIX 1

Admitting history and physical

Recuperative service unit

Date:

Referring hospital:

PCP: Telephone/fax:

SPEC./Surgeons: Telephone/fax:

Healthcare proxy phone number and name:

The patient is admitted to the RSU for:

Short-term rehabilitation:

History of present illness

Past medical history

Medications

Home medications:

Hospital medications changed from home:

Med reconciliation at Hebrew SeniorLife:

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Family history:

No known drug allergies

Social history

Lives with:

Code status:

Services at home:

Alcohol use:

Tobacco use:

Spiritual/religious:

Infection control:

Contact Precautions [*]

Strict Precautions [*]

Dramlet Progrations [

Droplet Precautions [*]

Neutropenic Precautions [*]

Immunization dates:

Influenza vaccine:

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Pneumovax:

Foreign bodies [such ostomy, foley, ivs, CPAP, pacemaker, pessary

Functional history

Ambulates independently

Transfers independently

Eats independently

Dresses independently

Toilets independently

Review of systems

General: Chronic pain negative, recent weight loss negative, overall decline negative, fatigue negative

Skin: Itching negative, new skin lesions negative, rash negative

Eyes visual changes negative, glasses negative legal blindness negative, irritation redness negative

ENT: Hearing loss negative, difficulty chewing negative, difficulty swallowing negative, difficulty speaking negative, hoarseness negative, sore throat negative, ear pain negative

Respiratory: Shortness of breath negative, dyspnea on exertion, negative cough, negative hemoptysis

Cardiovascular system: Chest pain negative, palpitations negative, orthopnea negative, edema negative, claudication negative

Endocrine: Polydipsia negative, polyuria negative

Hematologic: Easy bruising negative

Gastrointestinal: Heartburn negative, abdominal pain negative, constipation negative, diarrhea negative, blood in stools negative, incontinence negative

Genitourinary: Nocturia negative, frequency negative, urgency negative, burning pain negative, hematuria negative, incontinence negative

Musculoskeletal: Joint pain negative, straight swelling negative, muscle pain negative, back pain negative

Neurological: Confusion negative, headache negative, dizziness negative, falls negative, gait disorder negative, numbness negative, weakness negative, tremor negative

Psychiatric: Memory loss negative, anxiety negative, depression negative, sleep disorder negative, delusions negative, hallucinations negative, agitation negative

Physical exam

Well-nourished, no apparent distress

Skin: with good turgor, no pressure ulcers, no rashes

Head: normocephalic, atraumatic

Eyes: PERRLA no nystagmus normal sclerae

HEENT: normal hearing, no sinus tenderness, oropharynx negative, good dentition, no lymphadenopathy

Neck: normal range of motion, no carotid bruits, thyroid negative

Chest: kyphotic, clear to auscultation. No rubs, rales, rhonchi, wheezes

Heart: no murmurs, normal S1-S2, no rubs or gallops Peripheral vascular: 2+pulses

Breasts: no nipple discharge, no masses, no axillary adenopathy

Abdomen: nondistended, nontender, soft, positive bowel signs, no organomegaly, no rebound, no guarding

GU: negative

Extremities: no clubbing, cyanosis or edema. No contractures, no joint effusions, osteoarthritis changes

Neurologic: alert and oriented x3, cranials intact sensation, motor grossly normal

Gait: able to rise from a chair

Mini-Cog:

3 Item Recall Score: []/3

Clock Draw Score: []/1

Mini-Cog Score Total Score: [*]

Evidence of Confusion: yes no (if yes proceed with CAM assessment)

CAM Score: [*]

Laboratory data

Source: [] hospital [] admit

H/H: MCV: WBC: platelets:

BUN/Creatinine:

Na: K: CI: CO2:

Other:

ASSESSMENT/PLAN

BARRIERS TO DISCHARGE

Estimated RSU length of stay: [*] weeks time.

Rehabilitation potential: [*].

RSU goals: Increase strength and safety, stabilize and improve medical condition, prevent pain, prevent pressure sores and delirium, and increase independence in ADLs.

Diet: [*].

Physical therapy: Will work on gait training, safety, and strengthening.

Occupational therapy: Will work on ADLs.

Advance directives: Patient names [*] as the healthcare proxy. [He/She] confirmed [his/her] prior stated desires for [FULL/DNR] status. The patient has had [*] hospitalizations over the last 6 months. The patient elects [routine medical care/comfort only care] and [would/would not] desire future hospital transfers. Patient is aware of the diagnosis, condition, prognosis, and treatment plan.

Unable to reach family member/responsible party at time of admission history and physical.

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