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# Discharge disposition disagreements and re-admission risk among older adults: a retrospective cohort study

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**To cite:** Dinescu A, Korc-Grodzicki B, Farber J, *et al*. Discharge disposition disagreements and re-admission risk among older adults: a retrospective cohort study. *BMJ Open* 2012;**2**: e001646. doi:10.1136/bmjopen-2012-001646

▸ Prepublication history and additional material for this paper are available online. To view these files please visit the journal online (http://dx.doi.org/10.1136/bmjopen-2012-001646).

Received 29 June 2012
Accepted 2 October 2012



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## ABSTRACT

**Objectives:** Re-admissions after hospitalisation are a burden for patients and costly. Our objective was to examine whether re-admissions were increased among older patients when they or their surrogates disagreed with the discharge disposition recommended by the clinical team at hospital discharge.

**Design:** Retrospective cohort study.

**Setting:** Large academic medical centre in New York, NY.

**Participants:** 514 hospital discharges of older patients admitted to a geriatric inpatient service between 1 July 2007 and 30 June 2008.

**Primary outcome measure and main independent variable:** Re-admissions for any reason to any hospital within 30 days after discharge were identified. Agreement or disagreement with the discharge disposition recommended by the clinical team at hospital discharge was assessed.

**Results:** Among 514 hospital discharges of older patients, the mean age was 83.1 years (SD=8.3), 75.7% were women, and approximately 90% were living at home prior to hospitalisation, despite 47.1% having some degree of cognitive impairment and 56.4% requiring assistance for activities of daily living or independent activities of daily living. There were 42 (8.2%) disposition disagreements; the majority (n=25; 59.5%) were discharged home despite the clinical team's recommendation for discharge to an acute or subacute facility. Overall, 158 (30.7%) were re-admitted within 30 days. There was no difference in re-admission rates between discharges with and without disposition disagreements (33.3% (144 of 472) vs 30.5% (14 of 42), respectively; OR=1.14, 95% CI 0.57 to 2.19; p=0.71). Adjusted analyses were consistent with these findings.

**Conclusions:** Discharge disposition disagreements occurred relatively infrequently after hospitalisation among a group of older patients managed by a geriatrics inpatient service. In addition, we found no differences in re-admission when comparing patients who agreed or disagreed with the clinical team's recommended discharge disposition.

## ARTICLE SUMMARY

### Article focus

- Re-admissions after hospitalisation are a burden for patients and expensive.
- Patient disagreement with clinical team recommendations for place for discharge may increase re-admission risk.
- We examined the association between hospital re-admission and disposition disagreement among older patients at a single medical centre.

### Key messages

- Among more than 500 consecutive discharges from a geriatric inpatient service, more than 30% were re-admitted within 30 days.
- Disposition disagreements occurred infrequently, among fewer than 10% of discharges.
- There were no differences in re-admission when comparing patients who agreed or disagreed with the clinical team's recommended discharge disposition.

### Strengths and limitations of this study

- No prior study has examined the effect of disposition disagreement on re-admission risk.
- Because disposition disagreements occurred among fewer than 10% of discharges, our study may not have had sufficient statistical power to detect a true difference in re-admission risk.
- Our study was limited to the experience of a geriatric inpatient service at a large academic medical centre in New York, NY.

## INTRODUCTION

Re-admissions after initial hospitalisation are a burden for patients and account for a quarter of all inpatient medical expenditures.[1 2] Since 2009, hospital re-admissions have received increased scrutiny as part of the Center for Medicare and Medicaid Service's public reporting efforts focused on hospital quality of care through the Hospital Compare programme.[3] Moreover, the recently enacted US healthcare reform legislation includes a number of programmes specifically targeting re-admissions as a way to improve quality and lower costs.[4] However, risk of re-admission increases as patients age, which some attribute to the fact that two-thirds of older patients experience more than three transitions between acute

and subacute healthcare facilities within 3 months after discharge.[5]

Previous studies have examined the impact of many potential risk factors for re-admission among patients, including clinical predictors, such as function and disability, as well as whether specific discharge diagnoses, such as heart failure or chronic obstructive pulmonary disease, were associated with greater re-admission rates.[6–10] In addition, prior research has focused on demographic factors associated with re-admission, including income and education level. However, to our knowledge, no study to date has examined another critical factor in the pathway from hospital discharge to home that may be associated with re-admission risk: whether patients agree with clinical team recommendations for place for discharge, otherwise known as the discharge disposition.

Discharge disagreements occur when the patient and clinical team disagree on patient disposition at discharge. Disagreements can occur in either direction, including when the patient disagrees with the clinical team's recommended discharge location or vice versa, when the clinical team disagrees with the patient's requested discharge location. These disagreements can also reflect recommendations for both higher and lower intensity care, either by the clinical team or at the request of patients. Furthermore, discharge disposition is particularly important for elderly hospitalised patients, as they are most likely to suffer a higher degree of deconditioning (ie, loss of strength and functional capacity) during hospitalisation.[11] While there are no current estimates as to how often elderly patients who are admitted from their homes are discharged to another facility for acute or subacute rehabilitation, it is expected to occur quite often, creating the potential for disagreements over discharge dispositions between patients and the clinical team. Nevertheless, to our knowledge, there have been no studies of this issue. Complicating matters, it is unclear in which way discharge disagreements may impact on re-admission risk. For instance, when a patient requests less intensive care than the clinical team recommends, re-admission risk might be increased. In contrast, when a patient requests more intensive care than the clinical team recommends, re-admission risk might be decreased, because the patient is already receiving (potentially unnecessary) higher-intensity care. However, these are hypotheses that have not been tested.

Therefore, our research objective was to examine whether re-admission risk was increased among patients when they or their surrogates disagreed with the discharge disposition recommended by the clinical team when compared with patients who agreed with the clinical team. Our hypothesis was that for frail hospitalised elderly adult patients, disagreement between patients or their surrogates/families and the clinical geriatrics team regarding recommendation for patient's place of discharge would lead to a higher rate of re-admission. We anticipated that many discharge disposition disagreements are a result of patients preferring to be discharged home despite a clinical recommendation to be discharged to a supervised environment for clinical rehabilitation. Thus, we expected that patients who were not considered ready to be discharged home would have an increased risk of re-admission.

## METHODS

### Study design

We conducted a retrospective cohort study of patients hospitalised at the Mount Sinai Hospital in New York City who were managed by the Mobile Acute Care of Elderly (MACE) geriatric inpatient service. Of note, this hospitalist-based MACE service provides integrated, interdisciplinary clinical care in order to minimise the hazards of hospitalisation and prevent re-admission by developing a customised discharge plan for each patient during hospitalisation with close follow-up postdischarge from the MACE team and the outpatient practice, including one postdischarge telephone call by the team's Geriatric Nurse Practitioner. Mount Sinai geriatrics patients receive care in a so-called closed system, with all inpatient care provided by hospitalist geriatricians affiliated with the MACE service and all outpatient care provided by another group of geriatricians at the Martha Stewart Center for Living at Mount Sinai Hospital. The study population included all patients admitted to the MACE service from 1 July 2007 to 30 June 2008, identified through hospital administrative data. We excluded patients who died during their hospitalisation or were discharged to hospice. Institutional review board approval from the Mount Sinai School of Medicine was obtained prior to the study, which included exemption from requiring written informed consent because our study involved the examination of medical record data and posed no risk to enrolled patients. No patients were contacted during the course of this study.

### DISCHARGE DISPOSITION DISAGREEMENT

Our main variable of interest was whether patients or their surrogates agreed or disagreed with the discharge disposition recommended by the clinical team. A data abstraction tool was developed to collect patient information through medical record review, including demographics, functional and cognitive status, hospital course and physical therapy and social work recommendations for place of discharge, along with actual place of discharge. Actual place of discharge was verified against the last inpatient social worker note for accuracy. We defined discharge disposition disagreement as any difference between the clinical team recommended place of discharge and actual place of discharge. For instance, if the recommended place of discharge was to a rehabilitation or long-term care centre and the patient was discharged home, the discharge disposition was categorised

as a disagreement. Our measure of discharge disposition disagreement is limited as a proxy measure of disagreement. We were unable to discern patients' actual preferences and could not differentiate whether a patient's disposition disagreed with the clinical team's recommendation because of personal preference, family preferences, resources available or other reasons.

### Re-admission within 30 days

Our main outcome measure was re-admission for any reason to any hospital within 30 days after the date of discharge. Re-admissions to the Mount Sinai Hospital were identified by cross-checking patient medical record numbers against hospital administrative data for the 30 days after discharge at least 6 months after the initial hospitalisation. Re-admissions to other hospitals were identified by reviewing all ambulatory-care physician and nursing notes for all patients discharged from the hospital, up until 1 month after discharge or as of the first outpatient visit if it occurred after 30 days at least 6 months after the initial hospitalisation.

### Statistical analysis

Discharge disposition was determined for all patients in the sample with no missing observations. Fewer than 1% of discharges were missing information for other abstracted data, such as demographics, functional and cognitive status, hospital course and physical therapy and social work. We first performed descriptive analyses of the sample. We then compared sample characteristics between discharges where patients or their surrogates agreed and disagreed with the clinical team's recommended discharge disposition using $\chi^2$ and t tests. Finally, we compared proportions re-admitted between discharges where patients or their surrogates agreed and disagreed with the clinical teams recommended discharge disposition, adjusting analyses for demographic, clinical and hospital course characteristics that were found to have differed between the two groups, including living situation prior to hospitalisation, functional independence (measured using activities of daily living scales), number of prescription medications at admission, length of stay, discharge disposition and advancement in home-health-aid services at discharge.

All analyses were conducted using JMP V7.0.1 Software (SAS Institute Inc, Cary, North Carolina, USA) and all statistical tests were two-tailed, using a type I error rate of 0.05.

## RESULTS

There were 542 admissions to the MACE service from 1 July 2007 to 30 June 2008; 28 admissions were excluded either because they died during the hospitalisation or were discharged to hospice, leaving a final sample of 514 discharges. The mean age of the sample was 83.1 years (SD=8.3), 75.7% were women, and approximately one-third were each of Caucasian, African-American and Hispanic (table 1). Approximately 90% of the sample was living at home prior to hospitalisation, with or without family or additional health-aid services, despite 47.1% having some degree of cognitive impairment and 56.4% requiring assistance for activities of daily living and independent activities of daily living.

Among the 514 discharges from the MACE service, there were 42 (8.2%) disposition disagreements; 25 (59.5%) patients were discharged home despite the clinical team's recommendation for discharge to an acute or subacute facility, 13 (31%) patients were discharged to an acute or subacute facility despite the clinical team's recommendation for discharge to home, 3 (7.1%) patients were discharged to an assisted living facility despite the clinical team's recommendation for discharge to a subacute rehabilitation facility, and 1 (2.4%) patient was discharged to a subacute rehabilitation facility despite the clinical team's recommendation for discharge to an assisted living facility. When compared with discharges where patients or their surrogates agreed with the clinical team's recommended discharge disposition, discharges where patients or their surrogates disagreed with the clinical team were more likely to be living in an assisted living or subacute rehabilitation facility prior to hospitalisation and require assistance for activities of daily living and independent activities of daily living (table 1). In addition, discharges where patients or their surrogates disagreed with the clinical team's recommended discharge disposition were more likely to be discharged to an acute or subacute rehabilitation facility when compared with discharges where patients or their surrogates agreed with the clinical team (table 2).

Overall, 158 (30.7%) of the 514 discharges from the MACE service were re-admitted within 30 days. There was no crude difference in re-admission rates between discharges with and without disposition disagreements (33.3% vs 30.5%, respectively; OR=1.14, 95% CI 0.57 to 2.19; p=0.71). Furthermore, re-admission rates among discharges with disposition disagreements did not vary by type of disagreement. After adjustment for the living situation prior to hospitalisation, functional independence, number of prescription medications at admission, length of stay, discharge disposition and advancement in home-health-aid services at discharge, patients discharged with disposition disagreements were no more likely to be re-admitted at 30 days when compared with patients discharged without such disposition disagreements (OR=0.71, 95% CI 0.30 to 1.54; p=0.39).

## DISCUSSION

Discharge disposition disagreements occurred relatively infrequently after hospitalisation among a group of older patients managed by a geriatrics inpatient service. In addition, we found no differences in re-admission after initial hospitalisation among a group of older patients managed by a geriatrics inpatient service when

**Table 1** Sociodemographic and clinical characteristics among patients discharged from the Mobile Acute Care for the Elderly service from 1 July 2007 to 30 June 2008

| | Overall (n=514) | Patient-clinical team discharge disposition | | p Value |
|---|---|---|---|---|
| | | Agreement (n=472) | Disagreement (n=42) | |
| Mean age (SD) (years) | 83.1 (8.3) | 82.9 (8.4) | 84.5 (7.3) | 0.23 |
| Sex (%) | | | | 0.77 |
| Female | 75.7 | 75.9 | 73.8 | |
| Male | 24.3 | 24.2 | 26.2 | |
| Race/ethnicity (%) | | | | 0.90 |
| Caucasian | 35.8 | 35.4 | 40.5 | |
| African-American | 27.6 | 28.0 | 23.8 | |
| Hispanic | 34.6 | 34.8 | 33.3 | |
| Other | 1.9 | 1.9 | 2.4 | |
| Primary language (%) | | | | 0.25 |
| English | 69.6 | 68.9 | 77.5 | |
| Other | 30.4 | 31.1 | 22.5 | |
| Marital status (%) | | | | 0.67 |
| Married | 20.2 | 19.9 | 23.8 | |
| Widowed | 45.5 | 45.3 | 47.6 | |
| Divorced/separated | 13.0 | 13.6 | 7.1 | |
| Single, never married | 21.2 | 21.2 | 21.4 | |
| Living situation prior to hospitalisation, (%) | | | | 0.006 |
| Home alone with no home-health-aid services | 14.6 | 15.3 | 7.3 | |
| Home alone with home-health-aid services | 33.5 | 34.2 | 26.8 | |
| Home with family with no home-health-aid services | 16.1 | 16.6 | 9.8 | |
| Home with family and home-health-aid services | 26.0 | 25.7 | 29.3 | |
| Assisted living facility | 5.7 | 5.3 | 9.8 | |
| Sub-acute rehabilitation facility | 4.1 | 2.9 | 17.1 | |
| Hospital health insurance (%) | | | | 0.22 |
| Fee-for-service medicare (Part A) | 92.8 | 92.6 | 95.2 | |
| Medicare/medicaid dual eligible | 3.3 | 3.6 | 0.0 | |
| Private commercial | 3.9 | 3.8 | 4.8 | |
| Cognitive impairment (%) | | | | 0.69 |
| Present | 47.1 | 46.8 | 50.0 | |
| Absent | 52.9 | 53.2 | 50.0 | |
| Ambulation dependence (%) | | | | 0.12 |
| Walks independently | 21.9 | 23.0 | 10.3 | |
| Walks with assist device | 68.1 | 67.1 | 79.5 | |
| Wheel chair bound | 7.9 | 8.2 | 5.1 | |
| Bed bound | 2.1 | 1.8 | 5.1 | |
| Functional independence (%) | | | | 0.04 |
| Independent | 20.7 | 21.8 | 7.7 | |
| IADL dependent | 22.9 | 23.2 | 20.5 | |
| ADL and IADL dependent | 56.4 | 55.1 | 71.8 | |
| Mean Elixhauser Comorbidity Index (SD) | 3.4 (1.6) | 3.4 (1.6) | 3.4 (1.8) | 0.74 |
| No. active prescriptions (%) | | | | 0.07 |
| 0–5 | 8.4 | 9.0 | 2.4 | |
| 6–10 | 33.9 | 33.1 | 42.9 | |
| 11–15 | 38.4 | 37.8 | 45.2 | |
| >15 | 19.2 | 20.1 | 9.5 | |

Column percentages may not sum to 100 due to rounding.
ADL, activities of daily living; IADL, independent activities of daily living.

comparing patients who agreed or disagreed with the clinical team's recommended discharge disposition. Patients who were discharged home despite the clinical team's recommendation for discharge to an acute or subacute facility and patients who were discharged to an acute or subacute facility despite the clinical team's recommendation for discharge to home had similar 30-day re-admission rates as patients who were discharged according to the clinical team's recommendation. Although our study was small and limited to patients initially hospitalised at a single medical centre, to our knowledge, this study is the first to examine the

impact of discharge disposition disagreement on re-admission risk and has important implications for improving the quality-of-care transitions from the hospital to home or a subacute facility and for patient and family satisfaction with care.

There are a number of explanations for our finding no difference in re-admission rates between patients who agreed and disagreed with the clinical team's recommended discharge disposition. First, we found a low rate of disagreements, occurring only among 8% of discharges. Because our study was small, we may not have had sufficient statistical power to detect a true difference on the order of the 3% absolute difference in re-admission rates we observed. Second, the MACE service at the Mount Sinai Hospital that managed the patients hospitalised during our study is specifically designed to minimise hazards of hospitalisation and prevent re-admissions and includes integrated follow-up care, including standardised postdischarge follow-up phone calls. Perhaps this heightened attention to care transitions on the MACE service attenuated any increased risk of re-admission that may have been due to discharge disposition disagreements. Finally, the possibility also exists that discharge disposition disagreements represent examples of patients or their caregivers understanding their capabilities and limitations better than the clinical teams. Interestingly, patients who disagreed with the clinical team's recommended discharge disposition were more likely to be functionally dependent and they or their surrogates may have had greater insight as to what setting for postacute care was needed. As our findings are only generalisable to similar populations of older adults managed by specialised geriatrics services, future research should examine the impact of discharge disagreements on populations managed by non-specialised, general medical services in the hospital and should enrol greater number of patients to ensure sufficient statistical power.

Importantly, that we found that there were disagreements about disposition location among fewer than 10% of discharges reflects favourably on the care model instituted at the Mount Sinai Hospital. It is unknown if the rate of disagreement would have differed at another institution using a less geriatrics-focused model of inpatient care or if the pattern of disposition disagreements would have differed. In our study, while nearly 60% of the disagreements resulted from patients being discharged home despite the clinical team's recommendation for discharge to a supervised environment for acute or subacute clinical rehabilitation, other types of discharge disposition disagreements were observed as well. However, there was no difference in 30 day

**Table 2** Hospital course characteristics among patients discharged from the Mobile Acute Care for the Elderly service from 1 July 2007 to 30 June 2008

| | Overall (n=514) | Patient-clinical team discharge disposition | | p Value |
|---|---|---|---|---|
| | | Agreement (n=472) | Disagreement (n=42) | |
| Admission Source (%) | | | | 0.77 |
| Emergency department | 75.7 | 75.9 | 73.8 | |
| Non-acute healthcare facility or ambulatory care centre | 24.3 | 24.2 | 26.2 | |
| Discharge diagnosis (%) | | | | 0.69 |
| Acute infectious process | 23.2 | 22.9 | 26.2 | |
| Cardiovascular or circulatory disease | 19.3 | 19.9 | 11.9 | |
| Endocrinologic disease | 3.5 | 3.2 | 7.1 | |
| Gastrointestinal disease | 9.7 | 10.0 | 7.1 | |
| Pulmonary disease | 10.5 | 10.8 | 7.1 | |
| Renal disease or fluid imbalance | 8.2 | 7.8 | 11.9 | |
| Trauma, fracture or other musculoskeletal | 9.3 | 9.3 | 9.5 | |
| Other | 16.3 | 16.1 | 19.1 | |
| Mean length of stay (SD) (days) | 5.5 (5.7) | 5.4 (5.8) | 7.1 (4.2) | 0.07 |
| Discharge disposition (%) | | | | 0.02 |
| Home | 77.4 | 79.0 | 59.5 | |
| Assisted living or long-term care facility | 6.4 | 6.1 | 9.5 | |
| Acute or subacute rehabilitation facility | 16.2 | 14.8 | 31.0 | |
| Advancement in home-health-aid services at discharge (%) | | | | 0.05 |
| Yes | 21.0 | 19.9 | 33.3 | |
| No | 79.0 | 80.1 | 66.7 | |
| Re-admitted at 30 days (%) | | | | 0.71 |
| Yes | 30.7 | 30.5 | 33.3 | |
| No | 69.3 | 69.5 | 66.7 | |

Column percentages may not sum to 100 due to rounding.

re-admission rates among these varying types of discharge disposition disagreements. The low number of each type of discharge disposition disagreement prohibited further analysis.

Although our findings are preliminary, our findings have important implications for improving discharge planning, particularly with respect to managing disagreements among patients and the clinical team about the most appropriate posthospitalisation environment for patients. Without question, patient safety merits substantial attention. But patient preferences also must be taken into account. Discharge disposition disagreements may impact on patient and family satisfaction with care and lower patient satisfaction scores have been associated with higher re-admission rates.[12] Moreover, discharge to a subacute rehabilitation facility has not been associated with lower risk of re-admission, but has been associated with a greater risk of infection.[13] The clinical team's perception that patients may not be 'ready to go home' may be inaccurate, as patients are able to judge their capacity to provide for themselves at home. The benefits of being at home, including familiarity with the environment and social supports, may equal or even outweigh the benefits of being in a supervised setting. In the end, patients, their families and their healthcare team should be making informed decisions together when determining the most appropriate location for discharge during discharge planning. In addition, the trend towards a lower length of stay in the group without disposition disagreements suggests that there may be an opportunity to enhance discharge planning by identifying disagreements as early as possible in the hospital course.

Our preliminary study of discharge disposition disagreements has limitations that deserve consideration. First, ours was a retrospective observational study and cannot determine causal associations. Second, as mentioned, our study evaluated more than 500 discharges but identified disposition disagreements among only 8% and therefore may not have had sufficient statistical power to detect a true difference. Nevertheless, as the first study to examine disagreements in discharge planning between patients and clinical teams, our study provides empirical data on this issue. Third, our study was limited to the experience of a geriatric inpatient service at a single large academic medical centre in New York, NY, the Mount Sinai Hospital. Fourth, we may not have identified re-admissions that occurred outside of the Mount Sinai Hospital. We used administrative data from the Mount Sinai Hospital to identify re-admissions at this institution, where the preponderance of hospital admissions for these patients takes place, but relied upon outpatient medical record review to identify re-admissions to other institutions. However, since patient re-admissions are significant events, we believe that patient charts would be likely to include reference to all re-admissions, as the charts are used to document all patient ambulatory care visits as well as any other patient encounter, including telephone calls. Fifth, we may not have identified deaths that occurred without re-admission to the hospital, although since there is no known association between discharge disagreement and mortality risk, there is no reason to expect this limitation to have biased our analysis. Finally, our measure of discharge disposition disagreement could not differentiate whether a patient's disposition disagreed with the clinical team's recommendation because of personal preference, family preferences, resources available or other reasons.

## CONCLUSION

In conclusion, discharge disposition disagreements occurred relatively infrequently after hospitalisation among a group of older patients managed by a geriatrics inpatient service. In addition, we found no differences in re-admission when comparing patients who agreed or disagreed with the clinical team's recommended discharge disposition. Discharge planning should be as patient-focused as possible, matching patient preferences for discharge disposition with available resources. Additional research is necessary to further evaluate the impact on discharge disposition disagreement on re-admission risk and to determine the components of discharge planning that are associated with the lowest risk for re-admission.

**Contributors** AD, BK-G and JSR were responsible for the conception and design of this work and participated in the interpretation of the data. AD, BK-G and JF collected the data. AD and JSR drafted the manuscript. All authors critically revised the manuscript for important intellectual content. JSR provided supervision and conducted the statistical analysis. All authors had full access to all the data in the study and JSR takes responsibility for the integrity of the data and the accuracy of the data analysis.

**Funding** This study was not supported by any external grants or funds. Dr Ross is currently supported by the National Institute on Aging (K08 AG032886) and by the American Federation of Aging Research through the Paul B. Beeson Career Development Award Program, receives support from Medtronic to promote methods for clinical trial data sharing and from the Centers of Medicare and Medicaid Services (CMS) to develop and maintain performance measures that are used for public reporting, and is a member of a scientific advisory board for FAIR Health. These organisations had no role in study design, data collection and analysis, decision to publish, or preparation of the manuscript.

**Competing interests** None.

**Ethics approval** Mount Sinai School of Medicine Institutional Review Board.

**Provenance and peer review** Not commissioned; externally peer reviewed.

**Data sharing statement** Deidentified data used for this study can be made available on request for academic research.

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