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Planning Post-Discharge Destination for Gastrointestinal Surgery Patients: Room for Improvement?

Courtney J. Balentine^{1,2,3}, Kelly Kenzik², Daniel I. Chu¹, Melanie S. Morris¹, Sara J. Knight^{3,4}, Cynthia J. Brown^{5,6}, and Smita Bhatia²

¹ Department of Surgery, University of Alabama at Birmingham

² Institute for Cancer Outcomes & Survivorship, University of Alabama at Birmingham

³ Birmingham/Tuscaloosa VA Health Services Research & Development

⁴ Division of Preventive Medicine, University of Alabama at Birmingham

⁵ Birmingham/Atlanta VA GRECC, Birmingham, Alabama

⁶ Department of Medicine, Division of Gerontology, Geriatrics & Palliative Care, University of Alabama at Birmingham

Abstract

BACKGROUND—We compared short-term recovery for patients discharged to inpatient rehabilitation versus skilled nursing facilities after gastrointestinal surgery.

MATERIALS & METHODS—We conducted a propensity-matched cohort study of 12,939 adults discharged to inpatient rehabilitation or skilled nursing facilities after colectomy, pancreatectomy or hepatectomy at hospitals participating in the American College of Surgeons National Surgical Quality Improvement Program from 2011–2014. Primary outcomes were readmission and mortality rates 30 days after surgery.

RESULTS—9,259 (72%) patients were discharged to skilled nursing facilities and 3,680 (28%) to inpatient rehabilitation. Median age in both groups was 76 years and 82% of patients were white. There was no difference in 30-day readmission rates (16% for skilled nursing vs 16.8% for inpatient rehabilitation) but post-discharge mortality was higher for patients discharged to skilled nursing facilities (4.4%) compared to inpatient rehabilitation (1.6%, $p<0.001$).

CONCLUSIONS—Increased utilization of inpatient rehabilitation services after gastrointestinal surgery may improve postoperative outcomes.

Summary:

Short-term mortality following gastrointestinal surgery appears to be reduced when patients are discharged to inpatient rehabilitation rather than skilled nursing facilities.

Corresponding Author: Courtney Balentine, MD MPH, Department of Surgery, Institute for Cancer Outcomes and Survivorship, & Birmingham/Tuscaloosa VA Health Services Research & Development University of Alabama at Birmingham, cbalentine@uabmc.edu, Phone: 205-638-2152, 1600 7th Ave South, Lowder Building Suite 500, Birmingham, AL 35233.
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Keywords

post-acute care; inpatient rehabilitation; skilled nursing facilities; postoperative recovery; transitions of care; care coordination

INTRODUCTION

If surgeons hope to deliver the best evidence-based care to every patient, then our approach to discharge planning and post-acute care falls decidedly short of this objective. Up to 50% of gastrointestinal surgery patients rely on post-acute care services, including skilled nursing facilities (SNF) and inpatient rehabilitation facilities (IRF), to help recover and regain independence after their operations.^{1–3} Spending on post-acute care for surgical and medical patients is the most rapidly increasing health care cost in the United States, and accounts for \$62 billion in annual Medicare expenditures.⁴

Although use of post-acute care is common and costly, there are remarkably little data to guide decisions about which post-acute care setting (SNF or IRF) offers the best outcomes for surgical patients. Both SNFs and IRFs provide services that include physical rehabilitation, complex wound care, assistance with ostomies, administering intravenous medication, and nutritional support. IRF's generally offer more intensive physical therapy, and cost ~\$15,000 more per episode of care than SNFs.⁵ The two types of facilities treat very similar patient populations, and the decision to place a patient in IRF versus SNF is strongly influenced by financial incentives, local availability of resources, and provider preference.^{6–8} This results in substantial hospital and regional variation in the use of post-acute care, which increases costs without necessarily improving patient outcomes.^{4,9} Additionally, there is evidence that discharge to IRF may offer superior recovery for some conditions (stroke) but confers no benefit over SNF for others.^{5,6,10,11} Unfortunately, there is no risk-adjusted comparison of outcomes between SNF and IRF for gastrointestinal surgery patients.

To improve post-acute care decision-making and deliver more cost-effective care to patients, it is important to evaluate how the choice between SNF and IRF can affect postoperative recovery. The purpose of this study is to compare short-term postoperative recovery for gastrointestinal surgery patients discharged to either IRF or SNF, with a focus on 30-day mortality and readmissions. We hypothesized that IRF would offer improved short-term recovery after surgery when compared to SNF, due to the higher intensity physical therapy at IRF.

MATERIALS & METHODS

Patients & Setting

Inclusion—We included adults (age ≥ 18 years) from the American College of Surgeons National Surgical Quality Improvement Program (ACS-NSQIP) who had colectomy, pancreatectomy, or hepatectomy from 2011 to 2014, and were discharged to either SNF or IRF.

Exclusion—We excluded patients who were transferred from a skilled facility prior to surgery, had length of stay <1 day, or died prior to discharge.

Independent Variable

The main independent variable of interest was discharge to either SNF or IRF after surgery.

Covariates

Age was converted to a categorical variable (<50, 50–59, 60–69, 70–79, and 80+ years), and both length of stay and ACS-NSQIP estimated mortality were converted to quintiles. Race/ethnicity was coded as white, African American, Other, and a separate category was created for Missing/Unknown. All ACS-NSQIP co-morbidities were coded as present or absent, and surgeries were grouped according to whether the primary procedure involved resection of colon/rectum, pancreas, or liver. For postoperative complications prior to discharge, we considered the individual NSQIP complications and the total number of complications.

Outcomes

The primary outcomes of the study were (1) 30-day postoperative readmission, and (2) 30-day postoperative mortality for the entire matched cohort. Our prior work suggested that age and postoperative complications were important drivers of decisions about post-acute care.¹ Consequently, we planned and conducted secondary analyses of outcomes for select subgroups of patients based on their age at surgery, and the number of postoperative complications.

Analysis

To adjust for measured confounding and differences between patients discharged to SNF and those discharged to IRF, we used nearest neighbor propensity matching with caliper set to $0.1 \times \text{logit}$.¹² The demographic, co-morbidity, and postoperative complication data from Table 1 were used to generate a predicted probability of discharge to either SNF or IRF. The predicted probability between the two patient groups was then compared across strata of the propensity score and the standardized difference for the unmatched and matched groups was calculated.¹² A standardized difference of <10% for all variables is generally considered indicative of a reasonable match.¹³ Specification of the propensity score was adjusted in an iterative process until this criteria was satisfied. After matching, the average treatment effect and 95% confidence interval was calculated for both of the primary endpoints. All analysis was performed using Stata version 14.2, Copyright 1985–2015 StataCorp LLC. An alpha of <0.05 was used to identify statistically significant differences.

RESULTS

Patient Characteristics Prior to Matching

Our initial cohort consisted of 12,939 patients who were discharged to either SNF (N= 9,259) or IRF (N = 3,680) after colorectal, pancreas, or liver surgery. The two groups of patients had generally similar pre- and postoperative characteristics, with a standardized difference <10% for most variables (Table 1). SNF and IRF patients were similar in regard

to the following: age and gender distribution, preoperative mortality risk and co-morbidity profile, prolonged hospitalization, and postoperative complications. However, patients discharged to SNF were more likely to be white (83 vs 79%), partially or totally dependent in activities of daily living (13% vs 10%), to have surgery during the later years of the study (60% vs 52%), and to have colorectal surgery (86% vs 82%) when compared to IRF patients.

Patient Characteristics After Propensity Matching

To minimize differences in pre- and postoperative variables between SNF and IRF patients, we used propensity matching based on the variables in Table 1. We successfully matched 3,664 out of 3,680 (99%) of IRF patients to an equivalent patient discharged to SNF (Table 1). After matching, the differences in race/ethnicity, functional independence, year of surgery, and type of surgery were eliminated (standardized difference <10% for all variables). Additionally, nearly all the remaining variables showed greater similarity for SNF and IRF patients compared to the pre-matching cohort. These results indicated that known confounding was significantly reduced by the propensity matching strategy.

Outcomes: Mortality & Readmissions

After propensity matching, we proceeded to examine rates of readmission and mortality within 30 days of surgery. Among patients discharged to SNF, 585 (16%) were readmitted within 30 days of surgery compared to 616 (17%) of IRF patients (Figure 1). The estimated average treatment effect on readmissions for discharge to IRF was +0.8% (95% CI -0.8% to +2.5%), indicating that the difference was not statistically significant. By contrast, Figure 2 shows that 30-day mortality for IRF patients (1.6%) was significantly lower than for SNF patients (4.4%). The average treatment effect on mortality for discharge to IRF rather than SNF was -2.8% (95% CI -3.6% to -2%).

Effects of IRF According to Patient Age and Postoperative Complications

In addition to the primary comparison of outcomes for SNF versus IRF patients, we also evaluated outcomes for selected subgroups of patients based on age and postoperative complications (Tables 2 & 3). We selected these subgroups based on our prior work indicating that both age and the number of complications were important factors that guide decisions about post-acute care.¹

Age Effects: Readmission rates at 30 days after surgery for patients discharged to IRF remained slightly higher than for SNF among individuals <50 years old (20% vs 13%), 50–59 years old (16% vs 15%) and 70–79 years old (17% vs 15%), but were similar for other age groups (Table 2). For mortality, the greatest differences in outcomes were observed for the oldest patients with 80 year olds discharged to SNF having 6% mortality compared to 2% for IRF (Table 3). The difference in mortality between SNF and IRF was generally less for younger patients, with a 1% difference for those <60 years old.

Postoperative Complications: There was no consistent relationship between the number of postoperative complications and readmission rates for IRF compared to SNF patients (Table 2). Discharge to IRF was associated with a 2–3% increase in risk of

readmissions for patients without complications and for those with multiple complications. By contrast, patients with only 1 postoperative complication were slightly less likely to be readmitted after discharge to IRF rather than SNF. The association between discharge destination and mortality, however, showed a very different relationship based on the number of postoperative complications (Table 3). The mortality rate grew from 3% to 8% as the number of complications increased for patients discharged to SNF. Mortality for IRF patients remained stable at 1–2% regardless of how many postoperative complications the patient experienced.

DISCUSSION

We found that gastrointestinal surgery patients who are discharged to inpatient rehabilitation facilities have better short-term outcomes than similar patients discharged to skilled nursing facilities. IRF patients experienced significantly lower 30-day mortality and similar 30-day readmission rates compared to SNF patients. Additionally, the mortality benefits of IRF were greatest for patients who are most likely to experience poor outcomes: individuals in the oldest age groups and those who had a difficult postoperative recovery with multiple complications. Equally important, nearly all patients discharged to IRF could be matched to a comparable patient who was discharged to SNF. This suggests that a substantial number of patients who were sent to SNF after surgery could potentially have benefited from discharge to IRF. Our results are consistent with findings from studies commissioned by the Medicare Payment Advisory Commission that suggest a substantial proportion of non-surgical patients discharged to SNF could benefit from inpatient rehabilitation care.¹⁴

An important issue raised by our study is the need to assess how surgeons make decisions about which post-acute care setting is best for any given patient. As hospitals face growing financial pressure to decrease length of stay, more patients are reliant on post-acute care to assist with recovery after surgery.¹⁵ Choosing the optimal post-acute care setting for each patient, therefore, is a critical part of postoperative planning and can affect the quality of short- and long-term recovery.

There are several factors to consider when deciding whether patients ought to be referred to IRF versus SNF. First, there is more physician supervision and higher intensity physical therapy at IRF compared to SNF. Second, the higher level of care at IRF comes with a significantly greater cost (up to \$15,000 per episode of care), and IRF have long been incentivized by Medicare to prioritize admissions for a limited subset of patients that do not include gastrointestinal surgery.^{5,8} Third, there are more SNF than IRF, so it is often easier for patients to find a SNF in close proximity to their homes or families. Our study suggests that, in general, IRF may offer some short-term benefits over SNF for many patients. However, this does not mean that all patients will derive significant benefit from discharge to IRF, and it is important for surgeons to consider the relative advantages of each post-acute care modality when discussing discharge plans with their patients.

We have previously shown that there is substantial hospital-level variation in the use of post-acute care services after gastrointestinal surgery, suggesting that surgeons disagree about the relative benefits of IRF or SNF for many of their patients.⁹ We have also demonstrated that

gastrointestinal surgery patients discharged to post-acute care facilities experience significantly worse outcomes than comparable patients discharged home.¹⁶ The survival gap may be due to suboptimal selection of post-acute care setting. A more standardized and evidence-based approach to post-acute care decision making could not only improve outcomes for surgical patients, but could control costs by reducing variation in resource utilization.

Our findings add to data in other populations that identify inefficiencies and room for improvement in use of post-acute care services. Gage et al presented results from the Post-Acute Care Payment Reform Project commissioned by the Centers for Medicare and Medicaid Services.⁶ They found that for all Medicare patients (with both surgical and medical conditions), patients discharged to SNF and IRF had similar capacity for self-care and mobility at the time of hospital discharge. This suggests that the choice of post-acute care facility is frequently driven by factors other than the patient's medical or rehabilitation needs.^{8,17} They also found that the extent of functional recovery while at SNF or IRF was similar, but IRF patients showed a more rapid improvement in function. However, the study population consisted mostly of individuals with medical diagnoses, rather than patients having gastrointestinal surgery. Risk-adjustment was also based on administrative data and may not accurately capture co-morbidity or postoperative complications. Additionally, there is considerable evidence to suggest that the relative benefits and cost-effectiveness of each post-acute care setting will vary depending on which group of patients is studied.

Buntin et al found that for patients with hip fractures, discharge to SNF led to lower mortality and was less costly than IRF, but this was balanced by higher rates of institutionalization.¹¹ For stroke patients, by contrast, discharge to IRF led to lower mortality and decreased rates of institutionalization.¹¹ Chan et al conducted a prospective cohort study of stroke patients in California to compare the benefits of different post-acute care settings.¹⁸ They found that cognitive, self-care, and mobility scores showed greater improvement for patients discharged to IRF compared to SNF. A more mixed picture emerged from Chen et al, when they compared outcomes across post-acute care settings for patients with strokes, chronic obstructive pulmonary disease, congestive heart failure, and hip fractures.¹⁰ They found considerable variation in whether home health, SNF or IRF was the most cost-effective option for each condition at 6 weeks, 6 months and 1 year after discharge. They also found that home health was frequently more cost-effective than either SNF or IRF. Finally, Mallinson et al found that there was no advantage for any particular post-acute care setting for hip fracture patients, and suggested that the care setting matters less than the type, intensity, and duration of therapy offered at the individual sites^{19,20} These results highlight the need to assess the relative advantage of post-acute care settings for individual disease processes and surgeries, rather than generalizing based on data from mixed populations.

Limitations

There are several limitations to our study that should be acknowledged. We used propensity matching to generate a comparable cohort of SNF and IRF patients based on known confounders such as age, functional status, co-morbidity, length of hospitalization, estimated

mortality, and postoperative complications. Our approach still leaves room for the effects of unmeasured confounding that could affect conclusions. In particular, we could not fully adjust for functional status and exercise tolerance at the time of discharge. Given the admission criteria for IRF stays, it is entirely possible that patients discharged to IRF are more functionally independent than their matched SNF counterparts. While unmeasured confounding could account for improved survival in IRF, this is unlikely to fully account for the large differences in mortality that we observed, especially since the differences persisted for very sick (multiple complications) and older patients. With respect to functional differences, prior work has shown that patients discharged to SNF and IRF are remarkably similar in their functional capacity.²¹ Additionally, there is no retrospective dataset which adequately captures all confounding factors, and this study is not meant to definitively demonstrate the superiority of IRF over SNF. Instead, it serves as a preliminary evaluation of differences that can be further explored with prospective analysis. The follow up period includes only 30 days after surgery, so the long-term benefits of IRF and SNF were not evaluated. It is possible that adverse events could occur after 30 days that would alter the relative benefits of the two post-acute care settings. Additionally, we were not able to assess additional patient-centered outcomes, including quality of life and functional status. These are certainly important aspects of recovery, and studies of Medicare patients indicate that IRF offers a more rapid physical recovery than SNF. However, it is unclear if this difference leads to improved quality of life for IRF versus SNF patients. Finally, we had no information on the specific IRF and SNF that treated our study cohort after discharge. The quality of each facility and the degree of therapy offered at each site could certainly have an impact on outcomes, but is unlikely to be systematically different for IRF compared to SNF.

CONCLUSIONS

Overall, our study emphasizes the urgent need for well-designed prospective studies to better understand how post-acute care settings affect recovery for surgical patients. A comprehensive assessment of short and long-term outcomes (mortality, quality of life, functional status, satisfaction) after discharge to post-acute care is necessary to guide decision making and deliver cost-effective care. Once surgeons have a more comprehensive picture of how post-acute care affects recovery, we can make more informed decisions with patients that will improve outcomes and offer truly patient-centered care.

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Figure 1.

30-day readmission rates after gastrointestinal surgery are similar for patients discharged to skilled nursing facilities (SNF) and inpatient rehabilitation (IRF)

Figure 2.

30-day mortality after gastrointestinal surgery is significantly lower for patients discharged to inpatient rehabilitation (IRF) compared to patients discharged to skilled nursing facilities (SNF)

Table 1 –

Characteristics of patients discharged to skilled nursing facilities or inpatient rehabilitation before (left) and after (right) propensity score matching

Unmatched				Matched		
Variable	SNF N = 9259	IRF N = 3680	Standardized Difference	SNF N = 3664	IRF N = 3664	Standardized Difference
Age (years)			7.9			1.4
<50	324 (4)	148 (4)		141 (4)	147 (4)	
50–59	726 (8)	330 (9)		336 (9)	329 (9)	
60–69	1674 (18)	727 (20)		682 (19)	719 (17)	
70–79	2916 (31)	1155 (31)		1171 (32)	1151 (31)	
80+	3619 (39)	1320 (36)		1334 (36)	1318 (36)	
Gender			9.4			1.7
Male	3597 (39)	1600 (43)		1621 (44)	1591 (43)	
Female	5662 (61)	2080 (57)		2043 (56)	2073 (57)	
Race/Ethnicity			11.6			0.4
White	7663 (83)	2912 (79)		2900 (79)	2907 (79)	
African American	943 (10)	431 (12)		430 (12)	430 (12)	
Other	255 (3)	52 (1)		61 (1.6)	52 (1.4)	
Missing/Unknown	398 (4)	285 (8)		273 (7.5)	275 (7.5)	
Functional Status			10.8			0.4
Independent	8049 (87)	3308 (90)		3302 (90)	3292 (90)	
Partially Dependent	990 (11)	330 (9)		316 (9)	330 (9)	
Totally Dependent	220 (2)	42 (1)		46 (1)	42 (1)	
American Society of Anesthesiology Score			5.4			2
1	19 (0.2)	8 (0.2)		12 (0.3)	8 (0.2)	
2	1098 (12)	456 (12)		451 (12)	453 (12)	
3	5873 (63)	2416 (66)		2439 (66.5)	2404 (65.6)	
4	2202 (24)	773 (21)		737 (20.1)	772 (21)	
5	67 (0.7)	27 (0.7)		25 (0.68)	27 (0.74)	
Predicted Mortality Quintile			8.6			0.4
1	1801 (19)	789 (21)		790 (21.6)	782 (21.3)	
2	1807 (20)	789 (21)		769 (21)	782 (21)	
3	1849 (20)	742 (20)		773 (21)	742 (20.3)	
4	1900 (21)	683 (19)		646 (17.6)	682 (18.6)	
5	1902 (21)	677 (18)		686 (18.7)	676 (18.5)	
Transfer Status			0.3			2.6
Not Transferred	8173 (88)	3250 (88)		3212 (87.6)	3236 (88.3)	
Outside Emergency Room	406 (4)	151 (4)		146 (4)	151 (4)	
From Acute Care Hospital	680 (7)	279 (8)		306 (8.4)	277 (7.6)	

Unmatched				Matched		
Variable	SNF N = 9259	IRF N = 3680	Standardized Difference	SNF N = 3664	IRF N = 3664	Standardized Difference
Year of Surgery			17			0.6
2011	1581 (17)	917 (25)		910 (25)	905 (25)	
2012	2200 (24)	827 (22)		796 (22)	825 (23)	
2013	2541 (27)	933 (25)		952 (26)	932 (25.4)	
2014	2937 (32)	1003 (27)		1006 (27)	1002 (27)	
Co-Morbidities						
Smoker	1379 (15)	490 (13)	4.5	484 (13)	490 (13)	0.5
Diabetes			2.1			2.2
None	6978 (75)	2798 (76)		2817 (77)	2786 (76)	
Non-Insulin	1287 (14)	513 (14)		502 (14)	510 (14)	
Insulin	994 (11)	369 (10)		345 (10)	368 (10)	
Dyspnea			1.1			1.8
None	8025 (87)	3193 (87)		3205 (87)	3179 (87)	
Moderate Exertion	1052 (11)	427 (12)		399 (11)	426 (12)	
At Rest	182 (2)	60 (2)		60 (1)	60 (1)	
Chronic Obstructive Pulmonary Disease	1174 (13)	440 (12)	2.2	422 (11.5)	440 (12)	1.5
Ascites	152 (2)	61 (2)	0.1	64 (1.8)	61 (1.7)	0.6
Congestive Heart Failure	343 (4)	109 (3)	4.1	118 (3)	109 (3)	1.4
Acute Renal Failure	147 (2)	65 (2)	1.4	62 (1.7)	65 (1.8)	0.6
Hypertension	6456 (70)	2626 (71)	3.6	2598 (71)	2614 (71)	1
Dialysis	200 (2)	92 (3)	2.3	85 (2)	91 (2)	1.1
Open Wound	604 (7)	182 (5)	6.8	179 (5)	182 (5)	0.4
Steroids	834 (9)	383 (10)	4.7	379 (10)	381 (10)	0.2
Weight Loss	799 (9)	293 (8)	2.4	314 (8.6)	292 (8)	2.2
Bleeding Disorder	1010 (11)	407 (11)	0.5	410 (11)	405 (11)	0.4
Transfusion	688 (7)	270 (7)	0.4	258 (7)	270 (7)	1.3
Sepsis/Systemic Inflammatory Response Syndrome			3.8			3.1
None	6978 (75)	2840 (77)		2866 (78)	2825 (77)	
Systemic Inflammatory Response Syndrome	598 (6)	216 (6)		223 (6)	216 (6)	
Sepsis	1270 (14)	472 (13)		433 (11.8)	471 (12.8)	
Septic Shock	413 (4)	152 (4)		142 (3.9)	152 (4.2)	
Emergency Surgery	2602 (28)	979 (27)	3.4	843 (25.7)	979 (26.7)	2.2
Surgery Type			10.6			1
Colorectal	7949 (86)	3033 (82)		3009 (82.1)	3028 (82.6)	
Pancreas	1050 (11)	484 (13)		501 (13.7)	480 (13.1)	
Liver	260 (3)	163 (4)		154 (4.2)	156 (4.3)	

Unmatched				Matched		
Variable	SNF N = 9259	IRF N = 3680	Standardized Difference	SNF N = 3664	IRF N = 3664	Standardized Difference
Laparoscopic Surgery	1821 (20)	654 (18)	4.9	666 (18)	653 (18)	0.9
Ostomy	4215 (46)	1559 (42)	6.4	1522 (41.5)	1558 (42.5)	2
Length of Stay Quintile			8.7			2.5
1	1837 (20)	594 (16)		610 (16.7)	593 (16)	
2	1793 (19)	746 (20)		772 (21)	743 (20.3)	
3	1817 (20)	684 (19)		678 (18.5)	684 (18.7)	
4	1939 (21)	840 (23)		818 (22.3)	834 (22.8)	
5	1873 (20)	816 (22)		786 (21.5)	810 (22.1)	
Reoperation	960 (10)	413 (11)	2.8	384 (10.5)	410 (11.2)	2.3
# Complications			6.4			2.2
0	4561 (49)	1673 (45)		1705 (46.5)	1671 (45.6)	
1	2565 (28)	1107 (30)		1094 (29.9)	1098 (30)	
2+	2133 (23)	900 (24)		865 (23.6)	895 (24.4)	
Rates of Individual Complications						
Superficial Surgical Site Infection	709 (8)	354 (10)	7	354 (9.7)	353 (9.6)	0.1
Deep Surgical Site Infection	271 (3)	112 (3)		101 (2.8)	112 (3.1)	
Organ Space Infection	863 (9)	388 (11)	4.1	383 (10.5)	384 (10.5)	0.1
Dehiscence	281 (3)	123 (3)	1.8	122 (3.3)	123 (3.4)	0.2
Pneumonia	776 (8)	295 (8)	1.3	305 (8.3)	294 (8)	1.1
Reintubation	582 (6)	260 (7)	3.1	221 (6)	259 (7)	4.2
Pulmonary Embolism	150 (2)	67 (2)	1.5	64 (1.8)	66 (1.8)	0.4
Failure to Wean Ventilator	1041 (11)	419 (11)	0.5	394 (10.8)	418 (11.4)	2.1
Progressive Renal Insufficiency	156 (2)	68 (2)	1.2	62 (1.7)	68 (1.9)	1.2
Acute Renal Failure	155 (2)	63 (2)	0.3	65 (1.8)	63 (1.7)	0.4
Urinary Tract Infection	619 (7)	270 (7)	2.6			0.7
Stroke	91 (1)	60 (2)	5.7	58 (1.6)	54 (1.5)	1
Cardiac Arrest	80 (1)	35 (1)	0.9	32 (0.9)	35 (1)	0.9
Myocardial Infarction	182 (2)	84 (2)	2.2	74 (2)	84 (2.3)	1.9
Bleeding/Transfusion	2693 (29)	1190 (32)	7.1	1174 (32)	1181 (32)	0.4
Deep Venous Thrombosis	368 (4)	187 (5)	5.3	198 (5.4)	185 (5)	1.7
Sepsis	1010 (11)	384 (10)	1.5	436 (11.9)	382 (10.4)	4.8
Septic Shock	882 (10)	305 (8)	4.3	285 (7.8)	304 (8.3)	1.8

Table 2.

Neither age nor the number of postoperative complications show a consistent relationship with 30-day readmission rates for patients discharged to IRF versus SNF.

	Readmissions	
	SNF N = 3664	IRF N = 3664
Age (years)		
<50	18 (13)	29 (20)
50–59	50 (15)	54 (16)
60–69	126 (18)	128 (18)
70–79	173 (15)	196 (17)
80+	218 (16)	209 (16)
Number of Complications		
0	279 (16)	313 (19)
1	203 (19)	182 (17)
2+	103 (12)	121 (14)

Table 3.

The mortality benefit of discharge to IRF versus SNF increases with older age and the number of postoperative complications.

	Mortality	
	SNF N = 3664	IRF N = 3664
Age		
<50	2 (2)	2 (1)
50–59	7 (2)	2 (1)
60–69	24 (4)	4 (1)
70–79	43 (4)	26 (2)
80+	85 (6)	24 (2)
Number of Complications		
0	48 (3)	24 (1.4)
1	44 (4)	18 (2)
2+	70 (8)	16 (2)