Documentation of Prediction Models Used for Risk Adjustment of Home Health Agency Outcome Reports: 2006 Models

Appendix C
to
Overview of Risk Adjustment and Outcome Measures for Home Health Agency OBQI Reports[1]

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by

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[1] Peter W. Shaughnessy and David F. Hittle, "Overview of Risk Adjustment and Outcome Measures for Home Health Agency OBQI Reports: Highlights of Current Approaches and Outline of Planned Enhancements," September 2002, available at http://www.cms.hhs.gov/apps/hha/RiskAdj1.pdf.

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Documentation of Prediction Models Used for Risk Adjustment of Home Health Agency Outcome Reports: 2006 Models

The purpose of this document is to provide descriptions of the prediction models used to risk adjust outcome rates presented in home health agency outcome-based quality improvement (OBQI) reports. These risk models replace the models used to risk adjust outcomes that were used for outcome reports from April 2003 onward. The models presented in this document were developed using OASIS national repository data from assessments submitted between January 1, 2003 and June 30, 2005. A logistic regression model for each of 41 outcome measures was developed using a national sample of 500,000 home health agency patient episodes and validated using a larger set-aside sample of one million patient episodes from the same source.[2]

Use of Risk Models in Risk-Adjusted Outcome Reports

The risk-adjusted outcome report provided for home health agency outcome-based quality improvement includes, for each outcome measure, the agency's observed (actual) outcome rate and a risk-adjusted national reference rate. The observed agency outcome rate is the number of patients who achieve a particular outcome (e.g., improvement in ambulation) divided by the number of patients eligible[3] for that outcome, over a fixed period of time (12 months). The national reference rate[4] is calculated based on the observed national outcome rate (for the same time period as the agency observed outcome rate), adjusted to reflect case mix differences between the agency's patients and home health patients nationally. The method used to calculate the national reference rate for a given outcome for each home health agency is as follows:

- A predicted outcome probability is calculated for each patient in the agency, based on the patient's health status and other attributes at admission to home health care, using a statistical model specific to that outcome, as described later in this document.

- Predicted outcome probabilities are averaged across all of the agency's patients eligible for that particular outcome to yield an agency predicted outcome rate.

- Predicted outcome probabilities are averaged across all home health patients in the nation eligible for that particular outcome to yield a national predicted outcome rate.

- The National Reference Rate for a specific agency is calculated as:

  National Observed Rate + (Agency Predicted Rate - National Predicted Rate)

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[2] The number of cases used for risk model development and validation varies from one outcome measure to another, depending on the specific exclusion criteria that apply to each measure.

[3] A patient is eligible for a functional improvement measure if the patient was not fully independent on the functional status measure at start or resumption of care. Similarly, a patient is eligible for a functional stabilization measure if the patient was not at the most dependent level of functioning measured at start or resumption of care. A similar definition is used for physiological health status measures.

[4] The method used currently to calculate an agency-specific national reference rate for OBQI reports differs from the method used during the national OBQI demonstration. For the demonstration, models were estimated using a reference sample of patient episodes from the same time period as that covered by agency reports, and the agency's predicted outcome rate was reported as the agency-specific reference rate. The current method takes into account any differences in case mix or outcome performance that may exist between the sample used to estimate risk model parameters and the current national population of home health patients. This was not necessary during the demonstration because the reference population and the sample used for risk model estimation were essentially one and the same.

This method of calculating a risk-adjusted reference rate for home health agencies takes into account variations between agencies in patient case mix, and it provides a means for all agencies to measure their outcomes against a risk-adjusted standard that reflects current national outcome performance.

Use of Risk Models for Home Health Compare

The outcome measures reported to the public on Medicare's Home Health Compare web site are risk adjusted in a manner similar to the method used for each agency's outcome report, except that the national observed rate is reported and the agency rate is adjusted, as follows:

- Observed and predicted rates are calculated for the agency's patients and all patients nation-wide as described above.

- The Agency Risk-adjusted Rate is calculated as:

  Agency Observed Rate + (National Predicted Rate - Agency Predicted Rate)

Reading the Prediction Model Tables

Each table contains the following information:

- Table Title--The title identifies the name of the outcome measure model being presented.

- Risk Factor Measured at SOC/ROC -- This column lists the risk factors included in the prediction model. All risk factors pertain to Start of Care (SOC) or Resumption of Care after inpatient stay (ROC). The number of values in the measurement scale for each risk factor is displayed in parentheses. For risk factors that take on the value 0 and 1, the value 1 denotes the presence of the attribute and 0 denotes its absence. For risk factors that pertain to health or functional status and are defined using a scale that takes on more than two values, higher values of the scale typically indicate greater impairment or severity of illness. The meaning associated with specific numeric values for most risk factors can be determined by examining the related OASIS data item(s).

- Coefficient--The coefficient listed next to the risk factor is the coefficient for the risk factor in the logistic regression model for the outcome measure. All coefficients and associated odds ratios are significant at $p<.0001$ using the likelihood ratio test for the hypothesis that the coefficient is zero (i.e., the odds ratio is 1.00). A significance criterion of $p<.0001$ is used for developing risk models because of the very large developmental sample used to the create the models. Using a very stringent significance level and a large developmental sample results in very stable models whose performance tends to be excellent under cross validation.

- Odds Ratio--For a 0-1 risk factor, the odds ratio is the likelihood of the outcome when the risk factor is present divided by the likelihood of the outcome when the risk factor is not present. In general, the odds ratio indicates the strength of relationship between a risk factor and the outcome measure. The larger or smaller an odds ratio is for a particular risk factor (i.e., >1.00 or <1.00), the more influence the risk factor has on the outcome measure, in a positive or negative direction.

- 90% CI--These are the 90% confidence limits of the odds ratios in the previous column.

- Number of Risk Factors--This is the number of unique risk factors that are used in the logistic regression model for predicting the outcome measure.

- R^2--The R^2 value is the squared correlation between predicted and observed values for all patients in the developmental and validation samples, respectively.

- C--The C-statistic is a measure of association commonly used when predicting a binary dependent variable. Formally, it is the area under the Receiver Operating Characteristic curve. In a less formal sense it is the probability that two individuals who differ on the dependent variable (e.g., one achieves the outcome and one does not) also differ (in the same direction) on the predicted value calculated from the model.

Utility of Specific Risk Models

The predictive models for outcomes show a wide range of strength of relationship as measured by the goodness of fit statistics (R^2 and C) reported in the following tables. Until now, outcome measures for which risk models met a threshold of 0.10 for the validation sample R^2 have been included in a risk-adjusted outcome report, and outcome measures for which risk models did not meet the threshold were included in a descriptive outcome report, without risk adjustment. Going forward, we recommended that all outcome measures be reported with risk adjustment on a single outcome report. However, any outcome measure for which the predictive model fails to meet one or both of the following criteria – $R^2 >= 0.10$; $C >= 0.70$ – should be "flagged" in some way on the report to inform the user that risk adjustment is less adequate for these measures. Seven of the forty-one outcome measures would require this notation.

TABLE 1: Logistic Regression Model for Predicting the Outcome of Improvement in Grooming.

Risk Factor Measured at SOC/ROC*[†]	Coefficient[‡]	Odds Ratio[‡]	(90% CI)[‡]
Age: under 65 (0-1)	-0.095	0.909	(0.878 - 0.941)
Age: 85 or more (0-1)	-0.165	0.848	(0.829 - 0.868)
Both Medicare and Medicaid payment sources (0-1)	-0.146	0.864	(0.831 - 0.899)
Medicaid (not Medicare) as payment source (0-1)	-0.305	0.737	(0.701 - 0.776)
Patient lives alone (0-1)	0.154	1.166	(1.131 - 1.202)
Patient has informal caregiver(s) (0-1)	0.124	1.132	(1.095 - 1.170)
Inpatient discharge from hospital (0-1)	0.398	1.488	(1.454 - 1.523)
Inpatient discharge from rehabilitation facility (0-1)	0.460	1.584	(1.532 - 1.638)
Inpatient discharge from nursing home (0-1)	0.412	1.510	(1.458 - 1.563)
Overall prognosis moderate or better (0-1)	0.219	1.244	(1.202 - 1.289)
Overall prognosis not known (0-1)	0.291	1.337	(1.238 - 1.445)
Rehabilitative prognosis is good (0-1)	0.242	1.274	(1.242 - 1.307)
Disability in grooming: Level 2 (0-1)	1.039	2.827	(2.748 - 2.910)
Disability in grooming: Level 3 (0-1)	2.446	11.541	(10.886 - 12.235)
Disability in dressing upper body (0-3)	-0.236	0.790	(0.774 - 0.806)
Disability in bathing (0-5)	-0.036	0.964	(0.953 - 0.976)
Disability in toileting (0-4)	-0.104	0.901	(0.890 - 0.913)
Disability in transferring (0-5)	-0.088	0.916	(0.901 - 0.932)
Disability in ambulation (0-5)	-0.184	0.832	(0.819 - 0.845)
Disability in eating (0-5)	-0.095	0.910	(0.895 - 0.924)
Prior (2 weeks ago) disability in grooming (0-3)	-0.183	0.833	(0.814 - 0.851)
Prior (2 weeks ago) disability in dressing lower body (0-3)	-0.077	0.926	(0.909 - 0.944)
Disability in light meal preparation (0-2)	-0.065	0.937	(0.920 - 0.955)
Disability in transportation (0-2)	-0.145	0.865	(0.830 - 0.902)
Disability in telephone use (0-5)	-0.119	0.888	(0.880 - 0.895)
Patient does not have telephone (0-1)	-0.299	0.742	(0.696 - 0.791)
Disability in management of oral medications (0-2)	-0.136	0.873	(0.857 - 0.889)
No oral medications prescribed (0-1)	-0.331	0.718	(0.649 - 0.795)
Prior (2 weeks ago) disability in housekeeping (0-4)	-0.089	0.914	(0.905 - 0.924)
Vision impairment (0-2)	-0.126	0.882	(0.866 - 0.898)
Hearing impairment (0-4)	0.060	1.062	(1.047 - 1.077)
Speech/language impairment (0-5)	-0.128	0.880	(0.867 - 0.893)
Pain interfering with activity (0-3)	0.039	1.039	(1.029 - 1.050)
Anxiety level (0-3)	0.034	1.035	(1.022 - 1.048)
Disability in cognitive functioning (0-4)	-0.056	0.945	(0.928 - 0.963)
Confusion scale (0-4)	-0.063	0.939	(0.927 - 0.952)
Stage of most problematic pressure ulcer (0-4)	-0.075	0.928	(0.909 - 0.946)
Surgical wound(s) present (0-1)	0.259	1.296	(1.244 - 1.349)
Number of surgical wounds present (0-4)	0.090	1.094	(1.071 - 1.118)
Urinary catheter (0-1)	-0.257	0.773	(0.737 - 0.812)
Incontinent during day and night (0-1)	-0.077	0.926	(0.903 - 0.949)
Bowel incontinence frequency (0-5)	-0.058	0.944	(0.934 - 0.954)
Intractable pain prior to past 2 weeks (0-1)	0.084	1.088	(1.050 - 1.128)
Memory loss requiring supervision prior to past 2 weeks (0-1)	-0.090	0.914	(0.885 - 0.945)
Severity rating for primary diagnosis (0-4)	0.041	1.042	(1.026 - 1.059)
Number of diagnoses with severity rating >= 2 (0-6)	0.028	1.028	(1.021 - 1.036)
Acute condition: oxygen therapy (0-1)	-0.165	0.848	(0.824 - 0.872)
Acute condition: orthopedic (0-1)	0.193	1.213	(1.185 - 1.241)
Acute condition: cardiac/peripheral vascular (0-1)	0.053	1.055	(1.031 - 1.079)
Acute condition: gastrointestinal disorder (0-1)	0.095	1.099	(1.064 - 1.136)
Chronic condition: impaired ambulation/mobility (0-1)	0.183	1.201	(1.161 - 1.243)
Chronic condition: cognitive/mental/behavioral problems (0-1)	0.107	1.112	(1.079 - 1.147)
Chronic condition: at least one, but caregiver present (0-1)	0.070	1.072	(1.044 - 1.101)
Total number of chronic conditions reported (0-9)	-0.079	0.924	(0.912 - 0.936)
Diagnosis: skin/subcutaneous diseases (0-1)	-0.188	0.828	(0.797 - 0.861)
Diagnosis: ill-defined conditions (0-1)	0.073	1.076	(1.054 - 1.099)

TABLE 1: Logistic Regression Model for Predicting the Outcome of Improvement in Grooming. (cont'd)

Risk Factor Measured at SOC/ROC*†	Coefficient‡	Odds Ratio‡	(90% CI)‡
Diagnosis: neoplasms (0-1)	-0.267	0.765	(0.737 - 0.795)
Diagnosis: mental disease (0-1)	-0.082	0.921	(0.893 - 0.950)
Diagnosis: nervous system disorder (0-1)	-0.215	0.806	(0.784 - 0.829)
Resumption of Care with intervening in-patient stay (0-1)	-0.123	0.884	(0.857 - 0.912)
Rehabilitation procedures: other than physical therapy (0-1)	0.105	1.111	(1.069 - 1.155)
Rehabilitation procedures: physical therapy (0-1)	0.225	1.252	(1.221 - 1.284)
Constant	1.381		

Number of Risk Factors: 62

R^2:§	Developmental R^2 = 0.237	Validation R^2 = 0.237
C:§	Developmental C-statistic = 0.786	Validation C-statistic = 0.786

* SOC = Start of Care, ROC = Resumption of Care after inpatient stay. Risk factors pertain to SOC/ROC values.

† The number of values in the measurement scale for each risk factor is in parentheses. For risk factors that take on the value 0 and 1, the value 1 denotes the presence of the attribute and 0 denotes its absence. For risk factors that pertain to health or functional status and are defined using a scale that takes on more than two values, higher values of the scale typically indicate greater impairment or severity of illness. Selective risk factors take on values that simply represent counts (typically the number of problems) -- these are clear from context. The meaning associated with specific values for each risk factor can be determined from the OASIS data set.

‡ All coefficients/odds ratios are significant at P<.0001 using the likelihood ratio test for the hypothesis that the coefficient is zero. The odds ratios and their associated 90% CIs (confidence intervals) are given. These are considered significant at P<.0001 because of the very large developmental sample used to the create the models. Using this significance level and large developmental sample results in more stable models whose performance is superior under cross validation.

§ The R^2 values are the squared correlations between predicted and observed values for all patients in the developmental (validation) sample. The developmental sample size for all outcomes is 500,000, with some variation in the number of number of valid cases in this sample for particular outcome measures. The validation sample is 1,000,000 for all models, with similar variation in the number of valid cases for different outcome measures. These sample sizes pertain to both R^2s and C-statistics. The C-statistic is the area under the Receiver Operating Characteristic curve. Intuitively, the C-statistic can be described as follows: It is the probability that two individuals who differ on the dependent variable (e.g., one achieves the outcome and one does not) also differ (in the same direction) on the predicted value calculated from the model.

TABLE 2: Logistic Regression Model for Predicting the Outcome of Stabilization in Grooming.

Risk Factor Measured at SOC/ROC*†	Coefficient‡	Odds Ratio‡	(90% CI)‡
Age: 85 or more (0-1)	-0.195	0.823	(0.798 - 0.849)
Any HMO payment source (0-1)	-0.124	0.884	(0.848 - 0.921)
Patient lives alone (0-1)	0.214	1.239	(1.196 - 1.284)
Patient has informal caregiver(s) (0-1)	0.184	1.202	(1.155 - 1.250)
Caregiver provides ADL assistance (0-1)	-0.150	0.861	(0.834 - 0.889)
Inpatient discharge from hospital (0-1)	0.229	1.257	(1.217 - 1.298)
Inpatient discharge from rehabilitation facility (0-1)	0.199	1.220	(1.165 - 1.278)
Inpatient discharge from nursing home (0-1)	0.287	1.333	(1.272 - 1.397)
Medical regimen change in past 14 days (0-1)	0.113	1.120	(1.079 - 1.161)
Overall prognosis moderate or better (0-1)	0.296	1.344	(1.282 - 1.409)
Overall prognosis not known (0-1)	0.262	1.300	(1.173 - 1.440)
Rehabilitative prognosis is good (0-1)	0.281	1.325	(1.280 - 1.372)
Disability in grooming: Level 1 (0-1)	1.172	3.228	(3.095 - 3.366)
Disability in grooming: Level 2 (0-1)	2.659	14.284	(13.309 - 15.331)
Disability in dressing upper body (0-3)	-0.273	0.761	(0.742 - 0.781)
Disability in dressing lower body (0-3)	-0.107	0.899	(0.874 - 0.924)
Disability in bathing (0-5)	-0.048	0.953	(0.936 - 0.971)
Disability in toileting (0-4)	-0.130	0.878	(0.861 - 0.896)
Disability in transferring (0-5)	-0.112	0.894	(0.871 - 0.916)
Disability in ambulation (0-5)	-0.200	0.819	(0.802 - 0.836)
Prior (2 weeks ago) disability in grooming (0-3)	0.127	1.136	(1.098 - 1.174)
Prior (2 weeks ago) disability in dressing lower body (0-3)	-0.070	0.932	(0.907 - 0.958)
Prior (2 weeks ago) disability in bathing (0-5)	-0.049	0.952	(0.936 - 0.969)
Disability in light meal preparation (0-2)	-0.126	0.881	(0.860 - 0.903)
Disability in transportation (0-2)	-0.174	0.841	(0.789 - 0.896)
Disability in laundry (0-2)	-0.173	0.841	(0.809 - 0.875)
Disability in shopping (0-3)	-0.085	0.919	(0.897 - 0.941)
Disability in telephone use (0-5)	-0.108	0.898	(0.887 - 0.909)
Disability in management of oral medications (0-2)	-0.233	0.792	(0.774 - 0.810)
Prior (2 weeks ago) disability in housekeeping (0-4)	-0.106	0.899	(0.888 - 0.911)
Speech/language impairment (0-5)	-0.122	0.885	(0.867 - 0.903)
Pain interfering with activity (0-3)	0.054	1.056	(1.042 - 1.070)
Confusion scale (0-4)	-0.093	0.911	(0.897 - 0.925)
Stage 2-4 pressure ulcer(s) present (0-1)	-0.250	0.779	(0.728 - 0.832)
Surgical wound(s) present (0-1)	0.287	1.333	(1.252 - 1.420)
Number of surgical wounds present (0-4)	0.107	1.113	(1.077 - 1.150)
Urinary tract infection (0-1)	-0.143	0.867	(0.827 - 0.908)
Bowel incontinence frequency (0-5)	-0.094	0.910	(0.896 - 0.925)
Urinary catheter prior to past 2 weeks (0-1)	-0.222	0.801	(0.736 - 0.873)
Acute condition: oxygen therapy (0-1)	-0.234	0.791	(0.762 - 0.822)
Acute condition: open wound/lesion (0-1)	0.105	1.111	(1.075 - 1.148)
Chronic condition: eating disability (0-1)	-0.251	0.778	(0.717 - 0.844)
Diagnosis: skin/subcutaneous diseases (0-1)	-0.212	0.809	(0.768 - 0.852)
Diagnosis: musculoskeletal system diseases (0-1)	0.130	1.138	(1.104 - 1.173)
Diagnosis: neoplasms (0-1)	-0.580	0.560	(0.536 - 0.585)
Diagnosis: nervous system disorder (0-1)	-0.229	0.796	(0.766 - 0.826)
Resumption of Care with intervening in-patient stay (0-1)	-0.237	0.789	(0.757 - 0.823)
Rehabilitation procedures: physical therapy (0-1)	0.183	1.200	(1.162 - 1.240)
Constant	3.668		

Number of Risk Factors: 48

R^2:§ Developmental R^2 = 0.095 Validation R^2 = 0.093

C:§ Developmental C-statistic = 0.800 Validation C-statistic = 0.800

TABLE 2: Logistic Regression Model for Predicting the Outcome of Stabilization in Grooming. (cont'd)

* SOC = Start of Care, ROC = Resumption of Care after inpatient stay. Risk factors pertain to SOC/ROC values.

† The number of values in the measurement scale for each risk factor is in parentheses. For risk factors that take on the value 0 and 1, the value 1 denotes the presence of the attribute and 0 denotes its absence. For risk factors that pertain to health or functional status and are defined using a scale that takes on more than two values, higher values of the scale typically indicate greater impairment or severity of illness. Selective risk factors take on values that simply represent counts (typically the number of problems) -- these are clear from context. The meaning associated with specific values for each risk factor can be determined from the OASIS data set.

‡ All coefficients/odds ratios are significant at P<.0001 using the likelihood ratio test for the hypothesis that the coefficient is zero. The odds ratios and their associated 90% CIs (confidence intervals) are given. These are considered significant at P<.0001 because of the very large developmental sample used to the create the models. Using this significance level and large developmental sample results in more stable models whose performance is superior under cross validation.

§ The R^2 values are the squared correlations between predicted and observed values for all patients in the developmental (validation) sample. The developmental sample size for all outcomes is 500,000, with some variation in the number of number of valid cases in this sample for particular outcome measures. The validation sample is 1,000,000 for all models, with similar variation in the number of valid cases for different outcome measures. These sample sizes pertain to both R^2s and C-statistics. The C-statistic is the area under the Receiver Operating Characteristic curve. Intuitively, the C-statistic can be described as follows: It is the probability that two individuals who differ on the dependent variable (e.g., one achieves the outcome and one does not) also differ (in the same direction) on the predicted value calculated from the model.

TABLE 3: Logistic Regression Model for Predicting the Outcome of Improvement in Dressing Upper Body.

Risk Factor Measured at SOC/ROC*†	Coefficient‡	Odds Ratio‡	(90% CI)‡
Age: under 65 (0-1)	-0.085	0.918	(0.889 - 0.948)
Age: 85 or more (0-1)	-0.155	0.856	(0.838 - 0.875)
Both Medicare and Medicaid payment sources (0-1)	-0.103	0.902	(0.869 - 0.936)
Medicaid (not Medicare) as payment source (0-1)	-0.230	0.795	(0.758 - 0.834)
Patient lives alone (0-1)	0.209	1.233	(1.201 - 1.265)
Patient has informal caregiver(s) (0-1)	0.198	1.220	(1.186 - 1.254)
Caregiver provides ADL assistance (0-1)	-0.139	0.870	(0.846 - 0.894)
Caregiver provides IADL assistance (0-1)	0.188	1.206	(1.150 - 1.266)
Infrequency of caregiver assistance (1-7)	-0.024	0.976	(0.967 - 0.985)
Inpatient discharge from hospital (0-1)	0.403	1.496	(1.463 - 1.529)
Inpatient discharge from rehabilitation facility (0-1)	0.445	1.560	(1.513 - 1.609)
Inpatient discharge from nursing home (0-1)	0.396	1.486	(1.439 - 1.534)
Medical regimen change in past 14 days (0-1)	0.098	1.102	(1.073 - 1.132)
Overall prognosis moderate or better (0-1)	0.199	1.220	(1.180 - 1.261)
Overall prognosis not known (0-1)	0.267	1.306	(1.214 - 1.405)
Rehabilitative prognosis is good (0-1)	0.292	1.339	(1.308 - 1.371)
Disability in grooming (0-3)	-0.153	0.858	(0.846 - 0.870)
Disability in dressing upper body: Level 2 (0-1)	0.842	2.321	(2.265 - 2.379)
Disability in dressing upper body: Level 3 (0-1)	2.430	11.353	(10.782 - 11.956)
Disability in dressing lower body (0-3)	-0.072	0.931	(0.910 - 0.952)
Disability in bathing (0-5)	-0.043	0.958	(0.947 - 0.969)
Disability in toileting (0-4)	-0.116	0.890	(0.879 - 0.902)
Disability in transferring (0-5)	-0.108	0.897	(0.883 - 0.912)
Disability in ambulation (0-5)	-0.192	0.825	(0.811 - 0.839)
Disability in eating (0-5)	-0.083	0.920	(0.906 - 0.934)
Prior (2 weeks ago) disability in dressing lower body (0-3)	-0.199	0.820	(0.806 - 0.833)
Prior (2 weeks ago) disability in ambulation (0-5)	-0.045	0.956	(0.940 - 0.973)
Disability in light meal preparation (0-2)	-0.093	0.911	(0.896 - 0.927)
Disability in transportation (0-2)	-0.105	0.900	(0.864 - 0.937)
Disability in telephone use (0-5)	-0.102	0.903	(0.896 - 0.911)
Patient does not have telephone (0-1)	-0.217	0.805	(0.757 - 0.856)
Disability in management of oral medications (0-2)	-0.150	0.860	(0.847 - 0.875)
No oral medications prescribed (0-1)	-0.337	0.714	(0.649 - 0.786)
Prior (2 weeks ago) disability in housekeeping (0-4)	-0.082	0.921	(0.913 - 0.929)
Dyspnea (shortness of breath) (0-4)	0.023	1.023	(1.014 - 1.032)
Vision impairment (0-2)	-0.094	0.910	(0.895 - 0.926)
Hearing impairment (0-4)	0.076	1.079	(1.064 - 1.093)
Speech/language impairment (0-5)	-0.120	0.887	(0.875 - 0.899)
Pain interfering with activity (0-3)	0.038	1.038	(1.029 - 1.048)
Anxiety level (0-3)	0.035	1.035	(1.023 - 1.047)
Confusion scale (0-4)	-0.057	0.944	(0.934 - 0.955)
Stage of most problematic pressure ulcer (0-4)	-0.085	0.919	(0.901 - 0.936)
No observable pressure ulcer to measure stage (0-1)	-0.373	0.689	(0.596 - 0.796)
Surgical wound(s) present (0-1)	0.423	1.526	(1.489 - 1.564)
No observable surgical wound to measure status (0-1)	-0.505	0.604	(0.556 - 0.655)
Urinary incontinence severity (0-4)	-0.045	0.956	(0.949 - 0.963)
Bowel incontinence frequency (0-5)	-0.055	0.946	(0.937 - 0.956)
Memory loss requiring supervision prior to past 2 weeks (0-1)	-0.100	0.905	(0.877 - 0.933)
Alcoholism at SOC/ROC (0-1)	0.232	1.261	(1.162 - 1.369)
Severity rating for primary diagnosis (0-4)	0.075	1.078	(1.062 - 1.094)
Number of diagnoses with severity rating >= 2 (0-6)	0.016	1.017	(1.010 - 1.024)
Acute condition: oxygen therapy (0-1)	-0.209	0.811	(0.788 - 0.836)
Acute condition: orthopedic (0-1)	0.137	1.147	(1.120 - 1.174)
Acute condition: cardiac/peripheral vascular (0-1)	0.074	1.077	(1.054 - 1.101)
Acute condition: gastrointestinal disorder (0-1)	0.097	1.102	(1.068 - 1.136)

TABLE 3: Logistic Regression Model for Predicting the Outcome of Improvement in Dressing Upper Body. (cont'd)

Risk Factor Measured at SOC/ROC*†	Coefficient‡	Odds Ratio‡	(90% CI)‡
Chronic condition: impaired ambulation/mobility (0-1)	0.199	1.221	(1.179 - 1.263)
Chronic condition: cognitive/mental/behavioral problems (0-1)	0.131	1.140	(1.107 - 1.173)
Total number of chronic conditions reported (0-9)	-0.070	0.932	(0.921 - 0.943)
Diagnosis: genitourinary system diseases (0-1)	-0.090	0.914	(0.889 - 0.939)
Diagnosis: skin/subcutaneous diseases (0-1)	-0.157	0.855	(0.824 - 0.887)
Diagnosis: musculoskeletal system diseases (0-1)	0.067	1.069	(1.046 - 1.092)
Diagnosis: ill-defined conditions (0-1)	0.077	1.080	(1.059 - 1.101)
Diagnosis: neoplasms (0-1)	-0.257	0.773	(0.747 - 0.801)
Diagnosis: nervous system disorder (0-1)	-0.221	0.802	(0.781 - 0.823)
Diagnosis: respiratory system diseases (0-1)	0.067	1.070	(1.043 - 1.098)
Resumption of Care with intervening in-patient stay (0-1)	-0.115	0.891	(0.866 - 0.917)
Aftercare following hip, joint replacement or fracture (0-1)	0.341	1.406	(1.332 - 1.484)
Rehabilitation procedures: other than physical therapy (0-1)	0.089	1.093	(1.054 - 1.132)
Rehabilitation procedures: physical therapy (0-1)	0.206	1.229	(1.201 - 1.257)
Constant	1.039		

Number of Risk Factors: 69

R^2:§ Developmental R^2 = 0.233 Validation R^2 = 0.234

C:§ Developmental C-statistic = 0.783 Validation C-statistic = 0.784

* SOC = Start of Care, ROC = Resumption of Care after inpatient stay. Risk factors pertain to SOC/ROC values.

† The number of values in the measurement scale for each risk factor is in parentheses. For risk factors that take on the value 0 and 1, the value 1 denotes the presence of the attribute and 0 denotes its absence. For risk factors that pertain to health or functional status and are defined using a scale that takes on more than two values, higher values of the scale typically indicate greater impairment or severity of illness. Selective risk factors take on values that simply represent counts (typically the number of problems) -- these are clear from context. The meaning associated with specific values for each risk factor can be determined from the OASIS data set.

‡ All coefficients/odds ratios are significant at P<.0001 using the likelihood ratio test for the hypothesis that the coefficient is zero. The odds ratios and their associated 90% CIs (confidence intervals) are given. These are considered significant at P<.0001 because of the very large developmental sample used to the create the models. Using this significance level and large developmental sample results in more stable models whose performance is superior under cross validation.

§ The R^2 values are the squared correlations between predicted and observed values for all patients in the developmental (validation) sample. The developmental sample size for all outcomes is 500,000, with some variation in the number of number of valid cases in this sample for particular outcome measures. The validation sample is 1,000,000 for all models, with similar variation in the number of valid cases for different outcome measures. These sample sizes pertain to both R^2s and C-statistics. The C-statistic is the area under the Receiver Operating Characteristic curve. Intuitively, the C-statistic can be described as follows: It is the probability that two individuals who differ on the dependent variable (e.g., one achieves the outcome and one does not) also differ (in the same direction) on the predicted value calculated from the model.

TABLE 4: Logistic Regression Model for Predicting the Outcome of Improvement in Dressing Lower Body.

Risk Factor Measured at SOC/ROC*†	Coefficient‡	Odds Ratio‡	(90% CI)‡
Age: 85 or more (0-1)	-0.154	0.857	(0.840 - 0.875)
Gender: female (0-1)	0.053	1.055	(1.036 - 1.074)
Any HMO payment source (0-1)	-0.074	0.928	(0.904 - 0.953)
Both Medicare and Medicaid payment sources (0-1)	-0.102	0.903	(0.872 - 0.935)
Medicaid (not Medicare) as payment source (0-1)	-0.223	0.800	(0.769 - 0.832)
Patient lives alone (0-1)	0.337	1.400	(1.364 - 1.438)
Patient has informal caregiver(s) (0-1)	0.183	1.201	(1.166 - 1.237)
Primary caregiver present (0-1)	0.199	1.220	(1.139 - 1.308)
Caregiver provides ADL assistance (0-1)	-0.175	0.839	(0.819 - 0.860)
Caregiver provides IADL assistance (0-1)	0.175	1.192	(1.135 - 1.252)
Infrequency of caregiver assistance (1-7)	-0.063	0.939	(0.928 - 0.950)
Inpatient discharge from hospital (0-1)	0.329	1.390	(1.362 - 1.418)
Inpatient discharge from rehabilitation facility (0-1)	0.368	1.444	(1.405 - 1.484)
Inpatient discharge from nursing home (0-1)	0.335	1.398	(1.358 - 1.440)
Overall prognosis moderate or better (0-1)	0.230	1.259	(1.219 - 1.300)
Overall prognosis not known (0-1)	0.269	1.309	(1.220 - 1.404)
Rehabilitative prognosis is good (0-1)	0.288	1.333	(1.304 - 1.364)
Disability in grooming (0-3)	-0.066	0.936	(0.924 - 0.948)
Disability in dressing upper body (0-3)	-0.126	0.881	(0.864 - 0.899)
Disability in dressing lower body: Level 2 (0-1)	0.495	1.641	(1.602 - 1.680)
Disability in dressing lower body: Level 3 (0-1)	2.346	10.440	(9.958 - 10.944)
Disability in bathing (0-5)	-0.055	0.947	(0.938 - 0.956)
Disability in toileting (0-4)	-0.165	0.848	(0.834 - 0.862)
Disability in transferring (0-5)	-0.151	0.860	(0.847 - 0.873)
Disability in ambulation (0-5)	-0.182	0.834	(0.820 - 0.848)
Prior (2 weeks ago) disability in dressing upper body (0-3)	-0.054	0.947	(0.926 - 0.969)
Prior (2 weeks ago) disability in dressing lower body (0-3)	-0.210	0.811	(0.794 - 0.828)
Prior (2 weeks ago) disability in toileting (0-4)	0.063	1.065	(1.047 - 1.084)
Prior (2 weeks ago) disability in ambulation (0-5)	-0.093	0.911	(0.895 - 0.927)
Disability in light meal preparation (0-2)	-0.071	0.931	(0.918 - 0.945)
Disability in transportation (0-2)	-0.182	0.833	(0.798 - 0.870)
Disability in telephone use (0-5)	-0.092	0.913	(0.906 - 0.920)
Patient does not have telephone (0-1)	-0.139	0.870	(0.819 - 0.924)
Disability in management of oral medications (0-2)	-0.167	0.846	(0.829 - 0.863)
No oral medications prescribed (0-1)	-0.242	0.785	(0.717 - 0.859)
Prior (2 weeks ago) disability in transportation (0-2)	0.106	1.111	(1.083 - 1.141)
Prior (2 weeks ago) disability in housekeeping (0-4)	-0.067	0.935	(0.927 - 0.943)
Prior (2 weeks ago) disability in mgt. of oral medications (0-2)	0.071	1.074	(1.052 - 1.096)
Dyspnea (shortness of breath) (0-4)	0.031	1.031	(1.023 - 1.040)
Hearing impairment (0-4)	0.054	1.055	(1.042 - 1.069)
Speech/language impairment (0-5)	-0.100	0.904	(0.893 - 0.916)
Anxiety level (0-3)	0.032	1.033	(1.022 - 1.044)
Confusion scale (0-4)	-0.038	0.962	(0.952 - 0.973)
Stage 1-4 pressure ulcer(s) present (0-1)	-0.190	0.827	(0.796 - 0.860)
No observable pressure ulcer to measure stage (0-1)	-0.487	0.615	(0.535 - 0.706)
Stasis ulcer(s) present (0-1)	-0.261	0.770	(0.726 - 0.818)
Number of surgical wounds present (0-4)	0.095	1.099	(1.082 - 1.117)
Status of surgical wound (0-3)	0.060	1.061	(1.044 - 1.079)
Urinary incontinence severity (0-4)	-0.038	0.963	(0.956 - 0.970)
Bowel incontinence frequency (0-5)	-0.076	0.926	(0.917 - 0.936)
Urinary catheter prior to past 2 weeks (0-1)	-0.152	0.859	(0.810 - 0.911)
Memory loss requiring supervision prior to past 2 weeks (0-1)	-0.120	0.887	(0.860 - 0.914)
Obese at SOC/ROC (0-1)	-0.196	0.822	(0.803 - 0.841)
Alcoholism at SOC/ROC (0-1)	0.175	1.191	(1.106 - 1.284)
Severity rating for primary diagnosis (0-4)	0.080	1.084	(1.069 - 1.099)

TABLE 4: Logistic Regression Model for Predicting the Outcome of Improvement in Dressing Lower Body. (cont'd)

Risk Factor Measured at SOC/ROC*†	Coefficient‡	Odds Ratio‡	(90% CI)‡
Number of diagnoses with severity rating >= 2 (0-6)	0.025	1.025	(1.019 - 1.032)
Acute condition: oxygen therapy (0-1)	-0.200	0.819	(0.797 - 0.842)
Acute condition: orthopedic (0-1)	0.123	1.131	(1.109 - 1.153)
Acute condition: cardiac/peripheral vascular (0-1)	0.089	1.093	(1.072 - 1.115)
Acute condition: gastrointestinal disorder (0-1)	0.130	1.139	(1.107 - 1.172)
Chronic condition: impaired ambulation/mobility (0-1)	0.211	1.234	(1.194 - 1.276)
Chronic condition: cognitive/mental/behavioral problems (0-1)	0.172	1.188	(1.156 - 1.221)
Chronic condition: at least one, but caregiver present (0-1)	0.098	1.103	(1.078 - 1.128)
Total number of chronic conditions reported (0-9)	-0.085	0.919	(0.909 - 0.930)
Diagnosis: genitourinary system diseases (0-1)	-0.075	0.928	(0.904 - 0.952)
Diagnosis: skin/subcutaneous diseases (0-1)	-0.181	0.834	(0.806 - 0.863)
Diagnosis: ill-defined conditions (0-1)	0.071	1.074	(1.055 - 1.093)
Diagnosis: neoplasms (0-1)	-0.122	0.885	(0.858 - 0.914)
Diagnosis: nervous system disorder (0-1)	-0.239	0.787	(0.768 - 0.807)
Diagnosis: respiratory system diseases (0-1)	0.082	1.085	(1.059 - 1.112)
Resumption of Care with intervening in-patient stay (0-1)	-0.081	0.922	(0.898 - 0.948)
Rehabilitation procedures: other than physical therapy (0-1)	0.122	1.130	(1.093 - 1.168)
Rehabilitation procedures: physical therapy (0-1)	0.198	1.219	(1.193 - 1.245)
Constant	0.875		

Number of Risk Factors: 73

R^2:§ Developmental R^2 = 0.224 Validation R^2 = 0.223

C:§ Developmental C-statistic = 0.774 Validation C-statistic = 0.773

* SOC = Start of Care, ROC = Resumption of Care after inpatient stay. Risk factors pertain to SOC/ROC values.

† The number of values in the measurement scale for each risk factor is in parentheses. For risk factors that take on the value 0 and 1, the value 1 denotes the presence of the attribute and 0 denotes its absence. For risk factors that pertain to health or functional status and are defined using a scale that takes on more than two values, higher values of the scale typically indicate greater impairment or severity of illness. Selective risk factors take on values that simply represent counts (typically the number of problems) -- these are clear from context. The meaning associated with specific values for each risk factor can be determined from the OASIS data set.

‡ All coefficients/odds ratios are significant at P<.0001 using the likelihood ratio test for the hypothesis that the coefficient is zero. The odds ratios and their associated 90% CIs (confidence intervals) are given. These are considered significant at P<.0001 because of the very large developmental sample used to the create the models. Using this significance level and large developmental sample results in more stable models whose performance is superior under cross validation.

§ The R^2 values are the squared correlations between predicted and observed values for all patients in the developmental (validation) sample. The developmental sample size for all outcomes is 500,000, with some variation in the number of number of valid cases in this sample for particular outcome measures. The validation sample is 1,000,000 for all models, with similar variation in the number of valid cases for different outcome measures. These sample sizes pertain to both R^2s and C-statistics. The C-statistic is the area under the Receiver Operating Characteristic curve. Intuitively, the C-statistic can be described as follows: It is the probability that two individuals who differ on the dependent variable (e.g., one achieves the outcome and one does not) also differ (in the same direction) on the predicted value calculated from the model.

TABLE 5: Logistic Regression Model for Predicting the Outcome of Improvement in Bathing.

Risk Factor Measured at SOC/ROC*†	Coefficient‡	Odds Ratio‡	(90% CI)‡
Acute condition: orthopedic (0-1)	0.092	1.096	(1.078 - 1.115)
Acute condition: oxygen therapy (0-1)	-0.197	0.821	(0.802 - 0.841)
Acute condition: neurologic (0-1)	0.072	1.075	(1.049 - 1.102)
Acute condition: cardiac/peripheral vascular (0-1)	0.078	1.081	(1.063 - 1.098)
Age: 75 to 84, inclusive (0-1)	-0.078	0.925	(0.909 - 0.940)
Age: 85 or more (0-1)	-0.268	0.765	(0.750 - 0.780)
Disability in ambulation (0-5)	-0.206	0.814	(0.802 - 0.826)
Disability in bathing: Level 2 (0-1)	1.177	3.243	(3.174 - 3.314)
Disability in bathing: Level 3 (0-1)	2.288	9.856	(9.588 - 10.132)
Disability in bathing: Level 4 (0-1)	2.529	12.539	(12.152 - 12.938)
Disability in bathing: Level 5 (0-1)	3.888	48.815	(46.243 - 51.529)
Demonstrated behavior: impaired decision-making (0-1)	0.104	1.110	(1.085 - 1.135)
Bowel incontinence frequency (0-5)	-0.057	0.945	(0.936 - 0.954)
Chronic condition: impaired ambulation/mobility (0-1)	0.165	1.180	(1.149 - 1.212)
Chronic condition: eating disability (0-1)	-0.237	0.789	(0.750 - 0.830)
Chronic condition: urinary incontinence/catheter (0-1)	-0.123	0.884	(0.865 - 0.904)
Caregiver provides ADL assistance (0-1)	-0.107	0.898	(0.884 - 0.913)
Confusion scale (0-4)	-0.044	0.957	(0.948 - 0.966)
Surgical wound(s) present (0-1)	0.234	1.263	(1.228 - 1.300)
Dyspnea (shortness of breath) (0-4)	0.017	1.017	(1.010 - 1.024)
Gender: female (0-1)	-0.101	0.904	(0.890 - 0.917)
Disability in housekeeping (0-4)	-0.038	0.963	(0.956 - 0.969)
Urinary incontinence severity (0-4)	-0.023	0.978	(0.970 - 0.985)
Inpatient discharge from hospital (0-1)	0.297	1.346	(1.324 - 1.369)
Inpatient discharge from rehabilitation facility (0-1)	0.267	1.307	(1.277 - 1.337)
Inpatient discharge from nursing home (0-1)	0.235	1.265	(1.235 - 1.296)
Patient lives with family member (0-1)	0.173	1.189	(1.156 - 1.222)
Patient lives alone (0-1)	0.202	1.224	(1.189 - 1.261)
Patient has informal caregiver(s) (0-1)	0.094	1.098	(1.071 - 1.126)
Disability in management of oral medications (0-2)	-0.150	0.860	(0.850 - 0.871)
No oral medications prescribed (0-1)	-0.247	0.781	(0.724 - 0.843)
Pain interfering with activity (0-3)	0.032	1.032	(1.025 - 1.040)
Prior (2 weeks ago) disability in ambulation (0-5)	-0.090	0.914	(0.900 - 0.928)
Patient lives in own home (0-1)	0.066	1.069	(1.050 - 1.088)
Medicaid (not Medicare) as payment source (0-1)	-0.244	0.784	(0.758 - 0.811)
Both Medicare and Medicaid payment sources (0-1)	-0.081	0.922	(0.895 - 0.951)
Any HMO payment source (0-1)	-0.070	0.933	(0.912 - 0.954)
Prior (2 weeks ago) disability in bathing (0-5)	-0.199	0.819	(0.812 - 0.827)
Memory loss requiring supervision prior to past 2 weeks (0-1)	-0.077	0.926	(0.903 - 0.950)
Prior (2 weeks ago) disability in eating (0-5)	0.052	1.053	(1.036 - 1.071)
Disability in telephone use (0-5)	-0.066	0.936	(0.929 - 0.943)
Patient does not have telephone (0-1)	-0.194	0.823	(0.780 - 0.869)
Prior (2 weeks ago) disability in laundry (0-2)	-0.118	0.889	(0.876 - 0.902)
Overall prognosis moderate or better (0-1)	0.174	1.190	(1.156 - 1.224)
Overall prognosis not known (0-1)	0.213	1.237	(1.164 - 1.314)
Prior (2 weeks ago) disability in shopping (0-3)	-0.034	0.967	(0.956 - 0.978)
Prior (2 weeks ago) disability in toileting (0-4)	0.092	1.096	(1.079 - 1.113)
Stage of most problematic pressure ulcer (0-4)	-0.082	0.921	(0.907 - 0.936)
Rehabilitative prognosis is good (0-1)	0.302	1.352	(1.326 - 1.379)
Obese at SOC/ROC (0-1)	-0.138	0.871	(0.854 - 0.888)
Number of diagnoses with severity rating >= 2 (0-6)	0.030	1.030	(1.025 - 1.036)
Severity rating for primary diagnosis (0-4)	0.082	1.086	(1.073 - 1.099)
Speech/language impairment (0-5)	-0.074	0.928	(0.918 - 0.939)
Number of stasis ulcers present (0-4)	-0.103	0.902	(0.882 - 0.923)
Disability in toileting (0-4)	-0.139	0.871	(0.858 - 0.884)
Disability in transferring (0-5)	-0.096	0.908	(0.896 - 0.920)

TABLE 5: Logistic Regression Model for Predicting the Outcome of Improvement in Bathing. (cont'd)

Risk Factor Measured at SOC/ROC*†	Coefficient‡	Odds Ratio‡	(90% CI)‡
Disability in transportation (0-2)	-0.134	0.875	(0.845 - 0.906)
Disability in dressing upper body (0-3)	-0.095	0.909	(0.900 - 0.919)
Number of surgical wounds present (0-4)	0.047	1.048	(1.033 - 1.063)
No observable surgical wound to measure status (0-1)	-0.377	0.686	(0.640 - 0.735)
Diagnosis: genitourinary system diseases (0-1)	-0.104	0.901	(0.881 - 0.921)
Diagnosis: skin/subcutaneous diseases (0-1)	-0.193	0.825	(0.801 - 0.849)
Diagnosis: neoplasms (0-1)	-0.154	0.857	(0.835 - 0.881)
Diagnosis: mental disease (0-1)	-0.061	0.941	(0.919 - 0.964)
Diagnosis: nervous system disorder (0-1)	-0.214	0.807	(0.789 - 0.826)
Diagnosis: respiratory system diseases (0-1)	0.084	1.088	(1.066 - 1.110)
Diagnosis: digestive system diseases (0-1)	0.079	1.082	(1.058 - 1.107)
Resumption of Care with intervening in-patient stay (0-1)	-0.071	0.932	(0.911 - 0.954)
Rehabilitation procedures: physical therapy (0-1)	0.102	1.108	(1.088 - 1.127)
Rehabilitation procedures: other than physical therapy (0-1)	0.081	1.084	(1.054 - 1.115)
Aftercare following surgery (0-1)	0.172	1.188	(1.153 - 1.224)
Constant	-0.643		

Number of Risk Factors: 71

R^2:§ Developmental R^2 = 0.205 Validation R^2 = 0.204

C:§ Developmental C-statistic = 0.765 Validation C-statistic = 0.765

* SOC = Start of Care, ROC = Resumption of Care after inpatient stay. Risk factors pertain to SOC/ROC values.

† The number of values in the measurement scale for each risk factor is in parentheses. For risk factors that take on the value 0 and 1, the value 1 denotes the presence of the attribute and 0 denotes its absence. For risk factors that pertain to health or functional status and are defined using a scale that takes on more than two values, higher values of the scale typically indicate greater impairment or severity of illness. Selective risk factors take on values that simply represent counts (typically the number of problems) -- these are clear from context. The meaning associated with specific values for each risk factor can be determined from the OASIS data set.

‡ All coefficients/odds ratios are significant at P<.0001 using the likelihood ratio test for the hypothesis that the coefficient is zero. The odds ratios and their associated 90% CIs (confidence intervals) are given. These are considered significant at P<.0001 because of the very large developmental sample used to the create the models. Using this significance level and large developmental sample results in more stable models whose performance is superior under cross validation.

§ The R^2 values are the squared correlations between predicted and observed values for all patients in the developmental (validation) sample. The developmental sample size for all outcomes is 500,000, with some variation in the number of number of valid cases in this sample for particular outcome measures. The validation sample is 1,000,000 for all models, with similar variation in the number of valid cases for different outcome measures. These sample sizes pertain to both R^2s and C-statistics. The C-statistic is the area under the Receiver Operating Characteristic curve. Intuitively, the C-statistic can be described as follows: It is the probability that two individuals who differ on the dependent variable (e.g., one achieves the outcome and one does not) also differ (in the same direction) on the predicted value calculated from the model.

TABLE 6: Logistic Regression Model for Predicting the Outcome of Stabilization in Bathing.

Risk Factor Measured at SOC/ROC*[†]	Coefficient[‡]	Odds Ratio[‡]	(90% CI)[‡]
Age: under 65 (0-1)	0.157	1.170	(1.124 - 1.217)
Age: 75 to 84, inclusive (0-1)	-0.192	0.825	(0.800 - 0.850)
Age: 85 or more (0-1)	-0.393	0.675	(0.652 - 0.698)
Gender: female (0-1)	-0.181	0.834	(0.815 - 0.854)
Any HMO payment source (0-1)	-0.200	0.818	(0.792 - 0.846)
Caregiver provides ADL assistance (0-1)	-0.184	0.832	(0.809 - 0.856)
Medical regimen change in past 14 days (0-1)	0.099	1.104	(1.072 - 1.138)
Overall prognosis moderate or better (0-1)	0.296	1.345	(1.288 - 1.404)
Overall prognosis not known (0-1)	0.224	1.251	(1.142 - 1.370)
Rehabilitative prognosis is good (0-1)	0.297	1.346	(1.305 - 1.387)
Disability in dressing lower body (0-3)	-0.211	0.809	(0.795 - 0.824)
Disability in bathing: Level 1 (0-1)	1.319	3.740	(3.613 - 3.872)
Disability in bathing: Level 2 (0-1)	2.338	10.362	(9.968 - 10.772)
Disability in bathing: Level 3 (0-1)	3.790	44.240	(41.950 - 46.654)
Disability in bathing: Level 4 (0-1)	4.687	108.570	(101.347 - 116.308)
Disability in transferring (0-5)	-0.197	0.821	(0.803 - 0.839)
Disability in ambulation (0-5)	-0.382	0.683	(0.669 - 0.697)
Prior (2 weeks ago) disability in grooming (0-3)	-0.109	0.896	(0.878 - 0.915)
Prior (2 weeks ago) disability in toileting (0-4)	-0.097	0.907	(0.890 - 0.925)
Prior (2 weeks ago) disability in eating (0-5)	0.084	1.088	(1.057 - 1.120)
Disability in transportation (0-2)	-0.246	0.782	(0.744 - 0.821)
Disability in housekeeping (0-4)	-0.062	0.940	(0.930 - 0.951)
Disability in shopping (0-3)	-0.094	0.910	(0.893 - 0.927)
Disability in telephone use (0-5)	-0.072	0.931	(0.920 - 0.941)
Disability in management of oral medications (0-2)	-0.176	0.839	(0.823 - 0.855)
Prior (2 weeks ago) disability in laundry (0-2)	-0.201	0.818	(0.803 - 0.832)
Speech/language impairment (0-5)	-0.047	0.954	(0.937 - 0.972)
Pain interfering with activity (0-3)	0.051	1.052	(1.041 - 1.064)
Demonstrated behavior: impaired decision-making (0-1)	0.115	1.121	(1.080 - 1.164)
Stage of most problematic pressure ulcer (0-4)	-0.167	0.846	(0.825 - 0.867)
No observable pressure ulcer to measure status (0-1)	-0.520	0.595	(0.491 - 0.721)
Stasis ulcer(s) present (0-1)	-0.342	0.710	(0.661 - 0.763)
Surgical wound(s) present (0-1)	0.242	1.273	(1.235 - 1.313)
Bowel incontinence frequency (0-5)	-0.077	0.926	(0.912 - 0.939)
Urinary catheter prior to past 2 weeks (0-1)	-0.243	0.784	(0.724 - 0.849)
Memory loss requiring supervision prior to past 2 weeks (0-1)	-0.113	0.893	(0.858 - 0.930)
Obese at SOC/ROC (0-1)	-0.122	0.885	(0.857 - 0.914)
Existence of risk factors at SOC/ROC not known (0-1)	-0.238	0.788	(0.731 - 0.851)
Severity rating for primary diagnosis (0-4)	0.055	1.056	(1.038 - 1.076)
Acute condition: oxygen therapy (0-1)	-0.231	0.794	(0.768 - 0.820)
Acute condition: enteral/parenteral nutrition (0-1)	-0.308	0.735	(0.667 - 0.810)
Chronic condition: impaired ambulation/mobility (0-1)	0.215	1.240	(1.188 - 1.295)
Chronic condition: eating disability (0-1)	-0.316	0.729	(0.669 - 0.795)
Diagnosis: pregnancy problems (0-1)	1.263	3.535	(2.073 - 6.028)
Diagnosis: skin/subcutaneous diseases (0-1)	-0.154	0.857	(0.820 - 0.896)
Diagnosis: fractures (0-1)	-0.157	0.855	(0.818 - 0.893)
Diagnosis: neoplasms (0-1)	-0.389	0.677	(0.652 - 0.704)
Diagnosis: nervous system disorder (0-1)	-0.138	0.871	(0.842 - 0.902)
Diagnosis: circulatory system diseases (0-1)	0.083	1.086	(1.062 - 1.112)
Resumption of Care with intervening in-patient stay (0-1)	-0.211	0.809	(0.782 - 0.838)
Aftercare following surgery (0-1)	0.210	1.234	(1.171 - 1.299)
Constant	1.883		

Number of Risk Factors: 51

$R^{2,\S}$ Developmental R^2 = 0.105 Validation R^2 = 0.104

TABLE 6: Logistic Regression Model for Predicting the Outcome of Stabilization in Bathing. (cont'd)

C:[§] Developmental C-statistic = 0.790 Validation C-statistic = 0.789

* SOC = Start of Care, ROC = Resumption of Care after inpatient stay. Risk factors pertain to SOC/ROC values.

† The number of values in the measurement scale for each risk factor is in parentheses. For risk factors that take on the value 0 and 1, the value 1 denotes the presence of the attribute and 0 denotes its absence. For risk factors that pertain to health or functional status and are defined using a scale that takes on more than two values, higher values of the scale typically indicate greater impairment or severity of illness. Selective risk factors take on values that simply represent counts (typically the number of problems) -- these are clear from context. The meaning associated with specific values for each risk factor can be determined from the OASIS data set.

‡ All coefficients/odds ratios are significant at P<.0001 using the likelihood ratio test for the hypothesis that the coefficient is zero. The odds ratios and their associated 90% CIs (confidence intervals) are given. These are considered significant at P<.0001 because of the very large developmental sample used to the create the models. Using this significance level and large developmental sample results in more stable models whose performance is superior under cross validation.

§ The R^2 values are the squared correlations between predicted and observed values for all patients in the developmental (validation) sample. The developmental sample size for all outcomes is 500,000, with some variation in the number of number of valid cases in this sample for particular outcome measures. The validation sample is 1,000,000 for all models, with similar variation in the number of valid cases for different outcome measures. These sample sizes pertain to both R^2s and C-statistics. The C-statistic is the area under the Receiver Operating Characteristic curve. Intuitively, the C-statistic can be described as follows: It is the probability that two individuals who differ on the dependent variable (e.g., one achieves the outcome and one does not) also differ (in the same direction) on the predicted value calculated from the model.

TABLE 7: Logistic Regression Model for Predicting the Outcome of Improvement in Toileting.

Risk Factor Measured at SOC/ROC*†	Coefficient‡	Odds Ratio‡	(90% CI)‡
Age: under 65 (0-1)	-0.182	0.834	(0.799 - 0.870)
Age: 85 or more (0-1)	-0.095	0.909	(0.885 - 0.934)
Gender: female (0-1)	-0.070	0.932	(0.909 - 0.956)
Both Medicare and Medicaid payment sources (0-1)	-0.195	0.823	(0.786 - 0.862)
Medicaid (not Medicare) as payment source (0-1)	-0.271	0.763	(0.716 - 0.812)
Patient lives with family member (0-1)	0.106	1.112	(1.069 - 1.157)
Patient lives alone (0-1)	0.315	1.370	(1.307 - 1.435)
Patient has informal caregiver(s) (0-1)	0.202	1.224	(1.175 - 1.274)
Inpatient discharge from hospital (0-1)	0.407	1.502	(1.462 - 1.543)
Inpatient discharge from rehabilitation facility (0-1)	0.381	1.464	(1.409 - 1.522)
Inpatient discharge from nursing home (0-1)	0.345	1.411	(1.357 - 1.468)
Overall prognosis moderate or better (0-1)	0.154	1.167	(1.121 - 1.215)
Overall prognosis not known (0-1)	0.248	1.281	(1.172 - 1.401)
Rehabilitative prognosis is good (0-1)	0.234	1.263	(1.226 - 1.302)
Disability in grooming (0-3)	-0.077	0.926	(0.908 - 0.944)
Disability in dressing upper body (0-3)	-0.140	0.869	(0.849 - 0.889)
Disability in toileting: Level 2 (0-1)	1.054	2.869	(2.764 - 2.977)
Disability in toileting: Level 3 (0-1)	1.812	6.123	(5.636 - 6.652)
Disability in toileting: Level 4 (0-1)	2.049	7.762	(7.237 - 8.325)
Disability in transferring (0-5)	-0.237	0.789	(0.774 - 0.804)
Disability in ambulation (0-5)	-0.283	0.753	(0.741 - 0.765)
Disability in eating (0-5)	-0.078	0.925	(0.908 - 0.942)
Prior (2 weeks ago) disability in dressing lower body (0-3)	-0.112	0.894	(0.876 - 0.913)
Prior (2 weeks ago) disability in toileting (0-4)	-0.150	0.860	(0.844 - 0.877)
Disability in light meal preparation (0-2)	-0.064	0.938	(0.916 - 0.961)
Disability in transportation (0-2)	-0.183	0.833	(0.796 - 0.872)
Disability in telephone use (0-5)	-0.085	0.918	(0.910 - 0.927)
Patient does not have telephone (0-1)	-0.235	0.791	(0.736 - 0.850)
Disability in management of oral medications (0-2)	-0.151	0.860	(0.843 - 0.878)
No oral medications prescribed (0-1)	-0.378	0.685	(0.611 - 0.770)
Prior (2 weeks ago) disability in housekeeping (0-4)	-0.087	0.917	(0.906 - 0.928)
Vision impairment (0-2)	-0.080	0.923	(0.903 - 0.943)
Hearing impairment (0-4)	0.070	1.072	(1.055 - 1.090)
Speech/language impairment (0-5)	-0.090	0.914	(0.898 - 0.929)
Pain interfering with activity (0-3)	0.058	1.060	(1.047 - 1.072)
Anxiety level (0-3)	0.036	1.037	(1.022 - 1.052)
Disability in cognitive functioning (0-4)	-0.065	0.937	(0.922 - 0.953)
Stage of most problematic pressure ulcer (0-4)	-0.111	0.895	(0.875 - 0.915)
Surgical wound(s) present (0-1)	0.222	1.249	(1.188 - 1.313)
Number of surgical wounds present (0-4)	0.121	1.128	(1.098 - 1.160)
Urinary catheter (0-1)	-0.461	0.630	(0.598 - 0.665)
Urinary incontinence frequency (0-4)	-0.064	0.938	(0.931 - 0.945)
Bowel incontinence frequency (0-5)	-0.111	0.895	(0.885 - 0.905)
Bowel ostomy (0-1)	-0.334	0.716	(0.657 - 0.781)
Severity rating for primary diagnosis (0-4)	0.052	1.054	(1.034 - 1.074)
Number of diagnoses with severity rating >= 2 (0-6)	0.038	1.039	(1.030 - 1.048)
Acute condition: oxygen therapy (0-1)	-0.093	0.912	(0.879 - 0.946)
Acute condition: IV/infusion therapy (0-1)	-0.296	0.743	(0.685 - 0.807)
Acute condition: orthopedic (0-1)	0.160	1.173	(1.142 - 1.206)
Total number of acute conditions reported (0-16)	0.039	1.040	(1.028 - 1.052)
Chronic condition: dependence in personal care (0-1)	-0.118	0.889	(0.859 - 0.920)
Diagnosis: genitourinary system diseases (0-1)	-0.136	0.873	(0.843 - 0.904)
Diagnosis: skin/subcutaneous diseases (0-1)	-0.180	0.835	(0.798 - 0.875)
Diagnosis: ill-defined conditions (0-1)	0.064	1.066	(1.040 - 1.092)
Diagnosis: neoplasms (0-1)	-0.362	0.697	(0.666 - 0.729)
Diagnosis: nervous system disorder (0-1)	-0.223	0.800	(0.776 - 0.825)

TABLE 7: Logistic Regression Model for Predicting the Outcome of Improvement in Toileting. (cont'd)

Risk Factor Measured at SOC/ROC*†	Coefficient‡	Odds Ratio‡	(90% CI)‡
Rehabilitation procedures: physical therapy (0-1)	0.200	1.221	(1.188 - 1.256)
Constant	1.689		

Number of Risk Factors: 57

R^2:§	Developmental R^2 = 0.268	Validation R^2 = 0.264
C:§	Developmental C-statistic = 0.801	Validation C-statistic = 0.799

* SOC = Start of Care, ROC = Resumption of Care after inpatient stay. Risk factors pertain to SOC/ROC values.

† The number of values in the measurement scale for each risk factor is in parentheses. For risk factors that take on the value 0 and 1, the value 1 denotes the presence of the attribute and 0 denotes its absence. For risk factors that pertain to health or functional status and are defined using a scale that takes on more than two values, higher values of the scale typically indicate greater impairment or severity of illness. Selective risk factors take on values that simply represent counts (typically the number of problems) -- these are clear from context. The meaning associated with specific values for each risk factor can be determined from the OASIS data set.

‡ All coefficients/odds ratios are significant at P<.0001 using the likelihood ratio test for the hypothesis that the coefficient is zero. The odds ratios and their associated 90% CIs (confidence intervals) are given. These are considered significant at P<.0001 because of the very large developmental sample used to the create the models. Using this significance level and large developmental sample results in more stable models whose performance is superior under cross validation.

§ The R^2 values are the squared correlations between predicted and observed values for all patients in the developmental (validation) sample. The developmental sample size for all outcomes is 500,000, with some variation in the number of number of valid cases in this sample for particular outcome measures. The validation sample is 1,000,000 for all models, with similar variation in the number of valid cases for different outcome measures. These sample sizes pertain to both R^2s and C-statistics. The C-statistic is the area under the Receiver Operating Characteristic curve. Intuitively, the C-statistic can be described as follows: It is the probability that two individuals who differ on the dependent variable (e.g., one achieves the outcome and one does not) also differ (in the same direction) on the predicted value calculated from the model.

TABLE 8: Logistic Regression Model for Predicting the Outcome of Improvement in Transferring.

Risk Factor Measured at SOC/ROC*†	Coefficient‡	Odds Ratio‡	(90% CI)‡
Age: 75 to 84, inclusive (0-1)	-0.044	0.957	(0.940 - 0.974)
Age: 85 or more (0-1)	-0.217	0.805	(0.788 - 0.822)
Gender: female (0-1)	-0.061	0.940	(0.926 - 0.955)
Any HMO payment source (0-1)	-0.064	0.938	(0.916 - 0.960)
Both Medicare and Medicaid payment sources (0-1)	-0.104	0.901	(0.872 - 0.931)
Medicaid (not Medicare) as payment source (0-1)	-0.141	0.869	(0.837 - 0.902)
Patient has informal caregiver(s) (0-1)	0.111	1.117	(1.090 - 1.144)
Inpatient discharge from hospital (0-1)	0.281	1.325	(1.302 - 1.348)
Inpatient discharge from rehabilitation facility (0-1)	0.163	1.178	(1.151 - 1.205)
Inpatient discharge from nursing home (0-1)	0.125	1.134	(1.106 - 1.162)
Overall prognosis moderate or better (0-1)	0.111	1.118	(1.085 - 1.151)
Rehabilitative prognosis is good (0-1)	0.233	1.262	(1.235 - 1.290)
Rehabilitative prognosis not known (0-1)	0.210	1.233	(1.159 - 1.312)
Disability in grooming (0-3)	-0.039	0.962	(0.951 - 0.974)
Disability in dressing lower body (0-3)	-0.075	0.927	(0.917 - 0.938)
Disability in bathing (0-5)	-0.050	0.951	(0.944 - 0.959)
Disability in toileting (0-4)	-0.151	0.860	(0.847 - 0.873)
Disability in transferring: Level 2 (0-1)	2.387	10.876	(10.492 - 11.274)
Disability in transferring: Level 3 (0-1)	2.947	19.040	(17.901 - 20.251)
Disability in transferring: Level 4 (0-1)	3.621	37.357	(33.866 - 41.208)
Disability in transferring: Level 5 (0-1)	3.887	48.771	(44.380 - 53.596)
Disability in ambulation (0-5)	-0.241	0.786	(0.773 - 0.799)
Disability in eating (0-5)	-0.054	0.948	(0.935 - 0.961)
Prior (2 weeks ago) disability in dressing upper body (0-3)	-0.042	0.959	(0.946 - 0.972)
Prior (2 weeks ago) disability in toileting (0-4)	0.078	1.082	(1.063 - 1.100)
Prior (2 weeks ago) disability in transferring (0-5)	-0.272	0.762	(0.747 - 0.777)
Prior (2 weeks ago) disability in ambulation (0-5)	-0.170	0.844	(0.829 - 0.859)
Disability in transportation (0-2)	-0.134	0.875	(0.844 - 0.907)
Disability in telephone use (0-5)	-0.092	0.912	(0.899 - 0.925)
Disability in management of oral medications (0-2)	-0.075	0.928	(0.912 - 0.944)
Prior (2 weeks ago) disability in laundry (0-2)	-0.061	0.941	(0.924 - 0.959)
Prior (2 weeks ago) disability in housekeeping (0-4)	-0.032	0.969	(0.960 - 0.978)
Prior (2 weeks ago) disability in telephone use (0-5)	0.050	1.052	(1.036 - 1.067)
Prior (2 weeks ago) disability in mgt. of oral medications (0-2)	0.094	1.098	(1.074 - 1.122)
Vision impairment (0-2)	-0.078	0.925	(0.911 - 0.939)
Speech/language impairment (0-5)	-0.068	0.935	(0.924 - 0.946)
Demonstrated behavior: impaired decision-making (0-1)	0.067	1.069	(1.044 - 1.094)
Anxiety level (0-3)	0.025	1.025	(1.015 - 1.035)
Stage of most problematic pressure ulcer (0-4)	-0.096	0.908	(0.893 - 0.924)
Stasis ulcer(s) present (0-1)	-0.176	0.839	(0.793 - 0.887)
Surgical wound(s) present (0-1)	0.103	1.108	(1.075 - 1.142)
Number of surgical wounds present (0-4)	0.114	1.121	(1.106 - 1.137)
Urinary incontinence severity (0-4)	-0.059	0.942	(0.935 - 0.949)
Bowel incontinence frequency (0-5)	-0.051	0.950	(0.941 - 0.959)
Urinary incontinence prior to past 2 weeks (0-1)	-0.098	0.906	(0.886 - 0.927)
Urinary catheter prior to past 2 weeks (0-1)	-0.283	0.753	(0.712 - 0.797)
Obese at SOC/ROC (0-1)	-0.130	0.878	(0.861 - 0.896)
Acute condition: oxygen therapy (0-1)	-0.071	0.932	(0.909 - 0.955)
Acute condition: IV/infusion therapy (0-1)	-0.195	0.823	(0.781 - 0.868)
Acute condition: orthopedic (0-1)	0.087	1.091	(1.072 - 1.109)
Acute condition: neurologic (0-1)	0.119	1.127	(1.098 - 1.156)
Acute condition: open wound/lesion (0-1)	-0.059	0.943	(0.925 - 0.961)
Acute condition: gastrointestinal disorder (0-1)	0.081	1.085	(1.057 - 1.112)
Chronic condition: impaired ambulation/mobility (0-1)	0.234	1.264	(1.227 - 1.301)
Chronic condition: dependence in medication admin. (0-1)	-0.140	0.869	(0.846 - 0.894)

TABLE 8: Logistic Regression Model for Predicting the Outcome of Improvement in Transferring. (cont'd)

Risk Factor Measured at SOC/ROC*†	Coefficient‡	Odds Ratio‡	(90% CI)‡
Diagnosis: skin/subcutaneous diseases (0-1)	-0.157	0.855	(0.828 - 0.882)
Diagnosis: ill-defined conditions (0-1)	0.062	1.064	(1.048 - 1.081)
Diagnosis: nervous system disorder (0-1)	-0.172	0.842	(0.822 - 0.862)
Diagnosis: respiratory system diseases (0-1)	0.099	1.104	(1.081 - 1.127)
Resumption of Care with intervening in-patient stay (0-1)	-0.152	0.859	(0.838 - 0.881)
Aftercare following hip, joint replacement or fracture (0-1)	-0.086	0.918	(0.889 - 0.948)
Attention to artificial openings: gastro/colostomy (0-1)	0.249	1.283	(1.168 - 1.409)
Rehabilitation procedures: physical therapy (0-1)	0.182	1.200	(1.179 - 1.220)
Aftercare following surgery (0-1)	0.145	1.156	(1.121 - 1.191)
Constant	0.742		

Number of Risk Factors: 64

R^2:§ Developmental R^2 = 0.138 Validation R^2 = 0.137

C:§ Developmental C-statistic = 0.712 Validation C-statistic = 0.712

* SOC = Start of Care, ROC = Resumption of Care after inpatient stay. Risk factors pertain to SOC/ROC values.

† The number of values in the measurement scale for each risk factor is in parentheses. For risk factors that take on the value 0 and 1, the value 1 denotes the presence of the attribute and 0 denotes its absence. For risk factors that pertain to health or functional status and are defined using a scale that takes on more than two values, higher values of the scale typically indicate greater impairment or severity of illness. Selective risk factors take on values that simply represent counts (typically the number of problems) -- these are clear from context. The meaning associated with specific values for each risk factor can be determined from the OASIS data set.

‡ All coefficients/odds ratios are significant at P<.0001 using the likelihood ratio test for the hypothesis that the coefficient is zero. The odds ratios and their associated 90% CIs (confidence intervals) are given. These are considered significant at P<.0001 because of the very large developmental sample used to the create the models. Using this significance level and large developmental sample results in more stable models whose performance is superior under cross validation.

§ The R^2 values are the squared correlations between predicted and observed values for all patients in the developmental (validation) sample. The developmental sample size for all outcomes is 500,000, with some variation in the number of number of valid cases in this sample for particular outcome measures. The validation sample is 1,000,000 for all models, with similar variation in the number of valid cases for different outcome measures. These sample sizes pertain to both R^2s and C-statistics. The C-statistic is the area under the Receiver Operating Characteristic curve. Intuitively, the C-statistic can be described as follows: It is the probability that two individuals who differ on the dependent variable (e.g., one achieves the outcome and one does not) also differ (in the same direction) on the predicted value calculated from the model.

TABLE 9: Logistic Regression Model for Predicting the Outcome of Stabilization in Transferring.

Risk Factor Measured at SOC/ROC*†	Coefficient‡	Odds Ratio‡	(90% CI)‡
Age: 75 to 84, inclusive (0-1)	-0.167	0.846	(0.820 - 0.874)
Age: 85 or more (0-1)	-0.354	0.702	(0.676 - 0.728)
Inpatient discharge from hospital (0-1)	0.160	1.174	(1.140 - 1.209)
Overall prognosis moderate or better (0-1)	0.287	1.332	(1.270 - 1.398)
Overall prognosis not known (0-1)	0.244	1.277	(1.152 - 1.415)
Rehabilitative prognosis is good (0-1)	0.222	1.249	(1.204 - 1.295)
Disability in grooming (0-3)	-0.154	0.857	(0.839 - 0.877)
Disability in dressing lower body (0-3)	-0.179	0.836	(0.820 - 0.853)
Disability in bathing (0-5)	-0.068	0.934	(0.922 - 0.946)
Disability in transferring: Level 1 (0-1)	3.269	26.293	(25.065 - 27.580)
Disability in transferring: Level 2 (0-1)	3.772	43.466	(39.784 - 47.488)
Disability in transferring: Level 3 (0-1)	4.086	59.522	(52.666 - 67.270)
Disability in transferring: Level 4 (0-1)	4.424	83.396	(70.184 - 99.096)
Disability in ambulation (0-5)	-0.602	0.548	(0.533 - 0.563)
Prior (2 weeks ago) disability in toileting (0-4)	-0.149	0.862	(0.843 - 0.881)
Prior (2 weeks ago) disability in transferring (0-5)	0.109	1.115	(1.073 - 1.158)
Prior (2 weeks ago) disability in ambulation (0-5)	-0.070	0.932	(0.908 - 0.958)
Disability in transportation (0-2)	-0.229	0.795	(0.752 - 0.841)
Disability in telephone use (0-5)	-0.064	0.938	(0.927 - 0.949)
Prior (2 weeks ago) disability in laundry (0-2)	-0.198	0.820	(0.803 - 0.837)
Dyspnea (shortness of breath) (0-4)	-0.039	0.962	(0.949 - 0.975)
Demonstrated behavior: impaired decision-making (0-1)	0.125	1.133	(1.086 - 1.182)
Anxiety level (0-3)	0.078	1.081	(1.063 - 1.100)
Stage of most problematic pressure ulcer (0-4)	-0.186	0.831	(0.812 - 0.850)
No observable pressure ulcer to measure status (0-1)	-0.545	0.580	(0.474 - 0.710)
Stasis ulcer(s) present (0-1)	-0.344	0.709	(0.654 - 0.769)
Number of surgical wounds present (0-4)	0.189	1.208	(1.184 - 1.233)
No observable surgical wound to measure status (0-1)	0.604	1.830	(1.553 - 2.156)
Urinary incontinence severity (0-4)	-0.054	0.947	(0.937 - 0.958)
Bowel incontinence frequency (0-5)	-0.081	0.922	(0.907 - 0.937)
Urinary catheter prior to past 2 weeks (0-1)	-0.281	0.755	(0.693 - 0.822)
Obese at SOC/ROC (0-1)	-0.117	0.889	(0.856 - 0.924)
Acute condition: oxygen therapy (0-1)	-0.097	0.908	(0.870 - 0.946)
Chronic condition: eating disability (0-1)	-0.226	0.798	(0.746 - 0.853)
Diagnosis: neoplasms (0-1)	-0.313	0.732	(0.699 - 0.765)
Resumption of Care with intervening in-patient stay (0-1)	-0.250	0.779	(0.746 - 0.813)
Aftercare following hip, joint replacement or fracture (0-1)	-0.213	0.808	(0.748 - 0.873)
Rehabilitation procedures: physical therapy (0-1)	0.100	1.105	(1.067 - 1.144)
Aftercare following surgery (0-1)	0.232	1.261	(1.187 - 1.339)
Constant	2.843		

Number of Risk Factors: 39

R^2:§ Developmental R^2 = 0.101 Validation R^2 = 0.102

C:§ Developmental C-statistic = 0.847 Validation C-statistic = 0.847

* SOC = Start of Care, ROC = Resumption of Care after inpatient stay. Risk factors pertain to SOC/ROC values.

† The number of values in the measurement scale for each risk factor is in parentheses. For risk factors that take on the value 0 and 1, the value 1 denotes the presence of the attribute and 0 denotes its absence. For risk factors that pertain to health or functional status and are defined using a scale that takes on more than two values, higher values of the scale typically indicate greater impairment or severity of illness. Selective risk factors take on values that simply represent counts (typically the number of problems) -- these are clear from context. The meaning associated with specific values for each risk factor can be determined from the OASIS data set.

TABLE 9: Logistic Regression Model for Predicting the Outcome of Stabilization in Transferring. (cont'd)

‡ All coefficients/odds ratios are significant at P<.0001 using the likelihood ratio test for the hypothesis that the coefficient is zero. The odds ratios and their associated 90% CIs (confidence intervals) are given. These are considered significant at P<.0001 because of the very large developmental sample used to the create the models. Using this significance level and large developmental sample results in more stable models whose performance is superior under cross validation.

§ The R^2 values are the squared correlations between predicted and observed values for all patients in the developmental (validation) sample. The developmental sample size for all outcomes is 500,000, with some variation in the number of number of valid cases in this sample for particular outcome measures. The validation sample is 1,000,000 for all models, with similar variation in the number of valid cases for different outcome measures. These sample sizes pertain to both R^2s and C-statistics. The C-statistic is the area under the Receiver Operating Characteristic curve. Intuitively, the C-statistic can be described as follows: It is the probability that two individuals who differ on the dependent variable (e.g., one achieves the outcome and one does not) also differ (in the same direction) on the predicted value calculated from the model.

TABLE 10: Logistic Regression Model for Predicting the Outcome of Improvement in Ambulation/Locomotion.

Risk Factor Measured at SOC/ROC*†	Coefficient‡	Odds Ratio‡	(90% CI)‡
Age: 75 to 84, inclusive (0-1)	-0.097	0.908	(0.892 - 0.923)
Age: 85 or more (0-1)	-0.326	0.722	(0.707 - 0.738)
Gender: female (0-1)	-0.078	0.925	(0.911 - 0.940)
Any HMO payment source (0-1)	-0.089	0.914	(0.893 - 0.936)
Patient lives in own home (0-1)	0.083	1.087	(1.067 - 1.107)
Patient lives with family member (0-1)	0.080	1.084	(1.065 - 1.103)
Patient has informal caregiver(s) (0-1)	0.107	1.113	(1.083 - 1.143)
Caregiver provides ADL assistance (0-1)	-0.065	0.937	(0.921 - 0.953)
Inpatient discharge from hospital (0-1)	0.259	1.296	(1.273 - 1.318)
Medical regimen change in past 14 days (0-1)	0.107	1.113	(1.088 - 1.138)
Overall prognosis moderate or better (0-1)	0.201	1.223	(1.183 - 1.263)
Overall prognosis not known (0-1)	0.251	1.285	(1.200 - 1.376)
Rehabilitative prognosis is good (0-1)	0.304	1.355	(1.325 - 1.385)
Disability in dressing lower body (0-3)	-0.101	0.904	(0.895 - 0.913)
Disability in bathing (0-5)	-0.105	0.900	(0.894 - 0.907)
Disability in toileting (0-4)	-0.151	0.860	(0.846 - 0.874)
Disability in transferring (0-5)	-0.419	0.658	(0.646 - 0.670)
Disability in ambulation: Level 2 (0-1)	3.463	31.916	(31.059 - 32.796)
Disability in ambulation: Level 3 (0-1)	2.780	16.125	(15.398 - 16.885)
Disability in ambulation: Level 4 (0-1)	4.696	109.522	(102.917 - 116.550)
Disability in ambulation: Level 5 (0-1)	6.271	529.193	(478.434 - 585.338)
Prior (2 weeks ago) disability in toileting (0-4)	0.143	1.154	(1.134 - 1.173)
Prior (2 weeks ago) disability in transferring (0-5)	0.051	1.052	(1.032 - 1.073)
Prior (2 weeks ago) disability in ambulation (0-5)	-0.511	0.600	(0.590 - 0.610)
Disability in transportation (0-2)	-0.145	0.865	(0.834 - 0.897)
Disability in housekeeping (0-4)	-0.024	0.976	(0.969 - 0.983)
Disability in telephone use (0-5)	-0.136	0.873	(0.860 - 0.886)
Prior (2 weeks ago) disability in laundry (0-2)	-0.095	0.909	(0.896 - 0.923)
Prior (2 weeks ago) disability in shopping (0-3)	-0.051	0.951	(0.939 - 0.962)
Prior (2 weeks ago) disability in telephone use (0-5)	0.082	1.086	(1.069 - 1.103)
Dyspnea (shortness of breath) (0-4)	0.026	1.026	(1.018 - 1.034)
Vision impairment (0-2)	-0.085	0.918	(0.904 - 0.933)
Speech/language impairment (0-5)	-0.059	0.943	(0.932 - 0.955)
Demonstrated behavior: impaired decision-making (0-1)	0.116	1.123	(1.096 - 1.151)
Anxiety level (0-3)	0.062	1.064	(1.054 - 1.075)
Stage of most problematic pressure ulcer (0-4)	-0.154	0.857	(0.842 - 0.873)
No observable pressure ulcer to measure stage (0-1)	-0.348	0.706	(0.619 - 0.806)
Stasis ulcer(s) present (0-1)	-0.240	0.787	(0.743 - 0.833)
Number of surgical wounds present (0-4)	0.174	1.190	(1.179 - 1.201)
Urinary incontinence severity (0-4)	-0.044	0.957	(0.949 - 0.965)
Bowel incontinence frequency (0-5)	-0.073	0.929	(0.920 - 0.939)
Urinary catheter prior to past 2 weeks (0-1)	-0.171	0.843	(0.795 - 0.894)
Obese at SOC/ROC (0-1)	-0.198	0.820	(0.803 - 0.838)
Severity rating for primary diagnosis (0-4)	0.088	1.092	(1.078 - 1.105)
Number of diagnoses with severity rating >= 2 (0-6)	0.031	1.032	(1.026 - 1.038)
Acute condition: oxygen therapy (0-1)	-0.162	0.850	(0.829 - 0.872)
Acute condition: orthopedic (0-1)	-0.139	0.871	(0.854 - 0.888)
Acute condition: cardiac/peripheral vascular (0-1)	0.085	1.089	(1.070 - 1.109)
Acute condition: gastrointestinal disorder (0-1)	0.128	1.137	(1.101 - 1.174)
Chronic condition: eating disability (0-1)	-0.127	0.881	(0.842 - 0.922)
Chronic condition: urinary incontinence/catheter (0-1)	-0.124	0.883	(0.862 - 0.906)
Diagnosis: genitourinary system diseases (0-1)	-0.083	0.920	(0.898 - 0.943)
Diagnosis: skin/subcutaneous diseases (0-1)	-0.145	0.865	(0.838 - 0.893)
Diagnosis: musculoskeletal system diseases (0-1)	-0.140	0.869	(0.854 - 0.885)
Diagnosis: ill-defined conditions (0-1)	-0.082	0.922	(0.907 - 0.937)

TABLE 10: Logistic Regression Model for Predicting the Outcome of Improvement in Ambulation/Locomotion. (cont'd)

Risk Factor Measured at SOC/ROC*†	Coefficient‡	Odds Ratio‡	(90% CI)‡
Diagnosis: neoplasms (0-1)	0.101	1.106	(1.074 - 1.139)
Diagnosis: blood diseases (0-1)	-0.121	0.886	(0.860 - 0.912)
Diagnosis: nervous system disorder (0-1)	-0.241	0.786	(0.767 - 0.805)
Diagnosis: respiratory system diseases (0-1)	0.161	1.175	(1.150 - 1.201)
Diagnosis: digestive system diseases (0-1)	0.080	1.083	(1.050 - 1.117)
Resumption of Care with intervening in-patient stay (0-1)	-0.191	0.826	(0.805 - 0.848)
Attention to artificial openings: urinary (0-1)	0.319	1.376	(1.271 - 1.488)
Aftercare following hip, joint replacement or fracture (0-1)	-0.370	0.691	(0.668 - 0.715)
Attention to artificial openings: gastro/colostomy (0-1)	0.379	1.461	(1.338 - 1.596)
Rehabilitation procedures: physical therapy (0-1)	0.057	1.059	(1.039 - 1.078)
Aftercare following surgery (0-1)	0.276	1.318	(1.281 - 1.356)
Long-term use of therapeutic pharmaceuticals (0-1)	-0.094	0.910	(0.879 - 0.943)
Constant	-0.637		

Number of Risk Factors: 67

R^2:§ Developmental R^2 = 0.257 Validation R^2 = 0.257

C:§ Developmental C-statistic = 0.792 Validation C-statistic = 0.791

* SOC = Start of Care, ROC = Resumption of Care after inpatient stay. Risk factors pertain to SOC/ROC values.

† The number of values in the measurement scale for each risk factor is in parentheses. For risk factors that take on the value 0 and 1, the value 1 denotes the presence of the attribute and 0 denotes its absence. For risk factors that pertain to health or functional status and are defined using a scale that takes on more than two values, higher values of the scale typically indicate greater impairment or severity of illness. Selective risk factors take on values that simply represent counts (typically the number of problems) -- these are clear from context. The meaning associated with specific values for each risk factor can be determined from the OASIS data set.

‡ All coefficients/odds ratios are significant at P<.0001 using the likelihood ratio test for the hypothesis that the coefficient is zero. The odds ratios and their associated 90% CIs (confidence intervals) are given. These are considered significant at P<.0001 because of the very large developmental sample used to the create the models. Using this significance level and large developmental sample results in more stable models whose performance is superior under cross validation.

§ The R^2 values are the squared correlations between predicted and observed values for all patients in the developmental (validation) sample. The developmental sample size for all outcomes is 500,000, with some variation in the number of number of valid cases in this sample for particular outcome measures. The validation sample is 1,000,000 for all models, with similar variation in the number of valid cases for different outcome measures. These sample sizes pertain to both R^2s and C-statistics. The C-statistic is the area under the Receiver Operating Characteristic curve. Intuitively, the C-statistic can be described as follows: It is the probability that two individuals who differ on the dependent variable (e.g., one achieves the outcome and one does not) also differ (in the same direction) on the predicted value calculated from the model.

TABLE 11: Logistic Regression Model for Predicting the Outcome of Improvement in Eating.

Risk Factor Measured at SOC/ROC*†	Coefficient‡	Odds Ratio‡	(90% CI)‡
Age: 75 to 84, inclusive (0-1)	0.067	1.069	(1.045 - 1.093)
Gender: female (0-1)	0.064	1.066	(1.041 - 1.091)
Both Medicare and Medicaid payment sources (0-1)	-0.206	0.814	(0.779 - 0.849)
Medicaid (not Medicare) as payment source (0-1)	-0.186	0.831	(0.787 - 0.876)
Patient lives in own home (0-1)	0.113	1.120	(1.091 - 1.149)
Patient lives alone (0-1)	0.227	1.254	(1.209 - 1.301)
Patient has informal caregiver(s) (0-1)	0.200	1.222	(1.176 - 1.270)
Infrequency of caregiver assistance (1-7)	-0.016	0.984	(0.978 - 0.990)
Inpatient discharge from hospital (0-1)	0.352	1.422	(1.386 - 1.458)
Inpatient discharge from rehabilitation facility (0-1)	0.405	1.499	(1.443 - 1.557)
Inpatient discharge from nursing home (0-1)	0.387	1.472	(1.414 - 1.532)
Overall prognosis moderate or better (0-1)	0.140	1.150	(1.105 - 1.197)
Overall prognosis not known (0-1)	0.211	1.235	(1.129 - 1.351)
Rehabilitative prognosis is good (0-1)	0.102	1.107	(1.076 - 1.140)
Disability in grooming (0-3)	-0.105	0.900	(0.887 - 0.914)
Disability in toileting (0-4)	-0.085	0.918	(0.905 - 0.931)
Disability in transferring (0-5)	-0.109	0.896	(0.880 - 0.913)
Disability in ambulation (0-5)	-0.086	0.918	(0.903 - 0.933)
Disability in eating: Level 2 (0-1)	1.455	4.282	(4.028 - 4.553)
Disability in eating: Level 3 (0-1)	1.519	4.570	(3.917 - 5.332)
Disability in eating: Level 4 (0-1)	1.119	3.061	(2.648 - 3.540)
Disability in eating: Level 5 (0-1)	4.193	66.198	(50.404 - 86.941)
Prior (2 weeks ago) disability in eating (0-5)	-0.347	0.707	(0.686 - 0.728)
Disability in light meal preparation (0-2)	-0.144	0.866	(0.846 - 0.885)
Disability in telephone use (0-5)	-0.098	0.906	(0.898 - 0.915)
Patient does not have telephone (0-1)	-0.247	0.781	(0.726 - 0.840)
Disability in management of oral medications (0-2)	-0.168	0.845	(0.823 - 0.869)
No oral medications prescribed (0-1)	-0.446	0.640	(0.574 - 0.714)
Prior (2 weeks ago) disability in housekeeping (0-4)	-0.087	0.917	(0.907 - 0.927)
Prior (2 weeks ago) disability in mgt. of oral medications (0-2)	0.113	1.119	(1.085 - 1.154)
Vision impairment (0-2)	-0.142	0.867	(0.850 - 0.885)
Speech/language impairment (0-5)	-0.110	0.896	(0.884 - 0.909)
Demonstrated behavior: memory deficit (0-1)	-0.112	0.894	(0.868 - 0.920)
Surgical wound(s) present (0-1)	0.176	1.192	(1.138 - 1.249)
Number of surgical wounds present (0-4)	0.085	1.089	(1.063 - 1.115)
Urinary incontinence severity (0-4)	-0.048	0.954	(0.946 - 0.962)
Number of diagnoses with severity rating >= 2 (0-6)	0.018	1.019	(1.011 - 1.026)
Acute condition: oxygen therapy (0-1)	-0.106	0.900	(0.869 - 0.932)
Acute condition: enteral/parenteral nutrition (0-1)	-0.706	0.494	(0.441 - 0.553)
Acute condition: orthopedic (0-1)	0.123	1.131	(1.102 - 1.161)
Total number of acute conditions reported (0-16)	0.045	1.046	(1.035 - 1.057)
Chronic condition: eating disability (0-1)	0.265	1.304	(1.213 - 1.402)
Chronic condition: dependence in medication admin. (0-1)	-0.240	0.787	(0.756 - 0.819)
Chronic condition: at least one, but caregiver present (0-1)	0.092	1.097	(1.064 - 1.130)
Diagnosis: skin/subcutaneous diseases (0-1)	-0.182	0.834	(0.804 - 0.864)
Diagnosis: neoplasms (0-1)	-0.299	0.742	(0.711 - 0.774)
Diagnosis: nervous system disorder (0-1)	-0.177	0.838	(0.813 - 0.864)
Aftercare following hip, joint replacement or fracture (0-1)	0.312	1.366	(1.273 - 1.466)
Rehabilitation procedures: physical therapy (0-1)	0.238	1.268	(1.234 - 1.303)
Constant	0.964		

Number of Risk Factors: 49

R^2:§ Developmental R^2 = 0.196 Validation R^2 = 0.195

C:§ Developmental C-statistic = 0.757 Validation C-statistic = 0.756

TABLE 11: Logistic Regression Model for Predicting the Outcome of Improvement in Eating. (cont'd)

* SOC = Start of Care, ROC = Resumption of Care after inpatient stay. Risk factors pertain to SOC/ROC values.

† The number of values in the measurement scale for each risk factor is in parentheses. For risk factors that take on the value 0 and 1, the value 1 denotes the presence of the attribute and 0 denotes its absence. For risk factors that pertain to health or functional status and are defined using a scale that takes on more than two values, higher values of the scale typically indicate greater impairment or severity of illness. Selective risk factors take on values that simply represent counts (typically the number of problems) -- these are clear from context. The meaning associated with specific values for each risk factor can be determined from the OASIS data set.

‡ All coefficients/odds ratios are significant at P<.0001 using the likelihood ratio test for the hypothesis that the coefficient is zero. The odds ratios and their associated 90% CIs (confidence intervals) are given. These are considered significant at P<.0001 because of the very large developmental sample used to the create the models. Using this significance level and large developmental sample results in more stable models whose performance is superior under cross validation.

§ The R^2 values are the squared correlations between predicted and observed values for all patients in the developmental (validation) sample. The developmental sample size for all outcomes is 500,000, with some variation in the number of number of valid cases in this sample for particular outcome measures. The validation sample is 1,000,000 for all models, with similar variation in the number of valid cases for different outcome measures. These sample sizes pertain to both R^2s and C-statistics. The C-statistic is the area under the Receiver Operating Characteristic curve. Intuitively, the C-statistic can be described as follows: It is the probability that two individuals who differ on the dependent variable (e.g., one achieves the outcome and one does not) also differ (in the same direction) on the predicted value calculated from the model.

TABLE 12: Logistic Regression Model for Predicting the Outcome of Improvement in Light Meal Preparation.

Risk Factor Measured at SOC/ROC*†	Coefficient‡	Odds Ratio‡	(90% CI)‡
Age: 85 or more (0-1)	-0.227	0.797	(0.781 - 0.813)
Gender: female (0-1)	0.180	1.198	(1.178 - 1.218)
Any HMO payment source (0-1)	-0.076	0.927	(0.904 - 0.951)
Both Medicare and Medicaid payment sources (0-1)	-0.150	0.861	(0.832 - 0.891)
Medicaid (not Medicare) as payment source (0-1)	-0.154	0.858	(0.827 - 0.890)
Patient lives in own home (0-1)	0.254	1.290	(1.265 - 1.315)
Patient lives with family member (0-1)	0.309	1.362	(1.318 - 1.408)
Patient lives alone (0-1)	0.639	1.896	(1.832 - 1.962)
Patient has informal caregiver(s) (0-1)	0.284	1.328	(1.288 - 1.369)
Primary caregiver present (0-1)	0.219	1.245	(1.169 - 1.327)
Caregiver provides ADL assistance (0-1)	-0.063	0.939	(0.919 - 0.959)
Caregiver provides IADL assistance (0-1)	0.121	1.129	(1.079 - 1.181)
Infrequency of caregiver assistance (1-7)	-0.075	0.927	(0.918 - 0.938)
Inpatient discharge from hospital (0-1)	0.346	1.414	(1.387 - 1.441)
Inpatient discharge from rehabilitation facility (0-1)	0.417	1.517	(1.477 - 1.558)
Inpatient discharge from nursing home (0-1)	0.337	1.401	(1.362 - 1.441)
Overall prognosis moderate or better (0-1)	0.228	1.256	(1.215 - 1.298)
Overall prognosis not known (0-1)	0.253	1.289	(1.204 - 1.380)
Rehabilitative prognosis is good (0-1)	0.203	1.225	(1.199 - 1.253)
Disability in grooming (0-3)	-0.059	0.943	(0.931 - 0.955)
Disability in dressing upper body (0-3)	-0.114	0.893	(0.881 - 0.905)
Disability in toileting (0-4)	-0.139	0.870	(0.860 - 0.881)
Disability in transferring (0-5)	-0.077	0.926	(0.912 - 0.940)
Disability in ambulation (0-5)	-0.207	0.813	(0.801 - 0.825)
Disability in light meal preparation: Level 2 (0-1)	1.302	3.677	(3.586 - 3.771)
Disability in transportation (0-2)	-0.173	0.841	(0.807 - 0.877)
Disability in housekeeping (0-4)	-0.079	0.924	(0.914 - 0.934)
Disability in telephone use (0-5)	-0.112	0.894	(0.887 - 0.901)
Patient does not have telephone (0-1)	-0.419	0.658	(0.618 - 0.700)
Disability in management of oral medications (0-2)	-0.297	0.743	(0.733 - 0.754)
No oral medications prescribed (0-1)	-0.463	0.629	(0.575 - 0.688)
Prior (2 weeks ago) disability in light meal preparation (0-2)	-0.203	0.817	(0.798 - 0.836)
Prior (2 weeks ago) disability in laundry (0-2)	-0.125	0.882	(0.863 - 0.901)
Prior (2 weeks ago) disability in housekeeping (0-4)	-0.040	0.961	(0.950 - 0.973)
Vision impairment (0-2)	-0.095	0.909	(0.895 - 0.924)
Hearing impairment (0-4)	0.045	1.046	(1.033 - 1.059)
Speech/language impairment (0-5)	-0.071	0.932	(0.919 - 0.944)
Pain interfering with activity (0-3)	0.044	1.045	(1.036 - 1.053)
Anxiety level (0-3)	0.044	1.045	(1.034 - 1.056)
Confusion scale (0-4)	-0.078	0.925	(0.915 - 0.934)
Stage of most problematic pressure ulcer (0-4)	-0.054	0.948	(0.931 - 0.966)
Surgical wound(s) present (0-1)	0.108	1.114	(1.065 - 1.165)
Number of surgical wounds present (0-4)	0.055	1.056	(1.040 - 1.073)
Status of surgical wound (0-3)	0.087	1.091	(1.066 - 1.116)
Urinary incontinence severity (0-4)	-0.028	0.972	(0.966 - 0.979)
Memory loss requiring supervision prior to past 2 weeks (0-1)	-0.182	0.834	(0.810 - 0.858)
Alcoholism at SOC/ROC (0-1)	0.224	1.251	(1.170 - 1.338)
Severity rating for primary diagnosis (0-4)	0.044	1.045	(1.031 - 1.059)
Number of diagnoses with severity rating >= 2 (0-6)	0.032	1.032	(1.026 - 1.038)
Acute condition: oxygen therapy (0-1)	-0.193	0.824	(0.803 - 0.846)
Acute condition: enteral/parenteral nutrition (0-1)	-0.359	0.698	(0.651 - 0.749)
Acute condition: orthopedic (0-1)	0.110	1.116	(1.095 - 1.138)
Total number of acute conditions reported (0-16)	0.030	1.030	(1.022 - 1.039)
Chronic condition: dependence in living skills (0-1)	-0.171	0.843	(0.814 - 0.873)
Chronic condition: impaired ambulation/mobility (0-1)	0.205	1.228	(1.192 - 1.265)

TABLE 12: Logistic Regression Model for Predicting the Outcome of Improvement in Light Meal Preparation. (cont'd)

Risk Factor Measured at SOC/ROC*†	Coefficient‡	Odds Ratio‡	(90% CI)‡
Chronic condition: at least one, but caregiver present (0-1)	0.084	1.087	(1.062 - 1.113)
Total number of chronic conditions reported (0-9)	-0.032	0.968	(0.958 - 0.979)
Diagnosis: skin/subcutaneous diseases (0-1)	-0.134	0.874	(0.846 - 0.903)
Diagnosis: neoplasms (0-1)	-0.278	0.758	(0.736 - 0.780)
Diagnosis: mental disease (0-1)	-0.106	0.899	(0.875 - 0.924)
Diagnosis: nervous system disorder (0-1)	-0.170	0.843	(0.823 - 0.865)
Diagnosis: respiratory system diseases (0-1)	0.053	1.054	(1.031 - 1.078)
Aftercare following hip, joint replacement or fracture (0-1)	0.237	1.268	(1.214 - 1.324)
Rehabilitation procedures: physical therapy (0-1)	0.157	1.170	(1.147 - 1.193)
Aftercare following surgery (0-1)	0.109	1.116	(1.079 - 1.154)
Constant	0.036		

Number of Risk Factors: 65

R^2:§ Developmental R^2 = 0.267 Validation R^2 = 0.267

C:§ Developmental C-statistic = 0.798 Validation C-statistic = 0.797

* SOC = Start of Care, ROC = Resumption of Care after inpatient stay. Risk factors pertain to SOC/ROC values.

† The number of values in the measurement scale for each risk factor is in parentheses. For risk factors that take on the value 0 and 1, the value 1 denotes the presence of the attribute and 0 denotes its absence. For risk factors that pertain to health or functional status and are defined using a scale that takes on more than two values, higher values of the scale typically indicate greater impairment or severity of illness. Selective risk factors take on values that simply represent counts (typically the number of problems) -- these are clear from context. The meaning associated with specific values for each risk factor can be determined from the OASIS data set.

‡ All coefficients/odds ratios are significant at P<.0001 using the likelihood ratio test for the hypothesis that the coefficient is zero. The odds ratios and their associated 90% CIs (confidence intervals) are given. These are considered significant at P<.0001 because of the very large developmental sample used to the create the models. Using this significance level and large developmental sample results in more stable models whose performance is superior under cross validation.

§ The R^2 values are the squared correlations between predicted and observed values for all patients in the developmental (validation) sample. The developmental sample size for all outcomes is 500,000, with some variation in the number of number of valid cases in this sample for particular outcome measures. The validation sample is 1,000,000 for all models, with similar variation in the number of valid cases for different outcome measures. These sample sizes pertain to both R^2s and C-statistics. The C-statistic is the area under the Receiver Operating Characteristic curve. Intuitively, the C-statistic can be described as follows: It is the probability that two individuals who differ on the dependent variable (e.g., one achieves the outcome and one does not) also differ (in the same direction) on the predicted value calculated from the model.

TABLE 13: Logistic Regression Model for Predicting the Outcome of Stabilization in Light Meal Preparation.

Risk Factor Measured at SOC/ROC*†	Coefficient‡	Odds Ratio‡	(90% CI)‡
Age: 75 to 84, inclusive (0-1)	-0.129	0.879	(0.852 - 0.907)
Age: 85 or more (0-1)	-0.372	0.690	(0.665 - 0.715)
Gender: female (0-1)	0.233	1.262	(1.227 - 1.298)
Any HMO payment source (0-1)	-0.214	0.808	(0.776 - 0.840)
Patient lives in own home (0-1)	0.311	1.365	(1.320 - 1.412)
Patient lives with family member (0-1)	0.242	1.274	(1.207 - 1.345)
Patient lives alone (0-1)	0.684	1.982	(1.870 - 2.101)
Patient has informal caregiver(s) (0-1)	0.304	1.355	(1.292 - 1.420)
Primary caregiver present (0-1)	0.416	1.516	(1.400 - 1.642)
Caregiver provides ADL assistance (0-1)	-0.156	0.856	(0.827 - 0.886)
Infrequency of caregiver assistance (1-7)	-0.110	0.896	(0.882 - 0.910)
Inpatient discharge from hospital (0-1)	0.159	1.173	(1.138 - 1.208)
Inpatient discharge from nursing home (0-1)	0.180	1.198	(1.144 - 1.254)
Overall prognosis moderate or better (0-1)	0.156	1.169	(1.110 - 1.231)
Rehabilitative prognosis is good (0-1)	0.219	1.244	(1.199 - 1.291)
Disability in grooming (0-3)	-0.093	0.911	(0.889 - 0.934)
Disability in dressing upper body (0-3)	-0.163	0.850	(0.829 - 0.871)
Disability in toileting (0-4)	-0.168	0.846	(0.826 - 0.866)
Disability in transferring (0-5)	-0.076	0.927	(0.902 - 0.954)
Disability in ambulation (0-5)	-0.156	0.855	(0.836 - 0.875)
Disability in light meal preparation: Level 1 (0-1)	1.476	4.377	(4.233 - 4.526)
Disability in housekeeping (0-4)	-0.112	0.894	(0.883 - 0.906)
Disability in shopping (0-3)	-0.084	0.920	(0.900 - 0.940)
Disability in telephone use (0-5)	-0.069	0.933	(0.919 - 0.947)
Patient does not have telephone (0-1)	-0.304	0.738	(0.655 - 0.831)
Disability in management of oral medications (0-2)	-0.394	0.674	(0.658 - 0.690)
Prior (2 weeks ago) disability in laundry (0-2)	-0.241	0.786	(0.771 - 0.801)
Pain interfering with activity (0-3)	0.063	1.065	(1.051 - 1.080)
Confusion scale (0-4)	-0.077	0.926	(0.909 - 0.943)
Stage 2-4 pressure ulcer(s) present (0-1)	-0.225	0.799	(0.747 - 0.854)
Surgical wound(s) present (0-1)	0.237	1.267	(1.201 - 1.337)
Number of surgical wounds present (0-4)	0.100	1.105	(1.074 - 1.137)
Memory loss requiring supervision prior to past 2 weeks (0-1)	-0.146	0.864	(0.819 - 0.911)
Acute condition: oxygen therapy (0-1)	-0.164	0.849	(0.816 - 0.882)
Acute condition: enteral/parenteral nutrition (0-1)	-0.522	0.593	(0.524 - 0.672)
Diagnosis: musculoskeletal system diseases (0-1)	0.103	1.108	(1.075 - 1.142)
Diagnosis: neoplasms (0-1)	-0.425	0.654	(0.625 - 0.684)
Diagnosis: mental disease (0-1)	-0.118	0.889	(0.851 - 0.929)
Diagnosis: nervous system disorder (0-1)	-0.134	0.875	(0.839 - 0.912)
Resumption of Care with intervening in-patient stay (0-1)	-0.164	0.848	(0.812 - 0.886)
Constant	1.883		

Number of Risk Factors: 40

R^{2}:§ Developmental R^2 = 0.091 Validation R^2 = 0.092

C:§ Developmental C-statistic = 0.765 Validation C-statistic = 0.769

TABLE 13: Logistic Regression Model for Predicting the Outcome of Stabilization in Light Meal Preparation. (cont'd)

* SOC = Start of Care, ROC = Resumption of Care after inpatient stay. Risk factors pertain to SOC/ROC values.

† The number of values in the measurement scale for each risk factor is in parentheses. For risk factors that take on the value 0 and 1, the value 1 denotes the presence of the attribute and 0 denotes its absence. For risk factors that pertain to health or functional status and are defined using a scale that takes on more than two values, higher values of the scale typically indicate greater impairment or severity of illness. Selective risk factors take on values that simply represent counts (typically the number of problems) -- these are clear from context. The meaning associated with specific values for each risk factor can be determined from the OASIS data set.

‡ All coefficients/odds ratios are significant at P<.0001 using the likelihood ratio test for the hypothesis that the coefficient is zero. The odds ratios and their associated 90% CIs (confidence intervals) are given. These are considered significant at P<.0001 because of the very large developmental sample used to the create the models. Using this significance level and large developmental sample results in more stable models whose performance is superior under cross validation.

§ The R^2 values are the squared correlations between predicted and observed values for all patients in the developmental (validation) sample. The developmental sample size for all outcomes is 500,000, with some variation in the number of number of valid cases in this sample for particular outcome measures. The validation sample is 1,000,000 for all models, with similar variation in the number of valid cases for different outcome measures. These sample sizes pertain to both R^2s and C-statistics. The C-statistic is the area under the Receiver Operating Characteristic curve. Intuitively, the C-statistic can be described as follows: It is the probability that two individuals who differ on the dependent variable (e.g., one achieves the outcome and one does not) also differ (in the same direction) on the predicted value calculated from the model.

TABLE 14: Logistic Regression Model for Predicting the Outcome of Improvement in Laundry.

Risk Factor Measured at SOC/ROC*†	Coefficient‡	Odds Ratio‡	(90% CI)‡
Age: 75 to 84, inclusive (0-1)	-0.082	0.921	(0.907 - 0.937)
Age: 85 or more (0-1)	-0.365	0.694	(0.679 - 0.709)
Gender: female (0-1)	0.201	1.223	(1.204 - 1.242)
Any HMO payment source (0-1)	-0.177	0.837	(0.820 - 0.856)
Both Medicare and Medicaid payment sources (0-1)	-0.136	0.873	(0.846 - 0.901)
Medicaid (not Medicare) as payment source (0-1)	-0.105	0.900	(0.872 - 0.928)
Patient lives in own home (0-1)	0.178	1.195	(1.173 - 1.218)
Patient lives with family member (0-1)	0.174	1.190	(1.152 - 1.229)
Patient lives alone (0-1)	0.422	1.525	(1.476 - 1.577)
Patient has informal caregiver(s) (0-1)	0.204	1.226	(1.193 - 1.260)
Caregiver provides ADL assistance (0-1)	-0.097	0.908	(0.892 - 0.924)
Infrequency of caregiver assistance (1-7)	-0.024	0.976	(0.972 - 0.980)
Inpatient discharge from hospital (0-1)	0.250	1.284	(1.262 - 1.305)
Inpatient discharge from rehabilitation facility (0-1)	0.246	1.279	(1.251 - 1.308)
Inpatient discharge from nursing home (0-1)	0.229	1.258	(1.227 - 1.289)
Medical regimen change in past 14 days (0-1)	0.066	1.068	(1.045 - 1.091)
Overall prognosis moderate or better (0-1)	0.207	1.230	(1.189 - 1.272)
Overall prognosis not known (0-1)	0.288	1.334	(1.249 - 1.425)
Rehabilitative prognosis is good (0-1)	0.265	1.303	(1.276 - 1.330)
Disability in dressing upper body (0-3)	-0.116	0.890	(0.879 - 0.902)
Disability in dressing lower body (0-3)	-0.052	0.949	(0.938 - 0.960)
Disability in bathing (0-5)	-0.060	0.942	(0.935 - 0.949)
Disability in toileting (0-4)	-0.160	0.852	(0.840 - 0.865)
Disability in ambulation (0-5)	-0.274	0.761	(0.751 - 0.770)
Prior (2 weeks ago) disability in toileting (0-4)	0.052	1.053	(1.037 - 1.070)
Disability in light meal preparation (0-2)	-0.164	0.848	(0.838 - 0.859)
Disability in laundry: Level 2 (0-1)	2.312	10.093	(9.838 - 10.355)
Disability in housekeeping (0-4)	-0.073	0.929	(0.920 - 0.939)
Disability in shopping (0-3)	-0.104	0.901	(0.890 - 0.912)
Disability in telephone use (0-5)	-0.137	0.872	(0.865 - 0.879)
Patient does not have telephone (0-1)	-0.292	0.747	(0.699 - 0.798)
Disability in management of oral medications (0-2)	-0.232	0.793	(0.782 - 0.805)
No oral medications prescribed (0-1)	-0.200	0.819	(0.755 - 0.888)
Prior (2 weeks ago) disability in laundry (0-2)	-0.398	0.672	(0.659 - 0.684)
Prior (2 weeks ago) disability in housekeeping (0-4)	-0.053	0.948	(0.938 - 0.958)
Vision impairment (0-2)	-0.077	0.926	(0.912 - 0.941)
Hearing impairment (0-4)	0.039	1.040	(1.028 - 1.052)
Pain interfering with activity (0-3)	0.028	1.029	(1.022 - 1.036)
Demonstrated behavior: impaired decision-making (0-1)	0.073	1.075	(1.046 - 1.105)
Behavior problem frequency (0-5)	0.016	1.016	(1.009 - 1.023)
Anxiety level (0-3)	0.030	1.031	(1.021 - 1.040)
Confusion scale (0-4)	-0.063	0.939	(0.929 - 0.949)
Stage 1-4 pressure ulcer(s) present (0-1)	-0.173	0.841	(0.809 - 0.874)
Stasis ulcer(s) present (0-1)	-0.158	0.854	(0.810 - 0.899)
Status of surgical wound (0-3)	0.139	1.149	(1.139 - 1.159)
Presence of urinary incontinence (0-1)	-0.087	0.916	(0.901 - 0.932)
Memory loss requiring supervision prior to past 2 weeks (0-1)	-0.233	0.792	(0.768 - 0.818)
Obese at SOC/ROC (0-1)	-0.063	0.939	(0.921 - 0.957)
Alcoholism at SOC/ROC (0-1)	0.156	1.169	(1.106 - 1.236)
Severity rating for primary diagnosis (0-4)	0.104	1.109	(1.097 - 1.122)
Number of diagnoses with severity rating >= 2 (0-6)	0.024	1.025	(1.020 - 1.030)
Acute condition: oxygen therapy (0-1)	-0.310	0.733	(0.717 - 0.750)
Total number of acute conditions reported (0-16)	0.044	1.045	(1.037 - 1.052)
Chronic condition: dependence in personal care (0-1)	-0.066	0.937	(0.916 - 0.957)
Chronic condition: impaired ambulation/mobility (0-1)	0.127	1.135	(1.104 - 1.168)
Chronic condition: dependence in medication admin. (0-1)	-0.056	0.945	(0.926 - 0.965)

TABLE 14: Logistic Regression Model for Predicting the Outcome of Improvement in Laundry. (cont'd)

Risk Factor Measured at SOC/ROC*†	Coefficient‡	Odds Ratio‡	(90% CI)‡
Chronic condition: at least one, but caregiver present (0-1)	0.108	1.114	(1.093 - 1.136)
Diagnosis: genitourinary system diseases (0-1)	-0.103	0.902	(0.882 - 0.922)
Diagnosis: skin/subcutaneous diseases (0-1)	-0.085	0.918	(0.892 - 0.945)
Diagnosis: neoplasms (0-1)	-0.240	0.786	(0.767 - 0.806)
Diagnosis: mental disease (0-1)	-0.090	0.914	(0.890 - 0.937)
Diagnosis: nervous system disorder (0-1)	-0.193	0.824	(0.805 - 0.844)
Aftercare following hip, joint replacement or fracture (0-1)	0.158	1.172	(1.135 - 1.210)
Rehabilitation procedures: physical therapy (0-1)	0.162	1.176	(1.156 - 1.197)
Constant	-1.452		

Number of Risk Factors: 64

R^2:§ Developmental R^2 = 0.263 Validation R^2 = 0.262

C:§ Developmental C-statistic = 0.800 Validation C-statistic = 0.799

* SOC = Start of Care, ROC = Resumption of Care after inpatient stay. Risk factors pertain to SOC/ROC values.

† The number of values in the measurement scale for each risk factor is in parentheses. For risk factors that take on the value 0 and 1, the value 1 denotes the presence of the attribute and 0 denotes its absence. For risk factors that pertain to health or functional status and are defined using a scale that takes on more than two values, higher values of the scale typically indicate greater impairment or severity of illness. Selective risk factors take on values that simply represent counts (typically the number of problems) -- these are clear from context. The meaning associated with specific values for each risk factor can be determined from the OASIS data set.

‡ All coefficients/odds ratios are significant at P<.0001 using the likelihood ratio test for the hypothesis that the coefficient is zero. The odds ratios and their associated 90% CIs (confidence intervals) are given. These are considered significant at P<.0001 because of the very large developmental sample used to the create the models. Using this significance level and large developmental sample results in more stable models whose performance is superior under cross validation.

§ The R^2 values are the squared correlations between predicted and observed values for all patients in the developmental (validation) sample. The developmental sample size for all outcomes is 500,000, with some variation in the number of number of valid cases in this sample for particular outcome measures. The validation sample is 1,000,000 for all models, with similar variation in the number of valid cases for different outcome measures. These sample sizes pertain to both R^2s and C-statistics. The C-statistic is the area under the Receiver Operating Characteristic curve. Intuitively, the C-statistic can be described as follows: It is the probability that two individuals who differ on the dependent variable (e.g., one achieves the outcome and one does not) also differ (in the same direction) on the predicted value calculated from the model.

TABLE 15: Logistic Regression Model for Predicting the Outcome of Stabilization in Laundry.

Risk Factor Measured at SOC/ROC*†	Coefficient‡	Odds Ratio‡	(90% CI)‡
Age: under 65 (0-1)	0.159	1.172	(1.111 - 1.236)
Age: 75 to 84, inclusive (0-1)	-0.142	0.867	(0.831 - 0.906)
Age: 85 or more (0-1)	-0.341	0.711	(0.676 - 0.748)
Gender: female (0-1)	0.243	1.275	(1.230 - 1.321)
Any HMO payment source (0-1)	-0.232	0.793	(0.755 - 0.833)
Patient lives in own home (0-1)	0.230	1.258	(1.201 - 1.318)
Patient lives alone (0-1)	0.276	1.318	(1.266 - 1.372)
Patient has informal caregiver(s) (0-1)	0.215	1.239	(1.173 - 1.309)
Caregiver provides ADL assistance (0-1)	-0.171	0.842	(0.806 - 0.881)
Infrequency of caregiver assistance (1-7)	-0.053	0.948	(0.939 - 0.957)
Rehabilitative prognosis is good (0-1)	0.257	1.293	(1.238 - 1.349)
Disability in grooming (0-3)	-0.099	0.906	(0.871 - 0.942)
Disability in dressing upper body (0-3)	-0.142	0.868	(0.836 - 0.901)
Disability in bathing (0-5)	-0.058	0.944	(0.929 - 0.958)
Disability in toileting (0-4)	-0.120	0.887	(0.851 - 0.924)
Disability in ambulation (0-5)	-0.246	0.782	(0.757 - 0.808)
Disability in light meal preparation (0-2)	-0.191	0.826	(0.798 - 0.856)
Disability in laundry: Level 1 (0-1)	2.056	7.813	(7.484 - 8.156)
Disability in housekeeping (0-4)	-0.147	0.863	(0.848 - 0.879)
Disability in shopping (0-3)	-0.096	0.908	(0.883 - 0.934)
Disability in management of oral medications (0-2)	-0.254	0.776	(0.753 - 0.800)
Prior (2 weeks ago) disability in transportation (0-2)	-0.220	0.803	(0.769 - 0.838)
Prior (2 weeks ago) disability in shopping (0-3)	-0.107	0.899	(0.876 - 0.921)
Stage 1-4 pressure ulcer(s) present (0-1)	-0.383	0.682	(0.623 - 0.747)
Stasis ulcer(s) present (0-1)	-0.283	0.754	(0.683 - 0.832)
Severity rating for primary diagnosis (0-4)	0.087	1.091	(1.062 - 1.121)
Acute condition: oxygen therapy (0-1)	-0.317	0.728	(0.691 - 0.767)
Acute condition: open wound/lesion (0-1)	0.190	1.209	(1.168 - 1.252)
Chronic condition: impaired ambulation/mobility (0-1)	0.225	1.252	(1.162 - 1.349)
Diagnosis: neoplasms (0-1)	-0.350	0.705	(0.665 - 0.747)
Constant	0.638		

Number of Risk Factors: 30

$R^{2,\S}$: Developmental R^2 = 0.113 Validation R^2 = 0.109

C:§ Developmental C-statistic = 0.746 Validation C-statistic = 0.743

* SOC = Start of Care, ROC = Resumption of Care after inpatient stay. Risk factors pertain to SOC/ROC values.

† The number of values in the measurement scale for each risk factor is in parentheses. For risk factors that take on the value 0 and 1, the value 1 denotes the presence of the attribute and 0 denotes its absence. For risk factors that pertain to health or functional status and are defined using a scale that takes on more than two values, higher values of the scale typically indicate greater impairment or severity of illness. Selective risk factors take on values that simply represent counts (typically the number of problems) -- these are clear from context. The meaning associated with specific values for each risk factor can be determined from the OASIS data set.

‡ All coefficients/odds ratios are significant at P<.0001 using the likelihood ratio test for the hypothesis that the coefficient is zero. The odds ratios and their associated 90% CIs (confidence intervals) are given. These are considered significant at P<.0001 because of the very large developmental sample used to the create the models. Using this significance level and large developmental sample results in more stable models whose performance is superior under cross validation.

TABLE 15: Logistic Regression Model for Predicting the Outcome of Stabilization in Laundry. (cont'd)

§ The R^2 values are the squared correlations between predicted and observed values for all patients in the developmental (validation) sample. The developmental sample size for all outcomes is 500,000, with some variation in the number of number of valid cases in this sample for particular outcome measures. The validation sample is 1,000,000 for all models, with similar variation in the number of valid cases for different outcome measures. These sample sizes pertain to both R^2s and C-statistics. The C-statistic is the area under the Receiver Operating Characteristic curve. Intuitively, the C-statistic can be described as follows: It is the probability that two individuals who differ on the dependent variable (e.g., one achieves the outcome and one does not) also differ (in the same direction) on the predicted value calculated from the model.

TABLE 16: Logistic Regression Model for Predicting the Outcome of Improvement in Housekeeping.

Risk Factor Measured at SOC/ROC*†	Coefficient‡	Odds Ratio‡	(90% CI)‡
Age: 75 to 84, inclusive (0-1)	-0.082	0.922	(0.907 - 0.937)
Age: 85 or more (0-1)	-0.295	0.745	(0.729 - 0.760)
Gender: female (0-1)	0.179	1.196	(1.178 - 1.214)
Any HMO payment source (0-1)	-0.101	0.904	(0.885 - 0.924)
Both Medicare and Medicaid payment sources (0-1)	-0.080	0.924	(0.896 - 0.952)
Patient lives in own home (0-1)	0.165	1.180	(1.159 - 1.201)
Patient lives with family member (0-1)	0.148	1.160	(1.125 - 1.196)
Patient lives alone (0-1)	0.344	1.411	(1.368 - 1.455)
Patient has informal caregiver(s) (0-1)	0.197	1.218	(1.186 - 1.251)
Caregiver provides ADL assistance (0-1)	-0.050	0.951	(0.934 - 0.969)
Infrequency of caregiver assistance (1-7)	-0.021	0.979	(0.975 - 0.983)
Inpatient discharge from hospital (0-1)	0.263	1.301	(1.280 - 1.322)
Inpatient discharge from rehabilitation facility (0-1)	0.285	1.329	(1.299 - 1.360)
Inpatient discharge from nursing home (0-1)	0.267	1.306	(1.274 - 1.338)
Medical regimen change in past 14 days (0-1)	0.075	1.077	(1.055 - 1.100)
Overall prognosis moderate or better (0-1)	0.214	1.238	(1.201 - 1.277)
Overall prognosis not known (0-1)	0.265	1.303	(1.224 - 1.387)
Rehabilitative prognosis is good (0-1)	0.240	1.271	(1.245 - 1.296)
Disability in grooming (0-3)	-0.056	0.946	(0.934 - 0.957)
Disability in dressing upper body (0-3)	-0.085	0.918	(0.905 - 0.932)
Disability in dressing lower body (0-3)	-0.032	0.968	(0.957 - 0.980)
Disability in bathing (0-5)	-0.047	0.954	(0.947 - 0.960)
Disability in toileting (0-4)	-0.087	0.917	(0.906 - 0.927)
Disability in transferring (0-5)	-0.085	0.919	(0.906 - 0.932)
Disability in ambulation (0-5)	-0.229	0.796	(0.785 - 0.806)
Disability in light meal preparation (0-2)	-0.178	0.837	(0.827 - 0.848)
Disability in transportation (0-2)	-0.207	0.813	(0.784 - 0.843)
Disability in laundry (0-2)	-0.178	0.837	(0.818 - 0.856)
Disability in housekeeping: Level 2 (0-1)	2.793	16.329	(15.806 - 16.869)
Disability in housekeeping: Level 3 (0-1)	3.072	21.580	(20.964 - 22.215)
Disability in housekeeping: Level 4 (0-1)	3.456	31.694	(30.673 - 32.750)
Disability in shopping (0-3)	-0.104	0.901	(0.890- 0.912)
Disability in telephone use (0-5)	-0.105	0.900	(0.894 - 0.907)
Patient does not have telephone (0-1)	-0.279	0.756	(0.713 - 0.802)
Disability in management of oral medications (0-2)	-0.175	0.840	(0.830 - 0.850)
Prior (2 weeks ago) disability in laundry (0-2)	-0.138	0.871	(0.855 - 0.888)
Prior (2 weeks ago) disability in housekeeping (0-4)	-0.193	0.824	(0.816 - 0.833)
Vision impairment (0-2)	-0.100	0.905	(0.891 - 0.918)
Hearing impairment (0-4)	0.033	1.033	(1.022 - 1.045)
Pain interfering with activity (0-3)	0.022	1.022	(1.015 - 1.030)
Demonstrated behavior: impaired decision-making (0-1)	0.080	1.084	(1.058 - 1.110)
Anxiety level (0-3)	0.028	1.028	(1.018 - 1.038)
Depression symptom scale (0-5)	-0.040	0.961	(0.947 - 0.974)
Confusion scale (0-4)	-0.045	0.956	(0.946 - 0.965)
Stage 1-4 pressure ulcer(s) present (0-1)	-0.139	0.870	(0.839 - 0.902)
Stasis ulcer(s) present (0-1)	-0.123	0.884	(0.841 - 0.930)
Status of surgical wound (0-3)	0.127	1.135	(1.124 - 1.146)
Urinary incontinence severity (0-4)	-0.029	0.971	(0.965 - 0.977)
Bowel incontinence frequency (0-5)	-0.067	0.936	(0.926 - 0.945)
Memory loss requiring supervision prior to past 2 weeks (0-1)	-0.146	0.864	(0.841 - 0.889)
Obese at SOC/ROC (0-1)	-0.061	0.941	(0.923 - 0.959)
Alcoholism at SOC/ROC (0-1)	0.164	1.178	(1.113 - 1.246)
Severity rating for primary diagnosis (0-4)	0.083	1.086	(1.074 - 1.099)
Number of diagnoses with severity rating >= 2 (0-6)	0.019	1.019	(1.014 - 1.024)
Acute condition: oxygen therapy (0-1)	-0.309	0.734	(0.718 - 0.751)
Acute condition: enteral/parenteral nutrition (0-1)	-0.232	0.793	(0.743 - 0.846)

TABLE 16: Logistic Regression Model for Predicting the Outcome of Improvement in Housekeeping. (cont'd)

Risk Factor Measured at SOC/ROC*†	Coefficient‡	Odds Ratio‡	(90% CI)‡
Acute condition: orthopedic (0-1)	0.059	1.061	(1.043 - 1.079)
Acute condition: contagious/communicable disease (0-1)	0.122	1.129	(1.068 - 1.194)
Total number of acute conditions reported (0-16)	0.044	1.045	(1.037 - 1.052)
Chronic condition: impaired ambulation/mobility (0-1)	0.130	1.139	(1.113 - 1.165)
Chronic condition: at least one, but caregiver present (0-1)	0.068	1.070	(1.050 - 1.091)
Diagnosis: genitourinary system diseases (0-1)	-0.084	0.920	(0.899 - 0.940)
Diagnosis: pregnancy problems (0-1)	0.571	1.771	(1.434 - 2.186)
Diagnosis: skin/subcutaneous diseases (0-1)	-0.105	0.900	(0.875 - 0.926)
Diagnosis: neoplasms (0-1)	-0.265	0.767	(0.748 - 0.787)
Diagnosis: mental disease (0-1)	-0.073	0.929	(0.906 - 0.952)
Diagnosis: nervous system disorder (0-1)	-0.151	0.860	(0.841 - 0.880)
Aftercare following hip, joint replacement or fracture (0-1)	0.124	1.132	(1.093 - 1.171)
Rehabilitation procedures: other than physical therapy (0-1)	0.110	1.117	(1.085 - 1.149)
Rehabilitation procedures: physical therapy (0-1)	0.170	1.186	(1.165 - 1.207)
Aftercare following surgery (0-1)	0.119	1.126	(1.096 - 1.157)
Rehabilitation procedures: other than physical therapy (0-1)	0.110	1.117	(1.085 - 1.149)
Rehabilitation procedures: physical therapy (0-1)	0.170	1.186	(1.165 - 1.207)
Aftercare following surgery (0-1)	0.119	1.126	(1.096 - 1.157)
Constant	-1.661		

Number of Risk Factors: 71

R^2:§ Developmental R^2 = 0.299 Validation R^2 = 0.300

C:§ Developmental C-statistic = 0.815 Validation C-statistic = 0.816

* SOC = Start of Care, ROC = Resumption of Care after inpatient stay. Risk factors pertain to SOC/ROC values.

† The number of values in the measurement scale for each risk factor is in parentheses. For risk factors that take on the value 0 and 1, the value 1 denotes the presence of the attribute and 0 denotes its absence. For risk factors that pertain to health or functional status and are defined using a scale that takes on more than two values, higher values of the scale typically indicate greater impairment or severity of illness. Selective risk factors take on values that simply represent counts (typically the number of problems) -- these are clear from context. The meaning associated with specific values for each risk factor can be determined from the OASIS data set.

‡ All coefficients/odds ratios are significant at P<.0001 using the likelihood ratio test for the hypothesis that the coefficient is zero. The odds ratios and their associated 90% CIs (confidence intervals) are given. These are considered significant at P<.0001 because of the very large developmental sample used to the create the models. Using this significance level and large developmental sample results in more stable models whose performance is superior under cross validation.

§ The R^2 values are the squared correlations between predicted and observed values for all patients in the developmental (validation) sample. The developmental sample size for all outcomes is 500,000, with some variation in the number of number of valid cases in this sample for particular outcome measures. The validation sample is 1,000,000 for all models, with similar variation in the number of valid cases for different outcome measures. These sample sizes pertain to both R^2s and C-statistics. The C-statistic is the area under the Receiver Operating Characteristic curve. Intuitively, the C-statistic can be described as follows: It is the probability that two individuals who differ on the dependent variable (e.g., one achieves the outcome and one does not) also differ (in the same direction) on the predicted value calculated from the model.

TABLE 17: Logistic Regression Model for Predicting the Outcome of Stabilization in Housekeeping.

Risk Factor Measured at SOC/ROC*†	Coefficient‡	Odds Ratio‡	(90% CI)‡
Age: under 65 (0-1)	0.120	1.127	(1.081 - 1.176)
Age: 75 to 84, inclusive (0-1)	-0.121	0.886	(0.858 - 0.916)
Age: 85 or more (0-1)	-0.324	0.724	(0.697 - 0.751)
Gender: female (0-1)	0.188	1.207	(1.175 - 1.239)
Any HMO payment source (0-1)	-0.190	0.827	(0.797 - 0.858)
Patient lives in own home (0-1)	0.186	1.205	(1.166 - 1.245)
Patient lives alone (0-1)	0.223	1.249	(1.211 - 1.289)
Patient has informal caregiver(s) (0-1)	0.207	1.231	(1.182 - 1.281)
Caregiver provides ADL assistance (0-1)	-0.111	0.895	(0.867 - 0.925)
Caregiver provides IADL assistance (0-1)	0.159	1.172	(1.118 - 1.228)
Infrequency of caregiver assistance (1-7)	-0.058	0.944	(0.934 - 0.954)
Medical regimen change in past 14 days (0-1)	0.114	1.121	(1.085 - 1.159)
Overall prognosis moderate or better (0-1)	0.209	1.233	(1.166 - 1.304)
Overall prognosis not known (0-1)	0.334	1.396	(1.242 - 1.569)
Rehabilitative prognosis is good (0-1)	0.247	1.280	(1.235 - 1.326)
Disability in grooming (0-3)	-0.098	0.907	(0.885 - 0.930)
Disability in dressing upper body (0-3)	-0.141	0.868	(0.847 - 0.890)
Disability in toileting (0-4)	-0.103	0.902	(0.879 - 0.926)
Disability in transferring (0-5)	-0.082	0.921	(0.896 - 0.946)
Disability in ambulation (0-5)	-0.222	0.801	(0.781 - 0.821)
Disability in light meal preparation (0-2)	-0.218	0.804	(0.785 - 0.823)
Disability in transportation (0-2)	-0.162	0.851	(0.804 - 0.900)
Disability in housekeeping: Level 1 (0-1)	1.995	7.352	(7.009 - 7.711)
Disability in housekeeping: Level 2 (0-1)	2.168	8.737	(8.238 - 9.266)
Disability in housekeeping: Level 3 (0-1)	2.651	14.175	(13.389 - 15.007)
Disability in shopping (0-3)	-0.141	0.868	(0.851 - 0.886)
Disability in telephone use (0-5)	-0.041	0.960	(0.945 - 0.975)
Disability in management of oral medications (0-2)	-0.208	0.812	(0.795 - 0.830)
Prior (2 weeks ago) disability in laundry (0-2)	-0.281	0.755	(0.742 - 0.769)
Pain interfering with activity (0-3)	0.042	1.043	(1.030 - 1.056)
Stage 1-4 pressure ulcer(s) present (0-1)	-0.312	0.732	(0.683 - 0.784)
Stasis ulcer(s) present (0-1)	-0.241	0.786	(0.724 - 0.853)
Surgical wound(s) present (0-1)	0.208	1.231	(1.187 - 1.278)
Memory loss requiring supervision prior to past 2 weeks (0-1)	-0.124	0.883	(0.841 - 0.928)
Existence of risk factors at SOC/ROC not known (0-1)	-0.217	0.805	(0.740 - 0.876)
Acute condition: oxygen therapy (0-1)	-0.323	0.724	(0.697 - 0.752)
Acute condition: open wound/lesion (0-1)	0.098	1.103	(1.068 - 1.138)
Chronic condition: impaired ambulation/mobility (0-1)	0.233	1.262	(1.203 - 1.323)
Diagnosis: skin/subcutaneous diseases (0-1)	-0.134	0.874	(0.832 - 0.919)
Diagnosis: neoplasms (0-1)	-0.397	0.672	(0.643 - 0.702)
Diagnosis: nervous system disorder (0-1)	-0.148	0.863	(0.829 - 0.898)
Resumption of Care with intervening in-patient stay (0-1)	-0.136	0.873	(0.838 - 0.910)
Rehabilitation procedures: physical therapy (0-1)	0.146	1.157	(1.122 - 1.194)
Constant	0.259		

Number of Risk Factors: 43

R^2:§ Developmental R^2 = 0.094 Validation R^2 = 0.091

C:§ Developmental C-statistic = 0.721 Validation C-statistic = 0.719

TABLE 17: Logistic Regression Model for Predicting the Outcome of Stabilization in Housekeeping. (cont'd)

* SOC = Start of Care, ROC = Resumption of Care after inpatient stay. Risk factors pertain to SOC/ROC values.

† The number of values in the measurement scale for each risk factor is in parentheses. For risk factors that take on the value 0 and 1, the value 1 denotes the presence of the attribute and 0 denotes its absence. For risk factors that pertain to health or functional status and are defined using a scale that takes on more than two values, higher values of the scale typically indicate greater impairment or severity of illness. Selective risk factors take on values that simply represent counts (typically the number of problems) -- these are clear from context. The meaning associated with specific values for each risk factor can be determined from the OASIS data set.

‡ All coefficients/odds ratios are significant at P<.0001 using the likelihood ratio test for the hypothesis that the coefficient is zero. The odds ratios and their associated 90% CIs (confidence intervals) are given. These are considered significant at P<.0001 because of the very large developmental sample used to the create the models. Using this significance level and large developmental sample results in more stable models whose performance is superior under cross validation.

§ The R^2 values are the squared correlations between predicted and observed values for all patients in the developmental (validation) sample. The developmental sample size for all outcomes is 500,000, with some variation in the number of number of valid cases in this sample for particular outcome measures. The validation sample is 1,000,000 for all models, with similar variation in the number of valid cases for different outcome measures. These sample sizes pertain to both R^2s and C-statistics. The C-statistic is the area under the Receiver Operating Characteristic curve. Intuitively, the C-statistic can be described as follows: It is the probability that two individuals who differ on the dependent variable (e.g., one achieves the outcome and one does not) also differ (in the same direction) on the predicted value calculated from the model.

TABLE 18: Logistic Regression Model for Predicting the Outcome of Improvement in Shopping.

Risk Factor Measured at SOC/ROC*†	Coefficient‡	Odds Ratio‡	(90% CI)‡
Age: 75 to 84, inclusive (0-1)	-0.124	0.883	(0.870 - 0.897)
Age: 85 or more (0-1)	-0.353	0.702	(0.689 - 0.716)
Gender: female (0-1)	-0.070	0.932	(0.919 - 0.946)
Any HMO payment source (0-1)	-0.137	0.872	(0.854 - 0.890)
Both Medicare and Medicaid payment sources (0-1)	-0.076	0.927	(0.900 - 0.955)
Patient lives in own home (0-1)	0.155	1.168	(1.147 - 1.188)
Patient lives with family member (0-1)	0.154	1.166	(1.132 - 1.201)
Patient lives alone (0-1)	0.250	1.285	(1.247 - 1.324)
Patient has informal caregiver(s) (0-1)	0.072	1.074	(1.047 - 1.102)
Infrequency of caregiver assistance (1-7)	-0.022	0.978	(0.975 - 0.981)
Inpatient discharge from hospital (0-1)	0.239	1.271	(1.251 - 1.291)
Inpatient discharge from rehabilitation facility (0-1)	0.237	1.267	(1.240 - 1.295)
Inpatient discharge from nursing home (0-1)	0.214	1.239	(1.210 - 1.268)
Medical regimen change in past 14 days (0-1)	0.062	1.064	(1.043 - 1.086)
Overall prognosis moderate or better (0-1)	0.165	1.179	(1.147 - 1.213)
Rehabilitative prognosis is good (0-1)	0.227	1.255	(1.230 - 1.279)
Rehabilitative prognosis not known (0-1)	0.199	1.220	(1.156 - 1.289)
Disability in grooming (0-3)	-0.052	0.950	(0.940 - 0.960)
Disability in dressing lower body (0-3)	-0.045	0.956	(0.947 - 0.966)
Disability in bathing (0-5)	-0.080	0.923	(0.917 - 0.929)
Disability in toileting (0-4)	-0.083	0.920	(0.908 - 0.933)
Disability in ambulation (0-5)	-0.209	0.811	(0.802 - 0.820)
Prior (2 weeks ago) disability in toileting (0-4)	0.043	1.044	(1.029 - 1.058)
Disability in light meal preparation (0-2)	-0.106	0.900	(0.889 - 0.911)
Disability in transportation (0-2)	-0.225	0.798	(0.770 - 0.828)
Disability in laundry (0-2)	-0.165	0.848	(0.832 - 0.864)
Disability in housekeeping (0-4)	-0.064	0.938	(0.929 - 0.946)
Disability in shopping: Level 2 (0-1)	2.393	10.943	(10.669 - 11.225)
Disability in shopping: Level 3 (0-1)	3.607	36.837	(35.622 - 38.095)
Disability in telephone use (0-5)	-0.152	0.859	(0.853 - 0.866)
Patient does not have telephone (0-1)	-0.513	0.599	(0.566 - 0.634)
Disability in management of oral medications (0-2)	-0.144	0.866	(0.856 - 0.876)
No oral medications prescribed (0-1)	-0.234	0.791	(0.732 - 0.855)
Prior (2 weeks ago) disability in transportation (0-2)	-0.098	0.907	(0.889 - 0.925)
Prior (2 weeks ago) disability in housekeeping (0-4)	-0.033	0.968	(0.960 - 0.976)
Prior (2 weeks ago) disability in shopping (0-3)	-0.288	0.750	(0.740 - 0.760)
Dyspnea (shortness of breath) (0-4)	0.022	1.023	(1.016 - 1.030)
Vision impairment (0-2)	-0.058	0.943	(0.930 - 0.957)
Hearing impairment (0-4)	0.050	1.051	(1.039 - 1.062)
Speech/language impairment (0-5)	-0.086	0.918	(0.907 - 0.929)
Anxiety level (0-3)	0.041	1.041	(1.032 - 1.051)
Confusion scale (0-4)	-0.079	0.924	(0.915 - 0.933)
Stasis ulcer(s) present (0-1)	-0.181	0.834	(0.795 - 0.875)
Surgical wound(s) present (0-1)	0.093	1.098	(1.061 - 1.136)
Status of surgical wound (0-3)	0.089	1.093	(1.074 - 1.112)
Urinary incontinence frequency (0-4)	-0.023	0.977	(0.973 - 0.982)
Bowel incontinence frequency (0-5)	-0.070	0.932	(0.923 - 0.942)
Memory loss requiring supervision prior to past 2 weeks (0-1)	-0.210	0.810	(0.789 - 0.832)
Alcoholism at SOC/ROC (0-1)	0.158	1.171	(1.109 - 1.238)
Severity rating for primary diagnosis (0-4)	0.081	1.084	(1.072 - 1.096)
Number of diagnoses with severity rating >= 2 (0-6)	0.018	1.018	(1.013 - 1.023)
Acute condition: oxygen therapy (0-1)	-0.287	0.751	(0.734 - 0.768)
Acute condition: enteral/parenteral nutrition (0-1)	-0.198	0.820	(0.771 - 0.873)
Total number of acute conditions reported (0-16)	0.047	1.048	(1.041 - 1.056)
Chronic condition: impaired ambulation/mobility (0-1)	0.109	1.115	(1.088 - 1.143)
Chronic condition: at least one, but caregiver present (0-1)	0.086	1.090	(1.070 - 1.111)

TABLE 18: Logistic Regression Model for Predicting the Outcome of Improvement in Shopping. (cont'd)

Risk Factor Measured at SOC/ROC*†	Coefficient‡	Odds Ratio‡	(90% CI)‡
Diagnosis: infectious/parasitic disease (0-1)	0.098	1.103	(1.062 - 1.146)
Diagnosis: genitourinary system diseases (0-1)	-0.059	0.943	(0.923 - 0.963)
Diagnosis: skin/subcutaneous diseases (0-1)	-0.137	0.872	(0.851 - 0.893)
Diagnosis: neoplasms (0-1)	-0.241	0.786	(0.767 - 0.805)
Diagnosis: mental disease (0-1)	-0.094	0.910	(0.889 - 0.932)
Diagnosis: nervous system disorder (0-1)	-0.134	0.874	(0.855 - 0.893)
Aftercare following hip, joint replacement or fracture (0-1)	0.082	1.086	(1.051 - 1.121)
Rehabilitation procedures: other than physical therapy (0-1)	0.080	1.083	(1.054 - 1.113)
Rehabilitation procedures: physical therapy (0-1)	0.119	1.126	(1.107 - 1.145)
Aftercare following surgery (0-1)	0.144	1.155	(1.126 - 1.186)
Constant	-1.238		

Number of Risk Factors: 66

R^2:§ Developmental R^2 = 0.246 Validation R^2 = 0.243

C:§ Developmental C-statistic = 0.784 Validation C-statistic = 0.783

* SOC = Start of Care, ROC = Resumption of Care after inpatient stay. Risk factors pertain to SOC/ROC values.

† The number of values in the measurement scale for each risk factor is in parentheses. For risk factors that take on the value 0 and 1, the value 1 denotes the presence of the attribute and 0 denotes its absence. For risk factors that pertain to health or functional status and are defined using a scale that takes on more than two values, higher values of the scale typically indicate greater impairment or severity of illness. Selective risk factors take on values that simply represent counts (typically the number of problems) -- these are clear from context. The meaning associated with specific values for each risk factor can be determined from the OASIS data set.

‡ All coefficients/odds ratios are significant at P<.0001 using the likelihood ratio test for the hypothesis that the coefficient is zero. The odds ratios and their associated 90% CIs (confidence intervals) are given. These are considered significant at P<.0001 because of the very large developmental sample used to the create the models. Using this significance level and large developmental sample results in more stable models whose performance is superior under cross validation.

§ The R^2 values are the squared correlations between predicted and observed values for all patients in the developmental (validation) sample. The developmental sample size for all outcomes is 500,000, with some variation in the number of number of valid cases in this sample for particular outcome measures. The validation sample is 1,000,000 for all models, with similar variation in the number of valid cases for different outcome measures. These sample sizes pertain to both R^2s and C-statistics. The C-statistic is the area under the Receiver Operating Characteristic curve. Intuitively, the C-statistic can be described as follows: It is the probability that two individuals who differ on the dependent variable (e.g., one achieves the outcome and one does not) also differ (in the same direction) on the predicted value calculated from the model.

TABLE 19: Logistic Regression Model for Predicting the Outcome of Stabilization in Shopping.

Risk Factor Measured at SOC/ROC*†	Coefficient‡	Odds Ratio‡	(90% CI)‡
Age: under 65 (0-1)	0.205	1.227	(1.173 - 1.284)
Age: 75 to 84, inclusive (0-1)	-0.173	0.841	(0.812 - 0.870)
Age: 85 or more (0-1)	-0.468	0.626	(0.603 - 0.651)
Any HMO payment source (0-1)	-0.184	0.832	(0.800 - 0.864)
Patient lives in own home (0-1)	0.203	1.225	(1.187 - 1.264)
Patient lives alone (0-1)	0.116	1.123	(1.085 - 1.161)
Primary caregiver present (0-1)	0.257	1.293	(1.197 - 1.396)
Infrequency of caregiver assistance (1-7)	-0.070	0.932	(0.918 - 0.946)
Overall prognosis moderate or better (0-1)	0.269	1.309	(1.245 - 1.376)
Rehabilitative prognosis is good (0-1)	0.198	1.219	(1.176 - 1.264)
Disability in grooming (0-3)	-0.105	0.900	(0.879 - 0.921)
Disability in dressing upper body (0-3)	-0.104	0.901	(0.880 - 0.923)
Disability in bathing (0-5)	-0.052	0.949	(0.937 - 0.962)
Disability in toileting (0-4)	-0.076	0.927	(0.906 - 0.947)
Disability in transferring (0-5)	-0.063	0.939	(0.915 - 0.964)
Disability in ambulation (0-5)	-0.192	0.825	(0.805 - 0.845)
Disability in transportation (0-2)	-0.337	0.714	(0.675 - 0.755)
Disability in laundry (0-2)	-0.214	0.807	(0.783 - 0.832)
Disability in shopping: Level 1 (0-1)	2.299	9.965	(9.350 - 10.620)
Disability in shopping: Level 2 (0-1)	3.576	35.722	(33.325 - 38.291)
Disability in telephone use (0-5)	-0.093	0.912	(0.899 - 0.925)
Disability in management of oral medications (0-2)	-0.311	0.733	(0.717 - 0.749)
No oral medications prescribed (0-1)	-0.490	0.613	(0.538 - 0.697)
Prior (2 weeks ago) disability in housekeeping (0-4)	-0.139	0.870	(0.862 - 0.879)
Speech/language impairment (0-5)	-0.075	0.927	(0.906 - 0.949)
Pain interfering with activity (0-3)	0.066	1.069	(1.055 - 1.083)
Confusion scale (0-4)	-0.085	0.918	(0.902 - 0.935)
Stage 1-4 pressure ulcer(s) present (0-1)	-0.248	0.780	(0.738 - 0.824)
Surgical wound(s) present (0-1)	0.334	1.397	(1.352 - 1.444)
Bowel incontinence frequency (0-5)	-0.056	0.946	(0.928 - 0.964)
Memory loss requiring supervision prior to past 2 weeks (0-1)	-0.172	0.842	(0.799 - 0.886)
Severity rating for primary diagnosis (0-4)	0.058	1.059	(1.038 - 1.081)
Acute condition: oxygen therapy (0-1)	-0.179	0.836	(0.805 - 0.868)
Chronic condition: impaired ambulation/mobility (0-1)	0.189	1.207	(1.155 - 1.262)
Diagnosis: musculoskeletal system diseases (0-1)	0.082	1.085	(1.055 - 1.117)
Diagnosis: neoplasms (0-1)	-0.451	0.637	(0.609 - 0.665)
Constant	0.421		

Number of Risk Factors: 36

R^2:§ Developmental R^2 = 0.109 Validation R^2 = 0.108

C:§ Developmental C-statistic = 0.775 Validation C-statistic = 0.773

* SOC = Start of Care, ROC = Resumption of Care after inpatient stay. Risk factors pertain to SOC/ROC values.

† The number of values in the measurement scale for each risk factor is in parentheses. For risk factors that take on the value 0 and 1, the value 1 denotes the presence of the attribute and 0 denotes its absence. For risk factors that pertain to health or functional status and are defined using a scale that takes on more than two values, higher values of the scale typically indicate greater impairment or severity of illness. Selective risk factors take on values that simply represent counts (typically the number of problems) -- these are clear from context. The meaning associated with specific values for each risk factor can be determined from the OASIS data set.

TABLE 19: Logistic Regression Model for Predicting the Outcome of Stabilization in Shopping. (cont'd)

‡ All coefficients/odds ratios are significant at P<.0001 using the likelihood ratio test for the hypothesis that the coefficient is zero. The odds ratios and their associated 90% CIs (confidence intervals) are given. These are considered significant at P<.0001 because of the very large developmental sample used to the create the models. Using this significance level and large developmental sample results in more stable models whose performance is superior under cross validation.

§ The R^2 values are the squared correlations between predicted and observed values for all patients in the developmental (validation) sample. The developmental sample size for all outcomes is 500,000, with some variation in the number of number of valid cases in this sample for particular outcome measures. The validation sample is 1,000,000 for all models, with similar variation in the number of valid cases for different outcome measures. These sample sizes pertain to both R^2s and C-statistics. The C-statistic is the area under the Receiver Operating Characteristic curve. Intuitively, the C-statistic can be described as follows: It is the probability that two individuals who differ on the dependent variable (e.g., one achieves the outcome and one does not) also differ (in the same direction) on the predicted value calculated from the model.

TABLE 20: Logistic Regression Model for Predicting the Outcome of Improvement in Phone Use.

Risk Factor Measured at SOC/ROC*†	Coefficient‡	Odds Ratio‡	(90% CI)‡
Age: 85 or more (0-1)	-0.169	0.844	(0.822 - 0.868)
Any HMO payment source (0-1)	0.142	1.153	(1.104 - 1.204)
Both Medicare and Medicaid payment sources (0-1)	-0.184	0.832	(0.792 - 0.874)
Medicaid (not Medicare) as payment source (0-1)	-0.219	0.803	(0.751 - 0.859)
Patient lives in own home (0-1)	0.178	1.195	(1.163 - 1.228)
Patient lives alone (0-1)	0.208	1.232	(1.186 - 1.279)
Inpatient discharge from hospital (0-1)	0.327	1.386	(1.349 - 1.425)
Inpatient discharge from rehabilitation facility (0-1)	0.497	1.643	(1.570 - 1.720)
Inpatient discharge from nursing home (0-1)	0.322	1.379	(1.320 - 1.441)
Rehabilitative prognosis is good (0-1)	0.092	1.096	(1.067 - 1.127)
Disability in toileting (0-4)	-0.112	0.894	(0.874 - 0.914)
Disability in ambulation (0-5)	-0.101	0.904	(0.888 - 0.920)
Disability in eating (0-5)	-0.110	0.896	(0.879 - 0.913)
Prior (2 weeks ago) disability in toileting (0-4)	0.062	1.064	(1.040 - 1.087)
Disability in telephone use: Level 2 (0-1)	0.450	1.568	(1.509 - 1.630)
Disability in telephone use: Level 3 (0-1)	0.952	2.590	(2.467 - 2.720)
Disability in telephone use: Level 4 (0-1)	1.261	3.530	(3.304 - 3.771)
Disability in telephone use: Level 5 (0-1)	1.609	4.998	(4.611 - 5.418)
Prior (2 weeks ago) disability in light meal preparation (0-2)	-0.061	0.941	(0.919 - 0.964)
Prior (2 weeks ago) disability in telephone use (0-5)	-0.174	0.840	(0.826 - 0.855)
Prior (2 weeks ago) disability in mgt. of oral medications (0-2)	-0.156	0.855	(0.835 - 0.876)
Prior (2 weeks ago) no oral medications prescribed (0-1)	-0.395	0.674	(0.606 - 0.749)
Vision impairment (0-2)	-0.127	0.881	(0.863 - 0.900)
Speech/language impairment (0-5)	-0.251	0.778	(0.766 - 0.790)
Intractable pain (0-1)	0.197	1.217	(1.170 - 1.266)
Anxiety level (0-3)	0.065	1.067	(1.051 - 1.084)
Disability in cognitive functioning (0-4)	-0.071	0.931	(0.913 - 0.950)
Confusion scale (0-4)	-0.095	0.909	(0.896 - 0.922)
Surgical wound(s) present (0-1)	0.217	1.243	(1.197 - 1.290)
Urinary catheter (0-1)	-0.139	0.870	(0.820 - 0.924)
Bowel incontinence frequency (0-5)	-0.062	0.940	(0.929 - 0.952)
Obese at SOC/ROC (0-1)	0.136	1.146	(1.101 - 1.193)
Alcoholism at SOC/ROC (0-1)	0.365	1.441	(1.281 - 1.621)
Maximum severity rating among all diagnoses (0-4)	0.059	1.061	(1.039 - 1.083)
Number of diagnoses with severity rating >= 2 (0-6)	0.042	1.043	(1.034 - 1.052)
Acute condition: orthopedic (0-1)	0.102	1.108	(1.076 - 1.140)
Chronic condition: impaired ambulation/mobility (0-1)	0.135	1.144	(1.095 - 1.195)
Total number of chronic conditions reported (0-9)	-0.057	0.944	(0.931 - 0.957)
Diagnosis: skin/subcutaneous diseases (0-1)	-0.155	0.857	(0.822 - 0.893)
Diagnosis: neoplasms (0-1)	-0.225	0.799	(0.759 - 0.841)
Diagnosis: mental disease (0-1)	-0.148	0.862	(0.832 - 0.893)
Diagnosis: nervous system disorder (0-1)	-0.204	0.815	(0.790 - 0.841)
Rehabilitation procedures: physical therapy (0-1)	0.148	1.159	(1.124 - 1.196)
Constant	0.289		

Number of Risk Factors: 43

R^2:§ Developmental R^2 = 0.122 Validation R^2 = 0.119

C:§ Developmental C-statistic = 0.699 Validation C-statistic = 0.697

TABLE 20: Logistic Regression Model for Predicting the Outcome of Improvement in Phone Use. (cont'd)

* SOC = Start of Care, ROC = Resumption of Care after inpatient stay. Risk factors pertain to SOC/ROC values.

† The number of values in the measurement scale for each risk factor is in parentheses. For risk factors that take on the value 0 and 1, the value 1 denotes the presence of the attribute and 0 denotes its absence. For risk factors that pertain to health or functional status and are defined using a scale that takes on more than two values, higher values of the scale typically indicate greater impairment or severity of illness. Selective risk factors take on values that simply represent counts (typically the number of problems) -- these are clear from context. The meaning associated with specific values for each risk factor can be determined from the OASIS data set.

‡ All coefficients/odds ratios are significant at P<.0001 using the likelihood ratio test for the hypothesis that the coefficient is zero. The odds ratios and their associated 90% CIs (confidence intervals) are given. These are considered significant at P<.0001 because of the very large developmental sample used to the create the models. Using this significance level and large developmental sample results in more stable models whose performance is superior under cross validation.

§ The R^2 values are the squared correlations between predicted and observed values for all patients in the developmental (validation) sample. The developmental sample size for all outcomes is 500,000, with some variation in the number of number of valid cases in this sample for particular outcome measures. The validation sample is 1,000,000 for all models, with similar variation in the number of valid cases for different outcome measures. These sample sizes pertain to both R^2s and C-statistics. The C-statistic is the area under the Receiver Operating Characteristic curve. Intuitively, the C-statistic can be described as follows: It is the probability that two individuals who differ on the dependent variable (e.g., one achieves the outcome and one does not) also differ (in the same direction) on the predicted value calculated from the model.

TABLE 21: Logistic Regression Model for Predicting the Outcome of Stabilization in Phone Use.

Risk Factor Measured at SOC/ROC*†	Coefficient‡	Odds Ratio‡	(90% CI)‡
Age: 75 to 84, inclusive (0-1)	-0.246	0.782	(0.756 - 0.808)
Age: 85 or more (0-1)	-0.523	0.593	(0.572 - 0.615)
Patient lives in own home (0-1)	0.093	1.097	(1.066 - 1.129)
Patient lives alone (0-1)	0.321	1.379	(1.332 - 1.427)
Inpatient discharge from hospital (0-1)	0.178	1.195	(1.162 - 1.229)
Inpatient discharge from rehabilitation facility (0-1)	0.188	1.207	(1.155 - 1.261)
Inpatient discharge from nursing home (0-1)	0.137	1.147	(1.098 - 1.197)
Overall prognosis moderate or better (0-1)	0.212	1.236	(1.182 - 1.292)
Overall prognosis not known (0-1)	0.271	1.311	(1.184 - 1.452)
Rehabilitative prognosis is good (0-1)	0.167	1.182	(1.143 - 1.222)
Disability in grooming (0-3)	-0.097	0.908	(0.888 - 0.927)
Disability in dressing upper body (0-3)	-0.156	0.856	(0.837 - 0.875)
Disability in toileting (0-4)	-0.114	0.892	(0.877 - 0.908)
Disability in transferring (0-5)	-0.055	0.947	(0.925 - 0.968)
Disability in ambulation (0-5)	-0.143	0.866	(0.846 - 0.887)
Prior (2 weeks ago) disability in ambulation (0-5)	0.103	1.108	(1.086 - 1.131)
Disability in telephone use: Level 1 (0-1)	0.294	1.342	(1.278 - 1.408)
Disability in telephone use: Level 2 (0-1)	0.644	1.904	(1.821 - 1.989)
Disability in telephone use: Level 3 (0-1)	1.296	3.653	(3.465 - 3.852)
Disability in telephone use: Level 4 (0-1)	1.721	5.591	(5.242 - 5.963)
Disability in management of oral medications (0-2)	-0.511	0.600	(0.586 - 0.613)
No oral medications prescribed (0-1)	-0.858	0.424	(0.375 - 0.480)
Prior (2 weeks ago) disability in light meal preparation (0-2)	-0.135	0.874	(0.855 - 0.893)
Prior (2 weeks ago) disability in shopping (0-3)	-0.159	0.853	(0.838 - 0.868)
Dyspnea (shortness of breath) (0-4)	0.044	1.045	(1.033 - 1.058)
Vision impairment (0-2)	-0.199	0.820	(0.800 - 0.840)
Hearing impairment (0-4)	-0.106	0.899	(0.882 - 0.916)
Speech/language impairment (0-5)	-0.303	0.739	(0.725 - 0.754)
Pain interfering with activity (0-3)	0.128	1.136	(1.121 - 1.151)
Demonstrated behavior: impaired decision-making (0-1)	0.131	1.140	(1.094 - 1.187)
Anxiety level (0-3)	0.069	1.071	(1.053 - 1.089)
Confusion scale (0-4)	-0.151	0.860	(0.847 - 0.873)
Stage 1-4 pressure ulcer(s) present (0-1)	-0.213	0.808	(0.768 - 0.850)
Surgical wound(s) present (0-1)	0.352	1.422	(1.361 - 1.485)
Obese at SOC/ROC (0-1)	0.263	1.300	(1.248 - 1.355)
Acute condition: urinary incontinence/catheter (0-1)	-0.114	0.893	(0.860 - 0.926)
Acute condition: enteral/parenteral nutrition (0-1)	-0.382	0.683	(0.620 - 0.752)
Acute condition: open wound/lesion (0-1)	0.117	1.124	(1.090 - 1.159)
Chronic condition: cognitive/mental/behavioral problems (0-1)	-0.274	0.761	(0.733 - 0.789)
Diagnosis: musculoskeletal system diseases (0-1)	0.134	1.144	(1.112 - 1.177)
Diagnosis: neoplasms (0-1)	-0.438	0.645	(0.617 - 0.675)
Diagnosis: mental disease (0-1)	-0.177	0.838	(0.806 - 0.870)
Diagnosis: nervous system disorder (0-1)	-0.192	0.825	(0.797 - 0.855)
Rehabilitation procedures: physical therapy (0-1)	0.116	1.123	(1.090 - 1.157)
Aftercare following surgery (0-1)	0.265	1.304	(1.217 - 1.398)
Constant	3.590		

Number of Risk Factors: 45

R^2:§ Developmental R^2 = 0.094 Validation R^2 = 0.092

C:§ Developmental C-statistic = 0.805 Validation C-statistic = 0.804

TABLE 21: Logistic Regression Model for Predicting the Outcome of Stabilization in Phone Use. (cont'd)

* SOC = Start of Care, ROC = Resumption of Care after inpatient stay. Risk factors pertain to SOC/ROC values.

† The number of values in the measurement scale for each risk factor is in parentheses. For risk factors that take on the value 0 and 1, the value 1 denotes the presence of the attribute and 0 denotes its absence. For risk factors that pertain to health or functional status and are defined using a scale that takes on more than two values, higher values of the scale typically indicate greater impairment or severity of illness. Selective risk factors take on values that simply represent counts (typically the number of problems) -- these are clear from context. The meaning associated with specific values for each risk factor can be determined from the OASIS data set.

‡ All coefficients/odds ratios are significant at P<.0001 using the likelihood ratio test for the hypothesis that the coefficient is zero. The odds ratios and their associated 90% CIs (confidence intervals) are given. These are considered significant at P<.0001 because of the very large developmental sample used to the create the models. Using this significance level and large developmental sample results in more stable models whose performance is superior under cross validation.

§ The R^2 values are the squared correlations between predicted and observed values for all patients in the developmental (validation) sample. The developmental sample size for all outcomes is 500,000, with some variation in the number of number of valid cases in this sample for particular outcome measures. The validation sample is 1,000,000 for all models, with similar variation in the number of valid cases for different outcome measures. These sample sizes pertain to both R^2s and C-statistics. The C-statistic is the area under the Receiver Operating Characteristic curve. Intuitively, the C-statistic can be described as follows: It is the probability that two individuals who differ on the dependent variable (e.g., one achieves the outcome and one does not) also differ (in the same direction) on the predicted value calculated from the model.

TABLE 22: Logistic Regression Model for Predicting the Outcome of Improvement in Management of Oral Medications.

Risk Factor Measured at SOC/ROC*†	Coefficient‡	Odds Ratio‡	(90% CI)‡
Age: 75 to 84, inclusive (0-1)	-0.218	0.804	(0.787 - 0.821)
Age: 85 or more (0-1)	-0.444	0.641	(0.626 - 0.658)
Gender: female (0-1)	0.125	1.134	(1.112 - 1.155)
Patient lives in own home (0-1)	0.388	1.474	(1.443 - 1.507)
Patient lives with family member (0-1)	0.447	1.563	(1.504 - 1.625)
Patient lives alone (0-1)	0.553	1.738	(1.671 - 1.807)
Patient has informal caregiver(s) (0-1)	0.188	1.207	(1.165 - 1.251)
Primary caregiver present (0-1)	0.170	1.185	(1.117 - 1.258)
Caregiver provides ADL assistance (0-1)	-0.086	0.917	(0.896 - 0.939)
Infrequency of caregiver assistance (1-7)	-0.059	0.943	(0.932 - 0.954)
Inpatient discharge from hospital (0-1)	0.270	1.310	(1.282 - 1.338)
Inpatient discharge from rehabilitation facility (0-1)	0.300	1.350	(1.311 - 1.390)
Inpatient discharge from nursing home (0-1)	0.159	1.172	(1.137 - 1.208)
Medical regimen change in past 14 days (0-1)	0.067	1.069	(1.041 - 1.097)
Overall prognosis moderate or better (0-1)	0.123	1.130	(1.093 - 1.169)
Rehabilitative prognosis is good (0-1)	0.171	1.187	(1.159 - 1.216)
Disability in toileting (0-4)	-0.115	0.891	(0.876 - 0.906)
Disability in ambulation (0-5)	-0.145	0.865	(0.853 - 0.878)
Prior (2 weeks ago) disability in toileting (0-4)	0.049	1.050	(1.032 - 1.068)
Disability in light meal preparation (0-2)	-0.063	0.939	(0.921 - 0.956)
Disability in telephone use (0-5)	-0.151	0.860	(0.853 - 0.867)
Patient does not have telephone (0-1)	-0.525	0.591	(0.550 - 0.636)
Disability in management of oral medications: Level 2 (0-1)	1.438	4.214	(4.084 - 4.348)
Prior (2 weeks ago) disability in light meal preparation (0-2)	-0.136	0.873	(0.851 - 0.896)
Prior (2 weeks ago) disability in transportation (0-2)	-0.089	0.915	(0.892 - 0.939)
Prior (2 weeks ago) disability in laundry (0-2)	-0.096	0.909	(0.893 - 0.925)
Prior (2 weeks ago) disability in mgt. of oral medications (0-2)	-0.197	0.821	(0.799 - 0.845)
Prior (2 weeks ago) no oral medications prescribed (0-1)	-0.296	0.744	(0.669 - 0.827)
Dyspnea (shortness of breath) (0-4)	0.062	1.063	(1.054 - 1.073)
Vision impairment (0-2)	-0.082	0.922	(0.906 - 0.938)
Speech/language impairment (0-5)	-0.117	0.890	(0.877 - 0.903)
Pain interfering with activity (0-3)	0.077	1.080	(1.070 - 1.090)
Demonstrated behavior: impaired decision-making (0-1)	0.116	1.123	(1.088 - 1.159)
Anxiety level (0-3)	0.062	1.064	(1.052 - 1.076)
Disability in cognitive functioning (0-4)	-0.118	0.888	(0.873 - 0.904)
Confusion scale (0-4)	-0.145	0.865	(0.855 - 0.876)
Stage 1-4 pressure ulcer(s) present (0-1)	-0.122	0.885	(0.853 - 0.919)
Surgical wound(s) present (0-1)	0.212	1.236	(1.175 - 1.299)
Status of surgical wound (0-3)	0.065	1.067	(1.039 - 1.096)
Urinary incontinence severity (0-4)	-0.022	0.979	(0.971 - 0.987)
Urinary incontinence prior to past 2 weeks (0-1)	-0.090	0.914	(0.890 - 0.937)
Memory loss requiring supervision prior to past 2 weeks (0-1)	-0.185	0.831	(0.804 - 0.858)
Obese at SOC/ROC (0-1)	0.076	1.079	(1.052 - 1.107)
Severity rating for primary diagnosis (0-4)	0.099	1.104	(1.088 - 1.120)
Number of diagnoses with severity rating >= 2 (0-6)	0.026	1.027	(1.020 - 1.033)
Acute condition: oxygen therapy (0-1)	-0.119	0.887	(0.862 - 0.913)
Acute condition: enteral/parenteral nutrition (0-1)	-0.331	0.718	(0.662 - 0.779)
Acute condition: ventilator (0-1)	-0.917	0.400	(0.281 - 0.567)
Acute condition: orthopedic (0-1)	0.107	1.113	(1.088 - 1.138)
Acute condition: gastrointestinal disorder (0-1)	0.071	1.073	(1.042 - 1.105)
Chronic condition: dependence in living skills (0-1)	0.169	1.184	(1.142 - 1.227)
Chronic condition: impaired ambulation/mobility (0-1)	0.112	1.119	(1.085 - 1.154)
Chronic condition: dependence in medication admin. (0-1)	-0.512	0.599	(0.577 - 0.622)
Chronic condition: cognitive/mental/behavioral problems (0-1)	-0.194	0.824	(0.800 - 0.848)
Chronic condition: at least one, but caregiver present (0-1)	0.120	1.127	(1.097 - 1.159)

TABLE 22: Logistic Regression Model for Predicting the Outcome of Improvement in Management of Oral Medications. (cont'd)

Risk Factor Measured at SOC/ROC*†	Coefficient‡	Odds Ratio‡	(90% CI)‡
Diagnosis: genitourinary system diseases (0-1)	-0.069	0.933	(0.909 - 0.959)
Diagnosis: musculoskeletal system diseases (0-1)	0.071	1.073	(1.051 - 1.096)
Diagnosis: neoplasms (0-1)	-0.119	0.888	(0.858 - 0.918)
Diagnosis: endocrine/nutritional/metabolic (0-1)	-0.047	0.954	(0.936 - 0.973)
Diagnosis: mental disease (0-1)	-0.240	0.787	(0.765 - 0.810)
Diagnosis: nervous system disorder (0-1)	-0.181	0.834	(0.812 - 0.857)
Diagnosis: respiratory system diseases (0-1)	0.077	1.080	(1.054 - 1.106)
Resumption of Care with intervening in-patient stay (0-1)	-0.087	0.917	(0.891 - 0.943)
Aftercare following hip, joint replacement or fracture (0-1)	0.307	1.359	(1.291 - 1.431)
Aftercare following surgery (0-1)	0.181	1.199	(1.153 - 1.246)
Constant	-0.945		

Number of Risk Factors: 65

R^2:§ Developmental R^2 = 0.183 Validation R^2 = 0.184

C:§ Developmental C-statistic = 0.752 Validation C-statistic = 0.753

* SOC = Start of Care, ROC = Resumption of Care after inpatient stay. Risk factors pertain to SOC/ROC values.

† The number of values in the measurement scale for each risk factor is in parentheses. For risk factors that take on the value 0 and 1, the value 1 denotes the presence of the attribute and 0 denotes its absence. For risk factors that pertain to health or functional status and are defined using a scale that takes on more than two values, higher values of the scale typically indicate greater impairment or severity of illness. Selective risk factors take on values that simply represent counts (typically the number of problems) -- these are clear from context. The meaning associated with specific values for each risk factor can be determined from the OASIS data set.

‡ All coefficients/odds ratios are significant at P<.0001 using the likelihood ratio test for the hypothesis that the coefficient is zero. The odds ratios and their associated 90% CIs (confidence intervals) are given. These are considered significant at P<.0001 because of the very large developmental sample used to the create the models. Using this significance level and large developmental sample results in more stable models whose performance is superior under cross validation.

§ The R^2 values are the squared correlations between predicted and observed values for all patients in the developmental (validation) sample. The developmental sample size for all outcomes is 500,000, with some variation in the number of number of valid cases in this sample for particular outcome measures. The validation sample is 1,000,000 for all models, with similar variation in the number of valid cases for different outcome measures. These sample sizes pertain to both R^2s and C-statistics. The C-statistic is the area under the Receiver Operating Characteristic curve. Intuitively, the C-statistic can be described as follows: It is the probability that two individuals who differ on the dependent variable (e.g., one achieves the outcome and one does not) also differ (in the same direction) on the predicted value calculated from the model.

TABLE 23: Logistic Regression Model for Predicting the Outcome of Stabilization in Management of Oral Medications.

Risk Factor Measured at SOC/ROC*†	Coefficient‡	Odds Ratio‡	(90% CI)‡
Age: under 65 (0-1)	0.233	1.262	(1.203 - 1.325)
Age: 75 to 84, inclusive (0-1)	-0.370	0.691	(0.667 - 0.715)
Age: 85 or more (0-1)	-0.714	0.490	(0.471 - 0.509)
Gender: female (0-1)	0.213	1.238	(1.204 - 1.273)
Any HMO payment source (0-1)	-0.157	0.854	(0.822 - 0.888)
Patient lives in own home (0-1)	0.374	1.454	(1.408 - 1.502)
Patient lives with family member (0-1)	0.267	1.306	(1.240 - 1.377)
Patient lives alone (0-1)	0.508	1.662	(1.569 - 1.760)
Patient has informal caregiver(s) (0-1)	0.185	1.204	(1.148 - 1.263)
Primary caregiver present (0-1)	0.406	1.501	(1.383 - 1.629)
Caregiver provides ADL assistance (0-1)	-0.121	0.886	(0.857 - 0.916)
Infrequency of caregiver assistance (1-7)	-0.129	0.879	(0.865 - 0.893)
Overall prognosis moderate or better (0-1)	0.222	1.248	(1.187 - 1.312)
Rehabilitative prognosis is good (0-1)	0.179	1.197	(1.153 - 1.241)
Disability in dressing upper body (0-3)	-0.150	0.861	(0.844 - 0.877)
Disability in toileting (0-4)	-0.110	0.896	(0.877 - 0.915)
Disability in transferring (0-5)	-0.064	0.938	(0.914 - 0.963)
Disability in ambulation (0-5)	-0.137	0.872	(0.850 - 0.895)
Prior (2 weeks ago) disability in ambulation (0-5)	0.118	1.125	(1.099 - 1.151)
Disability in light meal preparation (0-2)	-0.181	0.835	(0.817 - 0.852)
Disability in telephone use (0-5)	-0.132	0.876	(0.863 - 0.889)
Disability in management of oral medications: Level 1 (0-1)	1.376	3.960	(3.796 - 4.131)
Prior (2 weeks ago) disability in transportation (0-2)	-0.264	0.768	(0.740 - 0.797)
Prior (2 weeks ago) disability in laundry (0-2)	-0.114	0.892	(0.870 - 0.915)
Prior (2 weeks ago) disability in shopping (0-3)	-0.073	0.929	(0.911 - 0.948)
Prior (2 weeks ago) disability in mgt. of oral medications (0-2)	0.219	1.245	(1.191 - 1.301)
Dyspnea (shortness of breath) (0-4)	0.059	1.060	(1.048 - 1.073)
Speech/language impairment (0-5)	-0.119	0.888	(0.865 - 0.911)
Pain interfering with activity (0-3)	0.130	1.139	(1.124 - 1.154)
Demonstrated behavior: impaired decision-making (0-1)	0.256	1.291	(1.221 - 1.366)
Disability in cognitive functioning (0-4)	-0.091	0.913	(0.886 - 0.941)
Confusion scale (0-4)	-0.190	0.827	(0.810 - 0.844)
Stage 1-4 pressure ulcer(s) present (0-1)	-0.243	0.784	(0.740 - 0.832)
No observable pressure ulcer to measure stage (0-1)	-0.581	0.559	(0.451 - 0.693)
Surgical wound(s) present (0-1)	0.474	1.606	(1.544 - 1.670)
Existence of risk factors at SOC/ROC not known (0-1)	-0.211	0.810	(0.739 - 0.887)
Severity rating for primary diagnosis (0-4)	0.051	1.052	(1.030 - 1.075)
Acute condition: neurologic (0-1)	-0.183	0.833	(0.795 - 0.872)
Acute condition: open wound/lesion (0-1)	0.094	1.098	(1.064 - 1.134)
Chronic condition: dependence in medication admin. (0-1)	-0.383	0.682	(0.646 - 0.719)
Chronic condition: cognitive/mental/behavioral problems (0-1)	-0.371	0.690	(0.660 - 0.722)
Diagnosis: musculoskeletal system diseases (0-1)	0.196	1.216	(1.182 - 1.252)
Diagnosis: neoplasms (0-1)	-0.377	0.686	(0.657 - 0.716)
Diagnosis: mental disease (0-1)	-0.348	0.706	(0.675 - 0.738)
Diagnosis: nervous system disorder (0-1)	-0.109	0.897	(0.858 - 0.937)
Aftercare following hip, joint replacement or fracture (0-1)	0.278	1.320	(1.228 - 1.419)
Constant	1.995		

Number of Risk Factors: 46

R^2:§ Developmental R^2 = 0.075 Validation R^2 = 0.074

C:§ Developmental C-statistic = 0.758 Validation C-statistic = 0.756

TABLE 23: Logistic Regression Model for Predicting the Outcome of Stabilization in Management of Oral Medications. (cont'd)

* SOC = Start of Care, ROC = Resumption of Care after inpatient stay. Risk factors pertain to SOC/ROC values.

† The number of values in the measurement scale for each risk factor is in parentheses. For risk factors that take on the value 0 and 1, the value 1 denotes the presence of the attribute and 0 denotes its absence. For risk factors that pertain to health or functional status and are defined using a scale that takes on more than two values, higher values of the scale typically indicate greater impairment or severity of illness. Selective risk factors take on values that simply represent counts (typically the number of problems) -- these are clear from context. The meaning associated with specific values for each risk factor can be determined from the OASIS data set.

‡ All coefficients/odds ratios are significant at P<.0001 using the likelihood ratio test for the hypothesis that the coefficient is zero. The odds ratios and their associated 90% CIs (confidence intervals) are given. These are considered significant at P<.0001 because of the very large developmental sample used to the create the models. Using this significance level and large developmental sample results in more stable models whose performance is superior under cross validation.

§ The R^2 values are the squared correlations between predicted and observed values for all patients in the developmental (validation) sample. The developmental sample size for all outcomes is 500,000, with some variation in the number of number of valid cases in this sample for particular outcome measures. The validation sample is 1,000,000 for all models, with similar variation in the number of valid cases for different outcome measures. These sample sizes pertain to both R^2s and C-statistics. The C-statistic is the area under the Receiver Operating Characteristic curve. Intuitively, the C-statistic can be described as follows: It is the probability that two individuals who differ on the dependent variable (e.g., one achieves the outcome and one does not) also differ (in the same direction) on the predicted value calculated from the model.

TABLE 24: Logistic Regression Model for Predicting the Outcome of Improvement in Pain Interfering with Activity.

Risk Factor Measured at SOC/ROC*†	Coefficient‡	Odds Ratio‡	(90% CI)‡
Age: under 65 (0-1)	-0.143	0.866	(0.843 - 0.890)
Age: 75 to 84, inclusive (0-1)	0.049	1.050	(1.030 - 1.070)
Age: 85 or more (0-1)	0.094	1.099	(1.073 - 1.125)
Gender: female (0-1)	-0.093	0.911	(0.896 - 0.926)
Any HMO payment source (0-1)	-0.121	0.886	(0.865 - 0.907)
Medicaid (not Medicare) as payment source (0-1)	-0.104	0.901	(0.870 - 0.934)
Patient lives in own home (0-1)	-0.062	0.940	(0.922 - 0.958)
Medical regimen change in past 14 days (0-1)	0.107	1.113	(1.088 - 1.139)
Overall prognosis moderate or better (0-1)	0.163	1.177	(1.140 - 1.216)
Rehabilitative prognosis is good (0-1)	0.246	1.279	(1.250 - 1.309)
Rehabilitative prognosis not known (0-1)	0.164	1.178	(1.105 - 1.256)
Prior (2 weeks ago) disability in bathing (0-5)	-0.049	0.952	(0.945 - 0.959)
Prior (2 weeks ago) disability in toileting (0-4)	0.046	1.047	(1.035 - 1.060)
Prior (2 weeks ago) disability in ambulation (0-5)	-0.112	0.894	(0.881 - 0.906)
Disability in management of oral medications (0-2)	0.038	1.039	(1.026 - 1.052)
Prior (2 weeks ago) disability in transportation (0-2)	0.066	1.068	(1.049 - 1.089)
Prior (2 weeks ago) disability in telephone use (0-5)	0.030	1.030	(1.022 - 1.039)
Pain interfering with activity: Level 2 (0-1)	0.289	1.336	(1.310 - 1.362)
Pain interfering with activity: Level 3 (0-1)	1.709	5.525	(5.343 - 5.713)
Intractable pain (0-1)	-0.232	0.793	(0.775 - 0.811)
Demonstrated behavior: impaired decision-making (0-1)	0.103	1.108	(1.074 - 1.144)
Anxiety level (0-3)	-0.088	0.916	(0.907 - 0.925)
Depression symptom scale (0-5)	-0.114	0.893	(0.879 - 0.906)
Number of stasis ulcers present (0-4)	-0.078	0.925	(0.903 - 0.947)
Status of surgical wound (0-3)	0.095	1.099	(1.088 - 1.111)
Presence of urinary incontinence (0-1)	-0.059	0.943	(0.926 - 0.960)
Intractable pain prior to past 2 weeks (0-1)	-0.238	0.788	(0.769 - 0.807)
Heavy smoking at SOC/ROC (0-1)	-0.138	0.871	(0.847 - 0.895)
Obese at SOC/ROC (0-1)	-0.104	0.901	(0.884 - 0.920)
Drug dependency at SOC/ROC (0-1)	-0.483	0.617	(0.569 - 0.669)
Acute condition: oxygen therapy (0-1)	-0.169	0.845	(0.823 - 0.867)
Acute condition: IV/infusion therapy (0-1)	-0.165	0.848	(0.808 - 0.890)
Acute condition: orthopedic (0-1)	-0.110	0.896	(0.877 - 0.915)
Acute condition: open wound/lesion (0-1)	-0.085	0.919	(0.900 - 0.937)
Acute condition: terminal (0-1)	-0.116	0.891	(0.864 - 0.919)
Total number of acute conditions reported (0-16)	0.068	1.070	(1.060 - 1.080)
Chronic condition: impaired ambulation/mobility (0-1)	0.097	1.102	(1.069 - 1.136)
Chronic condition: cognitive/mental/behavioral problems (0-1)	0.064	1.067	(1.039 - 1.095)
Diagnosis: musculoskeletal system diseases (0-1)	-0.253	0.776	(0.762 - 0.790)
Diagnosis: ill-defined conditions (0-1)	-0.053	0.948	(0.934 - 0.963)
Diagnosis: fractures (0-1)	-0.084	0.919	(0.896 - 0.944)
Diagnosis: other injury (0-1)	0.128	1.137	(1.103 - 1.172)
Diagnosis: neoplasms (0-1)	-0.141	0.868	(0.844 - 0.893)
Diagnosis: mental disease (0-1)	0.068	1.070	(1.042 - 1.100)
Diagnosis: circulatory system diseases (0-1)	0.113	1.120	(1.102 - 1.138)
Resumption of Care with intervening in-patient stay (0-1)	-0.182	0.833	(0.812 - 0.855)
Aftercare following surgery (0-1)	0.187	1.205	(1.173 - 1.239)
Constant	-0.082		

Number of Risk Factors: 47

R^2:§ Developmental R^2 = 0.059 Validation R^2 = 0.058

C:§ Developmental C-statistic = 0.637 Validation C-statistic = 0.636

TABLE 24: Logistic Regression Model for Predicting the Outcome of Improvement in Pain Interfering with Activity. (cont'd)

* SOC = Start of Care, ROC = Resumption of Care after inpatient stay. Risk factors pertain to SOC/ROC values.

† The number of values in the measurement scale for each risk factor is in parentheses. For risk factors that take on the value 0 and 1, the value 1 denotes the presence of the attribute and 0 denotes its absence. For risk factors that pertain to health or functional status and are defined using a scale that takes on more than two values, higher values of the scale typically indicate greater impairment or severity of illness. Selective risk factors take on values that simply represent counts (typically the number of problems) -- these are clear from context. The meaning associated with specific values for each risk factor can be determined from the OASIS data set.

‡ All coefficients/odds ratios are significant at P<.0001 using the likelihood ratio test for the hypothesis that the coefficient is zero. The odds ratios and their associated 90% CIs (confidence intervals) are given. These are considered significant at P<.0001 because of the very large developmental sample used to the create the models. Using this significance level and large developmental sample results in more stable models whose performance is superior under cross validation.

§ The R^2 values are the squared correlations between predicted and observed values for all patients in the developmental (validation) sample. The developmental sample size for all outcomes is 500,000, with some variation in the number of number of valid cases in this sample for particular outcome measures. The validation sample is 1,000,000 for all models, with similar variation in the number of valid cases for different outcome measures. These sample sizes pertain to both R^2s and C-statistics. The C-statistic is the area under the Receiver Operating Characteristic curve. Intuitively, the C-statistic can be described as follows: It is the probability that two individuals who differ on the dependent variable (e.g., one achieves the outcome and one does not) also differ (in the same direction) on the predicted value calculated from the model.

TABLE 25: Logistic Regression Model for Predicting the Outcome of Improvement in Dyspnea.

Risk Factor Measured at SOC/ROC*[†]	Coefficient[‡]	Odds Ratio[‡]	(90% CI)[‡]
Gender: female (0-1)	0.052	1.054	(1.037 - 1.071)
Any HMO payment source (0-1)	0.121	1.128	(1.100 - 1.158)
Medicaid (not Medicare) as payment source (0-1)	-0.084	0.920	(0.888 - 0.953)
Caregiver provides ADL assistance (0-1)	0.050	1.052	(1.034 - 1.070)
Inpatient discharge from hospital (0-1)	0.237	1.267	(1.244 - 1.291)
Inpatient discharge from rehabilitation facility (0-1)	0.239	1.270	(1.235 - 1.305)
Inpatient discharge from nursing home (0-1)	0.236	1.266	(1.230 - 1.302)
Overall prognosis moderate or better (0-1)	0.191	1.211	(1.172 - 1.251)
Overall prognosis not known (0-1)	0.265	1.303	(1.217 - 1.395)
Rehabilitative prognosis is good (0-1)	0.180	1.197	(1.171 - 1.223)
Disability in grooming (0-3)	-0.036	0.964	(0.954 - 0.975)
Disability in transferring (0-5)	-0.035	0.966	(0.954 - 0.979)
Prior (2 weeks ago) disability in ambulation (0-5)	-0.098	0.907	(0.894 - 0.920)
Disability in laundry (0-2)	0.076	1.078	(1.057 - 1.101)
Disability in shopping (0-3)	0.071	1.073	(1.056 - 1.091)
Prior (2 weeks ago) disability in laundry (0-2)	-0.093	0.912	(0.895 - 0.928)
Prior (2 weeks ago) disability in shopping (0-3)	-0.051	0.951	(0.937 - 0.964)
Dyspnea (shortness of breath): Level 2 (0-1)	1.129	3.092	(3.037 - 3.148)
Dyspnea (shortness of breath): Level 3 (0-1)	1.702	5.482	(5.348 - 5.620)
Dyspnea (shortness of breath): Level 4 (0-1)	2.226	9.261	(8.846 - 9.694)
Vision impairment (0-2)	-0.135	0.873	(0.859 - 0.888)
Hearing impairment (0-4)	-0.056	0.945	(0.935 - 0.956)
Anxiety level (0-3)	-0.059	0.943	(0.933 - 0.952)
Depression symptom scale (0-5)	-0.050	0.951	(0.937 - 0.965)
Surgical wound(s) present (0-1)	0.158	1.171	(1.120 - 1.225)
Status of surgical wound (0-3)	0.061	1.063	(1.040 - 1.088)
Urinary incontinence severity (0-4)	-0.036	0.964	(0.957 - 0.972)
Memory loss requiring supervision prior to past 2 weeks (0-1)	0.101	1.107	(1.077 - 1.137)
Heavy smoking at SOC/ROC (0-1)	-0.182	0.834	(0.812 - 0.857)
Obese at SOC/ROC (0-1)	-0.230	0.795	(0.779 - 0.811)
Acute condition: oxygen therapy (0-1)	-0.762	0.467	(0.456 - 0.477)
Acute condition: IV/infusion therapy (0-1)	-0.166	0.847	(0.805 - 0.891)
Acute condition: ventilator (0-1)	-0.565	0.568	(0.450 - 0.718)
Acute condition: orthopedic (0-1)	0.214	1.239	(1.216 - 1.263)
Acute condition: neurologic (0-1)	0.140	1.150	(1.118 - 1.183)
Acute condition: open wound/lesion (0-1)	-0.053	0.949	(0.931 - 0.967)
Acute condition: terminal (0-1)	-0.088	0.916	(0.890 - 0.941)
Chronic condition: impaired ambulation/mobility (0-1)	0.202	1.224	(1.188 - 1.261)
Chronic condition: urinary incontinence/catheter (0-1)	-0.087	0.917	(0.894 - 0.940)
Chronic condition: chronic pain (0-1)	-0.098	0.906	(0.879 - 0.935)
Diagnosis: skin/subcutaneous diseases (0-1)	-0.095	0.910	(0.884 - 0.936)
Diagnosis: ill-defined conditions (0-1)	0.083	1.086	(1.068 - 1.104)
Diagnosis: neoplasms (0-1)	-0.228	0.796	(0.774 - 0.819)
Diagnosis: circulatory system diseases (0-1)	-0.099	0.906	(0.891 - 0.921)
Diagnosis: respiratory system diseases (0-1)	-0.178	0.837	(0.821 - 0.854)
Resumption of Care with intervening in-patient stay (0-1)	-0.133	0.875	(0.854 - 0.897)
Aftercare following hip, joint replacement or fracture (0-1)	0.282	1.326	(1.265 - 1.390)
Rehabilitation procedures: physical therapy (0-1)	0.251	1.285	(1.260 - 1.311)
Aftercare following surgery (0-1)	0.083	1.087	(1.053 - 1.122)
Constant	-0.735		

Number of Risk Factors: 49

R^2:[§] Developmental R^2 = 0.120 Validation R^2 = 0.119

C:[§] Developmental C-statistic = 0.699 Validation C-statistic = 0.699

TABLE 25: Logistic Regression Model for Predicting the Outcome of Improvement in Dyspnea. (cont'd)

* SOC = Start of Care, ROC = Resumption of Care after inpatient stay. Risk factors pertain to SOC/ROC values.

† The number of values in the measurement scale for each risk factor is in parentheses. For risk factors that take on the value 0 and 1, the value 1 denotes the presence of the attribute and 0 denotes its absence. For risk factors that pertain to health or functional status and are defined using a scale that takes on more than two values, higher values of the scale typically indicate greater impairment or severity of illness. Selective risk factors take on values that simply represent counts (typically the number of problems) -- these are clear from context. The meaning associated with specific values for each risk factor can be determined from the OASIS data set.

‡ All coefficients/odds ratios are significant at P<.0001 using the likelihood ratio test for the hypothesis that the coefficient is zero. The odds ratios and their associated 90% CIs (confidence intervals) are given. These are considered significant at P<.0001 because of the very large developmental sample used to the create the models. Using this significance level and large developmental sample results in more stable models whose performance is superior under cross validation.

§ The R^2 values are the squared correlations between predicted and observed values for all patients in the developmental (validation) sample. The developmental sample size for all outcomes is 500,000, with some variation in the number of number of valid cases in this sample for particular outcome measures. The validation sample is 1,000,000 for all models, with similar variation in the number of valid cases for different outcome measures. These sample sizes pertain to both R^2s and C-statistics. The C-statistic is the area under the Receiver Operating Characteristic curve. Intuitively, the C-statistic can be described as follows: It is the probability that two individuals who differ on the dependent variable (e.g., one achieves the outcome and one does not) also differ (in the same direction) on the predicted value calculated from the model.

TABLE 26: Logistic Regression Model for Predicting the Outcome of Improvement in Urinary Tract Infection.

Risk Factor Measured at SOC/ROC*†	Coefficient‡	Odds Ratio‡	(90% CI)‡
Any HMO payment source (0-1)	-0.272	0.762	(0.699 - 0.829)
Inpatient discharge from hospital (0-1)	0.309	1.362	(1.268 - 1.463)
Inpatient discharge from rehabilitation facility (0-1)	0.507	1.660	(1.479 - 1.864)
Inpatient discharge from nursing home (0-1)	0.468	1.598	(1.420 - 1.797)
Disability in housekeeping (0-4)	0.097	1.102	(1.076 - 1.129)
Disability in cognitive functioning (0-4)	-0.096	0.909	(0.880 - 0.939)
Urinary catheter (0-1)	-0.514	0.598	(0.554 - 0.647)
Bowel incontinence frequency (0-5)	-0.075	0.928	(0.904 - 0.952)
Number of diagnoses with severity rating >= 2 (0-6)	0.088	1.092	(1.071 - 1.112)
Acute condition: IV/infusion therapy (0-1)	-1.065	0.345	(0.306 - 0.388)
Acute condition: orthopedic (0-1)	0.236	1.266	(1.174 - 1.366)
Diagnosis: genitourinary system diseases (0-1)	-0.673	0.510	(0.477 - 0.545)
Diagnosis: circulatory system diseases (0-1)	0.255	1.290	(1.213 - 1.372)
Constant	1.384		

Number of Risk Factors: 13

R^2:§ Developmental R^2 = 0.064 Validation R^2 = 0.059

C:§ Developmental C-statistic = 0.676 Validation C-statistic = 0.666

* SOC = Start of Care, ROC = Resumption of Care after inpatient stay. Risk factors pertain to SOC/ROC values.

† The number of values in the measurement scale for each risk factor is in parentheses. For risk factors that take on the value 0 and 1, the value 1 denotes the presence of the attribute and 0 denotes its absence. For risk factors that pertain to health or functional status and are defined using a scale that takes on more than two values, higher values of the scale typically indicate greater impairment or severity of illness. Selective risk factors take on values that simply represent counts (typically the number of problems) -- these are clear from context. The meaning associated with specific values for each risk factor can be determined from the OASIS data set.

‡ All coefficients/odds ratios are significant at P<.0001 using the likelihood ratio test for the hypothesis that the coefficient is zero. The odds ratios and their associated 90% CIs (confidence intervals) are given. These are considered significant at P<.0001 because of the very large developmental sample used to the create the models. Using this significance level and large developmental sample results in more stable models whose performance is superior under cross validation.

§ The R^2 values are the squared correlations between predicted and observed values for all patients in the developmental (validation) sample. The developmental sample size for all outcomes is 500,000, with some variation in the number of number of valid cases in this sample for particular outcome measures. The validation sample is 1,000,000 for all models, with similar variation in the number of valid cases for different outcome measures. These sample sizes pertain to both R^2s and C-statistics. The C-statistic is the area under the Receiver Operating Characteristic curve. Intuitively, the C-statistic can be described as follows: It is the probability that two individuals who differ on the dependent variable (e.g., one achieves the outcome and one does not) also differ (in the same direction) on the predicted value calculated from the model.

TABLE 27: Logistic Regression Model for Predicting the Outcome of Improvement in Urinary Incontinence.

Risk Factor Measured at SOC/ROC*†	Coefficient‡	Odds Ratio‡	(90% CI)‡
Any HMO payment source (0-1)	0.196	1.216	(1.174 - 1.260)
Medicaid (not Medicare) as payment source (0-1)	-0.162	0.850	(0.806 - 0.897)
Patient lives in own home (0-1)	0.110	1.117	(1.091 - 1.143)
Patient lives with family member (0-1)	0.127	1.136	(1.112 - 1.160)
Inpatient discharge from hospital (0-1)	0.266	1.305	(1.273 - 1.337)
Inpatient discharge from rehabilitation facility (0-1)	0.365	1.440	(1.391 - 1.492)
Inpatient discharge from nursing home (0-1)	0.195	1.215	(1.173 - 1.258)
Rehabilitative prognosis is good (0-1)	0.091	1.096	(1.069 - 1.123)
Disability in toileting (0-4)	-0.054	0.948	(0.935 - 0.960)
Disability in ambulation (0-5)	-0.061	0.941	(0.924 - 0.958)
Prior (2 weeks ago) disability in bathing (0-5)	-0.042	0.959	(0.949 - 0.969)
Prior (2 weeks ago) disability in ambulation (0-5)	-0.078	0.925	(0.910 - 0.941)
Disability in laundry (0-2)	0.109	1.115	(1.084 - 1.146)
Disability in shopping (0-3)	0.066	1.068	(1.049 - 1.088)
Disability in telephone use (0-5)	-0.041	0.960	(0.951 - 0.969)
Patient does not have telephone (0-1)	-0.255	0.775	(0.722 - 0.832)
Prior (2 weeks ago) disability in laundry (0-2)	-0.073	0.930	(0.911 - 0.949)
Dyspnea (shortness of breath) (0-4)	-0.046	0.955	(0.946 - 0.964)
Vision impairment (0-2)	-0.065	0.937	(0.918 - 0.956)
Speech/language impairment (0-5)	-0.052	0.949	(0.934 - 0.965)
Demonstrated behavior: impaired decision-making (0-1)	-0.071	0.932	(0.906 - 0.958)
Disability in cognitive functioning (0-4)	-0.094	0.910	(0.895 - 0.925)
Stage of most problematic pressure ulcer (0-4)	-0.063	0.939	(0.921 - 0.956)
Surgical wound(s) present (0-1)	0.182	1.200	(1.164 - 1.237)
Urinary tract infection (0-1)	-0.117	0.889	(0.862 - 0.917)
Presence of urinary incontinence (0-1)	-0.390	0.677	(0.644 - 0.712)
Urinary incontinence severity: Level 2 (0-1)	0.260	1.297	(1.241 - 1.355)
Urinary incontinence severity: Level 3 (0-1)	0.132	1.142	(1.113 - 1.171)
Bowel incontinence frequency (0-5)	-0.081	0.922	(0.913 - 0.932)
Bowel ostomy (0-1)	-0.222	0.801	(0.741 - 0.867)
Urinary catheter prior to past 2 weeks (0-1)	-0.316	0.729	(0.685 - 0.776)
Obese at SOC/ROC (0-1)	-0.075	0.928	(0.903 - 0.953)
Acute condition: IV/infusion therapy (0-1)	-0.242	0.785	(0.725 - 0.851)
Acute condition: open wound/lesion (0-1)	-0.173	0.841	(0.819 - 0.864)
Acute condition: terminal (0-1)	-0.147	0.863	(0.833 - 0.894)
Total number of acute conditions reported (0-16)	0.047	1.048	(1.037 - 1.060)
Chronic condition: urinary incontinence/catheter (0-1)	-0.339	0.713	(0.695 - 0.731)
Diagnosis: nervous system disorder (0-1)	-0.177	0.838	(0.814 - 0.863)
Resumption of Care with intervening in-patient stay (0-1)	-0.184	0.832	(0.804 - 0.861)
Attention to artificial openings: urinary (0-1)	0.265	1.303	(1.208 - 1.406)
Rehabilitation procedures: other than physical therapy (0-1)	0.137	1.147	(1.102 - 1.194)
Rehabilitation procedures: physical therapy (0-1)	0.119	1.127	(1.100 - 1.154)
Constant	0.404		

Number of Risk Factors: 42

R^2:§ Developmental R^2 = 0.099 Validation R^2 = 0.098

C:§ Developmental C-statistic = 0.679 Validation C-statistic = 0.677

TABLE 27: Logistic Regression Model for Predicting the Outcome of Improvement in Urinary Incontinence. (cont'd)

* SOC = Start of Care, ROC = Resumption of Care after inpatient stay. Risk factors pertain to SOC/ROC values.

† The number of values in the measurement scale for each risk factor is in parentheses. For risk factors that take on the value 0 and 1, the value 1 denotes the presence of the attribute and 0 denotes its absence. For risk factors that pertain to health or functional status and are defined using a scale that takes on more than two values, higher values of the scale typically indicate greater impairment or severity of illness. Selective risk factors take on values that simply represent counts (typically the number of problems) -- these are clear from context. The meaning associated with specific values for each risk factor can be determined from the OASIS data set.

‡ All coefficients/odds ratios are significant at P<.0001 using the likelihood ratio test for the hypothesis that the coefficient is zero. The odds ratios and their associated 90% CIs (confidence intervals) are given. These are considered significant at P<.0001 because of the very large developmental sample used to the create the models. Using this significance level and large developmental sample results in more stable models whose performance is superior under cross validation.

§ The R^2 values are the squared correlations between predicted and observed values for all patients in the developmental (validation) sample. The developmental sample size for all outcomes is 500,000, with some variation in the number of number of valid cases in this sample for particular outcome measures. The validation sample is 1,000,000 for all models, with similar variation in the number of valid cases for different outcome measures. These sample sizes pertain to both R^2s and C-statistics. The C-statistic is the area under the Receiver Operating Characteristic curve. Intuitively, the C-statistic can be described as follows: It is the probability that two individuals who differ on the dependent variable (e.g., one achieves the outcome and one does not) also differ (in the same direction) on the predicted value calculated from the model.

TABLE 28: Logistic Regression Model for Predicting the Outcome of Improvement in Bowel Incontinence.

Risk Factor Measured at SOC/ROC*†	Coefficient‡	Odds Ratio‡	(90% CI)‡
Age: under 65 (0-1)	-0.248	0.780	(0.735 - 0.828)
Patient has informal caregiver(s) (0-1)	0.182	1.200	(1.141 - 1.262)
Inpatient discharge from hospital (0-1)	0.302	1.353	(1.297 - 1.410)
Inpatient discharge from rehabilitation facility (0-1)	0.396	1.486	(1.380 - 1.599)
Inpatient discharge from nursing home (0-1)	0.314	1.369	(1.279 - 1.467)
Rehabilitative prognosis is good (0-1)	0.116	1.123	(1.079 - 1.169)
Disability in transferring (0-5)	-0.090	0.914	(0.892 - 0.936)
Disability in ambulation (0-5)	-0.103	0.903	(0.880 - 0.925)
Prior (2 weeks ago) disability in grooming (0-3)	-0.063	0.939	(0.916 - 0.964)
Prior (2 weeks ago) disability in toileting (0-4)	-0.105	0.900	(0.883 - 0.917)
Disability in telephone use (0-5)	-0.070	0.932	(0.918 - 0.946)
Patient does not have telephone (0-1)	-0.429	0.651	(0.588 - 0.721)
Speech/language impairment (0-5)	-0.084	0.919	(0.900 - 0.939)
Confusion scale (0-4)	-0.078	0.925	(0.908 - 0.942)
Stage 2-4 pressure ulcer(s) present (0-1)	-0.283	0.753	(0.712 - 0.797)
Urinary incontinence severity (0-4)	-0.109	0.897	(0.879 - 0.915)
Bowel incontinence frequency: Level 2 (0-1)	-0.048	0.953	(0.905 - 1.004)
Bowel incontinence frequency: Level 3 (0-1)	0.168	1.183	(1.106 - 1.266)
Bowel incontinence frequency: Level 4 (0-1)	0.285	1.329	(1.250 - 1.413)
Bowel incontinence frequency: Level 5 (0-1)	1.227	3.411	(3.053 - 3.812)
Acute condition: orthopedic (0-1)	0.108	1.115	(1.066 - 1.166)
Acute condition: cardiac/peripheral vascular (0-1)	0.133	1.142	(1.090 - 1.196)
Chronic condition: urinary incontinence/catheter (0-1)	-0.171	0.843	(0.804 - 0.884)
Diagnosis: genitourinary system diseases (0-1)	-0.143	0.867	(0.823 - 0.913)
Rehabilitation procedures: other than physical therapy (0-1)	0.215	1.240	(1.152 - 1.334)
Constant	1.408		

Number of Risk Factors: 25

$R^{2,\S}$: Developmental R^2 = 0.145 Validation R^2 = 0.146

C:§ Developmental C-statistic = 0.721 Validation C-statistic = 0.723

* SOC = Start of Care, ROC = Resumption of Care after inpatient stay. Risk factors pertain to SOC/ROC values.

† The number of values in the measurement scale for each risk factor is in parentheses. For risk factors that take on the value 0 and 1, the value 1 denotes the presence of the attribute and 0 denotes its absence. For risk factors that pertain to health or functional status and are defined using a scale that takes on more than two values, higher values of the scale typically indicate greater impairment or severity of illness. Selective risk factors take on values that simply represent counts (typically the number of problems) -- these are clear from context. The meaning associated with specific values for each risk factor can be determined from the OASIS data set.

‡ All coefficients/odds ratios are significant at P<.0001 using the likelihood ratio test for the hypothesis that the coefficient is zero. The odds ratios and their associated 90% CIs (confidence intervals) are given. These are considered significant at P<.0001 because of the very large developmental sample used to the create the models. Using this significance level and large developmental sample results in more stable models whose performance is superior under cross validation.

§ The R^2 values are the squared correlations between predicted and observed values for all patients in the developmental (validation) sample. The developmental sample size for all outcomes is 500,000, with some variation in the number of number of valid cases in this sample for particular outcome measures. The validation sample is 1,000,000 for all models, with similar variation in the number of valid cases for different outcome measures. These sample sizes pertain to both R^2s and C-statistics. The C-statistic is the area under the Receiver Operating Characteristic curve. Intuitively, the C-statistic can be described as follows: It is the probability that two individuals who differ on the dependent variable (e.g., one achieves the outcome and one does not) also differ (in the same direction) on the predicted value calculated from the model.

TABLE 29: Logistic Regression Model for Predicting the Outcome of Improvement in Status of Surgical Wounds.

Risk Factor Measured at SOC/ROC*†	Coefficient‡	Odds Ratio‡	(90% CI)‡
Age: under 65 (0-1)	-0.216	0.806	(0.776 - 0.836)
Age: 75 to 84, inclusive (0-1)	0.116	1.123	(1.090 - 1.158)
Age: 85 or more (0-1)	0.238	1.269	(1.211 - 1.330)
Gender: female (0-1)	0.125	1.133	(1.104 - 1.164)
Any HMO payment source (0-1)	-0.218	0.804	(0.776 - 0.834)
Both Medicare and Medicaid payment sources (0-1)	0.221	1.247	(1.163 - 1.336)
Patient lives in own home (0-1)	0.117	1.124	(1.085 - 1.164)
Patient has informal caregiver(s) (0-1)	-0.158	0.854	(0.806 - 0.904)
Inpatient discharge from rehabilitation facility (0-1)	0.089	1.093	(1.055 - 1.132)
Overall prognosis moderate or better (0-1)	0.248	1.282	(1.197 - 1.372)
Overall prognosis not known (0-1)	0.382	1.465	(1.257 - 1.708)
Disability in grooming (0-3)	0.062	1.064	(1.043 - 1.084)
Disability in transferring (0-5)	0.073	1.075	(1.052 - 1.099)
Prior (2 weeks ago) disability in bathing (0-5)	-0.031	0.970	(0.961 - 0.978)
Disability in housekeeping (0-4)	0.038	1.039	(1.028 - 1.049)
Disability in management of oral medications (0-2)	0.083	1.087	(1.062 - 1.112)
Dyspnea (shortness of breath) (0-4)	0.080	1.083	(1.068 - 1.098)
Vision impairment (0-2)	0.101	1.106	(1.068 - 1.146)
Number of surgical wounds present (0-4)	-0.109	0.897	(0.886 - 0.909)
Status of surgical wound: Level 2 (0-1)	1.271	3.564	(3.468 - 3.662)
Status of surgical wound: Level 3 (0-1)	2.358	10.569	(9.885 - 11.299)
Obese at SOC/ROC (0-1)	-0.090	0.914	(0.883 - 0.946)
Number of diagnoses with severity rating >= 2 (0-6)	0.054	1.056	(1.046 - 1.065)
Acute condition: orthopedic (0-1)	0.212	1.236	(1.197 - 1.276)
Acute condition: neurologic (0-1)	0.288	1.334	(1.246 - 1.428)
Acute condition: pulmonary (0-1)	0.128	1.136	(1.082 - 1.193)
Diagnosis: skin/subcutaneous diseases (0-1)	-0.141	0.869	(0.830 - 0.910)
Diagnosis: other injury (0-1)	-0.126	0.882	(0.837 - 0.929)
Diagnosis: circulatory system diseases (0-1)	0.153	1.165	(1.133 - 1.198)
Aftercare following hip, joint replacement or fracture (0-1)	-0.124	0.883	(0.847 - 0.922)
Aftercare following surgery (0-1)	-0.164	0.848	(0.822 - 0.876)
Constant	-0.405		

Number of Risk Factors: 31

R^2:§ Developmental R^2 = 0.091 Validation R^2 = 0.086

C:§ Developmental C-statistic = 0.701 Validation C-statistic = 0.696

* SOC = Start of Care, ROC = Resumption of Care after inpatient stay. Risk factors pertain to SOC/ROC values.

† The number of values in the measurement scale for each risk factor is in parentheses. For risk factors that take on the value 0 and 1, the value 1 denotes the presence of the attribute and 0 denotes its absence. For risk factors that pertain to health or functional status and are defined using a scale that takes on more than two values, higher values of the scale typically indicate greater impairment or severity of illness. Selective risk factors take on values that simply represent counts (typically the number of problems) -- these are clear from context. The meaning associated with specific values for each risk factor can be determined from the OASIS data set.

‡ All coefficients/odds ratios are significant at P<.0001 using the likelihood ratio test for the hypothesis that the coefficient is zero. The odds ratios and their associated 90% CIs (confidence intervals) are given. These are considered significant at P<.0001 because of the very large developmental sample used to the create the models. Using this significance level and large developmental sample results in more stable models whose performance is superior under cross validation.

TABLE 29: Logistic Regression Model for Predicting the Outcome of Improvement in Status of Surgical Wounds. (cont'd)

§ The R^2 values are the squared correlations between predicted and observed values for all patients in the developmental (validation) sample. The developmental sample size for all outcomes is 500,000, with some variation in the number of number of valid cases in this sample for particular outcome measures. The validation sample is 1,000,000 for all models, with similar variation in the number of valid cases for different outcome measures. These sample sizes pertain to both R^2s and C-statistics. The C-statistic is the area under the Receiver Operating Characteristic curve. Intuitively, the C-statistic can be described as follows: It is the probability that two individuals who differ on the dependent variable (e.g., one achieves the outcome and one does not) also differ (in the same direction) on the predicted value calculated from the model.

TABLE 30: Logistic Regression Model for Predicting the Outcome of Improvement in Number of Surgical Wounds.

Risk Factor Measured at SOC/ROC*†	Coefficient‡	Odds Ratio‡	(90% CI)‡
Age: under 65 (0-1)	-0.084	0.920	(0.891 - 0.949)
Age: 75 to 84, inclusive (0-1)	0.093	1.098	(1.070 - 1.126)
Age: 85 or more (0-1)	0.237	1.268	(1.219 - 1.319)
Gender: female (0-1)	0.086	1.090	(1.066 - 1.115)
Any HMO payment source (0-1)	-0.191	0.826	(0.801 - 0.853)
Both Medicare and Medicaid payment sources (0-1)	0.224	1.252	(1.182 - 1.326)
Patient has informal caregiver(s) (0-1)	-0.156	0.856	(0.815 - 0.898)
Inpatient discharge from rehabilitation facility (0-1)	0.116	1.123	(1.090 - 1.157)
Disability in grooming (0-3)	0.100	1.105	(1.086 - 1.125)
Disability in transferring (0-5)	0.083	1.087	(1.067 - 1.106)
Prior (2 weeks ago) disability in grooming (0-3)	-0.066	0.936	(0.916 - 0.957)
Disability in management of oral medications (0-2)	0.098	1.103	(1.077 - 1.129)
Prior (2 weeks ago) disability in transportation (0-2)	0.109	1.115	(1.087 - 1.143)
Prior (2 weeks ago) disability in mgt. of oral medications (0-2)	-0.084	0.920	(0.897 - 0.943)
Dyspnea (shortness of breath) (0-4)	0.063	1.065	(1.053 - 1.077)
Vision impairment (0-2)	0.157	1.170	(1.137 - 1.205)
Stage of most problematic pressure ulcer (0-4)	0.091	1.096	(1.067 - 1.125)
Stasis ulcer(s) present (0-1)	0.378	1.459	(1.291 - 1.649)
Number of surgical wounds present: Level 2 (0-1)	0.823	2.277	(2.207 - 2.350)
Number of surgical wounds present: Level 3 (0-1)	0.904	2.468	(2.361 - 2.581)
Number of surgical wounds present: Level 4 (0-1)	0.582	1.789	(1.724 - 1.856)
Status of surgical wound (0-3)	-0.387	0.679	(0.666 - 0.692)
Bowel ostomy (0-1)	0.277	1.319	(1.240 - 1.404)
Maximum severity rating among all diagnoses (0-4)	0.051	1.052	(1.033 - 1.072)
Number of diagnoses with severity rating >= 2 (0-6)	0.056	1.058	(1.050 - 1.066)
Acute condition: mental/emotional (0-1)	0.419	1.521	(1.291 - 1.791)
Acute condition: IV/infusion therapy (0-1)	0.314	1.369	(1.292 - 1.452)
Acute condition: neurologic (0-1)	0.223	1.250	(1.181 - 1.324)
Chronic condition: dependence in living skills (0-1)	0.120	1.127	(1.090 - 1.165)
Diagnosis: other injury (0-1)	0.161	1.174	(1.123 - 1.228)
Diagnosis: respiratory system diseases (0-1)	0.101	1.106	(1.065 - 1.148)
Attention to artificial openings: urinary (0-1)	0.323	1.382	(1.227 - 1.555)
Aftercare following hip, joint replacement or fracture (0-1)	-0.249	0.780	(0.753 - 0.807)
Aftercare following surgery (0-1)	-0.232	0.793	(0.772 - 0.814)
Long-term use of therapeutic pharmaceuticals (0-1)	-0.103	0.902	(0.864 - 0.942)
Constant	0.164		

Number of Risk Factors: 35

$R^{2,\S}$: Developmental R^2 = 0.070 Validation R^2 = 0.066

C:§ Developmental C-statistic = 0.653 Validation C-statistic = 0.649

* SOC = Start of Care, ROC = Resumption of Care after inpatient stay. Risk factors pertain to SOC/ROC values.

† The number of values in the measurement scale for each risk factor is in parentheses. For risk factors that take on the value 0 and 1, the value 1 denotes the presence of the attribute and 0 denotes its absence. For risk factors that pertain to health or functional status and are defined using a scale that takes on more than two values, higher values of the scale typically indicate greater impairment or severity of illness. Selective risk factors take on values that simply represent counts (typically the number of problems) -- these are clear from context. The meaning associated with specific values for each risk factor can be determined from the OASIS data set.

TABLE 30: Logistic Regression Model for Predicting the Outcome of Improvement in Number of Surgical Wounds. (cont'd)

‡ All coefficients/odds ratios are significant at P<.0001 using the likelihood ratio test for the hypothesis that the coefficient is zero. The odds ratios and their associated 90% CIs (confidence intervals) are given. These are considered significant at P<.0001 because of the very large developmental sample used to the create the models. Using this significance level and large developmental sample results in more stable models whose performance is superior under cross validation.

§ The R^2 values are the squared correlations between predicted and observed values for all patients in the developmental (validation) sample. The developmental sample size for all outcomes is 500,000, with some variation in the number of number of valid cases in this sample for particular outcome measures. The validation sample is 1,000,000 for all models, with similar variation in the number of valid cases for different outcome measures. These sample sizes pertain to both R^2s and C-statistics. The C-statistic is the area under the Receiver Operating Characteristic curve. Intuitively, the C-statistic can be described as follows: It is the probability that two individuals who differ on the dependent variable (e.g., one achieves the outcome and one does not) also differ (in the same direction) on the predicted value calculated from the model.

TABLE 31: Logistic Regression Model for Predicting the Outcome of Improvement in Anxiety Level.

Risk Factor Measured at SOC/ROC*†	Coefficient‡	Odds Ratio‡	(90% CI)‡
Acute condition: orthopedic (0-1)	0.129	1.137	(1.112 - 1.164)
Acute condition: oxygen therapy (0-1)	-0.108	0.897	(0.872 - 0.923)
Acute condition: open wound/lesion (0-1)	-0.065	0.937	(0.917 - 0.958)
Acute condition: cardiac/peripheral vascular (0-1)	0.062	1.064	(1.041 - 1.086)
Age: under 65 (0-1)	-0.147	0.863	(0.837 - 0.890)
Age: 85 or more (0-1)	0.060	1.062	(1.037 - 1.087)
Anxiety level scale Level 2 (0-1)	0.734	2.083	(2.042 - 2.125)
Anxiety level scale Level 3 (0-1)	1.693	5.434	(5.123 - 5.764)
Demonstrated behavior: verbal disruption (0-1)	-0.217	0.805	(0.754 - 0.859)
Chronic condition: impaired ambulation/mobility (0-1)	0.097	1.102	(1.068 - 1.136)
Disability in cognitive functioning (0-4)	-0.061	0.940	(0.924 - 0.957)
Confusion scale (0-4)	-0.049	0.952	(0.940 - 0.964)
Total number of chronic conditions reported (0-9)	-0.074	0.928	(0.921 - 0.936)
Depression symptom scale (0-5)	-0.147	0.863	(0.850 - 0.877)
Surgical wound(s) present (0-1)	0.121	1.129	(1.097 - 1.161)
Dyspnea (shortness of breath) (0-4)	-0.041	0.960	(0.951 - 0.969)
Gender: female (0-1)	-0.152	0.859	(0.842 - 0.877)
Inpatient discharge from hospital (0-1)	0.146	1.157	(1.133 - 1.181)
Inpatient discharge from rehabilitation facility (0-1)	0.231	1.259	(1.218 - 1.301)
Inpatient discharge from nursing home (0-1)	0.137	1.147	(1.109 - 1.186)
Disability in laundry (0-2)	0.054	1.056	(1.035 - 1.077)
Patient lives with family member (0-1)	0.085	1.089	(1.067 - 1.110)
Disability in dressing lower body (0-3)	0.066	1.068	(1.056 - 1.080)
Pain interfering with activity (0-3)	-0.049	0.953	(0.943 - 0.962)
Medicaid (not Medicare) as payment source (0-1)	-0.139	0.870	(0.833 - 0.909)
Any HMO payment source (0-1)	0.104	1.109	(1.075 - 1.144)
Disruptive/socially inappropriate behavior prior to past 2 weeks (0-1)	-0.204	0.816	(0.763 - 0.872)
Rehabilitative prognosis is good (0-1)	0.112	1.119	(1.095 - 1.144)
Heavy smoking at SOC/ROC (0-1)	-0.096	0.909	(0.880 - 0.938)
Speech/language impairment (0-5)	-0.065	0.937	(0.924 - 0.952)
Diagnosis: neoplasms (0-1)	-0.124	0.883	(0.853 - 0.915)
Diagnosis: mental disease (0-1)	-0.228	0.796	(0.775 - 0.818)
Rehabilitation procedures: physical therapy (0-1)	0.187	1.206	(1.178 - 1.234)
Aftercare following surgery (0-1)	0.122	1.130	(1.087 - 1.175)
Aftercare following hip, joint replacement or fracture (0-1)	0.173	1.188	(1.127 - 1.253)
Constant	-0.017		

Number of Risk Factors: 35

$R^{2,\S}$: Developmental R^2 = 0.065 Validation R^2 = 0.063

C:§ Developmental C-statistic = 0.646 Validation C-statistic = 0.645

* SOC = Start of Care, ROC = Resumption of Care after inpatient stay. Risk factors pertain to SOC/ROC values.

† The number of values in the measurement scale for each risk factor is in parentheses. For risk factors that take on the value 0 and 1, the value 1 denotes the presence of the attribute and 0 denotes its absence. For risk factors that pertain to health or functional status and are defined using a scale that takes on more than two values, higher values of the scale typically indicate greater impairment or severity of illness. Selective risk factors take on values that simply represent counts (typically the number of problems) -- these are clear from context. The meaning associated with specific values for each risk factor can be determined from the OASIS data set.

TABLE 31: Logistic Regression Model for Predicting the Outcome of Improvement in Anxiety Level. (cont'd)

‡ All coefficients/odds ratios are significant at P<.0001 using the likelihood ratio test for the hypothesis that the coefficient is zero. The odds ratios and their associated 90% CIs (confidence intervals) are given. These are considered significant at P<.0001 because of the very large developmental sample used to the create the models. Using this significance level and large developmental sample results in more stable models whose performance is superior under cross validation.

§ The R^2 values are the squared correlations between predicted and observed values for all patients in the developmental (validation) sample. The developmental sample size for all outcomes is 500,000, with some variation in the number of number of valid cases in this sample for particular outcome measures. The validation sample is 1,000,000 for all models, with similar variation in the number of valid cases for different outcome measures. These sample sizes pertain to both R^2s and C-statistics. The C-statistic is the area under the Receiver Operating Characteristic curve. Intuitively, the C-statistic can be described as follows: It is the probability that two individuals who differ on the dependent variable (e.g., one achieves the outcome and one does not) also differ (in the same direction) on the predicted value calculated from the model.

TABLE 32: Logistic Regression Model for Predicting the Outcome of Stabilization in Anxiety Level.

Risk Factor Measured at SOC/ROC*†	Coefficient‡	Odds Ratio‡	(90% CI)‡
Age: under 65 (0-1)	-0.094	0.911	(0.885 - 0.937)
Gender: female (0-1)	-0.309	0.734	(0.719 - 0.749)
Both Medicare and Medicaid payment sources (0-1)	0.168	1.183	(1.132 - 1.236)
Patient lives with family member (0-1)	0.064	1.066	(1.044 - 1.089)
Patient has informal caregiver(s) (0-1)	0.074	1.076	(1.043 - 1.110)
Overall prognosis moderate or better (0-1)	0.088	1.092	(1.053 - 1.132)
Rehabilitative prognosis is good (0-1)	0.152	1.164	(1.133 - 1.196)
Disability in management of oral medications (0-2)	-0.057	0.944	(0.930 - 0.959)
Prior (2 weeks ago) disability in shopping (0-3)	-0.025	0.975	(0.966 - 0.985)
Dyspnea (shortness of breath) (0-4)	-0.052	0.949	(0.940 - 0.959)
Vision impairment (0-2)	0.058	1.060	(1.039 - 1.082)
Speech/language impairment (0-5)	-0.052	0.949	(0.935 - 0.963)
Pain interfering with activity (0-3)	-0.053	0.948	(0.938 - 0.959)
Intractable pain (0-1)	-0.159	0.853	(0.827 - 0.879)
Demonstrated behavior: memory deficit (0-1)	0.099	1.104	(1.062 - 1.147)
Demonstrated behavior: verbal disruption (0-1)	-0.443	0.642	(0.585 - 0.704)
Anxiety level scale Level 1 (0-1)	0.879	2.408	(2.348 - 2.469)
Anxiety level scale Level 2 (0-1)	2.907	18.308	(17.220 - 19.464)
Depression symptom scale (0-5)	-0.284	0.753	(0.738 - 0.768)
Confusion scale (0-4)	-0.073	0.929	(0.917 - 0.942)
Status of surgical wound (0-3)	0.062	1.064	(1.052 - 1.077)
Bowel ostomy (0-1)	-0.174	0.840	(0.786 - 0.898)
Heavy smoking at SOC/ROC (0-1)	-0.151	0.860	(0.830 - 0.891)
Number of diagnoses with severity rating >= 2 (0-6)	-0.021	0.980	(0.973 - 0.986)
Acute condition: mental/emotional (0-1)	-0.440	0.644	(0.595 - 0.698)
Acute condition: oxygen therapy (0-1)	-0.108	0.897	(0.869 - 0.926)
Acute condition: orthopedic (0-1)	0.076	1.079	(1.053 - 1.105)
Chronic condition: cognitive/mental/behavioral problems (0-1)	-0.124	0.884	(0.855 - 0.913)
Diagnosis: musculoskeletal system diseases (0-1)	0.111	1.117	(1.092 - 1.144)
Diagnosis: neoplasms (0-1)	-0.219	0.804	(0.777 - 0.831)
Diagnosis: mental disease (0-1)	-0.303	0.739	(0.715 - 0.763)
Diagnosis: nervous system disorder (0-1)	-0.070	0.932	(0.905 - 0.960)
Diagnosis: respiratory system diseases (0-1)	-0.095	0.909	(0.885 - 0.934)
Resumption of Care with intervening in-patient stay (0-1)	-0.159	0.853	(0.828 - 0.879)
Rehabilitation procedures: other than physical therapy (0-1)	-0.159	0.853	(0.821 - 0.887)
Rehabilitation procedures: physical therapy (0-1)	0.156	1.168	(1.140 - 1.198)
Constant	2.063		

Number of Risk Factors: 36

$R^{2,\S}$:	Developmental R^2 = 0.042	Validation R^2 = 0.041
C:§	Developmental C-statistic = 0.686	Validation C-statistic = 0.686

* SOC = Start of Care, ROC = Resumption of Care after inpatient stay. Risk factors pertain to SOC/ROC values.

† The number of values in the measurement scale for each risk factor is in parentheses. For risk factors that take on the value 0 and 1, the value 1 denotes the presence of the attribute and 0 denotes its absence. For risk factors that pertain to health or functional status and are defined using a scale that takes on more than two values, higher values of the scale typically indicate greater impairment or severity of illness. Selective risk factors take on values that simply represent counts (typically the number of problems) -- these are clear from context. The meaning associated with specific values for each risk factor can be determined from the OASIS data set.

TABLE 32: Logistic Regression Model for Predicting the Outcome of Stabilization in Anxiety Level. (cont'd)

‡ All coefficients/odds ratios are significant at P<.0001 using the likelihood ratio test for the hypothesis that the coefficient is zero. The odds ratios and their associated 90% CIs (confidence intervals) are given. These are considered significant at P<.0001 because of the very large developmental sample used to the create the models. Using this significance level and large developmental sample results in more stable models whose performance is superior under cross validation.

§ The R^2 values are the squared correlations between predicted and observed values for all patients in the developmental (validation) sample. The developmental sample size for all outcomes is 500,000, with some variation in the number of number of valid cases in this sample for particular outcome measures. The validation sample is 1,000,000 for all models, with similar variation in the number of valid cases for different outcome measures. These sample sizes pertain to both R^2s and C-statistics. The C-statistic is the area under the Receiver Operating Characteristic curve. Intuitively, the C-statistic can be described as follows: It is the probability that two individuals who differ on the dependent variable (e.g., one achieves the outcome and one does not) also differ (in the same direction) on the predicted value calculated from the model.

TABLE 33: Logistic Regression Model for Predicting the Outcome of Improvement in Speech and Language.

Risk Factor Measured at SOC/ROC*†	Coefficient‡	Odds Ratio‡	(90% CI)‡
Age: under 65 (0-1)	-0.175	0.840	(0.808 - 0.873)
Any HMO payment source (0-1)	0.153	1.165	(1.123 - 1.209)
Medicaid (not Medicare) as payment source (0-1)	-0.175	0.839	(0.792 - 0.889)
Patient lives in own home (0-1)	0.091	1.096	(1.068 - 1.124)
Patient has informal caregiver(s) (0-1)	0.105	1.111	(1.075 - 1.148)
Inpatient discharge from hospital (0-1)	0.323	1.382	(1.348 - 1.417)
Inpatient discharge from rehabilitation facility (0-1)	0.342	1.408	(1.355 - 1.463)
Inpatient discharge from nursing home (0-1)	0.229	1.258	(1.211 - 1.307)
Rehabilitative prognosis is good (0-1)	0.061	1.063	(1.038 - 1.089)
Disability in bathing (0-5)	0.030	1.031	(1.019 - 1.042)
Disability in laundry (0-2)	0.134	1.143	(1.107 - 1.180)
Disability in shopping (0-3)	0.050	1.052	(1.031 - 1.073)
Disability in telephone use (0-5)	-0.168	0.845	(0.837 - 0.853)
Patient does not have telephone (0-1)	-0.598	0.550	(0.515 - 0.588)
Disability in management of oral medications (0-2)	-0.159	0.853	(0.836 - 0.871)
No oral medications prescribed (0-1)	-0.372	0.689	(0.621 - 0.765)
Prior (2 weeks ago) disability in laundry (0-2)	-0.082	0.921	(0.901 - 0.942)
Vision impairment (0-2)	-0.049	0.952	(0.933 - 0.971)
Speech/language impairment: Level 2 (0-1)	1.110	3.034	(2.934 - 3.137)
Speech/language impairment: Level 3 (0-1)	1.267	3.550	(3.372 - 3.739)
Speech/language impairment: Level 4 (0-1)	1.519	4.566	(4.224 - 4.935)
Speech/language impairment: Level 5 (0-1)	1.725	5.613	(4.967 - 6.344)
Pain interfering with activity (0-3)	0.037	1.037	(1.026 - 1.049)
Disability in cognitive functioning (0-4)	-0.188	0.828	(0.814 - 0.843)
Confusion scale (0-4)	-0.052	0.949	(0.937 - 0.962)
Surgical wound(s) present (0-1)	0.166	1.181	(1.145 - 1.217)
Urinary incontinence severity (0-4)	-0.022	0.979	(0.970 - 0.987)
Bowel incontinence frequency (0-5)	-0.032	0.968	(0.958 - 0.979)
Impaired decision-making prior to past 2 weeks (0-1)	-0.096	0.908	(0.883 - 0.934)
Acute condition: oxygen therapy (0-1)	0.122	1.129	(1.092 - 1.168)
Acute condition: enteral/parenteral nutrition (0-1)	-0.296	0.744	(0.691 - 0.801)
Acute condition: orthopedic (0-1)	0.083	1.086	(1.059 - 1.115)
Total number of chronic conditions reported (0-9)	-0.060	0.942	(0.932 - 0.951)
Diagnosis: infectious/parasitic disease (0-1)	0.174	1.190	(1.116 - 1.270)
Diagnosis: mental disease (0-1)	-0.111	0.895	(0.868 - 0.922)
Diagnosis: nervous system disorder (0-1)	-0.173	0.841	(0.817 - 0.866)
Resumption of Care with intervening in-patient stay (0-1)	-0.083	0.921	(0.888 - 0.954)
Rehabilitation procedures: physical therapy (0-1)	0.207	1.230	(1.198 - 1.262)
Constant	-0.274		

Number of Risk Factors: 38

R^2:§ Developmental R^2 = 0.097 Validation R^2 = 0.093

C:§ Developmental C-statistic = 0.679 Validation C-statistic = 0.677

* SOC = Start of Care, ROC = Resumption of Care after inpatient stay. Risk factors pertain to SOC/ROC values.

† The number of values in the measurement scale for each risk factor is in parentheses. For risk factors that take on the value 0 and 1, the value 1 denotes the presence of the attribute and 0 denotes its absence. For risk factors that pertain to health or functional status and are defined using a scale that takes on more than two values, higher values of the scale typically indicate greater impairment or severity of illness. Selective risk factors take on values that simply represent counts (typically the number of problems) -- these are clear from context. The meaning associated with specific values for each risk factor can be determined from the OASIS data set.

TABLE 33: Logistic Regression Model for Predicting the Outcome of Improvement in Speech and Language. (cont'd)

‡ All coefficients/odds ratios are significant at P<.0001 using the likelihood ratio test for the hypothesis that the coefficient is zero. The odds ratios and their associated 90% CIs (confidence intervals) are given. These are considered significant at P<.0001 because of the very large developmental sample used to the create the models. Using this significance level and large developmental sample results in more stable models whose performance is superior under cross validation.

§ The R^2 values are the squared correlations between predicted and observed values for all patients in the developmental (validation) sample. The developmental sample size for all outcomes is 500,000, with some variation in the number of number of valid cases in this sample for particular outcome measures. The validation sample is 1,000,000 for all models, with similar variation in the number of valid cases for different outcome measures. These sample sizes pertain to both R^2s and C-statistics. The C-statistic is the area under the Receiver Operating Characteristic curve. Intuitively, the C-statistic can be described as follows: It is the probability that two individuals who differ on the dependent variable (e.g., one achieves the outcome and one does not) also differ (in the same direction) on the predicted value calculated from the model.

TABLE 34: Logistic Regression Model for Predicting the Outcome of Stabilization in Speech and Language.

Risk Factor Measured at SOC/ROC*†	Coefficient‡	Odds Ratio‡	(90% CI)‡
Age: 85 or more (0-1)	-0.088	0.916	(0.892 - 0.940)
Gender: female (0-1)	0.080	1.083	(1.058 - 1.109)
Patient lives in own home (0-1)	0.118	1.126	(1.097 - 1.155)
Patient has informal caregiver(s) (0-1)	0.080	1.084	(1.049 - 1.120)
Inpatient discharge from hospital (0-1)	0.124	1.132	(1.105 - 1.160)
Overall prognosis moderate or better (0-1)	0.114	1.121	(1.079 - 1.165)
Rehabilitative prognosis is good (0-1)	0.168	1.183	(1.149 - 1.219)
Disability in grooming (0-3)	-0.076	0.927	(0.909 - 0.945)
Disability in dressing upper body (0-3)	-0.106	0.899	(0.877 - 0.922)
Disability in dressing lower body (0-3)	0.065	1.067	(1.046 - 1.090)
Disability in toileting (0-4)	-0.082	0.921	(0.908 - 0.934)
Disability in telephone use (0-5)	-0.151	0.860	(0.851 - 0.868)
Patient does not have telephone (0-1)	-0.505	0.604	(0.563 - 0.647)
Disability in management of oral medications (0-2)	-0.305	0.737	(0.721 - 0.754)
No oral medications prescribed (0-1)	-0.601	0.548	(0.493 - 0.609)
Prior (2 weeks ago) disability in transportation (0-2)	-0.184	0.832	(0.809 - 0.855)
Hearing impairment (0-4)	-0.095	0.910	(0.895 - 0.924)
Speech/language impairment: Level 1 (0-1)	1.588	4.894	(4.730 - 5.064)
Speech/language impairment: Level 2 (0-1)	2.446	11.541	(10.883 - 12.239)
Speech/language impairment: Level 3 (0-1)	2.963	19.351	(17.808 - 21.028)
Speech/language impairment: Level 4 (0-1)	3.882	48.530	(42.538 - 55.366)
Pain interfering with activity (0-3)	0.092	1.097	(1.085 - 1.109)
Demonstrated behavior: impaired decision-making (0-1)	0.096	1.101	(1.061 - 1.142)
Disability in cognitive functioning (0-4)	-0.295	0.744	(0.729 - 0.760)
Confusion scale (0-4)	-0.132	0.876	(0.864 - 0.889)
Stage 1-4 pressure ulcer(s) present (0-1)	-0.137	0.872	(0.836 - 0.909)
Surgical wound(s) present (0-1)	0.220	1.245	(1.188 - 1.306)
Number of surgical wounds present (0-4)	0.073	1.076	(1.049 - 1.104)
Urinary incontinence frequency (0-4)	-0.034	0.966	(0.959 - 0.973)
Obese at SOC/ROC (0-1)	0.139	1.149	(1.111 - 1.188)
Acute condition: mental/emotional (0-1)	-0.293	0.746	(0.692 - 0.805)
Acute condition: enteral/parenteral nutrition (0-1)	-0.394	0.674	(0.621 - 0.732)
Acute condition: orthopedic (0-1)	0.124	1.132	(1.100 - 1.165)
Acute condition: neurologic (0-1)	-0.259	0.772	(0.744 - 0.800)
Total number of acute conditions reported (0-16)	0.025	1.025	(1.015 - 1.036)
Chronic condition: impaired ambulation/mobility (0-1)	0.120	1.127	(1.092 - 1.164)
Chronic condition: eating disability (0-1)	-0.149	0.862	(0.817 - 0.910)
Chronic condition: dependence in medication admin. (0-1)	-0.163	0.849	(0.822 - 0.877)
Chronic condition: cognitive/mental/behavioral problems (0-1)	-0.308	0.735	(0.710 - 0.761)
Diagnosis: musculoskeletal system diseases (0-1)	0.107	1.113	(1.083 - 1.143)
Diagnosis: neoplasms (0-1)	-0.236	0.789	(0.759 - 0.822)
Diagnosis: mental disease (0-1)	-0.258	0.773	(0.748 - 0.799)
Diagnosis: nervous system disorder (0-1)	-0.092	0.912	(0.883 - 0.943)
Rehabilitation procedures: other than physical therapy (0-1)	-0.136	0.873	(0.835 - 0.912)
Rehabilitation procedures: physical therapy (0-1)	0.121	1.129	(1.098 - 1.161)
Constant	2.463		

Number of Risk Factors: 45

$R^{2,\S}$: Developmental R^2 = 0.083 Validation R^2 = 0.084

C:§ Developmental C-statistic = 0.757 Validation C-statistic = 0.757

TABLE 34: Logistic Regression Model for Predicting the Outcome of Stabilization in Speech and Language. (cont'd)

* SOC = Start of Care, ROC = Resumption of Care after inpatient stay. Risk factors pertain to SOC/ROC values.

† The number of values in the measurement scale for each risk factor is in parentheses. For risk factors that take on the value 0 and 1, the value 1 denotes the presence of the attribute and 0 denotes its absence. For risk factors that pertain to health or functional status and are defined using a scale that takes on more than two values, higher values of the scale typically indicate greater impairment or severity of illness. Selective risk factors take on values that simply represent counts (typically the number of problems) -- these are clear from context. The meaning associated with specific values for each risk factor can be determined from the OASIS data set.

‡ All coefficients/odds ratios are significant at P<.0001 using the likelihood ratio test for the hypothesis that the coefficient is zero. The odds ratios and their associated 90% CIs (confidence intervals) are given. These are considered significant at P<.0001 because of the very large developmental sample used to the create the models. Using this significance level and large developmental sample results in more stable models whose performance is superior under cross validation.

§ The R^2 values are the squared correlations between predicted and observed values for all patients in the developmental (validation) sample. The developmental sample size for all outcomes is 500,000, with some variation in the number of number of valid cases in this sample for particular outcome measures. The validation sample is 1,000,000 for all models, with similar variation in the number of valid cases for different outcome measures. These sample sizes pertain to both R^2s and C-statistics. The C-statistic is the area under the Receiver Operating Characteristic curve. Intuitively, the C-statistic can be described as follows: It is the probability that two individuals who differ on the dependent variable (e.g., one achieves the outcome and one does not) also differ (in the same direction) on the predicted value calculated from the model.

TABLE 35: Logistic Regression Model for Predicting the Outcome of Improvement in Cognitive Functioning.

Risk Factor Measured at SOC/ROC*†	Coefficient‡	Odds Ratio‡	(90% CI)‡
Age: 85 or more (0-1)	-0.100	0.905	(0.884 - 0.926)
Any HMO payment source (0-1)	0.126	1.134	(1.095 - 1.175)
Patient lives in own home (0-1)	0.120	1.127	(1.100 - 1.156)
Patient lives with family member (0-1)	0.168	1.183	(1.145 - 1.223)
Patient lives alone (0-1)	0.124	1.132	(1.089 - 1.178)
Inpatient discharge from hospital (0-1)	0.318	1.375	(1.341 - 1.409)
Inpatient discharge from rehabilitation facility (0-1)	0.366	1.443	(1.391 - 1.497)
Inpatient discharge from nursing home (0-1)	0.237	1.268	(1.223 - 1.314)
Rehabilitative prognosis is good (0-1)	0.068	1.070	(1.045 - 1.096)
Disability in housekeeping (0-4)	0.080	1.084	(1.070 - 1.097)
Disability in telephone use (0-5)	-0.113	0.894	(0.886 - 0.901)
Patient does not have telephone (0-1)	-0.433	0.649	(0.608 - 0.692)
Disability in management of oral medications (0-2)	-0.172	0.842	(0.824 - 0.860)
No oral medications prescribed (0-1)	-0.369	0.692	(0.622 - 0.769)
Prior (2 weeks ago) disability in housekeeping (0-4)	-0.056	0.945	(0.936 - 0.955)
Dyspnea (shortness of breath) (0-4)	0.035	1.036	(1.026 - 1.046)
Speech/language impairment (0-5)	-0.251	0.778	(0.766 - 0.789)
Pain interfering with activity (0-3)	0.033	1.033	(1.022 - 1.044)
Demonstrated behavior: memory deficit (0-1)	-0.130	0.878	(0.852 - 0.906)
Disability in cognitive functioning: Level 2 (0-1)	1.286	3.618	(3.506 - 3.735)
Disability in cognitive functioning: Level 3 (0-1)	2.051	7.779	(7.373 - 8.207)
Disability in cognitive functioning: Level 4 (0-1)	2.679	14.563	(13.363 - 15.872)
Confusion scale (0-4)	-0.186	0.831	(0.820 - 0.841)
Status of surgical wound (0-3)	0.093	1.098	(1.079 - 1.116)
Urinary incontinence frequency (0-4)	-0.046	0.955	(0.949 - 0.961)
Bowel incontinence frequency (0-5)	-0.044	0.957	(0.947 - 0.967)
Impaired decision-making prior to past 2 weeks (0-1)	-0.117	0.890	(0.864 - 0.916)
Memory loss requiring supervision prior to past 2 weeks (0-1)	-0.114	0.893	(0.865 - 0.921)
Obese at SOC/ROC (0-1)	0.100	1.105	(1.071 - 1.140)
Acute condition: open wound/lesion (0-1)	-0.077	0.926	(0.903 - 0.950)
Acute condition: terminal (0-1)	-0.097	0.908	(0.877 - 0.940)
Total number of acute conditions reported (0-16)	0.053	1.054	(1.043 - 1.065)
Chronic condition: eating disability (0-1)	-0.258	0.773	(0.737 - 0.811)
Chronic condition: dependence in medication admin. (0-1)	-0.147	0.863	(0.837 - 0.891)
Chronic condition: cognitive/mental/behavioral problems (0-1)	-0.151	0.860	(0.833 - 0.888)
Diagnosis: mental disease (0-1)	-0.196	0.822	(0.799 - 0.845)
Diagnosis: nervous system disorder (0-1)	-0.160	0.852	(0.828 - 0.877)
Diagnosis: circulatory system diseases (0-1)	0.054	1.056	(1.033 - 1.079)
Resumption of Care with intervening in-patient stay (0-1)	-0.084	0.920	(0.889 - 0.951)
Rehabilitation procedures: physical therapy (0-1)	0.199	1.221	(1.191 - 1.251)
Constant	-0.110		

Number of Risk Factors: 40

R^{2}:§ Developmental R^2 = 0.110 Validation R^2 = 0.107

C:§ Developmental C-statistic = 0.691 Validation C-statistic = 0.688

TABLE 35: Logistic Regression Model for Predicting the Outcome of Improvement in Cognitive Functioning. (cont'd)

* SOC = Start of Care, ROC = Resumption of Care after inpatient stay. Risk factors pertain to SOC/ROC values.

† The number of values in the measurement scale for each risk factor is in parentheses. For risk factors that take on the value 0 and 1, the value 1 denotes the presence of the attribute and 0 denotes its absence. For risk factors that pertain to health or functional status and are defined using a scale that takes on more than two values, higher values of the scale typically indicate greater impairment or severity of illness. Selective risk factors take on values that simply represent counts (typically the number of problems) -- these are clear from context. The meaning associated with specific values for each risk factor can be determined from the OASIS data set.

‡ All coefficients/odds ratios are significant at P<.0001 using the likelihood ratio test for the hypothesis that the coefficient is zero. The odds ratios and their associated 90% CIs (confidence intervals) are given. These are considered significant at P<.0001 because of the very large developmental sample used to the create the models. Using this significance level and large developmental sample results in more stable models whose performance is superior under cross validation.

§ The R^2 values are the squared correlations between predicted and observed values for all patients in the developmental (validation) sample. The developmental sample size for all outcomes is 500,000, with some variation in the number of number of valid cases in this sample for particular outcome measures. The validation sample is 1,000,000 for all models, with similar variation in the number of valid cases for different outcome measures. These sample sizes pertain to both R^2s and C-statistics. The C-statistic is the area under the Receiver Operating Characteristic curve. Intuitively, the C-statistic can be described as follows: It is the probability that two individuals who differ on the dependent variable (e.g., one achieves the outcome and one does not) also differ (in the same direction) on the predicted value calculated from the model.

TABLE 36: Logistic Regression Model for Predicting the Outcome of Stabilization in Cognitive Functioning.

Risk Factor Measured at SOC/ROC*†	Coefficient‡	Odds Ratio‡	(90% CI)‡
Age: 75 to 84, inclusive (0-1)	-0.300	0.741	(0.721 - 0.761)
Age: 85 or more (0-1)	-0.498	0.608	(0.589 - 0.627)
Any HMO payment source (0-1)	-0.099	0.906	(0.876 - 0.937)
Patient lives in own home (0-1)	0.074	1.076	(1.049 - 1.104)
Patient has informal caregiver(s) (0-1)	0.150	1.162	(1.125 - 1.200)
Inpatient discharge from hospital (0-1)	0.131	1.140	(1.113 - 1.168)
Medical regimen change in past 14 days (0-1)	0.081	1.084	(1.052 - 1.117)
Overall prognosis moderate or better (0-1)	0.125	1.133	(1.090 - 1.178)
Rehabilitative prognosis is good (0-1)	0.163	1.177	(1.143 - 1.212)
Disability in grooming (0-3)	-0.061	0.941	(0.927 - 0.955)
Disability in toileting (0-4)	-0.045	0.956	(0.941 - 0.971)
Disability in ambulation (0-5)	-0.046	0.955	(0.939 - 0.971)
Prior (2 weeks ago) disability in eating (0-5)	0.087	1.091	(1.064 - 1.118)
Disability in telephone use (0-5)	-0.080	0.923	(0.913 - 0.932)
Patient does not have telephone (0-1)	-0.292	0.746	(0.695 - 0.802)
Disability in management of oral medications (0-2)	-0.400	0.670	(0.656 - 0.685)
No oral medications prescribed (0-1)	-0.646	0.524	(0.472 - 0.581)
Prior (2 weeks ago) disability in transportation (0-2)	-0.145	0.865	(0.838 - 0.892)
Prior (2 weeks ago) disability in shopping (0-3)	-0.056	0.945	(0.932 - 0.959)
Dyspnea (shortness of breath) (0-4)	0.048	1.049	(1.039 - 1.060)
Vision impairment (0-2)	0.062	1.064	(1.041 - 1.088)
Hearing impairment (0-4)	-0.071	0.932	(0.917 - 0.947)
Speech/language impairment (0-5)	-0.317	0.728	(0.716 - 0.741)
Pain interfering with activity (0-3)	0.077	1.080	(1.068 - 1.092)
Disability in cognitive functioning: Level 1 (0-1)	1.589	4.900	(4.735 - 5.072)
Disability in cognitive functioning: Level 2 (0-1)	2.887	17.931	(16.920 - 19.001)
Disability in cognitive functioning: Level 3 (0-1)	4.173	64.913	(59.318 - 71.036)
Confusion scale (0-4)	-0.314	0.731	(0.720 - 0.741)
Surgical wound(s) present (0-1)	0.226	1.254	(1.197 - 1.314)
Number of surgical wounds present (0-4)	0.081	1.085	(1.057 - 1.112)
Presence of urinary incontinence (0-1)	-0.136	0.873	(0.851 - 0.895)
Bowel incontinence frequency (0-5)	-0.047	0.954	(0.942 - 0.966)
Disruptive/socially inappropriate behavior prior to past 2 weeks (0-1)	-0.254	0.775	(0.713 - 0.844)
Memory loss requiring supervision prior to past 2 weeks (0-1)	-0.191	0.826	(0.794 - 0.859)
Obese at SOC/ROC (0-1)	0.117	1.124	(1.087 - 1.163)
Acute condition: neurologic (0-1)	-0.144	0.866	(0.837 - 0.896)
Chronic condition: impaired ambulation/mobility (0-1)	0.151	1.163	(1.124 - 1.204)
Chronic condition: eating disability (0-1)	-0.225	0.798	(0.745 - 0.855)
Chronic condition: dependence in medication admin. (0-1)	-0.142	0.868	(0.840 - 0.897)
Chronic condition: cognitive/mental/behavioral problems (0-1)	-0.426	0.653	(0.632 - 0.675)
Diagnosis: musculoskeletal system diseases (0-1)	0.141	1.151	(1.123 - 1.179)
Diagnosis: neoplasms (0-1)	-0.223	0.800	(0.769 - 0.832)
Diagnosis: mental disease (0-1)	-0.400	0.670	(0.649 - 0.693)
Resumption of Care with intervening in-patient stay (0-1)	-0.159	0.853	(0.823 - 0.883)
Rehabilitation procedures: other than physical therapy (0-1)	-0.166	0.847	(0.812 - 0.883)
Rehabilitation procedures: physical therapy (0-1)	0.084	1.087	(1.058 - 1.117)
Constant	2.712		

Number of Risk Factors: 46

R^2:§ Developmental R^2 = 0.080 Validation R^2 = 0.082

C:§ Developmental C-statistic = 0.757 Validation C-statistic = 0.758

TABLE 36: Logistic Regression Model for Predicting the Outcome of Stabilization in Cognitive Functioning. (cont'd)

* SOC = Start of Care, ROC = Resumption of Care after inpatient stay. Risk factors pertain to SOC/ROC values.

† The number of values in the measurement scale for each risk factor is in parentheses. For risk factors that take on the value 0 and 1, the value 1 denotes the presence of the attribute and 0 denotes its absence. For risk factors that pertain to health or functional status and are defined using a scale that takes on more than two values, higher values of the scale typically indicate greater impairment or severity of illness. Selective risk factors take on values that simply represent counts (typically the number of problems) -- these are clear from context. The meaning associated with specific values for each risk factor can be determined from the OASIS data set.

‡ All coefficients/odds ratios are significant at P<.0001 using the likelihood ratio test for the hypothesis that the coefficient is zero. The odds ratios and their associated 90% CIs (confidence intervals) are given. These are considered significant at P<.0001 because of the very large developmental sample used to the create the models. Using this significance level and large developmental sample results in more stable models whose performance is superior under cross validation.

§ The R^2 values are the squared correlations between predicted and observed values for all patients in the developmental (validation) sample. The developmental sample size for all outcomes is 500,000, with some variation in the number of number of valid cases in this sample for particular outcome measures. The validation sample is 1,000,000 for all models, with similar variation in the number of valid cases for different outcome measures. These sample sizes pertain to both R^2s and C-statistics. The C-statistic is the area under the Receiver Operating Characteristic curve. Intuitively, the C-statistic can be described as follows: It is the probability that two individuals who differ on the dependent variable (e.g., one achieves the outcome and one does not) also differ (in the same direction) on the predicted value calculated from the model.

TABLE 37: Logistic Regression Model for Predicting the Outcome of Improvement in Confusion Frequency.

Risk Factor Measured at SOC/ROC*[†]	Coefficient[‡]	Odds Ratio[‡]	(90% CI)[‡]
Age: 75 to 84, inclusive (0-1)	-0.149	0.861	(0.842 - 0.882)
Age: 85 or more (0-1)	-0.236	0.790	(0.769 - 0.811)
Gender: female (0-1)	-0.066	0.936	(0.917 - 0.956)
Any HMO payment source (0-1)	0.093	1.098	(1.063 - 1.133)
Patient lives in own home (0-1)	0.073	1.075	(1.050 - 1.101)
Patient lives with family member (0-1)	0.176	1.193	(1.156 - 1.231)
Patient lives alone (0-1)	0.121	1.129	(1.088 - 1.172)
Inpatient discharge from hospital (0-1)	0.264	1.303	(1.274 - 1.332)
Inpatient discharge from rehabilitation facility (0-1)	0.341	1.406	(1.360 - 1.454)
Inpatient discharge from nursing home (0-1)	0.218	1.244	(1.204 - 1.286)
Rehabilitative prognosis is good (0-1)	0.081	1.084	(1.060 - 1.109)
Disability in dressing lower body (0-3)	0.041	1.042	(1.029 - 1.056)
Disability in bathing (0-5)	0.024	1.025	(1.014 - 1.035)
Disability in laundry (0-2)	0.107	1.113	(1.085 - 1.143)
Disability in telephone use (0-5)	-0.050	0.951	(0.936 - 0.966)
Disability in management of oral medications (0-2)	-0.179	0.836	(0.822 - 0.851)
Prior (2 weeks ago) disability in laundry (0-2)	-0.066	0.936	(0.919 - 0.954)
Prior (2 weeks ago) disability in telephone use (0-5)	-0.045	0.956	(0.942 - 0.972)
Prior (2 weeks ago) patient did not have phone (0-1)	-0.467	0.627	(0.588 - 0.668)
Prior (2 weeks ago) no oral medications prescribed (0-1)	-0.240	0.787	(0.724 - 0.855)
Speech/language impairment (0-5)	-0.112	0.894	(0.882 - 0.907)
Intractable pain (0-1)	0.086	1.090	(1.060 - 1.121)
Demonstrated behavior: memory deficit (0-1)	-0.101	0.904	(0.877 - 0.932)
Disability in cognitive functioning (0-4)	-0.284	0.753	(0.741 - 0.765)
Confusion scale: Level 2 (0-1)	1.568	4.795	(4.544 - 5.061)
Confusion scale: Level 3 (0-1)	1.348	3.849	(3.732 - 3.970)
Confusion scale: Level 4 (0-1)	2.004	7.419	(7.029 - 7.830)
Surgical wound(s) present (0-1)	0.127	1.135	(1.105 - 1.167)
Urinary incontinence frequency (0-4)	-0.030	0.971	(0.965 - 0.977)
Bowel incontinence frequency (0-5)	-0.045	0.956	(0.946 - 0.966)
Impaired decision-making prior to past 2 weeks (0-1)	-0.084	0.920	(0.893 - 0.947)
Memory loss requiring supervision prior to past 2 weeks (0-1)	-0.105	0.901	(0.873 - 0.929)
Number of diagnoses with severity rating >= 2 (0-6)	0.020	1.020	(1.014 - 1.027)
Acute condition: orthopedic (0-1)	0.091	1.095	(1.071 - 1.119)
Acute condition: neurologic (0-1)	0.091	1.096	(1.062 - 1.130)
Acute condition: terminal (0-1)	-0.079	0.924	(0.896 - 0.953)
Acute condition: pulmonary (0-1)	0.068	1.071	(1.043 - 1.099)
Chronic condition: impaired ambulation/mobility (0-1)	0.111	1.117	(1.081 - 1.154)
Chronic condition: cognitive/mental/behavioral problems (0-1)	-0.112	0.894	(0.865 - 0.924)
Total number of chronic conditions reported (0-9)	-0.054	0.948	(0.936 - 0.959)
Diagnosis: neoplasms (0-1)	-0.108	0.897	(0.864 - 0.932)
Diagnosis: mental disease (0-1)	-0.239	0.788	(0.767 - 0.809)
Diagnosis: nervous system disorder (0-1)	-0.200	0.819	(0.795 - 0.843)
Resumption of Care with intervening in-patient stay (0-1)	-0.090	0.914	(0.886 - 0.943)
Rehabilitation procedures: physical therapy (0-1)	0.149	1.161	(1.134 - 1.189)
Aftercare following surgery (0-1)	0.142	1.153	(1.103 - 1.206)
Constant	-0.280		

Number of Risk Factors: 46

R^{2}:[§] Developmental R^2 = 0.107 Validation R^2 = 0.105

C:[§] Developmental C-statistic = 0.688 Validation C-statistic = 0.688

TABLE 37: Logistic Regression Model for Predicting the Outcome of Improvement in Confusion Frequency. (cont'd)

* SOC = Start of Care, ROC = Resumption of Care after inpatient stay. Risk factors pertain to SOC/ROC values.

† The number of values in the measurement scale for each risk factor is in parentheses. For risk factors that take on the value 0 and 1, the value 1 denotes the presence of the attribute and 0 denotes its absence. For risk factors that pertain to health or functional status and are defined using a scale that takes on more than two values, higher values of the scale typically indicate greater impairment or severity of illness. Selective risk factors take on values that simply represent counts (typically the number of problems) -- these are clear from context. The meaning associated with specific values for each risk factor can be determined from the OASIS data set.

‡ All coefficients/odds ratios are significant at P<.0001 using the likelihood ratio test for the hypothesis that the coefficient is zero. The odds ratios and their associated 90% CIs (confidence intervals) are given. These are considered significant at P<.0001 because of the very large developmental sample used to the create the models. Using this significance level and large developmental sample results in more stable models whose performance is superior under cross validation.

§ The R^2 values are the squared correlations between predicted and observed values for all patients in the developmental (validation) sample. The developmental sample size for all outcomes is 500,000, with some variation in the number of number of valid cases in this sample for particular outcome measures. The validation sample is 1,000,000 for all models, with similar variation in the number of valid cases for different outcome measures. These sample sizes pertain to both R^2s and C-statistics. The C-statistic is the area under the Receiver Operating Characteristic curve. Intuitively, the C-statistic can be described as follows: It is the probability that two individuals who differ on the dependent variable (e.g., one achieves the outcome and one does not) also differ (in the same direction) on the predicted value calculated from the model.

TABLE 38: Logistic Regression Model for Predicting the Outcome of Improvement in Behavior Problem Frequency.

Risk Factor Measured at SOC/ROC*†	Coefficient‡	Odds Ratio‡	(90% CI)‡
Age: under 65 (0-1)	-0.189	0.827	(0.777 - 0.882)
Medicaid (not Medicare) as payment source (0-1)	-0.254	0.776	(0.711 - 0.848)
Patient lives in own home (0-1)	0.106	1.112	(1.068 - 1.157)
Inpatient discharge from hospital (0-1)	0.239	1.271	(1.220 - 1.323)
Inpatient discharge from rehabilitation facility (0-1)	0.396	1.486	(1.381 - 1.599)
Inpatient discharge from nursing home (0-1)	0.283	1.327	(1.240 - 1.421)
Demonstrated behavior: memory deficit (0-1)	-0.149	0.862	(0.822 - 0.904)
Demonstrated behavior: impaired decision-making (0-1)	-0.114	0.892	(0.855 - 0.931)
Demonstrated behavior: verbal disruption (0-1)	-0.156	0.856	(0.805 - 0.910)
Behavior problem frequency: Level 2 (0-1)	0.165	1.179	(1.045 - 1.331)
Behavior problem frequency: Level 3 (0-1)	-0.072	0.931	(0.861 - 1.007)
Behavior problem frequency: Level 4 (0-1)	0.155	1.168	(1.088 - 1.254)
Behavior problem frequency: Level 5 (0-1)	0.061	1.063	(0.996 - 1.134)
Disability in cognitive functioning (0-4)	-0.125	0.882	(0.860 - 0.906)
Confusion scale (0-4)	-0.057	0.945	(0.925 - 0.965)
Status of surgical wound (0-3)	0.086	1.090	(1.060 - 1.121)
Memory loss requiring supervision prior to past 2 weeks (0-1)	-0.113	0.893	(0.851 - 0.938)
Acute condition: terminal (0-1)	-0.146	0.864	(0.821 - 0.910)
Total number of chronic conditions reported (0-9)	-0.088	0.916	(0.904 - 0.927)
Diagnosis: mental disease (0-1)	-0.105	0.900	(0.862 - 0.940)
Rehabilitation procedures: physical therapy (0-1)	0.151	1.163	(1.113 - 1.216)
Constant	1.033		

Number of Risk Factors: 21

R^2:§ Developmental R^2 = 0.061 Validation R^2 = 0.059

C:§ Developmental C-statistic = 0.647 Validation C-statistic = 0.644

* SOC = Start of Care, ROC = Resumption of Care after inpatient stay. Risk factors pertain to SOC/ROC values.

† The number of values in the measurement scale for each risk factor is in parentheses. For risk factors that take on the value 0 and 1, the value 1 denotes the presence of the attribute and 0 denotes its absence. For risk factors that pertain to health or functional status and are defined using a scale that takes on more than two values, higher values of the scale typically indicate greater impairment or severity of illness. Selective risk factors take on values that simply represent counts (typically the number of problems) -- these are clear from context. The meaning associated with specific values for each risk factor can be determined from the OASIS data set.

‡ All coefficients/odds ratios are significant at P<.0001 using the likelihood ratio test for the hypothesis that the coefficient is zero. The odds ratios and their associated 90% CIs (confidence intervals) are given. These are considered significant at P<.0001 because of the very large developmental sample used to the create the models. Using this significance level and large developmental sample results in more stable models whose performance is superior under cross validation.

§ The R^2 values are the squared correlations between predicted and observed values for all patients in the developmental (validation) sample. The developmental sample size for all outcomes is 500,000, with some variation in the number of number of valid cases in this sample for particular outcome measures. The validation sample is 1,000,000 for all models, with similar variation in the number of valid cases for different outcome measures. These sample sizes pertain to both R^2s and C-statistics. The C-statistic is the area under the Receiver Operating Characteristic curve. Intuitively, the C-statistic can be described as follows: It is the probability that two individuals who differ on the dependent variable (e.g., one achieves the outcome and one does not) also differ (in the same direction) on the predicted value calculated from the model.

TABLE 39: Logistic Regression Model for Predicting the Outcome of Discharged to Community.

Risk Factor Measured at SOC/ROC*†	Coefficient‡	Odds Ratio‡	(90% CI)‡
Age: 75 to 84, inclusive (0-1)	0.050	1.051	(1.037 - 1.066)
Age: 85 or more (0-1)	0.073	1.076	(1.058 - 1.094)
Gender: female (0-1)	0.054	1.056	(1.043 - 1.069)
Any HMO payment source (0-1)	0.220	1.246	(1.222 - 1.270)
Both Medicare and Medicaid payment sources (0-1)	-0.139	0.870	(0.850 - 0.890)
Medicaid (not Medicare) as payment source (0-1)	-0.427	0.653	(0.638 - 0.667)
Patient lives in own home (0-1)	0.058	1.060	(1.045 - 1.075)
Patient lives with family member (0-1)	-0.063	0.939	(0.920 - 0.959)
Patient lives alone (0-1)	-0.183	0.833	(0.813 - 0.853)
Caregiver provides ADL assistance (0-1)	0.057	1.059	(1.043 - 1.075)
Caregiver provides IADL assistance (0-1)	0.103	1.109	(1.081 - 1.137)
Infrequency of caregiver assistance (1-7)	-0.015	0.985	(0.980 - 0.990)
Inpatient discharge from hospital (0-1)	-0.146	0.864	(0.852 - 0.876)
Inpatient discharge from rehabilitation facility (0-1)	-0.087	0.916	(0.898 - 0.935)
Inpatient discharge from nursing home (0-1)	-0.106	0.899	(0.880 - 0.918)
Medical regimen change in past 14 days (0-1)	0.075	1.078	(1.060 - 1.097)
Overall prognosis moderate or better (0-1)	0.242	1.274	(1.248 - 1.301)
Overall prognosis not known (0-1)	0.148	1.159	(1.110 - 1.210)
Rehabilitative prognosis is good (0-1)	0.284	1.329	(1.310 - 1.349)
Disability in grooming (0-3)	-0.028	0.972	(0.962 - 0.982)
Disability in dressing upper body (0-3)	-0.064	0.938	(0.929 - 0.948)
Disability in bathing (0-5)	-0.024	0.977	(0.970 - 0.983)
Disability in toileting (0-4)	-0.089	0.915	(0.905 - 0.926)
Disability in ambulation (0-5)	-0.082	0.922	(0.913 - 0.930)
Prior (2 weeks ago) disability in bathing (0-5)	-0.026	0.974	(0.967 - 0.981)
Prior (2 weeks ago) disability in toileting (0-4)	0.090	1.094	(1.081 - 1.107)
Disability in laundry (0-2)	0.057	1.059	(1.040 - 1.078)
Disability in housekeeping (0-4)	-0.035	0.965	(0.959 - 0.972)
Disability in telephone use (0-5)	-0.029	0.971	(0.961 - 0.982)
Disability in management of oral medications (0-2)	-0.152	0.859	(0.847 - 0.871)
Prior (2 weeks ago) disability in transportation (0-2)	-0.144	0.866	(0.852 - 0.879)
Prior (2 weeks ago) disability in laundry (0-2)	-0.097	0.908	(0.897 - 0.919)
Prior (2 weeks ago) disability in telephone use (0-5)	0.041	1.042	(1.031 - 1.054)
Prior (2 weeks ago) disability in mgt. of oral medications (0-2)	0.161	1.175	(1.156 - 1.195)
Dyspnea (shortness of breath) (0-4)	-0.136	0.873	(0.868 - 0.878)
Vision impairment (0-2)	-0.029	0.972	(0.961 - 0.983)
Speech/language impairment (0-5)	0.048	1.049	(1.039 - 1.058)
Pain interfering with activity (0-3)	-0.047	0.954	(0.948 - 0.960)
Intractable pain (0-1)	-0.116	0.890	(0.875 - 0.906)
Anxiety level (0-3)	-0.044	0.957	(0.950- 0.964)
Depression symptom scale (0-5)	-0.070	0.932	(0.922 - 0.942)
Confusion scale (0-4)	-0.032	0.968	(0.961 - 0.975)
Stage 3-4 pressure ulcer(s) present (0-1)	-0.238	0.788	(0.746 - 0.832)
Stage of most problematic pressure ulcer (0-4)	-0.096	0.908	(0.895 - 0.922)
No observable pressure ulcer to measure stage (0-1)	-0.420	0.657	(0.604 - 0.715)
Status of most problematic stasis ulcer (0-3)	-0.174	0.841	(0.828 - 0.853)
Surgical wound(s) present (0-1)	0.433	1.542	(1.484 - 1.601)
Status of surgical wound (0-3)	-0.101	0.904	(0.887 - 0.921)
No observable surgical wound to measure status (0-1)	-0.488	0.614	(0.576 - 0.654)
Urinary tract infection (0-1)	0.093	1.097	(1.074 - 1.122)
Urinary catheter (0-1)	-0.364	0.695	(0.672 - 0.718)
Bowel incontinence frequency (0-5)	-0.036	0.965	(0.958 - 0.971)
Bowel ostomy (0-1)	-0.311	0.733	(0.705 - 0.762)
Urinary catheter prior to past 2 weeks (0-1)	-0.321	0.726	(0.697 - 0.756)
Memory loss requiring supervision prior to past 2 weeks (0-1)	0.078	1.081	(1.059 - 1.103)
Obese at SOC/ROC (0-1)	0.080	1.083	(1.066 - 1.100)

TABLE 39: Logistic Regression Model for Predicting the Outcome of Discharged to Community. (cont'd)

Risk Factor Measured at SOC/ROC*†	Coefficient‡	Odds Ratio‡	(90% CI)‡
Drug dependency at SOC/ROC (0-1)	-0.144	0.866	(0.816 - 0.919)
Maximum severity rating among all diagnoses (0-4)	-0.089	0.915	(0.907 - 0.924)
Number of diagnoses with severity rating >= 2 (0-6)	-0.075	0.928	(0.924 - 0.932)
Acute condition: mental/emotional (0-1)	-0.346	0.707	(0.678 - 0.738)
Acute condition: oxygen therapy (0-1)	-0.243	0.784	(0.771 - 0.797)
Acute condition: IV/infusion therapy (0-1)	-0.389	0.678	(0.657 - 0.699)
Acute condition: enteral/parenteral nutrition (0-1)	-0.442	0.643	(0.617 - 0.670)
Acute condition: orthopedic (0-1)	0.162	1.175	(1.156 - 1.195)
Acute condition: neurologic (0-1)	0.113	1.120	(1.096 - 1.145)
Acute condition: open wound/lesion (0-1)	-0.084	0.919	(0.906 - 0.932)
Acute condition: terminal (0-1)	-0.109	0.897	(0.880 - 0.914)
Acute condition: cardiac/peripheral vascular (0-1)	-0.096	0.909	(0.895 - 0.923)
Chronic condition: impaired ambulation/mobility (0-1)	0.083	1.086	(1.064 - 1.109)
Chronic condition: eating disability (0-1)	0.083	1.086	(1.052 - 1.121)
Chronic condition: dependence in medication admin. (0-1)	-0.227	0.797	(0.781 - 0.813)
Diagnosis: infectious/parasitic disease (0-1)	-0.106	0.899	(0.873 - 0.926)
Diagnosis: genitourinary system diseases (0-1)	-0.194	0.824	(0.809 - 0.839)
Diagnosis: skin/subcutaneous diseases (0-1)	-0.141	0.869	(0.850 - 0.888)
Diagnosis: musculoskeletal system diseases (0-1)	0.099	1.104	(1.089 - 1.120)
Diagnosis: fractures (0-1)	0.089	1.094	(1.067 - 1.121)
Diagnosis: neoplasms (0-1)	-0.506	0.603	(0.591 - 0.614)
Diagnosis: endocrine/nutritional/metabolic (0-1)	-0.168	0.845	(0.835 - 0.856)
Diagnosis: blood diseases (0-1)	-0.242	0.785	(0.769 - 0.801)
Diagnosis: nervous system disorder (0-1)	0.084	1.087	(1.067 - 1.108)
Diagnosis: circulatory system diseases (0-1)	-0.088	0.916	(0.903 - 0.930)
Diagnosis: digestive system diseases (0-1)	-0.100	0.905	(0.889 - 0.920)
Resumption of Care with intervening in-patient stay (0-1)	-0.669	0.512	(0.504 - 0.520)
Attention to artificial openings: urinary (0-1)	-0.222	0.801	(0.761 - 0.842)
Aftercare following hip, joint replacement or fracture (0-1)	0.533	1.705	(1.637 - 1.775)
Attention to artificial openings: gastro/colostomy (0-1)	0.180	1.197	(1.123 - 1.276)
Rehabilitation procedures: physical therapy (0-1)	0.148	1.159	(1.142 - 1.177)
Aftercare following surgery (0-1)	0.141	1.151	(1.124 - 1.179)
Constant	2.186		

Number of Risk Factors: 88

R^{2}:§ Developmental R^2 = 0.171 Validation R^2 = 0.171

C:§ Developmental C-statistic = 0.745 Validation C-statistic = 0.745

* SOC = Start of Care, ROC = Resumption of Care after inpatient stay. Risk factors pertain to SOC/ROC values.

† The number of values in the measurement scale for each risk factor is in parentheses. For risk factors that take on the value 0 and 1, the value 1 denotes the presence of the attribute and 0 denotes its absence. For risk factors that pertain to health or functional status and are defined using a scale that takes on more than two values, higher values of the scale typically indicate greater impairment or severity of illness. Selective risk factors take on values that simply represent counts (typically the number of problems) -- these are clear from context. The meaning associated with specific values for each risk factor can be determined from the OASIS data set.

‡ All coefficients/odds ratios are significant at P<.0001 using the likelihood ratio test for the hypothesis that the coefficient is zero. The odds ratios and their associated 90% CIs (confidence intervals) are given. These are considered significant at P<.0001 because of the very large developmental sample used to the create the models. Using this significance level and large developmental sample results in more stable models whose performance is superior under cross validation.

TABLE 39: Logistic Regression Model for Predicting the Outcome of Discharged to Community. (cont'd)

§ The R^2 values are the squared correlations between predicted and observed values for all patients in the developmental (validation) sample. The developmental sample size for all outcomes is 500,000, with some variation in the number of number of valid cases in this sample for particular outcome measures. The validation sample is 1,000,000 for all models, with similar variation in the number of valid cases for different outcome measures. These sample sizes pertain to both R^2s and C-statistics. The C-statistic is the area under the Receiver Operating Characteristic curve. Intuitively, the C-statistic can be described as follows: It is the probability that two individuals who differ on the dependent variable (e.g., one achieves the outcome and one does not) also differ (in the same direction) on the predicted value calculated from the model.

TABLE 40: Logistic Regression Model for Predicting the Outcome of Any Emergent Care Provided.

Risk Factor Measured at SOC/ROC*†	Coefficient‡	Odds Ratio‡	(90% CI)‡
Age: under 65 (0-1)	0.077	1.080	(1.059 - 1.102)
Any HMO payment source (0-1)	-0.063	0.939	(0.920 - 0.959)
Both Medicare and Medicaid payment sources (0-1)	0.126	1.134	(1.106 - 1.162)
Medicaid (not Medicare) as payment source (0-1)	0.370	1.448	(1.411 - 1.486)
Patient lives alone (0-1)	0.087	1.091	(1.075 - 1.108)
Caregiver provides IADL assistance (0-1)	-0.046	0.955	(0.940 - 0.970)
Inpatient discharge from hospital (0-1)	0.186	1.205	(1.186 - 1.224)
Inpatient discharge from rehabilitation facility (0-1)	0.090	1.094	(1.070 - 1.120)
Inpatient discharge from nursing home (0-1)	0.147	1.158	(1.131 - 1.185)
Medical regimen change in past 14 days (0-1)	-0.052	0.949	(0.931 - 0.967)
Overall prognosis moderate or better (0-1)	-0.105	0.900	(0.882 - 0.918)
Rehabilitative prognosis is good (0-1)	-0.254	0.776	(0.763 - 0.788)
Disability in dressing upper body (0-3)	0.040	1.040	(1.031 - 1.050)
Disability in bathing (0-5)	0.024	1.024	(1.016 - 1.032)
Disability in toileting (0-4)	0.051	1.052	(1.039 - 1.065)
Disability in ambulation (0-5)	0.021	1.021	(1.012 - 1.030)
Prior (2 weeks ago) disability in bathing (0-5)	0.020	1.021	(1.013 - 1.028)
Prior (2 weeks ago) disability in toileting (0-4)	-0.069	0.933	(0.922 - 0.944)
Prior (2 weeks ago) disability in eating (0-5)	-0.043	0.958	(0.947 - 0.970)
Disability in housekeeping (0-4)	0.024	1.024	(1.017 - 1.031)
Disability in management of oral medications (0-2)	0.132	1.141	(1.124 - 1.158)
Prior (2 weeks ago) disability in transportation (0-2)	0.083	1.086	(1.068 - 1.105)
Prior (2 weeks ago) disability in laundry (0-2)	0.073	1.076	(1.063 - 1.089)
Prior (2 weeks ago) disability in telephone use (0-5)	-0.020	0.980	(0.974 - 0.986)
Prior (2 weeks ago) disability in mgt. of oral medications (0-2)	-0.098	0.907	(0.890 - 0.923)
Dyspnea (shortness of breath) (0-4)	0.085	1.089	(1.082 - 1.095)
Speech/language impairment (0-5)	-0.027	0.973	(0.965 - 0.982)
Pain interfering with activity (0-3)	0.023	1.024	(1.016 - 1.031)
Intractable pain (0-1)	0.105	1.111	(1.090 - 1.132)
Anxiety level (0-3)	0.052	1.054	(1.045 - 1.062)
Depression symptom scale (0-5)	0.062	1.064	(1.052 - 1.076)
Stage of most problematic pressure ulcer (0-4)	0.067	1.069	(1.058 - 1.080)
Number of stasis ulcers present (0-4)	0.088	1.092	(1.075 - 1.109)
Surgical wound(s) present (0-1)	-0.195	0.822	(0.807 - 0.838)
No observable surgical wound to measure status (0-1)	0.164	1.179	(1.112 - 1.249)
Urinary catheter (0-1)	0.224	1.251	(1.209 - 1.295)
Bowel incontinence frequency (0-5)	0.023	1.023	(1.016 - 1.030)
Bowel ostomy (0-1)	0.187	1.206	(1.159 - 1.254)
Urinary catheter prior to past 2 weeks (0-1)	0.167	1.181	(1.135 - 1.230)
Heavy smoking at SOC/ROC (0-1)	0.058	1.060	(1.037 - 1.083)
Maximum severity rating among all diagnoses (0-4)	0.051	1.053	(1.042 - 1.063)
Number of diagnoses with severity rating >= 2 (0-6)	0.046	1.047	(1.043 - 1.052)
Acute condition: mental/emotional (0-1)	0.246	1.278	(1.222 - 1.338)
Acute condition: oxygen therapy (0-1)	0.224	1.251	(1.228 - 1.273)
Acute condition: IV/infusion therapy (0-1)	0.227	1.254	(1.213 - 1.296)
Acute condition: enteral/parenteral nutrition (0-1)	0.361	1.434	(1.376 - 1.495)
Acute condition: orthopedic (0-1)	-0.147	0.863	(0.847 - 0.879)
Acute condition: neurologic (0-1)	-0.093	0.911	(0.890 - 0.933)
Acute condition: open wound/lesion (0-1)	0.117	1.124	(1.107 - 1.141)
Acute condition: cardiac/peripheral vascular (0-1)	0.085	1.089	(1.071 - 1.107)
Acute condition: contagious/communicable disease (0-1)	0.124	1.132	(1.085 - 1.182)
Chronic condition: dependence in medication admin. (0-1)	0.165	1.179	(1.153 - 1.205)
Diagnosis: genitourinary system diseases (0-1)	0.130	1.139	(1.119 - 1.159)
Diagnosis: musculoskeletal system diseases (0-1)	-0.101	0.904	(0.890 - 0.918)
Diagnosis: fractures (0-1)	-0.095	0.910	(0.885 - 0.935)

TABLE 40: Logistic Regression Model for Predicting the Outcome of Any Emergent Care Provided. (cont'd)

Risk Factor Measured at SOC/ROC*†	Coefficient‡	Odds Ratio‡	(90% CI)‡
Diagnosis: neoplasms (0-1)	0.183	1.201	(1.176 - 1.226)
Diagnosis: endocrine/nutritional/metabolic (0-1)	0.114	1.121	(1.106 - 1.136)
Diagnosis: blood diseases (0-1)	0.145	1.157	(1.132 - 1.182)
Diagnosis: nervous system disorder (0-1)	-0.063	0.939	(0.920 - 0.958)
Diagnosis: circulatory system diseases (0-1)	0.073	1.076	(1.058 - 1.093)
Diagnosis: respiratory system diseases (0-1)	0.067	1.069	(1.052 - 1.087)
Diagnosis: digestive system diseases (0-1)	0.090	1.094	(1.074 - 1.115)
Resumption of Care with intervening in-patient stay (0-1)	0.630	1.878	(1.847 - 1.909)
Attention to artificial openings: urinary (0-1)	0.143	1.154	(1.097 - 1.214)
Aftercare following hip, joint replacement or fracture (0-1)	-0.386	0.680	(0.651 - 0.710)
Rehabilitation procedures: physical therapy (0-1)	-0.061	0.941	(0.925 - 0.957)
Aftercare following surgery (0-1)	-0.081	0.922	(0.898 - 0.946)
Constant	-2.484		

Number of Risk Factors: 67

R^{2}:§ Developmental R^2 = 0.087 Validation R^2 = 0.086

C:§ Developmental C-statistic = 0.699 Validation C-statistic = 0.698

* SOC = Start of Care, ROC = Resumption of Care after inpatient stay. Risk factors pertain to SOC/ROC values.

† The number of values in the measurement scale for each risk factor is in parentheses. For risk factors that take on the value 0 and 1, the value 1 denotes the presence of the attribute and 0 denotes its absence. For risk factors that pertain to health or functional status and are defined using a scale that takes on more than two values, higher values of the scale typically indicate greater impairment or severity of illness. Selective risk factors take on values that simply represent counts (typically the number of problems) -- these are clear from context. The meaning associated with specific values for each risk factor can be determined from the OASIS data set.

‡ All coefficients/odds ratios are significant at P<.0001 using the likelihood ratio test for the hypothesis that the coefficient is zero. The odds ratios and their associated 90% CIs (confidence intervals) are given. These are considered significant at P<.0001 because of the very large developmental sample used to the create the models. Using this significance level and large developmental sample results in more stable models whose performance is superior under cross validation.

§ The R^2 values are the squared correlations between predicted and observed values for all patients in the developmental (validation) sample. The developmental sample size for all outcomes is 500,000, with some variation in the number of number of valid cases in this sample for particular outcome measures. The validation sample is 1,000,000 for all models, with similar variation in the number of valid cases for different outcome measures. These sample sizes pertain to both R^2s and C-statistics. The C-statistic is the area under the Receiver Operating Characteristic curve. Intuitively, the C-statistic can be described as follows: It is the probability that two individuals who differ on the dependent variable (e.g., one achieves the outcome and one does not) also differ (in the same direction) on the predicted value calculated from the model.substituting a patient's values for all risk factors into the risk model for the outcome under consideration.]

TABLE 41: Logistic Regression Model for Predicting the Outcome of Acute Care Hospitalization.

Risk Factor Measured at SOC/ROC*[†]	Coefficient[‡]	Odds Ratio[‡]	(90% CI)[‡]
Age: under 65 (0-1)	0.077	1.080	(1.059 - 1.102)
Age: 75 to 84, inclusive (0-1)	-0.051	0.950	(0.936 - 0.965)
Age: 85 or more (0-1)	-0.103	0.902	(0.886 - 0.918)
Gender: female (0-1)	-0.047	0.954	(0.942 - 0.966)
Any HMO payment source (0-1)	-0.225	0.798	(0.783 - 0.814)
Both Medicare and Medicaid payment sources (0-1)	0.162	1.176	(1.149 - 1.203)
Medicaid (not Medicare) as payment source (0-1)	0.395	1.485	(1.449 - 1.522)
Patient lives with family member (0-1)	0.066	1.068	(1.046 - 1.090)
Patient lives alone (0-1)	0.163	1.176	(1.150 - 1.204)
Caregiver provides ADL assistance (0-1)	-0.039	0.962	(0.948 - 0.977)
Caregiver provides IADL assistance (0-1)	-0.050	0.952	(0.936 - 0.968)
Inpatient discharge from hospital (0-1)	0.173	1.188	(1.171 - 1.206)
Inpatient discharge from rehabilitation facility (0-1)	0.081	1.084	(1.062 - 1.108)
Inpatient discharge from nursing home (0-1)	0.087	1.091	(1.068 - 1.115)
Medical regimen change in past 14 days (0-1)	-0.057	0.944	(0.928 - 0.961)
Overall prognosis moderate or better (0-1)	-0.098	0.907	(0.890 - 0.924)
Rehabilitative prognosis is good (0-1)	-0.270	0.764	(0.752 - 0.775)
Disability in grooming (0-3)	0.026	1.026	(1.016 - 1.036)
Disability in dressing upper body (0-3)	0.056	1.057	(1.046 - 1.069)
Disability in toileting (0-4)	0.071	1.073	(1.061 - 1.086)
Disability in ambulation (0-5)	0.064	1.067	(1.057 - 1.076)
Prior (2 weeks ago) disability in bathing (0-5)	0.043	1.044	(1.038 - 1.050)
Prior (2 weeks ago) disability in toileting (0-4)	-0.076	0.927	(0.916 - 0.938)
Disability in housekeeping (0-4)	0.027	1.028	(1.022 - 1.034)
Disability in management of oral medications (0-2)	0.136	1.146	(1.130 - 1.162)
Prior (2 weeks ago) disability in transportation (0-2)	0.149	1.160	(1.142 - 1.179)
Prior (2 weeks ago) disability in laundry (0-2)	0.079	1.083	(1.071 - 1.095)
Prior (2 weeks ago) disability in telephone use (0-5)	-0.023	0.977	(0.971 - 0.982)
Prior (2 weeks ago) disability in mgt. of oral medications (0-2)	-0.158	0.854	(0.840 - 0.869)
Dyspnea (shortness of breath) (0-4)	0.133	1.142	(1.136 - 1.149)
Vision impairment (0-2)	0.032	1.032	(1.020 - 1.044)
Speech/language impairment (0-5)	-0.046	0.955	(0.947 - 0.964)
Pain interfering with activity (0-3)	0.039	1.039	(1.033 - 1.046)
Intractable pain (0-1)	0.108	1.114	(1.094 - 1.133)
Anxiety level (0-3)	0.044	1.045	(1.037 - 1.052)
Depression symptom scale (0-5)	0.050	1.051	(1.040 - 1.062)
Confusion scale (0-4)	0.019	1.019	(1.012 - 1.027)
Stage 1-4 pressure ulcer(s) present (0-1)	-0.156	0.855	(0.800 - 0.914)
Stage 3-4 pressure ulcer(s) present (0-1)	0.182	1.200	(1.123 - 1.283)
Stage of most problematic pressure ulcer (0-4)	0.149	1.161	(1.120 - 1.203)
No observable pressure ulcer to measure stage (0-1)	0.395	1.485	(1.366 - 1.615)
Status of most problematic stasis ulcer (0-3)	0.170	1.186	(1.169 - 1.203)
Surgical wound(s) present (0-1)	-0.418	0.658	(0.633 - 0.684)
Status of surgical wound (0-3)	0.107	1.113	(1.092 - 1.135)
No observable surgical wound to measure status (0-1)	0.517	1.677	(1.573 - 1.788)
Urinary tract infection (0-1)	-0.094	0.911	(0.891 - 0.931)
Urinary catheter (0-1)	0.326	1.385	(1.340 - 1.431)
Bowel incontinence frequency (0-5)	0.032	1.033	(1.026 - 1.040)
Bowel ostomy (0-1)	0.327	1.387	(1.334 - 1.442)
Urinary catheter prior to past 2 weeks (0-1)	0.258	1.294	(1.244 - 1.346)
Memory loss requiring supervision prior to past 2 weeks (0-1)	-0.085	0.919	(0.900 - 0.938)
Obese at SOC/ROC (0-1)	-0.059	0.943	(0.928 - 0.958)
Maximum severity rating among all diagnoses (0-4)	0.081	1.084	(1.075 - 1.094)
Number of diagnoses with severity rating >= 2 (0-6)	0.072	1.074	(1.070 - 1.079)
Acute condition: mental/emotional (0-1)	0.339	1.404	(1.345 - 1.465)
Acute condition: oxygen therapy (0-1)	0.229	1.258	(1.237 - 1.278)
Acute condition: IV/infusion therapy (0-1)	0.387	1.472	(1.427 - 1.518)
Acute condition: enteral/parenteral nutrition (0-1)	0.475	1.608	(1.544 - 1.674)

TABLE 41: Logistic Regression Model for Predicting the Outcome of Acute Care Hospitalization. (cont'd)

Risk Factor Measured at SOC/ROC*†	Coefficient‡	Odds Ratio‡	(90% CI)‡
Acute condition: orthopedic (0-1)	-0.157	0.855	(0.841 - 0.870)
Acute condition: neurologic (0-1)	-0.139	0.870	(0.851 - 0.890)
Acute condition: open wound/lesion (0-1)	0.091	1.095	(1.080 - 1.111)
Acute condition: cardiac/peripheral vascular (0-1)	0.108	1.114	(1.097 - 1.131)
Chronic condition: impaired ambulation/mobility (0-1)	-0.078	0.925	(0.906 - 0.944)
Chronic condition: eating disability (0-1)	-0.090	0.914	(0.885 - 0.943)
Chronic condition: dependence in medication admin. (0-1)	0.232	1.261	(1.236 - 1.287)
Diagnosis: infectious/parasitic disease (0-1)	0.103	1.109	(1.077 - 1.142)
Diagnosis: genitourinary system diseases (0-1)	0.210	1.234	(1.212 - 1.256)
Diagnosis: skin/subcutaneous diseases (0-1)	0.147	1.158	(1.133 - 1.184)
Diagnosis: musculoskeletal system diseases (0-1)	-0.098	0.906	(0.893 - 0.920)
Diagnosis: fractures (0-1)	-0.099	0.906	(0.883 - 0.929)
Diagnosis: neoplasms (0-1)	0.345	1.412	(1.385 - 1.440)
Diagnosis: endocrine/nutritional/metabolic (0-1)	0.173	1.188	(1.174 - 1.203)
Diagnosis: blood diseases (0-1)	0.250	1.284	(1.258 - 1.310)
Diagnosis: nervous system disorder (0-1)	-0.093	0.911	(0.894 - 0.929)
Diagnosis: circulatory system diseases (0-1)	0.108	1.114	(1.097 - 1.130)
Diagnosis: digestive system diseases (0-1)	0.097	1.101	(1.082 - 1.121)
Resumption of Care with intervening in-patient stay (0-1)	0.646	1.908	(1.878 - 1.938)
Attention to artificial openings: urinary (0-1)	0.194	1.215	(1.156 - 1.277)
Aftercare following hip, joint replacement or fracture (0-1)	-0.572	0.564	(0.541 - 0.589)
Attention to artificial openings: gastro/colostomy (0-1)	-0.190	0.827	(0.776 - 0.881)
Rehabilitation procedures: physical therapy (0-1)	-0.123	0.885	(0.871 - 0.899)
Aftercare following surgery (0-1)	-0.118	0.889	(0.868 - 0.911)
Constant	-2.485		

Number of Risk Factors: 82

R^2:§ Developmental R^2 = 0.146 Validation R^2 = 0.144

C:§ Developmental C-statistic = 0.734 Validation C-statistic = 0.733

* SOC = Start of Care, ROC = Resumption of Care after inpatient stay. Risk factors pertain to SOC/ROC values.

† The number of values in the measurement scale for each risk factor is in parentheses. For risk factors that take on the value 0 and 1, the value 1 denotes the presence of the attribute and 0 denotes its absence. For risk factors that pertain to health or functional status and are defined using a scale that takes on more than two values, higher values of the scale typically indicate greater impairment or severity of illness. Selective risk factors take on values that simply represent counts (typically the number of problems) -- these are clear from context. The meaning associated with specific values for each risk factor can be determined from the OASIS data set.

‡ All coefficients/odds ratios are significant at P<.0001 using the likelihood ratio test for the hypothesis that the coefficient is zero. The odds ratios and their associated 90% CIs (confidence intervals) are given. These are considered significant at P<.0001 because of the very large developmental sample used to the create the models. Using this significance level and large developmental sample results in more stable models whose performance is superior under cross validation.

§ The R^2 values are the squared correlations between predicted and observed values for all patients in the developmental (validation) sample. The developmental sample size for all outcomes is 500,000, with some variation in the number of number of valid cases in this sample for particular outcome measures. The validation sample is 1,000,000 for all models, with similar variation in the number of valid cases for different outcome measures. These sample sizes pertain to both R^2s and C-statistics. The C-statistic is the area under the Receiver Operating Characteristic curve. Intuitively, the C-statistic can be described as follows: It is the probability that two individuals who differ on the dependent variable (e.g., one achieves the outcome and one does not) also differ (in the same direction) on the predicted value calculated from the model.