# Supplementary Appendix

This appendix has been provided by the authors to give readers additional information about their work.

Supplement to: Lindenauer PK, Rothberg MB, Pekow PS, et al. Outcomes of care by hospitalists, general internists, and family physicians. N Engl J Med 2007;357:2589-600.

Web Only Appendix A: Regression model estimates for hospital length of stay and cost

| | Length of stay | | | Cost | | |
|---|---|---|---|---|---|---|
| Covariates | Ratio* | Z | p-value | Ratio* | Z | p-value |
| Gender | | | | | | |
| Male (Ref) | 1.00 | | | 1.00 | | |
| Female | 1.03 | 6.5 | <.001 | 0.99 | -2.21 | 0.03 |
| Age Group | | | | | | |
| <= 49 (Ref) | 1.00 | 7.59 | <.001 | 1.00 | | |
| 50-64 | 1.07 | 6.2 | <.001 | 1.05 | 5.99 | <.001 |
| 65-74 | 1.07 | 11.42 | <.001 | 1.03 | 2.78 | 0.005 |

| | | | | | | |
|---|---|---|---|---|---|---|
| 75-84 | 1.13 | 10.75 | <.001 | 1.02 | 1.7 | 0.09 |
| 85+ | 1.13 | 7.59 | <.001 | 0.94 | -5.17 | <.001 |
| Race / Ethnicity | | | | | | |
| White (Ref) | 1.00 | | | 1.00 | | |
| American Indian | 1.06 | 3.05 | 0.002 | 1.03 | 1.27 | 0.20 |
| Asian/Pac Isles | 0.96 | -1.35 | 0.18 | 1.05 | 1.54 | 0.12 |
| Black | 1.03 | 3.65 | <.001 | 0.99 | -1.16 | 0.25 |
| Hispanic | 1.05 | 4.96 | <.001 | 1.31 | 24.22 | <.001 |
| Other | 1.05 | 6.74 | <.001 | 1.01 | 1.67 | 0.10 |
| Payor / Insurance | | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| Self Pay (Ref) | 1.00 | | | 1.00 | | |
| Medicaid - Mgd | 1.08 | 3.31 | <.001 | 1.15 | 5.95 | <.001 |
| Medicaid - Trad | 1.12 | 7.1 | <.001 | 1.12 | 7.01 | <.001 |
| Medicare - Mgd | 1.07 | 3.92 | <.001 | 1.12 | 6.78 | <.001 |
| Medicare - Trad | 1.10 | 6.56 | <.001 | 1.08 | 5.52 | <.001 |
| Other | 1.02 | 1.38 | 0.17 | 1.05 | 2.95 | 0.003 |
| Priv Ins - Comm | 1.01 | 0.72 | 0.47 | 0.95 | -2.83 | 0.005 |
| Priv Ins - Mgd | 1.00 | -0.07 | 0.95 | 1.03 | 2.03 | 0.04 |
| Annualized Patient Volume | | | | | | |
| Low (Ref) | 1.00 | | | 1.00 | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| High | 1.00 | 0.57 | 0.57 | 1.02 | 4.13 | <.001 |
| Comorbidities | | | | | | |
| Congestive heart failure | 1.23 | 26.79 | <.001 | 1.35 | 37.66 | <.001 |
| Chronic lung disease | 1.12 | 20.55 | <.001 | 1.11 | 18.4 | <.001 |
| Hypothyroidism | 1.01 | 1.95 | 0.05 | 1.01 | 1.43 | 0.15 |
| Renal Failure | 1.19 | 17.65 | <.001 | 1.20 | 17.81 | <.001 |
| Obesity | 1.09 | 10.5 | <.001 | 1.11 | 12.07 | <.001 |
| Fluid / Electrolyte Disorders | 1.25 | 41.57 | <.001 | 1.24 | 38.48 | <.001 |
| Depression | 1.05 | 5.87 | <.001 | 1.02 | 2.63 | 0.008 |
| Hypertension | 0.99 | -2.88 | 0.004 | 1.00 | -0.22 | 0.83 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Diabetes | 1.06 | 10.51 | <.001 | 1.05 | 8.72 | <.001 |
| Deficiency anemias | 1.20 | 28.93 | <.001 | 1.19 | 26.64 | <.001 |
| Neurological disorders | 1.10 | 11.23 | <.001 | 1.06 | 6.6 | <.001 |
| Peripheral vascular disease | 1.08 | 8.51 | <.001 | 1.07 | 7 | <.001 |
| Urban / Rural | | | | | | |
| Urban (Ref) | 1.00 | | | 1.00 | | |
| Rural | 0.92 | -12.97 | <.001 | 0.88 | -18.88 | <.001 |
| Teaching | | | | | | |
| Yes (Ref) | 1.00 | | | 1.00 | | |
| No | 1.05 | 7.07 | <.001 | 1.11 | 15.39 | <.001 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Bedsize | | | | | | |
| >= 400 (Ref) | 1.00 | | | 1.00 | | |
| < 200 | 0.90 | -11.37 | <.001 | 0.76 | -27.81 | <.001 |
| >= 200 & < 400 | 0.95 | -6.8 | <.001 | 0.82 | -28.75 | <.001 |
| Region | | | | | | |
| West (Ref) | 1.00 | | | 1.00 | | |
| Midwest | 0.99 | -1.04 | 0.30 | 1.15 | 12.9 | <.001 |
| Northeast | 1.21 | 12.19 | <.001 | 1.34 | 18.67 | <.001 |
| South | 1.13 | 12.49 | <.001 | 0.94 | -5.95 | <.001 |

* Ratios reported are the antilog of the parameter estimate, which can be interpreted in the original scale of the data as the impact relative to the reference level.

Web Only Appendix B. Propensity adjusted* outcomes of patients cared for by hospitalists, general internists and family physicians

| | LOS (days) | | Cost (US $) | | Mortality | | 14-day Readmission | |
|---|---|---|---|---|---|---|---|---|
| Diagnosis | Ratio† (95% CI) | p-value | Ratio† (95%CI) | p-value | *OR (95%CI)* | p-value | *OR (95%CI)* | p-value |
| All 7 Diagnoses | | | | | | | | |
| Hosp vs. Int | 0.90 (0.88, 0.93) | <.001 | 0.96 (0.92, 1.01) | 0.11 | 1.00 (0.87, 1.15) | 0.98 | 0.96 (0.88, 1.05) | 0.44 |
| Hosp vs. Fam Phys | 0.91 (0.86, 0.96) | <.001 | 0.97 (0.92, 1.02) | 0.25 | 1.00 (0.84, 1.18) | 0.96 | 0.89 (0.80, 0.99) | 0.04 |
| Pneumonia | | | | | | | | |
| Hosp vs. Int | 0.87 (0.84, 0.90) | <.001 | 0.94 (0.89, 0.98) | 0.009 | 1.09 (0.94, 1.26) | 0.27 | 1.04 (0.91, 1.20) | 0.54 |
| Hosp vs. Fam Phys | 0.89 (0.85, 0.93) | <.001 | 0.97 (0.91, 1.02) | 0.25 | 0.99 (0.83, 1.19) | 0.95 | 0.98 (0.83, 1.16) | 0.83 |
| Heart failure | | | | | | | | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Hosp vs. Int | 0.88 (0.85, 0.92) | <.001 | 0.95 (0.91, 1.01) | 0.08 | 0.91 (0.73, 1.12) | 0.35 | 0.90 (0.77, 1.05) | 0.17 |
| Hosp vs. Fam Phys | 0.90 (0.86, 0.94) | <.001 | 0.98 (0.92, 1.04) | 0.43 | 1.29 (0.98, 1.69) | 0.06 | 0.93 (0.77, 1.11) | 0.41 |
| Chest pain§ | | | | | | | | |
| Hosp vs. Int | 0.95 (0.92, 0.99) | 0.02 | 1.02 (0.93, 1.04) | 0.53 | -- | | 0.93 (0.72, 1.20) | 0.58 |
| Hosp vs. Fam Phys | 0.96 (0.92, 1.00) | 0.07 | 1.00 (0.84, 1.05) | 0.91 | -- | | 0.82 (0.62, 1.08) | 0.15 |
| Ischemic stroke | | | | | | | | |
| Hosp vs. Int | 0.93 (0.89, 0.98) | 0.003 | 0.99 (0.94, 1.05) | 0.77 | 1.01 (0.80, 1.26) | 0.96 | 0.91 (0.72, 1.15) | 0.44 |
| Hosp vs. Fam Phys | 0.91 (0.87, 0.96) | <.001 | 0.95 (0.89, 1.01) | 0.13 | 1.14 (0.85, 1.52) | 0.39 | 0.76 (0.58, 1.00) | 0.05 |
| Urinary tract infection | | | | | | | | |
| Hosp vs. Int | 0.92 (0.87, 0.96) | <.001 | 0.99 (0.93, 1.04) | 0.66 | 0.88 (0.53, 1.45) | 0.61 | 0.88 (0.68, 1.13) | 0.31 |
| | 0.91 (0.86, 0.96) | <.001 | 0.99 (0.92, 1.05) | 0.22 | 0.81 (0.48, 1.36) | 0.42 | 0.78 (0.59, 1.04) | 0.10 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Hosp vs. Fam Phys | | | | | | | | |
| Acute MI | | | | | | | | |
| Hosp vs. Int | 0.92 (0.86, 0.97) | 0.003 | 0.94 (0.86, 1.03) | 0.21 | 1.16 (0.94, 1.42) | 0.17 | 1.02 (0.82, 1.28) | 0.85 |
| Hosp vs. Fam Phys | 0.92 (0.86, 0.97) | 0.004 | 0.90 (0.98, 1.07) | 0.59 | 1.06 (0.83, 1.35) | 0.67 | 1.00 (0.77, 1.31) | 0.98 |
| AECOPD | | | | | | | | |
| Hosp vs. Int | 0.85 (0.81, 0.89) | <.001 | 0.92 (0.87, 0.98) | 0.008 | 1.01 (0.66, 1.53) | 0.98 | 1.01 (0.82, 1.24) | 0.93 |
| Hosp vs. Fam Phys | 0.87 (0.83, 0.92) | <.001 | 0.94 (0.88, 1.01) | 0.10 | 0.79 (0.49, 1.26) | 0.31 | 0.90 (0.70, 1.15) | 0.38 |

* Models adjust for propensity for treatment by hospitalists and propensity for treatment by internist, gender, age group, payor category, race, adjusted annual patient volume (<40 vs. 40+ pts/yr), primary diagnosis, comorbidities, hospital region, # of beds, teaching status. population, and interaction between specialty and primary diagnosis.

Odds ratios are reported for hospitalists relative to internists and hospitalists relative to family physicians.

† The ratios of hospitalist cost or LOS relative to internist or family physician are reported.

§ Chest pain patients were excluded from mortality models.