Supplementary table 1: Patient Characteristics Among Patients Receiving at least Partially Guideline-concordant vs. Guideline-discordant Antibiotics.

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| --- | --- | --- | --- |
| **Variable** | **Overall** | **HCAP-Guideline concordant** | **HCAP-Discordant** |
| **n(%)** | **n (%)** | **n(%)** |
| **149963 (100)** | **61963 (41.3)** | **88000 (58.9)** |
| **HCAP criteria** |   |   |   |
| Admit from SNF/ICF | 35426 (23.6) | 17400 (28.1) | 18026 (20.5) |
| Hemodialysis | 19195 (12.8) | 9408 (15.2) | 9787 (11.1) |
| Prior admit < 90 days | 94619 (63.1) | 39453 (63.7) | 55166 (62.7) |
| Immune suppressed | 43354 (28.9) | 19039 (30.7) | 24315 (27.6) |
| **Age**^, Median (Q1 - Q3), years | 73 (61 - 83) | 72 (60 - 82) | 74 (62 - 83) |
| **Gender** |   |   |   |
| Female | 77073 (51.4) | 30245 (48.8) | 46828 (53.2) |
| Male | 72890 (48.6) | 31718 (51.2) | 41172 (46.8) |
| **Race/Ethnicity** |   |   |   |
| White | 104378 (69.6) | 42113 (68.0) | 62265 (70.8) |
| Black | 18962 (12.6) | 8778 (14.2) | 10184 (11.6) |
| Hispanic | 5782 (3.9) | 2481 (4.0) | 3301 (3.8) |
| Other | 20841 (13.9) | 8591 (13.9) | 12250 (13.9) |
| **Marital status** |   |   |   |
| Married | 56056 (37.4) | 23301 (37.6) | 32755 (37.2) |
| Single | 79908 (53.3) | 33012 (53.3) | 46896 (53.3) |
| Other/Missing | 13999 (9.3) | 5650 (9.1) | 8349 (9.5) |
| **Insurance payor** |   |   |   |
| Medicare | 114238 (76.2) | 46526 (75.1) | 67712 (76.9) |
| Medicaid | 12090 (8.1) | 5507 (8.9) | 6583 (7.5) |
| Managed care | 13496 (9.0) | 5822 (9.4) | 7674 (8.7) |
| Commercial-Indemnity | 4340 (2.9) | 1732 (2.8) | 2608 (3.0) |
| Other | 5799 (3.9) | 2376 (3.8) | 3423 (3.9) |
| **Comorbidities** |   |   |   |
| Combined comorbidity score^, Median (Q1 - Q3) | 4 (2 - 6) | 4 (2 - 6) | 3 (2 - 5) |
|   |   |   |   |
| Congestive heart failure | 53582 (35.7) | 23114 (37.3) | 30468 (34.6) |
| Valvular disease | 19418 (12.9) | 7272 (11.7) | 12146 (13.8) |
| Pulmonary Hypertension | 13372 (8.9) | 5834 (9.4) | 7538 (8.6) |
| Peripheral vascular disease | 15255 (10.2) | 6765 (10.9) | 8490 (9.6) |
| Hypertension | 97699 (65.1) | 39638 (64.0) | 58061 (66.0) |
| Paralysis | 7412 (4.9) | 4040 (6.5) | 3372 (3.8) |
| Other neurological disorders | 23953 (16) | 10870 (17.5) | 13083 (14.9) |
| Chronic obstructive pulmonary disease  | 71007 (47.3) | 27896 (45.0) | 43111 (49.0) |
| Diabetes | 54908 (36.6) | 23912 (38.6) | 30996 (35.2) |
| Hypothyroidism | 25040 (16.7) | 10228 (16.5) | 14812 (16.8) |
| Acquired immune deficiency syndrome | 216 (0.1) | 109 (0.2) | 107 (0.1) |
| Lymphoma | 5445 (3.6) | 2467 (4.0) | 2978 (3.4) |
| Metastatic cancer | 8618 (5.7) | 4328 (7.0) | 4290 (4.9) |
| Solid tumor w/out metastasis | 7429 (5) | 3295 (5.3) | 4134 (4.7) |
| Rheumatoid arthritis/collagen vas | 7893 (5.3) | 3198 (5.2) | 4695 (5.3) |
| Obesity | 14965 (10) | 6391 (10.3) | 8574 (9.7) |
| Weight loss | 20480 (13.7) | 10960 (17.7) | 9520 (10.8) |
| Deficiency Anemias | 61367 (40.9) | 27597 (44.5) | 33770 (38.4) |
| Chronic Kidney disease  | 16145 (10.8) | 7265 (11.7) | 8880 (10.1) |
| **Principal diagnosis** |   |   |   |
| Pneumonia | 92768 (61.9) | 27913 (45.0) | 64855 (73.7) |
| Sepsis | 43916 (29.3) | 28231 (45.6) | 15685 (17.8) |
| Respiratory failure or arrest | 13279 (8.9) | 5819 (9.4) | 7460 (8.5) |
| **Other infections (POA)** |   |   |   |
| UTI | 27267 (18.2) | 13925 (22.5) | 13342 (15.2) |
| **ICU variables** |   |   |   |
| ICU on day 1 or 2 | 36825 (24.6) | 23882 (38.5) | 12943 (14.7) |
| ICU observation or CVICU on Day 1 or 2 | 8114 (5.4) | 4834 (7.8) | 3280 (3.7) |
| Intermediate care unit on Day 1 or 2 | 3395 (2.3) | 1548 (2.5) | 1847 (2.1) |
| **Steroids** |   |   |   |
| **Oral steroids (prednisone equivalent dosage)** |   |   |   |
| <10 mg  | 1785 (1.2) | 637 (1.0) | 1148 (1.3) |
| >=10mg but <= 80 mg  | 10772 (7.2) | 3980 (6.4) | 6792 (7.7) |
| >80 mg  | 3605 (2.4) | 1374 (2.2) | 2231 (2.5) |
| **Intravenous steroids (prednisone equivalent dosage)** |   |   |   |
| <10 mg  | 29 (0) | 18 (0) | 11 (0) |
| >=10mg but <=120  | 1515 (1.0) | 693 (1.1) | 822 (0.9) |
| >120 mg  | 36585 (24.4) | 14419 (23.3) | 22166 (25.2) |
| **Other Medications/treatments/therapies** |   |   |   |
| Bicarbonate | 8623 (5.8) | 5888 (9.5) | 2735 (3.1) |
| Vasopressors | 20946 (14) | 15258 (24.6) | 5688 (6.5) |
| Loop diuretics | 50814 (33.9) | 19770 (31.9) | 31044 (35.3) |
| Insulin | 48478 (32.3) | 23235 (37.5) | 25243 (28.7) |
| Arterial or Venous blood gas | 65878 (43.9) | 35080 (56.6) | 30798 (35.0) |
| Blood cultures | 135852 (90.6) | 58934 (95.1) | 76918 (87.4) |
| Sputum cultures | 20796 (13.9) | 10509 (17.0) | 10287 (11.7) |
| Urine cultures | 70339 (46.9) | 35513 (57.3) | 34826 (39.6) |
| Pleural fluid analysis | 1450 (1.0) | 761 (1.2) | 689 (0.8) |
| Blood lactate | 44004 (29.3) | 27520 (44.4) | 16484 (18.7) |
| Non-Invasive ventilation | 16624 (11.1) | 8861 (14.3) | 7763 (8.8) |
| Invasive Mechanical Ventilation | 21282 (14.2) | 14518 (23.4) | 6764 (7.7) |
| Central venous catheter | 6538 (4.4) | 4648 (7.5) | 1890 (2.1) |
| Arterial catheter | 1976 (1.3) | 1346 (2.2) | 630 (0.7) |
| Dobutamine | 1421 (0.9) | 1014 (1.6) | 407 (0.5) |
| Foley catheter | 23142 (15.4) | 12252 (19.8) | 10890 (12.4) |
| **Outcomes** |   |   |   |
| In-hospital mortality | 16706 (11.1) | 10189 (16.4) | 6517 (7.4) |
| Late§ IMV (day 3+) | 6808 (5.3) | 3593 (7.6) | 3215 (4.0) |
| Late ICU¤ admission (day 3+) | 5291 (4.7) | 2257 (5.9) | 3034 (4.0) |
| LOS^, Median (Q1 - Q3), days | 6 (4 - 10) | 7 (4 - 11) | 5 (3 - 8) |
| Costs^, Median (Q1 - Q3), $ | 10,049 (6,080 - 18,309) | 13,777 (8,222 - 24,798) | 8,171 (5,212 - 13,998) |

§ Among patients not mechanically ventilated in day 0/1/2 (n = 128,681)

¤ Among patients not admitted to ICU in day 0/1/2 (n = 113,138)

POA, Present on Admission; UTI, Urinary Tract Infection; ICU, Intensive Care Unit; IMV, Invasive Mechanical Ventilation;

All p-values were significant at <0.05 due to large size of data set.

Guideline concordant and partially guideline concordant were combined into one category for simplicity