

Supplementary Online Content

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

eTable 1. Pneumonia Diagnoses, by ICD-9-CM Code

| ICD-9-CM Code | Pneumonia diagnosis | No- AUD (N=132,744) | AUD (N=4,752) | p-value ^a |
|---------------|---|---------------------|---------------|----------------------|
| 481 | <i>Pneumococcal pneumonia</i> , No. (%) | 3,436(2.6) | 269(5.7) | <0.001 |
| 482 | Other bacterial pneumonia, No. (%) | 15,193(11.4) | 597(12.6) | 0.018 |
| 482.0 | Pneumonia due to <i>Klebsiella pneumoniae</i> , No. (%) | 789(0.59) | 31(0.65) | 0.61 |
| 482.1 | Pneumonia due to <i>Pseudomonas</i> , No. (%) | 2,084(1.6) | 68(1.4) | 0.45 |
| 482.2 | Pneumonia due to <i>Hemophilus influenzae</i> [<i>H. influenzae</i>], No. (%) | 740(0.56) | 33(0.69) | 0.21 |
| 482.30 | Pneumonia due to <i>Streptococcus</i> , unspecified, No. (%) | 601(0.45) | 46(0.97) | <0.001 |
| 482.31 | Pneumonia due to <i>Streptococcus</i> , group A, No. (%) | 90(0.07) | 4(0.08) | 0.67 |
| 482.32 | Pneumonia due to <i>Streptococcus</i> , group B, No. (%) | 122(0.09) | 9(0.19) | 0.032 |
| 482.39 | Pneumonia due to other <i>Streptococcus</i> , No. (%) | 217(0.16) | 17(0.36) | 0.001 |
| 482.40 | Pneumonia due to <i>Staphylococcus</i> , unspecified, No. (%) | 136(0.10) | 3(0.06) | 0.40 |
| 482.41 | Methicillin susceptible pneumonia due to <i>Staphylococcus</i> , No. (%) | 1,109(0.84) | 67(1.4) | <0.001 |
| 482.42 | Methicillin resistant pneumonia due to <i>Staphylococcus</i> , No. (%) | 3,137(2.4) | 101(2.1) | 0.29 |
| 482.49 | Other <i>Staphylococcus</i> pneumonia, No. (%) | 69(0.05) | 6(0.13) | 0.031 |
| 482.81 | Pneumonia due to anaerobes, No. (%) | 66(0.05) | 6(0.13) | 0.023 |
| 482.82 | Pneumonia due to <i>Escherichia coli</i> [<i>E. coli</i>], No. (%) | 514(0.39) | 15(0.32) | 0.43 |
| 482.83 | Pneumonia due to other Gram-negative bacteria, No. (%) | 2,803(2.1) | 77(1.6) | 0.020 |
| 482.84 | Pneumonia due to <i>Legionnaires'</i> disease, No. (%) | 487(0.37) | 46(0.97) | <0.001 |

| | | | | |
|-------------|--|--------------|-------------|--------|
| 482.89 | Pneumonia due to other specified bacteria, No. (%) | 76(0.06) | 1(0.02) | 0.30 |
| 482.9 | Bacterial pneumonia, unspecified, No. (%) | 3,083(2.3) | 98(2.1) | 0.24 |
| 483.0-483.8 | Pneumonia due to other specified organism, including <i>Mycoplasma pneumoniae</i> , <i>Chlamydia</i> , No. (%) | 871(0.66) | 51(1.1) | <0.001 |
| 484.0-484.8 | Pneumonia in infectious diseases classified elsewhere, No. (%) | 137(0.10) | 6(0.13) | 0.63 |
| 485 | Bronchopneumonia, organism unspecified, No. (%) | 624(0.47) | 19(0.40) | 0.49 |
| 486 | Pneumonia, organism unspecified, No. (%) | 94,265(71.0) | 2,915(61.3) | <0.001 |
| 507.0 | Pneumonitis due to inhalation of food or vomitus, No. (%) | 22,351(16.8) | 1,147(24.1) | <0.001 |

^aAll p-values based on Pearson's uncorrected chi-square test.

Abbreviations: AUD, alcohol use disorder

eTable 2. ICD-9-CM Codes for Alcohol Use Disorders

| Code | Diagnosis | Total (N=4,752) |
|---|--|----------------------------|
| Codes related to Alcohol Abuse | | |
| 303.00 | Acute alcoholic intoxication in alcoholism, unspecified, No. (%) | 97(2.0) |
| 303.01 | Acute alcoholic intoxication in alcoholism, continuous, No. (%) | 112(2.4) |
| 303.02 | Acute alcoholic intoxication in alcoholism, episodic, No. (%) | 4(0.08) |
| 303.90 | Other and unspecified alcohol dependence, unspecified, No. (%) | 1,432(30.1) |
| 303.91 | Other and unspecified alcohol dependence, continuous, No. (%) | 755(15.9) |
| 303.92 | Other and unspecified alcohol dependence, episodic, No. (%) | 16(0.34) |
| 305.00 | Alcohol abuse, unspecified, No. (%) | 1,862(39.2) |
| 305.01 | Alcohol abuse, continuous, No. (%) | 420(8.8) |
| 305.02 | Alcohol abuse, episodic, No. (%) | 36(0.76) |
| Codes related to Alcohol Withdrawal Syndrome | | |
| 291.81 | Alcohol withdrawal, No. (%) | 629(13.2) |
| 291.82 | Alcohol induced sleep disorders, No. (%) | 0(0.0) |
| 291.89 | Other alcohol-induced mental disorders, No. (%) | 6(0.13) |
| 291.9 | Unspecified alcohol-induced mental disorders, No. (%) | 2(0.04) |
| 291.0 | Alcohol withdrawal delirium, No. (%) | 379(8.0) |
| 291.1 | Alcohol-induced persisting amnesic disorder, No. (%) | 15(0.32) |
| 291.2 | Alcohol-induced persisting dementia, No. (%) | 114(2.4) |
| 291.3 | Alcohol-induced psychotic disorder with hallucinations, No. (%) | 5(0.11) |
| 291.5 | Alcohol-induced psychotic disorder with delusions, No. (%) | 2(0.04) |

eTable 3. Hospital Characteristics of Patients, by Absence or Presence of Alcohol Use Disorders

| Factor | No AUD (N=132,744) | AUD (N=4,752) | P Value^a |
|----------------------|-------------------------------|--------------------------|----------------------------|
| Bed size, No. (%) | | | <.001 |
| . < 200 Beds | 28,172(21.2) | 899(18.9) | |
| . 201 - 400 Beds | 57,248(43.1) | 1,830(38.5) | |
| . > 401 Beds | 47,324(35.7) | 2,023(42.6) | |
| Urban/Rural, No. (%) | | | .35 |
| . Rural | 16,012(12.1) | 552(11.6) | |
| . Urban | 116,732(87.9) | 4,200(88.4) | |
| Teach, No. (%) | | | <.001 |
| . No | 78,997(59.5) | 2,580(54.3) | |
| . Yes | 53,747(40.5) | 2,172(45.7) | |
| Region, No. (%) | | | .040 |
| . Midwest | 33,482(25.2) | 1,136(23.9) | |
| . Northeast | 24,772(18.7) | 863(18.2) | |
| . South | 56,729(42.7) | 2,127(44.8) | |
| . West | 17,761(13.4) | 626(13.2) | |

^aAll P values from Pearson's uncorrected chi-square test.

Abbreviations: AUD, alcohol use disorder

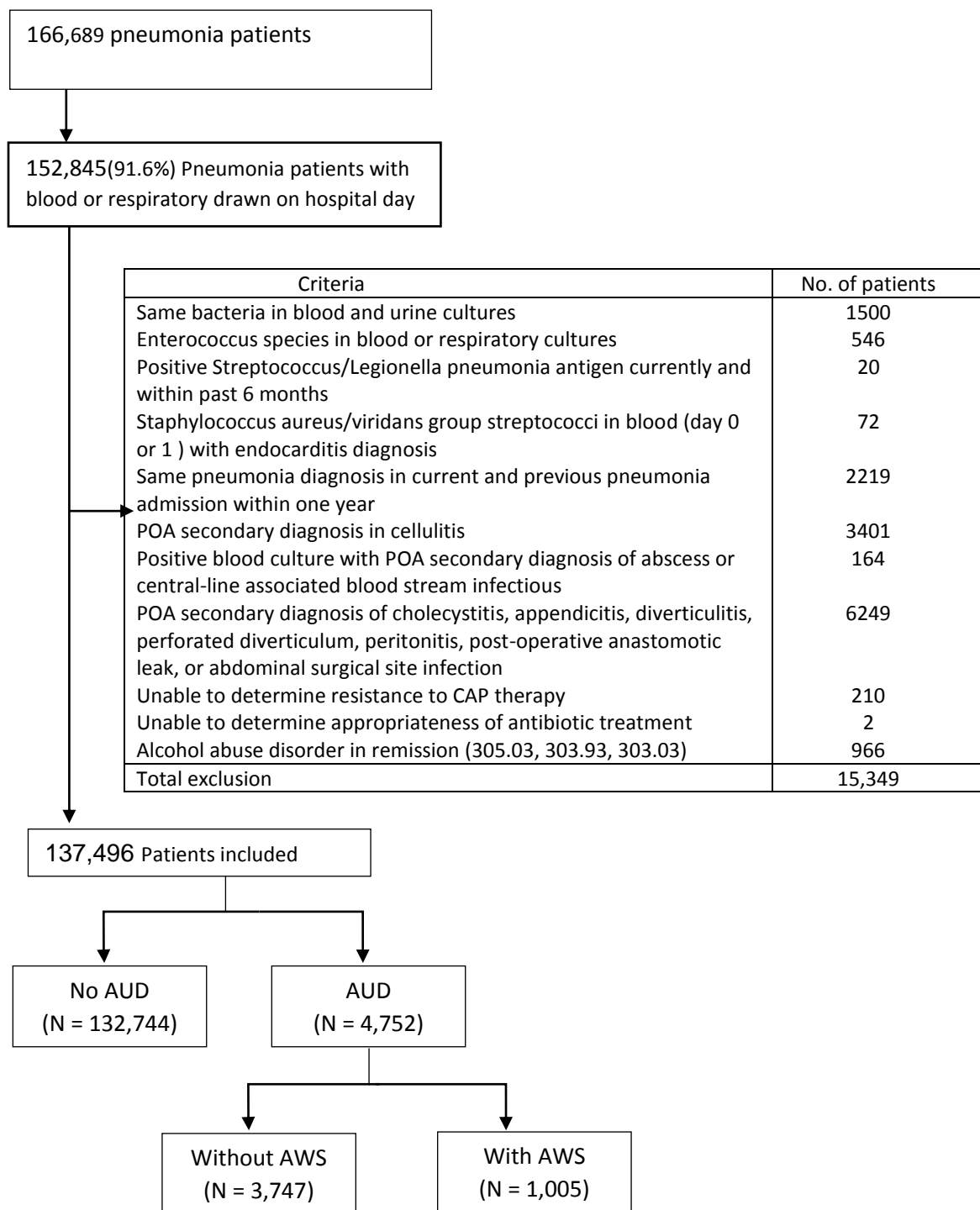
eTable 4. Pneumonia Etiologies, by Absence or Presence of Alcohol Use Disorder and Alcohol Withdrawal Syndrome

| | Total (N=137,496) | Non AUD (N=132,744) | Without AWS (N=3,747) | AWS (N=1,005) | P Value^a |
|--|-----------------------------|-------------------------------|---------------------------------|-------------------------|----------------------------|
| Positive culture, No. (%) | 12,686(9.2) | 12,050(9.1) | 489(13.1) | 147(14.6) | <.001 |
| --Resistant to CAP, No. (%) | 5,422(42.7) | 5,263(43.7) | 131(26.8) | 28(19.0) | <.001 |
| -- <i>Staphylococcus aureus</i> , No. (%) | 4,118(32.5) | 3,929(32.6) | 142(29.0) | 47(32.0) | .25 |
| -- <i>Streptococcus pneumoniae</i> , No. (%) | 3,347(26.4) | 3,069(25.5) | 209(42.7) | 69(46.9) | <.001 |
| -- <i>Pseudomonas aeruginosa</i> , No. (%) | 1,586(12.5) | 1,557(12.9) | 25(5.1) | 4(2.7) | <.001 |
| -- <i>Escherichia coli</i> , No. (%) | 1,261(9.9) | 1,216(10.1) | 35(7.2) | 10(6.8) | .046 |
| -- <i>Klebsiella pneumoniae</i> , No. (%) | 914(7.2) | 876(7.3) | 32(6.5) | 6(4.1) | .28 |

^aAll P values from Pearson's uncorrected chi-square test

Abbreviations: AUD, alcohol use disorder; AWS, alcohol withdrawal syndrome; CAP, community acquired pneumonia

eFigure. Inclusion/Exclusion Criteria Considered for Patients Included in the Study



Abbreviations: AUD – Alcohol Use Disorder; AWS – Alcohol Withdrawal Syndrome; POA – Present on Admission; CAP – Community Acquired Pneumonia