**Supplementary Table 1:** Hospital characteristics and Procalcitonin (PCT) testing options within the Johns Hopkins Health System. All hospitals use Elecsys® BRAHMS Procalcitonin (Roche Diagnostics Corporation, IN).

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| **Participating sites and characteristics** | | | | | | |
| **Site** | **Setting** | **Location** | **Type** | **Number of beds** | **PCT** | **PCT interpretation** |
| Hospital A | Acute care and specialty hospital | Baltimore, Maryland | Teaching, urban | 1056 | Not available | - |
| Hospital B | Acute care and specialty hospital | Baltimore, Maryland | Teaching, urban | 350 | Available | **1) Outside of the ICU**: ≥0.25ng/mL= start or continue antibiotic, <0.25 ng/mL = stop antibiotic  **2) In the ICU**: ≥0.5 ng/mL=start antibiotic, <0.5 ng/mL=stop antibiotic  A repeat PCT at 24-48hours is recommended to determine continuation of antibiotic |
| Hospital C | Acute care and specialty hospital | Columbia, Maryland | Community,  suburban | 264 | Available | **1) Systemic bacterial infection/sepsis**  <0.5 ng/mL= Low risk for sepsis, local bacterial infection possible  ≥0.5 to <2ng/mL= Sepsis is possible, other conditions possible  ≥2 to <10= Sepsis likely  ≥10 = Severe bacterial sepsis or septic shock probable  **2) Lower respiratory tract infection**  <0.1 ng/mL= Bacterial infection very unlikely  ≥0.1 to < 0.25ng/mL= Bacterial infection unlikely  ≥0.25 to <0.5ng/mL= Bacterial infection likely  ≥0.5ng/mL = Bacterial infection very likely |
| Hospital D | Acute care and specialty hospital | Bethesda, Maryland | Community,  suburban | 222 | Available |
| Hospital E | Acute care and specialty hospital | Washington, DC | Community,  urban | 318 | Available |

A negative PCT for hospital A was <0.25ng/mL outside of the ICU and <0.5ng/mL in the ICU. A negative PCT for hospitals C, D, and E was <0.25ng/mL.

**Supplementary Table 2**. Univariate and multivariate linear regression analysis of variables associated with duration of community-acquired pneumonia antibiotics among 660 patients (315 without procalcitonin [PCT] and 345 with negative PCT).

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| **Clinical variable** | **Univariate** | | | **Multivariate (before IPTW)** | | | **Multivariate (after IPTW)** | | |
| **Coefficient** | **95% CI** | **P value** | **Coefficient** | **95% CI** | **P value** | **Coefficient** | **95% CI** | **P value** |
| Negative procalcitonin | -0.21 | -0.72 - 0.30 | 0.42 | -0.002 | -0.73 –0.72 | 0.99 | -0.36 | -1.21 – 0.47 | 0.39 |
| Men | 0.41 | -0.07 – 0.91 | 0.09 | 0.17 | -0.30 – 0.65 | 0.46 |  |  |  |
| Hispanic ethnicity | -0.58 | -1.13 – -0.03 | 0.04 | 0.06 | -0.47 – 0.61 | 0.80 |  |  |  |
| Age >65 | 0.21 | -0.28 – 0.71 | 0.39 |  |  |  |  |  |  |
| Charlson comorbidity Index | 0.12 | -0.03 – .28 | 0.12 |  |  |  |  |  |  |
| Not immunocompromised | -2.16 | -3.26 – -1.06 | <0.01 | -2.68 | -3.69 - -1.67 | <0.01 |  |  |  |
| Severe disease (WHO scale)\* | 1.94 | 1.34 – 2.53 | <0.01 | 0.89 | 0.15 – 1.63 | 0.01 |  |  |  |
| Admission to intensive care unit | 3.30 | 2.54 – 4.05 | <0.01 | 2.34 | 1.29– 3.40 | <0.01 |  |  |  |
| Hospital (compared to hospital A)  Hospital B  Hospital C  Hospital D  Hospital E | 0.12  0.61  0.57  1.80 | -0.75 – 0.78  -0.08 – 1.33  -0.11 – 1.25  0.83 – 2.77 | 0.97  0.08  0.07  <0.01 | -0.86  -0.15  0.14  1.18 | -1.84 - 0.10  -1.13 - 0.83  -0.67 -0 .97  0.12 – 2.23 | 0.08  0.76  0.72  0.02 |  |  |  |
| Transferred to Hospital A | 1.64 | 0.91 – 2.38 | <0.01 | 0.42 | -0.47 – 1.32 | 0.35 |  |  |  |

IPTW: Inverse probability of treatment weighting. WHO: World Health Organization. \*Severe disease includes WHO score 5 (high-flow nasal cannula or noninvasive positive pressure ventilation), 6 (intubation and mechanical ventilation), and 7 (intubated; mechanical ventilation; and other signs of organ failure, including use of extracorporeal membrane oxygen, hemodialysis, or vasopressors).

**Supplementary Table 3**. Univariate and multivariate linear regression analysis of variables associated with duration of community-acquired pneumonia antibiotics among patients without evidence of bCAP (n=264) who had a negative or an abnormal procalcitonin (PCT).

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Clinical variable** | **Univariate** | | | **Multivariate (before IPTW)** | | | **Multivariate (after IPTW)** | | |
| **Coefficient** | **95% CI** | **P value** | **Coefficient** | **95% CI** | **P value** | **Coefficient** | **95% CI** | **P value** |
| Positive PCT | 1.88 | 1.01 – 2.75 | <0.01 | 1.73 | 0.83 – 2.63 | <0.01 | 1.88 | 1.01 – 2.75 | <0.01 |
| Men | -0.26 | -1.09 – 0.56 | 0.52 | -0.65 | -1.46 – 0.16 | 0.11 |  |  |  |
| Hispanic ethnicity | -0.98 | -1.87 – 0.08 | 0.03 | -0.62 | -1.52 – 0.27 | 0.17 |  |  |  |
| Age >65 | 0.40 | -0.44 – 1.22 | 0.33 | -0.32 | -1.17 – 0.51 | 0.44 |  |  |  |
| Charlson comorbidity Index | 0.16 | -0.12 – 0.44 | 0.12 | -0.06 | -0.35 – 0.21 | 0.63 |  |  |  |
| Not immunocompromised | -1.01 | -3.42 – -1.36 | 0.40 | -1.68 | -3.98 - -1.67 | 0.15 |  |  |  |
| Severe disease (WHO scale)\* | 1.28 | 0.10 – 2.46 | 0.03 | -0.06 | -1.37 – 1.23 | 0.91 |  |  |  |
| Admission to intensive care unit | 2.98 | 1.53 – 4.43 | <0.01 | 2.88 | 1.19– 4.60 | <0.01 |  |  |  |
| Hospital (compared to hospital B)  Hospital C  Hospital D  Hospital E | 0.65  1.69  2.36 | -0.44 – 1.75  0.58 – 2.80  0.76 – 3.95 | 0.24  <0.01  <0.01 | 0.19  1.21  2.06 | -0.87 – 1.27  0.10 – 2.32  0.50 – 3.63 | 0.71  0.03  0.01 |  |  |  |
| Transferred to Hospital A | 0.79 | -0.37 – 1.97 | 0.18 | 0.42 | -1.47 – 1.02 | 0.74 |  |  |  |

IPTW: Inverse probability of treatment weighting. WHO: World Health Organization. \*Severe disease includes WHO score 5 (high-flow nasal cannula or noninvasive positive pressure ventilation), 6 (intubation and mechanical ventilation), and 7 (intubated; mechanical ventilation; and other signs of organ failure, including use of extracorporeal membrane oxygen, hemodialysis, or vasopressors).

**Supplementary Table 4**. Univariate and multivariate linear regression analysis of variables associated with duration of community-acquired pneumonia antibiotics among patients with possible bCAP (n=263) who had a negative or an abnormal procalcitonin (PCT).

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Clinical variable** | **Univariate** | | | **Multivariate (before IPTW)** | | | **Multivariate (after IPTW)** | | |
| **Coefficient** | **95% CI** | **P value** | **Coefficient** | **95% CI** | **P value** | **Coefficient** | **95% CI** | **P value** |
| Positive PCT | 2.45 | 1.62 – 3.27 | <0.01 | 2.15 | 0.83 – 2.63 | <0.01 | 2.45 | 1.63 – 3.28 | <0.01 |
| Men | 1.06 | 0.19 – 1.92 | 0.52 | 0.87 | 0.08 – 1.67 | 0.03 |  |  |  |
| Hispanic ethnicity | -0.98 | -1.91 – 0.05 | 0.03 | -0.87 | -1.79 – 0.05 | 0.06 |  |  |  |
| Age >65 | 0.26 | -0.61 – 1.12 | 0.54 | -0.32 | -1.17 – 0.51 | 0.44 |  |  |  |
| Charlson comorbidity Index | 0.18 | -0.11 – 0.48 | 0.22 | 0.01 | -0.26 – 0.30 | 0.90 |  |  |  |
| Not immunocompromised | -0.95 | -3.11 – -1.21 | 0.38 | -0.80 | -2.86 - -1.27 | 0.43 |  |  |  |
| Severe disease (WHO scale)\* | 1.99 | 1.03– 2.96 | <0.01 | -0.06 | -0.14 – 1.93 | 0.09 |  |  |  |
| Admission to intensive care unit | 2.85 | 1.74 – 3.96 | <0.01 | 1.43 | 0.03– 2.82 | 0.04 |  |  |  |
| Hospital (compared to hospital B)  Hospital C  Hospital D  Hospital E | 0.63  0.01  2.24 | -0.46 – 1.75  -1.15 – 1.18  0.72 – 3.76 | 0.24  0.97  <0.01 | 0.42  -0.31  2.21 | -0.60 – 1.45  -1.42 – 0.79  0.79 – 3.63 | 0.41  0.58  <0.01 |  |  |  |
| Transferred to Hospital A | 2.01 | 0.94 – 3.08 | <0.01 | 0.42 | -0.83– 1.69 | 0.49 |  |  |  |

IPTW: Inverse probability of treatment weighting. WHO: World Health Organization. \*Severe disease includes WHO score 5 (high-flow nasal cannula or noninvasive positive pressure ventilation), 6 (intubation and mechanical ventilation), and 7 (intubated; mechanical ventilation; and other signs of organ failure, including use of extracorporeal membrane oxygen, hemodialysis, or vasopressors).

**Supplementary Table 5**: Median duration of CAP therapy for patients without bCAP and limited evidence of bCAP (possible bCAP) in patients without PCT, negative PCT and positive PCT with hospital A included (left) and excluded (right).

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **No bCAP (all hospitals)**  **N=435 (IQR)** | | | | | **No bCAP (excluding hospital A)**  **N=324 (IQR)** | | | | |
| **No PCT**  **N=171** | **Negative PCT**  **N=184** | ***P* value** | **Abnormal PCT**  **N=80** | ***P* value** | **No PCT**  **N=60** | **Negative PCT**  **N=184** | ***P* value** | **Abnormal PCT**  **N=80** | ***P* value** |
| 1  (0, 2) | 1  (0, 3.4) | 0.43 | 3.5  (0, 4.9) | <0.01 | 0  (0, 3.9) | 1  (0, 3.4) | 0.73 | 3.5  (0, 4.9) | <0.01 |
| **Possible bCAP (all hospitals)**  **N=398 (IQR)** | | | | | **Possible (excluding hospital A)**  **N= 298 (IQR)** | | | | |
| **No PCT**  **N=135** | **Negative PCT**  **N=151** | ***P* value** | **Abnormal PCT**  **N=112** | ***P* value** | **No PCT**  **N=35** | **Negative PCT**  **N=151** | ***P* value** | **Abnormal PCT**  **N=112** | ***P* value** |
| 1.6  (0, 4.6) | 1.9  (0.9, 4.5) | 0.3 | 4.7  (3, 6.6) | <0.01 | 3.3  (0, 6.1) | 1.9  (0.9, 4.5) | 0.42 | 4.7  (3, 6.6) | <0.01 |

IQR: interquartile range.