Supplemental Information

SUPPLEMENTAL TABLE 4 Median (IQR) Values of Biomarkers for Individual Outcomes

Outcome	*n* (%)	WBC Count Without Outcome, Median (IQR)	WBC Count With Outcome, Median (IQR)	*P*	ANC Without Outcome, Median (IQR)	ANC With Outcome, Median (IQR)	*P*	CRP Without Outcome, Median (IQR)	CRP With Outcome, Median (IQR)	*P*	Procalcitonin Without Outcome, Median (IQR)	Procalcitonin With Outcome, Median (IQR)	*P*
Mild disease	121 (25.4)	—	—	—	—	—	—	—	—	—	—	—	—
Mild-moderate disease	126 (26.4)	—	—	—	—	—	—	—	—	—	—	—	—
Moderate-severe disease	179 (37.5)	—	—	—	—	—	—	—	—	—	—	—	—
IVF bolus	74 (15.5)	11.9 (7.8–15.8)	11.0 (8.0–14.9)	.9	7.4 (4.7–11.8)	7.2 (4.8–11.3)	.8	2.5 (1.0–6.2)	4.1 (1.6–8.6)	.02	0.2 (0.1–0.8)	0.6 (0.2–3.3)	.001
Continuous IVF >12 h	61 (12.8)	11.4 (7.9–15.6)	12.9 (8.4–17.2)	.2	7.3 (4.7–11.6)	9.7 (5.0–13.5)	.2	2.5 (1.1–6.2)	5.1 (1.4–11.8)	.01	0.2 (0.1–0.8)	0.5 (0.2–1.7)	.008
Supplemental oxygen	172 (36)	11.2 (7.6–15.8)	11.9 (8.6–15.7)	.4	7.3 (4.5–11.8)	7.5 (5.1–11.5)	.5	2.6 (1.1–6.9)	2.7 (1.1–6.2)	.9	0.3 (0.1–1.0)	0.2 (0.1–0.8)	.7
Broadening of antibiotics	74 (15.5)	11.5 (7.7–15.5)	12.6 (9.0–17.7)	.1	7.3 (4.6–11.4)	8.8 (5.5–13.6)	.02	2.4 (1.0–6.2)	4.3 (2.1–8.6)	.001	0.2 (0.1–0.8)	0.4 (0.1–1.3)	.2
Complicated pneumonia	20 (4.2)	11.5 (7.9–15.5)	14.6 (5.7–26.3)	—[a]	7.3 (4.8–11.5)	12.3 (3.4–21.0)	—[a]	2.5 (1.0–6.1)	11.4 (6.6–17.4)	—[a]	0.2 (0.1–0.8)	1.0 (0.3–3.9)	—[a]
Presumed sepsis	11 (2.3)	11.9 (7.9–15.8)	7.9 (4.6–11.8)	—[a]	7.4 (4.8–11.8)	5.3 (3.3–9.7)	—[a]	2.5 (1.1–6.7)	4.8 (4.2–12.3)	—[a]	0.2 (0.1–0.9)	0.4 (0.1–3.5)	—[a]
Severe disease	51 (10.7)	—	—	—	—	—	—	—	—	—	—	—	—
ICU	42 (8.8)	11.6 (7.8–15.6)	12.9 (8.5–21.4)	.2	7.3 (4.7–11.7)	9.8 (4.8–14.3)	.3	2.6 (1.1–0.9)	2.5 (0.1–0.9)	.9	0.3 (0.1–0.9)	0.3 (0.1–2.2)	.5
Positive-pressure ventilation	19 (4)	11.7 (7.8–15.6)	13.0 (9.6–23.2)	—[a]	7.4 (4.8–11.8)	9.8 (3.5–13.9)	—[a]	2.6 (1.1–6.7)	3.6 (0.7–12.3)	—[a]	0.2 (0.1–0.9)	0.3 (0.1–3.5)	—[a]
Vasoactive infusions	6 (1.3)	11.8 (7.9–15.8)	7.7 (1.4–11.8)	—[a]	7.4 (4.8–11.8)	5.9 (0.6–1.0)	—[a]	2.6 (1.1–6.7)	5.9 (4.2–11.6)	—[a]	0.2 (0.1–0.9)	1.1 (0.8–14.1)	—[a]
Chest-drainage procedure	10 (2.1)	11.6 (7.9–15.6)	22.6 (4.5–27.7)	—[a]	7.3 (4.7–11.7)	19.1 (2.2–23.6)	—[a]	2.5 (1.0–6.3)	16.0 (7.5–18.1)	—[a]	0.2 (0.1–0.8)	3.1 (1.1–6.6)	—[a]
ECMO	2 (0.4)	11.8 (7.9–15.8)	1.1 (0.8–1.4)	—[a]	7.4 (4.8–11.8)	0.4 (0.2–0.6)	—[a]	2.6 (1.1–6.7)	11.2 (4.3–18.1)	—[a]	0.2 (0.1–0.9)	78.6 (14.1–143.1)	—[a]
Severe sepsis or septic shock diagnosis	10 (2.1)	11.7 (7.9–15.7)	11.6 (7.9–27.1)	—[a]	7.3 (4.7–11.8)	9.8 (5.3–20.0)	—[a]	2.6 (1.0–6.7)	4.8 (2.5–18.1)	—[a]	0.2 (0.1–0.9)	1.0 (0.1–4.3)	—[a]
Death	1 (0.2)	11.8 (7.9–15.8)	1.4 (1.4–1.4)	—[a]	7.4 (4.8–11.8)	0.2 (0.2–0.2)	—[a]	2.6 (1.1–6.8)	4.3 (4.3–4.3)	—[a]	0.3 (0.1–0.9)	14.1 (14.1–14.1)	—[a]

ECMO, extracorporeal membrane oxygenation; IVF, intravenous fluid; —, not applicable.

[a] *P* values were not calculated because of prevalence <5%.

SUPPLEMENTAL TABLE 5 Proportional Odds Logistic Regression: Association of Biomarkers With Disease Severity in Children With CAP

Biomarker[a]	Suspected CAP		Radiographic CAP	
	Unadjusted OR (95% CI)[b]	Adjusted OR (95% CI)[c]	Unadjusted OR (95% CI)[b]	Adjusted OR (95% CI)[c]
WBC count	1.13 (0.93–1.38)	1.03 (0.83–1.27)	1.16 (0.85–1.60)	1.14 (0.82–1.59)
ANC	1.09 (0.95–1.26)	1.06 (0.91–1.24)	1.16 (0.90–1.49)	1.13 (0.88–1.47)
CRP	1.08 (0.99–1.18)	1.15 (1.04–1.28)	1.11 (0.96–1.28)	1.16 (0.99–1.37)
Procalcitonin	1.07 (1–1.15)	1.09 (1.01–1.18)	1.08 (0.98–1.18)	1.09 (0.98–1.2)

[a] Biomarkers were analyzed by using $\log_2$ transformation.
[b] OR is interpreted as the odds of moving up 1 severity level (ie, mild to mild-moderate, mild-moderate to moderate-severe, and moderate-severe to severe) for every doubling of the biomarker level.
[c] Adjusted for age, receipt of antibiotics before arrival, fever duration, and viral pathogen detected.

SUPPLEMENTAL TABLE 6 Performance Characteristics of Biomarkers To Predict Mild Versus Moderate and/or Severe (ie, Mild-Moderate, Moderate-Severe, and Severe) Disease in Children With CAP

Biomarker	Threshold[a]	AUC (95% CI)	Sensitivity (95% CI)	Specificity (95% CI)	PPV (95% CI)	NPV (95% CI)	LR+ (95% CI)	LR− (95% CI)
Suspected CAP								
WBC count	11.5	0.55 (0.50–0.29)	0.54 (0.49–0.52)	0.55 (0.5–0.59)	0.77 (0.71–0.81)	0.31 (0.25–0.37)	1.21 (0.99–1.47)	0.83 (0.7–0.99)
ANC	7.605	0.53 (0.49–0.58)	0.51 (0.46–0.56)	0.56 (0.48–0.64)	0.76 (0.7–0.81)	0.30 (0.25–0.35)	1.16 (0.94–1.42)	0.88 (0.74–1.04)
CRP	2.1	0.55 (0.5–0.6)	0.60 (0.55–0.66)	0.5 (0.4–0.59)	0.78 (0.72–0.83)	0.30 (0.24–0.37)	1.2 (0.98–1.5)	0.8 (0.64–1.0)
Procalcitonin	0.17	0.57 (0.52–0.62)	0.62 (0.57–0.68)	0.51 (0.42–0.61)	0.79 (0.73–0.84)	0.32 (0.25–0.39)	1.28 (1.04–1.57)	0.73 (0.59–0.92)
Radiographic CAP								
WBC count (n = 206)	11.6	0.55 (0.48–0.63)	0.55 (0.47–0.63)	0.56 (0.42–0.69)	0.75 (0.65–0.83)	0.34 (0.25–0.45)	1.25 (0.91–1.71)	0.8 (0.6–1.07)
ANC (n = 206)	7.575	0.55 (0.48–0.63)	0.58 (0.5–0.66)	0.53 (0.39–0.65)	0.74 (0.65–0.82)	0.34 (0.25–0.45)	1.22 (0.9–1.6)	0.8 (0.59–1.09)
CRP (n = 200)	7.16	0.57 (0.5–0.64)	0.40 (0.32–0.49)	0.73 (0.6–0.84)	0.78 (0.67–0.87)	0.34 (0.26–0.43)	1.49 (0.94–2.37)	0.82 (0.66–1.01)
Procalcitonin (n = 205)	0.17	0.57 (0.49–0.64)	0.62 (0.53–0.7)	0.52 (0.39–0.65)	0.75 (0.66–0.82)	0.37 (0.27–0.48)	1.27 (0.95–1.7)	0.75 (0.54–1.02)

LR+, positive likelihood ratio; LR−, negative likelihood ratio.
[a] Empirical cut point estimation at the point closest to perfect sensitivity and specificity (ie, upper left-hand corner of the ROC curve).

SUPPLEMENTAL TABLE 7 Performance Characteristics of Biomarkers To Predict Mild and/or Mild-Moderate Versus Moderate-Severe and/or Severe Disease in Children With CAP

Biomarker	Threshold[a]	AUC (95% CI)	Sensitivity (95% CI)	Specificity (95% CI)	PPV (95% CI)	NPV (95% CI)	LR+ (95% CI)	LR− (95% CI)
Suspected CAP								
WBC count	11.1	0.51 (0.47–0.55)	0.56 (0.49–0.62)	0.47 (0.41–0.52)	0.47 (0.41–0.53)	0.56 (0.49–0.62)	1.04 (0.89–1.21)	0.95 (0.79–1.14)
ANC	7.735	0.51 (0.47–0.55)	0.48 (0.42–0.55)	0.53 (0.47–0.59)	0.46 (0.4–0.53)	0.55 (0.49–0.61)	1.03 (0.86–1.23)	0.97 (0.83–1.14)
CRP	2.1	0.55 (0.51–0.6)	0.63 (0.57–0.7)	0.47 (0.41–0.54)	0.52 (0.46–0.58)	0.59 (0.51–0.66)	1.2 (1.03–1.4)	0.78 (0.62–0.97)
Procalcitonin	0.35	0.53 (0.48–0.57)	0.45 (0.38–0.52)	0.6 (0.54–0.67)	0.51 (0.48–0.57)	0.55 (0.49–0.61)	1.13 (0.91–1.4)	0.92 (0.78–1.07)
Radiographic CAP								
WBC count (n = 206)	10.5	0.56 (0.49–0.63)	0.64 (0.54–0.73)	0.48 (0.38–0.58)	0.54 (0.44–0.63)	0.59 (0.48–0.69)	1.23 (0.98–1.56)	0.75 (0.54–1.04)
ANC (n = 206)	7.735	0.56 (0.5–0.63)	0.6 (0.5–0.7)	0.53 (0.43–0.63)	0.55 (0.45–0.64)	0.58 (0.48–0.63)	1.27 (0.98–1.65)	0.76 (0.56–1.02)
CRP (n = 200)	4.8	0.51 (0.44–0.58)	0.5 (0.4–0.6)	0.52 (0.42–0.62)	0.49 (0.39–0.59)	0.53 (0.43–0.63)	1.04 (0.78–1.38)	0.96 (0.73–1.26)
Procalcitonin (n = 205)	0.22	0.53 (0.46–0.6)	0.55 (0.44–0.65)	0.52 (0.42–0.62)	0.51 (0.41–0.6)	0.56 (0.46–0.66)	1.13 (0.87–1.48)	0.87 (0.66–1.16)

LR+, positive likelihood ratio; LR−, negative likelihood ratio.
[a] Empirical cut point estimation at the point closest to perfect sensitivity and specificity (ie, upper left-hand corner of the ROC curve).

SUPPLEMENTAL TABLE 8 Performance Characteristics of Biomarkers To Predict Individual Outcomes in Children With CAP

Outcome	*n* (%)	WBC Count				ANC				CRP				Procalcitonin			
		Cut[a]	Sensitivity, %	Specificity, %	AUC	Cut[a]	Sensitivity, %	Specificity, %	AUC	Cut[a]	Sensitivity, %	Specificity, %	AUC	Cut[a]	Sensitivity, %	Specificity, %	AUC
IVF bolus	74 (15.5)	10.8	56	44	0.5	9.22	41	61	0.51	3.45	59	60	0.59	0.38	59	63	0.61
Continuous IVF >12 h	61 (12.8)	12.3	56	56	0.56	9.55	51	63	0.57	4.17	56	66	0.61	0.42	55	63	0.59
Supplemental oxygen	172 (36)	12.8	48	59	0.53	6.775	58	48	0.53	2.88	50	55	0.52	0.21	55	40	0.48
Broadening of antibiotics	74 (15.5)	11.6	57	50	0.54	8.655	53	58	0.56	3.19	62	58	0.6	0.23	59	49	0.54
Complicated pneumonia	20 (4.2)	12.1	62	54	0.58	9.86	54	64	0.59	6.33	78	77	0.77	0.42	75	62	0.69
Chest-drainage procedure	10 (2.1)	21.9	55	89	0.72	11.77	73	76	0.74	6.73	91	75	0.83	0.85	91	74	0.83
Presumed sepsis	11 (2.3)	17.2	18	79	0.48	9.635	27	60	0.44	4.1	90	64	0.77	0.3	60	51	0.56
Severe sepsis or septic shock diagnosis	10 (2.1)	18.3	38	84	0.61	8.355	62	56	0.59	3.74	75	61	0.68	0.8	64	74	0.69
ICU	42 (8.8)	16.9	38	80	0.59	9.585	53	63	0.58	2.35	58	46	0.52	0.16	66	41	0.53
Positive-pressure ventilation	19 (4)	16.9	45	79	0.62	9.82	50	64	0.57	3.47	59	58	0.58	0.23	63	48	0.56
Vasoactive infusions	6 (1.3)	10.8	50	44	0.47	9.635	50	62	0.56	4.17	83	64	0.74	0.8	83	73	0.78

Extracorporeal membrane oxygenation ($n = 2$) and death ($n = 1$) were excluded because of low prevalence. IVF, intravenous fluid.

[a] Empirical cut point estimation at the point closest to perfect sensitivity and specificity (ie, upper left-hand corner of the ROC curve).