

1 **Supplemental Tables:**

2 **Supplemental Table 1. Overall Subject Characteristics.** Continuous variables are reported as  
 3 mean±standard deviation, while categorical variables are reported as percentage (95%  
 4 confidence interval).

Variable	Overall (n=102)	
Age (Years)	28.2±31.1	
Sex (% Male)	63.7% (53.6-73%)	
Body Mass Index (kg/m <sup>2</sup> )	23.2±6.65	
Antibiotic Administration	64.7% (54.6-73.9%)	
Fluid Administration	75.5% (66-83.5%)	
Nebulizer Administration	55.9% (45.7-65.7%)	
Temperature (Degrees Celsius)	37.7±1.43	
Heart Rate (Beats Per Minute)	141±36.7	
Respiratory Rate (Breaths Per Minute)	41±21.5	
Worst Oxygen Saturation (%)	89.1±6.53	
Greatest Oxygen Supplementation (L)	6.02±7.97	
Hospital Length of Stay (Days)	5.34±5	
White Blood Cell Count (10 <sup>9</sup> cells/L)	13.8±7.17	
Cough	78.4% (69.2-86%)	
Chest X-ray	Abnormal	48% (38-58.2%)
	Normal	25.5% (17.4-35.1%)
	Indeterminate	26.5% (18.2-36.1%)
Ultrasound	Abnormal	49% (39-59.1%)
	Normal	31.4% (22.5-41.3%)
	Indeterminate	19.6% (12.4-28.6%)

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7 **Supplemental Table 2. Pediatric Population Characteristics Compared to Chest X-ray**  
 8 **Result.** Results separated by consensus chest x-ray for pediatric subjects. Continuous variables  
 9 are reported as mean±standard deviation, while categorical variables are reported as percentage  
 10 (95% confidence interval). \*Ordinary one-way ANOVA for continuous variables, chi-squared  
 11 test for categorical variables, comparing x-ray abnormal, normal, and indeterminate/borderline  
 12 groups.

	Overall (n=62)	Chest X- ray Abnormal (n=22)	Chest X- ray Normal (n=23)	Chest X-ray Indeterminate (n=17)	P value*
Age (Years)	5.22±4.75	6.21±5.14	5.21±4.37	3.94±4.7	0.34
Sex (% Male)	59.7% (46.4- 71.9%)	63.6% (40.7- 82.8%)	52.2% (30.6- 73.2%)	64.7% (38.3- 85.8%)	0.65
Body Mass Index (kg/m <sup>2</sup> )	18.2±3.97	17.7±3	18±4.55	18.9±4.29	0.78
Antibiotic Administration	59.7% (46.4- 71.9%)	81.8% (59.7- 94.8%)	43.5% (23.2- 65.5%)	52.9% (27.8- 77%)	<b>0.026</b>
Fluid Administration	79% (66.8- 88.3%)	77.3% (54.6- 92.2%)	69.6% (47.1- 86.8%)	94.1% (71.3- 99.9%)	0.16
Nebulizer Administration	66.1% (53- 77.7%)	54.5% (32.2- 75.6%)	73.9% (51.6- 89.8%)	70.6% (44- 89.7%)	0.35
Temperature (Degrees Celsius)	38.1±1.48	38.1±1.33	38.1±1.19	37.9±2	0.9
Heart Rate (Beats Per Minute)	163±25	158±22	165±25.9	167±27.5	0.47
Respiratory Rate (Breaths Per Minute)	52±20.8	50.8±24.2	47.4±14.4	59.8±22.3	0.16
Worst Oxygen Saturation (%)	88.4±7.81	86.7±10.4	90.9±4.92	87.1±6.42	0.14
Greatest Oxygen Supplementation (L)	7.65±7.75	7.36±8.82	4.17±5.25	12.7±6.75	<b>0.0017</b>

Hospital Length of Stay (Days)		5.06±5.17	5.68±5.85	3.3±2.8	6.65±6.2	0.1
White Blood Cell Count (10 <sup>9</sup> cells/L)		14.8±7.51	17.7±7.16	13.9±7.52	11.9±6.99	0.053
Cough		88.7% (78.1-95.3%)	86.4% (65.1-97.1%)	87% (66.4-97.2%)	94.1% (71.3-99.9%)	0.71
						Cohen's kappa (95% CI, p value)
Ultrasound	Abnormal	33.9% (22.3-47%)	72.7% (49.8-89.3%)	8.7% (1.07-28%)	17.6% (3.8-43.4%)	0.48 (0.30-0.66, p<0.0001)
	Normal	43.5% (31-56.7%)	9.09% (1.12-29.2%)	78.3% (56.3-92.5%)	41.2% (18.4-67.1%)	
	Indeterminate	22.6% (12.9-35%)	18.2% (5.19-40.3%)	13% (2.78-33.6%)	41.2% (18.4-67.1%)	

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25 **Supplemental Table 3. Adult Population Characteristics Compared to Chest X-ray Result.**

26 Results separated by consensus chest x-ray for adult subjects. Continuous variables are reported  
 27 as mean±standard deviation, while categorical variables are reported as percentage (95%  
 28 confidence interval). \*Ordinary one-way ANOVA for continuous variables, chi-squared test for  
 29 categorical variables, comparing x-ray abnormal, normal, and indeterminate/borderline groups.

	Overall (n=40)	X-ray abnormal (n=27)	X-ray normal (n=3)	X-ray borderline (n=10)	P value*
Age (Years)	63.7±18.3	63.9±17.8	55.7±24.2	65.7±19.2	0.71
Sex (% Male)	70% (53.5- 83.4%)	63% (42.4- 80.6%)	100% (29.2- 100%)	80% (44.4- 97.5%)	0.3
Body Mass Index (kg/m <sup>2</sup> )	27.5±5.37	26.8±4.63	29±5.22	28.9±7.19	0.52
Antibiotic Administration	72.5% (56.1- 85.4%)	81.5% (61.9- 93.7%)	33.3% (0.84- 90.6%)	60% (26.2- 87.8%)	0.12
Fluid Administration	70% (53.5- 83.4%)	74.1% (53.7- 88.9%)	33.3% (0.84- 90.6%)	70% (34.8- 93.3%)	0.34
Nebulizer Administration	40% (24.9- 56.7%)	33.3% (16.5- 54%)	100% (29.2- 100%)	40% (12.2- 73.8%)	0.082
Temperature (Degrees Celsius)	37.2±1.17	37.3±1.22	37±1.15	36.9±1.1	0.57
Heart Rate (Beats Per Minute)	106±23	109±19.9	95.7±5.51	102±32.6	0.53
Respiratory Rate (Breaths Per Minute)	24±6.07	23.3±5.74	25±4.58	25.4±7.49	0.64
Worst Oxygen Saturation (%)	90.3±3.59	90.7±3.52	88±6.08	89.9±3.11	0.45
Greatest Oxygen Supplementation (L)	3.55±7.75	2.7±5.95	3.67±3.21	5.8±12.2	0.57
Hospital Length of Stay (Days)	5.78±4.77	5.52±4.67	5±1	6.7±5.83	0.78

White Blood Cell Count (10 <sup>9</sup> cells/L)		12.5±6.53	13.2±6.66	10.3±3.25	11.1±6.81	0.64
Cough		62.5% (45.8- 77.3%)	59.3% (38.8- 77.6%)	100% (29.2- 100%)	60% (26.2- 87.8%)	0.38
						Cohen's kappa (95% CI, p value)
Ultrasound	Abnormal	72.5% (56.1- 85.4%)	85.2% (66.3- 95.8%)	0% (0- 70.8%)	60% (26.2- 87.8%)	0.30 (0- 0.61, p=0.021)
	Normal	12.5% (4.19- 26.8%)	3.7% (0.0937- 19%)	66.7% (9.43- 99.2%)	20% (2.52- 55.6%)	
	Indeterminate	15% (5.71- 29.8%)	11.1% (2.35- 29.2%)	33.3% (0.84- 90.6%)	20% (2.52- 55.6%)	

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44 **Supplemental Table 4. Pediatric Population Characteristics Compared to Clinical**  
 45 **Diagnosis.** Results separated by clinical diagnosis for pediatric subjects. Continuous variables  
 46 are reported as mean±standard deviation, while categorical variables are reported as percentage  
 47 (95% confidence interval). \*Ordinary one-way ANOVA for continuous variables, chi-squared  
 48 test for categorical variables.

Variable	Pneumonia (n=17)	Asthma/non-RSV (n=29)	P value*
Age (Years)	7.54±5.11	5.67±3.94	0.17
Sex (% Male)	64.7% (38.3-85.8%)	58.6% (38.9-76.5%)	0.68
Body Mass Index (kg/m <sup>2</sup> )	18.5±3.32	19.1±4.56	0.74
Antibiotic Administration	88.2% (63.6-98.5%)	48.3% (29.4-67.5%)	<b>0.0067</b>
Fluid Administration	82.4% (56.6-96.2%)	75.9% (56.5-89.7%)	0.61
Nebulizer Administration	58.8% (32.9-81.6%)	82.8% (64.2-94.2%)	0.074
Temperature (Degrees Celsius)	37.9±1.37	37.8±1.49	0.9
Heart Rate (Beats Per Minute)	153±25.9	161±23.4	0.28
Respiratory Rate (Breaths Per Minute)	45.1±20.7	47.4±14.6	0.65
Worst Oxygen Saturation (%)	86.2±11.6	89.7±5.67	0.17
Most Oxygen Supplementation (L)	8.34±10.4	6.34±6.69	0.44
Hospital Length of Stay (Days)	5.71±6.45	3.72±3.13	0.17
White Blood Cell Count (10 <sup>9</sup> cells/L)	17.2±7.19	14.8±8.58	0.37
Cough	88.2% (63.6-98.5%)	93.1% (77.2-99.2%)	0.57
Chest X-ray	Abnormal	94.1% (71.3-99.9%)	<b>&lt;0.0001</b>
	Normal	0% (0-19.5%)	

	Indeterminate	5.88% (0.149-28.7%)	27.6% (12.7-47.2%)	
Ultrasound	Abnormal	94.1% (71.3-99.9%)	6.9% (0.846-22.8%)	<b>&lt;0.0001</b>
	Normal	0% (0-19.5%)	79.3% (60.3-92%)	
	Indeterminate	5.88% (0.149-28.7%)	13.8% (3.89-31.7%)	

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70 **Supplemental Table 5. Adult Subject Characteristics Compared to Clinical Diagnosis.**  
 71 Results separated by clinical diagnosis for adult subjects. Continuous variables are reported as  
 72 mean±standard deviation, while categorical variables are reported as percentage (95%  
 73 confidence interval). \*Ordinary one-way ANOVA for continuous variables, chi-squared test for  
 74 categorical variables.

Variable	Pneumonia (n=21)	CHF (n=10)	P value*
Age (Years)	64.4±19.1	68.1±13	0.59
Sex (% Male)	52.4% (29.8-74.3%)	90% (55.5-99.7%)	<b>0.041</b>
Body Mass Index (kg/m <sup>2</sup> )	26.6±4.9	29.9±6.89	0.13
Antibiotic Administration	95.2% (76.2-99.9%)	20% (2.52-55.6%)	<b>&lt;0.0001</b>
Fluid Administration	85.7% (63.7-97%)	40% (12.2-73.8%)	<b>0.0088</b>
Nebulizer Administration	33.3% (14.6-57%)	40% (12.2-73.8%)	0.72
Temperature (Degrees Celsius)	37.4±1.24	36.5±0.821	<b>0.048</b>
Heart Rate (Beats Per Minute)	112±19.8	91±25.7	<b>0.02</b>
Respiratory Rate (Breaths Per Minute)	23.8±6.66	24.3±6.46	0.83
Worst Oxygen Saturation (%)	91±3.46	88.2±2.94	<b>0.036</b>
Most Oxygen Supplementation (L)	4.48±10.4	2.9±3.35	0.65
Hospital Length of Stay (Days)	6.19±5.97	5.4±3.13	0.7
White Blood Cell Count (10 <sup>9</sup> cells/L)	14.1±5.72	8.63±3.49	<b>0.0095</b>
Cough	57.1% (34-78.2%)	50% (18.7-81.3%)	0.71
Chest X-ray	Abnormal	90.5% (69.6-98.8%)	<b>0.045</b>
	Normal	0% (0-16.1%)	
	Indeterminate	9.52% (1.17-30.4%)	
Ultrasound	Abnormal	95.2% (76.2-99.9%)	0.18
	Normal	0% (0-16.1%)	
	Indeterminate	4.76% (0.12-23.8%)	

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77 **Supplemental Table 6. Sensitivity and Specificity of Lung Ultrasound VSI.** Sensitivity and  
 78 specificity for detection of abnormal/normal x-ray by ultrasound, and detection of clinically  
 79 diagnosed pneumonia by ultrasound and x-ray. LR+ refers to the positive likelihood ratio, while  
 80 LR- refers to the negative likelihood ratio. \*Results of McNemar's test, comparing  
 81 sensitivity/specificity between ultrasound and x-ray.

Outcome	Predictor	Sensitivity	Specificity	Positive Predictive Value	Negative Predictive Value	LR+	LR-
<i>Imaging Outcome</i>							
Chest X-ray	Ultrasound	92.9% (80.5-98.5%)	90.9% (70.8-98.9%)	95.1% (83.5-99.4%)	87.0% (66.4-97.2%)	10.2 (2.72-38.4)	0.08 (0.03-0.24)
<i>Clinical Outcome</i>							
Pneumonia Versus All Other Clinical Diagnoses	Ultrasound	100% (90.3-100%)	69.6% (54.3-82.3%)	72.0% (57.5-83.8%)	100% (89.1-100%)	3.29 (2.12-5.09)	0
	X-ray	100% (90.0-100%)	65.0% (48.3-79.4%)	71.4% (56.7-83.4%)	100% (86.8-100%)	2.86 (1.87-4.36)	0
	<i>P value*</i>	>0.99	>0.99	-	-	-	-
Pneumonia Versus Non-RSV Viral Illness and Asthma	Ultrasound	100% (90.3-100%)	92.6% (75.7-99.1%)	94.7% (82.3-99.4%)	100% (86.3-100%)	13.5 (3.56-51.2)	0
	X-ray	100% (90.0-100%)	90.9% (70.8-98.9%)	94.6% (81.8-99.3%)	100% (83.2-100%)	11.0 (2.93-41.2)	0
	<i>P value*</i>	>0.99	0.48	-	-	-	-

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86 **Supplemental Table 7. Multivariate Analysis.** Results of multivariate logistic regression with  
 87 consensus ultrasound as predictor, either abnormal consensus x-ray or clinical diagnosis of  
 88 pneumonia as recorded in the electronic medical record as outcome, and age, sex, worst  
 89 temperature, and worst oxygen saturation as covariates.

Predictor	Abnormal Consensus X-ray		Clinical Diagnosis of Pneumonia	
	Odds Ratio (95% CI)	<i>P</i> value	Odds Ratio (95% CI)	<i>P</i> value
Consensus Ultrasound	9.08 (1.30-63.6)	<b>0.026</b>	25.6 (4.9-135)	<b>&lt;0.0001</b>
Age	1.02 (0.99-1.05)	0.18	1.00 (0.98-1.02)	0.89
Sex	0.84 (0.20-3.41)	0.80	2.53 (0.69-9.26)	0.16
Worst Temperature (Degrees Celsius)	1.02 (0.62-1.70)	0.94	1.02 (0.65-1.59)	0.94
Worst Oxygen Saturation (%)	0.92 (0.80-1.04)	0.18	0.99 (0.91-1.07)	0.78

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