**Appendices**

**Table S1. Detailed Patient Characteristics of Lung POCUS and Control Groups**

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Lung POCUS group** | **No lung POCUS group** |  |
| **Characteristics** |  **n = 81** |  **n = 243** | **P value** |
| Past history, n (%) |  |  |  |  |  |
|  Hypertension | 61 | (75.3) | 174 | (71.6) | 0.57 |
|  Diabetes | 35 | (43.2) | 92 | (37.9) | 0.43 |
|  Smoking | 31 | (38.3) | 108 | (44.4) | 0.37 |
|  MI/Angina | 30 | (37.0) | 121 | (49.8) | 0.054 |
|  Atrial fibrillation | 26 | (32.1) | 104 | (42.8) | 0.12 |
|  Chronic kidney disease | 21 | (25.9) | 68 | (28.0) | 0.78 |
|  Pacemaker | 16 | (19.8) | 13 | (5.4) | 0.0004 |
|  Stroke/TIA | 14 | (17.3) | 32 | (13.2) | 0.36 |
|  Asthma | 4 | (4.9) | 17 | (7.0) | 0.61 |
| Home oxygen, n (%) | 5 | (6.2) | 26 | (10.7) | 0.28 |
| Current cardiac medication, n (%) |  |  |  |  |  |
|  Diuretics | 50 | (61.7) | 148 | (60.9) | 1.00 |
|  Beta blockers | 49 | (60.5) | 134 | (55.1) | 0.44 |
|  Statins  | 44 | (54.3) | 144 | (59.3) | 0.44 |
|  ACEIs/ARBs | 39 | (48.2) | 122 | (50.2) | 0.80 |
|  Ca blockers | 32 | (39.5) | 72 | (29.6) | 0.10 |
|  Nitrates | 17 | (21.0) | 57 | (23.5) | 0.76 |
|  Antiarrhythmics | 8 | (9.9) | 15 | (6.2) | 0.32 |
| Current respiratory medication, n (%) |  |  |  |  |  |
|  Inhaled beta agonists | 33 | (40.7) | 106 | (43.6) | 0.70 |
|  Inhaled steroids | 22 | (27.2) | 61 | (25.1) | 0.77 |
|  Inhaled anticholinergics | 18 | (22.2) | 62 | (25.5) | 0.66 |
|  Oral steroids | 8 | (9.9) | 28 | (11.5) | 0.84 |
| Symptoms, n (%) Cough Sputum production Orthopnea Palpitation | 4834341 | (59.3)(42.0)(42.0)(1.2) | 163948714 | (67.1)(38.7)(35.8)(5.8) | 0.230.600.350.13 |
| Physical examination, n (%) Peripheral edema Bilateral crackles Bilateral wheezes | 525123 | (64.2)(63.0)(28.4) | 14114483 | (58.0)(59.3)(34.2) | 0.360.600.41 |

POCUS=point-of-care ultrasonography; MI=myocardial infarction; TIA=transient ischemic attack, ACEI=angiotensin-converting enzyme inhibitor; ARB=angiotensin II receptor antagonist, SD=standard deviation; BP=blood pressure

**Table S2. Characteristics of Lung POCUS**

|  |  |
| --- | --- |
|  | **Lung POCUS group** |
| **Characteristics** |  **n = 81** |
| Physician initial assessment time to POCUS time (minutes), median, Q1-Q3  | 71.0 | 34-153 |
| POCUS time to patient left ED time (minutes), median, Q1-Q3  | 374.0 | 221-848 |
| Timing of POCUS performed, n (%)  Before disease-specific treatment administration After disease-specific treatment administration | 4529 | (55.6)(35.8) |
| POCUS findings, n (%) |  |  |
|  B-lines Positive  Negative Indeterminate | 64170 | (79.0)(21.0)(0) |
| \*Non-physician sonographers refer to trained medical students or trained ultrasound techniciansPOCUS=point-of-care ultrasonography |

**Table S3. Incidence of Adverse Events for POCUS Group Versus No POCUS Group**

|  |  |  |
| --- | --- | --- |
|  | **Lung POCUS group** | **No lung POCUS group** |
| **Adverse events** |  **n = 81** |  **n = 243** |
| Potentially unnecessary treatment\*, n (%) Beta agonists Anticholinergics Steroids Diuretics Vasodilators | 853121 | (9.9)(6.2)(3.7)(1.2)(2.5)(1.2) | 302318642 | (12.4)(9.5)(7.4)(2.5)(1.6)(0.8) |
| Return within 7 days, n (%) | 3 | (3.7) | 12 | (4.9) |
| Inaccurate ED diagnosis, n (%) | 0 | (0) | 10 | (4.1) |

\*Potentially unnecessary treatment is defined as administration of disease-specific treatment for inaccurate diagnosis based on the final diagnosis

POCUS=point-of-care ultrasonography

**Table S4. Unadjusted and Adjusted Odds Ratios Comparing Incidence of Adverse Events for POCUS Group Versus No POCUS Group**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Unadjusted** |  | **Adjusted** |  |
| **Adverse events** | **OR** | **95% CI** | **P value\*** | **OR** | **95% CI** | **P value** |
| Potentially unnecessary treatment\* | 0.78 | 0.30 to 1.84 | 0.71 | 0.62 | 0.22 to 1.54 | 0.37 |
| Return within 7 days | 0.74 | 0.13 to 2.85 | 0.92 | 0.80 | 0.14 to 3.15 | 1.00 |
| Inaccurate ED diagnosis | 0.21 | 0 to 1.03 | 0.054 | 0.25 | 0 to 1.24 | 0.08 |

\*Potentially unnecessary treatment is defined as administration of disease-specific treatment for inaccurate diagnosis based on the final diagnosis

POCUS=point-of-care ultrasonography; ED=emergency department; OR=odds ratio; CI=confidence interval

**Figure S1. Schema of Timeline and Time Intervals in the ED**



POCUS may be done anytime after Physician Initial Assessment

ED=emergency department; POCUS=point-of-care ultrasonography

Figure S2. Kaplan-Meier Curves for Time to Disease-Specific Treatment for Patients with and without Lung POCUS, Accounting for POCUS as a Time-Dependent Variable



POCUS=point-of-care ultrasonography