



ORIGINAL RESEARCH ARTICLE

Clinical Profile and Severity Assessment of Community-Acquired Pneumonia in Adult Patients Admitted to a Tertiary Care Hospital: A Cross-Sectional Study

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Abstract

Background: Community-acquired pneumonia (CAP) remains a leading cause of hospital admission and mortality among adults, and validated severity assessment tools such as the CURB-65 score are widely used to guide site-of-care and management decisions.

Objectives: To describe the clinical profile of adult patients hospitalised with CAP and to evaluate the relationship between CURB-65 severity category and in-hospital outcome.

Methods: A cross-sectional study was conducted on 240 adult patients admitted with CAP. Clinical features were recorded, CURB-65 score was calculated at admission, and in-hospital outcomes were documented.

Results: Cough (95.0%) and fever (88.3%) were the most common presenting features. High-risk CURB-65 category (score 3–5) was present in 17.5% of patients. In-hospital mortality increased markedly with CURB-65 category, from 1.6% in the low-risk group to 26.2% in the high-risk group. High-risk CURB-65 category and multilobar radiographic involvement were independently associated with mortality on multivariate analysis.

Conclusion: CURB-65 severity category correlates strongly with in-hospital mortality among adults hospitalised with CAP, supporting its continued use as a practical bedside tool for risk stratification and management planning.

Keywords: Community-acquired pneumonia, CURB-65, severity assessment, mortality, general medicine.

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1 | INTRODUCTION

Community-acquired pneumonia (CAP) remains one of the most common infectious causes of hospital admission among adults and a leading cause of infection-related mortality worldwide.^{7,9} Accurate severity assessment at the time of presentation is central to appropriate management, guiding decisions regarding site of care, need for hospital admission, and intensity of monitoring required. (1, 2)

Several validated clinical prediction rules have been developed to assist with severity assessment in CAP, most notably the Pneumonia Severity Index (PSI), derived by Fine and colleagues from a large multicentre cohort, and the simpler CURB-65 score, derived and validated by Lim and colleagues, which incorporates confusion, elevated blood urea, raised respiratory rate, low blood pressure, and age 65 years or older. (1, 2) The relative simplicity of the CURB-65 score, requiring only bedside clinical assessment and a single laboratory parameter, has contributed to its widespread adoption in general medical practice, and it has been formally incorporated into major international treatment guidelines, including those of the British Thoracic Society and the Infectious Diseases Society of America/American Thoracic Society. (3, 4)

Multiple validation studies conducted across diverse healthcare settings have confirmed the prognostic value of CURB-65 in predicting mortality and the need for intensive care, including a large comparative validation study in Hong Kong and further validation work in Germany, both of which demonstrated good discriminatory performance of the score across different populations. (5, 6) Despite this substantial validation, most published data originate from specific national settings, and locally generated data on the distribution of CURB-65 categories and their relationship to outcome remain valuable for informing clinical practice in individual healthcare settings. (7, 8)

This study was undertaken to describe the clinical profile of adult patients hospitalised with CAP and to evaluate the relationship between CURB-65 severity category, clinical and radiographic findings, and in-hospital outcome.

2 | MATERIALS AND METHODS

2.1 | Study Design and Setting

This was a hospital-based, cross-sectional, analytical study conducted in the Department of General Medicine of a tertiary care teaching hospital over a period of twelve months.

2.2 | Study Population

A total of 240 adult patients admitted with a clinical and radiographic diagnosis of CAP were enrolled after obtaining informed consent.

2.3 | Inclusion Criteria

Adults aged 18 years and above with clinical features of acute lower respiratory tract infection and radiographically confirmed new pulmonary infiltrate, consistent with CAP, were included.

2.4 | Exclusion Criteria

Patients with hospital-acquired or ventilator-associated pneumonia, active pulmonary tuberculosis, known malignancy involving the lung, and those unwilling to provide consent were excluded.

2.5 | Data Collection

A structured proforma recorded demographic details, presenting clinical features, comorbidities, and vital signs at admission. CURB-65 score was calculated for each patient based on the presence of confusion, blood urea >7 mmol/L, respiratory rate ≥ 30 /min, systolic blood pressure <90 mmHg or diastolic ≤ 60 mmHg, and age ≥ 65 years, with one point assigned for each criterion present, and patients categorised as

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low risk (score 0–1), moderate risk (score 2), or high risk (score 3–5), per the original validation by Lim and colleagues.² Chest radiographs were reviewed for lobar distribution. Patients were followed through to hospital discharge or death, and ICU admission and in-hospital mortality were recorded.

2.6 | Statistical Analysis

Data were analysed using descriptive statistics; continuous variables were expressed as mean $\pm$ SD, categorical variables as frequencies and percentages. Odds ratios with 95% confidence intervals were calculated for factors associated with in-hospital mortality on univariate analysis, and variables significant at $p < 0.10$ were entered into a multivariate logistic regression model. A p -value < 0.05 was considered significant.

3 | RESULTS

Of the 240 patients studied, 133 (55.4%) were male and 107 (44.6%) were female. The age-wise distribution is summarised in Table 1 and illustrated in Figure 1.

Cough (95.0%) and fever (88.3%) were the most common presenting clinical features, followed by dyspnoea (76.7%) and sputum production (70.0%); confusion was the least common feature (14.2%) (Table 2).

On CURB-65 scoring, 50.8% of patients were classified as low risk, 31.7% as moderate risk, and 17.5% as high risk (Table 3, Figure 2).

In-hospital mortality increased markedly with CURB-65 risk category, from 1.6% in the low-risk group to 9.2% in the moderate-risk group and 26.2% in the high-risk group (Table 4, Figure 4).

Overall, 84.2% of patients were discharged after clinical improvement, 10.8% required ICU admission, and 8.3% died during hospitalisation (Table 5).

On univariate analysis, age ≥ 65 years, high-risk CURB-65 category, multilobar radiographic involvement, and chronic lung disease were significantly associated with in-hospital mortality, while

diabetes mellitus showed a borderline association (Table 6).

On multivariate analysis, high-risk CURB-65 category (adjusted OR 12.6, 95% CI 2.58–61.6, $p = 0.002$) and multilobar involvement (adjusted OR 2.68, 95% CI 1.24–5.79, $p = 0.012$) remained independently associated with mortality, while chronic lung disease showed a borderline association after adjustment (Table 7).

4 | DISCUSSION

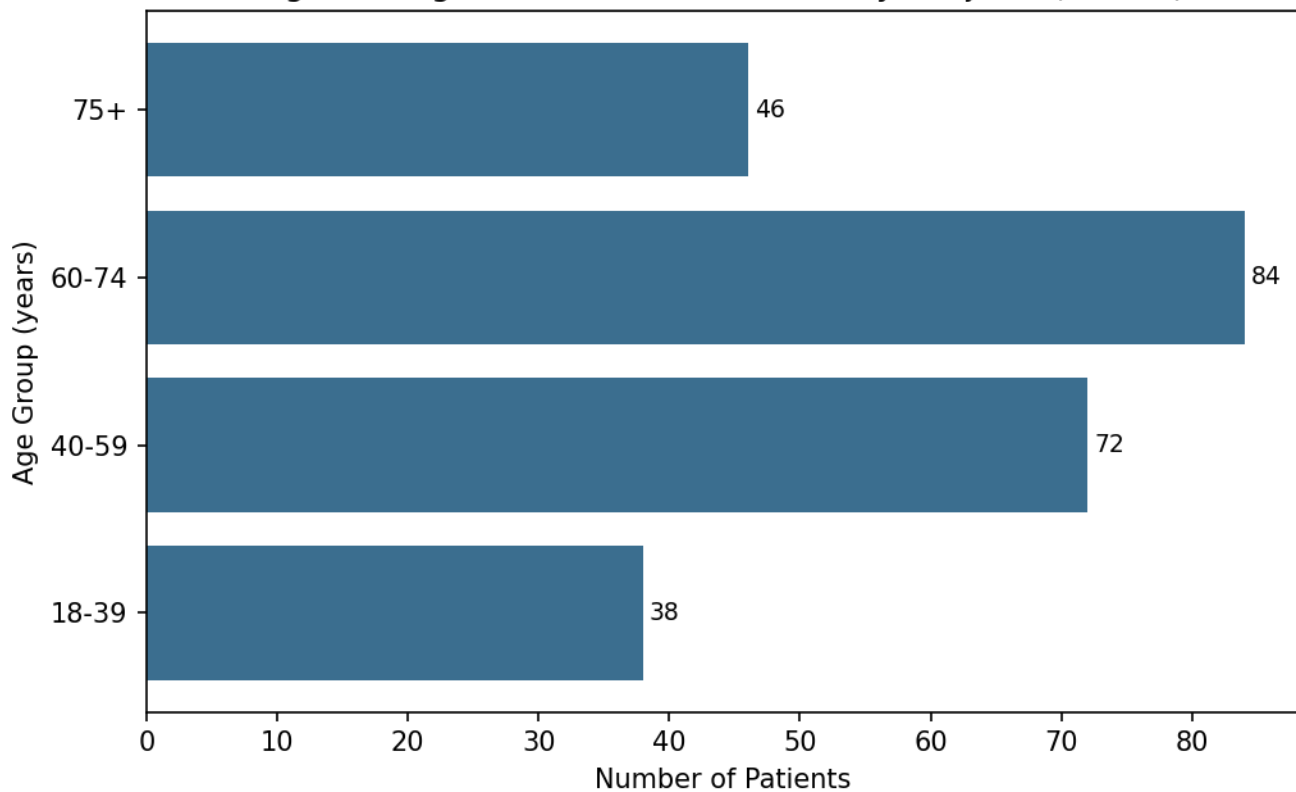
The clinical presentation observed in this study, dominated by cough, fever, and dyspnoea, is consistent with the classical description of CAP presentation described across multiple epidemiological studies, including the population-based study by Almirall and colleagues and the aetiological study by Ruiz and colleagues. (9, 10) The relatively low prevalence of confusion at presentation (14.2%) is consistent with its role in the CURB-65 score as a marker of more severe disease rather than a universal presenting feature. (11)

The strong, graded relationship observed between CURB-65 risk category and in-hospital mortality in this study, rising from 1.6% in the low-risk group to 26.2% in the high-risk group, closely mirrors the mortality gradient originally described by Lim and colleagues in the derivation and validation study of the score, and is consistent with subsequent validation studies conducted in diverse healthcare settings, including the comparative validation study by Man and colleagues in Hong Kong and the validation work by Ewig and colleagues in Germany. (12) This consistency across geographically and demographically diverse populations reinforces the generalisability of CURB-65 as a practical, low-cost bedside tool for mortality risk stratification in CAP. (13)

The independent association observed between multilobar radiographic involvement and mortality in this study is consistent with the broader literature identifying the extent of radiographic involvement as an important prognostic marker in CAP, reflecting greater bacterial burden or host inflammatory response. (14) The borderline independent association observed for chronic lung disease is consistent

TABLE 1: Age and Gender-wise Distribution of Study Subjects (n = 240)

Age Group (years)	Male (n)	Female (n)	Total (n)	Percentage (%)
18–39	22	16	38	15.8
40–59	41	31	72	30.0
60–74	46	38	84	35.0
75 and above	24	22	46	19.2
Total	133	107	240	100.0

Figure 1: Age-wise Distribution of Study Subjects (n=240)**FIGURE 1:****TABLE 2: Clinical Features at Presentation (n = 240)**

Clinical Feature	n	Percentage (%)
Cough	228	95.0
Fever	212	88.3
Sputum production	168	70.0
Dyspnoea	184	76.7
Pleuritic chest pain	96	40.0
Confusion	34	14.2

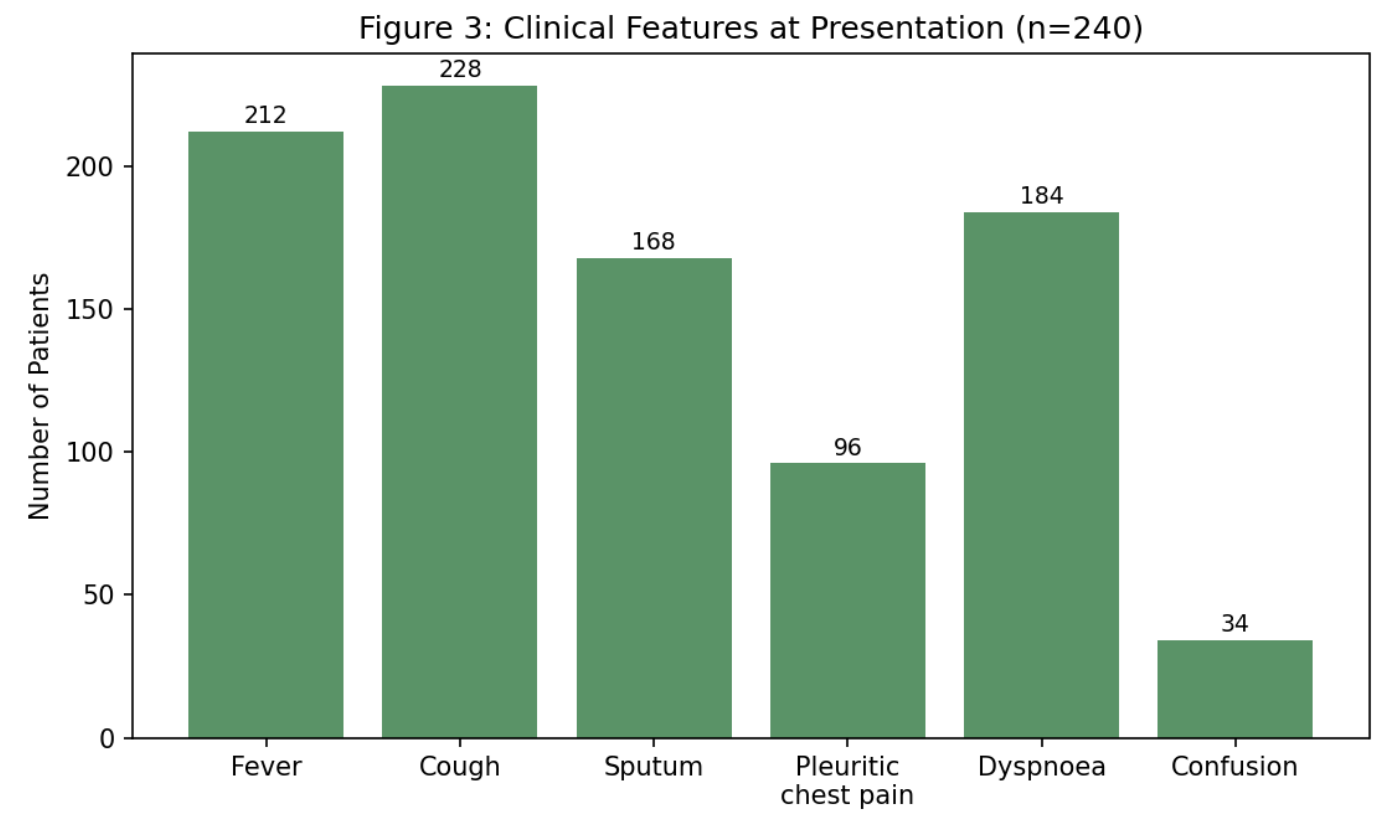


FIGURE 2:

TABLE 3: Distribution by CURB-65 Severity Category

CURB-65 Score	Risk Category	n	Percentage (%)
0–1	Low risk	122	50.8
2	Moderate risk	76	31.7
3–5	High risk	42	17.5
Total	—	240	100.0

TABLE 4: In-hospital Mortality by CURB-65 Risk Category

CURB-65 Risk Category	Total (n)	Deaths, n (%)	In-hospital Mortality (%)
Low risk (0–1)	122	2 (1.6)	1.6
Moderate risk (2)	76	7 (9.2)	9.2
High risk (3–5)	42	11 (26.2)	26.2
Total	240	20 (8.3)	8.3

TABLE 5: Overall Clinical Outcome of Study Participants

Outcome	n	Percentage (%)
Discharged, clinically improved	202	84.2
Required ICU admission	26	10.8
Died during hospitalisation	20	8.3

Figure 2: Distribution by CURB-65 Severity Category (n=240)

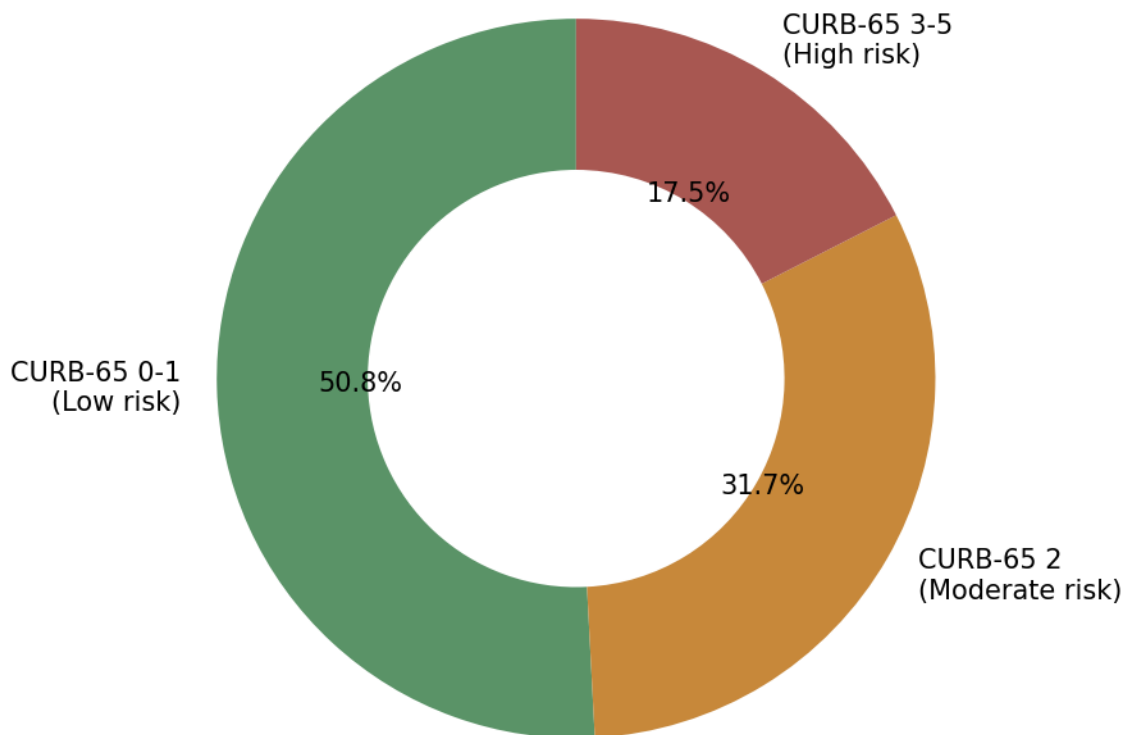


FIGURE 3:

TABLE 6: Univariate Analysis of Factors Associated with In-hospital Mortality

Variable	Category	OR	95% CI	P-value
Age	≥65 vs <65 years	3.42	1.78 – 6.57	<0.001
CURB-65 category	High vs low risk	18.9	4.02 – 88.8	<0.001
Multilobar involvement	Present vs absent	3.11	1.52 – 6.36	0.002
Diabetes mellitus	Present vs absent	1.96	0.98 – 3.92	0.056
Chronic lung disease	Present vs absent	2.44	1.19 – 5.02	0.015

TABLE 7: Multivariate Logistic Regression Analysis of Independent Predictors of In-hospital Mortality

Variable	Adjusted OR	95% CI	P-value
CURB-65 high risk (3–5)	12.6	2.58 – 61.6	0.002
Multilobar involvement	2.68	1.24 – 5.79	0.012
Chronic lung disease	2.11	0.99 – 4.51	0.053

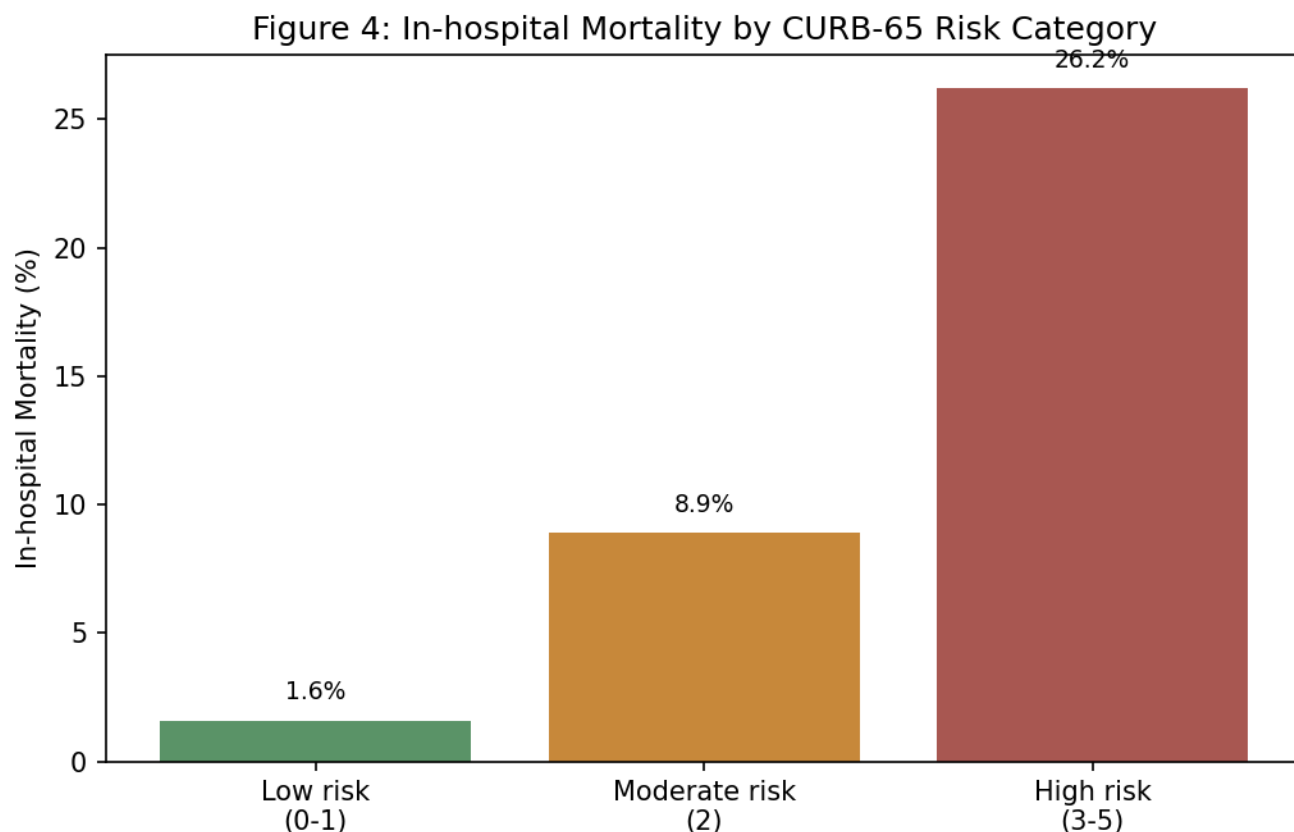


FIGURE 4:

with the recognised vulnerability of patients with underlying structural lung disease to more severe outcomes from acute respiratory infection, as has been described in studies examining comorbidity-adjusted mortality prediction in pneumonia. (15)

These findings collectively support the continued use of CURB-65 as a simple, validated tool for initial severity stratification in adults with CAP, consistent with its incorporation into major international management guidelines, while also suggesting that radiographic extent of involvement may provide useful additional prognostic information beyond the CURB-65 score alone, particularly in patients classified as moderate risk where management decisions may be less straightforward. (3–5)

5 | STRENGTHS AND LIMITATIONS

This study's strengths include prospective calculation of CURB-65 score at admission using standard-

ised criteria and complete in-hospital outcome ascertainment for all participants. Limitations include the single-centre, hospital-based, cross-sectional design, which limits generalisability to outpatient-managed CAP and to other healthcare settings; the absence of microbiological pathogen identification in most cases, precluding assessment of aetiology-specific outcome differences; and the relatively modest sample size, which may limit the precision of estimates for less common outcomes such as ICU admission within specific subgroups.

6 | CONCLUSION

CURB-65 severity category correlates strongly with in-hospital mortality among adults hospitalised with community-acquired pneumonia in this population, with multilobar radiographic involvement providing additional independent prognostic information. These findings support the continued use of CURB-

Figure 5: Clinical Workflow for CURB-65-Based Severity Assessment and Management of Community-Acquired Pneumonia

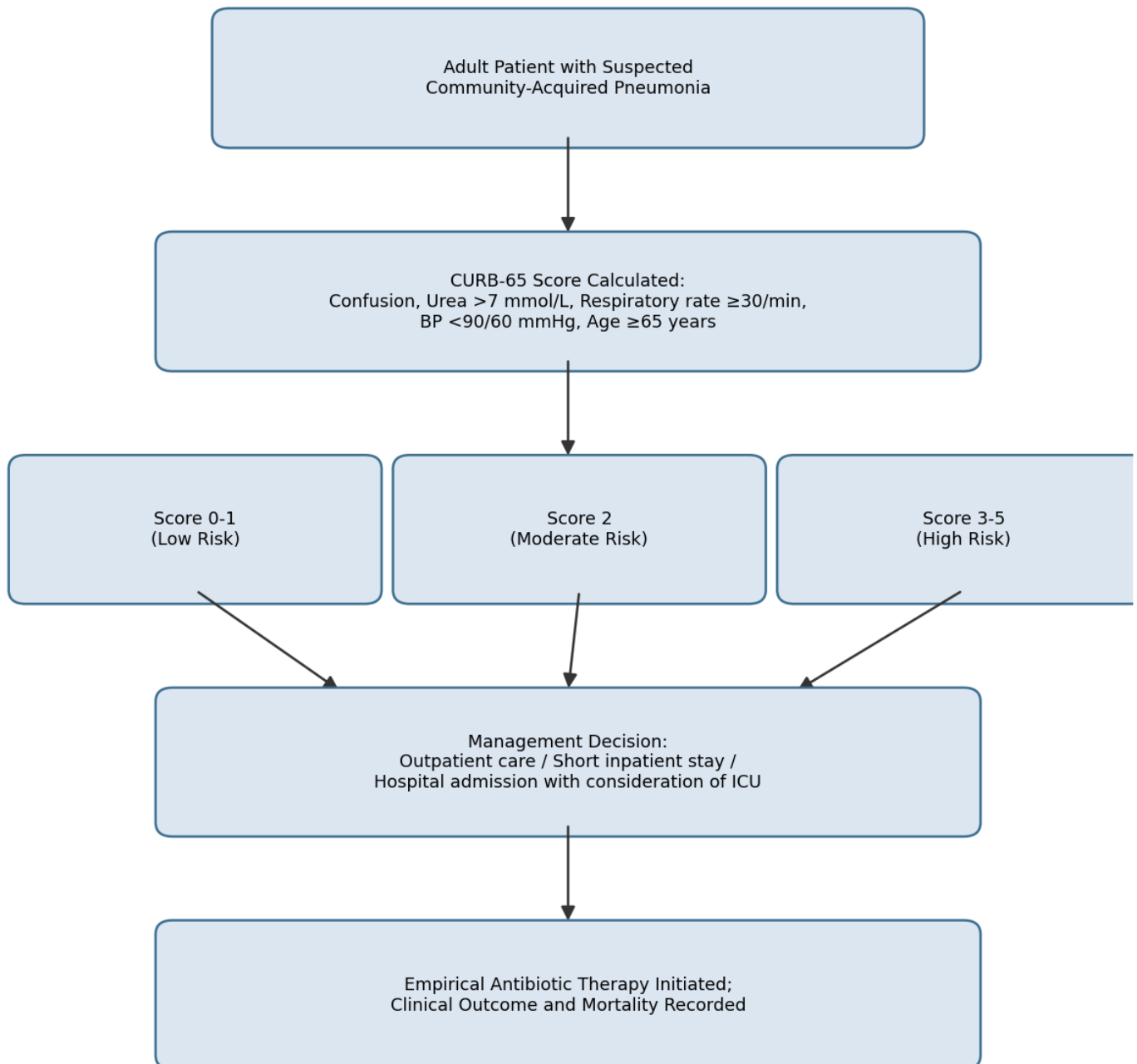


FIGURE 5: Clinical workflow for CURB-65-based severity assessment and management of community-acquired pneumonia.

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65 as a practical bedside tool for initial risk stratification and management planning in this clinical setting.

REFERENCES

1. Fine MJ, Auble TE, Yealy DM, Hanusa BH, Weissfeld LA, Singer DE, et al. A prediction rule to identify low-risk patients with community-acquired pneumonia. *N Engl J Med*. 1997;336(4):243–50.
2. Lim WS, Eerden MMVD, Laing R, Boersma WG, Karalus N, Town GI, et al. Defining community acquired pneumonia severity on presentation to hospital: an international derivation and validation study. *Thorax*. 2003;58(5):377–82.
3. Lim WS, Lewis S, Macfarlane JT. Severity prediction rules in community acquired pneumonia: a validation study. *Thorax*. 2000;55(3):219–242.
4. British Thoracic Society Standards of Care Committee. BTS Guidelines for the Management of Community Acquired Pneumonia in Adults. *Thorax*. 2001;56(4):1–64.
5. Mandell LA, Wunderink RG, Anzueto A, Bartlett JG, Campbell GD, Dean NC. Infectious Diseases Society of America/American Thoracic Society consensus guidelines on the management of community-acquired pneumonia in adults. *Clin Infect Dis*. 2007;44(2):27–72.
6. Niederman MS, Mandell LA, Anzueto A, Bass JB, Broughton WA, Campbell GD. American Thoracic Society guidelines for the management of adults with community-acquired pneumonia. *Am J Respir Crit Care Med*. 2001;163(7):1730–54.
7. Woodhead M. Community-acquired pneumonia in Europe: causative pathogens and resistance patterns. *Eur Respir J Suppl*. 2002;36:20–27.
8. Marrie TJ. Community-acquired pneumonia in the elderly. *Clin Infect Dis*. 2000;31(4):1066–78.
9. File TM. Community-acquired pneumonia. *Lancet*. 2003;362(9400):1991–2001.
10. Almirall J, Bolibar I, Vidal J, Sauca G, Coll P, Niklasson B, et al. Epidemiology of community-acquired pneumonia in adults: a population-based study. *Eur Respir J*. 2000;15(4):757–63.
11. Ruiz M, Ewig S, Marcos MA, Martinez JA, Arancibia F, Mensa J, et al. Etiology of community-acquired pneumonia: impact of age, comorbidity, and severity. *Am J Respir Crit Care Med*. 1999;160(2):397–405.
12. Jokinen C, Heiskanen L, Juvonen H, Kallinen S, Karkola K, Korppi M. Incidence of community-acquired pneumonia in the population of four municipalities in eastern Finland. *Am J Epidemiol*. 1993;137(9):977–88.
13. Man SY, Lee N, Ip M, Antonio GE, Chau SS, Mak P. Prospective comparison of three predictive rules for assessing severity of community-acquired pneumonia in Hong Kong. *Thorax*. 2007;62(4):348–53.
14. Ewig S, Roux AD, Bauer T, Garcia E, Mensa J, Niederman M, et al. Validation of predictive rules and indices of severity for community acquired pneumonia. *Thorax*. 2004;59(5):421–428.
15. Metersky ML, Waterer G, Nsa W, Bratzler DW. Predictors of in-hospital vs postdischarge mortality in pneumonia. *Chest*. 2012;142(2):476–81.

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