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CLINICAL UP-DATE

When, where and how should a patient with community acquired pneumonia be admitted?☆

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Abstract Community-acquired pneumonia is the leading cause of death (10–14%) from infectious disease and the source of many sepsis and septic shock cases attended in the emergency departments. There is great variability in the admission rates (22–61%), and 10–20% of such admissions have to be done in the intensive care unit. The correct determination of need for admission (when), admission site (where) and burden of delivered care (how) will determine the patient's prognosis, request for basic and microbiological studies, antibiotic regimen (via and duration), clinical follow-up intensity and, consequently, the use of socio-health resources (costs). This article aims to orient decision-making, taking into account the new trends in prognostic evaluation tendencies and the current alternatives to the classic hospital admission.

PALABRAS CLAVE
Neumonía adquirida en la comunidad;
Escalas pronósticas;
Urgencias;
Marcadores biológicos;
Procalcitonina;
Proadrenomedulina;
Unidad de corta estancia

¿Cuándo, dónde y cómo ingresar al paciente con neumonía adquirida en la comunidad?

Resumen La neumonía adquirida en la comunidad constituye la principal causa de muerte (10–14%) por enfermedad infecciosa y origina gran parte de las sepsis y shock sépticos atendidos en los servicios de urgencias. Existe gran variabilidad en sus tasas de ingreso (22–61%), y de estos, el 10–20% lo hace en una unidad de cuidados intensivos. Determinar correctamente la necesidad de ingreso (el cuándo), la ubicación (el dónde) y la intensidad de cuidados requeridos (el cómo) va a condicionar el pronóstico del paciente, la solicitud de pruebas básicas y estudios microbiológicos, la pauta antibiótica (vía y duración), la intensidad de observación clínica y, a la postre, la utilización de recursos sociosanitarios (costes). Este trabajo pretende orientar en la toma de estas decisiones teniendo en cuenta las nuevas tendencias en valoración pronóstica y las alternativas a la hospitalización convencional.

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Case report

A 38-year-old male was admitted to the emergency department (ED) with a fever of 39 °C, profuse sweating, chills, shivering and chest pain with deep inspiration in the right chest, exertional dyspnea and purulent reddish sputum. The patient presented considerable general impairment. His blood pressure (BP) was 120/70 mmHg, respiratory rate 34 breaths per minute, heart rate 116 beats per minute, and oxygen saturation ($SatO_2$) while breathing room air was 90%. Physical examination showed pronounced hypoventilation with crackles in the right lung area. The posteroanterior and lateral chest X-ray revealed an interstitial-linear infiltrate in the upper right lobe (URL) and in the lower right lobe. The analytical study showed 21,300 leucocytes μ/l (70% neutrophils, 16% band neutrophils), urea 42 mg/dl, sodium 134 mequiv./l, C-reactive protein (CRP) 90 mg/l; procalcitonin (PCT) 10 ng/ml and a baseline arterial gasometry with pH 7.48, arterial oxygen pressure (PaO_2) 58.4 mm Hg, arterial carbon dioxide partial pressure ($PaCO_2$) 38.6 mm Hg, HCO_3 24.2 mmol/l and $SatO_2$ 90.8%.

Based on a diagnosis of community-acquired pneumonia (CAP), a prognostic assessment according to the Fine index of group II and a score of 1 on the CURB-65 scale (confusion, urea, respiratory rate, systolic BP [SBP] or diastolic BP [DBP] and age ≥65 years), we ask the following questions:

a) Should we hospitalize the patient? If yes, where?
b) What impact should clinical judgment have on our decision?
c) What level of bacteremia is the patient predicted to have?
d) What impact do biomarkers (BM) and a clinical situation of sepsis (S) have on the indication for hospitalization?
e) What additional criteria should we assess along with the prognostic scales?
f) Are there alternatives to conventional hospitalization for patients with CAP?

Emergency departments and patients with community-acquired pneumonia

CAP represents the main cause of death due to infectious disease and the sixth overall in Western countries (10–14%, depending on age and associated risk factors). CAP causes a large portion of the cases of sepsis (S), severe sepsis (SS) and septic shock (SSh) treated in EDs.[1] In Spain, its incidence is approximately 2–11 cases/1000 inhabitants/year and may increase to 15–35 cases/1000 inhabitants/year during epidemic viral seasons, in winter, in those over 65 years of age and in chronically ill patients or those with toxic habits, among others.[2] There is considerable variability among centers and among clinics in the same center in the handling of the diagnostic and therapeutic issues of patients with CAP.[1] The hospitalization rates (22–61%) differ greatly depending on the center, season and patient characteristics. Between 10 and 20% of patients hospitalized with CAP are admitted to the intensive care unit (ICU), where the mortality may increase by 20–50%.[3]

At least 75% of those with CAP are treated in EDs, highlighting the transcendental role of the emergency physician in the initial management of these processes, which can determine the patients' evolution and subsequent morbidity and mortality.[1–3] The decision to hospitalize patients with CAP (when), the appropriate location (where) and the care they require (how) will determine the patients' prognosis (morbidity and mortality), the request for laboratory tests, microbiological studies, the initial selection of antimicrobial regimens, the intensity of clinical observation and the use of health center resources.[4] The final expenditures will depend on all these factors and will increase by 8–25 times in hospitalized patients when compared with those treated at home.[3] These decisions will have implications for the safety and quality of the care offered to patients[5] and for its cost-effectiveness.[4,6] Improper hospitalization increases the likelihood of experiencing medical malpractice, adverse episodes and nosocomial infections.[2,4] The use of clinical practice guidelines (CPG) decreases the proportion of patients with low-risk CAP, as well as those who are in groups I-III of the Pneumonia Severity Index (PSI), those who are improperly hospitalized (31–49%) and those who are readmitted to the ED. CPG use is also associated with a reduction in mortality.[3,7] Regardless of the prognostic assessment of the patient and the final decision as to where the patient should be treated, the administration of antibiotherapy should not be delayed, especially in the most seriously ill patients (those with severe sepsis and septic shock).[1–3]

In order to guide these decisions while taking into account new trends in the prognostic assessment of CAP (changing or adapting the traditional scales, new scales, additional criteria, prediction of bacteremia, clinical situation, biomarker assessment, expert professional clinical judgment, etc.) and the current alternatives to conventional hospitalization (early discharge, ED observation, short-stay unit [SSU], outpatient center, home care),[4] this study has been prepared for adult patients who are not immunocompromised or hospitalized with CAP.

The decision to hospitalize

An assessment of severity is essential for determining the intensity of the treatment required for the patient with CAP. The majority of prognostic severity scales (PSS) were developed with the idea of converting them into clinical rules that stratified patients into risk groups based on the mortality observed at 30 days.[8,9] These scales were designed according to the presence of various prognostic factors that were dependent on the patient (age, associated diseases, epidemiological aspects, etc.) or dependent on the process (clinical, laboratory and radiological findings).[4]

Once the decision has been made to hospitalize the patient, other issues should be considered such as the length of the hospital stay, the readmission rates at 30 days and the need to recognize patients who require surveillance in an ICU due to severe CAP (SCAP).[3,10,11] Avoiding both unnecessary admissions and improper discharges constitutes an undeniable objective.[1,4] It is known that 38–62% of patients with low-risk CAP are admitted to the hospital (40% due to a clinical decision) while in contrast, 3–13% of those with high-risk CAP are sent home.[4–12] It is difficult to find simple explanations for these facts. The care of each patient with CAP should be individualized, using PSS as a