

RECOMENDACIÓN 1**BÚSQUEDA Y SÍNTESIS DE EVIDENCIA DE EFECTOS DESEABLES E INDESEABLES**
GUÍA DE PRÁCTICA CLÍNICA NEUMONÍA ADQUIRIDA EN LA COMUNIDAD DE MANEJO
AMBULATORIO- 2017**PREGUNTA 1: CURB-65 PARA PREDECIR GRAVEDAD DE NEUMONÍA ADQUIRIDA EN LA COMUNIDAD**

Pregunta solicitada: En adultos de 65 años y más con neumonía adquirida en la comunidad ¿Se debe utilizar CURB-65 en comparación a utilizar Fine/escala española para evaluar la gravedad de la neumonía adquirida en la comunidad?

BÚSQUEDA DE EVIDENCIA

Se realizó una búsqueda general de revisiones sistemáticas asociadas al tema de “Neumonía adquirida en la comunidad”. Las bases de datos utilizadas fueron: Cochrane database of systematic reviews (CDSR); Database of Abstracts of Reviews of Effectiveness (DARE); HTA Database; PubMed; LILACS; CINAHL; PsychINFO; EMBASE; EPPI-Centre Evidence Library; 3ie Systematic Reviews and Policy Briefs Campbell Library; Clinical Evidence; SUPPORT Summaries; WHO institutional Repository for information Sharing; NICE public health guidelines and systematic reviews; ACP Journal Club; Evidencias en Pediatría; y The JBI Database of Systematic Reviews and implementation Reports. No se aplicaron restricciones en base al idioma o estado de publicación. Dos revisores de manera independiente realizaron la selección de los títulos y los resúmenes, la evaluación del texto completo y la extracción de datos. Un investigador experimentado resolvió cualquier discrepancia entre los distintos revisores. En caso de considerarse necesario, se integraron estudios primarios.

Seleccionadas las revisiones sistemáticas o estudios primarios asociadas a la temática, se clasificaron en función de las potenciales preguntas a las que daban respuesta. Los resultados se encuentran alojadas en la plataforma Living Overview of the Evidence (L-OVE). Por lo tanto, al momento de definir la pregunta, la evidencia ya se encontraba clasificada según intervenciones que comparadas.

SÍNTESIS DE EVIDENCIA

Análisis de los componentes de la pregunta en formato PICO

Población: Adultos mayores de 65 y más con NAC

Intervención: CURB-65

Comparación: Fine/PSI, escala española para evaluar la gravedad de la neumonía adquirida en la comunidad

Desenlace (outcome)

Exactitud pronóstica (sobre mortalidad)

Resumen de la evidencia identificada

No se identificaron estudios de impacto que comparan CURB-65 con PSI (estudios en que a un grupo se le aplicara CURB-65 y al otro PSI, midiendo desenlaces clínicos). Sí se encontraron estudios evaluando la exactitud de cada una de estas reglas de predicción pronóstica. Se identificaron 6 revisiones sistemáticas que incluyen 30 estudios primarios, todos ellos observacionales, para CURB-65. Se identificaron 6 revisiones sistemáticas que incluyen 61 estudios primarios que responden la pregunta de exactitud de PSI.

Tabla resumen de la evidencia identificada

Tipo de pregunta	Revisión sistemática	Estudios primarios
Impacto (CURB-65 versus PSI)	0	0
Exactitud pronóstica CURB-65	1 [1-6]	[7-18]
Exactitud pronóstica PSI	6 [1-6]	61 [19-77]

Estimador del efecto

CURB-65

Se realizó un análisis de la matriz de evidencia (CURB-65 para neumonía adquirida en la comunidad). Considerando que una revisión sistemática incluye la mayoría de los estudios primarios relevantes, y que aquellos no incluidos no modifican el resultado, se decidió reutilizar los metanálisis reportados en ella para confeccionar la tabla de resumen de resultados.

PSI

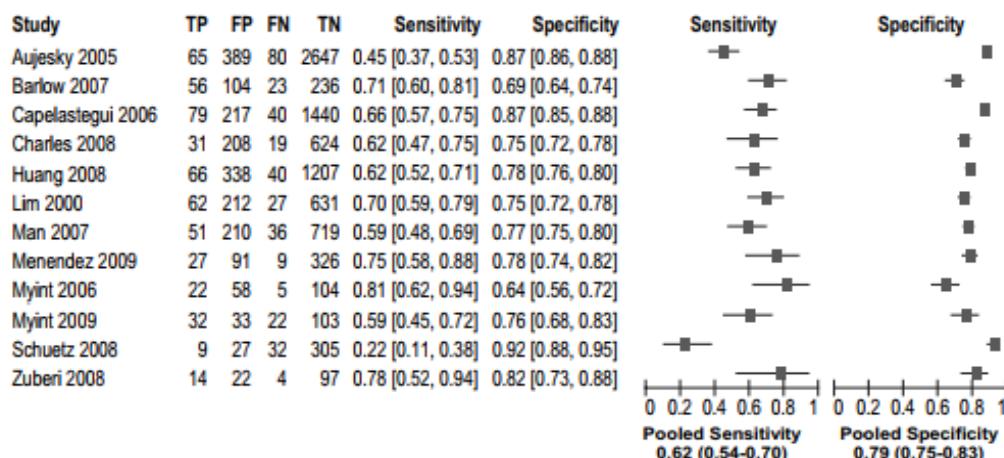
Se realizó un análisis de la matriz de evidencia (PSI para neumonía adquirida en la comunidad). Considerando que una revisión sistemática incluye la mayoría de los estudios primarios relevantes, y que aquellos no incluidos no modifican el resultado, se decidió reutilizar los metanálisis reportados en ella para confeccionar la tabla de resumen de resultados para cada regla de predicción clínica.

Metanálisis

CURB-65 para predecir mortalidad

b

CURB-65



PSI

a

PSI

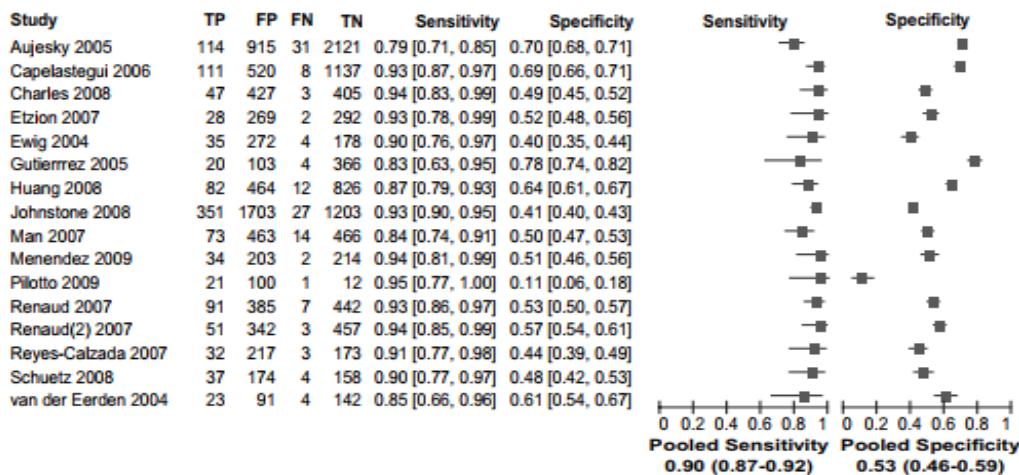


Tabla de Resumen de Resultados (Summary of Findings)

A. CURB-65 PARA PREDICIR MORTALIDAD EN NEUMONÍA ADQUIRIDA EN LA COMUNIDAD

Población Factor Desenlace	Pacientes con neumonía adquirida en la comunidad CURB-65 Mortalidad		
Desenlaces	Efecto por 1000 pacientes testeados (IC 95%) Prevalencia* 7%	Certeza de la evidencia (GRADE)	Mensajes clave en términos sencillos
Sensibilidad de 62% (IC 95% de 54 a 70%) Especificidad de 79% (IC 95% de 75 a 83%) -- 12 estudios (11.199 pacientes) [10, 11, 19, 24, 46, 51, 52, 54, 56, 58, 70, 77]			
Mortalidad correctamente predicha (verdaderos positivos)			
Mortalidad incorrectamente predicha (falsos positivos)	43 por 1000	⊕⊕○○ ^{1,2} Baja	En este grupo, el CURB-65 probablemente lleva a pocas modificaciones.
No mortalidad correctamente descartada (verdaderos negativos)	735 por 1000 (IC: 375 a 455)	⊕⊕○○ ^{1,2} Baja	En este grupo, el CURB-65 permite evitar cuidados, efectos adversos y gastos innecesarios.
Mortalidad incorrectamente predicha (falsos positivos)	195 por 1000	⊕⊕○○ ^{1,2} Baja	En este grupo, el CURB-65 considera como de alto riesgo a pacientes que no lo tienen. Esto redunda en cuidados, efectos adversos y gastos innecesarios.
Mortalidad incorrectamente descartada (falsos negativos)	27 por 1000	⊕⊕○○ ^{1,2} Baja	En este grupo, el CURB-65 considera como de bajo riesgo a pacientes que tienen un riesgo alto. Esto puede llevar a no aplicar los cuidados necesarios, o no hacerlo a tiempo, con el consiguiente aumento en la morbilidad.
Impacto en desenlaces clínicos	No se identificaron estudios		No se encontraron estudios evaluando desenlaces clínicos relevantes.

IC: Intervalo de confianza del 95%.
GRADE: grados de evidencia del GRADE *Working Group*

* La revisión sistemática [1] estimó una mortalidad en los estudios de alrededor de un 7%.

¹ Se disminuyó un nivel de certeza de la evidencia por inconsistencia por I2 de 81% para sensibilidad y 96% para especificidad.

² Se disminuyó un nivel de certeza de evidencia por tratarse de evidencia indirecta, ya que no evalúa a adultos mayores, sino a población general (sin distinguir entre adultos no mayores y mayores).

Fecha de elaboración de la tabla: 02/02/2018

B. PSI PARA PREDECIR MORTALIDAD EN NEUMONIA ADQUIRIDA EN LA COMUNIDAD

Pacientes Intervención Gold standard	Pacientes con neumonía adquirida en la comunidad PSI para predecir mortalidad Seguimiento clínico				
Desenlaces	Efecto por 1000 pacientes testeados (IC 95%) Prevalencia* 7%	Certeza de la evidencia (GRADE)	Mensajes clave en términos sencillos		
Sensibilidad de 90% (IC 95% de 87 a 92%) Especificidad de 53% (IC 95% de 46 a 59%) -- 16 estudios (16.519 pacientes) [10, 19, 24, 33, 35, 45, 46, 47, 52, 54, 61, 64, 65, 67, 70, 74]					
16 estudios (16.519 pacientes) [10, 19, 24, 33, 35, 45, 46, 47, 52, 54, 61, 64, 65, 67, 70, 74]					
Mortalidad correctamente predicha (verdaderos positivos)	63 por 1000	⊕⊕○○ ^{1,2} Baja	En este grupo, el PSI probablemente lleva a pocas modificaciones.		
No mortalidad correctamente descartada (verdaderos negativos)	493 por 1000 (IC: 375 a 455)	⊕⊕○○ ^{1,2} Baja	En este grupo, el PSI permite evitar cuidados, efectos adversos y gastos innecesarios.		
Mortalidad incorrectamente predicha (falsos positivos)	437 por 1000	⊕⊕○○ ^{1,2} Baja	En este grupo, el PSI considera como de alto riesgo a pacientes que no lo tienen. Esto redunda en cuidados, efectos adversos y gastos innecesarios.		
Mortalidad incorrectamente descartada (falsos negativos)	7 por 1000	⊕⊕○○ ^{1,2} Baja	En este grupo, el PSI considera como de bajo riesgo a pacientes que tienen un riesgo alto. Esto puede llevar a no aplicar los cuidados necesarios, o no hacerlo a tiempo, con el consiguiente aumento en la morbilidad.		
Impacto en desenlaces clínicos	No se identificaron estudios		No se encontraron estudios evaluando desenlaces clínicos relevantes.		
IC = Intervalo de confianza del 95%. GRADE: grados de evidencia del GRADE Working Group					
* La revisión sistemática [1] estimó una mortalidad en los estudios alrededor de un 7%.					
¹ Se disminuyó un nivel de certeza de la evidencia por inconsistencia por I2 de 59% para sensibilidad y 98% para especificidad.					
² Se disminuyó un nivel de certeza de evidencia por tratarse de evidencia indirecta, ya que no evalúa a adultos mayores, sino a población general (sin distinguir entre adultos no mayores y mayores).					
Fecha de elaboración de la tabla: 02/02/2018					

Referencias

1. Loke YK, Kwok CS, Niruban A, Myint PK. Value of severity scales in predicting mortality from community-acquired pneumonia: systematic review and meta-analysis. *Thorax*. 2010;65(10):884-90.
2. Akram AR, Chalmers JD, Hill AT. Predicting mortality with severity assessment tools in out-patients with community-acquired pneumonia. *QJM : monthly journal of the Association of Physicians*. 2011;104(10):871-9.
3. Chalmers JD, Singanayagam A, Akram AR, Mandal P, Short PM, Choudhury G, Wood V, Hill AT. Severity assessment tools for predicting mortality in hospitalised patients with community-acquired pneumonia. Systematic review and meta-analysis. *Thorax*. 2010;65(10):878-83.
4. Kwok CS, Loke YK, Woo K, Myint PK. Risk prediction models for mortality in community-acquired pneumonia: a systematic review. *BioMed research international*. 2013;2013(no pagination):504136.
5. Marti C, Garin N, Grosgeur O, Poncet A, Combescure C, Carballo S, Perrier A. Prediction of severe community-acquired pneumonia: a systematic review and meta-analysis. *Critical care (London, England)*. 2012;16(4):R141.
6. Chalmers JD, Mandal P, Singanayagam A, Akram AR, Choudhury G, Short PM, Hill AT. Severity assessment tools to guide ICU admission in community-acquired pneumonia: systematic review and meta-analysis. *Intensive care medicine*. 2011;37(9):1409-20.
7. Ananda-Rajah MR, Charles PG, Melvani S, Burrell LL, Johnson PD, Grayson ML. Comparing the pneumonia severity index with CURB-65 in patients admitted with community acquired pneumonia. *Scandinavian journal of infectious diseases*. 2008;40(4):293-300.
8. Angus DC, Marrie TJ, Obrosky DS, Clermont G, Dremsizov TT, Coley C, Fine MJ, Singer DE, Kapoor WN. Severe community-acquired pneumonia: use of intensive care services and evaluation of American and British Thoracic Society Diagnostic criteria. *American journal of respiratory and critical care medicine*. 2002;166(5):717-23.
9. Atlas SJ, Benzer TI, Borowsky LH, Chang Y, Burnham DC, Metlay JP, Halm EA, Singer DE. Safely increasing the proportion of patients with community-acquired pneumonia treated as outpatients: an interventional trial. *Archives of internal medicine*. 1998;158(12):1350-6.
10. Aujesky D, Auble TE, Yealy DM, Stone RA, Obrosky DS, Meehan TP, Graff LG, Fine JM, Fine MJ. Prospective comparison of three validated prediction rules for prognosis in community-acquired pneumonia. *The American journal of medicine*. 2005;118(4):384-92.
11. Barlow G, Nathwani D, Davey P. The CURB65 pneumonia severity score outperforms generic sepsis and early warning scores in predicting mortality in community-acquired pneumonia. *Thorax*. 2007;62(3):253-9.
12. Barlow G, Nathwani D, Myers E, Sullivan F, Stevens N, Duffy R, Davey P. Identifying barriers to the rapid administration of appropriate antibiotics in community-acquired pneumonia. *The Journal of antimicrobial chemotherapy*. 2008;61(2):442-51.
13. British Thoracic Society, Myint PK, Kamath AV, Vowler SL, Maisey DN, Harrison BD. Severity assessment criteria recommended by the British Thoracic Society (BTS) for community-acquired pneumonia (CAP) and older patients. Should SOAR (systolic blood pressure, oxygenation, age and respiratory rate) criteria be used in older people? A compilation study of two prospective cohorts. *Age and ageing*. 2006;35(3):286-91.
14. Brown SM, Jones BE, Jephson AR, Dean NC, Infectious Disease Society of America/American Thoracic Society 2007. Validation of the Infectious Disease Society of America/American Thoracic Society 2007 guidelines for severe community-acquired pneumonia. *Critical care medicine*. 2009;37(12):3010-6.

15. Busing KL, Thrusky KA, Black JF, MacGregor L, Street AC, Kennedy MP, Brown GV. A prospective comparison of severity scores for identifying patients with severe community acquired pneumonia: reconsidering what is meant by severe pneumonia. *Thorax*. 2006;61(5):419-24.
16. Busing KL, Thrusky KA, Black JF, MacGregor L, Street AC, Kennedy MP, Brown GV. Identifying severe community-acquired pneumonia in the emergency department: a simple clinical prediction tool. *Emergency medicine Australasia : EMA*. 2007;19(5):418-26.
17. Calbo E, Ochoa de Echagüen A, Rodríguez-Carballeira M, Ferrer C, Garau J. [Hospital admission, duration of stay and mortality in community-acquired pneumonia in an acute care hospital. Correlation between a pneumonia prognosis index and conventional clinical criteria for assessing severity]. *Enfermedades infecciosas y microbiología clínica*. 2004;22(2):64-9.
18. Campbell SG, Patrick W, Urquhart DG, Maxwell DM, Ackroyd-Stolarz SA, Murray DD, Hawass A, Department of Emergency Medicine, Dalhousie University, Halifax, Nova Scotia, Canada. Patients with community acquired pneumonia discharged from the emergency department according to a clinical practice guideline. *Emergency Medicine Journal*. 2004;21(6):667-669.
19. Capelastegui A, España PP, Quintana JM, Areitio I, Gorordo I, Egurrola M, Bilbao A. Validation of a predictive rule for the management of community-acquired pneumonia. *The European respiratory journal : official journal of the European Society for Clinical Respiratory Physiology*. 2006;27(1):151-7.
20. Carratalà J, Fernández-Sabé N, Ortega L, Castellsagué X, Rosón B, Dorca J, Fernández-Agüera A, Verdaguer R, Martínez J, Manresa F, Gudiol F. Outpatient care compared with hospitalization for community-acquired pneumonia: a randomized trial in low-risk patients. *Annals of internal medicine*. 2005;142(3):165-72.
21. Challen K, Bright J, Bentley A, Walter D. Physiological-social score (PMEWS) vs. CURB-65 to triage pandemic influenza: a comparative validation study using community-acquired pneumonia as a proxy. *BMC health services research*. 2007;7:33.
22. Chalmers JD, Singanayagam A, Hill AT. Systolic blood pressure is superior to other haemodynamic predictors of outcome in community acquired pneumonia. *Thorax*. 2008;63(8):698-702.
23. Chalmers JD, Taylor JK, Mandal P, Choudhury G, Singanayagam A, Akram AR, Hill AT. Validation of the Infectious Diseases Society of America/American Thoracic Society minor criteria for intensive care unit admission in community-acquired pneumonia patients without major criteria or contraindications to intensive care unit care. *Clinical infectious diseases : an official publication of the Infectious Diseases Society of America*. 2011;53(6):503-11.
24. Charles PG, Whitby M, Fuller AJ, Stirling R, Wright AA, Korman TM, Holmes PW, Christiansen KJ, Waterer GW, Pierce RJ, Mayall BC, Armstrong JG, Catton MG, Nimmo GR, Johnson B, Hooy M, Grayson ML, Australian CAP Study Collaboration. The etiology of community-acquired pneumonia in Australia: why penicillin plus doxycycline or a macrolide is the most appropriate therapy. *Clinical infectious diseases : an official publication of the Infectious Diseases Society of America*. 2008;46(10):1513-21.
25. Charles PG, Wolfe R, Whitby M, Fine MJ, Fuller AJ, Stirling R, Wright AA, Ramirez JA, Christiansen KJ, Waterer GW, Pierce RJ, Armstrong JG, Korman TM, Holmes P, Obrosky DS, Peyrani P, Johnson B, Hooy M, Australian Community-Acquired Pneumonia Study Collaboration, Grayson ML. SMART-COP: a tool for predicting the need for intensive respiratory or vasopressor support in community-acquired pneumonia. *Clinical infectious diseases : an official publication of the Infectious Diseases Society of America*. 2008;47(3):375-84.

26. Chen CZ, Fan PS, Lin CC, Lee CH, Hsue TR. Repeated pneumonia severity index measurement after admission increases its predictive value for mortality in severe community-acquired pneumonia. *Journal of the Formosan Medical Association = Taiwan yi zhi*. 2009;108(3):219-23.
27. Davydov L, Ebert SC, Restino M, Gardner M, Bedenkop G, Uchida KM, Bertino JS. Prospective evaluation of the treatment and outcome of community-acquired pneumonia according to the Pneumonia Severity Index in VHA hospitals. *Diagnostic microbiology and infectious disease*. 2006;54(4):267-75.
28. Dedier J, Singer DE, Chang Y, Moore M, Atlas SJ. Processes of care, illness severity, and outcomes in the management of community-acquired pneumonia at academic hospitals. *Archives of internal medicine*. 2001;161(17):2099-104.
29. Escobar GJ, Fireman BH, Palen TE, Gardner MN, Lee JY, Clark MP, Kipnis P. Risk adjusting community-acquired pneumonia hospital outcomes using automated databases. *The American journal of managed care*. 2008;14(3):158-66.
30. España PP, Capelastegui A, Gorordo I, Esteban C, Oribe M, Ortega M, Bilbao A, Quintana JM. Development and validation of a clinical prediction rule for severe community-acquired pneumonia. *American journal of respiratory and critical care medicine*. 2006;174(11):1249-56.
31. España PP, Capelastegui A, Quintana JM, Bilbao A, Diez R, Pascual S, Esteban C, Zalacaín R, Menendez R, Torres A. Validation and comparison of SCAP as a predictive score for identifying low-risk patients in community-acquired pneumonia. *The Journal of infection*. 2010;60(2):106-13.
32. España PP, Capelastegui A, Quintana JM, Soto A, Gorordo I, García-Urbaneja M, Bilbao A. A prediction rule to identify allocation of inpatient care in community-acquired pneumonia. *The European respiratory journal*. 2003;21(4):695-701.
33. Etzion O, Novack V, Avnon L, Porath A, Dagan E, Riesenbergs K, Avriel A, Schlaeffer F. Characteristics of low-risk patients hospitalized with community-acquired pneumonia. *European journal of internal medicine*. 2007;18(3):209-14.
34. Ewig S, de Roux A, Bauer T, García E, Mensa J, Niederman M, Torres A. Validation of predictive rules and indices of severity for community acquired pneumonia. *Thorax*. 2004;59(5):421-7.
35. Ewig S, Seifert K, Kleinfeld T, Göke N, Schäfer H. Management of patients with community-acquired pneumonia in a primary care hospital: a critical evaluation. *Respiratory medicine*. 2000;94(6):556-63.
36. Feagan BG, Marrie TJ, Lau CY, Wheeler SL, Wong CJ, Vandervoort MK. Treatment and outcomes of community-acquired pneumonia at Canadian hospitals. *CMAJ : Canadian Medical Association journal = journal de l'Association medicale canadienne*. 2000;162(10):1415-20.
37. Feldman C, Alanee S, Yu VL, Richards GA, Ortqvist A, Rello J, Chiou CC, Chedid MB, Wagener MM, Klugman KP, International Pneumococcal Study Group. Severity of illness scoring systems in patients with bacteraemic pneumococcal pneumonia: implications for the intensive care unit care. *Clinical microbiology and infection : the official publication of the European Society of Clinical Microbiology and Infectious Diseases*. 2009;15(9):850-7.
38. Fine MJ, Auble TE, Yealy DM, Hanusa BH, Weissfeld LA, Singer DE, Coley CM, Marrie TJ, Kapoor WN. A prediction rule to identify low-risk patients with community-acquired pneumonia. *The New England journal of medicine*. 1997;336(4):243-50.
39. Flanders WD, Tucker G, Krishnadasan A, Martin D, Honig E, McClellan WM. Validation of the pneumonia severity index. Importance of study-specific recalibration. *Journal of general internal medicine*. 1999;14(6):333-40.
40. Fukuyama H, Ishida T, Tachibana H, Nakagawa H, Iwasaku M, Saigusa M, Yoshioka H, Arita M, Hashimoto T. Validation of scoring systems for predicting severe community-acquired pneumonia. *Internal medicine (Tokyo, Japan)*. 2011;50(18):1917-22.

41. Garau J, Baquero F, Pérez-Trallero E, Pérez JL, Martín-Sánchez AM, García-Rey C, Martín-Herrero JE, Dal-Ré R, NACER Group. Factors impacting on length of stay and mortality of community-acquired pneumonia. *Clinical microbiology and infection : the official publication of the European Society of Clinical Microbiology and Infectious Diseases*. 2008;14(4):322-9.
42. Garcia-Vidal C, Fernández-Sabé N, Carratalà J, Díaz V, Verdaguer R, Dorca J, Manresa F, Gudiol F. Early mortality in patients with community-acquired pneumonia: causes and risk factors. *The European respiratory journal : official journal of the European Society for Clinical Respiratory Physiology*. 2008;32(3):733-9.
43. García-Vázquez E, Soto S, Gómez J, Herrero JA. Simple criteria to assess mortality in patients with community-acquired pneumonia. *Medicina clínica*. 2008;131(6):201-4.
44. Goss CH, Rubenfeld GD, Park DR, Sherbin VL, Goodman MS, Root RK. Cost and incidence of social comorbidities in low-risk patients with community-acquired pneumonia admitted to a public hospital. *Chest*. 2003;124(6):2148-55.
45. Gutiérrez F, Masiá M, Rodríguez JC, Mirete C, Soldán B, Padilla S, Hernández I, De Ory F, Royo G, Hidalgo AM. Epidemiology of community-acquired pneumonia in adult patients at the dawn of the 21st century: a prospective study on the Mediterranean coast of Spain. *Clinical microbiology and infection : the official publication of the European Society of Clinical Microbiology and Infectious Diseases*. 2005;11(10):788-800.
46. Huang DT, Weissfeld LA, Kellum JA, Yealy DM, Kong L, Martino M, Angus DC, GenIMS Investigators. Risk prediction with procalcitonin and clinical rules in community-acquired pneumonia. *Annals of emergency medicine*. 2008;52(1):48-58.e2.
47. Johnstone J, Eurich DT, Majumdar SR, Jin Y, Marrie TJ. Long-term morbidity and mortality after hospitalization with community-acquired pneumonia: a population-based cohort study. *Medicine*. 2008;87(6):329-34.
48. Kontou P, Kuti JL, Nicolau DP. Validation of the Infectious Diseases Society of America/American Thoracic Society criteria to predict severe community-acquired pneumonia caused by *Streptococcus pneumoniae*. *The American journal of emergency medicine*. 2009;27(8):968-74.
49. Lamy O, Van Melle G, Cornuz J, Burnand B. Clinical management of immunocompetent hospitalized patients with community-acquired pneumonia. *European journal of internal medicine*. 2004;15(1):28-34.
50. Liapikou A, Ferrer M, Polverino E, Balasso V, Esperatti M, Piñer R, Mensa J, Luque N, Ewig S, Menendez R, Niederman MS, Torres A. Severe community-acquired pneumonia: validation of the Infectious Diseases Society of America/American Thoracic Society guidelines to predict an intensive care unit admission. *Clinical infectious diseases : an official publication of the Infectious Diseases Society of America*. 2009;48(4):377-85.
51. Lim WS, van der Eerden MM, Laing R, Boersma WG, Karalus N, Town GI, Lewis SA, Macfarlane JT. Defining community acquired pneumonia severity on presentation to hospital: an international derivation and validation study. *Thorax*. 2003;58(5):377-82.
52. Man SY, Lee N, Ip M, Antonio GE, Chau SS, Mak P, Graham CA, Zhang M, Lui G, Chan PK, Ahuja AT, Hui DS, Sung JJ, Rainer TH. Prospective comparison of three predictive rules for assessing severity of community-acquired pneumonia in Hong Kong. *Thorax*. 2007;62(4):348-53.
53. Marrie TJ, Shariatzadeh MR. Community-acquired pneumonia requiring admission to an intensive care unit: a descriptive study. *Medicine*. 2007;86(2):103-11.
54. Menéndez R, Martínez R, Reyes S, Mensa J, Filella X, Marcos MA, Martínez A, Esquinas C, Ramirez P, Torres A. Biomarkers improve mortality prediction by prognostic scales in community-acquired pneumonia. *Thorax*. 2009;64(7):587-91.

55. Migliorati PL, Boccoli E, Bracci LS, Sestini P, Melani AS. A survey on hospitalised community-acquired pneumonia in Italy. Monaldi archives for chest disease = Archivio Monaldi per le malattie del torace / Fondazione clinica del lavoro, IRCCS [and] Istituto di clinica tisiologica e malattie apparato respiratorio, Università di Napoli, Secondo ateneo. 2006;65(2):82-8.
56. Myint PK, Bhaniani A, Bradshaw SM, Alobeidi F, Tariq SM. Usefulness of shock index and adjusted shock index in the severity assessment of community-acquired pneumonia. Respiration; international review of thoracic diseases. 2009;77(4):468-9.
57. Myint PK, Kamath AV, Vowler SL, Harrison BD. Simple modification of CURB-65 better identifies patients including the elderly with severe CAP. Thorax. 2007;62(11):1015-6; author reply 1016.
58. Myint PK, Sankaran P, Musonda P, Subramanian DN, Ruffell H, Smith AC, Prentice P, Tariq SM, Kamath AV. Performance of CURB-65 and CURB-age in community-acquired pneumonia. International journal of clinical practice. 2009;63(9):1345-50.
59. Ortega L, Sierra M, Domínguez J, Martínez J, Matas L, Bastart F, Galí N, Ausina V. Utility of a pneumonia severity index in the optimization of the diagnostic and therapeutic effort for community-acquired pneumonia. Scandinavian journal of infectious diseases. 2005;37(9):657-63.
60. Phua J, See KC, Chan YH, Widjaja LS, Aung NW, Ngerng WJ, Lim TK. Validation and clinical implications of the IDSA/ATS minor criteria for severe community-acquired pneumonia. Thorax. 2009;64(7):598-603.
61. Pilotto A, Addante F, Ferrucci L, Leandro G, D'Onofrio G, Corritore M, Niro V, Scarcelli C, Dallapiccola B, Franceschi M. The multidimensional prognostic index predicts short- and long-term mortality in hospitalized geriatric patients with pneumonia. The journals of gerontology. Series A, Biological sciences and medical sciences. 2009;64(8):880-7.
62. Putinati S, Ballerini L, Piattella M, Ritrovato L, Zabini F, Potena A. [Clinical policy for management and risk stratification of community-acquired pneumonia in patients hospitalized on the basis of conventional admission criteria]. Recenti progressi in medicina. 2003;94(5):199-203.
63. Querol-Ribelles JM, Tenías JM, Querol-Borrás JM, González-Granda D, Hernández M, Ferreruela R, Martínez I, Grupo NAC 2000. [Validation of the Pneumonia Severity Index for hospitalizing patients with community-acquired pneumonia]. Medicina clínica. 2004;122(13):481-6.
64. Renaud B, Coma E, Hayon J, Gurgui M, Longo C, Blancher M, Jouannic I, Betouille S, Roupie E, Fine MJ, PNEUMOCOM study investigators. Investigation of the ability of the Pneumonia Severity Index to accurately predict clinically relevant outcomes: a European study. Clinical microbiology and infection : the official publication of the European Society of Clinical Microbiology and Infectious Diseases. 2007;13(9):923-31.
65. Renaud B, Coma E, Labarere J, Hayon J, Roy PM, Boureux H, Moritz F, Cibien JF, Guérin T, Carré E, Lafontaine A, Bertrand MP, Santin A, Brun-Buisson C, Fine MJ, Roupie E, Pneumocom Study Investigators. Routine use of the Pneumonia Severity Index for guiding the site-of-treatment decision of patients with pneumonia in the emergency department: a multicenter, prospective, observational, controlled cohort study. Clinical infectious diseases : an official publication of the Infectious Diseases Society of America. 2007;44(1):41-9.
66. Restrepo MI, Mortensen EM, Velez JA, Frei C, Anzueto A. A comparative study of community-acquired pneumonia patients admitted to the ward and the ICU. Chest. 2008;133(3):610-7.
67. Reyes Calzada S, Martínez Tomas R, Cremades Romero MJ, Martínez Moragón E, Soler Cataluña JJ, Menéndez Villanueva R. Empiric treatment in hospitalized community-acquired pneumonia. Impact on mortality, length of stay and re-admission. Respiratory medicine. 2007;101(9):1909-15.
68. Riley PD, Aronsky D, Dean NC. Validation of the 2001 American Thoracic Society criteria for severe community-acquired pneumonia. Critical care medicine. 2004;32(12):2398-402.

69. Rosón B, Carratalà J, Dorca J, Casanova A, Manresa F, Gudiol F. Etiology, reasons for hospitalization, risk classes, and outcomes of community-acquired pneumonia in patients hospitalized on the basis of conventional admission criteria. *Clinical infectious diseases : an official publication of the Infectious Diseases Society of America.* 2001;33(2):158-65.
70. Schuetz P, Koller M, Christ-Crain M, Steyerberg E, Stoltz D, Müller C, Bucher HC, Bingisser R, Tamm M, Müller B. Predicting mortality with pneumonia severity scores: importance of model recalibration to local settings. *Epidemiology and infection.* 2008;136(12):1628-37.
71. Shah BA, Ahmed W, Dhobi GN, Shah NN, Khursheed SQ, Haq I. Validity of pneumonia severity index and CURB-65 severity scoring systems in community acquired pneumonia in an Indian setting. *The Indian journal of chest diseases & allied sciences.* 2010;52(1):9-17.
72. Spindler C, Ortqvist A. Prognostic score systems and community-acquired bacteraemic pneumococcal pneumonia. *The European respiratory journal : official journal of the European Society for Clinical Respiratory Physiology.* 2006;28(4):816-23.
73. Tejera A, Santolaria F, Diez ML, Alemán-Valls MR, González-Reimers E, Martínez-Riera A, Milena-Abril A. Prognosis of community acquired pneumonia (CAP): value of triggering receptor expressed on myeloid cells-1 (TREM-1) and other mediators of the inflammatory response. *Cytokine.* 2007;38(3):117-23.
74. van der Eerden MM, de Graaff CS, Bronsveld W, Jansen HM, Boersma WG. Prospective evaluation of pneumonia severity index in hospitalised patients with community-acquired pneumonia. *Respiratory medicine.* 2004;98(9):872-8.
75. Yandiola PP, Capelastegui A, Quintana J, Diez R, Gorordo I, Bilbao A, Zalacain R, Menendez R, Torres A. Prospective comparison of severity scores for predicting clinically relevant outcomes for patients hospitalized with community-acquired pneumonia. *Chest.* 2009;135(6):1572-9.
76. Yealy DM, Auble TE, Stone RA, Lave JR, Meehan TP, Graff LG, Fine JM, Obrosky DS, Mor MK, Whittle J, Fine MJ. Effect of increasing the intensity of implementing pneumonia guidelines: a randomized, controlled trial. *Annals of internal medicine.* 2005;143(12):881-94.
77. Zuberi FF, Khan JA. Prospective comparison of prediction rules of mortality risk for CAP in a developing country. *The international journal of tuberculosis and lung disease : the official journal of the International Union against Tuberculosis and Lung Disease.* 2008;12(4):447-52.