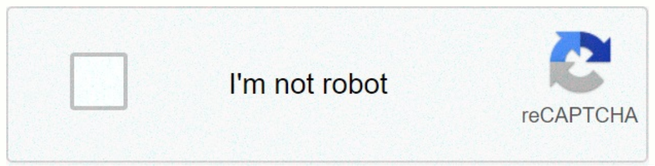

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Idsa community acquired pneumonia guidelines 2016 pdf

Background: This document provides evidence-based clinical case guidance on the management of adult patients with community-acquired pneumonia. How to: The medantic panel conducted a practical systematic review of relevant research and applied ratings of recommendations, assessments, developments, and evaluation methodologies for clinical recommendations. Results: The panel covered 16 specific areas for recommendations on diagnostic tests, treatment site decisions, initial empirical antibiotic treatment selection, and questions about subsequent management decisions. Although some recommendations are unchanged from the 2007 guidelines, the availability of results from new therapeutic trials and epidemiological surveys has led to revised recommendations for empirical treatment strategies and further management decisions. Conclusion: The panel formulated and provided recommendations for selected diagnostic and treatment strategies for adult patients with community-acquired pneumonia. Summary About How To Recommend Question 1: In adults with CAP, should they get gram stains and cultures of lower respiratory secretion at the time of diagnosis? Question 2: In adults with CAP, should blood culture be obtained at the time of diagnosis? Question 3: In adults with CAP, should legionella and pneumococcal urinary port tests be performed at the time of diagnosis? Question 4: In adults with CAP, should they test respiratory samples for influenza virus at the time of diagnosis? Question 5: In adults with CAP, should serum Procalcitonin plus clinical judgment versus clinical judgment be used to withhold the onset of antibiotic therapy alone? Question 6: Should clinical prediction rules and clinical judgments and clinical judgments on prognosis alone be used to determine the location of inpatient-to-outpatient care for adults with CAP? Question 7: Should clinical prediction rules for prognosis and clinical judgment alone be used to determine inpatient general medicine versus high levels of inpatient care intensity (ICU, step-down or telemetry unit) for adults with CAP? Question 8: What antibiotics are recommended for CAP empirical treatment in adults in outpatient settings? Question 9: In inpatient settings, what antibiotic regimens are recommended for the empirical treatment of CAP in adults without risk factors for MRSA and P. aeruginosa? Question 10: In an inpatient setting, should patients with suspected aspiration pneumonia receive additional anaerobic cover beyond standard empirical treatment for CAP? Question 11: In inpatient settings, should adults with CAP and risk factors for MRSA or P. aeruginosa be treated with extended spectrum antibiotic therapy instead of standard CAP prescriptions? 12: In an inpatient setting, should adults with CAP be treated with corticosteroids? Question 13: Testing positive in adults with CAP Should the prescription for treatment include antiviral therapy? Question 14: In adults with CAP who tested positive for influenza, should treatments include prescription antimicrobial treatments? Question 15: Who is improving in outpatient and inpatient adults with CAP, what is the right period of antibiotic treatment? Question 16: In adults with improvement caps, should they get follow-up chest imaging? In conclusion, more than a year after the American Thoracic Society (ATS)/Infectious Diseases Society (IDSA) community acquired pneumonia (CAP) guidelines (1), there were changes in the process for developing the guidelines, as well as the creation of new clinical data. ATS and IDSA agreed to transition from narrative styles in previous documents to grading in the form of recommendation assessment, development, and evaluation (GRADE). We have therefore developed this updated CAP guidelines with a series of answer questions from patients or populations, interventions, comparisons, and answers from available evidence in option B, which is better than option B using the Results (PICO) framework (2). Given the expansion of information related to diagnosis, treatment and management decisions about the treatment of CAP patients, we deliberately narrowed down the scope of these guidelines to address the decision of the point of clinical diagnosis of pneumonia (i.e., radiation confirmation and signs and symptoms of pneumonia) with the completion of antimicrobial therapy and subsequent chest imaging. This document does not cover early clinical diagnostic criteria or prevention of pneumonia. CAP is a very hedding disease, both in the range of responsible pathogens and in the host response. Therefore, the PICO questions identified for this guidance do not represent all relevant question scopes for CAP management, but they do include a set of key questions identified as high priority in the panel. In addition, although each question was addressed using a systematic review of the high-quality studies available, the evidence material was often insufficient, highlighting the continued importance of clinical judgment and experience in treating patients with this disease and the need for ongoing research. These guidelines cover the clinical entity of pneumonia acquired outside the hospital environment. Although we recognize that CAP is often diagnosed without the use of thoracic radiology, especially in an outpatient environment, we focused on studies using radiation credit to define CAP, given the known inaccuracies of clinical indications and symptoms alone for CAP diagnosis (3). The guidelines focus on patients in the United States who have not recently completed a foreign trip, especially those with emerging respiratory pathogens. The guidelines also focus on adults without immune compromise conditions, such as inherited or acquired immunodeficiciation or drug-induced hoso-ery, including patients. Patients who received cancer chemotherapy, and were infected with HIV with suppressed CD4 counts and solid organ or bone marrow transplant recipients. Antibiotic recommendations for the empirical treatment of CAP are based on the choice of effective agents for the main treatable bacterial causes of CAP. Traditionally, the bacterial pathogens include streptococcal pneumonia, hemolytic influenza, mycoplasma pneumonia, Staphylococcus aureus, Legionella species, chlamydia pneumonia, moraksella cataralis. Microbial ingology of CAP is particularly changing with the widespread introduction of pneumococcal conjugate vaccines, and awareness of the role of viral pathogens is increasing. The online supplement includes a more detailed discussion of CAP microbiology. Since bacterial pathogens often coexist with viruses and are not accurate or fast enough to determine that CAP is caused only by viruses at presentation time (see below), our recommendation is to empirically treat them for possible bacterial infections or nose infections in the first place. In addition, the appearance of multidred pathogens, including methicylin-resistant S. aureus (MRSA) and Pseudomonas aruginosa requires separate recommendations when the risk of each pathogen is increased. We acknowledge that other multidrug-resistant enterobacterials can cause CAP, including extended-spectrum β-lactamaase-causing organisms, but we do not discuss them separately because they are effectively covered by the strategies presented for P. aeruginosa. Therefore, throughout this article we are also referring to other similar multi-resistance ore-negative bacteria when discussing P. aeruginosa. We maintained the rules of separate recommendations on the basis of the severity of the disease. Historically, treatment sites (outpatients, inpatient general wards or ICU) have acted as severity surrogates, but decisions about treatment sites can be based on considerations other than severity and can vary greatly from hospital to practice site. Therefore, we have decided to use proven IDSA/ATS CAP severity criteria to define a severe CAP, such as one primary criterion or one that exists in patients with three or more minor criteria. (Table 1) Table 1. In 2007, one of the American Infectious Diseases Societies/ American Thoracic Society for Defining Severe Community Acquired Pneumonia included one main criterion or three or more minor criteria minor criteria respiratory ratio ≥30 respiratory/minute PaO2/FiO2 ratio ≤250 multi-rover confusion/disorientation Yerdxia (blood u incontinent nitrogen levels ≥ 20 mg/20 mg/20 mg/dl) lyukupencia* (white blood cell number < 4,000 cells /µl) platelets (platelet number < 100,000/µl) hypothermia (core temperature < 36°C) Hypotension requires a formatting impact by the main criteria required for respiratory failure of the vascular pressure. The guidelines reaffirm many of the recommendations in a 2007 statement. However, new evidence and new processes have resulted in significant changes outlined in Table 2.2. Differences between the American Sorashichi Society/Infectious Diseases Society in 2019 and 2007 U.S. Community Acquisition Pneumonia Guidelines Recommendations2007 ATS/IDSA Guideline2019 ATS/IDSA GuidelineSutum is mainly recommended in patients with severe illnesses recommended primarily in patients with severe illnesses during inuation, but mrsa or P. Recommendations for all inpatients for aeruginosaMacrolide alone therapy Preliminary recommendations for outpatients Preliminary recommendations for outpatients Preliminary recommendations for outpatients If active swallows for outpatients are not recommended, it is not recommended to determine the need for antimicrobial therapy in the beginning of therapeutic treatment. The use of the medical-related pneumonia category, which may be considered in patients with cancer-related sepsis shock, is accepted as being acquired at a 2005 ATS/IDSA hospital and introduced in the Respiratory-related Pneumonia Directive to abandon this classification. Focus on local dynamics and proven risk factors to determine the need for MRSA or P. aeruginosa cover. Increased critical CAPβ-lactam/macrolide and β-lactam/fluoride quinolone combinations allow for all but stronger evidence in favor of β-lactam/macrolide combinations in the case of negative cultures, and more robust evidence is not recommended for routine use of subsequent chest imaging. Patients may be eligible for lung cancer screening, which should be performed as clinically indicated, guidelines are addressed in an online supplement on how developmental methodologies and conflicts of interest are managed. In short, the PICO question list was finalized based on the overall length of the document and the priorities of the most important management decisions balanced with decisions to reduce the total number of recommendations, maximizing readability and usefulness. We follow grade standards for evaluating evidence for each PICO and assign quality of high, medium, low, or very low evidence ratings. Based on the quality of the evidence, recommendations were assigned strongly or conditionally. In some cases, strong recommendations were made in settings of low or very low evidence in accordance with GRADE rules for when these recommendations were acceptable (for example, when the outcome of the recommendations were high, for example, harming or saving lives). In all other cases, recommendations that are based on a low or very low quality of evidence and are not thought to indicate standards of care have been marked as conditional recommendations. Statement of Favors Recommendations are recommended.] Statements in favor of conditional recommendations begin with the word we suggest. We specified pico questions interactively for all antibiotic options in outpatient and inpatient settings, but rather than maintaining the PICO format in this section, we summarized the recommendations using a list of treatment options in no preferred order. We do not recommend that you routinely get sleagram stains and cultures from adults with CAP managed in outpatient settings (strong recommendations, very low quality of evidence). It is recommended to obtain a culture of pre-treatment gram stains and respiratory secretion culture in adults with CAP that is managed in a hospital setting:1. It is classified as a severe CAP (see Table 1), especially if you have a tube (strong recommendations, very low evidence quality). or2.a. MRSA or P. aeruginosa (strong recommendations, very low quality of evidence); Phrase. Previously MRSA or P. aeruginosa, in particular, were infected with previous respiratory infections (conditional referrals, very low quality of evidence); Oak. Whether hospitalized and hospitalized and hospitalized for events, over the past 90 days (conditional recommendations, very low quality of evidence) were received. 1) The argument for deciding the esoterology of CAP is that resistant pathogens can be identified; 2) Therapy can narrow; 3) Some pathogens, such as legionella, affect public health. 4) The therapy can be controlled when the patient fails the initial therapy; And 5) Cap's ever-changing dynamics require constant evaluation. These arguments are in contrast to the lack of high-quality evidence showing that routine diagnostic tests improve individual patient outcomes. Studies have demonstrated that no better patient outcomes have been demonstrated by specifically evaluating the use of sericlegic or bacterial stains and culture only (4-7) or in combination with other microbiological tests (8-11). The overall bad yield of sere evaluation for detecting organisms that cause CAP limits its impact on management and patient outcomes. Getting a serary sample available can be challenging due to patient-related characteristics (12-17). The performance characteristics of the test also depend on the organism, the receipt and setting of previous antibiotics. For example, in patients with thin sulfur pneumoniae did not receive antibiotics, microscopic examination and culture of high-quality sereum samples detects pneumococcal in 86% of cases 18. To balance the everyday slea culture with the desire for improved antimicrobial stewardship, the Committee decided to continue the position of previous guidelines on recommending or routinely obtaining slea and culture for all adults with CAP managed in hospital environments. Whether to culture patients should be determined by individuals. Based on clinical presentation, topical ingring considerations and local antimicrobial stewardship processes. The committee identified two situations in which we recommend phlegm-or-throat stains and cultures: in hospitalized patients with severe CAP, and when strong risk factors for MRSA and P. aeruginosa are identified, local pathogens should already have lower respiratory tract samples, such as pneumonia aspiration, and patients who already have severe CAP that need tubing, transmitted immediately after intubation for dram stains and cultures. These patients, in particular, may be more likely to have pneumonia due to MRSA or P. aeruginosa, and intracure has a better yield of microbial organisms than intangible cultures (19). We recommend getting gram stains and phlegm for culture in situations where risk factors for MRSA or P. aeruginosa exist, both when early empirical treatments are extended to cover these pathogens and if not expanded. In the previous case, the negative microbial test results may be used to lower the treatment, in the latter case, the positive microbial test results may be used to coordinate the treatment. As later explained, there are numerous studies identifying individual risk factors for MRSA and P. aeruginosa, but many of these associations are weak and vary by site. The most consistently strong risk factor to consider is pre-infection with MRSA or P. aeruginosa. In addition, hospitalization and treatment with non-cirrhotic antibiotics over the past 90 days have been associated with an increased risk of these pathogens, so we recommend a slea culture in these situations. These recommendations are not based on high hast evidence but they reflect the council's desire to improve antibiotic use and improve clinicians' understanding of their local pathogen prevalence and resistance patterns, which we believe is the key to choosing the right empirical antibiotic therapy. Identifying the organisms that cause CAP is rapid, cost-effective and sensitive, and certain diagnostic tests have the potential to improve routine care by supporting the use of targeted treatments, especially if there are risk factors for antibiotic-resistant pathogens. All new diagnostic tests should be evaluated in high-quality research studies that address the impact of testing strategies on treatment decisions and patient outcomes. We do not recommend getting blood culture from CAP patients managed in outpatient settings (strong recommendations, very low quality of evidence). We regularly suggest not acquiring blood culture from adults with CAP managed in hospital settings (conditional recommendations, very low quality of evidence). It is recommended to obtain pretreatment blood culture in adults with managed CAP in hospitals:1. classified as a serious CAP (see Table 1) (strong recommendations, very low quality of evidence); or2.a. treatment for MRSA or P. aeruginosa (strong recommendations, very low quality of evidence); Phrase. Previously MRSA or P. aeruginosa, in particular, were infected with previous respiratory infections (conditional referrals, very low quality of evidence); Oak. Whether hospitalized and hospitalized and hospitalized for events, over the past 90 days (conditional recommendations, very low quality of evidence) were received. There is no high-quality study that specifically compares patient outcomes with blood culture tests. One large observational study found low mortality rates for inpatients associated with obtaining blood culture at hospitalization (20). Three follow-up (smaller) observational studies found a similar association between hospitalization mortality and blood culture within 24 hours of hospitalization, but the results were not statistically significant (8, 21, 22). In most series of adults with non-persym CAP the yield of blood culture is low, 2% (outpatient) to 9% (inpatient) (14, 21, 23, 24); Moreover, blood culture rarely results in proper changes in empirical therapy (25), and blood samples containing skin pollutants can

produce false positive test results. Growth of organisms such as coagulation-negative staphylococcus aureus, which is not recognized as CAP pathogen (26), can lead to improper antimicrobial use, which increases the risk for adverse drug effects. Research of adults hospitalized with CAP found that blood culture was associated with a significant increase in the duration and duration of stay of antibiotic therapy (27). Given the observational nature of these studies, it is not clear whether the associations found with blood culture and patient outcomes were causal or because of undes measured confusion factors, including the severity of the disease. While additional diagnostic information can improve the quality of treatment decisions, support for routine collection of blood culture is reduced by the low quality of studies showing clinical benefits. Getting a regular blood culture can produce false positive results that lead to unnecessary antibiotic use and increased length of stay. In severe CAP, delays in cover less common pathogens can have serious consequences. Thus, the potential benefits of blood culture can be much higher when the results can be returned within 24 to 큽 hours. In the setting of risk factors for MRSA and P. aeruginosa, the recommended basis for blood culture is the same as for phlegm culture. We do not recommend routinely checking urine for pneumococcal antigens (conditional recommendations, low quality of evidence) in adults with CAP, except adults with severe CAP (conditional recommendations, low quality of proof). We do not recommend routinely testing urine for legionella antigens in adults with CAP (conditional recommendations, low quality of proof1). If shown by epidemiological factors, such as legionella outbreaks or recent trips (conditional recommendations, low quality of evidence); or2. In adults with severe CAP (see Table 1) (conditional recommendations, low quality of evidence). We recommend doing legionella urinary tract antagonist tests and collecting lower respiratory secretions for Legionella culture in selective media or legionella nucleic acid amplification tests in adults with severe CAP (conditional recommendations, low quality of evidence). Falguera and colleagues 28 randomized 177 patients to pathogen-oriented treatment (targeted therapy) based on urinary antigen test results for S. pneumonia and legionella and treated with empirical instruction-oriented therapies. Of the 88 patients in targeted therapeutic cancer, 25% were tested for positive urinary antigens and received pathogen-oriented therapy. There were no statistical differences in death, clinical recurrence, ICU admission, hospital stay, or antibiotic treatment period (28). The second trial of 262 patients included only extensive microbiological tests (sericle and blood culture) and legionella urinary antigen testing, but patients receiving pathogen-oriented treatment showed similar clinical outcomes to patients receiving empirical, guideline-driven treatments, including mortality, clinical failure rates, and duration of hospitalization (10). One observational study evaluated costs and antibiotic selection in patients for two hours with or without pneumococcal urinary antigen testing, but found no difference over two periods (29). In contrast, other observational studies that assessed the impact of matching previous CAP guidelines reported reduced mortality, with sites of previous CAP guidelines -concordant care including urinary antigen tests and early diagnostic tests with blood culture, treatment straddization and sites of guideline-matched therapy. Costantini and colleagues reported a statistically significant reduction probability of in-hospital mortality for patients receiving pneumococcal and legionella urinary antigen tests compared to untested patients, baseline demographics, and adjust clinical differences (27). Ue-Tsu and colleagues reported a 25 percent reduction in 30-day mortality in patients undergoing urinary antigen testing, but did not affect their length of hospitalization (7). However, neither study distinguishes whether mortality benefits caused by the test are a direct result of test results or markers of other advanced processes of care. Randomized trials did not identify benefits for urinary antigen testing for S. pneumonia and legionella. Concerns have been raised that narrowing down treatment in response to positive urinary antigen trials can lead to an increased risk of clinical relapse (28). In large observational studies, these diagnostic tests have been associated with reduced mortality; Therefore, we recommend testing in Serious illness. The increase in legionella infections in the United States over the past 10 years highlights the importance of this diagnosis among patients who are particularly severely ill in the setting of potential outbreaks due to common sources, although most cases are not associated with known outbreaks (30, 31). A new nucleic acid amplification system for sericle, urine and blood is being developed and public health benefits must be assessed in terms of additional case prevention and primary prevention strategies, as well as rigorous testing to assess the impact on treatment decisions and clinical outcomes for CAP patients. In particular, it acknowledges the emergence of rapid, low-cost genomic sequence detection acet drugs that can significantly improve pathogen-oriented therapies and improve antimicrobial stewardship. If the influenza virus circulates in the community, rapid influenza molecular analysis (i.e. influenza nucleic acid amplification test) is recommended for influenza testing (i.e. antigen testing) (strong recommendations, suitable evidence). Rapid influenza testing is becoming increasingly available, moving from early antigen-based detection tests to nucleic acid amplification tests. We were not able to confirm any research that evaluated the impact of influenza tests on outcomes in adults with CAP. In contrast, substantial literature assessed the importance of influenza trials among the general population, especially patients with diseases such as influenza (32). Our recommendations for influenza trials in adults with CAP are consistent with test recommendations for a wider population of adults with suspected influenza, as outlined in the recent IDSA Influenza Clinical Practice Guidelines (33). The benefits of antiviral therapy support the patient's testing during periods of high influenza activity. During periods of low influenza activity, tests may be considered but may not be routinely performed. Note, these testing recommendations have both therapeutic and infection control implications in hospital settings. Updated influenza test recommendations are also available on the CDC website at . We recommend that empirical antibiotic therapy should begin in adults with clinically suspected and radially identified CAP regardless of early serum procalcitonin levels (strong recommendations, reasonable quality of proof). Several studies have assessed procalcitonin's ability to distinguish acute respiratory infections due to acute bronchitis or upper respiratory infections (almost exclusively viral in ingology) pneumonia. However, for the purposes of these guidelines, the question is, among patients with clinically confirmed CAP, whether it is a measure It can distinguish patients with viral and bacterial inges and guide the need for early antibiotic treatment. Some investigators have suggested that procalcitonin levels of ≤0.1 μg/L indicate a high likelihood of viral infection, whereas levels ≥0.25 μg/L indicate a high likelihood of bacterial pneumonia (34-36). However, a recent study in hospitalized patients with CAP failed to identify a procalcitonin threshold that discriminates between viral and bacterial pathogens, although higher procalcitonin is strongly correlated with an increased probability of bacterial infection (37). The reported sensitivity of procalcitonin to detect bacterial infections ranges from 38% to 91%, and this test alone emphasizes that it cannot be used to justify withholding antibiotics from patients with CAP (38). Procalcitonin was used to lead the onset of antibiotics in patients with respiratory infections, but many of these studies are not limited to patients with pneumonia identified with radiation. Some patients with low procalcitonin levels had CAP and were treated safely without antibiotics (35), but these indicate a small group that raises concerns about the safety of using such strategies widely. Given the epidemiological evidence that the virus is an important cause of CAP, it is needed to validate the use of current rapid laboratory tests, including care tests, to accurately identify situations in which antimicrobial therapy can be safely withheld among adults with CAP. In addition to clinical judgment, clinicians are recommended to determine an adult's diagnostic needs using proven clinical prediction rules for prognosis, priority pneumonia severity index (PSI) (strong recommendations, moderate quality of evidence) and CURB-65 (a tool based on confusion, urea levels, respiratory rate, blood pressure, and age ≥65). BOTH PSI and CURB-65 were developed as prognostic models in immune patients with pneumonia, using patient demographics, and clinical variables from the time of diagnosis to predict a 30-day mortality rate (39, 40). Compared to CURB-65, PSI has a higher discriminatory power to identify a larger proportion of patients as low risk and predict mortality (41). Two multi-center, cluster randomized trials have demonstrated that the use of PSI safely increases the percentage of patients who can be treated in outpatient settings (42, 43). These clinical trials and one additional randomized controlled trial (RCT) support the safety of using PSI to guide the patient's initial treatment site without worsening mortality or other clinical outcomes (42-44). Consistent evidence from three pre-intervention studies and one prospective controlled observational study supports the effectiveness and safety of using PSI to guide the initial site of treatment (45-48). It's not just clinical severity. When determining the need for hospital admission (49, 50). Some patients have medical and/or psychosocytal contraindications to outpatient therapy such as inability to maintain oral intake, history of substance abuse, cognitive damage, severe comorbid disease and impaired functional conditions. PSI can underestimate disease severity among young patients and oversimplify how clinicians interpret persistent variables (for example, all systolic blood pressure <90mm Hg is considered abnormal regardless of the patient's baseline and actual measurements). Therefore, when used as a decision aid, PSI should be used with clinical judgment. Compared to PSI, there is less evidence that CURB-65 is effective as a decision aid in guiding the initial site of treatment. One pre-post, controlled intervention study, using an electronically calculated version of CURB-65, PaO2/FiO2 < 300, the absence of pleural osmosis and less than three minor ATS severity standards did not observe a significant increase in the use of outpatient treatment for adults with CAP (51). The randomized trial compared the safety of inpatients versus outpatient therapy of 49 patients with CURB-65 scores of less than 2 (52) but limited the power to detect differences in patient outcomes; In addition, outpatient care included daily nursing visits and non-cirrhotic antibiotic therapy, which are usually confined to inpatient care. Using PSI as an appendage of clinical judgment to guide the initial treatment site is based on consistent evidence of the effectiveness and safety of this approach. Using safe and effective decision-making assistance to increase outpatient treatment of patients with CAP has the potential to reduce unnecessary variability in hospitalization rates, the high cost of inpatient pneumonia treatment (53, 54), and the risk of hospital-acquired complications. Providing conditional recommendations for using CURB-65 considers the greater simplicity of use compared to PSI, despite the lack of evidence regarding its effectiveness or safety. Compared to PSI, it is important to study the effectiveness and safety of using new predictive rules for CURB scores or prognosis as decision aids to guide early treatment sites for CAP patients. Future studies of predictive rules should also test electronic versions generated in real time from data regularly recorded in electronic medical records and evaluate the performance of groups of patients excluded from the development of existing forecasting rules (55, 56). We recommend direct admission to the ICU for patients with hypotension who require blood vessels raising or respiratory failure that require gaseous ventilation (strong recommendations, low quality of proof). For patients who do not require vascular or mechanical ventilator support, it is recommended that the mild severity criteria (Table 1) of IDSA/ATS 2007 be used in addition to clinical judgment to guide the need for higher levels of therapeutic strength. recommendations, low quality of evidence). PSI and CURB-65 are not designed for CAP to help select the level of care that hospitalized patients need. Several prognostic models were designed to predict the need for higher levels of inpatient therapy intensity using severity parameters of the disease based on patient outcomes (ATS 2001, IDSA/ATS 2007, SMART-COP and SCCP scores). Studies of prognostic types used different endpoints including inpatient mortality (57, 58), ICU hospitalization (57-59), reception of intensive respiratory or vascular support (59, 60), or reception of major theatric therapy (61) plus ICU admission. In comparative studies, these prognostic models yield higher overall accuracy than PSI or CURB-65 when using disease outcomes other than mortality (58, 59, 61). The 2007 IDSA/ATS CAP guidelines recommended two major and nine minor sets of criteria to define severe pneumonia requiring ICU hospitalization (Table 1). These standards were based on empirical evidence from published studies and expert consensus. All elements can be used routinely in emergency department settings and can be calculated electronically (51, 61). Several group validated this criterion in pneumonia cohorts in other countries (57-59, 61), meta-analysis reported that one major or three minor criteria had a full sense of 84% and a specificity ICU admission prediction of 78% (62). Without the main criteria, the thresholds for three or more minor criteria (recommended in the 2007IDSA/ATS guidelines) showed a combined sensitivity of 56% and specificity of 91% to predict ICU admission prediction (63). SMART-COP is an alternative and proven predictive rule for identifying pneumonia patients who need vascular pressure support and/or mechanical ventilation. Eight SMART-COP standards, and nine 2007 IDSA/ATS trifling standards have five overlapping elements of hypoxic, confusion, breathing speed, multiplelobar radiation insolturcies and low systolic blood pressure. SMART-COP uses albumin, PaO2, and pH, which are not universally available in real-time clinical decision-making (60), although they showed 79% face-to-face and 64% specificity in ICU hospitalization predictions using three or more criteria. To predict ICU admissions, one comparison reported the equivalence of IDSA/ATS minor criteria and SMART-COP 63 and the other reported a much larger performance of IDSA/ATS minor criteria 61. Randomized studies did not assess the effectiveness or safety of disease severity tools as a decision aid to guide the intensity of inpatient care for patients hospitalized with CAP. Patients who were transferred to the ICU after being admitted to a hospital ward have a higher mortality rate than patients who were admitted directly to the ICU in the emergency room (64-67). This higher mortality rate may be caused in part by progressive pneumonia, but faulty screening of patients with unrealted severe pneumonia may be a contributing factor (64). That's A doctor's judgment alone is unlikely to be equivalent to a doctor's judgment, with a severe tool to guide on-site decisions. The 2007 IDSA/ATS severity cap criteria consist of severity parameters that are easier to use than other published scores and are recommended because they are more accurate than other scores described above. A controlled study is needed to study the effectiveness and safety of using disease severity tools as a decision aid to guide the intensity of treatment in adults hospitalized with pneumonia.1 For healthy outpatient adults with no risk factors for comorbidities or antibiotic-resistant pathogens listed below, we recommend (Table 3):• Amoxicilline 1 g three times daily (strong recommendations, Moderate quality of evidence), or • Doxicyclin 100 mg twice daily (conditional recommendations), low quality of evidence), or • Macro lead (azithromycin 500 mg on the first day then 250 mg daily or Clarity hromycin 500 mg daily or clarity hromycin extended release 1,000 mg) only in areas with pneumococcal resistance to macroeconomic lides <25% (conditional, moderate quality). For outpatient adults in comas such as chronic heart, lung, liver or kidney disease; Diabetes; alcoholism; malicious; Or asplenia We recommend (no specific order of preference) (Table 3): • Combination therapy: ◦ amoxiciline/clavulanate 500 mg/125 mg 3 times daily, Or amoxicline / clabulanate 875 mg / 125 mg twice daily, or 2,000 mg / 125 mg twice daily, or cephpodoxime (cefodoxime 200 mg 200 mg 2 0 days or cefuroxime 500 mg twice daily); And◦ macro lide (azithromycin 500 mg per day followed by 250 mg, clarithromycin [500 mg twice daily or extended release 1,000 mg daily]) (strong recommendations, moderate quality of evidence for combination therapy), or doxicycline 100 mg twice daily (conditional recommendations, low quality of evidence for combination therapy); OR• Monotherapy:◦ Respiratory fluoronolone (levoflosaccin 750 mg daily, moshiflowsacin 400 mg daily, or gemifloxacin 320 mg daily) (strong recommendation, moderate quality of evidence). Table 3. Initial treatment strategies for outpatients with community-acquired pneumonia standard prescription MRSA or Pseudomonas aeruginosa*Amoxicillin ordoxycycline ermacrolide for follusc or risk factors (cal resistance if local pneumococcal is <25%) † RCT of antibiotic treatment regimens for adults with CAP along with ‡comorbidities via comorbidities has little evidence of superiority or equivalence of one antibiotic regimen due to a small number, due to small numbers and rare occurrences of major consequences such as treatment failures caused by hospitalization. Several published trials included comparers who were no longer available (e.g. ketalids). This meaxi with data was pointed out in a 2014 Cochrane review It confirmed 16 related RCTs comparing two antibiotic regimens for the treatment of outpatient CAP (69-84). A meta-analysis of each group of studies revealed no differences in related outcomes among compared regimens. Similar findings were reported in a 2008 meta-analysis of antibiotic treatments for outpatient CAP (85). The committee also considered whether to accept data about oral antibiotics given to patients with CAP. We believed that although this evidence is indirect, it could be reasonably extended to outpatients because patients are generally a higher risk and are more severely ill. As suggested by observational data, inpatient and outpatient CAP seems reasonable to prescribe antibiotics that work for outpatients due to the same pathogens (69, 71-73, 82), with the exception of legionella and bram-negative basili, which are rarely documented in outpatient settings. Research of high dose oral amoxicilline has proven efficacy for inpatients with CAP (86-88). Similarly, there is evidence to support amoxiciline claulanic acid in outpatient CAP (71, 73) and inpatient CAP (89, 90). There is limited data regarding oral doxicycyline for pneumonia, mainly including a small number of patients (81). Intravenous doxycycline 100 mg is compared favorably to intravenous levofloxacin twice daily500 mg in patients with 65 CAP (91). In an open label randomized trial of intravenous doxycycline 100 mg twice daily in comparison to standard antibiotics, doxycycline was associated with faster responses and less changes in antibiotics (92). Given the meaxiness of RCT data in outpatient settings, the committee considered all possible evidence. The data included data about several RCTs of outpatient CAP, observational studies, RCTs of inpatient CAP treatment, antimicrobial resistance data from monitoring programs, and antibiotic-related adverse events. For patients without comorbidities who increased the risk for poor outcomes, the panel recommended amoxicillin 1 g every 8 hours or 100 mg of doxycycline twice daily. This treatment also has a long track record of safety. Recommendations for doxycycline were based on limited clinical trial data, but on a broad spectrum of behaviors, including the most common related organisms. Some experts recommend that the first dose of oral dosycycline be 200 mg, in order to achieve adequate blood donation levels more quickly. There is no data to assess whether this approach is associated with improved results. In a departure from previous CAP guidelines, the panel did not provide strong recommendations for routine use of macroride antibiotics as a sole therapy for outpatient CAP, even in patients without comorbidities. This was based on a study of macrolide failure in patients S. pneumonia (93, 94) is combined with the dash lead resistance of >30% of S. pneumonia in the United States, most of which is a high level of resistance 95. However, in settings where macrolide resistance is documented low and there are contraindications to alternative therapies, macroride as a alone therapy is a treatment option. Patients with comorbidities should undergo broader spectrum treatment for two reasons. First, such patients are more likely to have bad outcomes if an early empirical antibiotic regimen is inadequate. Second, many such patients have risk factors for antibiotic resistance by virtue of previous contact with the medical system and/or previous antibiotic exposure (see Referral 10), and therefore it is recommended to receive broader spectrum therapy to ensure proper cover. H. influenza and M. cataralis (both of which are often β-lactamase produced), S. aureus and thym-negative basilis are common causes of CAP in patients with comorbidities such as COPD. The diet recommended for patients with comorbidities includes lactam or β in combination with macroids or doxycycline. These combinations effectively target macro-lead and doxycycline-resistant S. pneumonia (because β-lactam resistance to S. pneumonia remains less common), H. influenza, many jangyin gram-negative basili, most methicillin-sensitive and β-lactamaze-producing strains of pneumonia. Listed mono therapy is also effective against common bacterial pathogens. The two treatment recommendations include multiple antibiotic options without setting preferences. The choice between these options needs a risk-benefit assessment for each individual patient weighing local epidemiological data on specific risk factors that increase the risk of individual choices, such as documented β-lactam or macrorid allergies, cardiac arrhythmias (macrorides), vascular diseases (fluoronolone), and Clostridium dipl infection history. In particular, despite concerns about side effects associated with fluoronolone, the panel believed that fluoronolone therapy was justified for adults with coma and CAP managed in outpatient environments. Those reasons included the performance of fluorism in numerous studies of outpatient CAP (70, 72, 75, 77, 80, 83) and inpatient CAP (see inpatient CAP section), much lower resistance in the common bacterial causes of CAP, their cover of typical organisms, their oral bioavailability, convenience of the short skin, and relative nearness of their serious indispils. However, there is increasing reports of side effects associated with fluorro quinolone use summarized in the U.S. Food and Drug Administration (96). FYIN, WE ADOPT THE RULES OF ADVANCE GUIDELINES TO RECOMMEND PATIENTS Exposure to one class of antibiotics recommended above is given an increased risk for bacterial resistance to early treatment regimens, and receive treatment with antibiotics in other classes. We also emphasize that patients with significant risk factors for CAP due to MRSA or P. aeruginosa (see Referral 11) are rarely managed in outpatient environments, but these patients may require antibiotics that include cover for these pathogens. Head-to-head of outpatient CAP therapy is needed for future RCTs, comparing clinical outcomes, including treatment failures, need for follow-up visits, hospitalization, general activity and time to return to adverse events. Moreover, in outpatients with pneumonia the prevalence of certain pathogens and their antimicrobial susceptibility patterns should be monitored. New formulations, including refamulin and omasseline, require further verification in an outpatient environment. The following empirical therapy (no preferred order) is recommended in non-patient adults with non-patient CAP (see Recommendation 11) with no risk factors for MRSA or P. aeruginosa (Table 4): • β Lactam (ampicylin + sulfate 1.5-3 g every 6 h, cepotaxime 1-2 g) or ceftaroline 600 mg every 12 h) and macrolide (azithromycin 500 mg daily or clarity 500 mg twice daily) (strong recommendation, high quality of evidence), or • Respiratory fluorine quinolone (levofloxacin 750 mg daily, moxifloxacin 40 mg) high evidence 4. Initial treatment strategies for community acquired pneumonia patients are acquired by the community by the risk level for acute and drug resistance Early treatment strategies for pneumonia Aeruginosa recent hospitalization and non-ginoclus antibiotics, and regionally validated risk factors mrsaprior respiratory isolation of MRSAPrior treatment strategies for acute and dangerous P by acute and risk levels for respiratory isolation. aeruginosa Nonsevere Inpatient Pneumonia*β-Lactam + Macroride† or Respiratory Fluroquinolone‡Added MRSA Coverage and Obtained Cultural/Nasal PCR to Increase The Need for Ongoing Care.* P. Guaranteed for aeruginosa| If a quick nasal PCR is available, a quick test can withhold additional empirical treatment for MRSA if it is negative or you can get a PCR positive culture, but add coverage if you start coverage for P. Obtain a culture/nasal PCR to increase the need for ongoing treatment by obtaining additional MRSA coverage § and cultural/nasal PCR per patient pneumonia * β-lactam + macro lead† or β lactam + fluroquinol ‡ only if aeruginosa cultural results are positive. and get a culture that allows escalation or confirmation of the need Treatment additional MRSA coverage § and the need for ongoing care to obtain nasal PCR and culture to allow discalation or confirmation of P. aeruginosa || And the third option for adults with CAP and CAP is to get a culture that allows for discalation or confirmation of the need for ongoing β lactam (ampicylin + yellowing, The most randomized studies of hospitalized adults with CAP comparing cefotaxime, ceftaroline, or ceftriaxone, above doses) and 10 mg of quality (twice) B-lactam/macroride therapy and fluoronolone alone therapy of 10 mg during dokok were designed to test with fire and sample size was limited (97-103). This data β patients treated with lactam/macrolide therapy have similar clinical outcomes compared to those treated with fluoride quinolone alone therapy. A systematic review of 16 RCTs in 4,809 patients found fluorine quinolone alone with significantly less incidence of clinical failure, treatment disruption and diarrhea β than lactam/macrolide combinations (104). However, mortality rates were lower overall, and there was no significant difference in mortality rates between the groups. Another systematic review of 20 experimental and observational studies in adults hospitalized with radiologically confirmed CAP, β-lactam+ macroride combination therapy or fluoroquinolone alone therapy typically has a lower mortality rate than β Lactam Alone Therapy (105). Therefore, β recommends β capifamam (campicillin plus sulbaktam, celltaxime, seftarolline or sephriacone) and great seride (azythromycin or klesteromycin) or pulmonary thesis, and contains revofloxacin (moxifloxacin). (Note that although not ajithromycin, sharpness can be used in non-visual formulations.) In choosing between these two options, clinicians should evaluate the risks and benefits of the drug, especially in light of individual risk factors, such as the history of C. difficile infection or risk factors associated with U.S. Food and Drug Administration Warning (96). The panel recommends using doxycycline as an alternative to macrorides with β-lactam as a third option in the presence of documented allergies or allergies or contraindications documented in clinical failure in macrorides or fluorescentquinolone or one of its agents. For reference, the new member of the tetracycline class, oadacycline has recently been reported to be equivalent to moxifloxacin as a sole therapy for adults with nonchalonted CAP is effective in the setting of tetracycline resistance 106. However, since this is a single published report and safety information is less well established, the committee has decided not to list this new agent as an alternative to the treatment options currently recommended. The panel also β as an option for lactam alone therapy. RCT in 580 patients with CAP could not rule out the possibility that lactam alone therapy was inferior β β lactam/macrolide therapy for patients with cap (107). Nie and colleagues confirmed several cohot (n = 4) and retrospective (n = 12) studies addressing this question and found that β lactam/macroride therapy reduced mortality rates in patients with CAP compared to patients treated with β lactam alone therapy (108). Similarly, Horita and colleagues β lactam/macrolide combination can reduce all-cause deaths, but mostly patients with severe CAP (109). Therefore, we β that lactam alone therapy should not be routinely used in patients with CAP through fluorro quinolone alone therapy or β lactam/macro-lead combination therapy. As summarized in Table 4, empirical antibiotic coverage recommendations for patients hospitalized with CAP remain aligned to cover the most likely pathogens that cause CAP. β there is a mealyth of RCT that favors the recommendation of β-Lactam Plus Macroide vs. Sole Therapy in combination with β-Lactam Plus alone therapy versus respiratory fluorine quinolone versus treatment combined with doxycycline. β high-quality evidence to support the use of combination therapy with lactam and doxycycline. Given the concerns about increased drug resistance (macrolides) and safety issues (macroride, fluoroquinolone), recently in the hospital of CAP1 (CAP1) a new flayumulin antibiotic that has been proven to be despicable to moshiflowsasin omasicline (see above) and research on new therapeutics for adults with CAP, including refamulin is needed. In severe CAP (see Table 1) without risk factors for MRSA or P. aeruginosa, we recommend (See Table 1) (note, certain agents and dosages are the same as 9.1):• β Lactam plus macro leads (strong recommendations, moderate quality of evidence); Or • β plus respiratory fluorro quinolone (strong recommendations, low quality of evidence). In the absence of RCT evaluating therapeutic alternatives in severe CAP, the evidence is from observational studies that used different definitions of disease severity to solve this question. Sligl and colleagues found in a meta-analysis of observational studies with nearly 10,000 critical patients (often with β-actam) that they were associated with significant mortality reductions (18% relative risk, 3% absolute risk) compared to non-macroeconomically contained therapies (111). Mortality benefits from macrolides have been observed mainly in the cohot with a majority of patients with severe CAP. In a systematic review Vardakas and colleagues compared lactam/fluoride quinolone in β lactam/macroride combination versus β treatment of patients with CAP (112). The authors found 17 observational studies and RCTs β that addressed this comparison. β mortality rates were higher than chemotherapy-lactam/macroride combination therapies, but the overall quality of the study was judged to be low, excluding final recommendations (112). In the absence of data from clinical trials showing excellence of some specific regimen for patients with severe CAP, the panel considered epidemiological data for observational studies comparing severe CAP pathogens and other regimens. As a result, β recommends that combination therapy with LactamPlus mellids or β-Lactam Plus respiratory fluoronolone should be the treatment of choice for severe CAP patients. The combination of fluoronolone β lactam plus doxycycline is not well studied in severe CAP and is not recommended as an empirical treatment for adults with severe CAP. Future well-designed RCTs should focus on treatment for patients most at risk of death from severe pneumonia, which is necessary to assess the benefits and risks of combination β-lactam and macrolide therapy compared to β lactam and respiratory fluoride therapy. Studies of fluoro quinolone alone therapy in severe CAP are also needed. We suggest not adding anaerobic coverage regularly for suspected aspiration pneumonia unless you suspect a lung abscess or empyema (conditional recommendations, very low quality of evidence). Aspiration is a common event, with half of all adults aspiring during sleep (113). As a result, the actual rate of aspiration pneumonia is difficult to quantify, and there is no definition of separating aspiration pneumonia patients from all others diagnosed with pneumonia. Some estimated that 5% to 15% of pneumonia hospitalizations are associated with aspiration (114). Rates are higher in populations hospitalized in nursing homes or expanded care facilities (115). Patients who aspib stomach contents are considered to have aspiration pneumonia. Many of these patients have a solution of symptoms within 24 to 48 hours and require only support treatment without antibiotics (116). A study evaluating microbiology in patients with aspirational pneumonia in the 1970s showed a high rate of isolation of anaerobic organisms (117, 118); However, this study often used intera interagim sampling and evaluated patients late in their disease process, two factors that might contribute to a higher likelihood of identifying anaerobic organisms (114). Several studies of acute aspiration events in hospitalized patients have suggested that anaerobic bacteria do not play an important role in ingrology (119-121). C. The increased rate of difficile infection (often associated with the use of clindamycin), the question of adding empirical anaerobic coverage (clindamycin or β-lctam/β-activase inhibitors) is an important one as well as routine CAP therapy in patients with suspected aspirations. However, there are no clinical trials comparing treatment regimens without anaerobic application for patients. with questionable aspirations. The most recent study provides only observational data on microbiological patterns and treatment therapies for patients hospitalized with small, retrospective and suspected aspirational pneumonia. While older studies of aspiration pneumonia patients have shown high isolation rates of anaerobic organisms, recent studies have shown that anaerobic is rare in patients hospitalized with suspected aspiration (119, 120). The increased prevalence of antibiotic-resistant pathogens and complications of antibiotic use highlight the need for a treatment approach that avoids unnecessary use of antibiotics. Clinical trials evaluating diagnostic and treatment strategies in patients with suspected aspirations are particularly needed in terms of the ability to distinguish micro- and macro-aspiration events that lead to lower respiratory infections from those that do not bring about infection. We recommend abandoning the use of previous classifications of healthcare-related cover (HCAP) to lead the selection of expanded antibiotic cover in adults with CAP (powerful recommendations, reasonable quality of proof). We recommend that clinicians cover only MRSA or P. aeruginosa empirically in adults with CAP if locally verified risk factors for either pathogen exist (strong recommendations, moderate quality of evidence). Empirical treatment options for MRSA include vanomicin (12 hours for every 15 mg/kg, adjusted according to levels) or linezoid (12 hours for every 600 mg). Empirical treatment options for P. aeruginosa include piperacillin-tazovactam (4.5 g every 6 h), cefepime (2 g 8 h), ceftazidime (2 g all 8 h), aztreonam (2 g 8 h), merapenlem (every 8 h 1 g), or imipenem (500 mg h). If clinicians are empirically cover for MRSA or P. aeruginosa in adults with CAP on the basis of currently published risk factors but do not have local erginology data, we recommend continuing empirical cover while obtaining cultural data to establish if these pathogens exist to justify continuous treatment for these pathogens after the first few days of empirical treatment (strong recommendations, low quality of evidence). As a distinct clinical institution that guarantees unique antibiotic treatment, HCAP was incorporated into the 2005 ATS/IDSA guidelines to include guidelines for hospital acquisition and the management of ventilator-related pneumonia (122). HCAP has been defined for patients with one of several potential risk factors for antibiotic-resistant pathogens, including living in nursing homes and other long-term care facilities, and for family members with ≥2 days of hospitalization, home injection therapy, chronic dialysis, home wound care, or known antibiotic-resistant pathogens. The introduction of HCAP was based on studies confirming the higher prevalence of pathogens susceptible to standard first-line antibiotic therapy, particularly MRSA and P. aeruginosa, in several subsets of patients with CAP (123). Since then, Studies have shown that the factors used to define HCAP do not predict the high prevalence of antibiotic-resistant pathogens in most settings. Moreover, significant increased use of a wide range of antibiotics (especially vancomycin and antipseudomonal β-lactams) results, without any obvious improvement in patient outcomes (124-133). The study confirmed risk factors for antibiotic-resistant pathogens, in some cases risk factors are distinguished for MRSA versus P. aeruginosa (134-154). However, most of these individual risk factors are weakly associated with these pathogens. The most consistently strong individual risk factors for respiratory infections with MRSA or P. aeruginosa are previous isolation of these organisms, especially in the respiratory tract, and/or recent hospitalizations and exposure to non-cirrhosor antibiotics (134, 155, 156). Therefore, we have highlighted these individual risk factors to help guide early microbiological testing and empirical cover for these pathogens. Unfortunately, there is no proven scoring system to identify MRSA or P. aeruginosa patients with high positive prediction values sufficient to determine the need for empirical extended spectrum antibiotic therapy. The development and validation of scoring systems is complicated by the various prevalence of MRSA and P. aeruginosa in different research groups. Moreover, the scoring system has not been proven to improve patient outcomes or reduce the abuse of a wide range of antibiotics. Although there is limited evidence to support the use of a specific set of risk factors to identify patients with a sufficiently high enough risk of MRSA or P. aeruginosa, a stronger evidence base is initially prescribed for the decalation of the therapy after extended spectrum therapy. Randomized trials have not been reported, but recent observations (157) and retrospective (158-161) studies in patients with CAP provide strong evidence that the discalation of antibiotic treatment at 48 hours is safe and reduces complications of antibiotic therapy, pathogenic period and broad spectrum therapy, depending on the microbiological results that do not yield MRSA or P. aeruginosa. These findings are bolstered by retrospective (162) and prospective and not randomized studies of patients with severe sepsis (163), most of which were enhanced by a recent meta-analysis of adults who had pneumonia and had sepsis (164). We suggest that clinicians need to get local data on whether MRSA or P. aeruginosa is prevalent in patients with CAP and whether risk factors for infection are at the local (i.e. hospital or watershed area) level. This process is called local validation. These recommendations are based on the absence of high-quality outcome studies, very low prevalence of MRSA or P. aeruginosa in most centers, and significant increased use of anti-MRSA and antipseudomonal antibiotics Caps (142, 155, 165). We acknowledge that the center may not currently have local dissemination data, but adopting recommendations on the culture of phlegm and blood when risk factors exist for MRSA or P. aeruginosa allows clinicians to generate these local data over time. We recommend analyzing the frequency of MRSA or P. aeruginosa as a CAP pathogen compared to the number of all cases of CAP, as well as those in which the culture is transmitted. Finally, routine incubation of patients empirically treated for MRSA or P. aeruginosa allows escalation to standard CAP therapy if the culture does not reveal drug-resistant pathogens and the patient is clinically improved at 48 hours. Our approach to treating inpatient adults with CAP is summarized in Table 4. Our recommendations for using previous categories of HCAP as a basis for choosing extended spectrum treatments are based on high-quality studies of patient outcomes. Although we understand that clinicians prefer simple rules that do not need to incorporate site-specific data, current evidence does not allow the guarantee of simple and accurate regulation to determine if patients with CAP should be cover for MRSA and/or P. aeruginosa. However, the alternative approaches to MRSA and P. aeruginosa that we largely suggest are not based on high-quality research because no such research exists. The lack of adequate results data and the marked variation between the sites in the prevalence of MRSA and P. aeruginosa makes any findings extremely difficult to generalize. We hope that future research will improve our understanding of this challenging clinical problem. Our first principle was to maintain a distinction between severe pneumonia and non-severe pneumonia according to previous guidelines because the risk of inadequate empirical antibiotic therapy is much greater in severe CAP. As previously mentioned, severity is defined by the degree of physiological disorders classified by the IDSA/ATS 2007 criteria. The second principle was that within the previous year, there was sufficient evidence to predict a very high risk of these pathogens being identified in patients who had pre-identification of MRSA or P. aeruginosa in the respiratory tract presented as CAP (139). 141, 143, 150, 155, 165) Thus these are sufficient indications to recommend blood and sleath culture and empirical therapy for these pathogens in patients with CAP in addition to cover for standard CAP pathogens, with decalation at 48 hours if the culture is negative. We guarantee empirical treatment recommendations for MRSA and P. aeruginosa provided by the 2016 Clinical Practice Guidelines from IDSA and ATS for hospital acquisition and management of adults with respiratory-related pneumonia (166). The main additional risk factors for MRSA and P. aeruginosa identified in the literature are hospitalization and non-gino-antibiotic exposure over the past 90 days (136-138, 140, 142-151, 153). In recent hospitalizations and exposed patients Antibiotics, in addition to cover for standard CAP pathogens for the treatment of severe CAP, in addition to cover for standard CAP pathogens for the treatment of severe CAP, recommend microbial testing without empirical extended spectrum therapy for cap and microbial testing, which is as unsaceive as extended spectrum empirical therapy, with an escalation to 48 hours if the culture is negative and patients are improved. The data supporting rapid MRSA nasal examination is solid (167, 168), and treatment for MRSA pneumonia can usually be withheld from non-core CAPS, especially when nasal swabs are negative. However, positive forecast values are not high. Therefore, when nasal swabs are positive, the guarantee against MRSA pneumonia should usually begin, but if the culture is negative, then the treatment should be escalated. However, this latter strategy of escalation in the face of positive nasal swabs depends on the severity of CAP and the local prevalence of MRSA as a pathogen. We do not recommend regularly using non-serious CAP-resistant corticosteroids (strong recommendations, high quality of evidence). We regularly suggest not using corticosteroids in adults with severe CAP (conditional recommendations, moderate quality of evidence). We regularly suggest not using corticosteroids that are pneumonia with severe influenza (conditional recommendations, low quality of evidence). We support the sepsis campaign recommendation to survive the use of corticosteroids in patients with CAP and home-resistant sepsis shock (169). Two randomized controlled studies of corticosteroids used in the treatment of CAP have shown significant reductions in mortality, duration of stay, and organ failure. The first study found a large scale of mortality benefits that were not replicated in other studies, raising concerns that the results overestimated the actual effect (170). In the second study, there was a reference difference in kidney function between the groups (171). Other RCTs of corticosteroids in the therapy of CAP showed no significant differences from clinically significant endpoints. Differences were observed at the time in the resolution of fever and other features of clinical stability, but these did not translate into differences in mortality, duration of stay, or long-term failure (172, 173). Some (174, 175), but not all (176, 177), meta-analyses of corticosteroid research published showed mortality benefits in patients with severe CAP although a consistent definition of disease severity is not used. Side effects of corticosteroids (in the order of 240 mg of hydrocorticone per day) require treatment and include significant increases in blood sugar and possible high secondary infection rates (178, 179). The reported study showed excess mortality in corticosteroid treatment units. In pneumonia caused by influenza, a meta-analysis of mostly small retrospective studies (180) suggests that mortality may increase in patients receiving corticosteroids. This discovery The importance of innate immunity in defense against influenza as opposed to bacterial pneumonia. Data suggesting the benefits of corticosteroids in non-serious CAP patients in relation to mortality or organ failure and limited data in severe CAP patients. The risk of corticosteroids equivalent to 240 mg of hydrocorticone per day for up to seven days is mainly hyperglycemia, but the read-in rate may be higher (176), and general concerns about larger complications for 30 to 90 days have been raised (179). At least one large trial (clinicaltrials.gov NCT01283009) has been completed but has not been reported and you may know a subgroup of patients who benefit from more steroids. We also approved survival sepsis campaign recommendations on the use of steroids in patients with sepsis impact indecisivity in proper fluid resuscitation and vascular support (169). Of note, our recommendations are not intended to redefine the clinically appropriate use of steroids for comorbid diseases such as chronic obstructive pulmonary disease, asthma, and autoimmune diseases, where corticosteroids are supported as a component of treatment. Defining a subset (if any) of patients who may benefit or potentially harm corticosteroid therapy requires large, multi-center, randomized clinical trials with well-defined inclusion and exclusion criteria and measurements of multiple relevant clinical outcomes. Trials should also make extensive efforts to define causal pathogens, clear pathogen-specific indications or contraindications to corticosteroid therapy (especially diseases caused by S. pneumonia and influenza). We recommend that antiinfluenza theatic therapy such as oseltamivir be prescribed for adults with CAP who test positive for influenza in an inpatient setting in the duration of the disease (strong recommendations, quality of proper evidence) before diagnosis. We recommend prescribing antiinfluenza therapy for adults with CAP to test positive for influenza in independent outpatient settings of the duration of the disease before diagnosis (conditional recommendations, low quality of evidence). No clinical trials have evaluated the effects of treatment with antiinfluenza agents in adults with influenza pneumonia, and data on the benefits of using anti-influenza agents on outpatient settings for patients with CAP who test positive against the influenza virus are scarce. Some observational research suggests that treatment with selfamivir is associated with a reduction risk of death in patients hospitalized for CAP, which tests positive for the influenza virus (181, 182). Treatment within 2 days of developing symptoms or hospitalization may have benefits of up to 4-5 days after symptoms start, but may have the best results (183, 184) (181, 185). The use of anti-influenza preparations in outpatient settings reduces the duration and symptoms of symptoms. Respiratory complications among patients with influenza 186 provide the most benefits when treatment is received within 48 hours of the onset of symptoms (187). For inpatients, a considerable body of observational evidence suggests that giving antiinfluenza agents reduces the risk of mortality in adults with influenza infection. The benefits are strongest when treatment begins within 48 hours of developing symptoms, but research supports starting later (185). This data is the basis of our strong recommendations for using CAP in inpatient settings consistent with the recently published IDSA Influenza Clinical Practice Guidelines (33) and antiinfluenza agents for patients with influenza. While we have not confirmed a study that specifically evaluated anti-influenza preparations for treating outpatients with CAP who test positive for influenza, they do make the same recommendations for inpatient data and outpatient data that show better time to address symptoms and prevent hospitalization among fluenza patients. Our recommendations are consistent with the recently published IDSA Influenza Directive (33). Randomized controlled studies are needed to support recommendations for the use of anti-influenza preparations to treat influenza pneumonia in an outpatient environment. Knowing whether treatment is worth it, especially when more treatment begins 48 hours after the onset of symptoms, will help guide clinical decision-making. We recommend that standard antimicrobial treatments be prescribed for adults with clinical and radiology evidence of CAP who initially tested positive for influenza in inpatient and outpatient settings (strong recommendations, low quality of evidence). Bacterial pneumonia can occur at the same time as influenza virus infection or later as symptoms worsen in patients recovering from primary influenza virus infection. 10% of patients hospitalized with influenza and bacterial pneumonia die as a result of infection (188). In the 2009 H1N1 influenza epidemic, an autopsy series found evidence of bacterial poisoning in about 30 percent of deaths (189).S. Aureus is one of the most common bacterial infections associated with influenza pneumonia, followed by S. pneumonia, H. influenza, group A Streptococcus; Other bacteria were also involved (188, 190-192). Given this spectrum of pathogens, the right agents for early therapy include the same agents commonly recommended for CAP. Risks to MRSA and the need for empirical assurance will follow the guidelines contained initially in this document. Rapidly progressive severe pneumonia with MRSA has previously been described in healthy young patients, especially in the setting of previous influenza; However, it is usually easily identified in nares or sn by slea, and you should follow the recommendations in the previous recommendations in this guideline. Routine recommendations In patients with influenza virus infection and pneumonia, antimicrobial agents were based on evidence that bacterial nose infections are a common and serious complication of influenza and that the presence of bacterial co-poisoning cannot be ruled out in CAP patients who have been tested positive for the influenza virus. Low levels of biomarkers such as procalcitonins reduce the possibility of bacterial infection in patients, but these biomarkers do not completely exclude bacterial pneumonia in individual patients with sufficient accuracy to justify withholding antibiotic treatment, especially among patients with severe CAP (37, 38, 193). We have provided strong recommendations due to the significant risk of treatment failure to delay proper antimicrobial therapy in patients with CAP. But in patients with CAP, benign influenza tests, no evidence of bacterial pathogens (including low procalcitonin levels), early clinical stability, consideration could be given to early disruption of antibiotic treatment at 48 to 72 hours. Randomized controlled studies are needed to establish whether antimicrobial therapy can be discontinued for 48 hours for CAP patients who test positive for influenza and do not have microbial evidence of biomarkers (e.g. procalcitonins) or concurrent bacterial infections. It is recommended that the duration of antibiotic therapy should be guided by a proven measure of clinical stability (resolution of more than vital signs [heart rate, respiratory rate, blood pressure, oxygen saturation, temperature], eating ability, normal joining), antibiotic therapy should continue until the patient achieves stability and recommends a total of 5 days (strong recommendations), the moderate quality of the evidence). A small number of randomized trials addressed the appropriate duration of antibiotic treatment at CAP, and high-quality randomized placebo-controlled trials were mostly limited to inpatient settings. In this trial, between 5 additional days of oral amoxicylin compared to placebo in clinically advanced patients on 3 days of venous ammocysiline (194), or between 2 days of venous hemooxime followed by 8 days versus 5 days of oral cefuroxime were observed. Similar results obtained 5 days of levofloxacin 750 days daily compared to 10 days of levofloxacin 500 mg daily (196) and 5 days compared to 10 days (197) of mac ceftriaxone. Several recent meta-analyses similarly show the efficacy of a short course of antibiotic therapy of 5 to 7 days (198-200). Several studies have demonstrated that the duration of antibiotic treatment can be reduced in CAP patients with the use of procalcitonin induced pathways and serial procalcitonin measurements compared to conventional treatments, but in most cases the average length of treatment has significantly exceeded current U.S. practice standards as well as current practice standards of these current guidelines. In addition, concerns have been raised that procalcitonin levels may not rise when there are important pathogens such as simultaneous virus and bacterial infections (201, 202) or legionella and mycoplasma SPP (37, 201, 203). Therefore, serial procalcitonin measurements can be most useful in settings where the average residence length of CAP patients exceeds normal practice (e.g. 5-7 d). Some patients are perceived as not responding to the standard period of treatment. A variety of criteria have been developed to determine clinical improvement for patients with CAP and have been validated in clinical trials, including the resolution of vital signs of over (heart rate, respiratory rate, blood pressure, oxygen saturation and temperature), ingestion capacity, and normal mention (204). Failure to achieve clinical stability within five days is associated with higher mortality rates and worse clinical outcomes (205-207). These failures should be rapidly assessed for the current treatment of pneumonia and/or complications (e.g., empyema or pulmonary abscess) and alternative sources of resistant pathogens or infections and/or inflammatory responses (208, 209). When the evaluation of clinical stability is introduced into clinical practice, the patient has a short period of antibiotic therapy without negative effects on the results (210). Therefore, all clinicians should use clinical stability assessments as part of routine care for CAP patients. A long course of antibiotic therapy 1) recommends pneumonia, which is complicated by meningitis, endocarditis and other deep-seated infections. Or 2) infections with other less common pathogens not covered in these guidelines (e.g., burkeholderia schdomalei, mycobacterium or endemic fungi). <Due to the lack of recent data to support antibiotic administration over a five-day period, risk-benefit standards recommend that patients be treated for at least five days, even if clinical stability is reached five days in advance. Since most patients will achieve clinical stability within the first 48 to 72 hours, a total period of five days of therapy will be appropriate for most patients. The same formulation or the same class of drugs should be used when switching from non-hemispheres to oral antibiotics. We acknowledge that most studies in support of five days of antibiotic therapy include patients without severe CAP, but we believe these results apply to patients with severe CAP and without infectious complications. We believe that due to suspected or proven MRSA or P. aeruginosa, the duration of treatment for CAP should be 7 days in line with the pneumonia and respiratory-related pneumonia guidelines (166) recently acquired by the hospital. A controlled study is needed to establish a period of antibiotic therapy for adults with complications of CAP, including empyema, and adults with extended time to achieve clinical stability. In adults with CAP who have symptoms resolved within 5-7 days, Subsequent thoracic imaging (conditional recommendations, low evidence quality) is given. There is limited data on the clinical usefulness of reimizing pneumonia patients. Most valid data has been evaluated to determine whether reimied patients detect lung malignancies and are not recognized during treatment for pneumonia. In patients recovering from the CAP range, the reported rate of malignant tumors ranges from 1.3% to 4% (211-214). If unsaimed nonmaligant pathology is included, the rate of abnormal findings can reach 5%. Nearly all patients with malignant tumors from the reported series were smokers or ex-smokers. One long-term study found that 9.2% of CAP survivors in the Veterans Affairs system (with a mostly male population and high smoking prevalence) made a new diagnosis of cancer, with an average time at a diagnosis of 297 days. However, only 27% were diagnosed within 90 days of discharge from hospital, suggesting the yield of routine follow-up post-discharge would be low (215). Available data suggests positive rates from 0.2% to 5.0% in the repeating imaging range. But many patients with new abnormalities in this study meet the criteria for lung cancer screening among current or past smokers (216). Further research may clarify the subgroups of patients who may benefit from further radiation assessment after initial treatment for pneumonia. Recommendations have been revised in light of the new data to help clinicians optimize the therapy for their patients with CAP. How quality is improved is critical to the implementation of guidance recommendations. It remains disappointing how few key clinical questions have been adequately studied to allow strong recommendations regarding standards of care. I hope the research priorities described in this article will call for a new investigation that addresss key knowledge gaps. Despite considerable concerns about the rise of antibiotic-resistant pathogens, most patients with CAP can be treated appropriately with a diet that has been used for decades. In addition, there is a growing subset of CAP patients with significant comorbidities and frequent contact with medical environments and antibiotics, and in some environments the infection rate for MRSA or P. aeruginosa is high enough to warrant empirical treatment. Unfortunately, microbial testing has not yet provided fast, accurate and affordable testing that results in proven benefits for CAP patients in terms of rapid delivery of targeted treatments or safe de-scullation of unnecessary treatments. Exceptions include rapid testing for MRSA and influenza. Until we have such a widely available (and proper) test, the therapy for many or most patients with CAP will remain empirical. Thus, clinicians need to recognize the spectrum of local pathogens, especially if infections with antibiotic-resistant pathogens such as MRSA and P. aeruginosa take care of patients from more common centers. Differences between

these and previous guidelines We have significantly increased the proportion of patients we recommend to routinely get respiratory pipe samples for microbiological research. This decision is mainly based on high quality evidence rather than a desire to address the abuse of anti-MRSA and antipseudomonal treatments that have occurred since the introduction of the HCAP classification (which we recommend to give up). We expect this change to generate significant research to prove or disprove the value of this approach. Since one size for empirical treatment for CAP cannot create an all-right schema, clinicians should validate any approach by taking into account the frequency of local spectrum and resistant pathogens, another driver for recommending increased testing. We similarly expect that our move against upholding single-family therapies with macrolides, based on population resistance data, will produce future outcome studies comparing different treatment strategies than high-quality clinical studies. We hope that clinicians and researchers will find these guidelines useful, but the recommendations contained here do not eliminate the need for clinical evaluation and knowledge to ensure that each individual patient receives appropriate and timely care. However, these guidelines describe the minimum clinical standards available and will help drive and help you achieve the best patient outcomes based on the data currently available. These clinical case guidelines were prepared by the ATS/IDSA Interim Committee on Community Acquired Pneumonia in Adults. Committee members include: Joshua P. Metlay, M.D., Ph.D. (Co-Chair) 1,2Grant W. Waterer, M.B.B. 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VA Medical Center, Houston, TX; and 18Weiler Medical School, Houston, TX1. Mandel LA, Wunderink RG, Anjueto A, Bartlett JG, Campbell GD, Dean NC, et al. American Institute of Infectious Diseases; American Thoracic Society. The American/American Thoracic Society Infectious Diseases Society guidelines for the management of community-acquired pneumonia in adults. Clean Infection Dis 2007;44:S27-S72. 2. Guyot GH, Oxman AD, Kunz R, Atkins D, Brozeke J, Beast G, et al. GRADE Guidelines: 2. Frame questions and decide important outcomes. J Clean Fidemiol 2011;64:395-400. 3. Merleigh JP, Kapoor WN, Fine MJ. Do these patients have community-acquired pneumonia? Diagnosed pneumonia by history and physical examination. JAMA 1997;278:1440-1445. 4. Sato T, Aoshima M, Omari N, Tada H, Chohnabayashi N. Usefulness of serous gram staining in community acquired pneumonia [Japanese]. Nihon Gokuki Kaki Jashi 2002;40:558-563. 5. Shariazade MR, Marie TJ. 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This official clinical case guidance was approved by the American Thoracic Society in May 2019 by the Infectious Diseases Society of August 2019. , at www.atsjournals.org.Author disclosures can be accessed from the content table of this issue: A.A. serves as a consultant to AstraZeneca, Bayer, Boehringer Ingelheim, GlaxoSmithKline, Novartis, Pfizer and Sunovion; He has dutyd on the advisory committees of AstraZeneca, Forrest and Novartis. provided to the data safety and monitoring board for Bayer; I received research support from GlaxoSmithKline. N.C.D. served as a Ceresa consultant. Provided to data safety and monitoring boards for Contrafect and Travans; He has dutyd on the advisory board of Cempra and Paratech. The S.A.F. received research support from Blue Cross Blue Shield in Michigan. Received a personal commission for expert testimony related to the practice of hospital medicine; Wally received royalties from Publishing. 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