The study by Ip et al suggests, in a preliminary fashion, that the demographics and even possibly the pathogenesis of OSA may be different for Asians in comparison with whites. Along these lines, a recent study by Li et al documented that Asian patients with OSA were less obese but had more severe symptoms than whites presenting over the same 1-year study interval. The authors attempted to attribute these differences to various facial characteristics derived by radiographic measurements that vary between Asians and whites. However, demonstrating an association does not indicate a causal relationship.

A crucial conclusion from these studies is that predictive equations for the presence of OSA developed from populations of obese, white men and based on weight or facial measurements are unlikely to be accurate in Asian men or, indeed, in many other groups. Such predictive equations are often promoted as less-costly recognition strategies for OSA than conventional 12-channel polysomnography. Their use is almost certain to gain broader application if earlier and widespread diagnosis of OSA becomes a public-health issue similar in significance to hyperlipidemia as a risk factor for increased cardiovascular morbidity and mortality.

The study by Ip et al is an important first step in illustrating that fundamental differences may occur in various ethnic populations of OSA patients. Recently, O’Connor et al showed that important differences also exist between populations of women and men with OSA. It is obvious that more studies are necessary to facilitate and allow for the accurate diagnosis and appropriate treatment of OSA in those other than middle-aged, white men.

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Appropriate Microbiological Testing in Community-Acquired Pneumonia

The appropriate microbiological investigation of the patient admitted with community-acquired pneumonia (CAP) remains a contentious issue. Several arguments favor microbiological investigation. First, the pathogen identified may be resistant to the chosen empiric antibiotic therapy. Second, identification of the pathogen may allow streamlining of antibiotic therapy, thereby reducing cost and possibly reducing the development of antibiotic resistance. Third, accurate epidemiologic data are required in order to design appropriate empiric therapy.

The countering arguments are that the currently available tests have insufficient sensitivity to significantly influence the choice of antibiotic therapy. Differences in the availability of microbiological resources and expertise at individual institutions, as well as local differences in microbiological etiology of CAP, significantly impact the yield of common tests, such as sputum Gram’s staining.

Evidence that identifying a pathogen improves outcome in patients with CAP is also lacking. Two studies of CAP have shown that infection with an organism subsequently shown to be resistant to initial empiric antibiotic therapy is an independent predictor of poor outcome. However, when change is required due to antibiotic failure, culture-based changes do not necessarily result in better outcomes than does an empiric, non-culture-directed change in therapy. It may be argued that knowledge of a probable pneumococcal infection is reassuring if a patient is not responding to therapy several days later. However, in a recent study of
patients with CAP who were not responding to empiric therapy, secondary nosocomial infection was not only the second most common cause, but the only one independently associated with fatal outcomes. Knowledge of the likely pathogen is, therefore, not necessarily helpful in managing patients who are not responding to initial therapy.

The ability to streamline antibiotic therapy is also questionable. As all current guidelines for empiric therapy of CAP recognize, pneumococcal infection must be covered in the choice of initial antibiotic therapy. Recognition of probable pneumococcal infection on a sputum Gram's stain or urinary antigen test is therefore unlikely to alter a physician's choice of antibiotic therapy, particularly in regions with a significant incidence of penicillin resistance. Even positive results of blood cultures do not lead routinely to narrowing of the choice of antibiotic therapy. Given the increased recognition of polymicrobial CAP (up to one third to one half of patients in some regions) and some suggestion of improved outcome with combination therapy of bacteremic pneumococcal CAP, the reluctance to switch to combination therapy. Recognition of probable pneumococcal infection on a sputum Gram's stain or urinary antigen test is therefore unlikely to alter a physician's choice of antibiotic therapy, particularly in regions with a significant incidence of penicillin resistance. Even positive results of blood cultures do not lead routinely to narrowing of the choice of antibiotic therapy.

Accurate etiologic information to design appropriate empiric therapy for patients with CAP is clearly needed. However, given the low yields of investigations in patients with mild-to-moderate CAP, obtaining this information in an ad hoc fashion has significant risks. Since invasive pneumococcal isolates are significantly less likely to be drug resistant than noninvasive specimens, reliance on blood cultures alone would underestimate the true prevalence of antibiotic resistance. If information were obtained only from blood and sputum cultures, atypical pathogens would only rarely be identified, skewing information regarding causative etiologies. Only with a comprehensive microbiological survey, using all available diagnostic techniques, can accurate etiologic data be obtained. This is clearly too expensive and difficult to do on a routine basis, and a more practical approach would be to use periodic comprehensive surveys.

In an ideal world, clinicians would always prefer to know the causative organism and antibiotic sensitivity for patients with CAP, even if the diagnostic yield of an individual test is low. However, in today's cost-conscious health-care environment, the expense for that reassurance may be excessive. For example, Chalasani et al found that $34,000 was spent on blood cultures for seven patients with a blood culture-directed change in therapy. However, the current diagnosis-related group-based reimbursement does recognize the importance of identifying a pathogen by providing a financial incentive to do so, partially offsetting the cost of diagnostic testing.

So should diagnostic testing in patients with CAP be completely abandoned or left only to certain institutions? The article in this issue of CHEST by Theerthakarai and colleagues (see page 181) provides data to support a compromise position. They demonstrated low yields of sputum Gram's stain, sputum culture, and blood culture in patients with mild CAP based on the pneumonia severity index of Fine et al. Even the most ardent supporters of aggressive diagnosis in patients with CAP do not recommend diagnostic testing in outpatients with CAP. This study supports extending that recommendation to hospitalized CAP patients whose severity indices would suggest that they could have been managed as outpatients without the social factors, age, or other concerns that led to inpatient treatment.

Conversely, in studies focused on patients with severe CAP, the yield of standard microbiological techniques is substantially higher. This is particularly true of the yield from blood cultures, a reflection of bacteremia as an independent predictor of worse outcome from CAP. Given the much greater risk of adverse outcome in patients with severe CAP, and the much greater likelihood of positive results, more aggressive investigation in patients with severe CAP seems prudent. Investigation of patients with specific risk factors for drug-resistant pathogens, such as those who received the frequent antibiotics for bronchiectasis or chronic bronchitis, also would seem to be appropriate.

In addition to stratification by severity, the degree of diagnostic workup should also be proportional to the type of empiric therapy. Most recommended empiric regimens suggest coverage for the possibilities of penicillin-resistant Streptococcus pneumoniae and Legionella. If the empiric antibiotics do not cover these microorganisms, a more aggressive diagnostic workup also may be warranted, especially in patients with severe CAP. An aggressive diagnostic approach to patients who either have nonresponding or progressive CAP is also likely to be a high-yield exercise. Arancibia et al recently have demonstrated that a definite etiology could be established in 65% of these patients. In particular, antibiotic-resistant microorganisms in patients with nonresponding pneumonia and nosocomial superinfection in patients with progressive pneumonia could frequently be documented.

Obtaining sputum and/or blood cultures should clearly not be used as a marker of quality of care in patients with CAP, as suggested by some external review agencies. Insistence on obtaining sputum or
blood cultures prior to the initiation of antibiotic therapy may conflict directly with an emphasis on avoiding delay in providing the first dose of an antibiotic, a quality-of-care issue that has been demonstrated to affect outcome.  

Recommendations against routine diagnostic testing are based on the lack of sensitivity of and the turnaround time of the currently available tests. Newer diagnostic tools, such as the detection of microbial DNA using a variety of polymerase chain reaction (PCR)-based techniques, show considerable promise. The ability to rapidly screen not only for pathogens but also for antibiotic resistance either with PCR or other molecular diagnostic techniques could substantially alter our approach to the management of patients with CAP in the future. Until then, the stratification of the diagnostic workup by severity, patient characteristics, and anticipated empiric antibiotic therapy is likely to lead to the most cost-effective overall care of patients with CAP.

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Weaning the Difficult Patient
The Evolution From Art to Science

Weaning patients from mechanical ventilatory support remains a significant challenge. Determining the optimal time and mode of weaning has been described as “an arbitrary clinical decision based on judgment and experience.” The fact that 50% of self-extubated patients do not require reintubation suggests that our judgment and experience are far from complete. The difficulty we still have in discontinuing mechanical ventilatory support is evidenced by the fact that 40% of the time that a patient spends receiving mechanical ventilation is devoted to weaning. Research performed in the last decade has yielded vital information that is making weaning more of a science and less of an art.

The utilization of traditional respiratory parameters such as the peak negative pressure, tidal volume (VT), respiratory rate, spontaneous minute ventilation, and the maximum voluntary ventilation have been shown to have poor predictive value in determining weaning outcomes. Newer parameters, such as the ratio of respiratory frequency to VT, ie, the rapid shallow breathing index (RSBI), have a better