adequately prepare pulmonologists to treat patients with sleep disorders other than OSA.

In conclusion, the findings of Krakow et al should heighten the awareness of practitioners evaluating both sleep apnea and insomnia complaints, and prompt further study of both disorders. It also highlights the need for more comprehensive training of pulmonologists in sleep medicine.

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Microalbuminuria
Simple, Inexpensive, and Dynamic Marker of Critical Illness

Predicting patient outcome is an important component of patient care in critical care units. Physicians are frequently faced with a number of challenging questions posed by patients, relatives, referring physicians, and other health-care providers. Will the patient make a full recovery? What functional status will the patient have following recovery? How soon will the patient be discharged? How aggressively should this patient be resuscitated in the case of cardiopulmonary arrest? Hospital administrators pose a different set of challenging questions. Are our limited resources properly allocated? Can we justify the cost?

Faced with these challenges, intensivists have developed a number of prognostication tools for patients admitted to the ICU. Though useful, these tools are complex. The widely used APACHE (acute physiology and chronic health evaluation) II score, for example, requires input of a large number of variables derived from the patient’s history, physical examination, and initial laboratory data. This is also true of the APACHE III score, sequential organ failure assessment score, simplified acute physiology score, and others. In addition, scoring systems rely mainly on data obtained early in the course of the illness. It is well-known that the physiologic responses of patients to insults and interventions vary. The strength of initial predications, therefore, may be influenced by numerous factors during the course of hospitalization. These factors may not be accounted for in the initial assessment. That this is the case is supported by studies that show that multiple severity-of-illness scores, including APACHE III, frequently underestimate hospital mortality in several conditions.

In this edition of CHEST (see page 1984), Abid et al propose microalbuminuria as a simple, inexpensive, and dynamic prognostic tool in a medical ICU. In a pilot study, they evaluated its prognostic value for the development of acute respiratory failure and/or multiple organ failure. There are theoretical reasons why this parameter should be a useful prognostic index in critically ill patients admitted to the ICU. First, it makes intuitive sense to look at one or more kidney functions as surrogate markers for systemic illness. Kidney involvement is a recognized complication of several systemic diseases. Furthermore, the kidney receives a generous portion of the cardiac output. Exogenous as well as endogenous agents precipitating or contributing to the patient’s critical illness have a high probability of traversing the kidney circulation and causing glomerular injury. Second, microalbuminuria is a reflection of capillary leak, which is observed in multiple organ dysfunction syndrome. In this syndrome, diffuse systemic inflammation results in systemic capillary leak in most vascular beds, including the kidney, where it manifests as albuminuria. Gossling observed peak albuminuria in patients with systemic inflammation up to 2 days before a detectable rise in other markers of inflammation.

Microalbuminuria, defined as urinary albumin levels in the range of 30 to 200 mg/L, can be detected...
by the use of a simple semiquantitative dipstick technique. The prognostic usefulness of microalbuminuria has been demonstrated in a number of conditions. In lung cancer patients, for example, Pedersen and Milman observed that the presence of microalbuminuria was associated with advanced disease and poor survival. A similar observation was made in patients with non-Hodgkin’s lymphoma. In addition, microalbuminuria was found to be a useful tool in predicting cardiovascular mortality in treated hypertensive men with or without diabetes mellitus. Borch-Johnsen et al concluded that microalbuminuria is an independent predictor of ischemic heart disease and its presence substantially increases cardiovascular risk. Microalbuminuria measured 6 h after ICU admission demonstrated a significant difference between survivors and nonsurvivors. In another study, an increase in glomerular permeability during the first 24 h after trauma correlated with the extent of injury, although it did not appear to have a positive predictive value with respect to severity of illness or outcome. It is interesting that these latter two studies attempted to evaluate microalbuminuria after some (albeit short) period of time had elapsed since hospital admission. This lends more credence to the notion that parameters measured during the course of hospitalization are important in predicting outcome.

In this context, the work of Abid et al on the prognostic value of microalbuminuria is very significant. The investigators measured this index of inflammation as early as 8 h after hospital admission, and repeated this measurement on a daily basis for 5 days. This allowed the investigators to follow changes in the magnitude of microalbuminuria with time. They found that patients with increasing microalbuminuria, suggesting progressive inflammation, had a worse outcome and higher mortality than those who had a decreasing trend. As expected, APACHE II and sequential organ failure assessment scores were higher in the former group. Interestingly, progressively decreasing microalbuminuria had a negative predictive value of 100% for the development of acute respiratory failure and 96% for multiple organ failure. This was superior to the positive predictive value of increasing microalbuminuria, which was 57% and 50% for these two parameters, respectively. Because of the limited number of patients in every diagnostic category, it was not possible to do subgroup analysis. Larger cohorts of patients may prove this tool to be even more useful in specific patient populations such as sepsis or respiratory tract infections. As the authors indicate, this is a pilot study that needs to be confirmed in larger studies encompassing multiple conditions. However, this study emphasizes the need to look for simple and inexpensive tools to predict outcome. Furthermore, this study confirms what intensivists have known for a long time: the predictive value of severity-of-illness scores can be substantially improved by utilizing data collected serially during the course of hospitalization in the ICU. The notion that severity-of-illness scores should incorporate data collected on an ongoing basis is here to stay.

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References
6 Markgraf R, Deutchinoff G. Comparison of acute physiology and chronic health evaluation II and III and simplified acute physiology score II: a prospective cohort study evaluating these methods to predict outcome in a German interdisciplinary intensive care unit. Crit Care Med 2000; 28:26–33
Fluoroquinolones for Respiratory Infections

Too Valuable To Overuse

In the current issue of CHEST (see page 2021), Guthrie has provided a broad and useful review of newer treatment options for the pathogens most commonly associated with both community-acquired pneumonia (CAP) and bronchitis, with a strong emphasis on the potential value of newer fluoroquinolones for empiric treatment. Guthrie discusses older fluoroquinolones such as ciprofloxacin (Bayer Pharmaceuticals; West Haven, CT) and levofloxacin (Ortho-McNeil Pharmaceutical; Raritan, NJ), and as newer fluoroquinolones moxifloxacin (Bayer Pharmaceuticals), gatifloxacin (Bristol-Myers Squibb; New York, NY), and trovafloxacin (Pfizer; New York, NY). He acknowledges his support by two of these pharmaceutical companies (Bayer Pharmaceuticals and Bristol-Myers Squibb).

Many share his view (as I do) that currently available fluoroquinolones provide excellent coverage for most treatable respiratory pathogens, including atypical and more readily cultured pathogens. Excellent absorption and minimal toxicity permit comparable oral and IV therapy for the treatment of serious infections, which sets these drugs apart from most β-lactam drugs and the older macrolide erythromycin. Either newer macrolide azithromycin and older broad-spectrum doxycycline can be comparably dosed orally and IV, and both cover atypical pathogens. However, fluoroquinolones variably offer greater Gram-negative coverage, greater efficacy with highly resistant pneumococci, and/or greater anaerobic coverage, providing advantages for treating selected patients when used as monotherapy. Rapid conversion from IV to oral therapy reduces the cost of hospitalization by reducing drug costs and, potentially, the length of stays in the hospital. As such, fluoroquinolones combine exceptional efficacy with cost-effectiveness. Therefore, it is not surprising that some medical systems have adopted fluoroquinolones as empiric therapy in clinical pathways for the treatment of CAP.1,2 Efficacy and tolerance data support their use among outpatients with exacerbations of chronic bronchitis as well.3

Some of the older, more established fluoroquinolones, including ciprofloxacin and levofloxacin, have proven remarkably safe over time at higher doses than usually are prescribed.4 Ciprofloxacin at 750 mg bid appears to be safe and at least comparable in effectiveness for the outpatient treatment of acute bronchitis and pneumonia when compared to other commonly utilized drugs.4,5 High doses of ciprofloxacin were recommended by the Infectious Diseases Society of America (IDSA) in their CAP guidelines when Pseudomonas aeruginosa infection is considered.6 Very high doses of ciprofloxacin and levofloxacin have successfully treated persistent osteomyelitis8 and may be useful for treatment of empyema where local concentrations exceed serum concentrations.9,10 Higher tissue concentrations of levofloxacin and newer fluoroquinolones in sites of inflammation provide theoretical advantages for the treatment of empyema or infections of other poorly vascularized spaces, but clinical trials of these conditions are lacking.

Two sets of guidelines for the treatment of CAP, one a combined effort of the Canadian Infectious Disease Society/Canadian Thoracic Society (CIDS/CTS)11 and the other by the IDSA,12 were recently published simultaneously. Readers are encouraged to seek copies of these guidelines and the accompanying editorial,13 which favor fluoroquinolones but somewhat less strongly than presented in the article by Guthrie. The guidelines generally favor the primary or secondary consideration of fluoroquinolones in the initial empiric treatment of patients who have the most complicated cases of CAP and are admitted to the hospital, while generally favoring macrolides or doxycycline for the treatment of less sick outpatients, at least among those without special needs for fluoroquinolones. These recommendations are summarized in tables in each of the two studies cited11,12 and are compared here in Table 1. Importantly, these guidelines presume that sputum and blood cultures are collected routinely and will lead to a change to an antibiotic with narrower coverage rather than the persistent use of fluoroquinolones in hospitalized patients. However, clinicians are often reluctant to withdraw what appears to be effective therapy in very sick patients. Furthermore, cultures frequently are not sufficiently diagnostic,14 fueling controversy regarding the value of routine sputum cultures. Therefore, because most patients with CAP improve in the hospital on empiric therapy, the initial therapy is continued in most patients when feasible.

The conditions of patients with acute exacerbations of chronic bronchitis associated with dyspnea and/or a change in sputum character generally also improve during antibiotic therapy,15 leading to the