and predicted the development of lung fibrosis with honeycombing.\textsuperscript{5,6} However, not all of the patients in these previous studies had biopsy-proved disease, and these studies did not evaluate patients with the histologic diagnosis of desquamative interstitial pneumonitis (DIP) separately from those with usual interstitial pneumonitis (UIP). Both UIP and DIP are generally included under the clinicopathologic umbrella of IPF. The useful article by Hartman and colleagues (see page 378) in this issue of CHEST re-emphasizes the fact that the clinical and radiologic course of DIP is markedly different from that of UIP. Using serial CT scans in 11 patients with DIP and 12 with UIP, they show that in patients with DIP, GGA usually regresses or stays stable in response to treatment, while in treated patients with UIP, GGA typically progresses, or is replaced by evidence of lung fibrosis (irregular lines or honeycombing). Because the outcome of GGA in DIP is substantially different than that in UIP, the study by Hartman and colleagues provides further support for the hypothesis that DIP and UIP are different diseases, rather than different phases of the same disease. Their paper reminds us once again that lung histology at diagnosis is an important predictor of the course of patients with IPF.\textsuperscript{7}

In summary, it seems that different lung histologies may account for some or most of the previously described difference in the temporal behavior of GGA on CT of patients with IPF. Interpretation of the results of this study must be tempered somewhat by the fact that it includes a relatively small number of patients with DIP and UIP. Two interesting questions warrant further investigation. Is extensive ground glass attenuation at presentation a determinant of prognosis (independent of histology) in patients with DIP or UIP? To answer this question would require a larger number of patients with each histologic diagnosis. Second, if the areas of GGA seen on CT in patients with UIP do not regress in response to steroid treatment, will they regress in response to other forms of immunosuppression or to more innovative treatments? The patients in the study by Hartman and colleagues, and in other recent studies,\textsuperscript{5,6} were treated largely with steroids, although some were treated with immunosuppressive drugs. Since the CT finding of isolated GGA (without traction bronchiectasis or broncholectasis) in IPF usually indicates alveolar inflammation,\textsuperscript{8,9} regression of this opacity on follow-up CT may be good evidence for the effectiveness of new treatments for the alveolitis of UIP.

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References


Protocol-Driven Respiratory Therapy

Closing in on Appropriate Utilization at Comparable Cost and Patient Outcomes

In this issue of CHEST, (see page 422) the medical director and a group of senior therapists from the Cleveland Clinic’s Respiratory Therapy Section report on the experience of their Respiratory Therapy Consult Service (RTCS). During an 18-month period in 1992-1993, 98 non-ICU adult inpatients were selected from 23,209 individuals receiving respiratory care services and were divided into 2 groups based on whether treatments were directed by resident physicians or respiratory therapists. The study suffers from two weaknesses in design: 1) lack of patient randomization into therapist- or physician-directed treatment and, 2) patient selection based upon availability of the study evaluator—each of which is appropriately addressed by the authors. The study showed that the two groups were closely matched and that outcome parameters (length of hospital stay, cost of respiratory therapy services, complications, and deaths) were comparable.

At the Cleveland Clinic, the RTCS cares for non-ICU, postoperative patients using treatment algorithms created by the RT Section and approved by the
Clinic's physicians and administrators. Frequently called therapist-driven (or-directed) protocols (TDPs), such algorithms have become increasingly popular in recent years.1,2 Ideally, TDPs enable experienced, allied health professionals to serve as physician extenders, assessing and treating pulmonary conditions as diverse as hypoxemia, bronchospasm, ventilator weaning, extubation, etc.2 At worst, they risk placing patients in life-threatening situations, if ill-prepared or inexperienced respiratory care practitioners (RCPs) are given excessive decision-making authority. This concern was highlighted in a recently published abstract that reported survey results of RT students', instructors', and practitioners' ability to assess and treat common situations presented as six case studies.3 All three groups selected correct interventions in less than 50% of cases. In a second report evaluating staff therapists with more than 1 year's experience with TDPs, correct treatments were selected a median of 78% of the time.4 Similarly, the current study reports that RTCS practitioners wrote inappropriate respiratory care orders on 33 to 40% of patients despite their familiarity with existing treatment protocols. The high prevalence of incorrect ordering emphasizes that only the most competent RCPs should participate in TDPs.

In their article in this issue, Stoller and colleagues chose clinical practice guidelines (CPGs) developed by the American Association for Respiratory Care (AARC) as the "gold standard" for providing postoperative respiratory care.5-8 The AARC guidelines were created by a committee of respiratory therapists working with selected physicians. I believe that physician acceptance and adoption of the guidelines would have been facilitated if other professional associations such as the American College of Chest Physicians, the American Thoracic Society, and the American Society of Anesthesiologists had been asked to participate in the development process. Even now, I would encourage the AARC to solicit review and endorsement from respiratory medicine specialty organizations. In so doing, these useful and timely guidelines would be more widely disseminated to medical students and physicians and would produce a greater impact on patient care.

The most important conclusion of the Stoller et al study is that therapist-directed, therapeutic interventions, conducted in accordance with approved algorithms, produced equivalent outcomes without increased cost or complications. Institutions approving TDPs should restrict participation to experienced RCPs proven to have specialized knowledge and skills. Additionally, postoperative patient care would almost certainly be improved if the AARC CPGs were widely accepted and were used to educate medical students and physicians about respiratory care treatment modalities, an area largely ignored during physician training. Finally, institutions such as the Cleveland Clinic should consider additional studies assessing cost effectiveness and outcomes when comparing TDPs to treatment plans initiated by fully trained physicians such as family practitioners, general internists, or pulmonary specialists.

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REFERENCES

2 Burton GG, Tietsort JA. Therapist-driven respiratory care protocols—a practitioner's guide. Los Angeles, Calif: Academy Medical Systems, Inc; 1993: 1-227
4 Pilbeam SP, Meredith RL, McCarthy K, et al. Proficiency in applying treatment algorithms: Training at clinical sites using therapist-driven protocols is associated with better performance. Resp Care 1993; 38:1219

Does Inverse Ratio Ventilation Predispose to Pulmonary Edema?

The basic imperative to maintain gas exchange in patients who require mechanical respiration has led to the development of a wide variety of ventilatory strategies. Advances in the design of mechanical ventilators have greatly simplified the clinical application of many of these approaches. However, it can be argued that our ability to influence each phase of ventilation has outstripped our understanding of how changes in the mode of ventilation alter gas exchange or influence pulmonary integrity in specific disorders of the lungs.

The introduction of positive end-expiratory pressure (PEEP) represented a major advance in the treatment of ARDS because adequate arterial oxygen tensions