Dr. Quenzer (see page 531) provides the clinician with a lucid description of the development, pharmaceutical action, and appropriate utilization of the cephalosporins in the treatment of pneumonias. However, his most important contribution may be contained in the four short paragraphs on cost considerations that extend far beyond antibiotic usage.

Hospital administrators and medical directors are finding the viability of their institutions threatened from all sides. Capitated payments are limiting the ability of the hospital to rob from the rich and give to the poor—yet the poor are always with us. Technology is reducing the need for hospital beds, leaving in the hospital only the sickest of patients who require increased hours of nursing and ancillary time—yet critics of the high cost of health care point only to the subsequent rise in per-day hospital costs as evidence of waste and mismanagement. HMOs and PPOs now trade discounted hospital payments for the potential of inpatient hospital volumes.

In response, at first in public and university hospitals and now in the private sector, hospital formulary committees are being asked to reduce hospital costs by selecting the least expensive of closely equivalent drugs for use in the institution, closing the formulary to more expensive items. Dr. Quenzer expands our view from cost per dose to cost per day. Cost per day includes the time and cost of the pharmacist, the nurse, the medication technician and the ward clerk—all of whom are involved in the transcription of orders, administration and documentation of treatment, records of which are essential if the institution is to fare well under Quality Assurance review or malpractice attacks.

A single adverse complication which adds a week of hospitalization could easily wipe out a year's saving of a lower cost/day formulary item. Therefore, the potential for, and incidence of, toxic reactions must be considered against the demographic characteristics of the population served by the hospital. Laboratory tests that are routinely required with the use of a medication now assume significant cost importance.

When the patient leaves the hospital, will the less expensive medication enhance or decrease patient compliance and subsequent disease relapse? For example, long acting, once-per-day therapy has consistently been associated with increased compliance when compared to treatment requiring dosing four times per day.

Unquestionably, cost is and will be an issue in therapy. Clinicians must quickly take the lead in understanding and quantitating true costs before others "help" us.

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Inverse Ratio Ventilation

PEEP in Disguise?

We note with considerable interest recent reports of inverse ratio ventilation (IRV) of infants and adults with severe pulmonary dysfunction. IRV is a ventilation technique which uses markedly increased inspiratory:expiratory ratios of up to 4:1. Inspiratory time is prolonged up to 80 percent of the respiratory cycle with a corresponding decrease in time allowed for expiration. Physiologic effects of IRV are unproven, but proponents postulate improved gas diffusion, and recruitment and stabilization of alveolar units. We propose a simple mechanism which could account for the heretofore unexplained effects of IRV on pulmonary gas exchange. In addition, we venture a note of caution against indiscriminate and widespread implementation of this technique until mechanisms and effects are more fully elucidated.

Inadequate expiratory time in mechanically ventilated patients can lead to air trapping and occult positive end-expiratory pressure ("auto-PEEP," "inadvertent PEEP," or "intrinsic PEEP"). The effect is functionally similar to installation of a PEEP valve on the expiratory circuit of the ventilator; alveolar pressure remains positive throughout the respiratory cycle with transmission of pressure to the pleural and intravascular spaces. IRV allows little time for expiration and is in all probability analogous to use of low inspiratory flow rates with conventional ventilation in propensity for producing auto-PEEP.

Auto-PEEP is a relatively common but seldom appreciated occurrence. Neither the presence nor magnitude of auto-PEEP is apparent during usual ventilator monitoring. Auto-PEEP can most easily be demonstrated by brief occlusion of the expiratory circuit at end-exhalation. Alternatively, the increased pleural pressure could be measured with an esophageal balloon.

The beneficial effects on pulmonary gas exchange attributed to IRV could be entirely due to the presence of additional, albeit occult, PEEP. Despite the obvious