with respiratory illness, bronchoscopic studies yielded the following pulmonary diagnoses: nonspecific interstitial pneumonitis (38%), tuberculosis (23%), cryptococcosis (13%), Kaposi’s sarcoma (9%), Pneumocystis carinii pneumonia (9%), and nonspecific changes in 16% of patients. This study suggested that primary prophylaxis against P carinii is not appropriate in African patients. Another study of 59 Rwandan patients with proven pulmonary tuberculosis observed that 81% were HIV-seropositive. These studies make it clear that P carinii infection, the most common infection among patients with AIDS in the western countries, is uncommon in African patients with AIDS. In African patients with AIDS, tuberculosis is the main pulmonary infection.

More than a dozen adults in our group were diagnosed as having small to moderate pleural effusions and several of these appeared to have AIDS. Clinically, it was difficult to decide if the pleural effusions were caused by Kaposi’s sarcoma, tuberculosis, ascites secondary to liver disease, which is quite common in Rwanda, congestive cardiac failure, or other causes. A study of 127 adult (mean age 34 years) Rwandan patients with pleural effusion recorded confirmation of pleural tuberculosis in 82% patients, and among the latter, 83% were HIV-1-seropositive. Other causes for pleural effusion included metastatic cancer in six patients, Kaposi’s sarcoma in three, pneumonia in four (four had AIDS), and congestive cardiac failure in three patients. Batungwanayo et al point out that in an African area highly endemic for coinfection by HIV-1 and Mycobacterium tuberculosis, pleural effusion should be considered a marker for tuberculosis as well as HIV-1 infection.

Overall, the experience gained in Rwanda was truly worth my time and effort. Importantly, it was very educational and meaningful in many ways. The basics of clinical examination were brought to the forefront. As expected, intermittent discouragement was inevitable because of the inability to confirm the diagnoses, absence of long-term follow-up, and the lack of therapy for tuberculosis and other illnesses. The gratifying aspects included the rapid recovery of patients, especially children with life-threatening dehydration from dysentery and other infectious and noninfectious maladies that plague Africa. I like to think that the lively sparks of hope and happiness in the eyes of a few children who recovered from life-threatening illnesses foretold a better future for Rwanda.

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Do Arterial Lines Equal Unnecessary Testing?

In this issue of Chest, Low and colleagues (see page 216) attempt to identify the independent contribution of the presence of an indwelling arterial line to laboratory testing costs and blood drawing volume in ICU patients. Smoler and Kruksall1 raised this concern a number of years ago and many physicians have taken it for granted that the presence of an indwelling arterial cannula leads to inappropriate lab-
oratory sampling. The study by Low et al is the first that attempts to control for differences of severity of illness and disease process between the patient groups studied. These authors found that patients with arterial lines were subjected to 30% more blood drawing episodes and laboratory tests, and lost an additional (estimated) 25 mL of blood during the first 2 days in the ICU compared with patients with similar APACHE II scores without arterial lines. Unfortunately, this was not a prospective, randomized study and the decision to place the indwelling catheter was made by the clinicians caring for the patient. Most of the patients with arterial lines had them placed electively in the operating room. Therefore, more surgical than medical patients were in the arterial line group. Medical patients made up the majority of patients without lines. This difference in clinical style may have affected the outcome or it may reflect more significant disease or risk of problems in the surgical group. Comparison of the subgroups of only surgical patients, with and without arterial cannulation, resulted in identical conclusions, however, supporting the initial contention that the simple presence of an arterial line increases laboratory testing.

Why are frequent laboratory tests ordered on patients in an ICU? The role of repeated chemical determinations is based on the premise that by identifying undesired trends early, untoward events can be avoided. Early clinical manifestations of such conditions as anemia, hypophosphatemia, and hyper and hyponatremia are often subtle and may be apparent only after large deviations from the normal have occurred. The first clinical sign may be lethal cardiac dysrhythmia or respiratory arrest. Frequent monitoring laboratory values should help prevent these catastrophes. Confirmation that “all is well” is another reason that frequent, normal, tests are necessary. The level of uncertainty in medical diagnosis and the usefulness of laboratory testing in reducing the concern of the physician may explain the results of this and other utilization studies.2,3

The belief that indwelling arterial lines contribute to unnecessary laboratory testing in the critically ill has led some clinicians to avoid use of these monitoring devices unless the patient is severely ill and hemodynamically unstable. This may have been the operative principle with the medical patients in this study. The concern about testing burdens seems to be higher among internists than surgeons. The additional testing that occurred in the group with arterial cannulae was not shown to be unnecessary in this or any other published study. Specific clinical and biochemical criteria need to be applied to the test ordering practices to evaluate whether they are appropriate in this or in any patient group. It is possible that the group without arterial lines failed to have appropriate, useful tests performed in a timely fashion because of the difficulty in obtaining samples. The use of protocols, algorithms, and education regarding diagnostic laboratory tests can standardize and increase the appropriateness of laboratory testing.4,5,6 Educational interventions such as these should make longer lasting changes in care-giver behavior than simply increasing the difficulty of obtaining samples.

Patient comfort was not considered or assessed in this study. An average of 5.8 (up to 12 per patient) independent phlebotomies or arterial punctures (not specified from what vessel blood was obtained) were performed in the first ICU day in patients without indwelling lines. This seems excessively unkind and not free of risk. It is possible that many of these tests were unnecessary as well. Rather than condemn the arterial line as the culprit, we should be looking at laboratory utilization practices for optimum sampling. If samples are required frequently, eg, more than four phlebotomies a day, then an arterial or venous indwelling catheter should be considered. Smaller samples and clustering of tests should be used to reduce the blood waste associated with sampling and line purging. Attention to laboratory practices is important in these times of cost containment.

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