To the Editor:

The criteria by Light et al (Ann Intern Med 1972; 77:507-13) for the separation of transudates from exudates have been used effectively now for almost a quarter of a century. The only evolution in the criteria has been a shift in emphasis for the third criterion; a cutoff of 0.6 for the ratio of the measured lactate dehydrogenase (LDH) to the upper limits of normal for the laboratory reporting the result has supplanted the use of an absolute LDH greater than 200 [200 was two thirds the upper limits of normal [Ann Intern Med 1972; 77:507-13] for the lab in the defining study]. I have read with interest the article by Costa et al (CHEST 1995; 108:1260-63) and now with even more interest the letter by Romero et al. The combination of the two illustrates elegantly the point that I and my colleagues were trying to make in our editorial.1 For years, different authors have struggled with the issue of exudate vs transudate and have created new criteria, which are “superior” or “equivalent” to those by Light et al (CHEST 1995; 108:1260-63, and 1991; 99:1077-1102),2,3 but which are shown upon re-examination in other patient groups to be good but not superior (CHEST 1993; 104:399-404).2 Today, we have another round in this series. Costa et al demonstrated that cholesterol-LDH were superior to Light’s criteria, and now Romero et al suggest that in another patient group they weren’t. This allows an endless series of articles; we are far from exhausting all of the possibilities in the Chem 27, which is a standard set of 27 biochemical studies.

The criteria of Costa et al are simple, but there is a logical reason why they would not be expected to hold up as well as Light’s criteria. Costa et al did not copy the basic mathematical brilliance of Light’s criteria, which uses ratios and an “and/or” structure. The use of ratios emphasizes the impact of the pleural barrier and minimizes intralgal variability. The and/or structure (transudate if one or more of the criteria are met) maximizes the sensitivity for transudates.

Light’s criteria have a sensitivity and accuracy in the upper 90s for exudative effusions (CHEST 1993; 104:399-404).4 The accuracy can probably be improved upon with clinical judgment and knowledge of the effect of diuresis upon transudates (CHEST 1990; 95:546-49).5 Isn’t this as much as we can expect from a clinical test? I will eventually be shown to be wrong. There are rare individuals or individuals with rare moments in which they resolve old issues with a brilliance or an insight that crystallizes a new understanding. That leaves the rest of us in most of our moments. Let’s move on to other pleural issues.

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Communications to the Editor

Reliability of the Polymerase Chain Reaction in the Diagnosis of Mycobacterial Infection

To the Editor:

A diagnosis of mycobacterial infection may be suggested by a patient’s symptoms and clinical or radiographic findings. However, the definitive diagnosis depends on the isolation of the etiologic agent. Conventional methods of detecting mycobacteria in clinical samples, such as microscopy or culture, are either low in sensitivity and specificity or time-consuming.5 Polymerase chain reaction (PCR) is a rapid, sensitive, and specific alternative that may facilitate the diagnosis of mycobacterial infection.6,7 The applications and limitations of this technique have been revised recently in this journal (CHEST 1995; 108:1383-1404). We agree with Ma’s opinion about the uncertainty of a large scale application of PCR for the diagnosis of tuberculosis (TB) at present and report three cases that are examples of this controversy.

A 65-year-old man who smokes and drinks was admitted to the hospital because of a 1-week history of fever, chills, sweating, arthralgias, dizziness, headache, sore throat, nausea, vomiting, and diarrhea. Physical examination and chest radiography revealed a right pleural effusion with atelectasis of the right inferior lobe. Acid-fast bacilli were seen on the smears of sputum specimens, and cultures revealed the growth of atypical mycobacteria. Yet, the results of repeated PCR-specific tests of sputum specimens for Mycobac-
terium tuberculosis and for genus Mycobacterium were negative. With appropriate treatment, the patient recovered completely.

A 27-year-old HIV-positive woman who had a 3-week history of fever, productive cough, and dyspnea came to the hospital. Examination revealed reddish breath sounds bilaterally, diffuse ronchi, and bibasilar crackles. Chest radiography showed heterogeneous consolidation areas in both upper lobes and right inferior lobe and a diffuse reticulonodular infiltrate in the rest. No bacteria, fungi, or parasites were seen in sputum or blood. No acid-fast bacilli were seen on the smears of sputum specimens and the results of repeated PCR-specific tests of sputum specimens for M tuberculosis and for genus Mycobacterium were negative. The PCR test of sputum for Pneumocystis carinii was also negative. The patient received broad empiric antimicrobial treatment, including antitubercular agents. Eight weeks later, the culture of sputum revealed growth of M tuberculosis. Clinical and radiologic improvements were observed under TB treatment.

A 69-year-old woman was evaluated for a 24-h high fever. The patient related a 1-month history of fatigue and night sweats. The chest film showed occupied costophrenic angles and a small bilateral basal pattern of reticulonodular markings. Laboratory tests showed an elevated erythrocyte sedimentation rate (110 mm/h) and high α globulins. She had a 25-mm reaction to the tuberculin skin test. No acid-fast bacilli were seen in sputum specimens and cultures revealed no growth of mycobacteria. However, the result of a sputum PCR test for M tuberculosis was positive. The patient received antituberculosis treatment, and the clinical and biological manifestations disappeared.

In the first two cases, the PCR test failed to detect mycobacterial infection diagnosed by conventional methods, even though the usefulness of specific PCR for the genus Mycobacterium is documented.5 False-negative reactions can be caused by inhibitors that interfere with the Taq polymerase.5 Nevertheless, in the third case, PCR was the only diagnostic probe able to confirm the strong clinical suspicion of TB. According to some authors, the sensitivity of PCR for a diagnosis of active TB is 100%.6 However, the reliability of PCR in the diagnosis of TB has already been questioned.1,7 We conclude that more studies on the sensitivity and specificity of PCR in the diagnosis of TB are necessary.