simple mask to a human patient simulator. As we pointed out in our article, our human lung model simply reflected a baseline estimate of the distance traveled by any potentially infectious aerosols while the patient was breathing at rest with a respiratory rate of 12 breaths/min. With appropriate references,2,3 we have already stressed the importance of full personal protective equipment as an effective infection control measure in protecting health-care workers against severe acute respiratory syndrome.1

We are well aware of the possibility that viral infection such as severe acute respiratory syndrome has the potential of spreading by an airborne route, and indeed our institution has made a significant contribution to the literature on this issue.4,5 It is important for clinicians involved in the management of infectious diseases to understand that environmental factors such as medical ward airflow and ventilation may play a significant role in the aerosol transmission of infection in health-care premises.6 In addition to full personal protective equipment and good personal hygiene, the World Health Organization and the Centers for Disease Control and Prevention have recommended in influenza pandemic plans enhanced infection control precautions in health-care facilities, including placing patients with suspected and confirmed H5N1 influenza in negative-pressure isolation rooms with 6 to 12 air exchanges per hour (if available) due to the high lethality of the disease and uncertainty about the mode of human to human transmission.7,8 The negative-pressure room will reduce the spread of airborne contamination between rooms, and a recent study9 has shown that the air exchange rate and airflow patterns are important factors in the control of airborne virus infection, and good ventilation arrangement may enhance the safety of staff when performing medical treatments within isolation rooms.

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Diagnosing Pleural Effusion
Moving Beyond Transudate-Exudate Separation

To the Editor:

The primary aim of the physician investigating the patient with an undiagnosed pleural effusion is to establish the correct diagnosis with a minimum number of investigations. For >30 years, the first step in this process is to determine whether the fluid is a transudate or an exudate, which dictates further investigations and management. One consequence of this is the relentless search to find “better” indexes to differentiate transudates from exudates. This letter expresses our view that research efforts directed to this end would be better channeled into identifying disease-specific diagnostic markers.

Simple criteria such as the effusion/serum ratio of protein and lactate dehydrogenase (ie, “Light’s criteria”), have proved to be robust in separating transudates from exudates1 with a diagnostic accuracy of 96%.2 This is as near to perfect as is practically possible because the “gold standard” for comparison is clinical diagnosis, which itself carries a small but definite error rate. Even if superior diagnostic criteria were theoretically possible, to establish the superiority of any new proposed criteria over Light’s criteria a sample size of >13,000 subjects is required (α, 0.05; desired power, 0.90).

Exudates are defined by a higher effusion/serum level of proteins; hence, the levels of most proteins will be higher in exudative effusions, without the proteins necessarily having any specific diagnostic accuracy. Substantial resources can be expended assessing whether a novel marker is a better marker of the transudate-vs-exudate differentiation for little return.

Novel technologies such as global gene profiling and proteomics are now available to improve on this by identifying “fingerprint” for specific diagnoses. Success in this area will help in identifying the cause for an exudate and would be of great clinical value for patients with pleural effusions. We believe that the search for a better marker of a pleural fluid exudate should now be abandoned and that resources should be focused on identifying specific disease markers and improving clinical management.3

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