argument that these two types of patients did not need a biopsy for the physician to be confident that the patient likely had sarcoidosis and not a lymphoma. Since patients in the study by Judson and colleagues were not counted as “diagnosed” until they had biopsy confirmation of their diagnoses, it may be that the primary care physicians and the pulmonary physicians whom they consult generally perform better than the data in this report would suggest.

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Chest Ultrasound for “Dummies”

In this issue of CHEST (see page 436), Diacon et al report that bedside ultrasonography performed by a pulmonologist increases the success of thoracentesis by 26% in patients with pleural effusion when compared with puncture site localization by clinical examination and a chest radiograph. Many proposed sites for thoracentesis based on clinical examination were in areas that had insufficient pleural fluid, and a few proposed sites were at risk for hepatic or splenic puncture. The sensitivity and specificity of clinical examination for fluid detection was found to be only 76.6 and 60.3%, respectively.

At first glance, this study suggests we all should go out and buy one of the new laptop-sized ultrasound machines and carry it with us throughout the hospital and to the office. Late-generation portable ultrasound devices are extremely light, weigh < 5 lb, and are relatively inexpensive ($12,000 to $15,000). Probes for vascular imaging to assist in line placement and detection of deep venous thrombosis in the ICU can be interchanged with chest probes to detect pleural fluid and parietal pleural masses. Needles can be placed accurately on the first puncture. In short, we should all watch one, do one, and teach one to our colleagues for the betterment of our patients.

Anyone beginning a chest ultrasonography program should start with the evaluation of pleural disease. It is hard to conceive a simpler entry into sonography than detection of a pleural effusion. Although it is often said that sonographic diagnosis is operator dependent, it is probably even more task specific. In other words, the basic skill required to detect a pleural effusion may be acquired in minutes and may then improve with experience. Anyone already performing thoracentesis the traditional way can get started with little instruction. Once a basic familiarity with pleural effusion ultrasonography has been obtained, the clinician can easily proceed to ultrasound-guided small-bore thoracostomy tube placement. Chest ultrasonography in the clinician’s hands allows procedures that previously required transport to the radiology suite to be performed at the bedside. This is an important advantage in the critically ill. In our institution, ultrasonography has already replaced CT guidance for small-bore thoracostomy tube placement and is routinely used for paracentesis in the ICU. We also routinely perform core biopsies of pleural masses and lung masses abutting the pleura. Our overall experience with ultrasonography has been that it integrates with our practice and fellow training, and that it frequently obviates transport of the critically ill.

Yet, before ultrasonography becomes the standard of care for thoracentesis, is more work required? We believe the answer is yes. A review of known thoracentesis complications suggests that pneumothorax is a rare event when experienced operators are performing the procedure. Hemothorax, although rare, would not decrease with ultrasound since the intercostal vessel injury cannot be prevented by ultrasonography. Major organ puncture of the liver or spleen may be underappreciated and underreported, but complications from organ puncture remain the subject of case reports.

Other modalities of chest imaging are also clinically useful when an effusion is present. Chest CT can certainly show the amount and distribution of fluid as well as ultrasound but often fails to demon-
strate internal structures such as septations. Decubitus chest radiographs demonstrate whether fluid is free flowing, but this information is not needed if an ultrasound examination is planned prior to thoracentesis. Both imaging techniques may reveal additional information over ultrasonography about the pathology in the underlying lung with CT being superior to lateral decubitus chest radiographs. We believe that ultrasonography obviates the need for lateral decubitus chest radiographs and should be seen as a complementary modality to chest CT in the evaluation of pleural effusion.

The obvious next step for pleural effusion care is to determine whether best clinical care with ultrasonography is superior in outcome to best clinical care without ultrasonography. This study would require a large population, since no study to date has proven that thoracentesis improves clinical outcome in any disease (although most of us think that it should). Can the study be done? We are not sure. The value of ultrasonography is self-evident to anybody who has used it because it saves time and improves first puncture success of thoracentesis. Effusions can be assessed for size and complexity immediately prior to the procedure. We feel it unlikely that physicians with access to ultrasonography will forgo ultrasonography and perform clinically guided thoracentesis for the purpose of a study. Therefore, the ultrasound machine is destined to slowly make its way into the pulmonary and critical care armamentarium until everyone agrees with the value of the technology.

Without a pivotal study to demonstrate a new standard of care, the pulmonary and critical care community should begin training in chest ultrasonography with an eye to the future. The adoption of the technology by the community will set the stage for larger scale evaluation to determine its proper place in the management of pleural disease. As technology changes, the challenges to stay current do as well; ultrasound-guided thoracentesis opens the door to chest ultrasonography in a painless way and yet will prepare the clinician for what is ahead.

The reason that the For Dummies® series has been so successful is that our pride has prevented us from asking for help with new technology. We believe that ultrasound training should be provided to pulmonary and critical care physicians through every fellowship training program in the country, although training standards will need to be established. Should more studies with ultrasonography be performed? Absolutely. Should we slow the advance of this exciting new technology? Not unless you are a “Dummy.”

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One From Column A
Choosing Between CT, Positron Emission Tomography, Endoscopic Ultrasound With Fine-Needle Aspiration, Transbronchial Needle Aspiration, Thoracoscopy, Mediastinoscopy, and Mediastinotomy for Staging Lung Cancer

The pulmonologist is the focal point for the diagnosis and staging of lung cancer. Accurate staging is imperative because of the implications that stage has on different treatment modalities and subsequently on survival. Early stage lung cancer is treated with surgery alone. For the majority of patients, locally advanced lung cancer with involvement of the mediastinum is treated with chemotherapy combined with radiotherapy. Finally, metastatic lung cancer is treated with chemotherapy alone. Accurate staging not only allows for the choice of the most appropriate therapy, it predicts survival. For example, early stage lung cancer treated with surgical resection has a 5-year survival on the order of 60 to 75%. However, with metastasis to the mediastinum (stage IIIA disease), the 5-year survival drops to approximately 17%.

Recent advances in technology in both imaging and endoscopic techniques have allowed for greater accuracy in staging lung cancer, but have also led to confusion regarding the indications and timing for each of these staging studies. In this issue of CHEST (see page 442), Fritscher-Ravens and colleagues compare CT, positron emission tomography (PET), and endoscopic ultrasound with fine-needle aspiration (EUS-FNA) for detection of mediastinal metastases in potentially resectable patients with lung cancer. Their study concluded that EUS-FNA is more accurate than both CT and PET scan in detecting abnormal lymph nodes in the mediastinum. The fact that CT is inaccurate is not news. In pooled data of 4,793 patients with lung cancer and an enlarged mediastinal lymph node, the sensitivity was only 60% and the specificity 81%.1 It is the low specificity that is so bothersome. If the pulmonolo-