may be controlled by balloon tamponade. This technique allowed avoidance of a major surgical procedure in a high-risk patient.

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Opinions expressed herein are those of the author and not necessarily those of the Air Force or the Department of Defense.

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The Unresponsive Asthmatic
Misuse of a Spacer System

To the Editor:

Asthma treatment emphasizes inhaled medication to manage airway inflammation. Because of difficulties encountered in the use of metered-dose inhalers (MDIs), many physicians recommend spacers.

A 56-year-old man with steroid-dependent asthma, vasculitis, and bilateral vision loss secondary to retinal artery occlusion used oral theophylline, oral prednisone, and inhaled metaproterenol, ipratropium, and triamcinolone via MDI. He was stable until six months before presentation, when symptoms worsened. Flunisolide was added via Aerochamber (Monaghan Medical Co, Plattsburgh, NY), but the symptoms rapidly progressed. We subsequently noted the patient inserting a new MDI into the spacer with the cap in place (Fig 1). When the MDI was removed, the cap remained and was forced into the chamber with the next inhaler. After reinsertion, improvement occurred, allowing tapering of oral corticosteroids.

Up to 5 percent of asthmatics forget to remove the cap within the spacer, which interferes with spacer function. This unique reason for the failure of an aggressive inhaled anti-inflammatory regimen serves to remind us to ensure the correct use of not only the MDI but also accessory devices used to deliver medication.

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Percutaneous Fragmentation and Dispersion versus Pulmonary Embolectomy by Catheter Device in Massive Pulmonary Embolism

To the Editor:

In the September 1991 issue of Chest, Timsit and colleagues presented their results with the treatment of acute severe pulmonary embolism in 18 patients by radiologically guided embolectomy using a catheter device. This article and the accompanying editorial described the benefits of this technique in treating patients who present early with massive pulmonary embolism.

Unfortunately, the devices developed for ensnaring and removing pulmonary emboli are bulky, and their insertion requires cutdown or use of a large venous sheath, with risk of subsequent bleeding from the entry site. Furthermore, the manipulation of such devices in the pulmonary arteries requires dexterity and, ideally, training.

We recently described a method of fragmentation and distal dispersion of massive pulmonary emboli using conventional 8F diagnostic catheters. Since the volume of the thrombus is large relative to that of the main pulmonary arteries, but small when compared with the total volume of the smaller vessels, dispersing the clot into the distal branches will substantially increase pulmonary blood flow. We have shown this procedure to be successful in three patients who presented with acute severe pulmonary embolism. There were substantial improvements in arterial blood pressure and oxygenation in each case following this procedure, which was both well tolerated and not associated with any serious complication. The procedure requires no more skill than does right heart catheterization, a technique rapidly learned by most trainees in internal medicine.

Since two thirds of patients who die of pulmonary embolism do so within an hour of onset of symptoms, our experience with three

Figure 1. Spacer device with cap embedded in Aerochamber membrane, as placed by patient in demonstrating use of MDI. The other caps were found inside the spacer and are covered with residue from previous activations of the MDI.
patients leads us to believe that percutaneous catheter fragmentation and dispersion of the thrombus using conventional cardiac catheters is important in the emergency management of patients who have collapsed or are seriously compromised because of a massive pulmonary embolus. While catheter pulmonary embolectomy by experienced operators undoubtedly has saved lives, clinicians in hospitals without angiographic equipment but with access to x-ray screening facilities should still consider attempting percutaneous catheter fragmentation and dispersion in such patients.

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To the Editor:

We appreciate the interest expressed by Brady and colleagues in our article and fully agree that only an experienced physician can carry out pulmonary embolectomy using a catheter device. We read with great interest the experience at the Hammersmith Hospital with breakdown of pulmonary emboli using conventional catheters.1

We recently undertook this procedure in an 82-year-old woman who had suffered from a massive acute pulmonary embolism with collapse and iterative cardiac arrests. Fragmentation of the thrombi was attempted via the femoral vein with an 8F pigtail catheter mounted on a J wire. Despite significant angiographic revascularization of the left pulmonary artery, the mean pulmonary arterial pressure remained elevated (27 mm Hg before and after the procedure), and inotropic support could not be reduced until 48 h after the procedure. Even if promising results were obtained in the three patients reported by Brady et al.,1 the present case suggests that percutaneous catheter fragmentation could have variable success in improving hemodynamic and clinical status. One possible explanation is that dispersal of a proximal thrombus into the more distal branches would not significantly increase pulmonary blood flow if the smaller vessels are partially obstructed, so that catheter fragmentation would be less effective in this situation.

In our opinion, isolated proximal emboli are probably infrequent in massive pulmonary embolism. Therefore, there is need for further experience, on a more large-scale basis, to assess the efficacy of this attractive and simple technique.

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Another Complication of Barotrauma

To the Editor:

Pressure-induced injury, commonly known as barotrauma, occurs in 1 percent to 20 percent of patients receiving mechanical ventilation.1 The presence of subcutaneous air in the neck or upper part of the thorax is pathognomonic of pulmonary barotrauma.2 We recently cared for a patient who developed an unusual complication of barotrauma.

A 45-year-old man with a past medical history significant for traumatic C5-6 quadriplegia was admitted to the hospital with mental status changes. His initial examination was significant for clouding of the sensorium, but the findings were otherwise unchanged from those during previous hospital visits. While being examined, the patient's condition deteriorated rapidly; respiratory failure developed, necessitating assisted ventilation and prompting his admission to the intensive care unit. His chest radiograph showed bilateral diffuse opacities, and arterial blood gas analysis revealed significant hypoxemia. Blood cultures obtained on admission showed Candida parapsilosis infection, which was treated with intravenous amphotericin B.

Six days after admission the patient's clinical condition continued to deteriorate with worsening hypoxemia unresponsive to increasing levels of supplemental oxygen and positive end-expiratory pressure. Subsequently the patient developed a right-sided pneumothorax, which was managed by tube thoracostomy. Within hours, a left-sided pneumothorax occurred, which was treated similarly. His oxygenation status remained marginal.

On day 8 after admission it was noted that the patient's scrotal size had increased rapidly (Fig 1). The scrotum was distended and tense. However, no scrotal masses were found on palpation or transillumination. No changes in skin color were noted. A chest radiograph obtained at the same time revealed significant subcutaneous emphysema and a loculated left-sided pneumothorax. No evidence of pneumoperitoneum was found on multiple abdominal radiographs. Unfortunately, multisystem failure ensued, and the patient died on day 10.

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FIGURE 1. Scrotum was distended and tense, and size had increased rapidly.