Physicians who read these stories may truly see the consequences of devoting excessive time and energy to further their careers. They see the consequences of blindly accepting the conventions of society or their professions. When physicians vicariously experience the consequences along with the characters in the story, they may be moved to reexamine their present commitments and interests. To put it another way, stories such as The Death of Ivan Ilych and A Dreary Story offer readers the possibility of experiencing characters who resemble themselves in their faults, foibles, and humanity. When this happens, the reader’s education begins. How is my life like Ivan or Nicholas? Am I making the same mistakes as these men? What can I do to avoid the mistakes they made?

Physicians also learn the importance of examining the kind of life they lead before illness and death occur. If Ivan and Nicholas had truly understood that death is always near for all human beings, they may have chosen to live their lives differently. Some may say that physicians do not need to read these stories. They are awakened to the possibility of death every day on rounds. Or are they? They are certainly exposed to much suffering, but they are not necessarily awakened to the fact of their own eventual death. On the contrary, physicians steel themselves against the idea of their own death in order to remain objective and dispassionate; in order to treat their patients with a clear mind and steady hand. Yet a certain degree of identification with the patient is necessary for the development of empathy and compassion. Without them, true healing is very difficult, if not impossible.

The self-knowledge gained from reading such stories also benefits the physician’s patients. Physicians who are comfortable with the knowledge of their own death are more likely to be comfortable talking to patients about death. They can use this knowledge to help patients ask and answer questions such as: what’s really important in my life? How should I spend my energy and time before I die? How do I wish to die? Honest and open discussion about death with a knowledgeable and trusting physician will go a long way toward easing the present difficulties many patients experience at the end of their lives.

Not every physician will benefit from reading about Ivan or Nicholas. Some will not see themselves in these men. They will read the words of Ivan, and believe them: “Caius is a man, men are mortal, therefore Caius is mortal” had always seemed to him correct as applied to Caius but certainly not as applied to himself. . . . Caius really was mortal, and it was right for him to die; but for me, Little Vanya, Ivan Ilych, with all my thoughts and emotions, it’s altogether a different matter. It cannot be that I ought to die. That would be too terrible.” In other words, some are unable to empathize with Ivan. They are unable to imagine that they could be in his predicament. Others may empathize, but shudder when they find themselves in the imaginary shoes. The pain and suffering are too great.

As colleagues or educators, we can do several things for these physicians. First, we can offer how these stories change the way we lead our own lives. Second, we can show them how these stories enhance our ability to move back and forth between empathic and detached perspectives—an essential skill for true healers. Convincing physicians of the value of empathy may encourage them to develop it.

**Summary**

Physicians are usually not encouraged to critically examine the kind of professional and personal lives they lead. However, without self-reflection, physicians may find themselves living lives that resemble Ivan Ilych and Nicholas Stepanovich. Reading The Death of Ivan Ilych and A Dreary Story may move physicians to reexamine their lives. Such examination may positively change the way they live their lives, and the way they care for patients.

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**References**


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**Pulmonary Barotrauma in Divers**

**Can Prospective Pulmonary Function Testing Identify Those at Risk?**

In the 1930s a number of deaths were observed during submarine escape training in the US Navy. Studies by Behnke, Polack and Adams, and Shil-
ling showed that the mechanism was arterial air embolism caused by pulmonary barotrauma. They reported the features of this injury as separate from the already-understood problem of decompression sickness. Subsequently, fatalities were identified in which no evidence of pulmonary disease was present, but pulmonary barotrauma occurred, resulting in air embolism. In some cases, obstruction of a single bronchus caused overexpansion of a lung segment. Consequently, diving and submarine training was prohibited for subjects with a history of any disease that caused airway obstruction, including asthma. Later studies provided further insight into the mechanisms and prevention of pulmonary barotrauma. Asymptomatic anatomic abnormalities of the lung or airways reactivity were thought to contribute to the risk of barotrauma. Until recently, military and commercial diving prohibited candidates who had a history of asthma from diving. The concern was for bronchospasm, air trapping, pulmonary overpressure, arterial air embolism, and serious embolic complications from diving. During authorities thought that a significant reduction in injury and death would be achieved by disallowing anyone with asthma from diving.

This practice in undersea medicine continued until the 1950s when the sport-diving community began to expand rapidly, and the strict medical criteria imposed upon military and commercial divers were relaxed. Surveys of the sport-diving population indicated that 6 to 8% of the sport-diving population had asthma or a history of asthma, and that screening the sport-diving community was unsuccessful in prohibiting the asthmatic population from diving. At the same time, data from diving accident reports maintained by the Diver’s Alert Network at Duke University identified a small, non-significant increase in risk of a diving accident in divers with a history of asthma. These accident statistics were interesting in that they showed the risk was in asthmatics who were actively wheezing at the time they were diving. A study from England pointed out that many asthmatic divers were diving successfully without injury or fatality. This observation, along with requests from the sport-diving community to develop rational guidelines for asthma and diving, led to several workshops, which pointed out that many asthmatics were diving safely, that a history of reactive airway disease was inadequate to prohibit sport-diving, and that measures of pulmonary function could be used to discriminate the diver at risk from the individual with a history of reactive airway disease who would not be at risk. The conclusion of a workshop in 1995 suggested that pulmonary function with flow-volume curves demonstrating that mid-expiratory flow was within 80% of expected normal levels would allow safe diving without concern for pulmonary overpressure and barotrauma.

The paper by Tetzloff and colleagues in this issue of CHEST (see page 654) provides important clinical observations that support a role for prospective pulmonary function testing as a means of distinguishing individuals with a history of reactive airway disease who can dive safely from those who might be at risk for pulmonary barotrauma. Although their study is retrospective, they were able to identify changes in the flow-volume curve; specifically, reduced mid-expiratory flow at 25% of vital capacity occurred in pulmonary barotrauma patients compared with those who had decompression sickness, but not pulmonary barotrauma. FEV1 was similar in both groups.

The workshop on asthma and diving held in 1995 suggested similar criteria for selection of safe divers among an asthmatic population. The study by Tetzloff and colleagues is the first since the workshop to confirm that an abnormal flow volume curve is an important criteria for selecting divers at risk. Expiratory flow at the late portions of the flow volume curve appear to be more valuable than peak expiratory flow, FEV1, or flow at 75% of vital capacity. The fact that the obstruction to flow occurs at small lung volumes is also significant in that simple bedside spirometry measurement of FEV1 will not detect the changes.

The authors also performed CT of the chest and found 13 abnormalities among the 15 patients with pulmonary barotrauma. Although only four cases in the control group had CT of the chest, none had an abnormal finding.

Points on the flow-volume curve (peak, mid-expiratory flow [MEF\textsubscript{175}, MEF\textsubscript{50}, and MEF\textsubscript{25}] can identify diving candidates who would be at risk for pulmonary barotrauma. An additional study of the chest by CT would add anatomic information, particularly regarding lung cysts and blebs which might not be identified by a functional test. In the population of Tetzloff and colleagues five of the barotrauma patients had lung cysts.

The finding that FEV1 and vital capacity were normal in patients with barotrauma is important to physicians evaluating patients for diving as these tests, which are simple to perform, are not indicative of risk. The flow-volume curve with measurements near the end of expiration provides more information.

Based on the assumption that exercise-induced asthma can occur during diving, the current recommendation for assessing safety in diving candidates with a history of asthma is to perform flow-volume curves before and immediately after exercise. Heavy
exercise often occurs when divers are swimming on the surface. Thus, exercise-induced asthma is not likely to contribute to pulmonary barotrauma, but may contribute to drowning when exercise on the surface causes severe dyspnea and panic.

As understanding of reactive airway disease improves, and the relationship between exercise, reactive airway disease, and functional testing is clarified, a more precise screening capacity will be available for the practicing physician. The fact that Tetzloff and colleagues were able to identify risk factors in 93% of the patients who suffered pulmonary barotrauma after diving indicates that we can develop the necessary screening to eliminate individuals who are at risk.

As usual, a careful history is important. Identifying lung cysts or blebs on CT and reduction of the MEF 25 flow to below 80% of normal may contribute to the screening of high-risk individuals. Larger studies are needed to confirm this combination of screening techniques, and attention must be paid to the cost of screening, particularly if screening involves CT studies. However, if flow-volume curves can identify high-risk individuals who have a history of asthma and wish to dive, the cost of pulmonary screening is an excellent investment.

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Pulmonary Embolism

The Diagnostic Repertoire

The standard approach to the diagnosis of acute pulmonary embolism (PE) involves recognizing a clinically compatible setting, proceeding with ventilation-perfusion scanning, and performing pulmonary angiography when diagnostic uncertainty remains. Unfortunately, most lung scans are nondiagnostic. The approach to acute PE has evolved, and both newer techniques and application of existing technology have enhanced our diagnostic repertoire. Instead of angiography, other diagnostic algorithms involving the lungs or lower extremities have become increasingly popular in the setting of suspected PE. Spiral (helical) CT, MRI, echocardiography, and lower extremity ultrasound are being increasingly applied in patients with suspected venous thromboembolism. Artificial neural networks and the serum D-dimer test have also been evaluated. There are advantages and disadvantages to all of these techniques.

In this issue of CHEST (see page 722), Pruszczyzk and colleagues prospectively compared the utility of spiral CT scanning with transesophageal echocardiography (TEE) in 49 consecutive patients with suspected acute or chronic PE associated with surface echocardiographic signs of unexplained right ventricular overload. These individuals were selected from a larger group of 211 patients with suspected PE. Specific criteria for right ventricular overload were outlined. The main and lobar pulmonary arteries were evaluated for emboli with both TEE and CT, but segmental and subsegmental vessels were evaluated only with spiral CT. Both tests were blindly interpreted. Forty patients had confirmed emboli (high-probability ventilation-perfusion scan or angiography). Main and lobar emboli were identified in 32 of 40 (80%) and 36 of 40 (90%) of these patients by TEE and spiral CT, respectively. There were no false-positive central emboli with either test. Although the sensitivity for peripheral emboli improved for spiral CT (97.5%), the specificity de-