ON THE MEND NOW, SHE PEERS AT BOUJOUKOS BLEARILY. "HOW'S YOUR BREATHING TODAY?" HE ASKS. "DO YOU FEEL SHORT OF BREATH?" LEANING CLOSE TO HEAR HER ANSWER, BOUJOUKOS NODS. "SQUEEZE THIS HAND TIGHT," HE SAYS. "TIGHT! TIGHT! TIGHTER! TIGHTER! THERE YOU GO!"
The beeping of a cardiac monitor and whoosh of a ventilator greet Arthur Boujoukos as he approaches the woman in Bed 15 of the cardiothoracic intensive care unit at UPMC Presbyterian. Resting one palm gently on her forehead, Boujoukos’ other hand grasps one of hers. She stirs, almost imperceptibly. “Good morning, dear,” he says. “How are you? It’s Dr. Boujoukos. Open your eyes.”

The woman, who had a coronary bypass a few days earlier, developed colitis in the hospital and was transferred to the cardiothoracic (CT) ICU. On the mend now, she peers at Boujoukos blearily. “How’s your breathing today?” he asks. “Do you feel short of breath?”
Leaning close to hear her answer, Boujoukos nods. “Squeeze this hand tight,” he says.

“Tight! Tight! Tighter! There you go!”

Making some notes, Boujoukos, who oversees the CT ICU, steps away from the bed and consults with fellows Paula Gordon and Indra Singh. They move to the computer terminal near the bedside and check the woman’s charts. “No matter what, we should get her out of bed today,” Boujoukos tells Singh and Gordon.

This is one of the most hectic places in Presbyterian; patients come and go quickly, and the 22 beds are rarely empty for long. This morning, Boujoukos, an associate professor of critical care medicine at Pitt, has a full house.

Compared to ICUs nationwide, the CT ICU at Presbyterian is something of an anomaly. It’s overseen by an intensivist—a physician specializing in critical care medicine. Only intensivists or attending surgeons can write orders here; Boujoukos often does so in consultation with other specialists.

More than 4 million Americans are admitted to ICUs each year. But according to the Leapfrog Group, a national consortium of organizations that purchase health insurance, only 10 percent of those ICUs are “closed”—that is, directed and staffed by intensivists. In the bulk of the rest, patients are treated by the doctors who admitted them. This model, called the “open ICU,” is common in the United States, but it severely tests the ability of physicians to manage patient care, says Derek Angus, an associate professor and vice chair of research at Pitt’s Department of Critical Care Medicine, the first such department in a U.S. medical school.

Physicians whose patients are in an open ICU usually have other responsibilities in the hospital or at their practice, he says. “If you round on the patient in the morning, write a bunch of orders, and go to your office or clinic, you’re relying on juggling things by telephone, or relying on the quality of the nurses or the resident in the ICU,” Angus says.

Leapfrog, the Society for Critical Care Medicine, and other groups now recommend that intensivists be put in charge of ICUs. “They are at the bedside, continuously changing the care plan, evaluating the results,” says Mitchell Fink, who chairs Pitt’s new Department of Critical Care Medicine.

Until recently, policy makers and healthcare administrators paid less attention to the ICU than to other areas of hospitals. But recent studies indicate that intensivist-run ICUs would save a lot of money—and a lot of lives.

The concept of dedicated units for the critically ill grew out of the poliomyelitis epidemics of the 1950s. Before development of the whole body ventilator—the “iron lung”—polio was frequently fatal, because patients were unable to breathe. Though the early ventilators saved lives, they were also expensive to operate, and cumbersome. The first “acute care” units opened in Scandinavia in the 1950s to provide an efficient central location for iron lungs.

Other lifesaving medical techniques—some developed during World War II and the Korean War—were also advancing rapidly. So were complications. “The need became apparent to provide life support for long periods for comatose or otherwise unstable patients from any service—medicine, surgery, gynecology, obstetrics, or pediatrics.” Peter Safar wrote years later of his work as an anesthesiologist at Baltimore City Hospital. “I thought, why not have such a unit next to the BACH polio ward, using the same nurses.”

Already, according to Angus, $180 billion is spent annually on critical care—almost 2 percent of the gross domestic product. ICUs now consume, on average, 25 percent of hospital budgets.

The first physician-staffed intensive care unit in the United States was opened at BACH in 1958. ICUs soon sprang up at hospitals across the country. Safar opened the first ICU at Presbyterian shortly after coming to Pitt in 1961 to chair the new Department of Anesthesiology.

American ICUs developed along a different path than European units, because care in the United States is less centralized, says Angus, a Scot who trained in Glasgow. In Europe, where closed ICUs are universal, anesthesiology residents do much of their training in critical care, and most intensivists are anesthesiologists. In the United States, according to Peter Pronovost, an associate professor of anesthesiology and critical care medicine at Johns Hopkins University, finances drove anesthesiology departments to be oriented toward ORs, where insurance reimbursements were greater.

“There was no ‘owner’ of the ICU system here,” Pronovost says. Instead, most American hospitals adopted open ICUs, where any physician with rights to practice could write orders. Open ICUs—which represent nearly 70 percent of the United States’ 6,000 critical care units—provide continuity of care but don’t have the patients’ attending physicians available to manage emergencies. (Some U.S. ICUs are semi-closed, meaning intensivists manage problems as they arise and primary care physicians and specialists also write orders.) But ICU patients are prone to ailments, like sepsis and respiratory distress, that few office-based physicians treat regularly, Angus says.

Pronovost, of Hopkins, collaborated with peers at Pitt on a study of ICU staffing. Using 35 years of data, the researchers found that where intensivists manned the units—the “closed ICU” model—patient mortality dropped 29 percent. Hospital stays were reduced in about 75 percent of the cases. The resulting article, by Angus and Pronovost, was published in the November 6, 2002 Journal of the American Medical Association.

A 2000 review funded by the Department of Veterans Affairs also found that intensivist-
that, on average, ICUs now consume 25 percent of hospital budgets.

“This is really an area that hospitals should be paying more attention to, because this is where patients are dying, and [hospitals are] spending a huge amount of money,” Breslow told Modern Healthcare.

Suzanne Delbanco, executive director of Leapfrog, cites a Dartmouth study that found staffing large ICUs solely with intensivists would cut annual costs by $5.3 billion. The savings would come from reduced ICU admissions, fewer unnecessary tests, and more efficient use of physician time, she says.

The premise—that doctors trained in ICU practices should be in charge of ICUs—sounds simple. In fact, patients usually assume that’s the case and are “startled” to learn otherwise, says Delbanco. “Most people don’t think about it until they’re there.”

Though the School of Medicine’s CCM department may be the first in the United States, the interest in reforming ICUs suggests it won’t be the last. The academic department, which celebrated its first anniversary in January, could be a model for other schools of medicine to follow.

Pronovost sees Pitt, Hopkins, Harvard, and the University of California, San Francisco as the U.S. leaders in critical care training. Pitt’s new academic department “is quite visionary,” he says. Granting critical care its own academic home, on an equal footing with primary specialties such as surgery and medicine, can help direct needed ICU reforms, notes Pronovost.

Despite the increased interest, proponents of closed ICUs—standard in Canada and Australia as well as Europe—say this country has a long way to go. Medical centers are large organizations, and large organizations are, by their nature, reluctant to change, Fink says. Even with Pitt’s proud history of critical care research, featuring the likes of Safar and Ake Grenvik, the creation of a stand-alone academic CCM department met with some resistance. A lot of specialties have a “vested interest” in critical care, says Fink. He notes that critical care and emergency medicine are the only two specialties defined by areas of the hospital.

A survey last year of 831 practicing physicians, conducted by the Harvard School of Public Health and the Kaiser Family Foundation, found only 34 percent thought that having ICUs staffed by intensivists would “very effectively” cut down on medical errors.

Angus calls this “the natural history of an evolving specialty.” Reluctance by physicians to adopt closed ICUs will wane as better studies become available, he says. Public pressure may help break down that reluctance; the same 2002 Harvard survey found that 73 percent of the public was in favor of staffing ICUs with intensivists.

Financial pressures will mount as well. Leapfrog is encouraging the employers it represents to ask insurance companies if their hospital coverage complies with its “ICU Physician Staffing” standard. The standard discourages the use of open ICUs.

“IT’s about making sure the right care is delivered at the right time to the right person,” Delbanco says.

At 10:30 a.m., Boujoukos, the intensivist in the Presbyterian CT ICU, stops to consult with Ken McCurry, assistant professor of surgery at Pitt and director of lung and heart-lung transplantation for the Thomas E. Starzl Transplantation Institute. One of McCurry’s patients, who awaits a heart-lung transplant, was admitted to the ICU in respiratory distress a few days ago. Now her condition is stable, and she’s...
Leapfrog is encouraging the employers it represents to ask insurance companies if their hospital coverage complies with its “ICU Physician Staffing” standard. The standard discourages the use of open ICUs.

Keep all of the doctors well-informed and to seek out their expertise. They also ensure that one specialist’s recommendations aren’t jeopardizing another’s treatment.

When Boujoukos started his career in internal medicine, he found he didn’t want to narrow his scope to any particular organ system or patient population. Nor did he want an office practice. Becoming an intensivist gave him “an opportunity to stay in multiple fields,” he says.

Yet intensive care is still considered a subspecialty in this country. Intensivists start out in a residency in anesthesia, emergency medicine, internal medicine, pediatrics, or surgery. When their residency ends, their critical care training begins. Those who complete surgical or internal medicine residencies do two more years in critical care, for instance. Pediatric intensivists complete a three-year fellowship.

At any given time, Pitt has 25 trainees in adult critical care medicine and 10 in pediatrics. Since 1963, when Safar created a critical care fellowship program within the anesthesia-logy department, 550 physicians have been trained in critical care at Pitt.

Most trainees take a more direct route than pediatric critical care fellow Mary Hartman. “I was going to work for the EPA,” she says.

Hartman was a junior geology major at Mount Holyoke College in Massachusetts when she attended a seminar on environmental issues and healthcare policy.

“It dawned on me that the reason I was interested was because I’m interested in how the environment impacts people,” she says. “But I was headed for a career that would have me working alone, riding around in a pickup truck, checking soil samples. I said, ‘Oh, my God, I don’t want this.’”

Hartman will get her wish. Her chosen field is filled with human interaction and some. In her routine workday, the immediacy of life and death and disability will be laid bare from moment to moment.

“Critical care is unique,” she says. “You have a very intense connection with a patient and their family, and then they’re gone. The best intensivists really connect with the family very quickly, and learn about them very quickly.”

Fink says the relationship between an intensivist and a patient can become as deep as that of a family practice physician—the difference, besides the severity of illness, is that relationships are measured in days or weeks, not lifetimes. Intensivists are “short feedback loop kind of people,” Fink says. “And they like dealing with an excess of data rather than a paucity of data. To them, it’s not daunting—it’s stimulating.”

The variety and severity of ICU cases appeal to intensivists, he says.

“It’s an enormous palette of problems, ranging from routine post-operative monitoring to multiple organ system failure and multiple trauma,” says Fink, who came to Pitt in 1999 from Harvard Medical School, where he was the Johnson & Johnson Professor of Surgery and chief surgeon at Beth Israel Deaconess Medical Center.

Now, Hartman, who recently completed her pediatrics residency at the University of Rochester Medical Center, is beginning a pediatric critical care fellowship at Pitt. Many pediatric CCM fellows complete their clinical fellowship then spend a fourth year working on research. Hartman is first earning a master’s degree from Pitt’s Graduate School of Public Health—to learn the statistical methods she’ll need for her future research. She begins her clinical work this July.

At Pitt, investigation of new therapies is moving at a rapid pace, notes Fink. (See “Follow-ups” on pp. 29 and 30.) The department was launched with $5 million in federal research funding; the amount has since risen 80 percent.

“We’re starting to get to the point where we can treat the reasons for organ failures, rather than just the organ failures,” he says. “This is the best time to be doing critical care medicine. The level of understanding of the biology of critical illness is good enough that we can really make a difference for these patients.”

Another priority for training programs like Pitt’s is to address the shortage of intensive care specialists.

In 2000, Angus wrote that if current trends continued, the United States in 20 years would need four times as many intensivists.

“I’m not necessarily proposing that we go out and hire another 20,000 intensivists,” he says. “For one thing, there aren’t 20,000 intensivists to hire; the existing programs are full. But U.S. hospitals, especially in smaller areas, have to consider combining their ICUs to conserve resources.”

There may also be room to simplify the training. In Spain, physicians serve a six-year residency in intensive care, which has been a primary specialty for 20 years, Angus says. As the importance of intensive care becomes more evident to insurers, hospitals, and policy makers, Fink predicts, that day will come in the United States.

For now, he jokes, what the field really needs is to raise its profile is a TV show: “Instead of ER, it would be called ICU.”

Some details in this story were changed to obscure patient identities.

FOR MORE INFORMATION:
http://jama.ama-assn.org/