



Mind Matters

When you or someone you love is checked into a hospital ICU, the idea is to get them better. However, new findings show that the ICU experience can take a potentially devastating blow to the brain, resulting in delirium, and possibly permanent damage.

by KAITLIN N. PETERSEN

My grandfather was in the hospital last summer. And the summer before that. It's strange because he's actually a really healthy guy. Seriously. I remember, when I was a kid, he'd wake up early to go to aerobics classes before work. He bicycled to work every day, too, except when it was raining. I remember him on his old Schwinn, in part because I remember him teaching me how to ride a bicycle, a big one with no training wheels that I was convinced was far too tall. Turns out, it wasn't. That was a long time ago, but he'll never let me forget about that blue bike — I think it's still in the garage.

But what he's already mostly forgotten is being in the hospital. In fact, he'd forgotten most of the experience by the time he came home.

And what he remembered, it wasn't exactly right. You can't tell someone that their memories are wrong — that, in itself, seems wrong — but his are. Somewhere, in the dark pockets of his brain, his memories got mixed up. Maybe his whole brain was mixed up. He's not sure, since he doesn't really remember. We don't know because we're just family, and the doctors never told us what was wrong with him.

This is my story, but it's not really mine to tell. I'm supposed to tell you about what I saw, but what I saw doesn't really matter. What matters is what he felt, and he can't tell you because even he barely remembers it, either.

Delirium.

Although it used to masquerade under frightening monikers like "ICU psychosis," this is the word

medical professionals now use to describe the symptoms my grandfather experienced last summer.

Characterized by disorganized thinking and the inability to pay attention, delirium is an acquired brain disorder that besets sick patients who lose track of reality and struggle to think clearly. It affects up to 80 percent of all ICU patients and can lead to permanent mental impairment if undetected. Yet most people don't even know it exists.

Delirium in and of itself is certainly not a new medical phenomenon. In fact, it was commonplace enough to be immortalized by Charles Dickens in a chapter from *The Pickwick Papers* in 1837 called "The Stroller's Tale," which details the feverish madness of a dying man. What is new, however, is the way the medical community is approaching the problem.

At the forefront of current research is the ICU Delirium and Cognitive Impairment Study Group, a coalition of researchers at Vanderbilt University School of Medicine. The group was founded by Dr. E. Wesley Ely, a professor of medicine at Vanderbilt, who specializes in geriatric pulmonary and critical care. He wanted to ensure that the elderly weren't experiencing a disproportionate amount of brain damage during their hospital stay.

"I realized that it was the brain, that the older patient would come in with less neuroplasticity, or less resilience, of the brain," he says. "And it turned out that there was a huge amount of delirium and

subsequent dementia or neuropsychological dysfunction in these older patients.” Although younger patients experience delirium, too, their brains seem to be more resilient when they recover.

Despite its prevalence in the ICU, delirium remains unrecognized in 66 to 84 percent of patients. “It’s one of those ‘if you don’t look, you won’t find’ things,” explains Ely. “It simply has not been looked for.”

When you bake a cake, which specific ingredient is the one that makes it taste good? What ingredient makes your recipe different from someone else’s? It’s hard to single out just one. Maybe it’s the balance of the ingredients or the order in which you combine them. How can you ever really be sure?

Discerning which symptom has triggered delirium is equally elusive, says Dr. Jeffery S. Vender, chairman of the department of anesthesiology and director of critical care services at NorthShore University HealthSystem.

“How do you separate out the cognitive impairment of being critically ill from cog-

nitive impairment associated with delirium?” he asks. “A lot of the time when people have critical illnesses, the secondary effects can be what we refer to as multifactorial. They’re not necessarily due to any one of the critical illnesses; it can be due to the combination of their effects.”

Indeed, the list of potential causes of delirium seems endless. The Vanderbilt study group found that the average critically ill patient has at least 10 different risk factors for delirium at any given time during their hospitalization. Even being critically ill in and of itself is a predisposing risk factor, says Vender.

According to Ely, the most common causes of delirium are systematic illnesses, such as severe sepsis and congestive heart failure, which affect blood flow to the brain. Drug or alcohol withdrawal, infections and preexisting mental illness or impairment can all trigger delirium. So can medical procedures like surgery. Even medications administered in the ICU can be triggers. Ventilators are a risk factor as an indicator of extreme illness but may also render the patient incapable of communication. Psychoactive drugs, sedatives and

painkillers — all frequently prescribed in the ICU — are leading culprits.

But just as often, delirium stems not from something physical or medical but from the patient’s environment. Loud ICU rooms are bright and full of interruptions, check-ups and distractions. Although patients appear to be resting, albeit under the influence of sedatives, they get very little real sleep while in the ICU. This sleep deprivation facilitates delirious episodes. Drab, windowless ICU rooms also offer minimal access to the outside world. Walled-off patients, immobilized in their beds, can easily lose track of time and place.

There are three types of delirium, but it is the hyperactive variety that gets everyone’s attention, as it causes agitated behavior and makes patients irritable, noisy and difficult to deal with. “It’s easy to find someone who’s hyperactive and delirious,” says Dr. Jeff Zilberstein, an intensivist at Northwest Community Hospital in Arlington Heights. “They’re pulling out their IVs, they’re yelling at the nurses, they’re yelling at their loved ones.” Still, although visible, it accounts

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for only five percent of all delirium cases. A large majority of patients are hypoactive, which manifests itself in lethargy and withdrawal from one's surroundings and is much more difficult to spot. "They're not giving us any problems here in the ICU," says Zilberstein, "so if we're not assessing for it and really looking out for it, then we might not see it." Patients with mixed delirium, a combination of the two types, experience only mild hyperactive outbursts.

Two tests developed to detect delirium — the CAM-ICU and the RASS test — search for indicators such as acute mental status changes, inattention, disorganized thinking or altered levels of consciousness. The tests are conducted at admission, then incorporated into nursing checklists. Patients are screened continuously throughout their ICU stay.

"When a patient is really restless, you can't really tell — are they in pain, do they need some sedation because they're really anxious, or is it truly delirium?" says Karen Kopan, an acute nurse practitioner in the ICU at Evanston Hospital. "Being able to assess for those three dif-

ferent things ... helps decision-making for what the treatment should be."

There's that uneasy feeling when you wake up from a bad dream and you have to reestablish the boundaries between what's real and what you've just imagined. But what if you couldn't? Imagine living in that world for days on end, balancing precariously between reality and something that you don't even realize you've created out of thin air.

To heal a broken arm, it must be immobilized in a cast. But when the cast comes off, the arm muscles are weakened and significantly smaller after weeks of disuse — they've atrophied.

With delirium, the brain is experiencing the exact same phenomenon. Just as any other organ can fail, delirium is the way brain cells show that they are no longer functioning properly. The longer a patient remains delirious, the more brain cells die, and patients actually lose brain tissue.

Watching a delirious patient, it's hard to imagine that this is what brain failure actually looks like. It's not dramatic like anything in the movies, and nobody's got the

paddles out. "You'll just think that because their eyes are open and they're looking around, that their brain's on," explains Ely. "But it's really not." Most patients won't remember the delirious episodes, or will recall fragments. The brain's misinterpretation of the environment can seep into the memories. In some cases, patients develop clinical depression or post-traumatic stress disorder as a result of their delirious nightmares and hallucinations.

This loss of brain tissue is what medical experts like Ely think causes the cognitive impairment and dementia that are associated with delirium. Although the link has not yet been proven, studies at both Vanderbilt and Harvard show a high correlation between length of delirium and cognitive impairment. In a Vanderbilt study of patients who experienced delirium, at least one in three ICU survivors experienced long-term cognitive impairment, the equivalent of mild to moderate dementia. In another Vanderbilt study of mechanically ventilated patients, delirium was the strongest indicator of a longer hospital stay and tripled the rate of death within six months. Patients who experi-

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enced delirium were also likely to have increased medical costs.

There is no intuitive cure-all for delirium. Many treatment methods are the same tools used to prevent it — correcting environmental problems goes hand in hand with prescribing the best medications to calm delirious patients.

Because delirium is so closely associated with serious illness, it often disappears as health improves. A quick recovery minimizes the probability of delirious episodes, or, at the very least, shortens their duration. The very best solutions are non-pharmacologic, says Zilberstein, which means that they don't involve any medications at all. The focus in these efforts is redirection — reminding the patient of where they are and whom they are by talking to them or putting family photos in the room. Studies show that even little things, like a calendar in the room and a clock on the wall, can help. Minimizing use of restraints and catheters, maintaining electrolyte levels, preventing dehydration, adjusting the room's light-dark cycle and getting patients off sedatives and ventilators so they can move around, all go a long way toward preventing and halting delirium.

Ultimately, the more the patient gets reoriented, the better it is. "Getting out of the ICU as soon as medically appropriate often helps get rid of the delirium," says Christine Lawlor, an RN in Evanston Hospital's ICU. "This environment is just so much. Even when you try to make everything quiet, there are still monitors attached, there are still people checking on you frequently." The home environment can help — a combination of the illness receding enough for hospital discharge while reentering a familiar environment can do wonders for mental health.

"When you put people into their home settings versus the hospital setting, there's something magical that happens sometimes," says Zilberstein. Suddenly, patients know who they are, and they don't need to be redirected anymore.

When you do wake up, when you're not delirious anymore, you won't remember all of the cruel things you've said. You won't remember your anger, your petulance, your stubborn, indignant responses to the people who only wanted

to help you feel better. If you remember the blood on the walls of your room, you'll remember that the doctors told you that they needed your help disconnecting all those tubes, not that you yanked them out one by one, then made your way, bleeding, towards the hospital exit in a blind desire to go home.

You'll remember that your children were disrespectful, not that they kept reminding you to take a sip of water. You'll remember that no one would listen to you, but you won't realize that all you asked for were your shoes, your driver's license and your keys. You wanted to drive home.

You were ready to go home, you'll remember, but they wouldn't let you. You still had a drainage tube in your chest, but you won't remember that either.

North Shore hospitals are tackling delirium in their own ways.

At Northwest Community Hospital, Zilberstein is part of a 24-hour intensivist program. He and his colleagues focus solely on critically ill patients. He elected to work there, he says, because of the program's understanding that addressing issues like delirium is part of helping patients make a complete recovery.

At Evanston Hospital, part of NorthShore University HealthSystem, the new ICU was designed with the patient experience in mind. Private rooms block out hallway noise, and the unit itself is quieter because smaller nursing stations are dispersed throughout the unit instead of staff operating out of a loud, central hub. Both utilize the CAM-ICU or RASS tests in their routine patient evaluations, and a number of other local hospitals are in the process of doing the same.

Our previous lack of knowledge about delirium should not be chalked up to negligence. In fact, the shift in attention to delirium prevention is a direct result of medical advancements, explains Ely.

When ICUs came into being, their main priority was to keep patients alive. "But as we got better at keeping them alive," he says, "we then began to say, 'How well can I keep them alive?' It became, in a sense, a luxury of improved ICU care. We could then begin thinking about the brain." 



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