

A new way of evaluating brain injuries could save more lives. **Gina Kolata** reports

Change of Guard

Dr Geoffrey Manley, a neurosurgeon at the University of California, San Francisco, US, wants the medical establishment to change the way it deals with brain injuries. His work is motivated in part by what happened to a police officer he treated in 2002, just after completing his medical training.

The man arrived at the emergency room unconscious, in a coma. He had been in a terrible car crash while pursuing a criminal. Two days later, Dr Manley's mentor said it was time to tell the man's family there was no hope. His life support should be withdrawn. He should be allowed to die.

Dr Manley resisted. The patient's brain oxygen levels were encouraging. Seven days later, the police officer was still in a coma. Dr Manley's mentor again pressed him to talk to the man's family about withdrawing life support. Again, Dr Manley resisted.

Ten days after the accident, the police officer began to come out of his coma. Three years later, he was back at work and was named San Francisco Police Officer of the Month. In 2010, he was Police Officer of the Year.

"That case, and another like it," Dr Manley said, "changed my practice."

But little has changed in the world of traumatic brain injuries since Dr Manley's patient woke up. Assessments of who will recover and how severely patients are injured are pretty much the same.

This results in patients being told they "just" have a concussion, who then have trouble getting care for recurring symptoms like memory lapses or headaches. And it results in some patients in the position of that police officer, who have their life support with-

drawn when they might have recovered completely.

Now, though, Dr Manley and 93 others from 14 countries are proposing a new way to evaluate patients. They published their classification system recently in the journal *Lancet Neurology*.

The system is the result of a request made three years ago by the National Academies of Science, Engineering and Medicine in the US for experts to reconsider how they characterise traumatic brain injury patients. That led to a group that was put together by the National Institute of Neurological Disorders and Stroke, US.

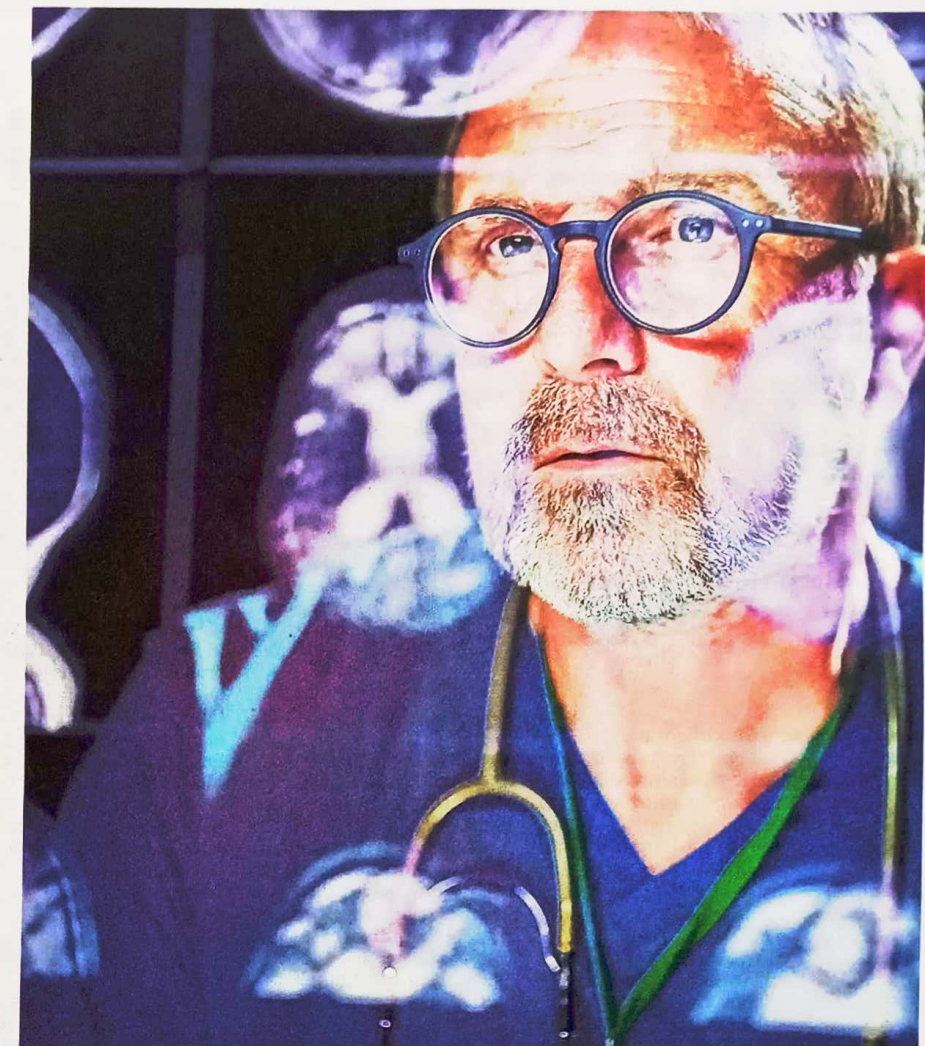
Traumatic brain injuries are typically caused by automobile accidents, falls and assaults. They kill more than 69,000 people a year in the US. More than 5.3 million Americans who have survived a traumatic brain injury live with a lifelong or long-term disability as a result.

For decades, doctors used the Glasgow Coma Scale to evaluate patients' consciousness and make prognoses. The test assesses a person's ability to respond to commands, whether their pupils react to light and other factors. Patients' injuries are categorised as mild, moderate or severe.

But that sort of assessment is insufficient today, said Dr Michael McCrea, a member of the group proposing the new classification and professor of neurosurgery at the Medical College of Wisconsin, US. It sounds, he said, "like a cartoon" to evaluate patients by asking, for example, "How many fingers am I holding up? What city are we in?"

"We know we can do much better than the age-old mild, moderate, severe categories," he said. "It's really just embarrassing."

"Mild" traumatic brain injuries are often not mild; patients can have continuing problems, Dr McCrea said. And, he added, some with "severe" injuries can



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achieve full recoveries.

"What you call someone actually dictates their care," Dr Manley said.

Dr Manley said that using only the coma scale also made research more difficult. He remembers "a flurry of clinical trials", he said, more than 30, that had failed in part because "the classification system is terrible". They made it difficult to know if patients in a study had suffered similar injuries and whether a treatment had helped, he said.

"What if I were to go to the FDA and say, 'I am doing a cancer trial for 'severe' cancer'? They would look at me and say, 'What are you talking about?'" Dr Manley said.

The newly proposed standards start with the Glasgow scale but add other signs, like whether patients have post-trau-

matic amnesia or headaches or are sensitive to light or noise.

But the new system also looks for blood biomarkers of brain injury and includes scans, including CT and MRIs, to look for blood clots, skull fractures and haemorrhaging.

Another part of the classification system considers the person's social environment.

Two patients might have the same injury, Dr McCrea said, but one is homeless, a substance abuser and has post-traumatic stress disorder. The other has extensive family support, no substance abuse problems and good mental health.

The first patient, he said, will have "a much tougher road and a significantly greater risk of a poor outcome".

The hope is to end the medical reliance on oversimplified testing. A better classification system will help researchers de-

velop drug treatments and better procedures, Dr McCrea said.

He was especially enthusiastic about adding blood tests to the mix.

Suppose, he said, someone was in a car crash in a rural area and had clear signs of a brain injury. Hours could be wasted waiting for a CT scan at a local hospital before the patient was transported to a regional trauma centre.

"Imagine, instead, doing a blood biomarker test in the ambulance," he said. If the test indicates severe damage, the person would be taken to the trauma centre immediately.

"Time is brain," Dr McCrea pointed out.

"We all grew up with the categories mild, moderate, severe," he said. "We can do much better than that."

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