

TIMES ONLINE

Is pain all in the mind?

New medical technology shows that the best way of treating chronic pain may be with CBT-style brain retraining



Professor Irene Tracey is busy burning my hand. She has good professional cause — she is looking into my brain to see what happens when I experience pain. Tracey, an Oxford professor, is pioneering a new scientific understanding of pain. It reveals how we may be wrongly treating millions of patients who suffer it every day.

Until now, pain has been seen as a symptom. But it is a disease in itself, argues Tracey: one that can cause serious brain damage. She and a growing number of specialists are using hi-tech imaging scanners to reveal how medicine often tackles pain from the wrong perspective. The source of the problem is in our heads — and as such, the way we treat it needs to be radically reassessed.

Thanks to powerful medical scanners, we can now see our pain responses in detailed action. Tracey's unit, at the Oxford Centre for Functional Magnetic Resonance Imaging of the Brain, has two of the most advanced scanners in Britain; it examines more than 100 pain patients a week.

To assess my pain threshold and anxiety levels Tracey uses heat and needles. Her heat machine, a grey box with a dial and two buttons worryingly marked "arm" and "deliver", powers a small metal pad that delivers 50C of heat on to the back of my hand until I ask her to "stop, please!".

The pain starts at discomfort, but as it intensifies I decide to stop being brave. Then, in a second experiment, her skin pricking needles, precision-looking German-made medical instruments, deliver steadily sharper pricks until I suggest that "that's enough thank you". The MRI scanners provide a detailed picture of which parts of my brain light up when I get sizzled or prodded.

Tracey's brain scans also reveal how my mood, attitude and beliefs all determine how I experience pain. "When you are anxious or depressed, it can make pain worse," she says. "When you are distracted, enjoying a song or movie, it does not feel so bad."

"Pain is all in the mind" used to mean that it didn't matter, but it turns out that pain really is in your head — and more real than we have ever thought. Our beliefs play a fundamental role, she adds: "They can completely override the most powerful analgesics known to science. We've just done an experiment where we told people that we had stopped giving them a strong opioid drug, when in fact

we were still giving it. Suddenly they said that their pain levels were going up, because they thought that the analgesic had stopped.”

The long-term effects of negative beliefs may create a devastating spiral. The more anxious, stressed and depressed you become about your pain, the more you may physically rewire your brain’s architecture so that it ultimately becomes hypersensitive to physical stimulus. “In chronic pain, the area of your brain that processes your anxieties, fears and worries really plays havoc,” Tracey explains. “Normal everyday touch can piggyback on to the pain system and fire off widespread brain regions, so that even putting on clothes can cause burning sensations.”

Chronic pain affects nearly eight million people in the UK — more than one in ten of the population. It is defined as pain that persists six months after injury or surgery. It costs our economy more than £12 billion a year in disability and care costs. Until now, it has not been treated as a distinct condition. Tracey and her colleagues are lobbying to have it redefined as a recognised clinical disease.

This isn’t a matter of semantics. Getting the Department of Health to take it seriously could radically improve the way that pain is treated and how treatments are funded. Tracey recently published an imaging study showing how chronic pain damages the brain’s very structure. “No one has been arguing that our evidence does not fit the definition of a disease,” she says. Nevertheless, mainstream materialistic medicine still tends to believe that “if you can’t prod it, then it doesn’t exist”.

In fact, imaging shows that when we are in constant pain, the brain atrophies. “It does not just sit like a sponge and take all this. It can start to degenerate. The main pain-transmitting nerve transmitters start to dysfunction,” says Tracey. “This may be reversible in some cases. We have seen this in patients with hip osteoarthritis pain, who seem to recover within a year of having a hip replacement. But if you let people carry on with this level of pain, they go beyond the point of no return. You get really sick brains, and at that point maybe no treatment is going to work for them.”

To break the stress-anxiety-pain cycle, it would seem wise to give chronic pain sufferers emotional support early on. Instead, only one patient in ten gets to see a specialist, according to the Chronic Pain Policy Coalition. Often, they wait years. For example, Samantha Gibbs, 33, was given a diagnosis of fibromyalgia, a chronic condition that causes pain all over the body, in 2000. It was eight years before she saw a specialist, and only after doctors had run out of painkillers to try on her.

Last week Gibbs, a parcel-service manager from Hinckley, Leicestershire, completed a two-month pain-management programme at University Hospital Leicester. This aims to help her to modify her thinking habits, using a programme based around cognitive behavioural therapy (CBT). It has been a revelation, she says. “The condition affects different parts of my body on different days, but it’s pretty much constant,” Gibbs explains. “The course taught visualisation techniques that help me to relax by imagining myself in a more pleasurable space, such as a warm beach.”

The one-day-per-week course has also been an invaluable source of social support, she adds. “The eight of us in the group are able to talk and text about something that others just don’t understand. It’s a great morale-boost. My circle of friends has really shrunk since I developed fibromyalgia. Isolation makes me feel anxious, then I get more pain, and the classic vicious cycle starts over again.”

The Leicester course is run by Dr Beverly Collett, a consultant in pain medicine for 24 years. “In many of my patients it is not possible to find any physical cause of pain in the area that seems to be affected. I see people with constant back pain whose back-scans show up as normal. I see women with chronic pelvic pain who test negative for conditions such as endometriosis,” she says. “But we know now that in persistent pain, calcium and sodium signalling channels are activated in the spinal

cord and brain. Once you start these cells firing, they continue to fire. Doctors have tended to be unbelieving when patients don't have an identifiable cause — they think that there 'must be something pressing on something'. But what's happened is that there is an alteration in nerve function."

Collett says that drug companies are working on therapies to block the nerves from firing, but adds: "In any pain there is a psychological element, because we use our brains to feel pain. That's why, for example, pre-operative anxiety increases people's post-operative pain levels." Indeed in a condition such as neuropathic pain, there is actually a loss of peripheral nerve input, but the patients still feel chronic pain. "Our programme is about educating the patient, working through their fears and anxieties. Muscle tension and anxiety make pain worse," says Collett. "Clinical studies of our approach show that it works. People function better, feel more able to cope and are more in control of their pain, rather than the pain being in control of them."

The psychological aspect of chronic pain may be still stranger and stronger than we currently know. A study by G. Lorimer Moseley, an Oxford University researcher writing in the journal *Current Biology*, asked ten people with chronic pain in one arm to move the limb while watching it through a pair of binoculars held the wrong way round. Their reported pain levels reduced significantly. Swelling in the affected areas also diminished. Moseley believes that the brain changes its protective responses according to its perception of danger levels.

In similar vein, scientists at Hadassah Medical Centre in Jerusalem are pioneering virtual-reality goggles that may help the condition. The goggles give patients the impression that their pain-affected body parts are moving freely and easily. Shimon Shiri, the lead investigator, believes that the brains of patients with chronic pain can be "imprinted" with the belief that parts of their body are painful. When the brain "sees" through virtual reality that this is not the case, it may be tricked into rewiring itself.

We are also learning how our perception of pain can be socially taught. Dr Ann Pakalnis of Columbus Children's Hospital in Ohio has found that parents who report high levels of chronic pain-related conditions are far more likely to have children who suffer debilitating headaches. The link is unlikely to be physical, Pakalnis recently told the American Headache Society: environmental factors are clearly at work. "Pain is certainly subjective, and an individual's response to pain, I think some of that is learnt."

This kind of mechanism may be at play in Alicia Adcock's recovery from a disabling condition called complex regional pain syndrome. Adcock, 20, a student at the University of Nottingham, developed the chronic pain disorder after pulling a door open on to her foot. One in every 4,000 people in the UK suffers from the syndrome. It can leave patients in such agony that they say they want to cut off the affected limb. "At A&E the X-rays showed that my foot was not broken. But the pain remained unbearable and neither painkillers nor physiotherapy worked," she says. "Tasks such as putting shoes on and showering were almost impossible."

After two and a half years, Adcock's family offered to pay for her to attend a three-day course in "Lightning Process", a training programme derived from osteopathy, neuro-linguistic programming and life coaching. The technique uses bodywork and reflective questions to help participants to focus on noticing their negative behaviour and to modify their thoughts to generate endorphin pleasure-hormones instead of stress hormones. It claims a number of high-profile successes, including the wife of the rugby union player, Austin Healey. The NHS is currently examining it.

"It's a training course, not a treatment. They make that clear before you start," says Adcock. "They assess you by phone before they agree to take you on, to see if you have got the right mindset. They want to know that you are ready to change how you approach things. Actually, I was quietly

unconvinced about the course, which cost around £800. My grandma and great aunt said that they would pay. I put it off for months because I did not want them to waste their money. I was sceptical the first day, but when on the second I was able to walk properly for the first time in two years, I started to think that it could work.

“I went last September, and I am still having to do what they taught me every day. You basically coach yourself to change. You have to step around a mat on the floor, telling yourself that you are a ‘powerful genius’. It sounds wacky but there’s sense to it. You are powerful enough to make yourself ill by thinking in a certain way — if you can do that to yourself, you can also use your mind to stop this process.

“For the first month, you have to do it numerous times a day. Now I do it once or twice daily. It takes two minutes at most. It makes you realise that your brain can do a lot more than you realise. In fact, it’s sort of irritating that something so simple has changed everything, when I spent two years going through tears and pain.”