

The View

'INSTEAD OF TRYING TO PUSH NEGATIVE EMOTIONS ASIDE, WE SHOULD ACCEPT THEM.' —PAGE 19



Virtual-reality experiences, like this one from DeepStream VR, are increasingly being used to treat chronic and acute pain

HEALTH

Can virtual reality help people manage pain?

By Alexandra Sifferlin

SNOWFLAKES FALL AROUND ME AS I float above a river, weaving through an icy wonderland. I toss a fish to an otter, and it shivers with glee. Then, as I exit a cave full of colorful rocks, I flow into a bright spring landscape, complete with cherry blossoms.

This trippy yet oddly relaxing simulation (officially titled COOL!) comes courtesy of DeepStream VR, a Seattle-based virtual-reality startup. But it's no game: early research has shown that for people with chronic or acute pain, having the same experience I did can offer a much needed reprieve—not just during the treatment but for days after. “We can manipulate the experience to get the best outcome for people,” says Howard Rose, DeepStream’s co-founder and CEO.

He’s not alone in that excitement.

As VR technology gets better, cheaper and more accessible—thanks in part to consumer-friendly headsets like the Oculus Rift, which debuted in March—a small but growing number of scientists and entrepreneurs are using it to treat medical conditions, including PTSD and chronic pain. The financial stakes are high: Goldman Sachs expects total revenue from the VR industry to hit \$95 billion in 2025, of which over \$5 billion could come from medical applications. Virtual reality could also reshape the nature of medicine itself, enabling doctors to abandon what Rose calls “a one-pill-fits-all approach” to treatment.

Right now, though, its proponents still have a lot to prove. Although individual studies of people with chronic pain have shown that VR can offer

relief, a 2014 review of 17 studies of people with acute pain revealed that relief was mostly short-lived. And for psychological conditions like social-anxiety disorder, a 2015 study showed in-person therapy worked better than VR. “I am on the fence [about VR health care] right now,” says Bernie Garrett, an associate professor at the University of British Columbia School of Nursing who is studying how VR affects chronic pain. “There are definitely some benefits, but we don’t understand what they are.”

That’s starting to change. Until recently, it cost millions to build VR labs and to conduct tests, which was too steep a price tag for most researchers. Now that the technology is more readily available, it’s a lot easier to experiment—and to gather the data necessary to draw more informed conclusions.


DeepStream is one of several for-profit startups in this space, alongside AppliedVR and Pear Therapeutics. But academics like Garrett are working hard too. At the University of Southern California, for example, researchers are virtually re-creating battle scenarios for veterans in order to treat their PTSD. It’s a more immersive version of exposure therapy, a common psychological treatment in which people talk repeatedly about traumatic events in order to process them. For patients who can’t “emotionally engage with their imagination,” VR can offer an invaluable assist, says Skip Rizzo, who’s heading the initiative at USC. “We can put people in environments that resemble what they went through, and help them go back and confront [their traumas],” he explains. “It adds to the menu of treatment options.”

It’s less clear how or why VR relieves chronic pain, since it’s a very new type of treatment. The prevailing theory is that it offers a distraction. Since humans can pay attention to only one or two things at a time, creating an environment that blocks everything out and makes them focus on a task—like, say, feeding an otter—makes it harder to focus on pain. “I’m very optimistic” about its potential, says Walter Greenleaf, who’s researching VR health care at Stanford University. Of course, immersing oneself in a virtual reality can have its own side effects, like motion sickness. During one of Garrett’s trials, a woman became so nauseated, she had to lie down for three hours to recover.

But for Ted Jones, a clinical psychologist at Pain Consultants of East Tennessee, the prospect of a new way to manage pain without pills is worth the risk. His patients have already experimented with COOL! and logged encouraging results. Now, Jones says, he’s waiting for VR treatment to become more widely accepted, so insurance companies will cover it. “We are in the heart of opioid-abuse land down here in Southern Appalachia,” he explains. “A non-opioid alternative is just what we need.” □

VERBATIM
‘Creating room for people is not only doable, it is a moral imperative. It is the moral imperative of our time.’

CHIMAMANDA NGOZI ADICHIE, best-selling author, on immigration



BOOK IN BRIEF
The hidden history of books

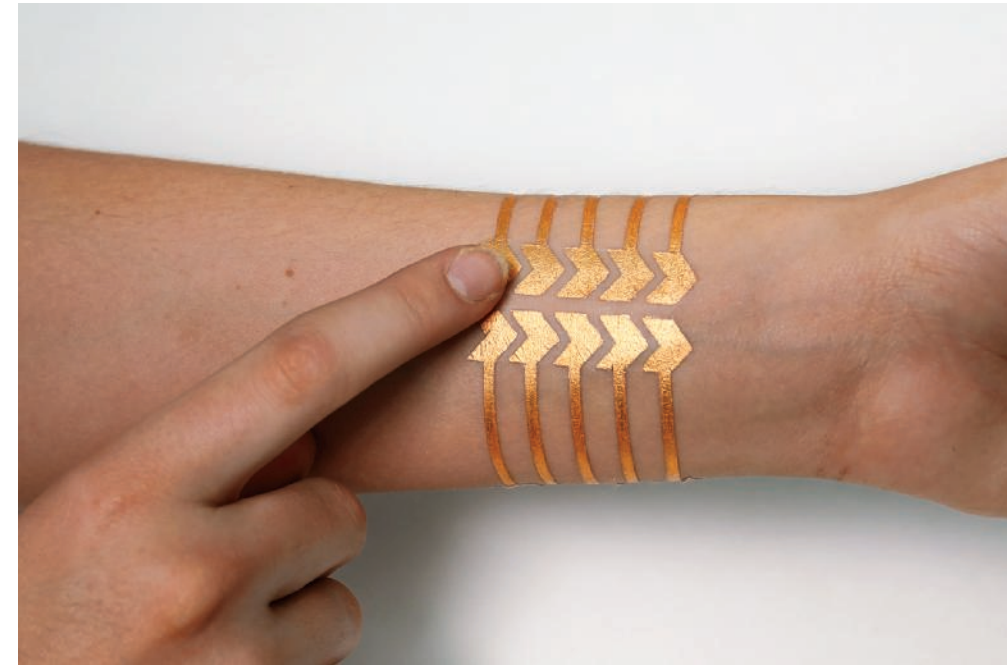
THAT A BOOK LOOKS AND WORKS AS it does is an easy thing to take for granted, but it took a thousand disruptions over the course of millennia to make those bound objects what they are. In his new history of the book, written in a moment when those analog objects have an uncertain future, author Keith Houston traces the evolutions of writing, illustrating and papermaking from the ancient world to today. The attendant tales in *The Book*—of warring Greeks, backstabbing Chinese courtesans, of religion, pride, domination, failure and ingenuity—prove that the book’s story is a reflection of human beings too. As Houston notes amid his explanation of how written language came to be: “The letters in this book are the offspring of ancient Egyptian writing, filtered through 4,000 years of human history.” Are e-books the end of the story? “Yes,” Houston says. “And also no. And also maybe.”



—KATY STEINMETZ

BIG IDEA
‘Smart’ tattoos

Forget smartphones and watches. DuoSkin, a new product from Microsoft and the MIT Media Lab, can turn your epidermis into a touch pad. Or a remote. Made with naturally conductive gold leaf, DuoSkin places a technological interface directly on your body. One potential application would include a Bluetooth-like chip so wearers could sync their temporary tattoo to a music system, then swipe it to change volume. Another version changes colors. The process is designed so people can customize both form and function for a tattoo that lasts only a day. The goal, says lead researcher Cindy Hsin-Liu Kao, is to create technology that’s as personal as lotion or makeup, so “it really blends into the wearer’s identity.” —Julia Zorthian



VIEWPOINT
The bright side of darker emotions

By Susan David

IT’S NATURAL TO WANT TO BE HAPPY all the time. But it’s telling that most of what many consider to be our seven basic emotions—joy, anger, sadness, fear, surprise, contempt and disgust—reflect the dark side of the human experience. These emotions are still with us because they’ve helped us survive through several million years of evolution, and they are an integral part of what makes us human.

It’s troubling, then, that so many of us try to avoid them. We use default behaviors that we hope can deflect or disguise them. We settle deeply into them, refusing to let them go. Or we attempt to ignore them entirely through cynicism, irony or gallows humor, refusing to admit anything in life is worth taking seriously. As Nietzsche once said, loosely

translated, “A joke is an epitaph for an emotion.” Or as Taylor Swift, that more contemporary philosopher, said, “Shake it off.”

Whatever we may think we’re accomplishing, these strategies don’t serve our health or our happiness. When we don’t go directly to the source of what’s causing an emotion, we miss the ability to really deal with what’s causing our distress, and we lose our ability to be fully engaged with the world around us. Instead of trying to push negative emotions aside, we should accept them as a useful—though sometimes uncomfortable—part of our lives.

Adapted from the forthcoming book Emotional Agility: Get Unstuck, Embrace Change, and Thrive in Work and Life

CHARTOON
Before Pinterest



JOHN ATKINSON, WRONG HANDS

ADICHIE: GETTY IMAGES; BIG IDEA: JIMMY DAY

DATA
THIS JUST IN

A roundup of new and noteworthy insights from the week’s most talked-about studies:

1

BREADWINNING IS GOOD FOR WOMEN AND BAD FOR MEN

A study from the University of Connecticut, which analyzed Bureau of Labor Statistics data, found that acting as the primary breadwinner in a family has a negative impact on the mental and physical health of men. For women, however, there was a positive psychological effect.

2

LOW EXPECTATIONS MAY AFFECT BREAST-CANCER TREATMENT

A study in the journal *Annals of Oncology* found that women with low expectations during hormonal therapy for breast cancer experienced twice as many side effects from the treatment as those with less negative thoughts.

3

DOGS MAY PREFER PRAISE OVER FOOD

In a study published in *Social Cognitive and Affective Neuroscience*, researchers who analyzed canine behavior and neural responses found that most dogs liked getting praise from their owners just as much as they liked getting food, if not more so.

—J.Z.