Human behavior has as much effect on the body as disorders of circulation or respiration, but is far less understood. The Vermont Center on Behavior & Health seeks answers that can change patients’ lives.

On a hazy June afternoon, Carrie Dyer sits at a picnic table near the playground in Battery Park in Burlington. With one arm she’s holding her three-month-old baby, and with the other she’s sipping water from a bottle. I’m chowing down on French fries from Beanie’s Bus. I skipped my lunch to go running and now the salty, fatty fries taste great. Dyer turns to encourage her seven-year-old daughter who is working her way across the monkey bars. Then she takes another sip of water, brings her baby into a close embrace, and continues talking.

“I started smoking when I was eight years old,” she says. “I was at my dad’s girlfriend’s house and she had older daughters and they were trying to push me into smoking. And I didn’t want to. And I went into the house and told my dad and I was told, ‘do whatever they want. You’re getting in my way.’ So that’s how that one happened. And the smoking just stuck.”

Carrie Dyer and her daughter at Burlington’s Battery Park playground. Dyer’s participation in a Vermont Center on Behavior and Health study is helping her break a smoking habit begun in early childhood.
Now Dyer is trying to get unstuck. “When I used to work traffic control I was up to four packs a day,” she says. But on January 5, 2014, well into her second trimester of pregnancy, at age 38, she quit. Her baby — her fourth child — was born in March.

“Well, I’ve pretty much quit,” she says with an unguarded smile. “I’ve slipped up a few times here and there, but I’ve passed all my UAs since I started.”

The “UAs” are urinalysis tests for nicotine. And what she started was participating in a clinical research study at the College of Medicine’s new Vermont Center on Behavior and Health, directed by vice-chair of psychiatry and Virginia H. Donaldson M.D.’51 Professor Stephen T. Higgins, Ph.D.

“You can think of behavior as a biological system, like respiration or circulation,” Higgins says. “How well could you practice medicine if you ignored circulation? In medicine in the past, and to some extent today, we have left out one whole system — behavior — which needs to be studied as a key part of keeping people well, to understand the source of illnesses, and where you need to intervene.”

Higgins is particularly interested in one kind of behavioral intervention: incentives. For her healthy behavior — not smoking — Carrie Dyer gets paid. A clean urine test means cash or vouchers for merchandise. “I have anxiety and depression and PTSD — I have traumatic brain injury as well. In 2012 I went through the windshield,” Dyer says, brushing her short greying hair with her fingers. She’s been unemployed for three years, has heart problems, qualifies for Medicaid, and is applying for disability. She has two older children who don’t live with her.

“Not smoking makes my stress get outrageous,” she says, but she has pressing reasons to quit. She looks at her baby and then across the woodchips to where her other daughter is climbing backward up a slide. “It’s scary for me right now; she’s seven. She knows I’m a smoker.”

When she started, the US Department of Health and Human Services, under the leadership of Vice-Chairman of Psychiatry Professor Virginia H. Donaldson M.D.’51, launched the Vermont Center on Behavior and Health.

“Bring Long-Term Success to the Start of Any Cardiac Rehabilitation Program,” the center’s tagline, is right on the money when it comes to the new center’s mission. It’s straightforward: to motivate positive behavioral change in patients participating in a cardiac rehabilitation program. To do this, the center is using financial incentives to motivate patients to not smoke during their pregnancy — substantially better than the 10 percent quit rate achieved by a control group.

Small Achievements Bring Long-Term Success

In a brick office building in South Burlington, at the Cardiac Rehabilitation Center, a young man in dreadlocks and camo-shorts sweats on an elliptical trainer, a grey-haired woman in pink velour lifts weights, and a rockably tune fills the air. Matt Bessette finishes his fifty-minute workout on a treadmill — and steps into an office to collect $54. The 62-year-old retired plumber has completed 17 exercise sessions since he started his treatment here following a heart attack. “A year ago, I was driving and I had this wicked pain across here,” he says, drawing his hand across his shoulder and broad chest. “I had pain all over. I couldn’t even use my cell phone. I thought I was going to die right there.” But he didn’t. Instead, several months later, he had two stents put into his heart — and joined a clinical trial led by cardiologist Philip Ades, M.D., and UVM psychologist Diane Gabelman, Ph.D.

“Most people who survive a heart attack could benefit from rehabilitation. A program of education and exercise increases quality of life and decreases chances of dying from heart disease — but less than 35 percent of eligible patients participate in rehab programs. And a vanishingly small number of cardiac patients from marginalized parts of society — low-income or homeless or with substance abuse histories — even start. “We are trying to motivate behavior change in these vulnerable populations,” Gabelman says. All the patients in her new study — including Matt Bessette (not his real name; he was happy to share his story, but asked me to use a pseudonym) — qualify for Medicaid, which means they don’t have much money.

“The incentive schedules we use are based on the idea that changing behavior long-term is hard,” says Gabelman. “The reality is that if you’ve had a heart attack you are going to have to change the way you live for the rest of your life. You are going to have to change the way you live for the rest of your life.” She points out that even the four months of a cardiac rehab program can be a long and difficult time for patients to maintain their new behavior. “The idea behind incentives is that they break down these difficult behaviors into small,
achievables. chunks. Putting the focus on what they can do and achieve today helps people take these intermediary steps toward the longer goals they’ll need to meet. It really is a form of treatment and much more subtle than just paying people to do healthy things,” Galema says.

Bessette was randomly assigned to a group that received a cash payment each time they come to the rehab center and complete their prescribed exercises. “It starts at four bucks for the first one and goes up from there,” Galema explains. If the patients don’t miss a session, the rate builds to $50 per session. But if they have an unexcused absence, the payment schedule resets to the bottom. After 36 rehab sessions — the maximum covered by Medicaid insurance — successful participants will have earned about $1,200, “which is not trivial,” Ades says.

But it’s pocket change compared to the cost of another heart attack.

“Preventing one cardiac rehabilitation is saving $10,000 to $30,000,” Ades says, “and cardiac rehab is known to decrease cardiac rehabilitation by 30 percent in the first year.”

The United States healthcare system is by far the most expensive in the world, but in a 2014 report from the Commonwealth Fund — a think tank whose funders include governments in many nations — Australia, Canada, France, Germany, the Netherlands, New Zealand, Norway, Sweden, Switzerland, the United Kingdom, and the United States — the U.S. ranks last in health outcomes and healthy lives.

In all these industrialized nations, including the U.S., the population’s main health problems come from chronic conditions like addiction, coronary heart disease, type-2 diabetes, and obesity. “We can’t afford to keep spending more and more to treat disease outcomes that are connected to unhealthy behaviors,” Ades says. Which is why he and other scientists in the new UVM center look to

The principle of reinforcement and the tools of behavioral economics, like financial incentives, help difficult-to-treat populations like cocaine addicts and pregnant smokers.

Now the scientists at the Vermont Center on Behavior and Health want to understand how well that approach can be extended to much broader health problems, like heart disease — and especially with those people of low socioeconomic status who bear a disproportionate burden of many chronic diseases.

“The new study looks promising. ‘We’re seeing more minorities and many other people we’ve never seen in rehab before,’ Ades says, ‘unemployed people, drug addicts, homeless people. Often invisible to the medical system — until they hit the emergency room with very expensive problems — they tend to be ‘higher risk’ than other cardiac patients we see: they have worse cardiac behaviors, exercise less, smoke more, tend to be more overweight,” Ades says. “They are the people we need to reach.”

“We’re seeing them because of the incentives,” he says. “They literally get paid to come to exercise.” Matt Bessette is happy to help his wife with her workouts. “When I come here, I have the desire to do almost anything.” Following the cardiac stents, he began to feel better, “but I was in very bad shape,” he recalls. That’s where the rehab program helped. “For me, I need structure. I have a treadmill at home, but I don’t use it,” he says. Once his 36 sessions in the study are over and the incentives stop, he plans to continue coming to the rehab center, join cardiac rehab “phase 3” and continue with his workouts. “When I come here, I have to do it. And the other people are real nice.” Feeling better, he’s happy to help his wife around the house, “hanging pictures and getting the house in kind of a disarray.” he says. “Not good for half a day. But that’s better than a quarter of a day or nothing.”

The idea behind incentives is that they break down these difficult behaviors into small, achievable chunks. Putting the focus on what they can do and achieve today helps people take these intermediary steps toward the longer goals they’ll need to meet.

— Dianne Galema, Ph.D., UVM Professor of Psychiatry

The Vermont Center on Behavior and Health (VCBH) was established in 2013, sponsored in part by a grant from the National Institute on Drug Abuse.

VCBH researchers and Associate Professors of Psychiatry Sarah Heil, Ph.D. (top), and Stacey Tigges, Ph.D. (bottom).