Think Vermont’s too bucolic to have drug addiction problems? Think again. UVM’s addiction researchers show how a small state can have a big impact in helping to combat the problem.

Green pastures, cows, and... pill bottles? The conventional wisdom that addictive behavior and its resulting crime and social problems is strictly an urban problem has slowly eroded over the last decade, as national statistics show a rise of addiction in the nation’s rural counties. While Vermont has seemed to duck the national rural methamphetamine scourge, news of pharmacy and doctor’s office break-ins throughout the state, from the population centers of Chittenden and Rutland counties to the small towns of the Northeast Kingdom, attests to the proliferation of prescription drug abuse. Working to mitigate this problem, and a range of other addictive behaviors, is a group of UVM researchers whose work offers Vermonters step-by-step treatments to help pull themselves out of addiction.

In a 2004 federal report, more than 6.3 million Americans reported current use of prescription drugs for non-medical purposes in 2003. What's even more concerning is the age of the consumers. The 2007 Youth Risk Behavior Survey by the Centers for Disease Control and Prevention (CDC) reports that 16 percent of 8th to 12th graders in Vermont have taken a prescription drug not prescribed for them sometime in their lifetime.
Lisa Thompson*, now 21 and nearly two years into treatment for opiate dependence, was one of those teenagers. Fresh from her daily visit to The Chittenden Center, Vermont’s only methadone clinic, one recent April morning, she apologizes for her lateness as she walks into the small office located down the corridor from the clinic in the University Health Center. Her 13-month-old son Max* sits on her lap as she talks, his bright blue eyes curiously surveying the room. Max spies his bottle peeking out of the diaper bag in the corner of the room and his eyes light up. His mother laughs as he looks up at her, then he climbs down and slowly toddles over to retrieve it. For Lisa, Max was the small but crucial reason she was able to break a four-year addiction and create a stable life.

Thompson’s introduction to illegal drugs began at home — she smoked marijuana for the first time with her mother at the age of 13. By age 16, she had progressed to popping an occasional prescription painkiller, a habit that rapidly escalated and eventually led to injecting heroin. She overdosed twice by the time she was 17. Soon after, she entered a rehab program and stayed clean for seven months, but reuniting with the ex-boyfriend who had introduced her to heroin pulled her off the wagon; she resumed taking pills and was quickly hooked.

At age 19, Thompson found out she was pregnant with Max. Despite steady employment, her daily drug use consumed all of her income, and she depended on her grandmother for housing and expenses. “There was no way I was going to live like that with my son,” she admits. “I realized that I had to do something, but I didn’t know what. I felt guilty; I didn’t want to do anything to him.” A physician referral led her to the UVM’s Substance Abuse Treatment Center (SATC) and a clinical trial called Maternal Opioid Treatment: Human Experimental Research (MOTHER), one of a number of National Institute on Drug Abuse studies at UVM that provide free and much-needed treatment for Vermonters who struggle with dependence on opiates, cocaine, and nicotine.

The MOTHER clinical trial sought to determine whether there was any difference between treating opioid-dependent pregnant women with methadone versus another drug called buprenorphine in terms of the babies’ outcomes. Though FDA-approved for use in adults, neither methadone nor buprenorphine are approved for use in pregnant women. Methadone, established as the standard of care treatment for this population in 1999, has been used to treat pregnant women for years.

Sarah Heil, Ph.D., a research associate professor of psychiatry, is the UVM site lead investigator for the MOTHER trial. “This is a landmark study in many ways,” says Heil. “It’s the biggest sample of opiate-dependent pregnant women ever run through a rigorous study.” Of 30 women who enrolled, 25 pregnant opiate-dependent women, including Thompson, completed the study at UVM. Participants received what Heil describes as “the Cadillac of assessments and support.” In addition to providing free treatment and free counseling, researchers collected detailed records over the course of the pregnancy — regular urine samples, weekly and monthly assessments of each woman’s psychosocial functioning, which medication the mothers were taking — to assess exposure to their babies. Financial-based vouchers, small monetary rewards designed to reinforce abstinence and prenatal care, were offered to the mothers in return for clean urinalysis results and compliance with prenatal care visits. The study participants’ response to the use of this tool will also provide insight into why some pregnant women abuse opiates despite the potential harm that may do to the fetus. The financial incentive provided extra motivation for Thompson. “It was either $43 for clean urine or nothing,” she says. “I needed it at that point. I would bring in my electric bill and they would pay it for me online.”

Participants at UVM were seen daily for an average of 27 weeks, so the relationships and high level of support provided to this group was incredibly strong. Heil expects the study will achieve multiple levels of impact: “If we did

* Both Lisa and Max’s names have been changed for this article.
nothing else but provide treatment to these women, great! If we did something on a larger scale, somewhere in the middle level of understanding more about how to treat this population better, wonderful; if we go even further and find out that one of these medications is better than the other, we’ve met the study’s main objective.” Helping these women break the family drug abuse cycle is an equally important aim. “We want these women to not just try and behave in a way that is going to be good for them, for society, and good for their children — we want to try and ensure that the same thing that happened to them doesn’t happen to their children,” says Heil. A related study, now underway, focuses on following up with the babies born to the women in MOTHER. “We’re assessing cognitive and motor function so we really know how these babies are doing and the moms are getting tested as well,” says Heil. “We want to make sure that they’re still doing OK and, if not, making sure we provide referrals to get them what they need.”

A key moment for UVM’s addiction work began more than 20 years ago when Stephen Higgins, Ph.D., professor and vice chair of psychiatry and director of the SATC, began research to develop a non-pharmacological approach to treating cocaine dependence. He and his colleagues focused on a psychologically-based strategy that would attract people to treatment, as well as keep them in treatment. They found success with a program involving voucher-based incentives and counseling that encouraged the positive behavior change of abstinence from cocaine use. Professionally referred to as Contingency Management (CM), this system — a piece of which was incorporated into the MOTHER study — hinges on the belief that providing a reward for a specific behavior, even a relatively small one, reinforces the likelihood that the behavior will be repeated. Higgins and Heil have literally written the book on this approach: they are co-authors of Contingency Management in Substance Abuse Treatment, published in 2008.

Higgins’ work over two decades has produced broader and better overall results using CM. “We went from asking ‘how do we get them to show up for treatment?’ to ‘who does well longer term?’” he explains. Achieving long-term success was dependent on short-term success, so Higgins set out to determine the best strategy for assisting individuals who struggled during the earlier part of treatment. “Those financial incentives were very helpful for that, but lifestyle changes were a big merit too,” he says. As Higgins’ team’s incentive-based approach gained more positive results and appeared in more peer-reviewed publications, and become a nationally accepted standard of care, it has started to spread internationally.

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In January, Higgins’ participation in a conference convened by the National Institute on Drug Abuse and the Department of Defense introduced a new opportunity for expanding his group’s work. Higgins’ story of success using voucher-based incentives with pregnant women and drug-dependent individuals attracted the attention of an unexpected future partner — the U.S. Navy — which is struggling not only with managing substance abuse in its personnel, but also obesity, cigarette smoking and excessive drinking.

Substance-abuse treatment studies remain the core of the SATC’s efforts and a field ripe for further exploration in Vermont. Heil is currently working on a grant that aims to capture more information about how vouchers work with pregnant women and drug-dependent individuals attracted the attention of an unexpected future partner — the U.S. Navy — which is struggling not only with managing substance abuse in its personnel, but also obesity, cigarette smoking and excessive drinking.

Almost all — 98 percent — of the opioid-dependent population smokes cigarettes, while only 21 percent are smokers in the non-opioid-dependent population, according to a 2007 CDC report. Despite the prevalence of nicotine addiction in this challenging clinical population, little is known about how to address it. Sigmon, with support from the National Institute on Drug Abuse, aims to develop an effective smoking cessation treatment for individuals receiving methadone treatment.

The trial has two arms — an active arm that compares the effectiveness of a brief educational intervention coupled with voucher-based incentives received for evidence of smoking abstinence, and a placebo arm where educational intervention and dispensing of vouchers take place independent of proof of abstinence. Over the course of two weeks, biochemical measures, including breath carbon monoxide levels and urine tests that detect cotinine, a metabolite version of nicotine, are collected to determine the participants’ smoking status.

The aim of this two-week effort, explains Sigmon, is to develop an intervention that helps participants stop smoking. This, and another clinical trial focusing on sustained smoking abstinence, will help shape a formal program that, if proven successful, could be disseminated through methadone and buprenorphine clinics nationwide. Overall, the clinical trials at UVM’s SATC offer free, empirically-supported treatment that few Vermonters could otherwise receive.

In addition to her NIH-funded research to find effective treatment for prescription opioid abusers, Sigmon also directs the Chittenden Center, Vermont’s first and largest methadone clinic, where 220 patients currently receive maintenance treatment and another 120 are on the waiting list. The program opened in 2002, and is a joint collaboration of UVM, Fletcher Allen, and the Howard Center for Human Services. The Chittenden Center has benefited from its alliance with the SATC, and offers individual and group counseling, medical management, urinalysis, and medication administration to patients.

“We have remarkably high rates of drug abstinence for a methadone clinic in the U.S. — 93 percent of urine samples test negative for illicit opiates,” says Sigmon. “Our program is thoughtfully created and grounded in empirically-based protocols.”

Addiction’s cause, not a microbe or a virus, but the vagaries of human behavior, make it elusive to understand and perhaps harder to control. For Lisa Thompson and the hundreds of Vermonters who seek treatment every year, small steps add up to major gains, both for them and for their community. “A year and a half ago, I’d have never have thought that I’d have a job, be paying bills myself, be going to school and getting the help I need,” she says. “I want to stay on track and, hopefully, one day help people the way these people have helped me.”

Shetal Patel, lab technician and incoming UVM medical student, administers a breath analyzer that measures cigarette abstinence compliance.