

NIH HEAL INITIATIVE

4TH ANNUAL NIH HEAL Initiative Investigator Meeting Summary

FEBRUARY 21-22, 2023



The Present and Future of the NIH HEAL Initiative



Dr. Rebecca Baker
Director, NIH HEAL Initiative

“Imagine a future where we have safe and non-addictive treatment options for a variety of pain conditions ... a future in which many options are available to treat opioid use disorder across the addiction cycle ... a future where effective prevention reduces the risk of addiction, chronic pain, or suicide ... a future in which communities choose and use evidence-based practices to thrive.”



Researchers are conducting **314 clinical trials** to test new management strategies for pain and opioid use disorder in diverse populations.

This is the future the NIH HEAL Initiative is striving toward, said HEAL Director Dr. Rebecca Baker at the Fourth Annual HEAL Investigator meeting, even as the current situation remains bleak with record-high numbers of fatal overdoses. “We still face a fragmented system of care for people with pain and people who use substances,” Baker explained.

But, Baker noted, since its inception in 2018, HEAL has made great strides to meet the needs of people affected by pain and/or substance use disorders and to support their communities.

HEAL has funded 42 research programs in all 50 states; within these programs, \$2.5 billion has been awarded for more than 1,000 research projects.

More than 100 projects are addressing back pain alone, and more than 200 projects are seeking safe and effective medications for opioid use disorder. HEAL projects have submitted 41 applications to the U.S. Food and Drug Administration for testing and approval of new drugs and devices.



“Through our research, we are delivering hope to communities across the country.”

—Dr. Rebecca Baker

Researchers are conducting 314 clinical trials to test new management strategies for pain and opioid use disorder in diverse populations.

These efforts involve not only academic research but also active ongoing partnerships with more than 100 small businesses from the private sector.

HEAL’s progress is guided by four cross-cutting themes, Baker said. Targeting the underlying biology of pain and addiction, including where areas of overlap exist, is the basis for an innovative precision-medicine approach to research.

Second, researchers and healthcare providers should focus on the whole person. People who use illicit drugs often do so because

they experience inadequately managed pain or have mental illness. “We need to look across conditions to provide real impact,” Baker noted.

Equally important is the need to work with communities to bring research to life. A prime example of this strategy is the HEALing Communities Study, which examines implementation of measures to reduce drug use and overdose in communities in four states that have been highly affected by the opioid crisis. “Through our research, we are delivering hope to communities across the country,” Baker said.

Finally, HEAL research needs to keep a close eye on persistent systemic challenges and inequities that prevent many



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From left to right: Dr. Jing Li, Georgia Institute of Technology, Dr. Catherine Chong, Mayo Clinic, Dr. Sung Han, Salk Institute for Biological Studies, Dr. Lingyong Li, University of Alabama at Birmingham, Dr. Armen Akopian, University of Texas Health Science Center, Dr. Ted Zheng, National Institute of Arthritis and Musculoskeletal and Skin Diseases

“We still face a fragmented system of care for people with pain and people who use substances.”

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individuals and groups from receiving the care they need. As Baker said, “We will not be successful if interventions only help some people.”

Baker described new results that have recently emerged from the initiative, including advanced tools for screening potential pain medications; noninvasive stimulation for chronic carpal tunnel syndrome pain; and a novel infrared light-based therapy showing promise for craving, anxiety, and depression in patients with opioid use disorder. She also pointed to major new findings from some of HEAL’s larger programs: Advancing Clinical Trials in Neonatal Opioid Withdrawal Syndrome (ACT NOW) and the HEALing Communities Study.

Despite HEAL’s ongoing efforts, Baker emphasized that many questions remain unanswered. New HEAL research programs will evaluate coordinated care for patients with pain: in particular rural populations, people taking opioid pain medications long-

term, and people with sickle cell disease. Other efforts aim to optimize addiction care and prevention, expand the evidence base for keeping people safe from overdose, and enhance recovery support. Future research will further address such issues as pain in children, the needs of mothers with pain or opioid use disorder, co-occurring mental health conditions, or the role of sleep in recovery.

Baker stressed that we can only tackle these challenges if researchers and other stakeholders work together: “We know that we need research excellence, and we need collaboration across disciplines. We know that we need transfer and sharing of knowledge from experienced scientists to the next generation. And, we know that we need partnerships with communities.”



Forging *a New Path* in Pain Management



Dr. Walter Koroshetz
Director, National Institute of
Neurological Disorders and Stroke

“Trying to relieve pain is really the basis of medicine,” said Dr. Walter Koroshetz, Director of the National Institute of Neurological Disorders and Stroke, at the Fourth Annual NIH HEAL Initiative Investigator Meeting. However, he added, *“Despite decades of research, effective pain management for all patients is still elusive.”*

About 50 million adults in the United States have chronic pain, and about 20 million people experience high-impact chronic pain that interferes with their daily activities.

While opioid pain medications are effective for some pain conditions, excessive opioid prescribing a few decades ago contributed to the current opioid crisis. This realization led to more stringent regulation of opioid prescribing. In turn, prescribing rates have dropped by about 50% from their peak in 2012. While reducing the number of people inappropriately treated with opioids, the decrease did not overcome the many challenges for people with chronic pain, who have difficulty getting the medications they need, and for their healthcare providers, who

need better options for treating their patients.

Why is chronic pain so difficult to treat? Koroshetz explained that one reason is the fact that the brain’s pain and reward systems are heavily interconnected. “In a very simplistic way, the human brain was put together to seek reward and avoid pain,” Koroshetz explained. “As scientists, it is our job to dissect the brain circuits to intervene on the pain side while trying to stay away from the reward side.”

Additionally, people with chronic pain often have multiple co-occurring conditions that influence pain management. “It takes a lot of time and empathy for doctors to work with a patient with chronic pain and find the best therapies for them to get



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“None of this could be done without the NIH HEAL Initiative—HEAL really provides a unique opportunity for pain science.”

—Dr. Walter Koroshetz

them to the highest level of function,” Koroshetz said, adding that the task is even harder in a fee-for-service reimbursement system. HEAL researchers are working to address all of these issues, with three priorities. One goal is to accelerate the discovery and development of new targets for treating pain. These include developing small molecules and “genomic keys” to switch off specific cells or brain areas that transmit pain signals but have no rewarding properties. Another priority is to advance new potential products through the clinical pipeline. The biopharmaceutical industry’s pain therapeutic pipeline has declined by 44% over the past 5 years, often due to failed clinical trials and safety concerns. To counter these trends, HEAL seeks to de-risk the process for the private sector—for example, by validating new biological targets and identifying and validating biomarkers that connect knowledge between animals and humans. Cooperation with small businesses plays an important part in this process.

The third goal is to inform best practices for effective pain management while minimizing the risk of addiction. A key element is building a workforce of pain researchers dedicated to achieving the best functional outcomes for all patients.

Koroshetz stressed the importance of lived experience: including people with chronic

pain in the research process. Their input is essential for addressing the real-world problems these individuals experience.

“None of this could be done without the NIH HEAL Initiative,” concluded Koroshetz. “HEAL really provides a unique opportunity for pain science.”



Clockwise from top left: Dr. Jiande Chen, University of Michigan, Dr. Catherine Chong, Mayo Clinic, Dr. Matthew Mauck, University of North Carolina at Chapel Hill, Dr. Eric Hudak, National Institute of Neurological Disorders and Stroke

Collaboration Is Key *to Solving the Opioid and Overdose Crisis*



Dr. Nora Volkow
Director, National Institute on
Drug Abuse

As the overdose crisis continues to evolve and escalate, one thing has become clear, said Dr. Nora Volkow, Director of the National Institute on Drug Abuse, at the Fourth Annual NIH HEAL Initiative Investigator meeting.

“We cannot address the overdose crisis without collaboration, and this collaboration absolutely requires that scientists from different disciplines come together. It requires that agencies and other groups work together, and work with patients.”

In 2022, 107,000 individuals died from drug overdoses, particularly among younger adults ages 18 to 44. This increase was driven mostly by synthetic opioids like fentanyl, which also often contaminate other drugs, as well as fake prescription medications.

“We have the tools to address these overdose deaths; we have very effective medications that can prevent overdoses—but we are not utilizing them,” said Volkow. Only 16% of people with opioid use disorder are treated with medications such as methadone, buprenorphine, or naltrexone. The overdose reversal drug, naloxone, also is underused, even though it greatly reduces the number of people who die after an overdose.

One problem contributing to the underuse of effective tools, according to Volkow, is that healthcare and other stakeholder systems are fragmented and don’t sufficiently connect people with substance use disorders to treatment. Several HEAL programs are working to change this:

- ▶ The NIDA Clinical Trials Network brings together addiction specialists with healthcare providers from other backgrounds, such as primary care, emergency medicine, or infectious disease, to include these providers and settings in clinical trials and share the findings.
- ▶ The Justice Community Opioid Innovation Network (JCOIN) establishes partnerships between health systems and justice settings, such as jails and prisons.



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—Dr. Nora Volkow

- ▶ The HEALing Communities Study engages and creates partnerships with communities and community stakeholders.

Collaboration is essential not only between the research community and other stakeholders, but also between researchers from different scientific fields. “Science

and knowledge can give us extraordinarily powerful tools to address the current crisis,” Volkow stated.

New tools are particularly needed in light of the increasing availability of highly potent fentanyl and similar drugs that now contribute to the majority of overdose

deaths. As Volkow explained, these drugs are much more potent and addictive than, for example, heroin. They often are disguised as illicitly manufactured prescription drugs, such as stimulants, sleep aids, or anti-anxiety medications that are available on the black market. In some cases, a single pill contains enough fentanyl to cause a fatal overdose.

Fentanyl also enters the brain more quickly than heroin, shortening the window during which an overdose can be reversed with naloxone—often requiring multiple naloxone doses.

Volkow noted that pills laced with fentanyl are especially risky for adolescents who typically don’t seek out heroin or pure opioid drugs but may obtain illicit



Dr. Lynn Fiellin, Yale University



As a result of **fentanyl contamination** of drugs, **mortality** among **15- to 19-year-olds** in the United States **DOUBLED** from **2019 to 2020**.

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—Dr. Nora Volkow



Ms. Morgan Justice, Kaiser Permanente Washington Health Research Institute

prescription drugs. As a result of fentanyl contamination of those drugs, mortality among 15- to 19-year-olds in the United States doubled from 2019 to 2020.

To address these issues, new treatment strategies as well as new targets and formulations for medications are needed, Volkow said, and HEAL provides funding for all of these areas.

She also pointed to the value of prevention and treatment, as well as efforts to improve pain management and treat mental health conditions.

“If we do not advance pain management, people will

continue to seek out drugs to relieve the subjective experience of pain,” she said, and the same is true for mental health problems.

Finally, Volkow emphasized that the research community and other stakeholders need to look beyond immediate healthcare concerns. “What has made us so vulnerable to drug use as a nation?” she asked.

“Yes, untreated pain and mental illness play a role. But the social systems that create inequality and loneliness and hopelessness for so many people also contribute to both drug use escalation and the overdose crisis.”

FIRESIDE CHAT WITH FEDERAL LEADERS:

Translating Evidence *Into* Policy *and* Practice



Dr. Lawrence Tabak, Acting Director of the National Institutes of Health
in conversation with

Dr. Shari Ling, Deputy Chief Medical Director, Centers for Medicare and Medicaid Services
Mr. Stephen Ferketic, J.D., Chief of Staff, Drug Enforcement Administration
Dr. Robert Califf, Commissioner, U.S. Food and Drug Administration

The NIH HEAL Initiative’s mission to find scientific solutions to the opioid crisis addresses an important part of the equation, but laws and policy informed by science are also critical.

“The research community cannot on its own extend the reach of treatments that we know are effective from clinical trials,” said Lawrence Tabak, D.D.S., Ph.D., Acting Director of NIH. Various federal sister agencies—such as the U.S. Food and Drug Administration (FDA), Drug Enforcement Administration (DEA), and Centers for Medicare & Medicaid Services (CMS)—play a key role in implementing evidence-based approaches as

well as shaping overall policies related to the opioid crisis.

What evidence are they looking for? What evidence is needed from the research community to improve treatment access and delivery? Tabak discussed these

issues with FDA Commissioner Robert Califf, M.D.; DEA Chief of Staff Stephen Ferketic, J.D.; and CMS Deputy Chief Medical Director Shari Ling, M.D.

According to Califf, FDA could be considered a referee that gathers

“The research community cannot on its own extend the reach of treatments that we know are effective from clinical trials.”

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Dr. Robert Califf, Commissioner, U.S. Food and Drug Administration

available scientific evidence and then approves or rejects novel treatments based on this evidence. A broad array of evidence is needed, including not only for innovative treatments but also regarding outcomes for individuals who take opioid medications long-term. FDA recognizes that abstinence from drugs may not be the only relevant outcome when looking at new treatment approaches. Reduced drug use or fewer symptoms can also indicate a substantial benefit for patients, as can other outcomes that are

reported by patients rather than traditionally measured outcomes. “But it’s not just a matter of collecting opinions,” Califf cautioned. “You have to do the research and have the evidence that the measure matters.”

A research priority for DEA is to investigate the impact of recent federal policy changes aimed at increasing the availability of medications for the treatment of opioid use disorder. For example, physicians no longer need to obtain certain qualifications (X-waiver) to prescribe buprenorphine for opioid use disorder. The goal of this policy change was to increase treatment access for all who need it. Despite these changes, however, statewide regulatory interpretations continue to influence access to care. “Seeing how treatment access differs among states or communities with different restrictions will be very important,” Ferketic said.

Ling noted that CMS policies directly affect about one-third of

“Seeing how treatment access differs among states or communities with different restrictions will be very important.”

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This policy change was to make it **easier for healthcare providers** to prescribe buprenorphine and thereby **INCREASE ACCESS** to treatment for **all individuals who need it.**

all Americans who receive benefits mainly through Medicare and Medicaid. “The challenge we have is that the populations we serve are becoming increasingly complex with comorbidities,” she said. CMS needs evidence that interventions lead to improved outcomes that are not only significant from a clinical perspective but also are meaningful to the individuals served by CMS programs. Evidence can inform CMS policies and rules by giving a better understanding of the dynamics of healthcare delivery—what are barriers to effective care? What

“This will help the system move into the direction of value-based care; care that is high quality, safe, and equitable.”

—Dr. Shari Ling



Mr. Stephen Ferketic, J.D., Chief of Staff, Drug Enforcement Administration

are challenges to implementing treatment approaches in real-life care settings that are known to be effective in clinical trials?

All three agencies are attuned to the increasing presence of digital and telehealth interventions, which have become more prominent during and after the COVID-19 pandemic. Both DEA and CMS implemented provisions allowing telehealth interventions during the pandemic, but are now looking for continued research on the effectiveness and other effects of telehealth interventions and/or

hybrid models as compared with traditional in-person services. How do these interventions affect access to care? Which patients benefit from them? When and how can telehealth be best implemented? Califf agreed, noting, “When it comes to telehealth, we can’t just open the floodgates—we need to do the research on the appropriate ways to do it.”

Ling concluded the discussion by encouraging the research



Dr. Shari Ling, Deputy Chief Medical Director, Centers for Medicare and Medicaid Services

Policies and rules can be **IMPROVED** by gaining a **better understanding** of the dynamics of healthcare delivery.

community to hold themselves to high standards in their work and in their interactions with patients and research participants. “This will help the system move into the direction of value-based care; care that is high-quality, safe, and equitable.”

A Holistic Approach to Pain and Substance Use Disorders



Dr. Rena D'Souza
Director of the National Institute of
Dental and Craniofacial Research

D'Souza pointed to several HEAL programs that are implementing integrated approaches that can expand the breadth of research and discovery. For example, assessing the effects on infants of opioid exposure during pregnancy can intersect with studies looking at various harmful pre-birth exposures to effects on tooth development. She also pointed to additional examples of holistic research: the HEAL-funded Back Pain Consortium (BACPAC) research program and the new Restoring

Joint Health and Function to Reduce Pain Consortium (RE-JOIN).

Integrating diverse perspectives in new ways will be central to the success of many projects, D'Souza predicted. For example, despite using a wide range of advanced research techniques, individual projects studying painful jaw joint (temporomandibular) disorders have not made much headway. Therefore, NIDCR is launching the Temporomandibular Disorders Initiative—a

According to Dr. Rena D'Souza, Director of the National Institute of Dental and Craniofacial Research (NIDCR), the greatest benefit of the NIH HEAL Initiative is its ability to look holistically at the problems of pain management and substance use disorders, toward solving problems in a way that has never before been possible.

“HEAL is uniquely positioned as an integrative platform that connects ecosystems, catalyzes cross-fertilization, and generates excitement at the interface of traditional fields,” D'Souza said.

collaborative effort that will tie together a wide range of perspectives to address these complex disorders.

Echoing a HEAL priority, D'Souza noted the crucial importance of including patients and their perspective and experience in research planning and conduct. This notion was amplified during the COVID-19 pandemic, when patients' awareness grew significantly. “Patients themselves are an invaluable source of knowledge,” she said.

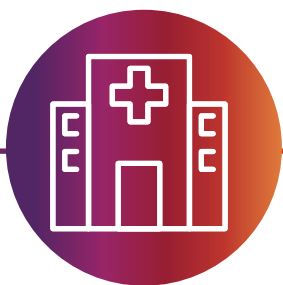
Early Foundations *for* HEALing: Findings From *the* Eat, Sleep, Console Care Approach



“It’s critical to know if there is any difference in later outcomes of infant and family wellness.”

—Dr. Stephanie Merhar

Left to right: Dr. Lori Devlin, University of Louisville School of Medicine, Dr. Stephanie Merhar, Cincinnati Children’s Hospital Medical Center, Dr. Leslie Young, University of Vermont Larner College of Medicine



In a **study of 54 centers**, the proportion of infants with NOWS who were treated with opioids ranged from **5% to 85%**.

HEAL-funded research is striving to help people of all ages—including at the very beginning of life. “Since its inception, the NIH HEAL Initiative has worked to optimize the health of infants exposed to opioids,” said Dr. Diana Bianchi, Director of the *Eunice Kennedy Shriver* National Institute of Child Health and Human Development.

If a pregnant person uses opioids, the fetus is also exposed to these drugs and may experience severe withdrawal symptoms after birth: a condition known as neonatal opioid withdrawal syndrome (NOWS). Infants with NOWS are often treated with opioid

medications from which they are slowly weaned. The result is prolonged hospital stays and disruptions to family life. Bianchi noted that there is no standard of care for these infants. “In a study of 54 centers around the country, the proportion of babies with



Dr. Diana Bianchi, Director, *Eunice Kennedy Shriver* National Institute of Child Health and Human Development

Since 2009, the rates of NOWS have skyrocketed, and it's now a significant public health concern."

Dr. Lori Devlin



Infants could be discharged **an average of 7 DAYS EARLIER** from the hospital, and fewer infants required opioid medication treatment.

NOWS who were treated with opioids ranged from 5% to 85%," she said.

Through several studies conducted by the Advancing Clinical Trials in Neonatal Opioid Withdrawal (ACT NOW) program, HEAL aims to fill this critical gap: toward establishing a standard of care for diagnosing and treating infants with NOWS. One of these studies, the Eat, Sleep, Console

(ESC) clinical trial, recently yielded promising results that were presented at the meeting by three of the participating researchers: Dr. Lori Devlin from the University of Louisville, Kentucky; Dr. Leslie Young from the University of Vermont; and Dr. Stephanie Merhar from Cincinnati Children's Hospital.

The scope of the problem is enormous. "Since 2009, the rates of NOWS have skyrocketed, and it's now a significant public health concern," Devlin said. These infants remain in the hospital for nearly 2 weeks—and twice that long if they need treatment with opioid medications. Caring for these infants is resource- and time-intensive, and they often are admitted to neonatal intensive care units. "This places a substantial burden on healthcare systems, on families, and on communities," Devlin said. Young explained that for decades, infants with NOWS have been assessed using a tool called the Finnegan Neonatal Abstinence Scoring Tool (FNAST) to determine how severe their symptoms are. Hospitals then decide if the infants should be

treated with opioids. Many believe this screening tool has drawbacks, including its subjectiveness and tendency to overestimate need for medication treatment.

The ESC care approach, in contrast, assesses the infants for three basic functions: the ability to eat, sleep, and be consoled within 10 minutes of crying. Infants that can perform all three functions likely don't need medication. The ESC approach involves the families as much as possible. "The mom can give her input, and the medical team works together with mom to identify ways in which the baby's care can be optimized," Young said.

The HEAL research team compared the ESC approach to the traditional FNAST approach in 26 hospitals across 18 states, including in communities that don't typically participate in clinical research, and they found clear benefits from using the ESC approach. Infants could be discharged an average of 7 days earlier from the hospital, and fewer infants required opioid medication treatment. Equally important to the researchers was



It's critical to know if there is any difference in **LATER OUTCOMES** of **infant and family wellness.**

how the ESC approach affected the mothers. "Moms feel like their opinions matter and that they can contribute to the care of their infants," noted Young. "For

"For the first time, many of these moms feel valued, and that's critical to improving care."

Dr. Leslie Young

the first time, many of these moms feel valued, and that's critical to improving care." Despite these observed benefits of the ESC approach, many questions remain, both regarding the ESC approach as well as other issues regarding providing the best care for infants with NOWS and their families. "For example, it's critical to know if there is any difference in later outcomes of infant and family

wellness," explained Merhar. "We are treating fewer babies pharmacologically, but is that better? And when they do need pharmacologic treatment, is one drug better than another?" Several ongoing studies in the ACT NOW research program are addressing these and other questions, including a study following some of the ESC study participants for 2 years.

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Dialogue: Learning Across *the* HEAL Landscape



Dr. Helene Langevin, Director of the National Center for Complementary and Integrative Health
Dr. Lindsey Criswell, Director of the National Institute of Arthritis and Musculoskeletal and Skin Diseases

The whole of the NIH HEAL Initiative is greater than the sum of its parts, and large collaborative projects can be tremendously successful for moving science forward. These were the main premises discussed in a dialogue session between HEAL Executive Committee members Dr. Lindsey Criswell, Director of the National Institute of Arthritis and Musculoskeletal and Skin Diseases, and Dr. Helene Langevin, Director of the National Center for Complementary and Integrative Health, and three HEAL investigators. Using the example of four collaborative HEAL programs studying joint pain, the participants explored the benefits of collaborating and learning from each other across the entire HEAL landscape.

The programs used to exemplify this collaborative approach included:

- ▶ Restoring Joint Health and Function to Reduce Pain (RE-JOIN), which focuses on the knee and jaw joints
- ▶ Back Pain Consortium (BACPAC), which is studying back pain and its treatment
- ▶ PRECISION Human Pain Center, which studies molecular and cellular mechanisms of pain signal transmission
- ▶ The myofascial pain program, which focuses on imaging and other biomarkers of pain treatment responses.

Although these programs address seemingly disparate research areas, Criswell



Information from
**translational
and clinical
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basic research.

suggested that researchers should explore how findings from one program can be applied to questions in other programs, or how resources and insights could be shared. “We need to address the whole system. We need to integrate information across all domains—from environment, behavior, and mechanics to tissue, and cellular and molecular processes,” she said.

Langevin provided some specific examples for how the four pain-focused programs could inform one another’s progress. For example, as part of the RE-JOIN research program, animal studies are used to determine how



One challenge for **successful collaboration** and integration is identifying the **most promising overlap** between programs.

different joint tissues behave during certain movements. The translation of these insights to human patients can benefit from findings from the myofascial biomarker program. Similarly, information gained through analyses of the innervation of knee and jaw joints in the RE-JOIN program or through the myofascial biomarker program may be applicable to the treatment of back pain in the BACPAC research program. She likened the different programs to separate puzzle pieces that may eventually merge into a coherent picture. “Not all pieces of the puzzle are filled in, but we will keep working until everything is filled in and we understand how to help people with a wide variety of types of musculoskeletal pain,” Langevin said.

“We need to address the whole system. We need to integrate information across all domains—from environment, behavior, and mechanics to tissue, and cellular and molecular processes.”

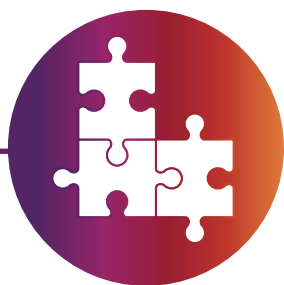
Dr. Lindsey Criswell

The traditional linear view of research progressing from basic science to translational research and, ultimately, to clinical trials is not always accurate. Information from translational and clinical research also can inform basic research. However, even if various programs form large, complex ecosystems, Criswell emphasized, “the key issue is how to keep the focus on the clinical experience, on the patient, at the forefront of our minds.”

One challenge for successful collaboration and integration is identifying the most promising overlap between programs. Doing so can improve how plans are shared across programs to make sure the right targets are addressed, said Re-JOIN scientist Dr. Alejandro Almarza from the University of Pittsburgh. Criswell

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Dr. Helene Langevin

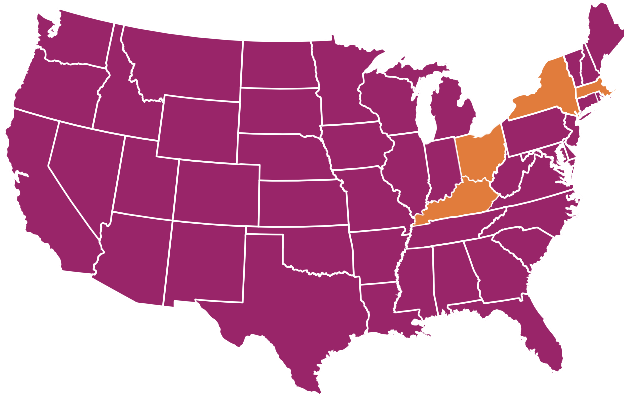


HEAL’s cooperative research approach yields **exceptionally complex and rich data**, which can be leveraged to **improve treatments** for both pain and addiction.

agreed that moving forward requires a certain culture change that can only be solved if the research community comes together to identify and address common challenges through coordinating their efforts. BACPAC researcher Dr. Matthew Mauck from the University of North Carolina noted that HEAL’s cooperative research approach yields exceptionally complex and rich data, which can be leveraged to improve treatments for both pain and addiction. Criswell suggested that this challenge is being met through the HEAL Data Ecosystem that uses standardized common data elements. She noted that HEAL leadership is always interested in learning how to facilitate cooperation between teams and implement new ways of leveraging the data.

Dr. Ziyang Yin from the Mayo Clinic, a researcher who is part of the HEAL myofascial pain program, asked about how to collaborate outside HEAL. Criswell explained that some external NIH collaborations already exist—for example, with NIH’s Accelerating Medicines Program and the NIH Common Fund program to address the transition from acute to chronic pain.

The HEALing Communities Study: Empowering Communities *to* Combat Opioid Overdose Deaths



The study is conducted in **67 rural and urban communities** in **four states** hit hard by the opioid crisis:

**KENTUCKY,
MASSACHUSETTS,
NEW YORK,
AND OHIO.**

One of the NIH HEAL Initiative's largest projects, the HEALing Communities Study, investigates the implementation of evidence-based practices to reduce overdose deaths in real-life settings in diverse communities. In a dedicated session, several HEAL scientists provided an overview of the study and its progress to date.

The study is conducted in 67 rural and urban communities in four states hit hard by the opioid crisis: Kentucky, Massachusetts, New York, and Ohio. It is being conducted in two phases, to compare outcomes. The first set of communities chose among a “menu” of evidence-based interventions (the “Communities That HEAL” program). The other half were considered control communities that chose

interventions after data has been collected from the first phase; Wave 2 began in July 2022. Evidence-based interventions are numerous but fall into three categories: strategies related to opioid education and naloxone distribution, measures to promote medication treatment for opioid use disorder, and safer prescribing practices to reduce opioid use. Other activities include community engagement driven by community coalitions and health communication campaigns. Dr. Emmanuel Oga of Research Triangle International reported that despite complications caused by the COVID-19 pandemic, the study counts many achievements to date. The first wave of communities implemented 718 interventions, and participating investigators provided more

than 6,000 hours of training and technical assistance to their local partners. Additionally, communication campaigns developed more than 6,000 products to raise awareness of naloxone, reduce stigma, and increase demand for medications for opioid use disorder.

Detailed results of HEALing Communities Study interventions and communication campaigns are still being evaluated, but it is already clear that the research had a significant impact on local communities. Massachusetts communities saw increases in adoption of medications for opioid use disorder, admissions to treatment programs, and referrals to treatment providers prescribing buprenorphine. In Kentucky, numerous partnerships in various settings

Detailed results of HEALing Communities Study interventions and communication campaigns are still being evaluated, but it is already clear that the research had a significant impact on local communities.

were established, and many individuals were connected to treatment. In Ohio, successful cooperation with faith-based organizations helped to reach Black communities and women. In New York communities, geotargeting approaches were used to place naloxone boxes in locations with high need, such as train stations, parking lots, or motels.

“These examples highlight the ability and intention of the research to support communities in selecting tailored interventions that are specific to each community’s context and which have high feasibility and high impact,” Oga stated.

Dr. Edward Nunes of Columbia University described in more detail which types of

interventions communities chose from a large catalog of options. Communities were required to implement a minimum of five interventions, which had to include one opioid education/naloxone distribution strategy, three strategies to expand medication treatment for opioid use disorder, and one safer opioid prescribing strategy. However, in all four states, communities selected far more strategies than required. “This clearly reflects the perceived need in these communities for interventions at multiple levels,” Nunes concluded.

The team learned that communities were most likely to choose additional opioid education/naloxone distribution measures, which are easiest to implement. Among measures to promote medication treatment for opioid use disorder, those that enhanced treatment access were more popular than those that sought to create new treatment slots, particularly for methadone



The first wave of communities implemented **718 INTERVENTIONS**, and participating investigators provided more than **6,000 HOURS** of training and technical assistance to their local partners.

“It’s important to customize and localize campaigns and to understand cultural stigma and barriers so that we can work around them.”

Dr. Nicky Lewis

treatment. “This likely reflects the regulatory environment, particularly for methadone treatment, and also stigma around methadone,” Nunes suggested. The research teams are now evaluating how the research findings affect overdose death outcomes.

Health communication campaigns are an integral part of the HEALing Communities Study. In each participating community, researchers, communication experts, and community coalitions co-designed three campaigns to increase demand for and availability of naloxone, reduce stigma associated with medication treatment for opioid use disorder, and encourage people to seek treatment. These

campaigns were tailored to individual communities and featured personal narratives to reach local audiences. To study their impact, research teams conducted surveys before and after implementation of the community-targeted messaging.

“We found that communication campaigns can reduce stigma and support adoption and use of evidence-based practices,” reported Dr. Nicky Lewis of the University of Kentucky. For example, after the campaigns, more community individuals reported that they:

- ▶ Had heard about the HEALing Communities Study.
- ▶ Knew where to find treatment for opioid use disorder.

- ▶ Recently suggested treatment for opioid use disorder to others or their loved ones.
- ▶ Were willing to carry naloxone to help people with an overdose.

The team also saw some improvement in reducing stigma toward opioid use disorder; however, more work needs to be done to build on this early progress. “We must build communication planning into community interventions from the beginning,” Lewis said. “It’s important to customize and localize campaigns and to understand cultural stigma and barriers so that we can work around them.”

Making Data Speak: *The Promise of the HEAL Data Platform*



Dr. Stanley Ahalt, University of North Carolina at Chapel Hill
Dr. Jessica Mazerik, NIH HEAL Initiative
Dr. Robert Grossman, University of Chicago

Through its Data Ecosystem, the NIH HEAL Initiative is at the forefront of integrating technology and practices to rapidly share HEAL-generated data, digital assets, and results. This open science approach—and participation by all HEAL researchers—is essential for addressing the opioid crisis devastating American communities. Dr. Jessica Mazerik, Director of the HEAL Data Ecosystem; Dr. Robert Grossman of the University of Chicago; and Dr. Stanley Ahalt of the University of North Carolina at Chapel Hill provided an overview of HEAL’s innovative data sharing **platform**.

What is a data ecosystem?

HEAL has established a Data Ecosystem to revolutionize data reuse and facilitate new connections between seemingly disparate datasets. Grossman emphasized that more and more

data are arriving in data repositories, but knowing which repositories to search, and going to many different places to find and retrieve datasets, is challenging and tedious. The HEAL Platform is at the heart of its data ecosystem and allows

discovery and analysis of well-annotated, ready-to-use datasets across multiple data repositories.

Why is the HEAL Data Ecosystem important?

Metadata adds substantial value to raw data from any study. Metadata is “data about data,” such as the type of study conducted or types of variables measured. By analyzing metadata across multiple studies, researchers can increase knowledge, uncover relationships, and gain insights into pathways and mechanisms that may ultimately identify new treatments or treatment targets. Moreover, metadata are open and publicly accessible even if

“It starts with planning what data will be collected and how it’s collected, collecting and capturing all of the relevant information as the study progresses, and depositing it in the right repository so that we know where things are.”

—Dr. Stanley Ahalt

associated raw data are sensitive or proprietary. “The time and energy we spend now in doing this collection of metadata will pay off because we’ll be able to reuse this data for years to come,” Ahalt explained.

What do researchers need to do?

HEAL investigators play a critical role in making these cutting-edge efforts broadly successful. HEAL researchers are required to register their studies with the HEAL Data Ecosystem, submit HEAL-defined metadata, and plan their data management and sharing early in the study

planning. “This is not work we can do at the end of a study,” Ahalt said. “It starts with planning what data will be collected and how it’s collected, collecting and capturing all of the relevant information as the study progresses, and depositing it in the right repository so that we know where things are.”

Researchers can obtain more information about the HEAL Data Ecosystem, what they need to do to **comply with HEAL’s data sharing policy**, access to the HEAL Platform, and more on the **HEAL website**.



The HEAL Platform is at the heart of its **data ecosystem** and allows discovery and analysis of **well-annotated, ready-to-use datasets** across multiple data repositories.



Members of the HEAL Data Ecosystem team

Scientific Symposia

Exploring New Biology, Inviting Diverse Views, and Adapting Current Systems: HEAL Research in Progress

Engaging Diverse Perspectives for Innovation and Impact

This Scientific Symposium led by Dr. Tamara Haegerich from the National Institute on Drug Abuse examined challenges involved in engaging people with lived experience and community members to form meaningful partnerships in scientific research projects. It also presented some strategies to overcome these challenges.

Dr. Megan Bennett Irby from Wake Forest University discussed the importance of advancing health equity in pain management. This goal should be incorporated across all stages of a research project, from study design to implementation, analysis, and dissemination of findings. Two presenters gave examples of community engagement in HEAL-funded studies. Ms. Beth Hribar from the Albert Einstein College of Medicine focused on engaging people with lived experience in the research and described some strategies for effective

engagement that were employed in the Integrative Management of chronic Pain and OUD for Whole Recovery: The IMPOWR Research Center at Montefiore/Einstein pilot project for addressing chronic pain and opioid use disorder. Similarly, Ms. Lauren Perron from Temple University described how the perspective of the affected community was incorporated in a study analyzing the challenges of linking people under community supervision to medication treatment for opioid use disorder. This research helped identify barriers to treatment access as well as linkage gaps in various systems. Finally, Ms. Jessica Hulseley from the Addiction Policy Forum presented the Justice Community Opioid Innovation Network's (JCOIN) framework for stakeholder engagement. Her presentation focused on how stakeholders can be engaged to amplify dissemination and implementation efforts.



Dr. Megan Bennett Irby, Wake Forest University



Ms. Jessica Hulseley, Addiction Policy Forum

Systems as Change Agents to Break Implementation Barriers



Dr. Gracelyn Cruden,
Oregon Social Learning Center

In this Scientific Symposium, which was led by Dr. Tisha Wiley from the National Institute on Drug Abuse, the presenters discussed practices that can increase access to treatment and implementation of best practices for opioid use disorder and chronic pain.

Dr. Nasim Sabounchi from the City University of New York discussed how system dynamics modeling is used to support action planning and implementation of evidence-based practices to reduce opioid overdoses and fatalities in the New York division of the HEALing Communities Study. This approach was used, for example, to predict the impact

of various interventions in the HEALing Communities Study. Dr. Grace Cruden from the Oregon Social Learning Center noted that financial and resource costs are a main factor determining the adoption of treatments or programs, as well as their success and sustainability. She shared evidence-based tools to anticipate and account for implementation and intervention costs. Ms. Morgan Justice from the Kaiser Permanente Washington Health Research Institute discussed implementation barriers that may affect pragmatic clinical trials, using the example of a study assessing acupuncture for the treatment of back pain in older adults. These trials often face system-dictated barriers that require flexibility and creativity. The final presentation came from Dr. Dale Klatzker from Gaudenzia Inc., a substance-use treatment provider that partners with the JCOIN research program. He described strategies for overcoming resistance and stigma during implementation of medication treatment for opioid use disorder while moving away from abstinence-only treatments in a large treatment organization.



Financial and resource costs are a **MAIN FACTOR** determining the adoption of treatments or programs.

Neuronal Insights for the Development of Novel Pain and Opioid Use Disorder

This Scientific Symposium, which was led by Dr. Ted Zheng from the National Institute of Arthritis and Musculoskeletal and Skin Diseases, presented new insights into molecular mechanisms contributing to the actions of opioids as well as pain development.

Two presentations focused on mechanisms of actions of opioids. Dr. Lingyong Li from the University of Alabama at Birmingham reported on the identification of a protein called Tiam1 that is essential for the development of tolerance to the pain-relieving effects of opioid medications. Studies using mice in which Tiam1 was eliminated helped identify the protein's role in tolerance development. Dr. Sung Han from the Salk Institute for Biological Studies presented findings to explain how morphine's opposing actions in the brain can define opioid preference versus opioid seeking. In some brain areas, morphine activates cells producing mu opioid receptors, whereas in

other brain areas morphine inhibits such cells. The other two presenters addressed pain mechanisms. Dr. Armen Akopian from the University of Texas is investigating the mechanism underlying chronic pain in jaw muscles (masseter muscle) in patients with chronic myogenous temporomandibular disorder (TMD-M). Breakdown of structural molecules between cells (extracellular matrix) in the masseter muscle and activation of the immune system resulting from this degradation are key for the transition to chronic pain. Dr. Catherine Chong from the Mayo Clinic and Dr. Jing Li from the Georgia Institute of Technology described the identification of a biomarker signature to predict persistence of headaches that occur after a concussion or mild traumatic brain injury and which in some patients can last for days or months. This biomarker combined information from patients with findings of magnetic resonance imaging (MRI) of the brain.



Dr. Ted Zheng, National Institute of Arthritis and Musculoskeletal and Skin Diseases



Dr. Armen Akopian, University of Texas Health Science Center



Dr. Jing Li, Georgia Institute of Technology

Technology-Focused Treatments for Pain and Opioid Use Disorder



From left to right: Dr. Bin He, Carnegie Mellon University, Dr. Jiande Chen, University of Michigan, Dr. Eric Hudak, National Institute of Neurological Disorders and Stroke, Dr. Ali Rezai, West Virginia University

Device-based technologies hold promise as alternatives to pharmacological treatment of opioid use disorder or chronic pain. In this Scientific Symposium facilitated by Dr. Eric Hudak from the National Institute of Neurological Disorders and Stroke, researchers introduced promising new devices.

Two of these approaches aim to relieve pain. Dr. Jiande Chen from the University of Michigan described optimization of a technique called transcutaneous electrical acustimulation for the treatment of abdominal pain. With this technique, acupuncture points in the vicinity of targeted peripheral nerves are electrically

stimulated using a wearable device. Dr. Bin He from Carnegie Mellon University reported on the use of noninvasive, focused ultrasound neuromodulation to treat pain associated with sickle cell disease. Following promising studies in animals, the researchers are now investigating this approach in larger animals and conducting a feasibility study in humans. Technology-focused approaches also are being investigated for opioid use disorder. Dr. Ali Rezai from West Virginia University discussed deep brain stimulation for the treatment of refractory opioid use disorder. In a recent study, three of four participants showed

abstinence or only isolated relapse after the procedure, and all reported reduced craving, anxiety, and depression. Dr. Alejandro Covalin from Spark Biomedical described a technique known as transcutaneous auricular neurostimulation that uses electrical stimulation of the nerves in the head (cranial nerves) via a wearable patch. In a clinical trial, people with opioid use disorder receiving the treatment reported clinically meaningful reductions in craving and other improvements in health.

Targeting Health Systems to Treat Co-Occurring Disorders



Dr. Beth Ann Griffin, RAND Corporation

People with opioid use disorder often also have mental health problems. Adults with mental health problems are prescribed 50% of all opioid medications but often do not receive the care they need for their mental health and opioid use problems. This Scientific Symposium led by Dr. Mike Freed from the National Institute of Mental Health explored how health systems can be adapted to improve treatment of people with co-occurring opioid use disorder and mental health problems.

Three presenters described ongoing studies assessing treatments for patients with opioid use disorder and mental health problems. Dr. Katherine Bradley from the

Kaiser Permanente Washington Health Research Institute presented an ongoing pragmatic trial to evaluate whether a collaborative care model can increase treatment engagement for opioid use disorder and improve depression in people with both disorders. Similarly, Dr. Beth Ann Griffin from the RAND Corporation described a trial evaluating a collaborative care approach for people with opioid use disorder with co-occurring depression and/or post-traumatic stress disorder (PTSD). Dr. Johanna Starrels from the Albert Einstein College of Medicine described three hybrid effectiveness-implementation trials of integrated care for people with opioid use disorder and chronic pain with or without mental health problems; the trials are part of HEAL's IMPOWR program. The complex relationships between prescription opioids, chronic pain, and suicidal behavior were reviewed by Dr. Robert Aseltine from the University of Connecticut. Among people without chronic pain, those who received frequent opioid prescriptions, regardless of dose, had a higher suicide risk, whereas among people with chronic pain, those who received opioids had a lower suicide risk.



Adults with mental health problems are **prescribed 50% OF ALL OPIOID MEDICATIONS** but often **do not receive the care** they need for their mental health and opioid use problems.

Scientific Symposia

Understanding Community Perspectives and Innovating in Treatments for an Evolving Crisis: HEAL Research in Progress

Scientific Solutions to Mitigate Stigma



Dr. TaLisa Carter, American University



Dr. Jane Atkinson, National Center for Advancing Translational Sciences

People with chronic pain and/or substance use disorders often face stigma, including from healthcare providers. This may interfere with the care these individuals are receiving. This Scientific Symposium led by

Dr. Jane Atkinson from the National Center for Advancing Translational Research discussed scientific solutions to mitigate stigma.

Dr. Carla Bann from RTI International described stigma experienced by pregnant women with opioid use disorder based on data from the ACT NOW Outcomes of Babies with Opioid Exposure (OBOE) study. For these women, real or perceived stigma may impact their care and, consequently, the development of their child. Dr. Brianna Norton from the Albert Einstein College of Medicine introduced a universal training to reduce stigma when conducting research with people who use drugs. Insufficient training and structural or personal stigma can hamper research in this population. Dr. Nora Nock from Case Western Reserve University discussed the issue of multidimensional stigma experienced by people with substance use disorder. She also described implicit bias of



Dr. Nora L. Nock, Case Western Reserve University

providers of treatment for substance use disorders toward their clients. Similarly, Dr. TaLisa Carter from American University presented results of surveys of staff in community facilities and jails providing medication treatment for opioid use disorder to determine their perceptions on the effectiveness and appropriateness of various medications. The study found that community providers and jail staff differed in how they viewed the different medications; interagency collaborations between jails and community institutes also influenced attitudes and opinions.

Increasing Access to Innovative Treatment and Prevention Services



Dr. Marc Fishman,
Maryland Treatment Centers

This Scientific Symposium, which was facilitated by Dr. Amy Goldstein from the National Institute on Drug Abuse, focused on strategies developed by HEAL-funded researchers to increase access to effective prevention and treatment services in various populations.

Two presenters described interventions aimed at youth. Dr. Lynn Fiellin from Yale University presented a digital intervention—the videogame PlaySmart—to prevent the initiation of opioid misuse in older adolescents. The intervention has received media interest and has been added to

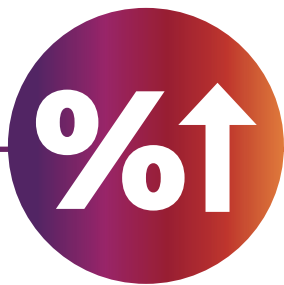
the U.S. Surgeon General's advisory list of resources around mental health for adolescents. Dr. Marc Fishman from Maryland Treatment Centers gave an update on the Youth Opioid Recovery Support (YORS) project to improve treatment for opioid use disorder in youth. Analyses after 6 months found greater medication adherence and lower relapse rates among youth receiving the YORS intervention than in a control group. Veterans with co-occurring chronic pain and opioid use disorder are the target group of an integrated treatment described by Dr. Katie Witkiewitz from the University of New Mexico. In an initial study, the intervention, which combines Acceptance and Commitment Therapy with Mindfulness-Based Relapse Prevention, significantly reduced opioid use, pain interference, and pain intensity. Dr. Richard Schottenfeld from Howard University reported on efforts to increase engagement and retention in medication treatment for opioid use disorder in the Black community through



Analyses after
6 MONTHS found
greater medication adherence and lower relapse rates among youth receiving the YORS intervention than in a control group.

community partnerships. A pilot study is testing a program to address barriers to treatment by providing medication treatment in a faith-based, nonmedical community center using telemedicine and peer care providers.

Developing and Implementing Treatments to Address the Polysubstance Use Crisis



A high percentage of **OVERDOSE DEATHS** involve another **opioid, stimulant, prescription drug, or alcohol**—often unintentionally.

In recent years, a high percentage of overdose deaths involve another opioid, stimulant, prescription drug, or alcohol—often unintentionally. This Scientific Symposium led by Dr. Kristen Huntley from the National Institute on Drug Abuse presented efforts from preclinical studies to clinical trials to address the complexities of treatment for polysubstance use.

Dr. George Uhl from the University of Maryland described efforts to identify new targets for treatment of polysubstance use.



Dr. George Uhl, University of Maryland School of Medicine

The research focuses on a gene that influences vulnerability to several substance use disorders and which is active in neurons involved in drug reward but also pain signaling. Dr. Babak Esmaeli-Azad from CellCure/CiBots Inc. introduced his company's NarcoBond technology. It comprises tiny microspheres that carry "decoy" receptors for one or more drugs. When circulating in the body, the spheres act as sponges that soak up the drugs without entering the brain. Dr. Jennifer McNeely from New York University summarized two studies from the NIDA Clinical Trials Network that address unhealthy opioid and polysubstance use in



Dr. Babak Esmaeli-Azad, CellCure (CiBots, Inc.) and Dr. Kristen Huntley, National Institute on Drug Abuse

primary care settings. The ongoing Subthreshold Opioid Use Disorder Prevention Trial (STOP) employs collaborative care to reduce risky opioid use; a second trial plans to adapt and intensify this model to address polysubstance use.

Dr. Lisa Saldana from the Oregon Social Learning Center presented the Families Actively Improving Relationships intervention that was originally developed to help families involved with the child welfare system. It addresses substance use, mental health, parenting issues, and other social determinants of health using comprehensive services delivered by a single provider.

Innovative Therapeutic Strategies for Pain and Opioid Use Disorder



From left to right: Dr. Brett Tounge, Mebias Discovery, Inc., Dr. Roy Clifford Levitt, University of Miami Miller School of Medicine, Dr. David White, National Institute on Drug Abuse, Dr. Iván Montoya, National Institute on Drug Abuse, Dr. Marco Pravetoni, University of Washington School of Medicine

This Scientific Symposium, which was facilitated by Dr. Iván Montoya and Dr. David White from the National Institute on Drug Abuse, presented novel compounds and strategies that are currently being developed for the treatment of pain and opioid use disorder.

Two presenters discussed approaches aimed at pain management. Dr. Roy Clifford Levitt from the University of Miami reported on progress in developing a disease-modifying gene therapy for treatment of chronic pain in the knee. It uses DNA encoding a protein piece (peptide) with pain-relieving properties and, in animal studies,

showed evidence of long-lasting pain relief. Dr. Brett Tounge from Mebias Discovery, Inc., reviewed findings of preclinical studies of a new non-addictive pain medication called MEB-1170. The compound acts on the same mu-opioid receptor as opioid drugs and in animal models was as effective as morphine at relieving pain. Two other presentations focused on opioid use disorder. Dr. Marco Pravetoni from the University of Washington described the development of vaccines and monoclonal antibodies for people with opioid and other substance use disorders or at risk of exposure. Initial clinical trials of a vaccine that targets oxycodone,

hydrocodone, and oxycodone are ongoing, and vaccines for fentanyl or other drugs are being developed and tested in animals. Monoclonal antibodies can be used as treatment after drug exposure to prevent fatal overdoses. Dr. Nurulain Zaveri from Astraera Therapeutics described a next-generation pharmacotherapy for opioid use disorder based on improving buprenorphine treatment. In animal studies, their compound AT-121 was more potent than morphine at relieving pain, decreased reinforcing effects of oxycodone, produced no physical dependence, and had no abuse potential.

Presentation of HEAL Director's Awards



HEAL was excited to announce five inaugural NIH HEAL Initiative Director's Awards for 2023.

HEAL researchers and NIH scientific staff were encouraged to nominate colleagues who are making a uniquely meaningful impact on HEAL research.

At the meeting, HEAL Director Dr. Rebecca Baker recognized researchers across the research spectrum in the categories of Trailblazer, Excellence in Research, Interdisciplinary Collaboration, Community Engagement, and Mentorship.

Those selected as Trailblazer awardees presented their work during the plenary session, "The Future of HEAL: Trailblazer Awards Announcement and Presentations." An additional 10 researchers were awarded a Trailblazer honorable mention and recognized during a poster session. Read about the awardees below.

HEAL Director's Trailblazer Award

The HEAL Director's Trailblazer Award recognizes HEAL-funded researchers in the early to middle stages of their careers, across all disciplines, who are applying an innovative approach or creativity in their research or are expanding HEAL research into addressing the pain and opioid crisis in new directions. The 2023 awardees demonstrate the ability to develop or apply novel techniques, approaches, models, or methodologies to HEAL research.



Meredith Adams M.D., M.S., is an Associate Professor of Anesthesiology, Biomedical Informatics, Physiology & Pharmacology, and Public Health Sciences at Wake Forest University. She helps design informatics solutions that connect projects and data sets for the Integrative Management of Chronic Pain and OUD for Whole Recovery (IMPOWR) program and for the HEAL Data 2 Action program.



Amanda Bunting, Ph.D., is an Assistant Professor at the New York University Grossman School of Medicine, where she is a principal investigator for a project that adapts a trauma intervention for people with polysubstance use who also experienced trauma. She is quickly becoming a high-impact leader of polysubstance use research.



Ryan Logan, Ph.D., is an Associate Professor at the University of Massachusetts Medical School whose research investigates how circadian rhythms are disrupted in people with opioid use disorder. He is an innovative researcher who implements a broad range of cutting-edge strategies that bridge multiple disciplines.



William Renthal, M.D., Ph.D., is an Assistant Professor of Neurology and Director of Headache Research at Brigham and Women's Hospital and Harvard Medical School. He is Program Director of the Harvard PRECISION Human Pain Center and an accomplished researcher studying the pathophysiology of chronic pain.



Chelsea Shover, Ph.D., is an Assistant Professor-in-Residence at UCLA School of Medicine. Her innovative research project unites "big picture" epidemiology with "local picture" community-based research to predict where fatal and nonfatal overdoses are likely to occur in Los Angeles County, so that treatment and harm reduction services can be targeted appropriately.

HEAL Director's Award for Excellence in Research

The Director's Awards for Excellence in Research recognize individuals who excel in their research, have had a major transformative impact in their field, and have demonstrated leadership in the scientific community.



Gail D'Onofrio, M.D., M.S., is the Albert E. Kent Professor of Emergency Medicine at Yale School of Medicine. She is the lead investigator of the "Emergency Department-Initiated buprenorphine and VALIDaTION Network Trial" (ED-INNOVATION). Her work has changed clinical practice by showing that emergency department-initiated buprenorphine can increase engagement in addiction treatment for people with opioid use disorder.



Lisa Saldana, Ph.D., is a Senior Research Scientist at the Oregon Social Learning Center. She is the Principal Investigator on two programs that use evidence-based approaches to help underserved families to overcome mental health and substance use problems. The projects, which are implemented in several Oregon clinics, have garnered support for sustainment and policy changes from the state of Oregon.



Gregory Scherrer, Ph.D., is an Associate Professor at the University of North Carolina, Chapel Hill and is Principal Investigator for a project that seeks to discover targets in the brain that are responsible for the unpleasant experience associated with pain. He uses a wide range of approaches to untangle the shared circuitry of the sensory, affective, and cognitive dimensions of the pain experience and opioid signaling.

HEAL Director's Award for Interdisciplinary Collaboration

The Director's Awards for Interdisciplinary Collaboration are for individuals who look beyond their primary research areas. These individuals broker relationships across fields of science and have established collaborations that integrate diverse levels of analysis, methodologies, ways of thinking, and/or scientific communities.



Sean Murphy, Ph.D., is an Associate Professor of Population Health Sciences at Weill Cornell Medical College and a health economist engaged with the Justice Community Opioid Innovation Network (JCOIN). As part of this project, he collaborates with criminal-legal partners, public health colleagues, implementation scientists, treatment providers, and others to evaluate the economic impact of the interventions.



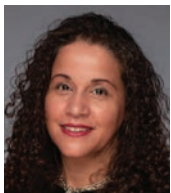
Daniel Rotroff, Ph.D., is an Assistant Professor of Medicine at the Cleveland Clinic. He is leading a transdisciplinary project to identify risk of chemotherapy-induced neuropathic pain in breast cancer patients. The team he manages across numerous study sites includes researchers and clinicians from a wide range of disciplines, as well as nurses, data scientists, and coordinators.



Sharon Walsh, Ph.D., is a Professor and Director of the Center on Drug and Alcohol Research at the University of Kentucky's College of Medicine and the Principal Investigator of the Kentucky section of the HEALing Communities Study. Recognizing the study's scope, she has assembled a diverse group of more than 20 faculty from seven colleges at the University of Kentucky as well as developed external collaborations for additional expertise.

HEAL Director's Award for Community Partnership

The Director's Awards for Community Partnership recognize individuals who have demonstrated a commitment to community engagement and have established community relationships characterized by respect, equity, and engagement in multiple phases of their research.



Linda Sprague Martinez, Ph.D., is an Associate Professor at the Boston University School of Social Work. As a nationally recognized expert in community engagement and participatory research, she is Co-Director of the Massachusetts Community Engagement Core of the HEALing Communities Study. She has helped establish community advisory boards and infused racial equity throughout the study.



Kamila Venner, Ph.D., is an Associate Professor of Psychology and Scientist at the Center on Alcohol, Substance use, and Addictions at the University of New Mexico; she is Principal Investigator of an IMPOWR project to improve opioid and pain treatment in Native American communities. She focuses on ameliorating the substantial substance-related health inequities faced by Native Americans and is committed to developing culturally centered approaches to improve treatment outcomes.



Deanna Wilson, M.D., M.P.H., is an Assistant Professor of Family Medicine and Community Health at the University of Pennsylvania. She acts as lead for community engagement and health equity for the Pittsburgh Center of the IMPOWR program. Through her work, she has ensured community members, including non-English speaking immigrants, were encouraged and able to participate in all stages of the research process.

HEAL Director's Award for Mentorship

The Director's Awards for Mentorship recognize individuals who support the career trajectories of mentees and prepare them to become successful mentors themselves. They are also committed to inclusion, diversity, and creating a supportive research environment in their institutions.



Erin Bonar, Ph.D., is an Associate Professor at the University of Michigan and a Principal Investigator for a project to optimize interventions that seek to prevent opioid use disorder among adolescents and young adults visiting the emergency department. She has supported a diverse group of mentees—particularly women, first-generation students, and underrepresented scientists. Her mentorship addresses tangible research goals as well as career development, managing professional relationships and networking, and maintaining work-life balance.



Jessica Merlin, M.D., Ph.D., M.B.A., is a Professor of Medicine at the University of Pittsburgh and involved in a project that is part of the IMPOWR program and works on developing effective, equitable, and sustainable interventions for chronic pain and opioid use disorder, particularly in rural and Black communities. Her mentorship has helped numerous scientists develop into independent investigators and leaders themselves. She especially creates opportunities to promote individuals from underrepresented groups in science.



Thaddeus Tarpey, Ph.D., is a Professor and Ph.D. Program Director at the New York University Grossman School of Medicine. Throughout his career, he has mentored 40 individuals, including undergraduate students, Ph.D. students, medical professionals, postdoctoral trainees, junior faculty, and other early career scientists. His mentees benefit from his example of integrity, standards of personal excellence, gentle leadership, and supportive learning environment.



Katie Witkiewitz, Ph.D., is Distinguished Professor and Director at the University of New Mexico. She is the Principal Investigator of the University's IMPOWR Center. She has shown ongoing commitment to mentoring, justice, diversity, equity, and inclusion, successfully mentoring numerous predoctoral, postdoctoral, and early career investigators from a wide range of historically marginalized and minoritized groups.



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