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Implementation Science

Surgeon's TRI Program Project Reduces Opioid Prescribing



Kyle Kalkwarf, M.D., used the knowledge he gained in the two-year TRI Implementation Science Scholars Program to implement his successful opioid reduction project.

UAMS surgeon Kyle J. Kalkwarf, M.D., wanted to address opioid prescribing practices in the surgical intensive care unit (SICU) after hypothesizing that some patients were receiving higher doses than necessary. As an initial step, he conducted a study that found a 45% difference between the highest and lowest prescribing physicians from January 2019 to June 2020.

He believed that with the right approach, his group of SICU surgical intensivists could significantly reduce opioid prescribing, and they would do it by choice.

He was right. Kalkwarf's novel approach, developed in the TRI Implementation Science Scholars Program,

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Dear Colleagues,

In this issue of The TRIBune, we share an inspiring story that highlights the impact of implementation science and the crucial role it can play in improving medical practices.

Kyle Kalkwarf, M.D., a surgeon at UAMS, recognized the need to address opioid prescribing practices in the surgical intensive care unit (SICU). As a TRI Implementation Science Scholars Program participant, he documented significant variation in opioid doses administered by surgeons, highlighting the potential for improvement.

With guidance from Geoffrey Curran, Ph.D., who leads the TRI scholars program and the UAMS Center for Implementation Research, Dr. Kalkwarf implemented a novel strategy that resulted in a remarkable 20% reduction in opioid dosing for surgery patients on ventilators.

Dr. Kalkwarf's project was a powerful motivator for change. By receiving transparent data on their prescribing practices, the surgeons could compare their performance with peers,

leading to a healthy competition and a desire to improve patient care.

This success story exemplifies how implementation science can address issues that transform medical practices. By adopting evidence-based interventions and applying implementation science principles, we can bridge the gap between knowledge and action. Ultimately we will deliver higher quality care and improve patient outcomes.

Let us all be inspired by Dr. Kalkwarf's work as we strive to integrate implementation science into our own research and clinical practices.

Sincerely,

Laura James, M.D.
Director, TRI

Kyle Kalkwarf, M.D., used a novel approach to produce a 20% reduction in opioids prescribed for surgery patients on ventilators.

produced a 20% reduction in opioid use for surgery patients on a ventilator — well above his initial 10% goal.

“The implementation science program gave me a structure and a way to think about the problem. It also allowed me to look at all the ways to ensure buy-in,” said Kalkwarf, who was named UAMS trauma medical director in February 2023.

Quality Mentorship

He was mentored by Geoffrey Curran, Ph.D., who leads the TRI program and directs the UAMS Center for Implementation Research.

“The project evolved quite a bit from my original idea, and I think with TRI’s support and Dr. Curran’s mentorship, we improved its impact,” he said.

Kalkwarf’s goals, based on Centers for Disease Control and Prevention guidelines, are to treat pain using the minimum required dosage and duration in order to decrease the risk of harmful side effects associated with opioid use, such as tolerance and dependence.

“It is not about making patients endure more pain,” said Kalkwarf, an associate professor in the College of Medicine Department of Surgery, Division of Acute Care Surgery. “There are other pain medications that work just as well with few side effects, but the myth is that opioids are better.”

Potency Primer

His two-year project began with a survey of UAMS physicians and nurses, which identified knowledge gaps about opioid potency and morphine milligram equivalents (MME) of different opioids. One way he addressed the lack of transparency with opioid potency was by putting the MME for different opioids on an information card that he provided to SICU residents.

The card shows, for example, how potent fentanyl is compared to oxycodone. A physician can quickly see that the most potent prescribed oral opioid is 10 mg of oxycodone every four hours, or 90 MME per day, while intravenous infusions of fentanyl were commonly ordered at a rate of 960 MME per day.

The most influential piece of his project was a prospectively collected review of opioid prescribing practices for all attending physicians. In collaboration with UAMS data experts, Kalkwarf built a database showing how the physicians compared with their SICU peers. The database allows a prescribing physician to see their prescribing history while maintaining the anonymity of the colleagues to whom they are being compared.

Powerful Motivator

After Kalkwarf determined that his colleagues were confident in the accuracy of the data being collected, he let them know their prescribing practices would be tracked in the coming months by an “audit and feedback” system he developed with UAMS pharmacist Brett Bailey, Pharm.D. Between February 2022 and December 2022, the highest prescribers decreased their MME prescriptions to within the rest of the group’s range, and the overall opioid prescribing for patients on a ventilator decreased by 20%.

“That was a major goal, to decrease the variance,” he said. “It gets us to a more appropriate level to reduce the high tolerance for opioids and avoid withdrawal.”

Kalkwarf believes that allowing his colleagues to see how they compared with their peers was a powerful motivator.

“Surgeons are competitive by nature, so I’m not surprised,” he said.

His colleagues have responded positively. Katie Kimbrough, M.D., an associate professor in the Division of Acute Care Surgery, expressed her gratitude in an email.

“This is really great work,” she said. “I know it has helped me change my practice for the better.”

“This is really great work. I know it has helped me change my practice for the better.” – Katie Kimbrough, M.D.

The TRI Summer Writing Challenge has begun!

Join the 2023 Summer Writing Challenge!



UAMS Translational Research Institute

If you are a UAMS-affiliated researcher and received any TRI support since 2017, you are invited to join your colleagues for this friendly competition and a chance to win one or more great prizes.

Prizes will be awarded based on academic rank. For example, last year, Jennifer Andersen, Ph.D., won the Astounding Apprentice Award for Most Submitted Manuscripts for the Rank of Assistant Professor/Instructor. She also won the Most Reflective of Community Engagement and Partnerships category. Who will be our Astounding Apprentice this year?

Other award categories are:

- Sage Scribe (professors)
- Wise Wordsmith (associate professors)
- Best Representation of Translational Informatics
- Best Representation of Implementation Science

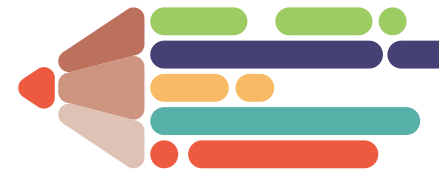
TRI will host a mixer Sept. 7, 3-4 p.m., to celebrate the winners at both the Little Rock and Northwest Arkansas campuses.

Questions?

Contact Nikolas Berardi, ndberardi@uams.edu

Please **submit your manuscripts here** through Aug. 31, or use the QR code.

Scan here



TRI Study of the Month

UAMS Principal Investigator: Larry Johnson, M.D., professor, College of Medicine Department of Internal Medicine; director, Division of Pulmonary and Critical Care Medicine; director, Adult Cystic Fibrosis Program

Summary: A Phase 1b/2a, multicenter study to evaluate nebulized bacteriophage treatment for adults with cystic fibrosis with chronic pseudomonas aeruginosa (PsA) pulmonary infection. The study will determine if the new drug candidate, BX004-A, which contains three bacteriophages, is safe to inhale.

Significance: BX004-A could potentially help patients with chronic PsA lung infections by reducing the amount of PsA in the sputum.

TRI Services: Medicare coverage analysis, study budget development, regulatory support, administration of Clinical Trial Management System, and post-award financial management.

Sponsor: BiomX Inc.



Larry Johnson, M.D. (right), is assisted on the study by TRI's Faryal Jalbani, M.D., MSPH, regulatory affairs specialist II (left) and Monica Smith, B.A., CRS, TRI Regulatory Affairs manager.

Six Early-Career UAMS Researchers Receive KL2 Scholar Awards

Six early-career researchers have been selected to receive two years of funded translational research training and support in the TRI KL2 Mentored Research Career Development Scholar Awards Program.

The promising junior faculty researchers were selected for the 2023-2024 program through a competitive application process. KL2 scholars receive two years of mentored translational research training, 75% salary support and up to \$25,000 a year for research, tuition, travel and education.

Funding for the program comes from TRI, supported by the NIH National Center for Advancing Translational Sciences, Clinical and Translational Science Award KL2 TR003108, Winthrop P. Rockefeller Cancer Institute and Arkansas Children's Research Institute.

The scholars, their project titles and primary mentors are:

Michail Mavros, M.D., assistant professor, College of Medicine Department of Surgery (Oncology)
“Venous Thromboembolism in Pancreatic Cancer Patients Undergoing Pancreatectomy: Risk Factors and Effectiveness of Pharmacoprophylaxis”
Primary Mentor: Mario Schootman, Ph.D.

Brian D. Piccolo, Ph.D., assistant professor, College of Medicine Department of Pediatrics
“Mechanisms by Which Culturally Specific Foods Influence Infant Gut Development and Barrier Function”
Primary Mentor: Mario Ferruzzi, Ph.D.

Megha Sharma, M.D., assistant professor, College of Medicine Department of Pediatrics, Division of Neonatology
“Beyond Race: Objectively Assessed Skin Color and its Association with Pulse Oximeter Bias in Critically Ill Infants”
Primary Mentor: Mario Schootman, Ph.D.

Ankita Shukla, M.D., assistant professor, College of Medicine Department of Pediatrics, Division of Neonatology
“PERFORM: Persistent Effects of Intrauterine Growth Restriction on Infant Brain Development: A Comparative MEG Study”
Primary Mentor: Hari Eswaran, Ph.D.

Alicja Urbaniak, Ph.D., instructor, College of Medicine Department of Biochemistry and Molecular Biology
“Monensin and its Derivatives as Adjuvants to Immune Checkpoint Inhibitors for the Treatment of Metastatic Breast Cancer”
Primary Mentor: Alan Tackett, Ph.D.



The 2023-2024 KL2 Scholars are (l-r, clockwise from top): Katy Allison, Michail Mavros, Brian D. Piccolo, Megha Sharma, Ankita Shukla and Alicja Urbaniak.