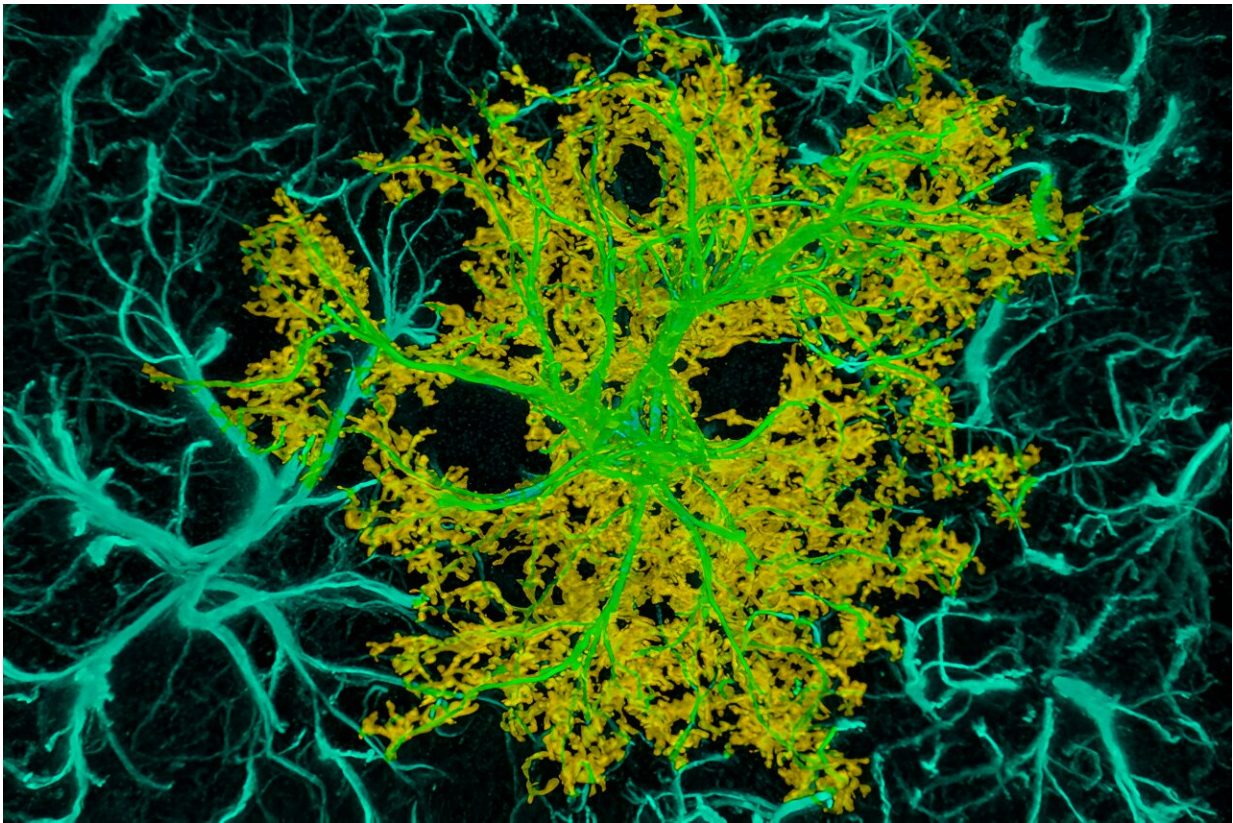


# Could an already approved drug cut down on opioid use after surgery?

January 13 2024, by Josef Blaszkiewicz

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An astrocyte, a type of non-neuronal cell, in the rodent cortex. The outer boundary of the cell is shown in yellow; the cell "skeleton" in teal. Credit: Medical University of South Carolina, Dr. Michael D. Scofield

Researchers in the Department of Anesthesia and Perioperative

Medicine at the Medical University of South Carolina (MUSC) have found that an FDA-approved drug may help to decrease pain after surgery. In the pilot study published in *Pain Management*, spinal surgery patients who received N-acetylcysteine (NAC) during surgery in addition to standard pain control treatments reported lower pain scores and requested fewer opioids after surgery than patients given a placebo.

Opioids are often given for a short time after surgery to treat [pain](#). Although effective, their potency can wain and addictive potential can be dangerous without careful supervision by a health care provider. As such, physicians welcome the opportunity to limit opioid use in managing pain.

"Can we stop giving opiates completely? Likely not. Can we decrease the amount patients need? We should try," said Sylvia Wilson, M.D., the Jerry G. Reves Endowed Chair in Anesthesia Research in the Department of Anesthesia and Perioperative Medicine and a principal investigator of the study.

Wilson has worked for years on efforts to improve [pain management](#) and limit opioid usage after surgical operations. As it turns out, a collaboration with a basic scientist within her own department could offer a solution.

Wilson began to work closely with Michael Scofield, Ph.D., the Jerry G. Reves Endowed Chair in Basic Science Anesthesiology Research and a senior author of the published study. Scofield has conducted laboratory research on NAC, an anti-inflammatory drug that is used to treat acetaminophen poisoning, mushroom poisoning and liver damage. Researchers, such as Scofield, have also studied its effects on the [nervous system](#), especially in the areas of addiction and pain perception. Wilson's clinical goals and Scofield's research on NAC made them ideal collaborators.

"This project is really an elegant synthesis of basic science and [clinical research](#), using things we find have efficacy in the laboratory and taking them to the clinic," said Scofield.

Wilson believes that partnerships between physicians and basic scientists can spur clinical advances. She credits the supportive environment within the department fostered by Chairman Scott Reeves, M.D., and former College of Medicine Dean Jerry G. Reves, M.D., for making such partnerships possible.

## **Promising trial insights**

The research team chose spinal surgery patients for its [pilot study](#) because these patients often experience chronic pain before surgery and are more likely to be exposed to higher levels of opioids before, during and after surgery. During surgery, patients received a standard regimen of anesthesia in addition to a dose of NAC or a saline infusion. Information on patients' pain and opioid consumption was then collected.

In the 48 hours after surgery, patients who were administered NAC via IV infusion (150 mg/kg) received 19% fewer opioid doses on average than patients who received saline. NAC patients also reported lower pain scores and took a longer time to request [pain medication](#) after their surgery than the saline patients. The researchers were especially encouraged to see that the beneficial effect seemed to last longer than the NAC was expected to remain in the body.



Michael Scofield, Ph.D. (left) is the Jerry G. Reves Endowed Chair in Basic Science Anesthesiology Research at the Medical University of South Carolina. Sylvia Wilson, M.D. (right) is the Jerry G. Reves Endowed Chair in Anesthesia Research at MUSC. Credit: Medical University of South Carolina, Sarah Pack

"We've seen the impact of giving this medication persisting, and I think that's significant," said Wilson. "We're not seeing a rebound effect when that medication wears off."

This extended effect on pain perception mirrored previous findings from Scofield's laboratory research.

"For [heroin addiction](#), we had seen in NAC preclinical studies that protection against relapse vulnerability is long lasting," said Scofield.

"Certainly, the hope is that it's something that has a long duration."

## Looking to the future

Next, the research team wants to investigate whether the findings can be translated to other procedures. They are currently enrolling patients undergoing minimally invasive hysterectomies in a larger trial. As more patients are enrolled, the researchers will be able to conduct more in-depth statistical tests to improve their understanding of the effects of NAC on surgery-associated pain. This will help them to set the stage for future clinical trials of NAC during [surgery](#).

"To change practice, you need many large clinical trials with different settings, different types of surgeries to show that you're going to cause benefit, not harm," said Wilson. "We want to show good clinical efficacy, but also safety in that situation."

**More information:** Sylvia H Wilson et al, The impact of intraoperative N-acetylcysteine on opioid consumption following spine surgery: a randomized pilot trial, *Pain Management* (2023). [DOI: 10.2217/pmt-2023-0061](#)

Provided by Medical University of South Carolina

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