

# Inhaling nitric oxide eases pain crises in sickle cell patients

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Dr. C. Alvin Head is chairman of the Department of Anesthesiology at the Medical College of Georgia School of Medicine. Credit: Phil Jones, Campus Photographer

Inhaling nitric oxide appears to safely and effectively reduce pain crises in adults with sickle cell disease, researchers report.

A study of 18 patients in Atlanta, Chicago and Detroit showed that the nine inhaling [nitric oxide](#) for four hours had better pain control than those receiving only the standard self-administered [morphine](#), said Dr. C. Alvin Head, chairman of the Department of [Anesthesiology](#) at the Medical College of Georgia School of Medicine.

"This study shows that you can breathe the gas and have less pain, which is the major reason sickle cell patients are admitted to the hospital," said Head, corresponding author of the study published in the *American Journal of [Hematology](#)*.

A larger study will help define the optimal dose as well as timing and duration for the treatment, Head said. If findings continue to hold, he envisions sickle cell patients, much like asthmatics, having nitric oxide inhalers handy to forestall a full-blown pain crisis. The pain results when sickle cell patients' abnormally shaped hemoglobin impedes oxygen delivery.

"By the time you see a patient in the [emergency room](#) or the clinic, they have a significant amount of pain and you are always playing catch-up," Head said. "The idea would be to use this as early as possible."

While it's not certain how nitric oxide helps, Head has laboratory evidence and some early clinical indications that nitric oxide, which has a great affinity for [hemoglobin](#), restore's hemoglobin's natural shape and charge. The more normal negative charge helps cells repel each other, melts sticky polymers and may prevent new ones from forming. In fact, he suspects that one of nitric oxide's usual duties in the body is to help prevent [clot formation](#).

"If you have pain relief without more narcotic then we must be attacking the problem," Head noted. The study participants receiving nitric oxide use slightly less morphine than the control group and continued to experience [pain relief](#) two hours after the therapy ended. No patients showed signs of nitric oxide toxicity.

Head suspects morphine will eventually be replaced by a mix of other drugs, such as nitric oxide, that address the pain's root cause.

He is planning human and animal studies to see if extremely low doses of nitric oxide during pregnancy also can improve delivery rates. "We think it will be productive so the mother has fewer crises, less stress, more blood flow to the placenta and an improved chance of a baby to be delivered," Head said.

Provided by Medical College of Georgia

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