

Nitrous oxide offers superior patient satisfaction over opioids and benzodiazepines for analgesia and anxiolysis during outpatient urological procedures

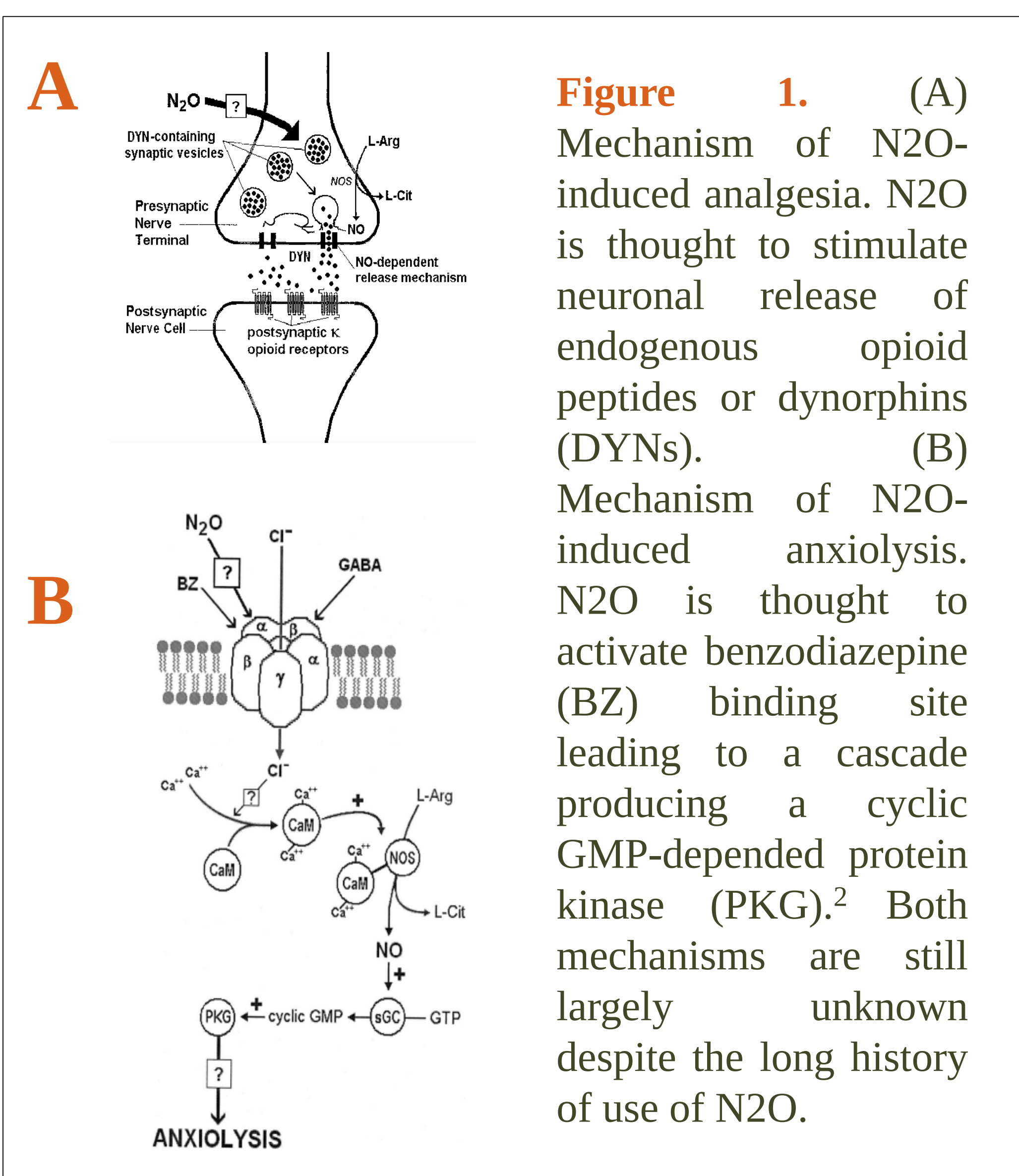
Brent Sharpe, M.D.*; Cash Sterling, M.D.†

Georgia Urology*; NGHS General Surgery Residency Program†
Northeast Georgia Medical Center, Gainesville, Georgia



INTRODUCTION

Nitrous oxide (N₂O) has been shown to be a safe and effective anxiolytic and analgesic agent having been used extensively for office-based procedures (e.g., in dentistry and plastic surgery) for decades. (Fig. 1) Many urology patients require office-based procedures that have significant associated pain and anxiety due to the sensitive anatomical location of procedures. Traditionally, patients have been offered medications such as benzodiazepines and opioids for these procedures. However, the CDC and FDA currently recommend against combining opioid and benzodiazepines whenever possible.¹ We report superior patient satisfaction with the Pro-Nox Nitrous Oxide 50/50 mix system over opioids and benzodiazepines for control during office-based urological procedures. (Fig. 2)



OBJECTIVES

- Evaluate patient satisfaction of N₂O use compared to opioid and benzodiazepine use for office-based procedures.
- Evaluate patient perceived duration of N₂O and perceived relative time to return to normal.
- Evaluate likelihood of recommendation to other urology patients to use N₂O and to seek urologists who offer N₂O.

METHODS

A retrospective survey was conducted on consecutive patients who utilized 50/50 N₂O via the Pro-Nox system during eight different urological office-based procedures. Fifty-one patients (70%) responded. Previous procedural histories of patients were obtained. Patients were asked to assess satisfaction of using N₂O over previously used non-N₂O regimens by responding yes or no to the following assessment domains: overall improved experience, rate of return to normal, preference over opioid/benzo, likelihood of recommendation to other patients, likelihood of use for next procedure, and duration (<15 min and >30 min).

RESULTS

We report the most diverse series using the Pro-Nox Nitrous Oxide 50/50 mix system for pain and anxiety control during in-office urological procedures. Ninety-six percent of patients stated that N₂O "helped" and 82% stated it "absolutely helped" during their procedure. Seventy-eight percent of patients rated their NO based procedure better than previous opioid-based procedures and 71% would choose N₂O for future procedures. Eighty-eight percent of patients stated they would be "very likely" to recommend N₂O to other patients. Patients stated the effects of the N₂O lasted less than 15 minutes and less than 30 minutes in 75% and 90%, respectively. Eighty four percent of patients said they returned to normal faster than with other analgesic medications. We had zero procedure complications, terminations, or delays with the Pro-Nox N₂O system.

Assessment of Patient Satisfaction Domains after Using Pro-Nox N₂O System Compared to Previous Use of a Non-N₂O Medication for Outpatient Urological Procedures

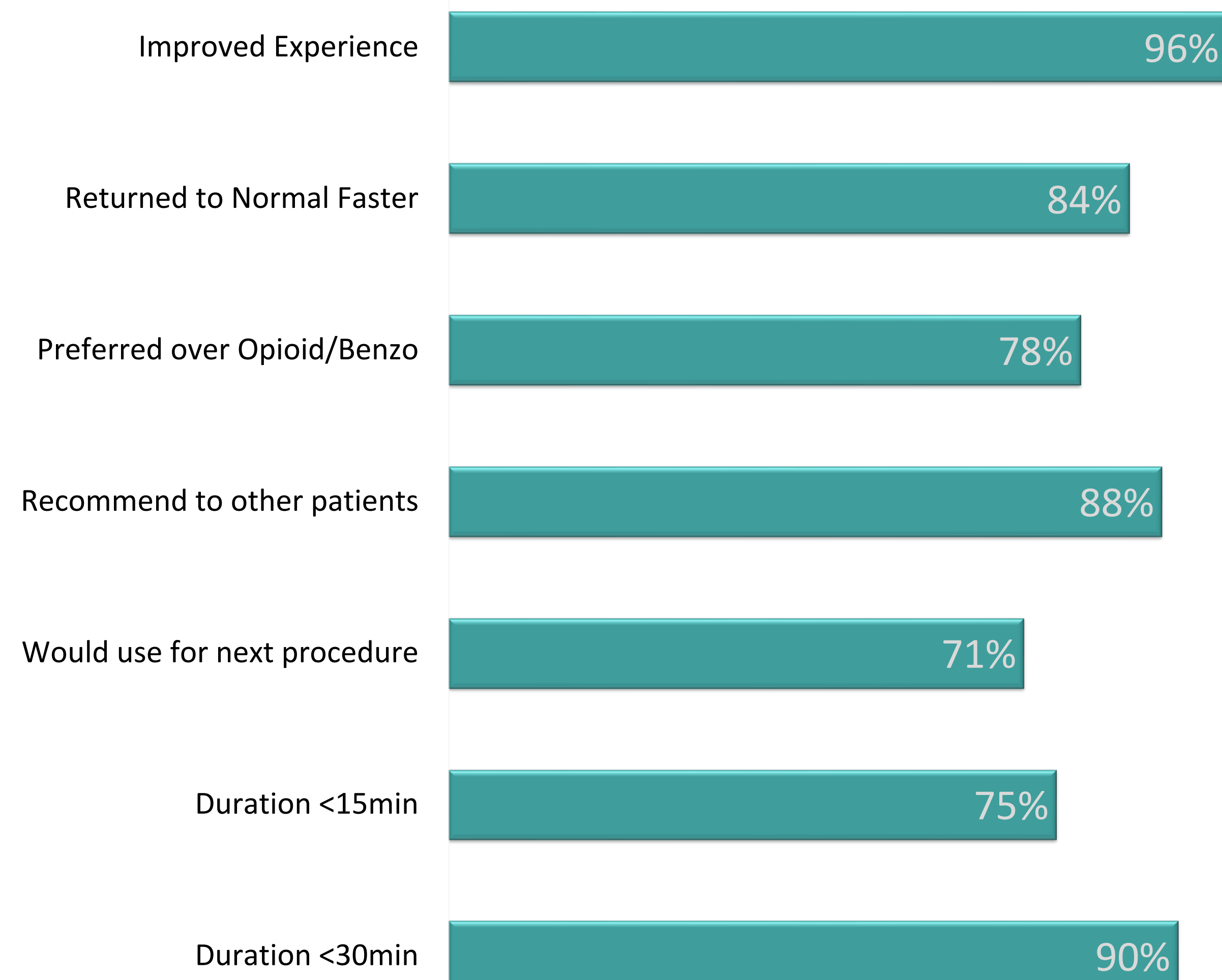


Figure 3. Assessment of patient satisfaction domains after using Pro-Nox N₂O system compared to previous use of a non-N₂O medication for outpatient urological procedures. Data is represented by percentages of "yes" replies to each assessment domain.

CONCLUSION

- N₂O offers superior pain and anxiety control over benzodiazepines and opioids for office-based urology procedures, eliminating the need for these regimens in this setting.
- The Pro-Nox N₂O system as a patient-controlled analgesic and anxiolytic provides excellent safety profile and fast recovery.
- Urology patients are likely to recommend use of N₂O to other urology patients and are likely to seek out providers that utilize N₂O for office-based urologic procedures.



Figure 2. Patient demonstrating use of the Pro-Nox system.

REFERENCES

1. Dowell D, Haegerich TM, Chou R. CDC Guideline for Prescribing Opioids for Chronic Pain — United States, 2016. *MMWR Recomm Rep*. 2016;65. doi:10.15585/mmwr.rr6501e1er.
2. Emmanouil, D.E., & Quock, R. (2007). Advances in understanding the actions of nitrous oxide. *Anesthesia progress*, 54 1, 9-18 .
3. Peyton PJ, Chao I, Weinberg L, et al. Nitrous oxide diffusion and the second gas effect on emergence from anesthesia. *Anesthesiology* 2011; 114:596.
4. Zarate CA Jr, Machado-Vieira R. Potential Pathways Involved in the Rapid Antidepressant Effects of Nitrous Oxide. *Biol Psychiatry*. 2015; 78:2.

CONTACT

- Brent A Sharpe, M.D., Georgia Urology, 7316 Spout Springs Rd, Flowery Branch, GA 30542
- Cash C Sterling, M.D., General Surgery Resident Physician, Northeast Georgia Medical Center, 743 Spring St NE, Gainesville, GA 30501