

Pediatric Sedation Service with a Nurse Driven Nitrous Oxide Program

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Introduction: Nitrous oxide (N₂O) is a rapid onset colorless and odorless gas. N₂O works by acting on the N-methyl-D-aspartate (NMDA) and gamma-aminobutyric acid (GABA) receptors. It has anxiolytic, analgesic, and amnestic properties. N₂O, when used as a single agent, provides anxiolysis and analgesia making it ideal for short and painful procedures in a pediatric population. We describe our interdisciplinary team's methods for utilizing N₂O in our pediatric population.

Discussion: The Pediatric Pain Sedation and Consult service (PSC) operates in a 150-bed children's hospital within a large academic center. The PSC serves both inpatient and outpatient services. The interdisciplinary team consists of specially trained Registered Nurses, Child Life Specialists, Pediatric Nurse Practitioners, and Pediatric Anesthesiologists. The PSC service is capable of providing anxiolysis, moderate sedation, deep sedation, or general anesthesia as required for various diagnostic studies and procedures. In May 2017, the PSC implemented a Nurse Driven Nitrous Oxide Program. Training of PSCT staff took place from March to May 2017. Training included didactic learning, simulation training, and mentored hands-on training. Training was completed for both wall-mounted N₂O delivery system and mobile delivery system.

Patients receiving short painful procedures are triaged by PSC Registered Sedation Nurses and Pediatric Nurse Practitioners. Patients who were given N₂O were able to complete procedures that included peripheral intravenous line insertion, wound dressing changes, excision of cysts, and suture removals. We conclude that N₂O administration in a Nurse Driven Nitrous Oxide Program provides a viable safe and efficient option for short painful procedures in a pediatric population.

References:

- Babl, F. E. et al., *Annals of Emergency Medicine*, 2015
- Galeotti, A. et al., *Research International*, 2016
- Schallner, N. et al., *Anesthesiology*, 2013
- Tobias, J. D. et al., *Pediatric Emergency Care*, 2013
- Tsze, D.S., et al., *Journal of Pediatrics*, 2016
- Zier, J., et al., *Pediatric Emergency Care*, 2011