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| **Name:** |
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| **Basic Science Question:** |
| How does nitrous oxide reduce patient anxiety? |
| **Report:** |
| Dental anxiety is more common than we think, especially in children. According to the study conducted by the Journal of Dental Anesthesia and Pain Medicine, “The number of children who experienced dental fear was (42%)… Of these fears, injections ranked the highest, followed by dentist drills…”. (JDAP 2016-2,3). This can be a serious problem, as children consciously will try to avoid dental appointments due do this fear. They may have caries present, and if left untreated, can progress and affect their oral health. Dental anxiety may be persistent as the patients get older. In general, anxiety involves an increase in neuronal activity. There are certain measures that can be taken to reduce dental anxiety and neuronal activity in patients. One commonly used is nitrous oxide. Nitrous oxide is mixed with oxygen and inhaled through a small mask placed over the nose. After a few minutes of inhaling through this mask, the patient starts to feel calm and relaxed. This change of mood is caused by the anxiolytic effect of nitrous oxide. “The anxiolytic effect involves the activation of GABA A receptor…” (AAPD 2018-2). GABA, which is an inhibitory neurotransmitter, allows chloride ions to hyperpolarize a neuron and reduce its activity. Since nitrous oxide increases the activation of GABA A receptors, more GABA ligands bind to these receptors, and thus, the neuronal activity that can cause anxiety gets reduced. In addition, dopamine is released, which gives patients a euphoric or happy feeling. When combined, both of these effects can reduce the anxiety in patients and allow them to be comfortable and more responsive to requests. This helps patients have a calmer experience compared to those without the use of nitrous oxide. |
| **References:** |
| Kakkar, Mayank, et al. “Prevalence of Dental Anxiety in 10-14 Years Old Children and Its Implications.” *Journal of Dental Anesthesia and Pain Medicine*, 21 Sept. 2016, jdapm.org/search.php?where=aview.  *Use of Nitrous Oxide for Pediatric Dental Patients*. American Academy of Pediatric Dentistry, 2018, www.aapd.org/research/oral-health-policies--recommendations/use-of-nitrous-oxide-for-pediatric-dental-patients/ |