

# Why Buffer Dental Anesthetics?

## What is Buffering?

“Buffering” describes the process of increasing the pH of an acidic solution to be closer to the body’s natural pH (around 7.4). When a dental anesthetic is injected, our bodies naturally buffer this acidic solution and raise its pH for the anesthetic to take full effect. Buffering can be expedited outside the body by mixing a sodium bicarbonate solution with dental anesthetics to produce a neutral pH.

## What Does the Expert Say?

“The use of a buffered local anesthetic will increase patient comfort during injection as a result of (1) the increased pH of the anesthetic solution (7.35 to 7.5) and (2) the presence of CO<sub>2</sub> in the buffered solution. CO<sub>2</sub> possesses anesthetic properties.”<sup>1</sup>

- Dr. Stanley Malamed

## What Does the Research Show?



### Improved Patient Comfort

“The present study demonstrates a significant reduction in the pain perceived in patients during the administration of LA agents buffered with sodium bicarbonate when used during pulpal involvement.”<sup>2</sup>

- Comparison of buffered and non-buffered lidocaine: pH and pain perception



### Faster Onset

“The findings of this study suggest that buffered LA is more effective than non-buffered LA of the same composition when used for IANB particularly concerning a significantly faster rate of onset and less pain at the injection site.”<sup>3</sup>

- Effectiveness of buffered and non-buffered local anesthetic in inferior alveolar nerve block: a randomized study



### Enhanced Efficiency

“This investigation revealed that buffered LAs are more effective than nonbuffered LAS when used for mandibular or maxillary anesthesia in pulpally involved teeth. Buffering of LAS has a 2.29 times greater likelihood of achieving successful anesthesia.”<sup>4</sup>

- Do buffered local anesthetics provide more successful anesthesia than non-buffered solutions in patients with pulpally involved teeth requiring dental therapy?: A systematic review.

1. Malamed, S. F. (2020). Handbook of local anesthesia (7th ed.), pg.180. Elsevier.

2. Sadananda, V., M K, J., Hegde, M.N., Shetty, A., & Gatti, P. (2022). Comparison of buffered and non buffered lidocaine: pH and pain perception. World Academy of Sciences Journal, 4, 37. <https://doi.org/10.3892/wasj.2022.172>

3. Bala M, Taiwo AO, Ibikunle AA, Olosoji HO, Sulaiman AO, Chukwuma BC, et al. Effectiveness of buffered and non-buffered local anaesthetic in inferior alveolar nerve block: A randomised study. Br J Oral Maxillofac Surg 2023;61:351-5

4. Kattan, S., Lee, S. M., Hersh, E. V., & Karabucak, B. (2019). Do buffered local anesthetics provide more successful anesthesia than nonbuffered solutions in patients with pulpally involved teeth requiring dental therapy?: A systematic review. Journal of the American Dental Association (1939), 150(3), 165-177. <https://doi.org/10.1016/j.adaj.2018.11.007>



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There are numerous studies illustrating the positive outcomes to dental anesthetic buffering. Please scan to read some of these in the Septodont resource library.