

# Review of Top 10 Prescribed Drugs and Their Interaction with Dental Treatment



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## KEYWORDS

- Drug interactions with dental treatment • Hypothyroidism • Hypertension • Diabetes
- Hypercholesterolemia • Asthma • Pain management

## KEY POINTS

- The top 10 prescribed drugs and their interactions with dental treatment are reviewed.
- This article demonstrates the different ways drugs may interact with dental treatment for example, side effects, drug–drug interactions.
- This article facilitates analysis of any drug and what to seek out when considering relevant drug interactions with dental treatment.

The global proportion of people over the age of 60 is growing faster than any other age group.<sup>1</sup> Chronic medical conditions such as cancer, cardiovascular disease, hypertension, and diabetes are prevalent in this age group and contribute to this group's overall morbidity and mortality.<sup>2</sup> Poor oral health in this cohort is also common and presents in the form xerostomia, tooth loss, periodontal disease, and edentulism.<sup>3</sup> Dental visits by patients over age 65 are also increasing.<sup>4</sup>

Owing to our aging population and their multiple comorbidities, 9 out of 10 patients over age 65 are taking one or more medications (compared with 1 in 4 when compared with children). Because dentists will be seeing an increasing number of patients taking 1 or more medications, it is important for the dentist to become familiar with the interactions between dental treatment and commonly prescribed medications. Elements of dental treatment with potential for interactions with medications include:

1. Local anesthetics;
2. The dental treatment itself; and
3. Medications the dentist may prescribe.

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The authors have nothing to disclose.

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In this article, we review the top 10 prescribed drugs and their interactions with dental treatment. According to the IMS institute national prescriptions audit of January 2015, the following drugs were the top 10 most prescribed drugs in the United States, by number of dispensed prescriptions:

1. Levothyroxine
2. Acetaminophen with hydrocodone
3. Lisinopril
4. Metoprolol
5. Atorvastatin
6. Amlodipine
7. Metformin
8. Omeprazole
9. Simvastatin
10. Albuterol

## **LEVOTHYROXINE**

### ***Background***

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Levothyroxine is marketed as Synthroid (Abbvie Inc, North Chicago, IL) and is the most commonly prescribed drug in the United States, with 119.9 million prescriptions dispensed in 2014. Levothyroxine is a thyroid hormone supplement.

### ***Pharmacology***

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The thyroid gland is responsible for synthesizing and releasing the hormones triiodothyronine and tetraiodothyronine (T<sub>4</sub>). Triiodothyronine is 10 times more potent than T<sub>4</sub>; however, 80% of triiodothyronine is actually formed by deiodination of T<sub>4</sub> in peripheral tissues.<sup>5</sup> Levothyroxine is a synthetic form of T<sub>4</sub>.

Thyroid hormones are believed to exert their physiologic effect by modulating DNA transcription and promoting protein synthesis. These proteins then act on their target organs to secrete hormones that regulate growth and metabolism.<sup>6</sup>

Supplementing deficient thyroid hormones requires delicate titration because the therapeutic index of levothyroxine is narrow. Excessive thyroid hormone administration can precipitate symptoms of thyrotoxicosis that include adverse cardiac, respiratory, central nervous system, and gastrointestinal, hepatic, and musculoskeletal sequelae.

### ***Interactions with Dental Treatment***

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For the well-controlled hypothyroid patient taking a longstanding stable dose of levothyroxine, there are no specific interactions between levothyroxine and dental treatment. For patients who are recently diagnosed with hypothyroidism and are not yet euthyroid, elective treatment is best deferred and emergent treatment carried out with caution.<sup>7</sup> The concern in the uncontrolled patient is that if the thyroid levels are too high then thyrotoxicosis can ensue. Hypothyroidism rarely results in an emergent situation; however, these patients are at risk for arrhythmias, heart failure, and myxedema coma if severely deficient.<sup>8</sup>

Levothyroxine has several important relevant drugs interactions. Specifically, there are interactions with levothyroxine and warfarin, ketamine, and carbamazepine. Levothyroxine increase the International Normalized Ratio (INR) in patients taking warfarin. It is therefore important, especially when initiating levothyroxine, to monitor INR levels and adjust warfarin dosage until the INR is stable. Levothyroxine may increase the hypertension and tachycardia that occurs with administration of ketamine

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