



## HYPOTHYROIDISM

# Levothyroxine use following a partial thyroidectomy may increase the risk of osteoporosis

### BACKGROUND

Thyroid hormone has important effect on bone turnover. In hyperthyroidism, or when taking high doses of levothyroxine, bone turnover is increased and can lead to bone loss. Some studies have shown an increased risk of osteoporosis after thyroidectomy, especially when patients are treated with high doses of levothyroxine as is done in patients with thyroid cancer. After discovering the connection between osteoporosis and low TSH levels in thyroid cancer patients, the practice of prescribing thyroid hormone after thyroid cancer surgery was changed. Nowadays, only patients with aggressive forms of thyroid cancer receive higher doses of levothyroxine to suppress TSH levels and most thyroid cancer patients are treated with a dose of levothyroxine that is sufficient to maintain a low normal or slightly low TSH level. This present study was done to investigate the risk of osteoporosis after thyroid surgery of any kind.

### THE FULL ARTICLE TITLE

Hung CL et al 2018 Is partial or total thyroidectomy associated with risk of long-term osteoporosis: a nationwide population-based study. *World J Surg* 42:2864–2871. PMID: 29541822.

### SUMMARY OF THE STUDY

The study was done in Taiwan. In Taiwan, universal health insurance is offered and extensive information regarding different medical problems in Taiwanese population is available. The authors of this study found 1426 patients who had partial or complete thyroid surgery from year 2000 to 2005. They compared these patients to 5704 other patients who had never had thyroid surgery or any

other form of thyroid disease but had similar age, sex and medical problems other than thyroid. None of the patients at either group had diagnosis of osteoporosis or fracture related to osteoporosis before the year 2000. They compared the rate of osteoporosis and fractures related to osteoporosis developed afterward in these two groups.

The study found more osteoporosis in patients who started taking levothyroxine after surgery than patients who never had thyroid surgery. The risk of developing osteoporosis was about 1.4 times higher in patients with thyroid surgery. The higher risk was mainly detected in females and in patients who were 20 to 49 year old at the time of surgery. The risk of fractures related to osteoporosis was not affected.

### WHAT ARE THE IMPLICATIONS OF THIS STUDY?

This study suggests that requiring levothyroxine after thyroid surgery, even partial thyroid surgery, may increase the possibility of osteoporosis for women, especially those who are younger than 50. However, this study was done based on general information that was available in population health records and the details regarding the levothyroxine dose and the thyroid hormone and TSH levels of patients in study were not included. The finding of this study should be confirmed. However, it is important for physicians and patients to know that treatment with levothyroxine may increase the risk of osteoporosis and attention to proper dosing should be given.

— Shirin Haddady, MD

### ATA THYROID BROCHURE LINKS

Thyroid Cancer (Papillary and Follicular): <https://www.thyroid.org/thyroid-cancer/>  
Thyroid Hormone Treatment: <https://www.thyroid.org/thyroid-hormone-treatment/>  
Thyroid Surgery: <https://www.thyroid.org/thyroid-surgery/>





## HYPOTHYROIDISM, continued

### ABBREVIATIONS & DEFINITIONS

**Thyroidectomy:** surgery to remove the entire thyroid gland. When the entire thyroid is removed it is termed a total thyroidectomy. When less is removed, such as in removal of a lobe, it is termed a partial thyroidectomy.

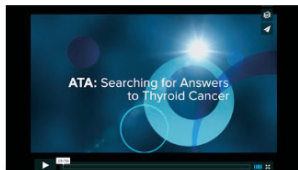
**Partial thyroidectomy:** surgery that removes only part of the thyroid gland (usually one lobe with or without the isthmus).

**Osteoporosis:** a decrease in bone mineral density in which the individual is at a significantly increased risk for fractures with little or no trauma or force. This occurs with a bone mineral density T score of  $>-2.5$ . The areas at highest risk for osteoporotic fractures are the wrist, spine and hip.

**Levothyroxine (T4):** the major hormone produced by the thyroid gland and available in pill form as Synthroid™, Levoxyl™, Tyrosint™ and generic preparations.

**TSH: thyroid stimulating hormone** — produced by the pituitary gland that regulates thyroid function; also the best screening test to determine if the thyroid is functioning normally.

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