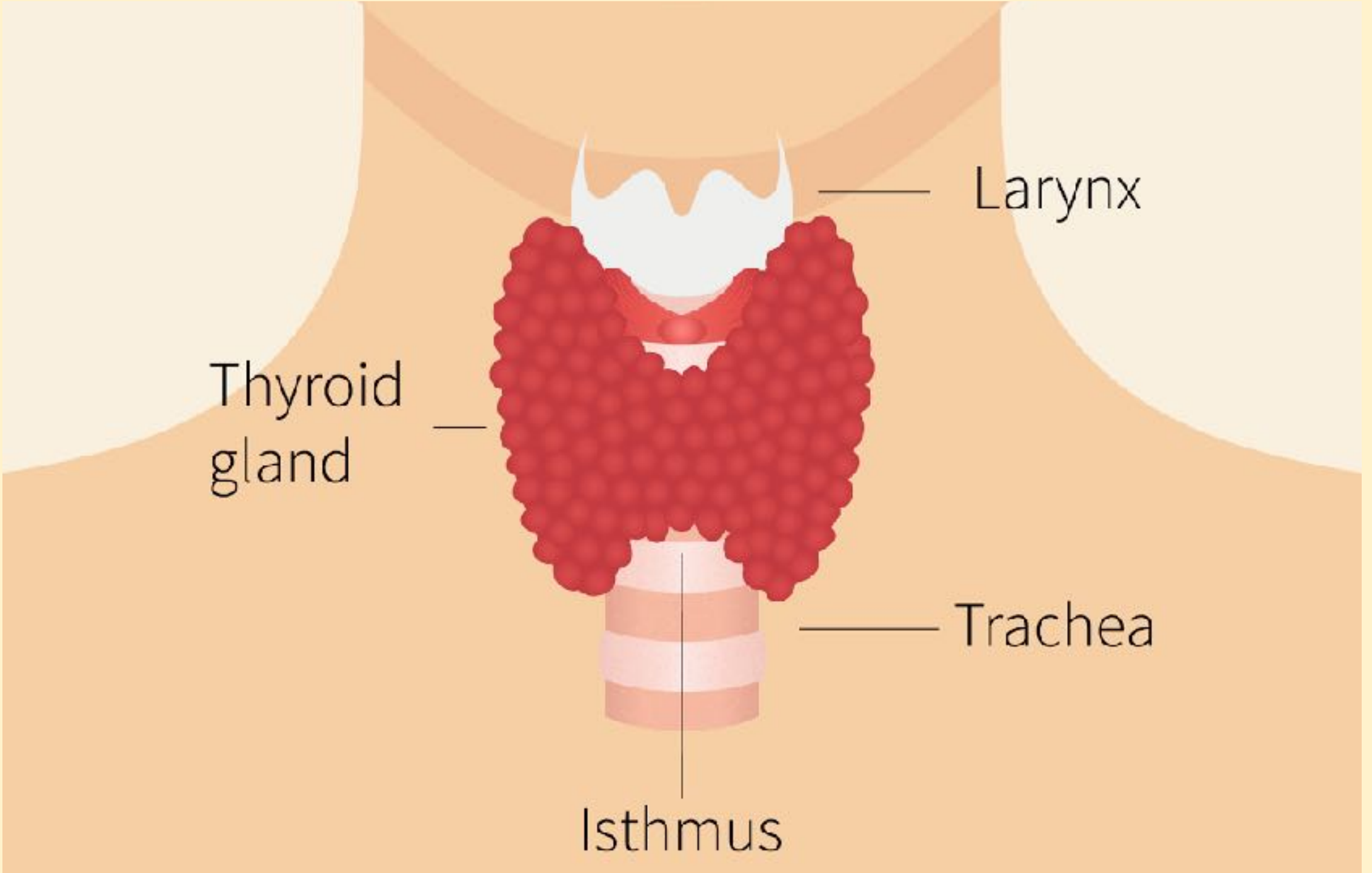
Thyroid Removals

Dr. John Bergman

What is the Thyroid?

- The thyroid gland is a **butterfly-shaped gland** found inside your neck
- It's located right under your **larynx or voice box**
- It's two-inch long and it's a highly vascular gland
- It has two lobes located on each side of the windpipe, connected by a tissue called the isthmus


Larynx
Thyroid gland
Trachea
Isthmus

What does the Thyroid do?

Your thyroid is responsible for producing hormones that affect **every function in your body**

It produces three types of hormones:

- Triiodothyronine (T3)
- Thyroxine (T4)
- Diiodothyronine (T2)

What do Thyroid Hormones do?

- Thyroid hormones **regulate metabolism and body weight** by controlling the burning of fat for energy and heat.
- Thyroid hormones are also **required for growth and development** in children.

They signal the production of virtually **all growth factors** in your body, including:

- Somatomedins (skeletal tissue growth)
- Erythropoietin (involved in the development of red blood cells)
- Nerve growth factor
- Epidermal growth factor

What do Thyroid Hormones do?

In pregnant women:

- Thyroid hormone is involved in the **production of prolactin**, a hormone responsible for milk production.

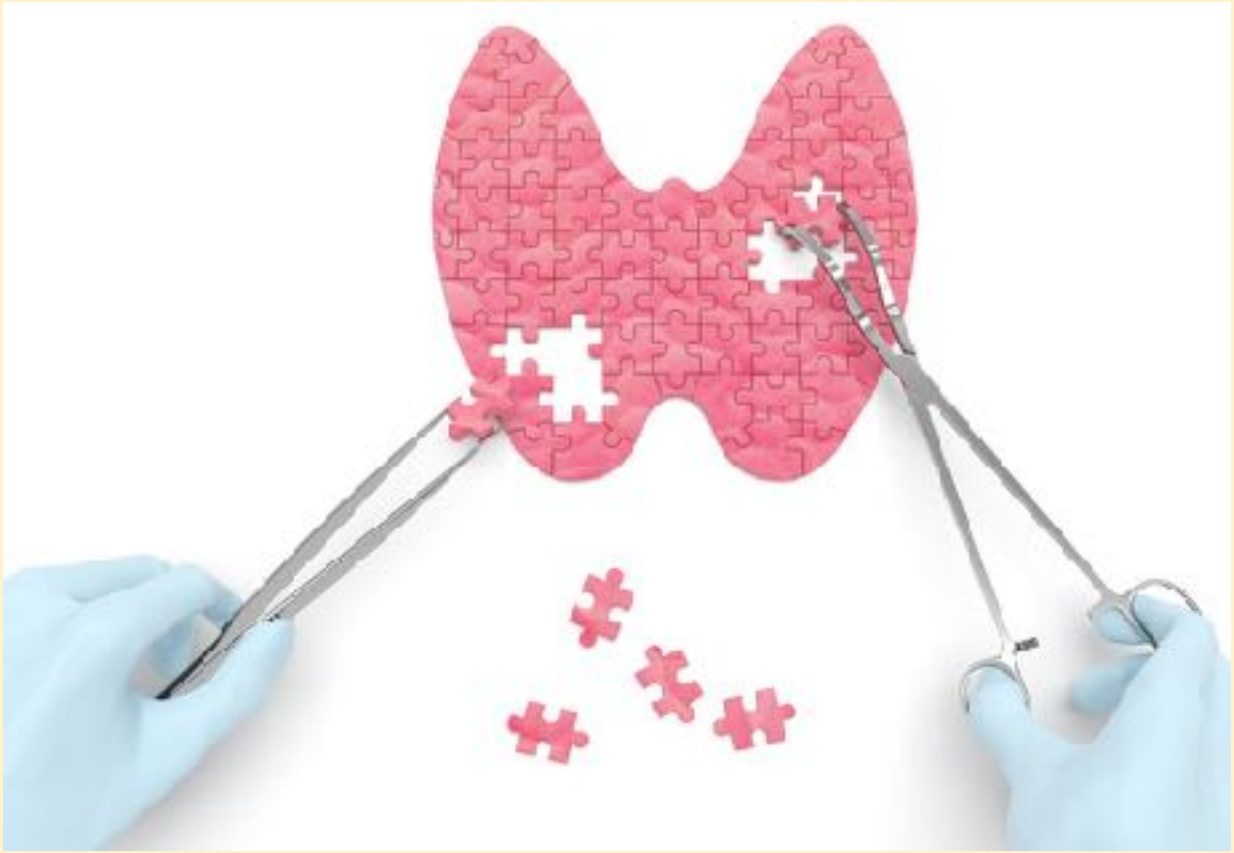
Hormones secreted by the thyroid **interact with all your other hormones** including:

- Insulin
- Cortisol
- Sex hormones like estrogen, progesterone, and testosterone

What is a Thyroidectomy?

"Thyroidectomy is the removal of all or part of your thyroid gland.

Mayo Clinic



Why is it done?

A thyroidectomy may be recommended for conditions such as:

- Thyroid cancer (Most Common)
- Noncancerous enlargement of the thyroid (goiter)
- Overactive thyroid (hyperthyroidism)

Mayo Clinic

How much of the Thyroid is Removed?

"How much of your thyroid gland is removed during thyroidectomy depends on the reason for surgery. If only a portion is removed **(partial thyroidectomy),** your thyroid may be able to function normally after surgery.

If your entire thyroid is removed **(total thyroidectomy),** you need daily treatment with thyroid hormone to replace your thyroid's natural function."

Complications of a Thyroidectomy

- Bleeding
- Infection
- Injury to the Recurrent Laryngeal Nerve
- Hypoparathyroidism
- Thyrotoxic Storm
- Injury to the Superior Laryngeal Nerve
- Hypothyroidism

Complications of a Thyroidectomy

"**Chronic hypoparathyroidism** is a serious and potentially debilitating disorder that results from a variety of causes. It most commonly occurs as a complication of thyroid surgery…"

"Persistent postoperative hypoparathyroidism usually results from intentional or inadvertent extirpation of the parathyroid glands during thyroidectomy or from interruption of the blood supply to the glands with subsequent infarction."

Journal of General Internal Medicine

Complications of a Thyroidectomy

"Signs and symptoms of the ensuing hypocalcemia include **perioral or distal extremity paresthesia, muscle cramping, positive Trousseau and Chvostek signs, laryngeal stridor, and convulsions. The latter conditions may prove fatal.**

The long-term sequelae of untreated or inadequately treated hypoparathyroidism include **premature cataract development, calcification of the basal ganglia, recurrent seizures, osteomalacia, and psychiatric symptomatology**."

Journal of General Internal Medicine

Hypothyroidism after a Thyroidectomy

- Once the thyroid is removed, you will be **hypothyroid**
- If you had a **subtotal thyroidectomy**, you may produce some hormones naturally but not the amount the body needs
- A **total removal** of the thyroid gland means that you'll have no natural thyroid function
- In either case you'll probably have to take a daily thyroid hormone replacement for the rest of your life

Should Thyroidectomies be Done?

"The **risk of serious complication from thyroid surgery** has long tempered physicians' enthusiasm for recommending thyroidectomy. Over 100 years ago, an author wrote in a surgical textbook that,

'If a surgeon should be so foolhardy as to undertake [thyroidectomy], . . . lucky he will be . . . if his victim lives long enough to enable him to finish his horrid butchery.'"

Journal of General Internal Medicine

Should Thyroidectomies be Done?

"With the advent of improved surgical technique and effective preoperative medical therapy for hyperthyroidism, concern for the development of potentially fatal thyrotoxicosis or 'storm' has abated.

Nevertheless, the internist should continue to refer patients for thyroidectomy with some unease and caution because of the **risk of permanent hypoparathyroidism and paralysis of recurrent or superior laryngeal nerves**."

Journal of General Internal Medicine

Should Thyroidectomies be Done?

"Historically, the risks associated with major surgery to treat thyroid disease and the problems of adequate hormonal replacement deterred surgeons from performing total thyroidectomies. **Although the procedure remains controversial it is increasingly being performed**..."

Canadian Journal of Surgery

What other procedures are done to the Thyroid?

Radioactive Iodine Therapy

"This treatment can be **used to ablate (destroy) any thyroid tissue not removed by surgery** or to treat some types of thyroid cancer that have spread to lymph nodes and other parts of the body."

American Cancer Society

What is Radioactive Iodine Therapy?

"Your thyroid gland absorbs nearly all of the iodine in your body. When radioactive iodine (RAI), also known as I-131, is taken into the body in liquid or capsule form, it concentrates in thyroid cells.

The radiation can destroy the thyroid gland and any other thyroid cells that take up iodine."

American Cancer Society

Risks and Side Effects of RAI Therapy

"**Your body will give off radiation for some time** after you get RAI therapy. Depending on the dose of radioiodine used and where you are being treated, you might need to be in the hospital for a few days after treatment, staying in a special isolation room to prevent others from being exposed to radiation...

Once you are allowed to go home after treatment, you will be given instructions on how to protect others from radiation exposure and how long you need to take these precautions."

American Cancer Society

Risks and Side Effects of RAI Therapy

"Men who receive large total doses because of many treatments with RAI may have **lower sperm counts or... become infertile.** Radioactive iodine may also affect a woman's ovaries, and some women may have **irregular periods** for up to a year after treatment. Many doctors recommend that women avoid becoming pregnant for 6 months to a year after treatment.

Both men and women who have had RAI therapy may have a slightly increased **risk of developing leukemia** in the future."

American Cancer Society

Thyroid Hormone Replacement after Thyroidectomy

"After a thyroidectomy, **the body can no longer make the thyroid hormone it needs**, so patients must take thyroid hormone pills to replace the loss of the natural hormone."

American Cancer Society

Challenges of Thyroid Hormone Therapy

"Thyroid hormone replacement (THR) therapy in athyreotic patients following thyroidectomy for thyroid cancer **should be a relatively straightforward** clinical problem to solve.

The thyroid is absent, the hormone levels are low, the physician prescribes a dose of levothyroxine to replace what the body would otherwise manufacture, and that resolves the problem....

Rambam Maimonides Medical Journal

Challenges of Thyroid Hormone Therapy

"…Nevertheless, as simple a clinical intervention as this seems, one of the most common dissatisfactions for athyreotic patients is the perception that the dose of thyroid hormone (TH) is incorrect, resulting in **complaints of lethargy, weight gain, fatigue, and brain fog.**"

Most often the problems are related to the dose and preparation of thyroid hormone (TH) to use. **Some patients feel less well following thyroidectomy and/or radioiodine ablation than they did before their diagnosis."**

Rambam Maimonides Medical Journal

Too Many Cooks in the Kitchen?

"Hormone replacement after thyroid and parathyroid surgery is a common clinical challenge. **The initiation of hormone replacement therapy is not always a simple matter**, as it often overlaps with the transition from inpatient to outpatient care (i.e., from surgery and the immediate postoperative period to the period of ambulatory follow-up), and **hormone replacement is either begun or continued by physicians from multiple specialties (surgery, internal medicine, family medicine).**"

Deutsches Ärzteblatt International

Side Effects of Thyroid Hormone Therapy

"Taking higher than normal levels of thyroid hormone seems to have few short-term side effects, but some doctors have expressed concerns about taking them for long periods of time.

High levels of thyroid hormone can lead to problems with a rapid or irregular heartbeat. Over the long run, high doses of thyroid hormone can lead to weak bones (osteoporosis)."

American Cancer Society

Two Basic Types of Thyroid Hormones

Natural and Synthetic

Most Common Synthetic Thyroid Hormone

- **Synthroid** contains Thyroxine also called T4,which is identical hormone produced by the thyroid gland.

Common Brand Names

- Levothyroxine is the generic form of Synthroid.
- In Europe: Thyrax, Euthyrox, Levaxin, L-thyroxine, Eltroxin and Thyrax Duotab in Europe;
- In Asia: Thyrox
- In North America: Eutirox, Levoxyl and Synthroid

Natural Thyroid hormones

- Include Nature-Throid, Armor Thyroid and Westhroid

Made from desiccated pig thyroid glands and contain the full spectrum of thyroid hormones:

- Thyroxine (T4)
- T3
- T2
- T1
- Calcitonin

Natural vs Synthetic

"In contrast to Naturally Desiccated Thyroid (NDT) containing T3 and T4, most synthetic medications contain T4 (or T3) only. In reality, **many patients don't start to feel normal again until they switch from synthetic to NDT**.

Natural Desiccated Thyroid hormone replacement has been used since the late 1800s, and **it is one of the safest drugs available.** It contains a full spectrum of thyroid hormones, T4 and T3 and also T2 and T1 as well."

Thyroid Science

Problems with Synthroid

- A common problem for many patients who don't feel well on Synthroid is the **inability to convert T4 to T3**
- Synthroid contains T4 which must be converted to T3 by the body for it to work
- This conversion is done by the **De-Iodinase Enzyme**
- Sometimes this **enzyme is deficient or not working**, and many patients have an inability to convert T4 to T3

According to:

The Journal of Clinical Investigation

Journal of Clinical Endocrinology & Metabolism

Problems with Synthroid

- According to the British Medical Journal (April 2011) elderly women on Synthroid have **increased fracture risk**.

"Our findings provide evidence that levothyroxine treatment may increase the risk of fragility fractures in older people even at conventional dosages."

British Medical Journal

Why would Levothyroxine cause fractures?

- The Thyroid makes **Calcitonin**, a hormone manufactured by the parafollicular cells (C cells) in the thyroid tissue
- Calcitonin is involved in calcium metabolism, bone maintenance and prevents osteoporosis
- **T4-only medication does not contain calcitonin and is associated with loss of bone density and increased fracture risk**

- **Natural desiccated Thyroid contains contains Calcitonin**, which helps with bone density and prevents osteoporosis.

Is this the Perfect Business?

The Business of Thyroidectomies

"…from **1996 and 2006**… The total number of thyroidectomies **increased 39%, from 66,864 to 92,931 cases per year** during the study timeframe."

"Inflation-adjusted per-capita charges for inpatient thyroidectomies more than doubled from $9,934 in 1996 to $22,537 in 2006, while aggregate national inpatient charges tripled from **$464 million to $1.37 billion**."

Thyroid Journal

The Business of Thyroid Replacement Therapy

"Synthroid, had sales exceeding **$400 million** in 2000 when about 13 million people in the United States depend on thyroid drugs, including 8 million who take Synthroid."

New York Times

This is just Synthroid and this was back in 2000!

What should you do immediately after a Thyroidectomy?

Step 1:

- Clear liquid diet, such as broth, apple juice or plain gelatin

Step 2:

- Easily swallowed soft foods, such as smoothies, soup, ice cream, yogurt, cottage cheese, pudding, oatmeal, tender vegetables, soft-cooked eggs, mashed potatoes and applesauce or other mashed fruit.

Step 3

- A Healthy Diet and Lifestyle

Life after a Thyroidectomy (Diet)

The Ideal Diet

- 45-60% should be fruits and vegetables
- 10-35% should be lean protein (meat) or protein rich plants
- 25-35% should be healthy fats
- Low Sugar, low-grain, mainly raw and organic

You Should Avoid

- Packaged and Processed food
- Non-Organic Food
- GMO food
- Goitrogentic Food

Goitrogenic Foods

- Certain foods, like **cruciferous vegetables** and products that have **soy isoflavones**, contain **goitrogenic compounds**
- These are chemicals that can interfere with thyroid hormones
- Even without a thyroid **these can negatively your supplemental thyroid hormones**

- Goitrogenic compounds in vegetables can be **deactivated by heating**
- So Don't eat broccoli, cabbage or other cruciferous vegetables raw
- The goitrogenic effects of soy are lessened if the soy is **fermented (miso and tempeh)**

Life after a Thyroidectomy (Exercise)

- Strength training exercises are especially important for people without a thyroid because **building lean muscle mass will help burn more calories**
- Muscle tissue requires more energy than fat
- **The greater your ratio of muscle to fat, the higher your metabolism**
- All forms of physical activity help to burn calories -- and anything that burns calories will **boost metabolism and help keep you at a healthy weight**

Nutrients after a Thyroidectomy

- Vitamin B12
- Vitamin D
- Calcium
- Vitamin C
- Vitamin A

Vitamin B12

- **Vitamin B12 is found in every cell of the body**.
- It is required for cellular metabolism and energy production, the production and regulation of the DNA and for fatty acid metabolism
- **People without a thyroid gland might have low levels of vitamin B-12**
- An underactive thyroid potentially **impairs the body's ability to absorb vitamin B-12**

Sources of B12

1) Beef liver
2) Sardines
3) Beef (grass-fed)
4) Tuna
5) Raw cheese
6) Cottage cheese
7) Lamb
8) Raw Milk
9) Eggs
10) Salmon

Vitamin D and Calcium

- Vitamin D deficiency is associated with All Thyroid disorders
- Vitamin D **helps regulate insulin secretion and balances blood sugar which effects thyroid physiology**
- Hypocalcemia (loss of calcium) occurs in some patients following a total thyroidectomy
- **Supplementing with Calcium and Vitamin D can prevent or help with symptoms of hypocalcemia**

Optimize Your Vitamin D levels

- **UVB exposure** from the Sun is the best way to optimize your vitamin D levels
  - At least 20 minutes of **sun exposure daily** during mid day
  - Your shadow shouldn't be longer than your height

- Most regions of the planet don't get proper sunlight for **6 months** out of the year
- Vitamin D3 supplementation during the winte
- Adults required about **8,000 IUs per day**

Vitamin D and Vitamin K2

- Vitamin K2 is essential for proper utilization of vitamin D

Sources of Vitamin K2

- Grass-fed organic animal products (eggs, butter, dairy)
- Fermented foods
- Certain cheeses (Brie, Gouda)

Sources of Calcium

1) Raw Milk
2) Kale (cooked)
3) Sardines (with bones)
4) Yogurt or Kefir
5) Broccoli
6) Watercress
7) Cheese
8) Bok Choy
9) Okra
10) Almonds

Vitamin C

- Vitamin C deficiency has been linked to All Thyroid disorders but this is likely the result of **adrenal fatigue**
- The **adrenal glands contain the highest concentrations of vitamin C** where is plays a crucial role in both the adrenal cortex and adrenal medulla
- **Vitamin C deficiency along with Chronic Stress lead to adrenal fatigue and Thyroid dysfunction**
- Vitamin C can reverse thyroid damage
- **Vitamin C also helps the body absorb synthetic or natural thyroid hormones after a thyroidectomy**

Natural Sources of Vitamin C

- Oranges
- Red Peppers
- Kale
- Brussels Sprouts
- Broccoli
- Strawberries
- Grapefruit
- Guava
- Kiwi
- Green Peppers

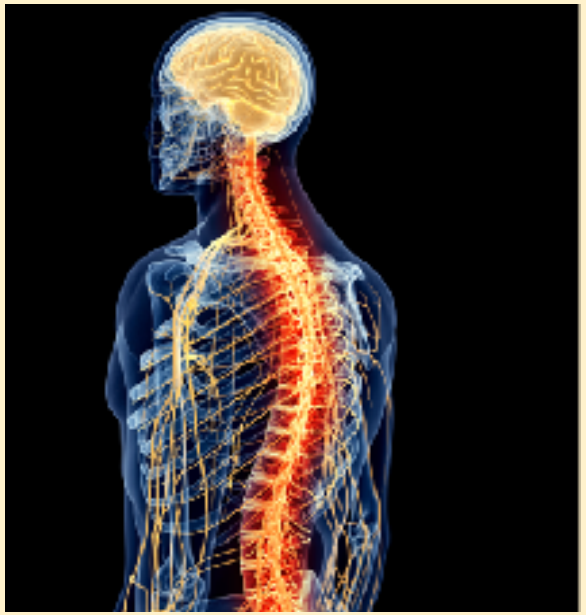
Vitamin A

- **Poor thyroid function can cause vitamin A deficiency and low levels of vitamin A can result in an underactive thyroid**
- People with hypothyroidism have a reduced ability to convert beta-carotene into vitamin A
- Vitamin A is an active byproduct of beta-carotene conversion in the body
- **A vitamin A deficiency could limit the body's ability to produce thyroid stimulating hormones (TSH) after a partial thyroidectomy**

Sources of Vitamin A

- Beef Liver
- Carrots
- Sweet potato
- Kale
- Spinach
- Apricots
- Broccoli
- Butter
- Eggs
- Winter Squash

The 5 Keys to Health and Healing



Proper nerve supply

Regular Exercise

Proper Nutrition

Sufficient Rest

Prayer and Meditation

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