

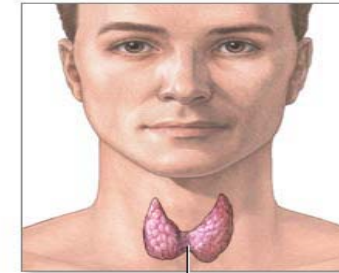
Thyroid Health

Nourishing your Thyroid through Food

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THYROID GLAND



Thyroid

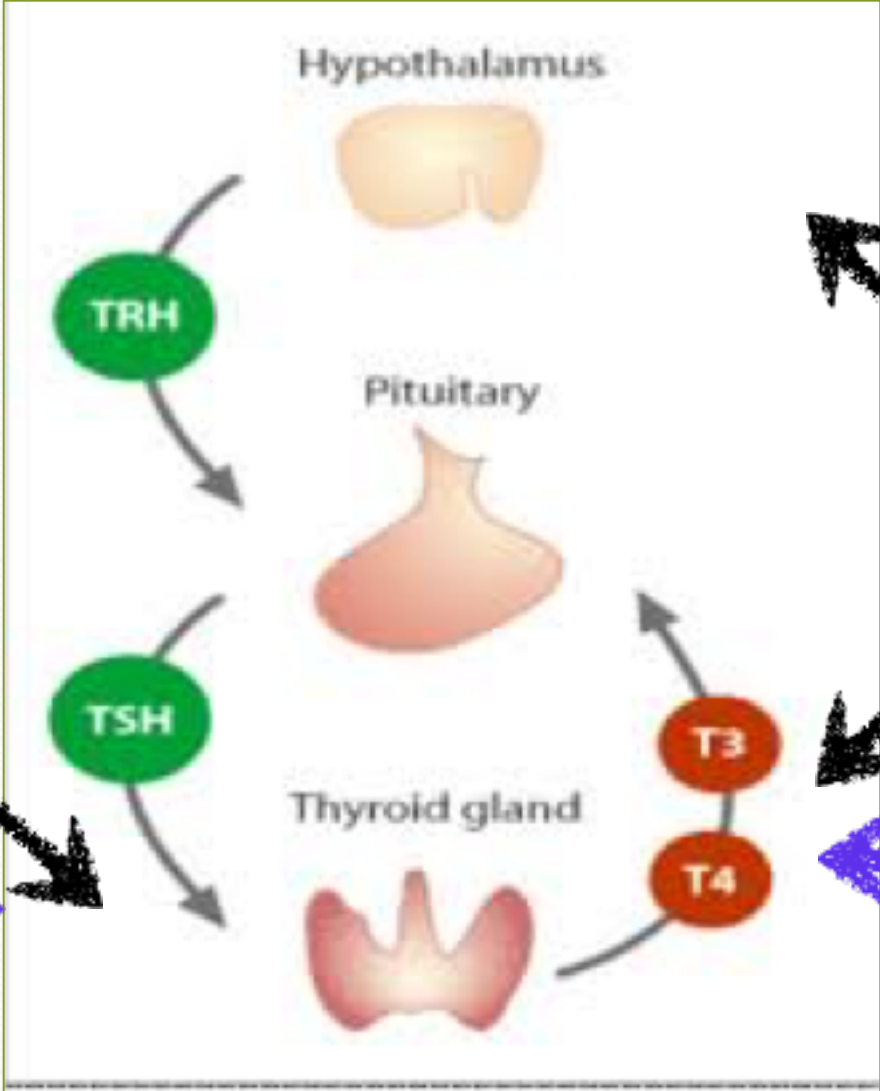
ADAM.

- Small endocrine gland in the neck, in front of your breathing airway (trachea) and below the Adam's apple
- The thyroid gland makes thyroid hormones, which circulate in the bloodstream to all of the tissues
- Thyroid hormones control metabolism, growth, brain function, reproduction, fat mobilization, sugar

Meet the Players

Goitrogens?
EDCs

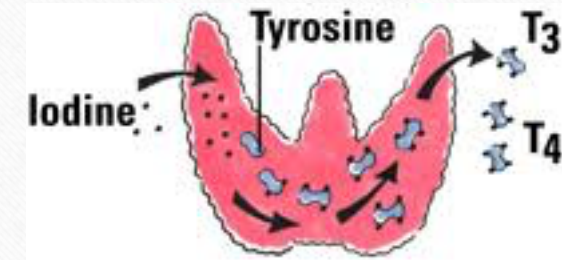
Iodine
Iron
Tyrosine



Stress
Illness

Selenium
Zinc
Vitamin A
Kaempferol

Iodine



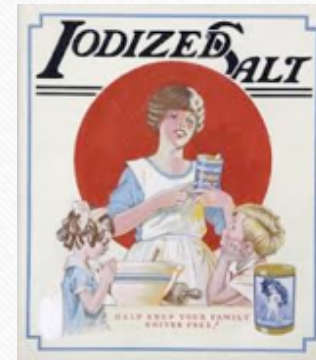
- Iodine is an essential nutrient (our bodies cannot make iodine)
- Iodine is key to make thyroid hormone and brain function (fetus, children)
- Sufficient iodine is important to keep away chemicals such as fluoride, bromide, phthalates, nitrates, and perchlorate
- But too much iodine may be as bad as too little. Knowing your own risk is important

IODINE DEFICIENCY

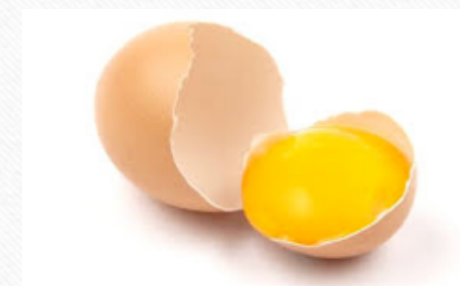




How Much Iodine



- Children 90 mcg per day
 - Adult 150 mcg per day
 - Pregnant women 250 mcg per day
 - MCG = MICROGRAMS
- 1/2 tsp iodized salt contains 150 mcg
 - 1/2 tsp dulse flakes contain 150 mcg
 - 1 cup of milk...56 mcg
 - 1 medium potato (with skin)... 60 mcg
 - 1 sheet of Nori...70 mcg
 - 3 oz cod... 99 mcg



❖ **USDA does not mandate labels to include iodine content of package food items**

Keeping track...



- No USDA mandate for packaged foods to be labeled for iodine content
- Most prenatal vitamins do not contain enough iodine or contain none at all
- Kelp more variable as source of iodine than potassium iodine
- Processed and canned foods contain salt, but most likely this is non-iodized (taste)

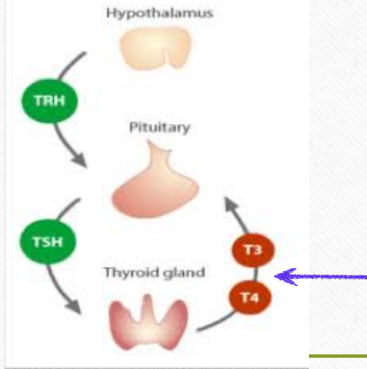
**So, if a bit of iodine is good...
a lot is better, right?**

Not necessarily...

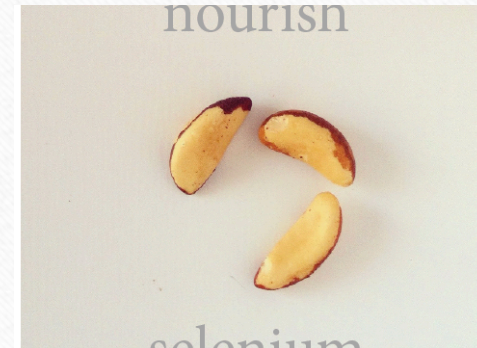
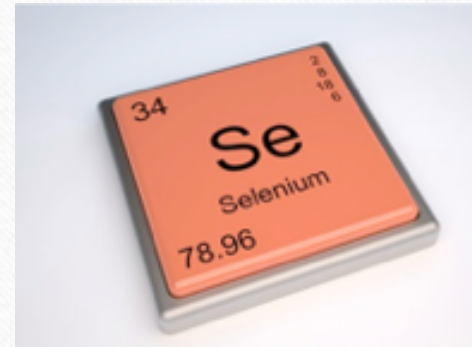
When is TOO much

- Recommended Maximum: 500-1100 mcg/day (>1 mg is generally too much)
- Food is best, choose your seaweed wisely (nori, dulse and wakame OK for daily consumption)
- If supplements, keep to potassium iodine (KI) around 100-250 mcg per day
- This is especially a concern if you have:
 - Hashimoto's thyroiditis or Graves' disease (any form of autoimmune thyroid disease)
 - Nodules
 - A sensitivity to iodine
 - Pregnant women in their third trimester
- MG = Milligrams 1 MG = 1,000 MCG

Selenium



- Essential nutrient
- Backbone of two thyroid enzymes and detox pathways
- Low selenium is linked to more thyroid problems
- Important in autoimmune thyroid disease (Hashimoto's, Graves')
- But too much could be problematic (diabetes, glaucoma)



Selenium through FOOD



25 High Selenium Foods, mcg per 1 serving

Food	Serving size	Selenium	RDA
Brazil nuts	5 nuts	480	686%
Pork, kidneys, cooked	1 cup	436	623%
Chicken, giblets, cooked	1 cup	145	207%
Beef, kidneys, cooked	3 oz.	143	204%
Tuna, canned in water	1 can	133	190%
Whole-wheat flour	1 cup	85	121%
Oysters, cooked	2 medium	77	110%
Mussels, cooked	3 oz.	76	109%
Octopus, cooked	3 oz.	76	109%
Chicken, liver, cooked	3 oz.	75	107%
Flounder, cooked	1 fillet	74	106%
Turkey, liver, cooked	3 oz.	69	99%
Salmon, smoked	3 oz.	63	90%
Chicken, gizzards	1 cup	60	85%
Tilapia, cooked	3 oz.	45	66%
Pork chops, cooked	3 oz.	44	63%
Cod, cooked	1 fillet	42	60%
Whole-wheat pasta	1 cup	36	52%
Egg, fried	2 large	32	44%
Whole-wheat pita	1 large	28	40%
Oats, all varieties	1 cup	23	33%
Sunflower seeds, dried	1 oz.	22	32%
Mustard seed, yellow	1 tablespoon	15	21%
Shiitake mushrooms	6 dried	11	15%
Sesame seeds, dried	1 tablespoon	8	11%

Source: nutritiondata.com

- Selenium content in foods is determined by the soil content, use of selenium-containing fertilizers and agricultural practices
- RDA for Selenium (30-85 $\mu\text{g}/\text{d}$):
 - 55 mcg in adults
 - 60 mcg in pregnant women
 - 75 mcg in lactating women
- Tolerable upper limit 400 mcg/d for >14 y.o.

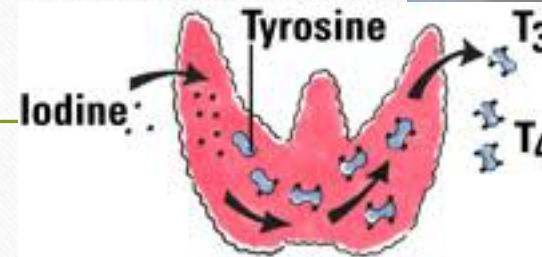
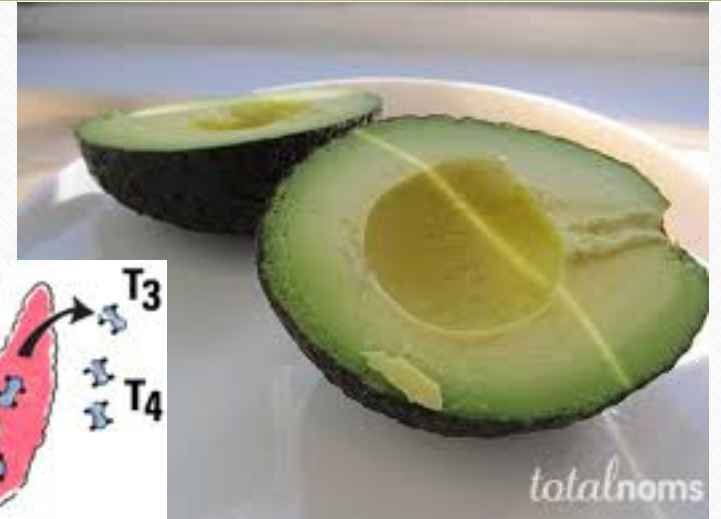
Selenium and Hashimoto's

- Improves well-being, decreases anxiety
- 100 mcg twice a day most commonly used dose (2 Brazil nuts a day)
- 80 mcg a day might be enough
- If on the US East coast, and at risk for diabetes, consider starting a lower dose or use food
- Test levels 3 months after starting on a "selenium protocol"





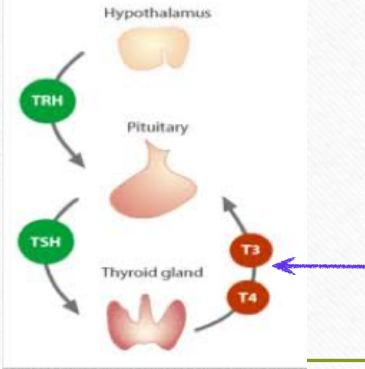
Tyrosine



- Non-essential aminoacid
- Important in thyroid hormone, nerve chemicals, and making skin pigment
- Found in soy products, chicken, turkey, fish, peanuts, almonds, avocados, bananas, milk, cheese, yogurt, cottage cheese, lima beans, pumpkin seeds, and sesame seeds
- Rare to encounter tyrosine deficiency



Zinc



- Important to prevent thyroid nodules, goiter, perhaps autoimmunity
- Important to help make T3, our active thyroid hormone
- Dietary sources:
 - yeast, whole grains, nuts (almonds, peanuts, soy nuts) and seeds (pumpkin -1/4 cup = 2.57 mg-, sunflower), legumes (lentils), oysters (6=32 mg), beef (3.5 oz = 4.8 mg), crab (3.5 oz = 7.5 mg) , seafood, and poultry.
- Supplemental zinc: 15-30 mg/d unless deficient. Watch for copper

Iron

- Important as a helper to Thyroid hormone production
- Lack of iron linked to autoimmune thyroid disease
- Women and children have increased iron needs
- Dark meats, clams, mussels, oysters, sardines, molasses, dark green leafy vegetables, legumes/beans (soak first), hibiscus, nettles (infusion)
- Vitamin C helps increase absorption of iron





Vitamins



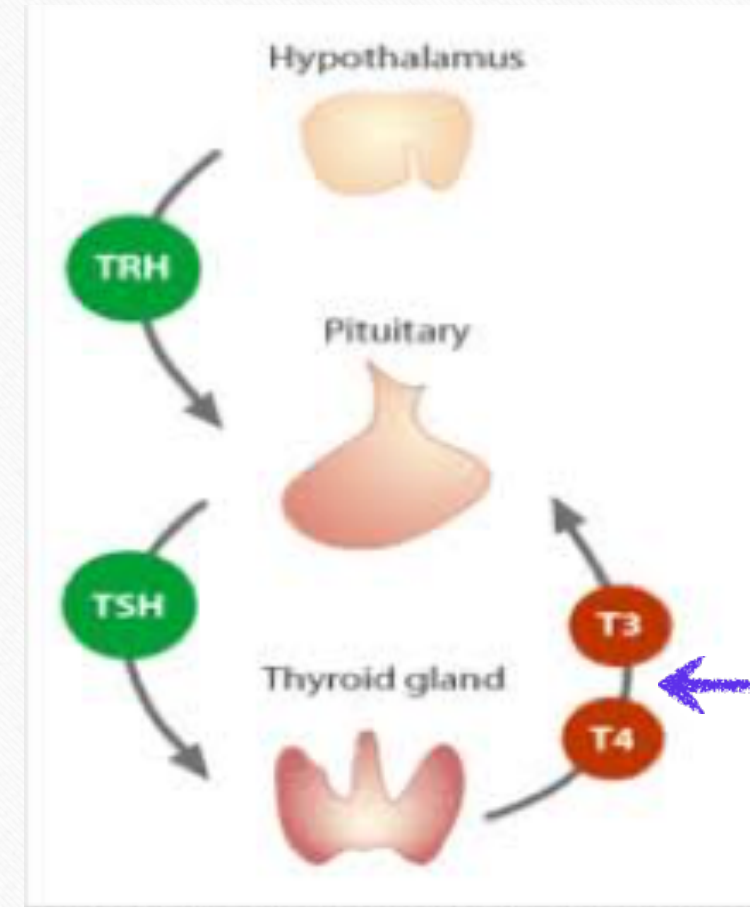
- Vitamin A (important likely along with iodine and iron)
- B vitamins because of their role in methylation
- Vitamin C because of antioxidant effect (sweet peppers, tomato juice, citrus fruits, kiwi fruit...).
- Vitamin D because of effect on autoimmunity



Kaempferol

- Flavonoid (polyphenol) found in:
 - Tea, broccoli, cabbage, kale, beans, endive, leek, tomato, strawberries and grapes
 - Ginkgo biloba, linden, horsetail, moringa, and propolis

-Produces a 10-fold stimulation of Deiodinase 2 activity (T4 to T3 conversion) and increases T3 production



Herbs for Thyroid Health

- Herbs can work as
 - immune amphoterics, nourishing the immune system (mushrooms, astragalus, licorice, holy basil)
 - immune regulators, controlling the excess immune response (turmeric)
 - adaptogens, helping the body adapt to stress (holy basil, licorice)

What To Avoid



~~BPA~~



- Environmental Disrupting Chemicals (EDCs)
- Soy?
- Goitrogens?



Goitrogens

- Definition: Substance that blocks thyroid hormone production
- Many kinds with different mechanisms of action
 - Iodine competition
 - Inhibition of TPO enzyme
 - Effect at receptor level
- Effect is dependent on dose for many
- Food vs environmental pollutants



To consider:

- Malnutrition enhances the action of goitrogens
- Significant consumption of goitrogens AND iodine deficiency seem necessary for an effect
- When eaten raw, cruciferous vegetables release the enzyme myrosinase, which accelerates the break-down of glucosinolates into goitrogens; the cooking process largely deactivates the myrosinase in these vegetables (and prevents goitrogens)

Soy



- Antithyroid effect
- Most studies show no effect except when consuming 30 g/d of soybeans
- Goiter reported in infants fed non-iodine-fortified soy formula
- In people with mild hypothyroidism, 16 mg phytoestrogens daily (representative of a vegetarian diet) for 8 weeks carried a 3-fold increase in the development of full-blown hypothyroidism
- Effects not reversible

HEART HEALTH

SOY PROTEIN FOR YOUR HEART



The FDA says 25 grams of soy protein a day, as part of a diet low in saturated fat, may reduce the risk of heart disease, the only plant protein to have such claim.



Research demonstrates that including soy protein in your daily diet will reduce LDL cholesterol levels by

2-7%

SOY PROTEIN CHART

All soy-based foods bearing the FDA soy and heart health claim provide at least 6.25 grams of soy protein.

Product	Serving	Ave. Grams of Soy Protein
Soy "burger"	1 patty	14
Tempeh	3 ounces	13
Soy pasta	1/2 cup (cooked)	13
Soy nutrition bar	1 bar	6-14
Edamame	1/2 cup	11
Soy nuts, roasted	1/4 cup	11
Soy breakfast patty	2 patties	11
Meatless soy crumbles	1/3 cup	10
Soy yogurt	1 cup	9
Tofu	3 ounces	8
Soy milk	1 cup	7
Soy chips	1 bag	7
Soy nut butter	2 Tbsp.	7

5 DAYS OF SIMPLE SWAPS

Reaching 25 grams a day of soy protein is so easy!

Breakfast	Bowl of cereal with soymilk	7 grams
Snack	Soy chips	7 grams
Dinner	Soy pasta	13 grams
Total		27 grams of soy protein

Breakfast	Soy breakfast patties	11 grams
Lunch	Soy nut butter sandwich	7 grams
Dinner	Tacos with soy crumbles	10 grams
Total		28 grams of soy protein

Breakfast	Soymilk smoothie	7 grams
Snack	Soy nuts	11 grams
Dinner	Stir-fry with tofu	8 grams
Total		26 grams of soy protein

Breakfast	Bowl of soy cereal	7 grams
Lunch	Soy nutrition bar	14 grams
Dinner	Soy pudding for dessert	6 grams
Total		27 grams of soy protein

Breakfast	Tofu-egg scramble	8 grams
Snack	Soy yogurt with berries	9 grams
Dinner	Green salad with edamame	11 grams
Total		28 grams of soy protein

Food Phytoestrogen Content

Miso 30 mg per 1/4 cup

Edamame (boiled) 16 mg per 1/2 cup

Tempeh 30 mg per 3 oz

Tofu 20 mg per 3 oz

Soy Milk 6 mg per 1 cup

Roasted Soybeans 140 mg per 3 1/2 ounces

Textured Vegetable Protein 138 mg per 3 1/2 ounces

Green Soybeans 135 mg per 3 1/2 ounces

Tofu yogurt 16 mg per 3 1/2 ounces

Soy hot dog 15 mg per 3 1/2 ounces

Soy noodles (dry) 8.5 mg per 3 1/2 ounces

From Harvard "The Nutrition Source"

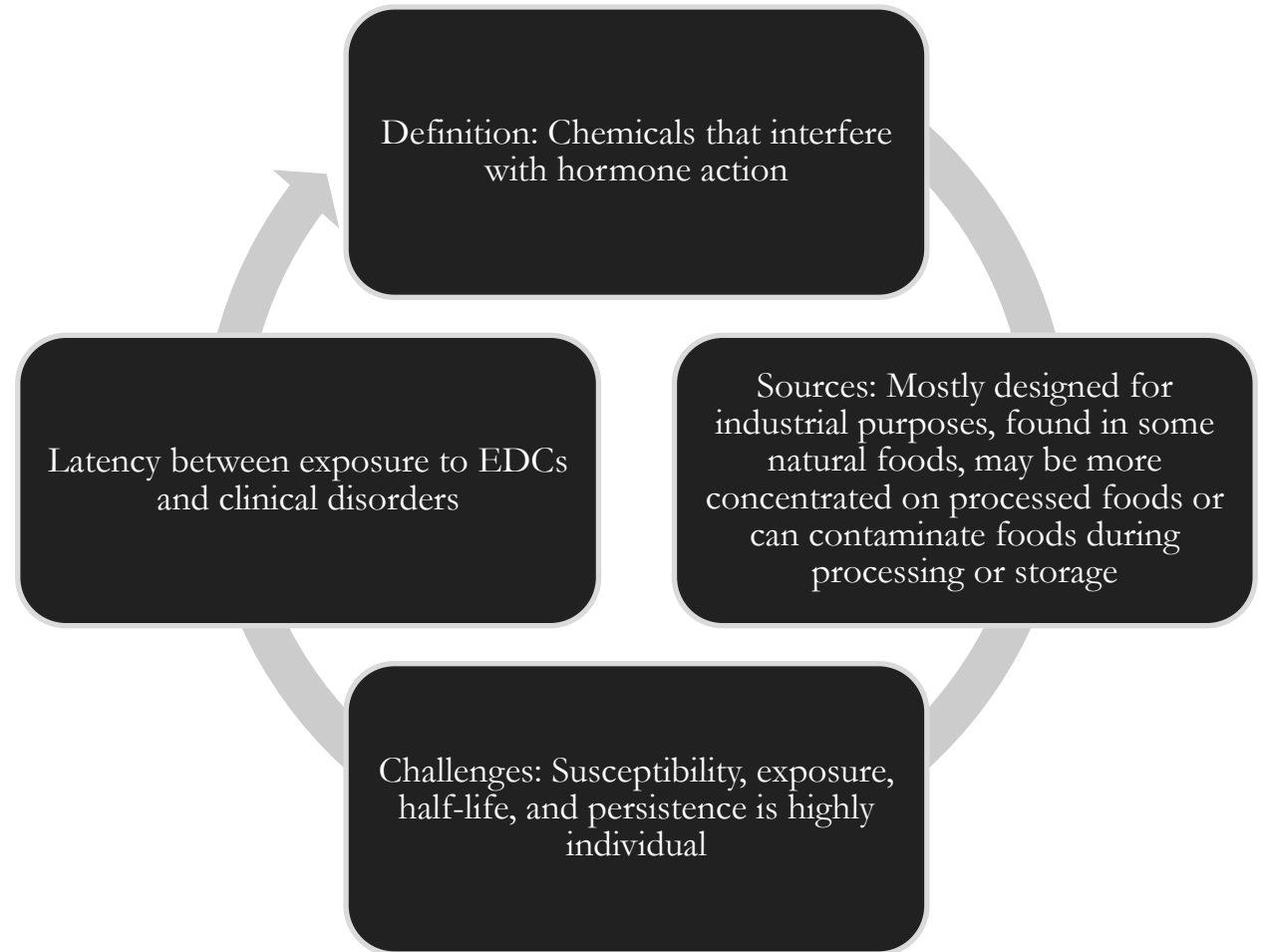


In Practice

- Cruciferous vegetable (kale family) not a problem unless iodine-deficient and on a “cabbage-only” diet
- 15 cups of raw kale per day (for a long time), or other kale-family green, especially if severe iodine deficiency
- Cooking (over 112°F) inactivates myrosinase and lowers exposure
- Keep soy to a maximum of 30 grams per day (organic, non-GMO)

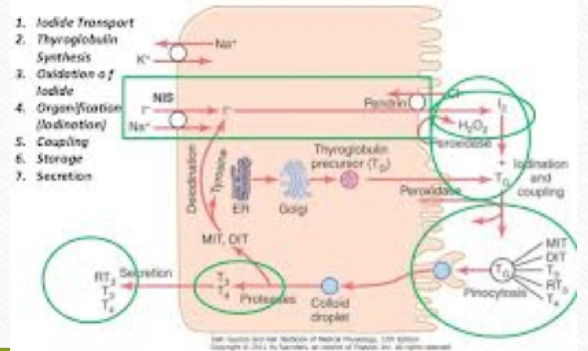


Endocrine- Disrupting Chemicals (EDCs)



Environmental Disrupting Chemicals (EDCs)

Bio-synthesis and Secretion of Thyroid Hormone



- **Perchlorate** (US drinking and irrigation water, tomato, cucumber, cow's milk, lettuce, eggs, multivitamin)- Reverse osmosis, some activated-carbon filters
- **Phthalates** (plastics, adhesives)- AVOID Plastic containers
- **Thiocyanate** (cigarette smoke)
- **Nitrates** (naturally in leafy greens, added as a preservative in processed meats, fertilizer)
- **Fluoride** (Water) <https://amwater.com/njaw/water-quality/fluoride>

Environmental Disrupting Chemicals (EDCs)

- **BPA** (watch for canned products, dental sealants, store receipts)
- **Triclosan** (sanitizers)
- **PCBs** (fish)

How To Protect Your Thyroid



- Ensure enough iodine, but not too much
- Take one or two Brazil nuts every day (or your favorite selenium-rich food)
- Avoid contaminants (plastics, can-liners...)
- Do not forget about zinc and iron
- Eat the foods that help you make more of the active thyroid hormone:
 strawberries, broccoli, cabbage, kale, beans, endive, leeks, tomatoes, and grapes
- Sleep, de-stress, do not overwork

Thank you!

