



INE | INSTITUTE OF
NUTRITIONAL
ENDOCRINOLOGY

Micronutrients: Vitamin C

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Medical Disclaimer: The information in this presentation is not intended to replace a one-on-one relationship with a qualified health care professional and is not intended as medical advice. It is intended as a sharing of knowledge and information from the research and experience of Dr. Ritamarie Loscalzo, drritamarie.com, and the experts who have contributed. We encourage you to make your own health care decisions based upon your research and in partnership with a qualified health care professional.



**“To date, NO infectious diseases
have been found in which
Vitamin C administration is
dangerous or inappropriate”**

**Thomas E. Levy, MD, JD in *Curing the
Incurable: Vitamin C, Infectious
Diseases and Toxins***

Vitamin C in Action

- ✓ A potent reducing agent - it readily donates electrons to recipient molecules
- ✓ 2 main actions are related to this oxidation-reduction (redox) potential



➤ Antioxidant

- Protects proteins, lipids, carbohydrates, and nucleic acids (DNA and RNA) from free radical damage
- Redox recycling of other important antioxidants, i.e. it regenerates vitamin E from its oxidized form

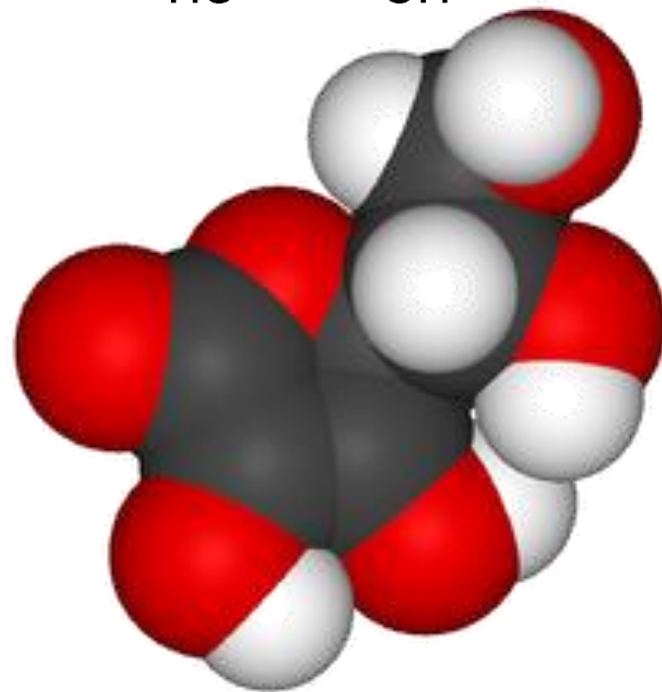
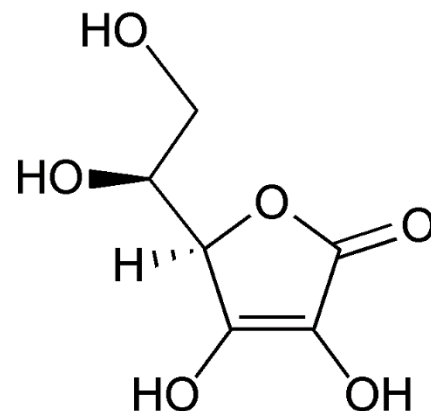
➤ Cofactor

- Biosynthesis of collagen
- Synthesis of carnitine
- Catecholamine production

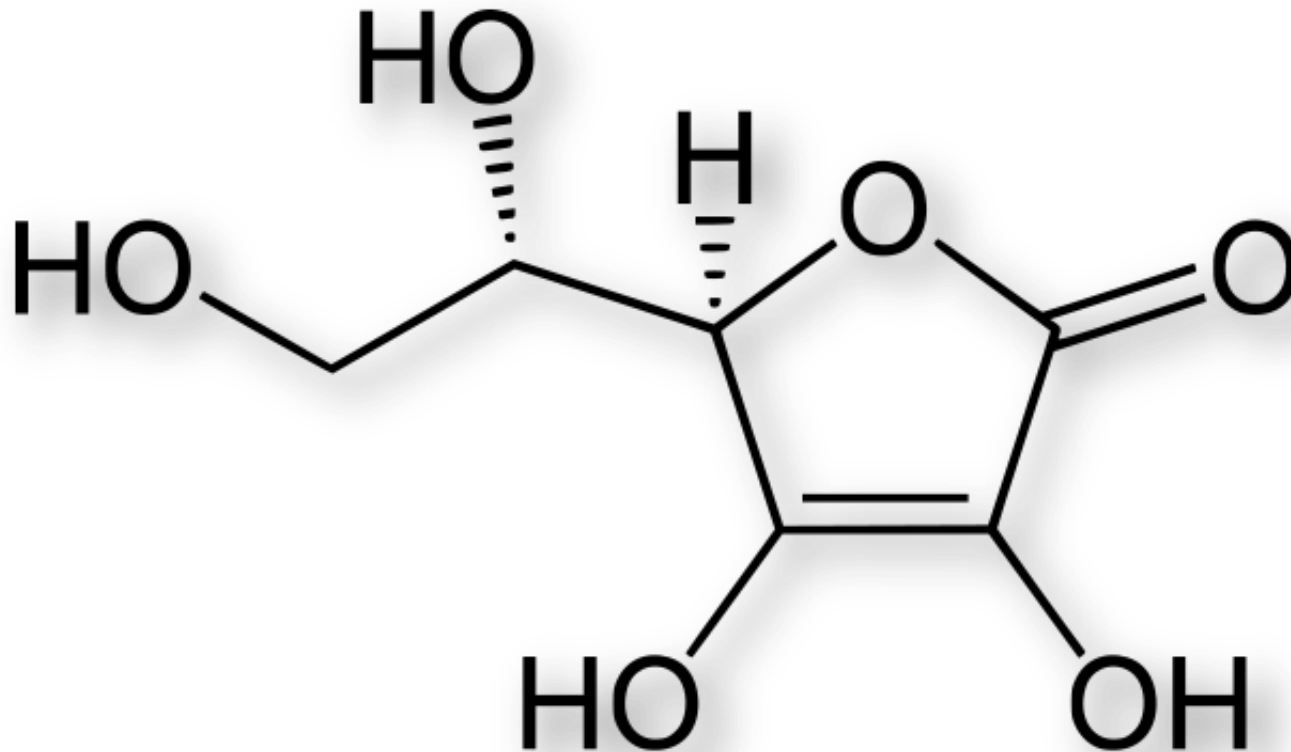


Main Functions of Vitamin C

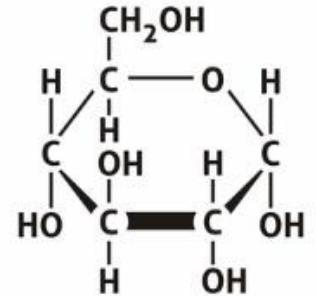
- ✓ Improves immune system
- ✓ Combats infection
- ✓ Antihistamine
- ✓ Reduces inflammation
- ✓ Participates in making adrenaline
- ✓ Increases iron uptake
- ✓ Heals connective tissue
- ✓ Antioxidant
- ✓ Aids in wound healing
- ✓ Cardiovascular health
- ✓ Cancer prevention and reversal
- ✓ **Transport of fat into cells for ATP**



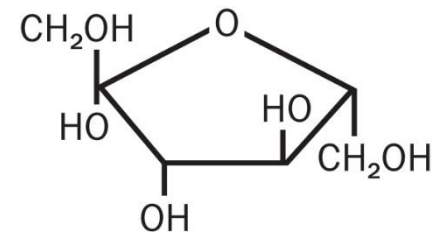
Vitamin C Structure



GLUCOSE MOLECULE



Fructose



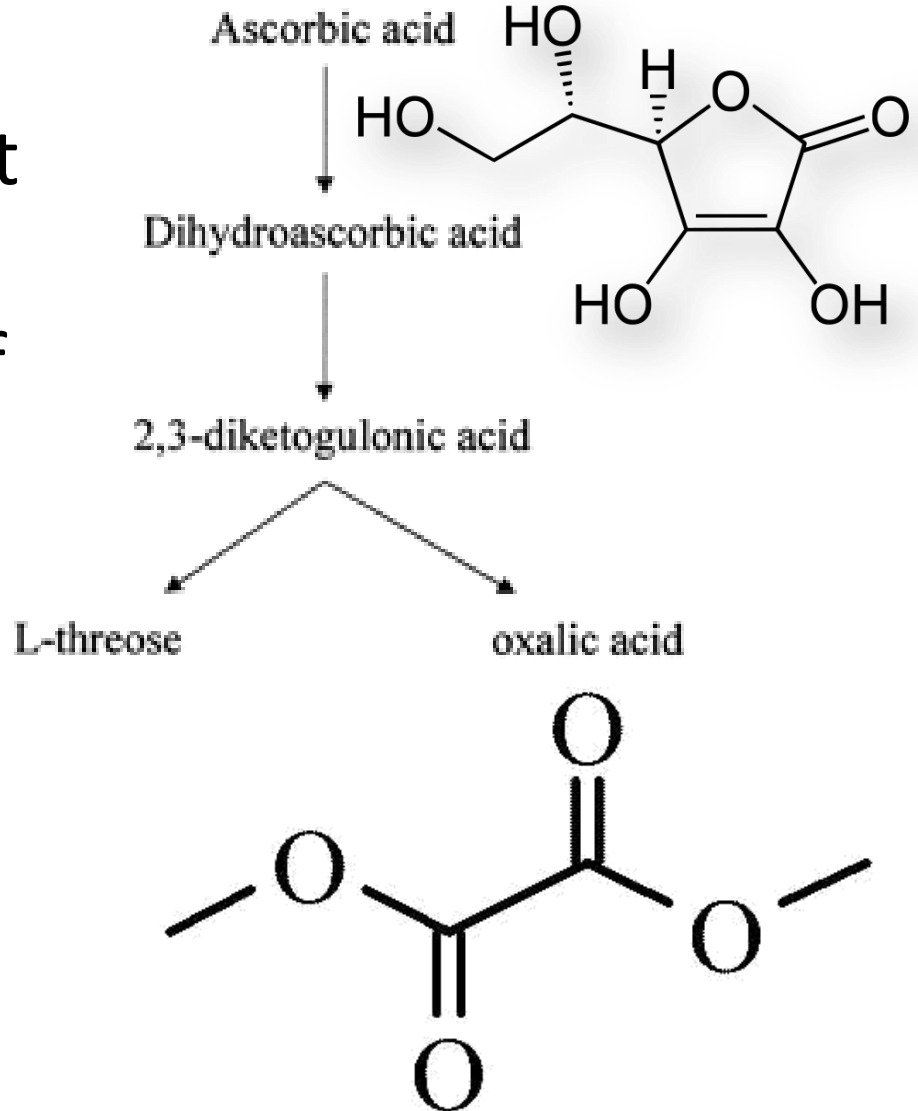
Therapeutic Uses of IV Vitamin C

- ✓ Infection – bacterial and viral
 - Hepatitis
 - Lyme
 - Bacterial
- ✓ Arthritis
- ✓ Injury repair
- ✓ Post surgical repair
- ✓ Cancer



Vitamin C and Oxalates

- ✓ Vitamin C can be converted to oxalates but the conversion system is saturated at low levels of vitamin C
- ✓ Oxalate formed when greater than 4 g per day are consumed



VERY HIGH OXALATE (over 50mg per serving)

The following foods may contain very large amounts of oxalate in the range of 50 - 520mg oxalate per serving size listed.

Vegetables

Beetroot - boiled or pickled
Beet greens (Mangold)
Leeks

Serving size

$\frac{1}{4}$ cup (50g)
1 oz (30g)
 $\frac{1}{2}$ cup (62g)

Soybeans and soy products

Soy milk
Soy burger
Textured vegetable/soy protein

Serving size

$\frac{1}{4}$ cup
1 item (67g)
1 oz

Okra
Poke weed
Spinach
Sweet potatoes
Swiss chard (boiled)
Swiss chard (raw)

$\frac{1}{2}$ cup (100g)
1 oz (30g)
1 oz (30g)
 $\frac{1}{2}$ cup (120g)
1 oz (30g)
 $\frac{1}{4}$ cup (9g)

Soy Flour
Soy nuts
Soy tofu
Soy yogurt
Soy breakfast links

1 oz
 $\frac{1}{4}$ oz
3 oz
 $\frac{1}{2}$ cup
1 item (45g)

Fruits

Elderberry, raw
Figs, dried
Green gooseberries
Rhubarb, raw, canned or stewed
Star fruit (Carambola)

Serving size

3.5 oz (100g)
3.5 oz (100g)
 $\frac{1}{2}$ cup (75g)
 $\frac{1}{4}$ cup (120g)
1 oz (30g)

Legumes, Nuts and Seeds

Almonds (slices)
Hazel nut (chopped)
Lentils, dried beans (cooked)
Refried beans (cooked)
Peanuts
Peanut butter
Pecans (and other nuts)
Pistachio
Sesame seeds (and Tahini)

Serving size

$\frac{1}{8}$ cup (14g)
 $\frac{1}{4}$ cup (28g)
 $\frac{1}{2}$ cup (85g)
 $\frac{1}{4}$ cup (42g)
 $\frac{1}{4}$ cup (36g)
 $\frac{1}{2}$ T (8g)
 $\frac{1}{4}$ cup (28g)
 $\frac{1}{2}$ cup (56g)
1 teaspoon (~2.5g)

Grains and Starches

Amaranth*
Buckwheat, dry
Wheat bran, dry

Serving size

1 oz (30g)
2 oz (60g)
1 oz (30g)



Vitamin C RDA

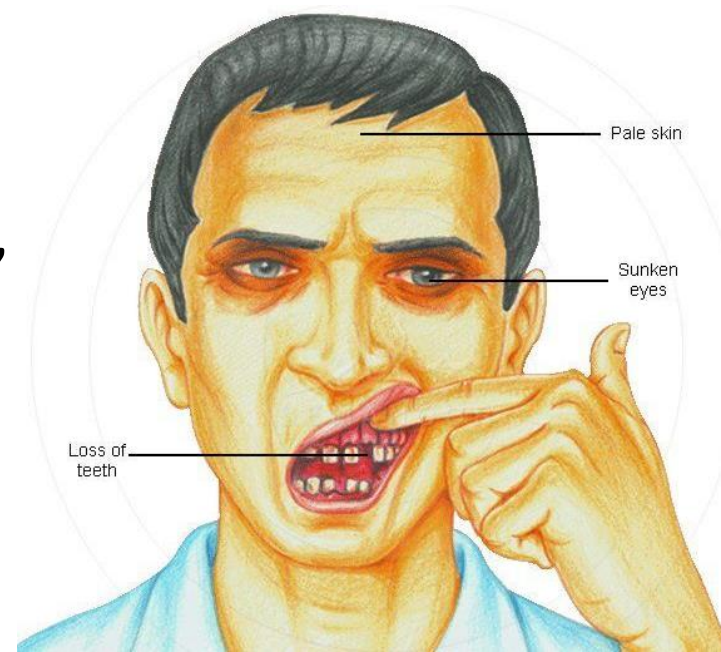
Table 1. Recommended Dietary Allowance (RDA) for Vitamin C

Life Stage	Age	Males (mg/day)	Females (mg/day)
Infants	0-6 months	40 (AI)	40 (AI)
Infants	7-12 months	50 (AI)	50 (AI)
Children	1-3 years	15	15
Children	4-8 years	25	25
Children	9-13 years	45	45
Adolescents	14-18 years	75	65
Adults	19 years and older	90	75
Smokers	19 years and older	125	110
Pregnancy	18 years and younger	-	80
Pregnancy	19 years and older	-	85
Breast-feeding	18 years and younger	-	115
Breast-feeding	19 years and older	-	120



Vitamin C Deficiency

- ✓ **Severe – scurvy:** Subcutaneous bleeding, poor wound closure, bruising easily, hair and tooth loss, and joint pain and swelling due to weakening of blood vessels, connective tissue, and bone, which all contain collagen
- ✓ **Early symptoms of scurvy:** Fatigue which may result from diminished levels of carnitine, needed to derive energy from fat, or from decreased synthesis of the catecholamine norepinephrine



Vitamin C Excess



- ✓ **Diarrhea:** When vitamin C intake exceeds need or threshold to absorb orally, the excess is excreted in feces (causes water to be pulled into intestines)
- ✓ **Oxalate build-up:** In sensitive individuals, excess vitamin C can be converted to oxalate and build up of oxalate can lead to inflammation, joint pain, vulvodynia, and theoretically kidney stones.
 - Taking vitamin B6 with large vitamin C doses can decrease risk of oxalate formation



Signs of Imbalance

- Bruise easily
- Hemorrhoids
- Joint injuries
- Muscle weakness
- Puffy, bleeding, red gums
- Varicose veins
- Weakened immune system
- Mucus membranes raw and bleeding
- Spongy and bleeding gums are spongy

LABS:

- Hematocrit –
- Alkaline Phosphatase +
- RBC +
- Hemoglobin –
- Hematocrit –
- MCV +
- MCH +
- MCHC +



Vitamin C Assessment

- ✓ Blood test
- ✓ Urine test: Strips
<http://www.drritamarie.com/go/VitaChekCUrine>
- ✓ White blood cell:
Spectra cell
- ✓ Organic acids test
- ✓ NutrEval
- ✓ Vitamin C calibration
aka flush



Therapeutic Uses of Vitamin C

- ✓ Vitamin C flush and oral supplementation – buffered
- ✓ IV vitamin C
- ✓ Intramuscular
- ✓ Liposomal



World's Healthiest Foods ranked as quality sources of vitamin C

Food	Serving Size	Cals	Amount (mg)	DRI/DV (%)	Nutrient Density	World's Healthiest Foods Rating
Papaya	1 medium	118.7	168.08	224.11	34.0	excellent
Bell Peppers	1 cup	28.5	117.48	156.64	98.9	excellent
Broccoli	1 cup	54.6	101.24	134.99	44.5	excellent
Brussels Sprouts	1 cup	56.2	96.72	128.96	41.3	excellent
Strawberries	1 cup	46.1	84.67	112.89	44.1	excellent
Pineapple	1 cup	82.5	78.87	105.16	22.9	excellent
Oranges	1 medium	61.6	69.69	92.92	27.2	excellent
Kiwifruit	1 2 inches	42.1	63.96	85.28	36.5	excellent
Cantaloupe	1 cup	54.4	58.72	78.29	25.9	excellent
Cauliflower	1 cup	28.5	54.93	73.24	46.2	excellent
Kale	1 cup	36.4	53.30	71.07	35.1	excellent
Cabbage	1 cup	43.5	51.60	68.80	28.5	excellent
Bok Choy	1 cup	20.4	44.20	58.93	52.0	excellent



Top 12 Vitamin C Herbs and Spices

Food Name	Vitamin C (mg)	Calories (mg)	Protein (mg)	Sugar (mg)	Fat (mg)
Dried Coriander Leaf Spices	566.7	279	21.93	7.27	4.78
Fresh Thyme	160.1	101	5.56	0	1.68
Dried Parsley Spices	125	292	26.63	7.27	5.48
Fresh Dill Weed	85	43	3.46	0	1.12
Saffron Spices	80.8	310	11.43	0	5.85
Ground Cloves Spices	80.8	323	5.98	2.38	20.07
Red Or Cayenne Pepper Spices	76.4	318	12.01	10.34	17.27
Dried Rosemary Spices	61.2	331	4.88	0	15.22
Dried Marjoram Spices	51.4	271	12.66	4.09	7.04
Dried Tarragon Spices	50	295	22.77	0	7.24
Dried Dill Weed Spices	50	253	19.96	0	4.36
Dried Thyme Spices	50	276	9.11	1.71	7.43



Rosehips



Camu Camu



Amla



Acerola Cherry



Goji Berries



Ways to Get Vitamin C in Your Client's Daily Diet

- ✓ Smoothies
- ✓ Sauces
- ✓ Soups
- ✓ Salad dressings
- ✓ Nut milks
- ✓ Salad
- ✓ Elixirs



Resources

- ✓ ***Curing the Incurable: Vitamin C, Infectious Diseases and Toxins*** - Thomas E. Levy, MD, JD
<http://www.drritamarie.com/go/CuringTheIncurable>
- ✓ **Food Sources of Vitamin C:**
<http://www.drritamarie.com/go/WHFoodsVitC>
- ✓ **Herb and Spice Sources of Vitamin C**
<http://www.drritamarie.com/go/HerbsSpicesVitC>
- ✓ **Vitamin C IV Protocol**
<http://www.drritamarie.com/go/RiordanIVCProtocol>
- ✓ **Vitamin C Calibration**
<http://www.drritamarie.com/go/VitaminCCalibration>
- ✓ ***How to Make Liposomal Vitamin C At Home***
<http://www.drritamarie.com/go/LiposomalVitCVideo>



Vitamin C Action Plan

- ✓ Eat vitamin C rich foods daily
- ✓ Supplement with vitamin C: 1000 mg three times a day in cases with allergies, low immune function, or high stress, supplement
- ✓ Determine needs with vitamin C flush (calibration)
- ✓ Add vitamin C rich herbs and spices to meals

