



*Daily Orange  
Change Your Life*

باشراف: د. عمر أكرم

A glass of orange juice is the central focus, with several orange slices arranged around its base. The background is a soft, out-of-focus pink and white pattern. The text is overlaid on the left side of the image.

# VITAMIN C METABOLISM

***By: Rana Manhal***⊙

***Rand Muhammed***⊙

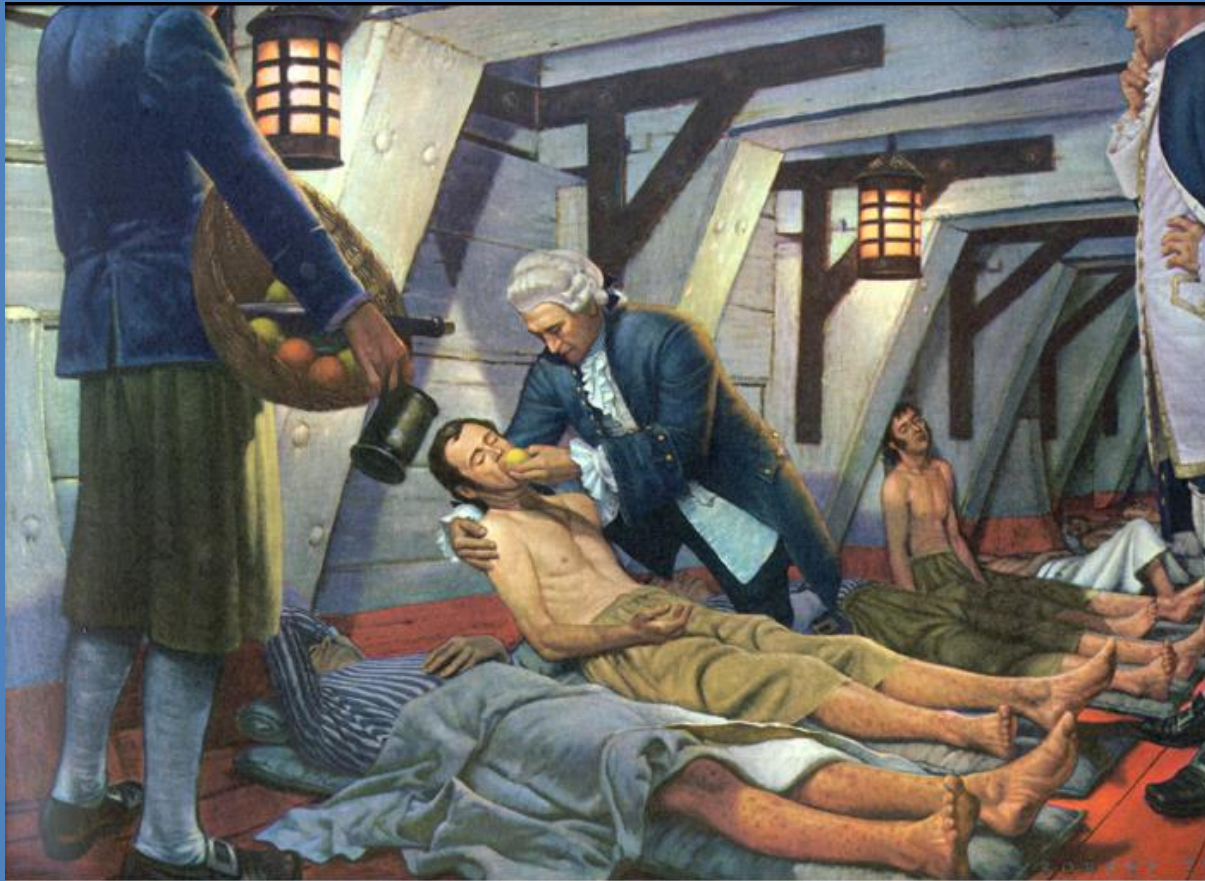
***Ruaa Faris***⊙

*Rana Manhal*

# HISTORY OF VITAMIN C

© Early during 17<sup>th</sup> century vitamin C discovered by James Lind (a surgeon in Royal Navy)





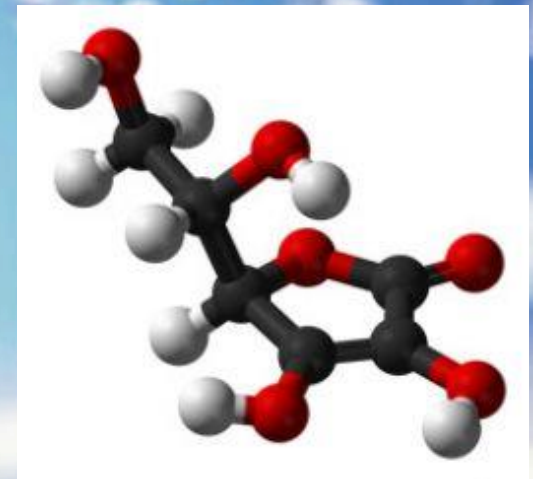
**James Lind, a surgeon in the Royal Navy, conducted clinical tests that proved that citrus fruits and their juices would cure and prevent scurvy, the disease which killed a million seamen between 1600 and 1800. In this painting he is shown aboard HMS *Salisbury* in 1747. Lind published his paper, *A Treatise on the Scurvy* was published in 1751. He later became Chief Surgeon of the Royal Naval Hospital and published many more papers on how to safeguard the health of sailors.**

Image from *A History of Medicine in Pictures*, published by Parke, Davis & Co. in 1960; Artist: Robert A.Thom

# WHAT IS VITAMIN C?

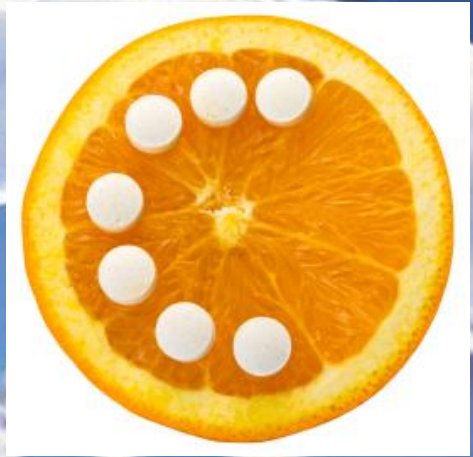
- Also known as L-ascorbic acid it is an essential nutrient for humans.
- It is needed for metabolic reactions in all plants and animals.
- It is a water soluble vitamin that is necessary for growth and development.

L-ascorbic acid molecule →



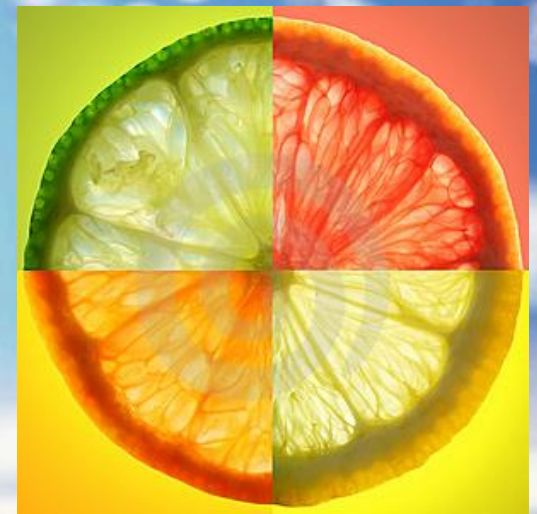
# USES OF VITAMIN C

- Protects against immune system deficiencies, cardio vascular disease, prenatal health problems, eye disease, and skin wrinkling.
- Helps form collagen in bones, cartilage, muscle, and blood vessels.
- Helps absorb iron.



# VITAMIN C IS FOUND...

- Mostly in citrus fruit and juices (limes, lemons, oranges, peaches, strawberries, bananas, and grapefruits)
- Also in cabbage, broccoli, cauliflower, leaf lettuce, tomatoes, potatoes, and beans.
- There are also vitamin C pills and other things for supplements.





# HOW MUCH SHOULD I TAKE?

- How much of each vitamin you need depends on your age and gender. Other factors, such as pregnancy and illnesses, are also important.
- The best way to get the daily requirement of essential vitamins, including vitamin C, is to eat a balanced diet that contains a variety of foods.



# DIETARY REFERENCE INTAKES FOR VITAMIN C:

- ⦿ Adults
- ⦿ Men age 19 and older: 90 mg/day
- ⦿ Women age 19 year and older: 75 mg/day
- ⦿ Pregnant women: 85 mg/day
- ⦿ Breastfeeding women: 120 mg/day

Smokers or those who are around secondhand smoke at any age should increase their daily amount of vitamin C an additional 35 mg per day.

# HOW DOES VITAMIN C WORK?

- Vitamin C reaches every cell of the body and plays a role in the making and protecting of our connective tissue that holds the body together.
- Helps the immune system fight off diseases
- Helps the cardiovascular system by facilitating fat metabolism
- Helps the nervous system by converting amino acids into neurotransmitters
- Vitamin C's formation of collagen protects teeth and bones.



# VITAMIN C IN OTHER ANIMALS

- All animals need vitamin C
- Some animals can make their own
- Humans, apes, guinea pigs and a few others have lost this ability



# VITAMIN C TOXICITY

Ruaa Faris Dhaher

# VITAMIN C

Ascorbic acid is Toxic to viruses, bacteria, and some malignant tumor cells.

Antioxidant.

water-soluble.

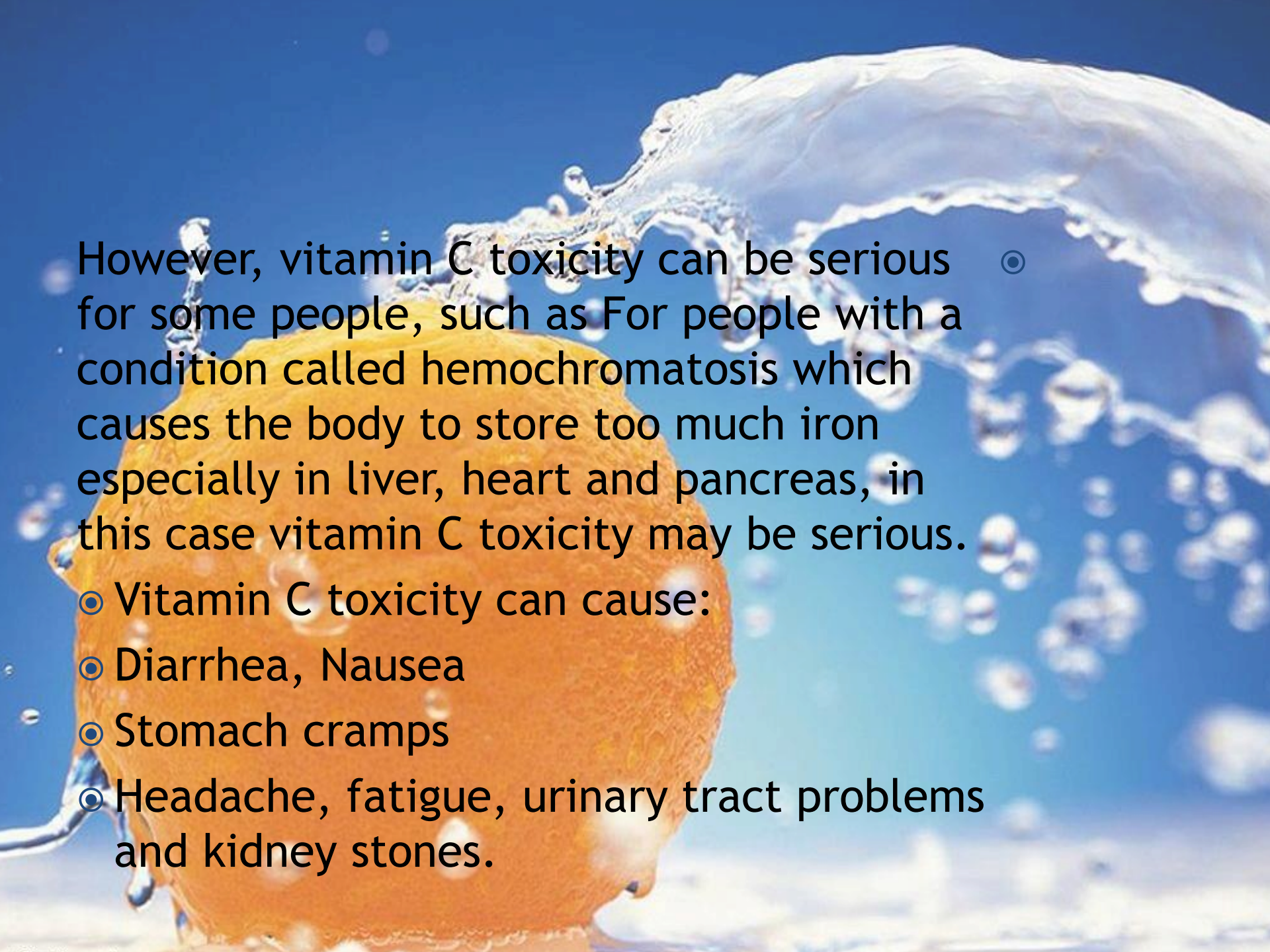
Since Vitamin C is water-soluble excess amounts that the body does not need will be excreted, but larger doses can cause some problems. .



## HARMFUL EFFECTS IN LARGER DOSES:

- While it is uncommon to take in too much vitamin C, it is still possible. Vitamin C toxicity is usually caused by taking too many supplement.
- Vitamin C toxicity is usually not serious and is treated by stopping vitamin C supplements.

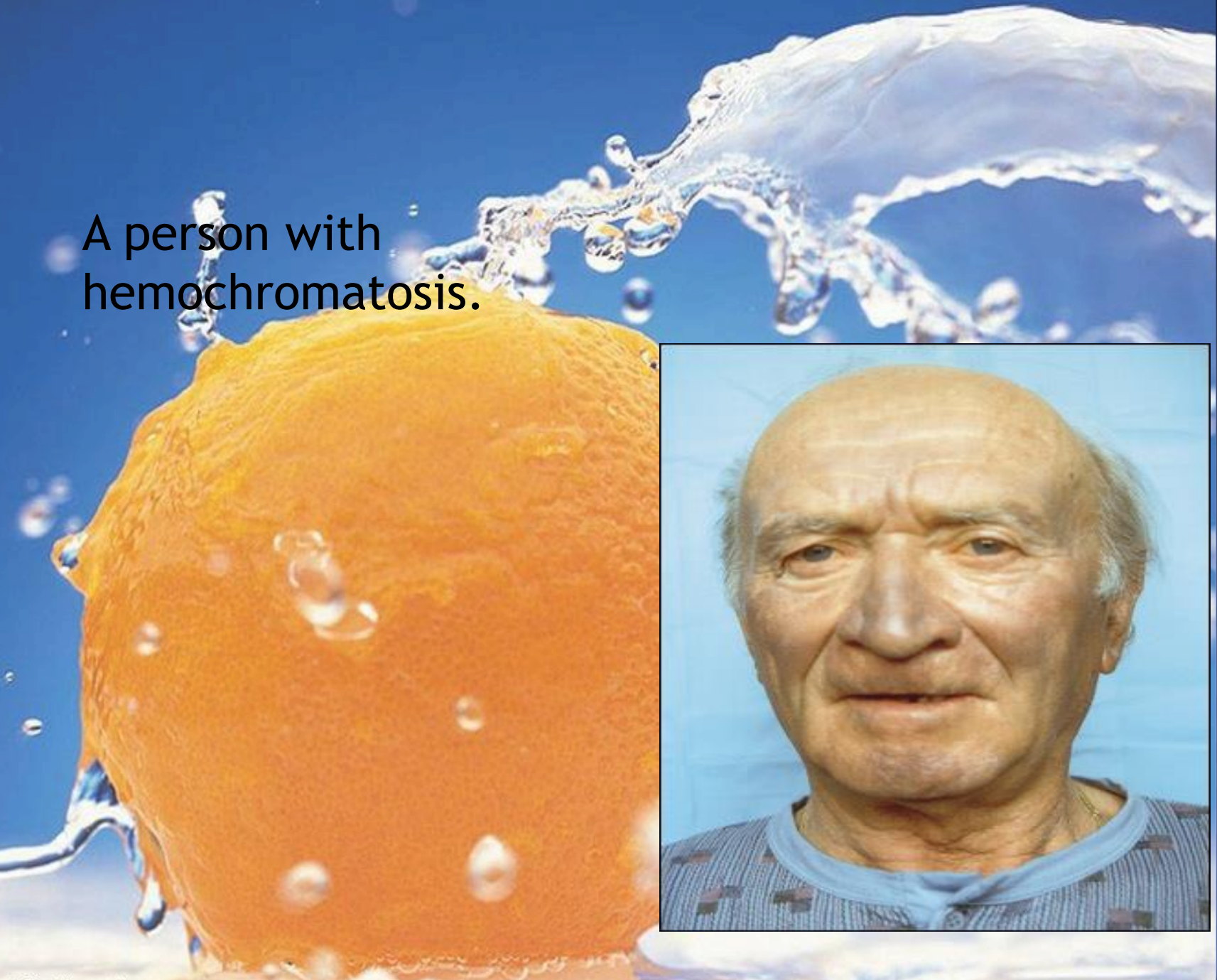




However, vitamin C toxicity can be serious for some people, such as For people with a condition called hemochromatosis which causes the body to store too much iron especially in liver, heart and pancreas, in this case vitamin C toxicity may be serious.

- Vitamin C toxicity can cause:
- Diarrhea, Nausea
- Stomach cramps
- Headache, fatigue, urinary tract problems and kidney stones.

A person with  
hemochromatosis.



*Under diagnosed*

*cirrhosis*

*loss of  
sex drive*

*endocrine  
problems*

*arthritis*

*chronic  
fatigue type  
problems*

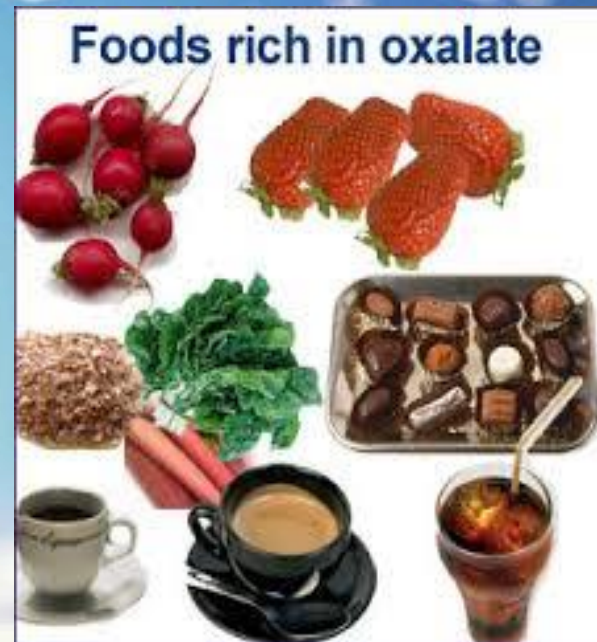
*cardiac  
problems*

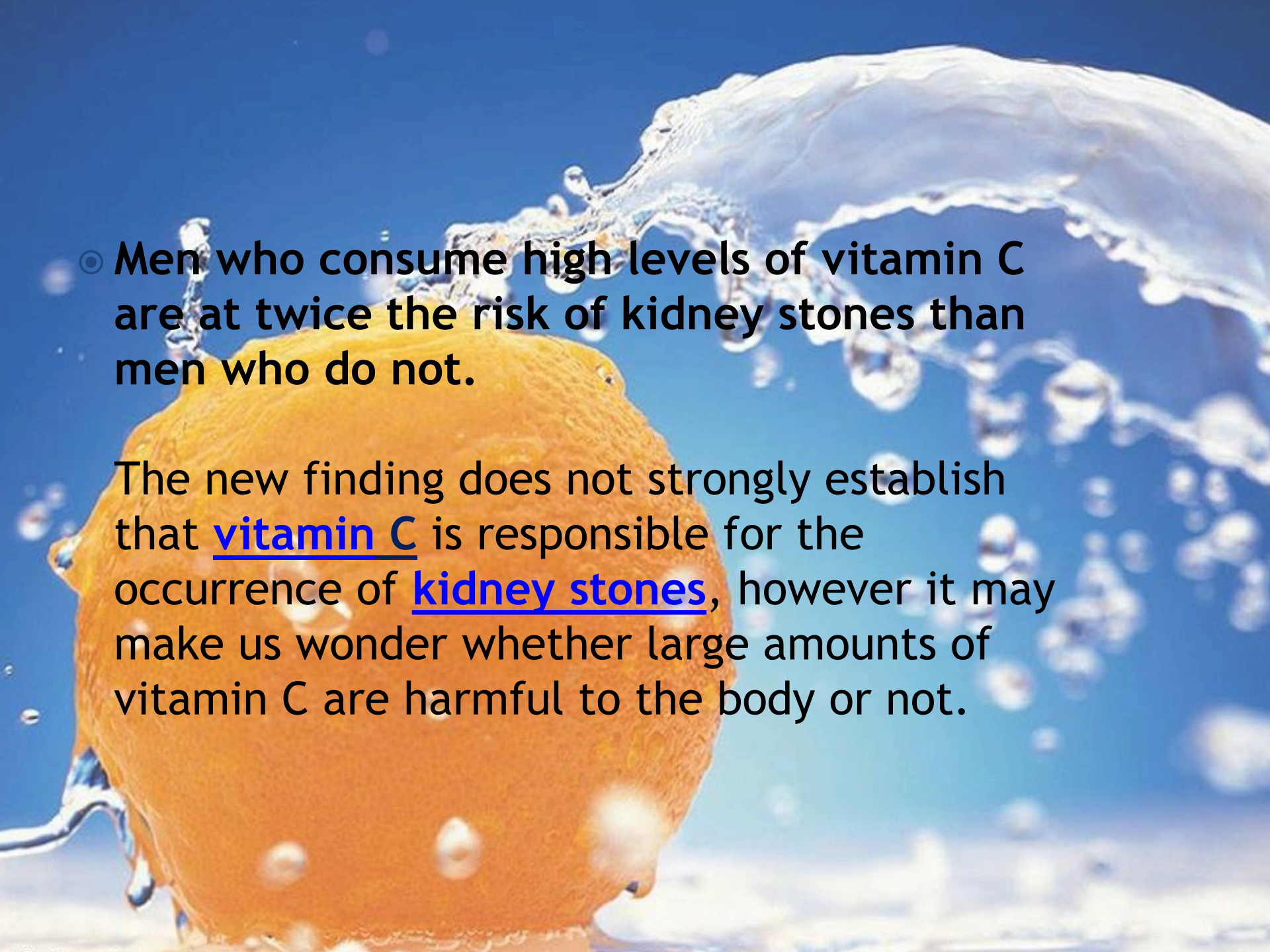


*Excess Iron*  
**HAEMOCHROMATOSIS**

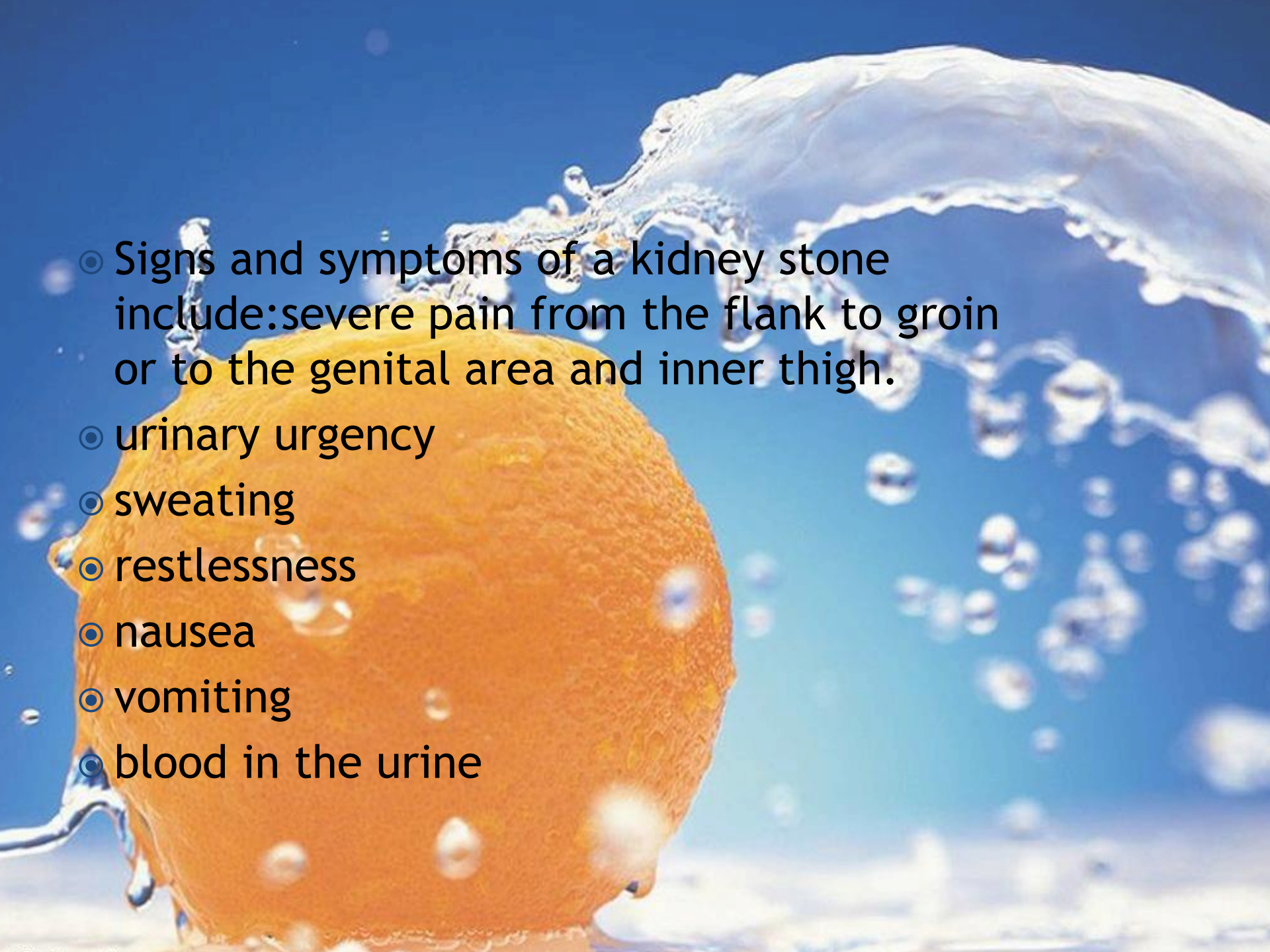
*common*

Large Amounts of Vitamin C Increase Risk of Kidney Stones. The researchers suspected that greater amounts of vitamin C could elevate the risk of kidney stones because the body breaks down the vitamin into material known as oxalate - a part of the stones.



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- Men who consume high levels of vitamin C are at twice the risk of kidney stones than men who do not.

The new finding does not strongly establish that vitamin C is responsible for the occurrence of kidney stones, however it may make us wonder whether large amounts of vitamin C are harmful to the body or not.

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- Signs and symptoms of a kidney stone include:severe pain from the flank to groin or to the genital area and inner thigh.
  - urinary urgency
  - sweating
  - restlessness
  - nausea
  - vomiting
  - blood in the urine

# *DIFECIENCY OF VITAMIN C*

***Rand Muhammed***

# VITAMIN C DEFICIENCY

● The important disease result from severe vitamin C deficiency is Scurvy





# SCURVY

- It has been known for many centuries as the potentially fatal disease.
- By the late 1700's the British navy was aware that scurvy could be cured by eating oranges or lemons, even though vitamin C would not be isolated until the early 1930's. [4]



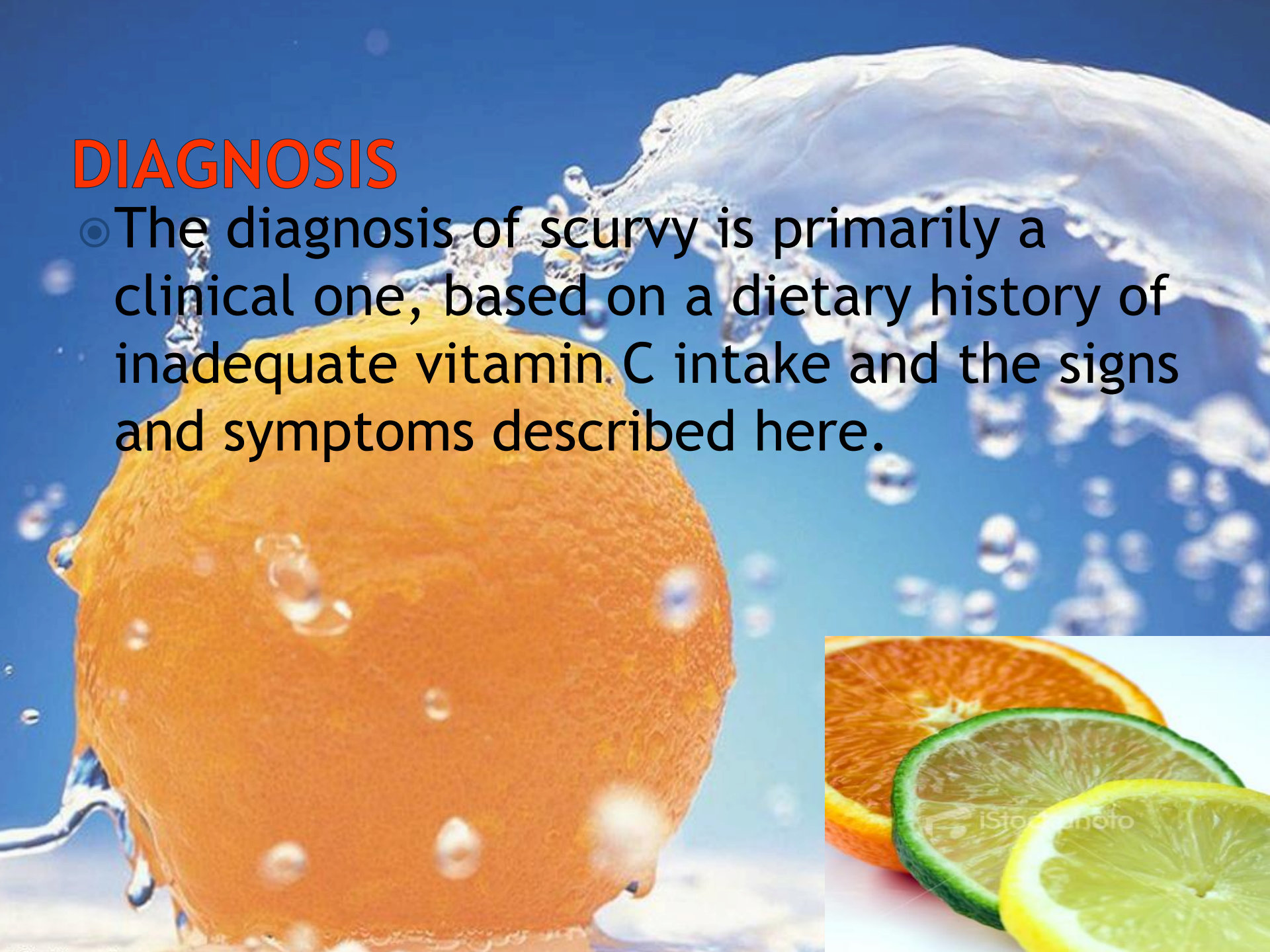
## ◎ People at risk of scurvy include:

- ◎ People with chronic malnutrition or those that eat less than 2 servings of fruits/vegetables per day
- ◎ Alcoholics
- ◎ Elderly
- ◎ Men who live alone (bachelor or widower scurvy)
- ◎ Children
- ◎ People on peculiar diets or food fads
- ◎ People with other medical conditions that may prevent the intake and/or absorption of vitamin C
- ◎ Dialysis patients
- ◎ Malabsorption disorders
- ◎ Severe dyspepsia. [2]+[1]



# DIAGNOSIS

- ⦿ The diagnosis of scurvy is primarily a clinical one, based on a dietary history of inadequate vitamin C intake and the signs and symptoms described here.



# SIGNS & SYMPTOMS

- Symptoms of scurvy generally develop after at least 3 months of severe or total vitamin C deficiency, they includes:
- Weakness & fatigue
- Bruising easily & bleeding from weakening blood vessel, connective tissue & bones due to collagen loss.
- Hair, teeth loss & gingivitis .
- Infants may be irritable, have pain when they move, and lose their appetite. Infants do not gain weight as they normally do. In infants and children, bone growth is impaired, and bleeding and anemia may occur. [1]+[2]

# COMPLICATIONS

- ◉ **Skin problems:** one of the first signs of scurvy is the development of perifollicular hyperkeratotic papules, These appear as reddish/bluish bruise-like spots surrounding hair follicles. The central hairs are twisted like corkscrews that may break easily. The papules may join together to form large areas of palpable purpura or ecchymoses (bruises).
- ◉ **Oral problems:** gums may swell and become red, soft and spongy. Any slight friction may cause the gums to bleed. Often this results in poor oral hygiene and dental diseases.
- ◉ **Musculoskeletal problems:** bleeding in the joints causes extreme discomfort and pain. Joints may be swollen and tender and the pain can be so severe that patients cannot walk.
- ◉ **Heart and lung problems:** shortness of breath, low blood pressure, and chest pain leading to shock and death. [2]



Figure 2 : Corkscrew hair [3]

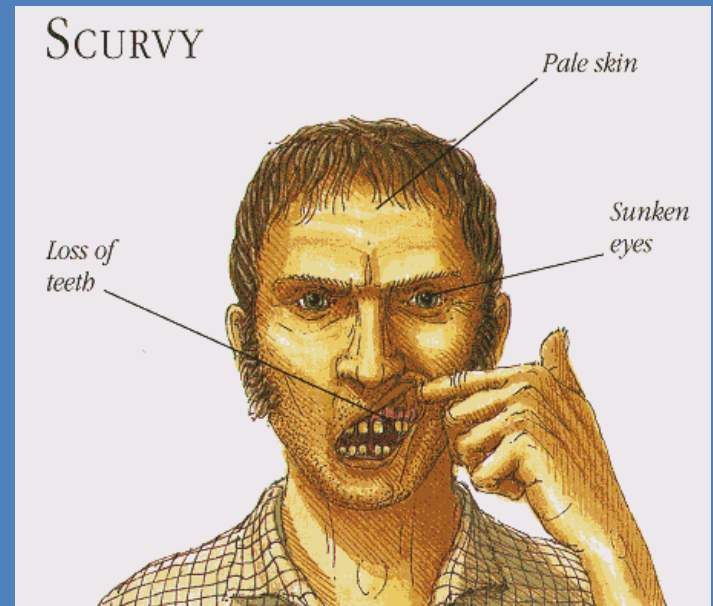


Figure3: gingivitis

# TREATMENT & PREVENTION

- Treatment is simply with vitamin C supplements taken orally.
- The adult dose is 800-1000mg/day for at least 1 week, then 400mg/day until complete recovery.
- In the U.S., the recommended dietary allowance (RDA) for vitamin C was recently revised upward from 60 mg daily for men and women. The RDA continues to be based primarily on the prevention of deficiency disease, rather than the prevention of chronic disease and the promotion of optimum health.
- Infants who are being weaned from breast milk to cow's milk need a supplement containing vitamin C. [5]+[2]



A vibrant orange is shown splashing in water, creating a large, white, crown-like splash that arches over the top of the fruit. The background is a clear, bright blue. The orange is in the foreground, and the water droplets are frozen in time, giving a sense of motion and freshness.

*...Thank you...*

*Rana Manhal*

*Ruaa Faris*

*Rand muhammed*



# REFERENCES

- [1] DRI DIETARY REFERENCE INTAKES *FOR Vitamin C, Vitamin E, Selenium, and Carotenoids*, Food and Nutrition Board, Institute of Medicine, NATIONAL ACADEMY PRESS Washington, D.C. pp. 95 -115
- [2] <http://dermnetnz.org/systemic/pdf/scurvy-vitaminodeficiency-dermnetnz.pdf>
- [3] <http://www.nlm.nih.gov/MEDLINEPLUS/ency/article/002404.htm>
- [4] <http://lpi.oregonstate.edu/infocenter/vitamins/vitaminC/>
- [5] <http://en.wikipedia.org/wiki/Scurvy#Prevention>

