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DefinitionSymptomsComplicationsDiagnosisTreatmentPreventionOutlookSummaryA prolonged vitamin C deficiency can cause severe and potentially life threatening symptoms. Eating a variety of fruits and vegetables can help maintain optimal levels of this important nutrient. Vitamin C is essential for tissue growth and repair and helps protect cells
from damage. Vitamin C deficiency is uncommon in the United States. It mainly affects individuals with very limited diets and those with certain underlying health issues. People who are deficient in vitamin C require urgent treatment to prevent serious complications. This article outlines the causes, symptoms, diagnosis, and treatment of vitamin C
deficiency. It also lists some foods and drinks that are high in vitamin C and discusses the outlook for people with vitamin C and discusses the outlook for males on Pinterest Anna Janecka/Getty Images on Pinteres
NIH uses the term "vitamin C deficiency" to refer to a daily vitamin C intake of less than 10 mg. It also uses the term "vitamin C intake that exceeds 10 mg but falls short of the RDA. As the NIH explains, vitamin C intake of less than 10 mg. It also uses the term "vitamin C intake of less than 10 mg. It also uses the term "vitamin C intake of less than 10 mg. It also uses the term "vitamin C intake of less than 10 mg. It also uses the term "vitamin C intake of less than 10 mg. It also uses the term "vitamin C intake of less than 10 mg but falls short of the RDA. As the NIH explains, vitamin C intake of less than 10 mg. It also uses the term "vitamin C intake of less than 10 mg. It also uses the term "vitamin C intake of less than 10 mg but falls short of the RDA. As the NIH explains, vitamin C intake of less than 10 mg. It also uses the term "vitamin C intake of less than 10 mg. It also uses the term "vitamin C intake of less than 10 mg. It also uses the term "vitamin C intake of less than 10 mg. It also uses the term "vitamin C intake of less than 10 mg. It also uses the term "vitamin C intake of less than 10 mg. It also uses the term "vitamin C intake of less than 10 mg. It also uses the term "vitamin C intake of less than 10 mg. It also uses the term "vitamin C intake of less than 10 mg. It also uses the term "vitamin C intake of less than 10 mg. It also uses the term "vitamin C intake of less than 10 mg. It also uses the term "vitamin C intake of less than 10 mg. It also uses the term "vitamin C intake of less than 10 mg. It also uses the term "vitamin C intake of less than 10 mg. It also uses the term "vitamin C intake of less than 10 mg. It also uses the term "vitamin C intake of less than 10 mg. It also uses the term "vitamin C intake of less than 10 mg. It also uses the term "vitamin C intake of less than 10 mg. It also uses the term "vitamin C intake of less than 10 mg. It also uses the term "vitamin C intake of less than 10 mg. It also uses the term "vitamin C intake of less than 10 mg. It also uses 
individuals who have a limited diet and in those with certain health conditions. Some factors that increase a person's risk of vitamin C inadequacy or deficiency include: limited food variety, which may occur due to: following a restrictive dietdisliking and avoiding many foodsmental health issuesalcohol or substance misusesmoking or exposure to
secondhand smokemedical conditions that reduce vitamin C absorption or increase the body's vitamin C notice as a coording to the NIH, obvious symptoms of vitamin C notice as a coording to the NIH, obvious symptoms of vitamin C notice as a coording to the NIH, obvious symptoms of vitamin C notice as a coording to the NIH, obvious symptoms of vitamin C notice as a coording to the NIH, obvious symptoms of vitamin C notice as a coording to the NIH, obvious symptoms of vitamin C notice as a coording to the NIH, obvious symptoms of vitamin C notice as a coording to the NIH, obvious symptoms of vitamin C notice as a coording to the NIH, obvious symptoms of vitamin C notice as a coording to the NIH, obvious symptoms of vitamin C notice as a coording to the NIH, obvious symptoms of vitamin C notice as a coording to the NIH, obvious symptoms of vitamin C notice as a coording to the NIH, obvious symptoms of vitamin C notice as a coording to the NIH, obvious symptoms of vitamin C notice as a coording to the NIH, obvious symptoms of vitamin C notice as a coordinate and obvious symptoms of vitamin C notice as a coordinate and obvious symptoms of vitamin C notice as a coordinate and obvious symptoms of vitamin C notice as a coordinate and obvious symptoms of vitamin C notice as a coordinate and obvious symptoms of vitamin C notice as a coordinate and obvious symptoms of vitamin C notice as a coordinate and obvious symptoms of vitamin C notice and vitamin C
scurvy may include:malaisefatiquequm inflammationAs vitamin C deficiency progresses, the body will not have enough vitamin C to help synthesize collagen, a type of protein. This leads to weakness of the connective tissues, which may result in the following signs and symptoms: hyperkeratosis, which is a thickening of the outer layer of the
skinpetechiae, which are small blood spots beneath the surface of the skin or mucus membranespurpura, which is a rash of purple spots due to bleeding from small blood vessels beneath the skinbruisingcorkscrew hairswound healing issuesjoint painOther potential signs and symptoms of scurvy include:depressionbleeding gumstooth lossiron
deficiency anemiaAccording to a 2022 review, blood tests to check plasma and ascorbic acid levels below 0.2 mg per deciliter of blood indicate severe vitamin C deficiency. Doctors may also conduct a skin biopsy to help with
diagnosis. If a vitamin C deficiency is present, biopsies may show signs of the following: thickening of the skin surrounding the hair folliclescorkscrew hairsa large number of blood vesselsUntreated scurvy can cause serious and potentially life threatening problems, so prompt treatment with vitamin C supplementation
is necessary. A 2023 review explains that the vitamin C dosage necessary to treat scurvy depends on the severity of the condition and a person's age and require between 500 mg and 1000 mg per day. For some adults, doctors may recommend a starting
dose of 2 grams per day for the first 3 days, followed by 500 mg per day for 1 to 3 months. A 2022 review notes that most people who undergo treatment for scurvy find that their symptoms resolve within days or weeks of starting treatment. Learn about why vitamin C is important. The best way to prevent scurvy is to
eat a healthy, balanced diet rich in fruits and vegetables. People can also consider taking a vitamin C supplement, but those who are pregnant or breastfeeding need to consult a doctor first. As a 2023 review explains, certain lifestyle factors increase an individual's daily vitamin C requirement. These include: Pregnant individuals require 85
mg of vitamin C per day.Lactation: People producing breastmilk require 120 mg per day. Find the 7 best vitamin C supplements. According to the NIH, fruits and vegetables are the best sources of vitamin C. A person who eats a variety of these
foods should meet their RDA of vitamin C through diet alone. The NHS lists some fruits and vegetables that are particularly high in vitamin C. These include: The NIH adds that cooking foods can reduce their vitamin C content. Steaming or microwaving may be better at retaining the vitamin C content. Read more about foods high in vitamin C. These include: The NIH adds that cooking foods can reduce their vitamin C content.
outlook for people who receive treatment for vitamin C deficiency is positive. Most individuals notice an improvement in the United States and other developed countries but can occur in people with limited diets and those with certain
medical conditions. Early symptoms of vitamin C deficiency may include malaise, fatigue, and swollen gums. Prolonged deficiency is high dose vitamin C deficiency is high dose v
weeks of starting the treatment. The best way to prevent vitamin C deficiency is to eat a healthy and balanced diet that is rich in fruits and vegetables. SupplementsNutrition / Diet Disease, corbutus,[1] Barlow's disease, hypoascorbemia,[1]
vitamin C deficiencyScorbutic gums, a symptom of scurvy. The triangle-shaped areas between the teeth show redness, feeling tired, changes to hair, sore arms and legs, gum disease, easy bleeding[1][2]CausesLack of vitamin C[1]Risk factorsMental disorders, unusual eating habits, alcohol use
disorder, substance use disorder, intestinal malabsorption, dialysis,[2] voyages at sea (historic), being stuck adriftDiagnostic methodBased on symptoms[2]TreatmentVitamin C supplements,[1] diet that contains fruit and vegetables (notably citrus)FrequencyRare (contemporary)[2] Scurvy is a deficiency disease (state of malnutrition) resulting from a
lack of vitamin C (ascorbic acid).[1] Early symptoms of deficiency include weakness, fatigue, and sore arms and legs.[1][2] Without treatment, decreased red blood cells, gum disease, changes to hair, and bleeding from the skin may occur.[1][3] As scurvy worsens, there can be poor wound healing, personality changes, and finally death from infection
or bleeding.[2] It takes at least a month of little to no vitamin C in the diet before symptoms occur.[1][2] In modern times, scurvy occurs most commonly in people with mental disorders, unusual eating habits, alcoholism, and older people who live alone.[2] Other risk factors include intestinal malabsorption and dialysis.[2] While many animals produce
their vitamin C, humans and a few others do not.[2] Vitamin C, an antioxidant, is required to make the building blocks for collagen, carnitine, and catecholamines, and assists the intestines in the absorption of iron from foods.[2][4][5] Diagnosis is typically based on outward appearance, X-rays, and improvement after treatment.[2] Treatment is with
vitamin C supplements taken by mouth.[1] Improvement often begins in a few days with complete recovery in a few weeks.[2] Sources of vitamin C in the diet include citrus fruit and several vegetables, including red peppers, broccoli, and tomatoes.[2] Sources of vitamin C in the diet include citrus fruit and several vegetables, including red peppers, broccoli, and tomatoes.[2] Sources of vitamin C in the diet include citrus fruit and several vegetables, including red peppers, broccoli, and tomatoes.[2] Sources of vitamin C in the diet include citrus fruit and several vegetables, including red peppers, broccoli, and tomatoes.[3] Sources of vitamin C in the diet include citrus fruit and several vegetables, including red peppers, broccoli, and tomatoes.[4] Sources of vitamin C in the diet include citrus fruit and several vegetables, including red peppers, broccoli, and tomatoes.[5] Sources of vitamin C in the diet include citrus fruit and several vegetables, including red peppers, broccoli, and tomatoes.[6] Sources of vitamin C in the diet include citrus fruit and several vegetables, including red peppers, broccoli, and tomatoes.[7] Sources of vitamin C in the diet include citrus fruit and several vegetables, including red peppers, broccoli, and tomatoes.[8] Sources of vitamin C in the diet include citrus fruit and several vegetables.
other nutritional deficiencies.[2] It occurs more often in the developing world in association with malnutrition.[2] Rates among refugees are reported at 5 to 45 percent.[6] Scurvy was described as early as the time of ancient Egypt, and historically it was a limiting factor in long-distance sea travel, often killing large numbers of people.[2][7] During
the Age of Sail, it was assumed that 50 percent of the sailors would die of scurvy on a major trip.[8] In long sea voyages, crews were isolated from land for extended periods and there foods containing vitamin C in diets of sailors resulted in scurvy.
[9] Early symptoms are malaise and lethargy. After one to three months, patients develop shortness of breath and bone pain. Myalgias may occur because of reduced carnitine production. Other symptoms include skin changes with roughness, easy bruising, and petechiae, gum disease, loosening of teeth, poor wound healing, and emotional changes
(which may appear before any physical changes). Dry mouth and dry eyes similar to Sjögren's syndrome may occur. In the late stages, jaundice, generalised edema, oliguria, neuropathy, fever, convulsions, and eventual death are frequently seen.[10] A child presenting a "scorbutic tongue" due to vitamin C deficiency A child with scurvy in flexion
posture Photo of the chest cage with scorbutic rosaries Scurvy, including subclinical scurvy, is caused by a deficiency of dietary vitamin C, the lack of working L-gulonolactone oxidase (GULO) enzyme has no significance. In modern Western societies,
scurvy is rarely present in adults, although infants and elderly people are affected.[11] Virtually all commercially available baby formulas contains sufficient vitamin C, preventing infantile scurvy. Human breast milk contains sufficient vitamin C if the mother has an adequate intake. Commercial milk is pasteurized, a heating process that destroys the
natural vitamin C content of the milk.[8] Scurvy is one of the accompanying diseases of malnutrition (other such micronutrient deficiencies are beriberi and pellagra) and thus is still widespread in areas of the world dependent on external food aid.[12] Although rare, there are also documented cases of scurvy due to poor dietary choices by people
living in industrialized nations.[13][14] X-ray of the knee joint (arrow indicates scurvy line) Vitamins are essential to the production and use of enzymes in ongoing processes throughout the human body.[8] Ascorbic acid is needed for a variety of biosynthetic pathways, by accelerating hydroxylation and amidation reactions. The early symptoms of
malaise and lethargy may be due to either impaired fatty acid metabolism from a lack of carnitine and/or from a lack of carnit
production. ATP is needed for cellular functions, including muscle contraction (For low ATP within the muscle cell, see also Purine nucleotide cycle.) In the synthesis of collagen, ascorbic acid is required as a cofactor for prolyl hydroxylase amino
acids in collagen. Hydroxyproline and hydroxylysine are important for stabilizing collagen by cross-linking the propeptides in collagen. Collagen is a primary structural protein in the human body, necessary for healthy blood vessels, muscle, skin, bone, cartilage, and other connective tissues. Defective connective tissue leads to fragile capillaries,
resulting in abnormal bleeding, bruising, and internal hemorrhaging. Collagen is an important part of bone, so bone formation is also affected. Teeth loosen, bones break more easily, and once-healed breaks may recur.[8] Defective collagen fibrillogenesis impairs wound healing. Untreated scurvy is invariably fatal.[15] Diagnosis is typically based on
physical signs, X-rays, and improvement after treatment.[2] Various childhood-onset disorders can mimic the clinical and X-ray picture of scurvy such as: Rickets Osteochondrodysplasias especially osteogenesis imperfecta Blount's disease Osteomyelitis Foods and their Vitamin C content per 100 grams Item Vitamin C contents (mg) Camu Camu
2000.00 Amla 610.00 Urtica 333.00 Guava 228.30 Blackcurrant 181.00 Kiwifruit 161.30 Chili pepper 80.40 Paraley 133.00 Green kiwifruit 92.70 Broccoli 89.20 Brussels sprout 85.00 Bell pepper 80.40 Papaya 62.00 Strawberry 58.80 Orange 53.20 Lemon 53.00 Cabbage 36.60 Spinach 28.00 Turnip 27.40 Potato 19.70 Scurvy can be prevented by a
diet that includes uncooked vitamin C-rich foods such as amla, bell peppers (sweet peppers), blackcurrants, broccoli, chili peppers, guava, kiwifruit, and parsley. Other sources rich in vitamin C are fruits such as lemons, limes, oranges, papaya, and strawberries. It is also found in vegetables, such as brussels sprouts, cabbage, potatoes, and spinach.
Some fruits and vegetables not high in vitamin C may be pickled in lemon juice, which is high in vitamin C. Nutritional supplements that provide ascorbic acid well above what is required to prevent scurvy, and even
partly treat it.[17] Scott's 1902 Antarctic expedition used fresh seal meat and increased allowance of bottled fruits, whereby complete recovery from incipient scurvy will improve with doses of vitamin C as low as 10 mg per day though doses of around 100 mg per day are typically
recommended.[19] Most people make a full recovery within 2 weeks.[20] Symptoms of scurvy have been recorded in Ancient Egypt as early as 1550 BC.[21] It was first reported amongst soldiers and sailors having inadequate access to fruits and vegetables which resulted in vitamin C deficiency.[22] In Ancient Egypt as early as 1550 BC.[21] It was first reported amongst soldiers and sailors having inadequate access to fruits and vegetables which resulted in vitamin C deficiency.[22] In Ancient Egypt as early as 1550 BC.[21] It was first reported amongst soldiers and sailors having inadequate access to fruits and vegetables which resulted in vitamin C deficiency.[22] In Ancient Egypt as early as 1550 BC.[21] It was first reported amongst soldiers and sailors having inadequate access to fruits and vegetables which resulted in vitamin C deficiency.[22] In Ancient Egypt as early as 1550 BC.[21] It was first reported amongst soldiers and vegetables which resulted in vitamin C deficiency.[22] In Ancient Egypt as early as 1550 BC.[21] It was first reported amongst soldiers and vegetables which resulted in vitamin C deficiency.[22] In Ancient Egypt as 250 BC.[23] In Ancient Egy
370 BC) described symptoms of scurvy, specifically a "swelling and obstruction of the spleen."[23][24] In 406 CE, the Chinese monk Faxian wrote that ginger was carried on Chinese ships to prevent scurvy.[25][failed verification][26] The knowledge that consuming certain foods is a cure for scurvy has been repeatedly forgotten and rediscovered into
the early 20th century.[27][28] Scurvy occurred during the Great famine of Ireland in 1845 and also the American Civil War. In 2002, scurvy outbreaks were recorded in Afghanistan following the most intense phase of the war.[29] In the 13th century.[30] In the 1497 expedition of Vasco da Gama, the curative effects of
citrus fruit were already observed[28][31] and were confirmed by Pedro Álvares Cabral and his crew in 1507.[32] The Portuguese planted fruit trees and vegetables on Saint Helena, a stopping point for homebound voyages from Asia, and left their sick who had scurvy and other ailments to be taken home by the next ship if they recovered.[33] In
1500, one of the pilots of Cabral's fleet bound for India noted that in Malindi, its king offered the expedition fresh supplies such as lamb, chicken, and duck, along with lemons and oranges, due to which "some of our ill were cured of scurvy".[34][35] These travel accounts did not prevent further maritime tragedies caused by scurvy, partly because of
the lack of communication between travelers and those responsible for their health, and because fruits and vegetables could not be kept for long on ships. [36] In 1536, the French explorer Jacques Cartier, while exploring the St. Lawrence River, used the local St. Lawrence Iroquoians' knowledge to save his men dying of scurvy. He boiled the needles
of the aneda tree (generally believed to have been eastern white cedar) to make a tea that was later shown to contain 50 mg of vitamin C per 100 grams.[37][38] Such treatments were not available aboard ship, where the disease was most common. Later, possibly inspired by this incident, several European countries experimented with preparations of
various conifers, such as spruce beer, as cures for scurvy. [39] In 1579, the Spanish friar and physician Agustin Farfán published a book Tractado breve de anathomía y chirugía, y de algunas enfermedades que más comúnmente suelen haver en esta Nueva España in which he recommended oranges and lemons for scurvy, a remedy that was already
known in the Spanish navy.[40] In February 1601, Captain James Lancaster, while commanding the first English East India Company fleet en route to Sumatra, landed on the northern coast of Madagascar specifically to obtain lemons and oranges for his crew to stop scurvy.[41] Captain Lancaster conducted an experiment using four ships under his
command. One ship's crew received routine doses of lemon juice while the other three did not receive such treatment. As a result, members of the non-treated ships started to contract scurvy, with many dying as a result. [42] Researchers have estimated that during the Age of Exploration (between 1500 and 1800), scurvy killed at least two million
sailors.[43][8] Jonathan Lamb wrote: "In 1499, Vasco da Gama lost 116 of his crew of 170; In 1520, Magellan lost 208 out of 230; ... all mainly to scurvy."[44] In 1593, Admiral Sir Richard Hawkins advocated drinking orange and lemon juice to prevent scurvy."[45] A 1609 book by Bartolomé Leonardo de Argensola recorded several different remedies
for scurvy known at this time in the Moluccas, including a kind of wine mixed with cloves and ginger, and "certain herbs". The Dutch sailors in the East India Company, published The Surgion's Mate as a handbook for apprentice
surgeons aboard the company's ships. He repeated the experience of mariners that the cure for scurvy was fresh food or, if not available, oranges, lemons, limes, and tamarinds.[47] He was, however, unable to explain the reason why, and his assertion had no impact on the prevailing opinion of the influential physicians of the age, that scurvy was a
digestive complaint. Besides afflicting ocean travelers, until the late Middle Ages scurvy was common in Europe in late winter, when few green vegetables, fruits, and root vegetables, fruits
previously been endemic.[48]:11 James Lind, a pioneer in the field of scurvy prevention In 2009, a handwritten household book authored by a Cornishwoman in 1707 was discovered in a house in Hasfield, Gloucestershire, containing a "Recp.t for the Scurvy" amongst other largely medicinal and herbal recipes. The recipe consisted of extracts from
various plants mixed with a plentiful supply of orange juice, white wine, or beer.[49] In 1734, Leiden-based physician Johann Bachstrom published a book on scurvy in which he stated, "scurvy is solely owing to a total abstinence from fresh fruit
and vegetables as a cure.[50][51][52] It was not until 1747 that James Lind formally demonstrated that scurvy could be treated by supplementing the diet with citrus fruit, in one of the first controlled clinical experiments reported in the history of medicine.[53][54] As a naval surgeon on HMS Salisbury, Lind had compared several suggested scurvy
cures: hard cider, vitriol, vinegar, seawater, oranges and lemons, and a mixture of balsam of Peru, garlic, myrrh, mustard seed and radish root. In A Treatise on the Scurvy (1753)[2][53] Lind explained the details of his clinical trial and concluded "the results of all my experiments was, that oranges and lemons were the most effectual remedies for this
distemper at sea."[8][53] However, the experiment and its results occupied only a few paragraphs in a work that was long and complex and had little impact. Lind himself never actively promoted lemon juice as a single 'cure'. He shared medical opinion at the time that scurvy had multiple causes - notably hard work, bad water, and the consumption
of salt meat in a damp atmosphere which inhibited healthful perspiration and normal excretion - and therefore required multiple solutions.[8][56] Lind was also sidetracked by the possibilities of producing a concentrated 'rob' of lemon juice by boiling it. This process destroyed the vitamin C and was therefore unsuccessful.[8] During the 18th century,
scurvy killed more British sailors than wartime enemy action. It was mainly by scurvy that during George Anson's voyage around the world he lost nearly two-thirds of his crew (1,300 out of 2,000) within the first 10 months of the voyage. [8][57] The Royal Navy enlisted 184,899 sailors during the Seven Years' War; 133,708 of these were "missing" or
died from disease, and scurvy was the leading cause. [58] Although sailors and naval surgeons were increasingly convinced that citrus fruits could cure scurvy throughout this period, the classically trained physicians who determined medical policy dismissed this evidence as merely anecdotal, as it did not conform to their theories of disease.
Literature championing the cause of citrus juice had no practical impact. The medical theory was based on the assumption that scurvy was a disease of internal putrefaction brought on by faulty digestion caused by the hardships of life at sea and the naval diet. Although successive theorists gave this basic idea different emphases, the remedies they
advocated (and which the navy accepted) amounted to little more than the consumption of 'fizzy drinks' to activate the digestive system, the most extreme of which was the regular consumption of 'elixir of vitriol' - sulphuric acid taken with spirits and barley water, and laced with spices. In 1764, a new and similarly inaccurate theory on scurvy
appeared. Advocated by Dr David MacBride and Sir John Pringle, Surgeon General of the Army and later President of the Royal Society, this idea was that scurvy was the result of a lack of 'fixed air' in the tissues which could be prevented by drinking infusions of malt and wort whose fermentation within the body would stimulate digestion and restore
the missing gases.[59] These ideas received wide and influential backing, when James Cook set off to circumnavigate the world (1768-1771) in HM Bark Endeavour, malt and wort were top of the list of the remedies he was ordered to investigate. The others were beer, Sauerkraut (a good source of vitamin C), and Lind's 'rob'. The list did not include
lemons.[60] Cook did not lose a single man to scurvy, and his report came down in favor of malt and wort. The reason for the health of his crews on this and other voyages was Cook's regime of shipboard cleanliness, enforced by strict discipline, and frequent replenishment of fresh food and greenstuffs.[61] Another beneficial rule implemented by
Cook was his prohibition of the consumption of salt fat skimmed from the ship's copper formed compounds that prevented the absorption of vitamins by the intestines. [62] The first major long-distance expedition that experienced virtually no scurvy was that of
the Spanish naval officer Alessandro Malaspina, 1789-1794. Malaspina's medical officer, Pedro González, was convinced that fresh oranges and lemons were essential for preventing scurvy. Only one outbreak occurred, during a 56-day trip across the open sea. Five sailors came down with symptoms, one seriously. After three days at Guam, all five
were healthy again. Spain's large empire and many ports of call made it easier to acquire fresh fruit.[63] Although towards the end of the century, MacBride's theories were being challenged, the medical authorities in Britain remained committed to the notion that scurvy was a disease of internal 'putrefaction' and the Sick and Hurt Board, run by
administrators, felt obliged to follow its advice. Within the Royal Navy, however, opinion - strengthened by first-hand experience with lemon juice at the siege of Gibraltar and during Admiral Rodney's expedition to the Caribbean - had become increasingly convinced of its efficacy. This was reinforced by the writings of experts like Gilbert Blane[64]
and Thomas Trotter[65] and by the reports of up-and-coming naval commanders. With the coming of war in 1793, the need to eliminate scurvy became more urgent. The first initiative came not from the admirals. Ordered to lead an expedition against Mauritius, Rear Admiral Gardner was uninterested in the wort,
malt, and elixir of vitriol that were still being issued to ships of the Royal Navy, and demanded that he be supplied with lemons, to counteract scurvy on the voyage. Members of the Royal Navy, and demanded that he be supplied with lemons, to counteract scurvy on the voyage. Members of the Royal Navy, and demanded that he be supplied with lemons, to counteract scurvy on the voyage.
minute change of plan, and the expedition against Mauritius was canceled. On 2 May 1794, only HMS Suffolk and two sloops under Commodore Peter Rainier sailed for the east with an outward bound convoy, but the warships were fully supplied with lemon juice and the sugar with which it had to be mixed. In March 1795, it was reported that the
Suffolk had arrived in India after a four-month voyage without a trace of scurvy and with a crew that was healthier than when it set out. The effect was immediate. Fleet commanders clamored also to be supplied with lemon juice, and by June the Admiralty acknowledged the groundswell of demand in the navy and agreed to a proposal from the Sick
and Hurt Board that lemon juice and sugar should in future be issued as a daily ration to the crews of all warships.[66] It took a few years before the method of distribution to all ships in the fleet had been perfected and the supply of the huge quantities of lemon juice required to be secured, but by 1800, the system was in place and functioning. This
led to a remarkable health improvement among the sailors and consequently played a critical role in gaining an advantage in naval battles against enemies who had yet to introduce the measures. Scurvy was not only a disease of seafarers. The early colonists of Australia suffered greatly because of the lack of fresh fruit and vegetables in the winter.
time aboard HM Convict Ship Barrosa (1841/2) The surgeon-in-chief of Napoleon's army at the Siege of Alexandria (1801), Baron Dominique-Jean Larrey, wrote in his memoirs that the consumption of horse meat helped the French to curb an epidemic of scurvy. The meat was cooked but was freshly obtained from young horses bought from Arabs, and
 was nevertheless effective. This helped to start the 19th-century tradition of horse meat consumption in France.[68] Lauchlin Rose patented a method used to preserve citrus juice without alcohol in 1867, creating a concentrated drink known as Rose's lime juice. The Merchant Shipping Act 1867 required all ships of the Royal Navy and Merchant
people.[70] The plant Cochlearia officinalis, also known as "common scurvygrass", acquired its common name from the observation that it cured scurvy, and it was taken on board ships in dried bundles or distilled extracts. Its bitter taste was usually disguised with herbs and spices; however, this did not prevent scurvygrass drinks and sandwiches
juice, which had been exposed to light and air, and piped through copper tubing, all of which significantly reduced the Vitamin C. Indeed, a 1918 animal experiment using representative samples of the Navy and Merchant Marine's lime juice showed that it had virtually no antiscorbutic power at all.[28] The belief that scurvy was fundamentally a
nutritional deficiency, best treated by consumption of fresh food, particularly fresh citrus or fresh meat, was not universal in the 19th and early 20th century. For example, the Belgian Antarctic Expedition of 1897-1899 became seriously affected by scurvy when its leader
Adrien de Gerlache, initially discouraged his men from eating penguin and seal meat. In the Royal Navy's Arctic expeditions in the mid-19th century, it was widely believed that scurvy was prevented by good hygiene on board ship, regular exercise, and maintaining crew morale, rather than by a diet of fresh food. Navy expeditions continued to be
plagued by scurvy even while fresh (not jerked or tinned) meat was well known as a practical antiscorbutic among civilian whalers and explorers in the Arctic. In the latter half of the 19th century, there was greater recognition of the value of eating fresh meat as a means of avoiding or treating scurvy, but the lack of available game to hunt at high
latitudes in winter meant it was not always a viable remedy. Criticism also focused on the fact that some of the men most affected by scurvy on Naval polar expeditions that this predisposed them to the condition. [72] Even cooking fresh meat did not destroy its antiscorbutic properties, especially as many
cooking methods failed to bring all the meat to high temperature. The confusion is attributed to several factors:[28] while fresh citrus (particularly lemons) cured scurvy; fresh meat (especially organ meat and raw meat)
consumed in arctic exploration) also cured scurvy, undermining the theory that fresh vegetable matter was essential to preventing and curing scurvy; increased marine speed via steam shipping, improved nutrition on land, reduced the incidence of scurvy and thus the ineffectiveness of copper-piped lime juice compared to fresh lemons was not
urban upper class. While pasteurization killed bacteria, it also destroyed vitamin C. This was eventually resolved by supplementing with onion juice or cooked potatoes. Native Americans helped save some newcomers from scurvy by directing them to eat wild onions.[74] By the early 20th century, when Robert Falcon Scott made his first expedition to
the Antarctic (1901-1904), the prevailing theory was that scurvy was caused by "ptomaine poisoning", particularly in tinned meat.[75] However, Scott discovered that a diet of fresh meat from Antarctic seals curvy before any fatalities occurred.[76] But while he saw fresh meat as a cure for scurvy, he remained confused about its underlying
beriberi research. They fed quinea pigs their test diet of grains and flour, which had earlier produced beriberi in their pigeons, and were surprised when classic scurvy resulted instead. This was a serendipitous choice of animal. Until that time, scurvy had not been observed in any organism apart from humans and had been considered an exclusively
human disease. Certain birds, mammals, and fish are susceptible to scurvy, but pigeons are unaffected since they can synthesize ascorbic acid internally. Holst and Frølich found they could cure scurvy, which was made even
before the essential idea of "vitamins" in foods had been put forward, has been called the single most important piece of vitamin C research.[78] In 1915, New Zealand troops in the Gallipoli Campaign had a lack of vitamin C research.[78] In 1915, New Zealand troops in the Gallipoli Campaign had a lack of vitamin C research.[78] In 1915, New Zealand troops in the Gallipoli Campaign had a lack of vitamin C research.[78] In 1915, New Zealand troops in the Gallipoli Campaign had a lack of vitamin C research.[78] In 1915, New Zealand troops in the Gallipoli Campaign had a lack of vitamin C research.[78] In 1915, New Zealand troops in the Gallipoli Campaign had a lack of vitamin C research.[78] In 1915, New Zealand troops in the Gallipoli Campaign had a lack of vitamin C research.[78] In 1915, New Zealand troops in the Gallipoli Campaign had a lack of vitamin C research.[78] In 1915, New Zealand troops in the Gallipoli Campaign had a lack of vitamin C research.[78] In 1915, New Zealand troops in the Gallipoli Campaign had a lack of vitamin C research.[78] In 1915, New Zealand troops in the Gallipoli Campaign had a lack of vitamin C research.[78] In 1915, New Zealand troops in the Gallipoli Campaign had a lack of vitamin C research.[78] In 1915, New Zealand troops in the Gallipoli Campaign had a lack of vitamin C research.[78] In 1915, New Zealand troops in the Gallipoli Campaign had a lack of vitamin C research.[78] In 1915, New Zealand troops in the Gallipoli Campaign had a lack of vitamin C research.[78] In 1915, New Zealand troops in the Gallipoli Campaign had a lack of vitamin C research.[78] In 1915, New Zealand troops in the Gallipoli Campaign had a lack of vitamin C research.[78] In 1915, New Zealand troops in the Gallipoli Campaign had a lack of vitamin C research.[78] In 1915, New Zealand troops in the Gallipoli Campaign had a lack of vitamin C research.[78] In 1915, New Zealand troops in the Gallipoli Campaign had a lack of vitamin C research.[78] In 1915, New Zealand troops in the Gallipoli Campaign had a 
among the Inuit, proved that the all-meat diet they consumed did not lead to vitamin deficiencies. He participated in a study in New York's Bellevue Hospital in February 1928, where he and a companion ate only meat for a year while under close medical observation, yet remained in good health.[80] In 1927, Hungarian biochemist Albert Szent-
Györgyi isolated a compound he called "hexuronic acid".[81] Szent-Györgyi suspected hexuronic acid, which he had isolated from adrenal glands, to be the antiscorbutic agent, but he could not prove it without an animal-deficiency model. In 1932, the connection between hexuronic acid and scurvy was finally proven by American researcher Charles
Glen King of the University of Pittsburgh. [82] King's laboratory was given some hexuronic acid by Szent-Györgyi and soon established that it was the sought-after anti-scorbutic agent. Because of this, hexuronic acid was subsequently renamed ascorbic acid. Rates of scurvy in the developed world are low due to the greater access to vitamin C-rich
foods.[83] Those most commonly affected are malnourished people in the developing world and homeless people.[84] There have been outbreaks of the condition in refugee camps.[85] Case reports in the developing world of those with poorly healing wounds have occurred.[86] In 2020, the overall incidence of scurvy in the US was about one in 4,000 and homeless people.
people, up significantly from even a few years before. About two-thirds of all scurvy is found in autistic people with autism are at risk of developing scurvy because some of them, the restricted diet takes the form of avoidant/restrictive and pasta).[88][89] For some of them only eat a small number of foods (e.g., only rice and pasta).[88][89] For some of them only eat a small number of foods (e.g., only rice and pasta).[88][89] For some of them only eat a small number of foods (e.g., only rice and pasta).[88][89] For some of them only eat a small number of foods (e.g., only rice and pasta).[88][89] For some of them only eat a small number of foods (e.g., only rice and pasta).[88][89] For some of them only eat a small number of foods (e.g., only rice and pasta).[88][89] For some of them only eat a small number of foods (e.g., only rice and pasta).[88][89] For some of them only eat a small number of foods (e.g., only rice and pasta).[88][89] For some of them only eat a small number of foods (e.g., only rice and pasta).[88][89] For some of them only eat a small number of foods (e.g., only rice and pasta).[88][89] For some of them only eat a small number of foods (e.g., only rice and pasta).[88][89] For some of them only eat a small number of foods (e.g., only rice and pasta).[88][89] For some of them only eat a small number of foods (e.g., only rice and pasta).[88][89] For some of them only eat a small number of foods (e.g., only rice and pasta).[88][89] For some of them only eat a small number of foods (e.g., only rice and pasta).[89] For some of them only eat a small number of foods (e.g., only rice and pasta).[89] For some of them only eat a small number of foods (e.g., only rice and pasta).[89] For some of them only eat a small number of foods (e.g., only rice and pasta).[89] For some of them only eat a small number of eat a small numb
food intake disorder (ARFID).[90] Notable human dietary studies of experimentally induced scurvy were conducted on conscientious objectors during World War II in Britain and the United States on Iowa state prisoner volunteers in the late 1960s.[91][92] These studies both found that all obvious symptoms of scurvy previously induced by an
experimental scorbutic diet with extremely low vitamin C content could be completely reversed by additional vitamin C per day (which produced blood levels of vitamin C of about 0.55 mg/dl, about 1/3 of tissue saturation of only 10 mg per day. In these experiments, no clinical difference was noted between men given 70 mg vitamin C per day. In these experiments, no clinical difference was noted between men given 70 mg vitamin C per day. In these experiments, no clinical difference was noted between men given 70 mg vitamin C per day.
levels), and those given 10 mg per day (which produced lower blood levels). Men in the prison study developed the first signs of scurvy about four weeks after starting the vitamin C-free diet, whereas in the British study, six to eight months were required, possibly because the subjects were pre-loaded with a 70 mg/day supplement for six weeks
before the scorbutic diet was fed.[91] Men in both studies, on a diet devoid or nearly devoid of vitamin C too low to be accurately measured when they developed signs of scurvy, and in the Iowa study, at this time were estimated (by labeled vitamin C too low to be accurately measured when they devoid of vitamin C too low to be accurately measured when they developed signs of scurvy, and in the Iowa study, at this time were estimated (by labeled vitamin C too low to be accurately measured when they developed signs of scurvy, and in the Iowa study, at this time were estimated (by labeled vitamin C too low to be accurately measured when they developed signs of scurvy, and in the Iowa study, at this time were estimated (by labeled vitamin C too low to be accurately measured when they developed signs of scurvy, and in the Iowa study, at this time were estimated (by labeled vitamin C too low to be accurately measured when they developed signs of scurvy, and in the Iowa study, at this time were estimated (by labeled vitamin C too low to be accurately measured when they developed signs of scurvy, and in the Iowa study, at this time were estimated (by labeled vitamin C too low to be accurately measured when they developed signs of scurvy, and in the Iowa study, at this time were estimated (by labeled vitamin C too low to be accurately measured when the Iowa study is 
only 2.5 mg/day.[92] See also: Vitamin C, notably simians and tarsiers. These make up one of two major primate suborders
haplorrhini, and this group includes humans. [93] The strepsirrhini (non-tarsier prosimians) can make their vitamin C, and these include lemurs, lorises, pottos, and galagos. Ascorbic acid is also not synthesize their vitamin C. All species
that do not synthesize ascorbate require it in the diet. Deficiency causes scurvy in humans, and somewhat similar symptoms in other animals.[95][96][97] Animals that can contract scurvy all lack the L-gulonolactone oxidase (GULO) enzyme, which is required in the last step of vitamin C synthesis. The genomes of these species contain GULO as
pseudogenes, which serve as insight into the evolutionary past of the species.[98][99][100] In babies, scurvy is sometimes referred to as Barlow's disease may also refer to mitral valve prolapse (Barlow's syndrome), first described by John
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scurvy in Wiktionary, the free dictionary. Retrieved from "Vitamins are a group of substances needed in small amounts by the body to maintain health. Vitamin C is also called ascorbic acid. It cannot be made by the human body and so is an essential component of your diet. Vitamin C is needed to make a substance called collagen which is required
for the health and repair of various tissues in the body, including: Skin. Bone. Cartilage. Ligaments and tendons. Blood vessel walls. Teeth. Foods rich in vitamin C, including: Citrus fruits like oranges, grapefruit, limes and lemons. Berries such as blackcurrants, strawberries, raspberries, blueberries and
cranberries. Cantaloupe melon and watermelon. Kiwi fruit. Vegetables such as spinach, green and red peppers, tomatoes, cauliflower, cabbage, broccoli, Brussels sprouts and potatoes. Certain foods such as spinach, green and red peppers, tomatoes, cauliflower, cabbage, broccoli, Brussels sprouts and potatoes. Certain foods such as spinach, green and red peppers, tomatoes, cauliflower, cabbage, broccoli, Brussels sprouts and potatoes. Certain foods such as spinach, green and red peppers, tomatoes, cauliflower, cabbage, broccoli, Brussels sprouts and potatoes. Certain foods such as spinach, green and red peppers, tomatoes, cauliflower, cabbage, broccoli, Brussels sprouts and potatoes. Certain foods such as spinach, green and red peppers, tomatoes, cauliflower, cabbage, broccoli, Brussels sprouts and potatoes.
found in fresh milk, fish and offal such as liver and kidney. Most vitamin C in the due to depend on age and sex. Recommendations may vary in different countries. Pregnant and
breastfeeding women also need higher amounts of vitamin C per day. Children aged 1-10 years need 30 mg of vitamin C per day. Children aged 1-14 years need 35 mg of vitamin C in their diet. Children aged 1-10 years need 30 mg of vitamin C per day. Children aged 1-14 years need 30 mg of vitamin C in their diet. Children aged 1-10 years need 30 mg of vitamin C per day. Children aged 1-10 years need 30 mg of vitamin C per day. Children aged 1-10 years need 30 mg of vitamin C per day. Children aged 1-10 years need 30 mg of vitamin C per day. Children aged 1-10 years need 30 mg of vitamin C per day. Children aged 1-10 years need 30 mg of vitamin C per day. Children aged 1-10 years need 30 mg of vitamin C per day. Children aged 1-10 years need 30 mg of vitamin C per day. Children aged 1-10 years need 30 mg of vitamin C per day. Children aged 1-10 years need 30 mg of vitamin C per day. Children aged 1-10 years need 30 mg of vitamin C per day. Children aged 1-10 years need 30 mg of vitamin C per day. Children aged 1-10 years need 30 mg of vitamin C per day. Children aged 1-10 years need 30 mg of vitamin C per day. Children aged 1-10 years need 30 mg of vitamin C per day. Children aged 1-10 years need 30 mg of vitamin C per day. Children aged 1-10 years need 30 mg of vitamin C per day. Children aged 1-10 years need 30 mg of vitamin C per day. Children aged 1-10 years need 30 mg of vitamin C per day. Children aged 1-10 years need 30 mg of vitamin C per day.
vitamin C in your diet. Over time, a lack of vitamin C means that new collagen cannot be formed. This causes various tissues in your body to start to break down and the health and repair of your body to start to break down and the health and repair of your body to start to break down and the health and repair of your body to start to break down and the health and repair of your body to start to break down and the health and repair of your body to start to break down and the health and repair of your body to start to break down and the health and repair of your body to start to break down and the health and repair of your body to start to break down and the health and repair of your body to start to break down and the health and repair of your body to start to break down and the health and repair of your body to start to break down and the health and repair of your body to start to break down and the health and repair of your body to start to break down and the health and repair of your body to start to break down and the health and repair of your body to start to break down and the health and repair of your body to start to break down and the health and repair of your body to start to break down and the health and repair of your body to start to break down and the health and repair of your body to start to break down and the health and repair of your body to start to break down and the health and repair of your body to start to break down and the health and repair of your body to start to break down and the health and repair of your body to start to break down and the health and repair of your body to start to break down and the health and repair of your body to start to break down and the health and repair of your body to start to break down and the health and repair of your body to start to break down and the health and your body to be a start to break down and your body to be a start to break down and your body to be a start to break down and your body to be a start to break down and your body to be a start 
scurvy, Scurvy due to vitamin C deficiency is rare in the UK. It is more common in poorer countries where malnutrition is more common. There are studies to show it is increasing in the United States amongst people reliant on fast food restaurants. There are certain groups of people who are more at risk of vitamin C deficiency. They include: People
dependent on drugs and/or alcohol who may not have a healthy, balanced diet. People with a medical condition that affects the body's ability to digest and absorb food, such as Crohn's disease and ulcerative colitis. Older people
or neuro-atypical people who may eat a less varied diet. Smokers. Smoking affects the absorption of vitamin C from foods and also vitamin C is used up in the body more quickly in those who smoke. Pregnant and breastfeeding women because they need higher amounts of vitamin C. Early symptoms. The first symptoms of vitamin C deficiency tend to
be: Tiredness and weakness. Muscle and joint pains. Easy bruising. Spots that look like tiny, red-blue bruises on the gums. Sudden and unexpected bleeding from the gums. Nosebleeds. Poor healing of wounds. Problems fighting infections. Bleeding into joints, causing severe joint.
pains. Changes in the bones. Tooth loss. Weight loss. If not diagnosed and treated, vitamin C deficiency can also lead to shortness of breath, nerve problems, high temperature (fever) and fits (convulsions). Bleeding inside the brain and around the heart can cause death in some people with untreated vitamin C deficiency. However, this is extremely
rare. Vitamin C blood tests are almost never done on the NHS. Most specialists advise that they are very difficult to interpret and rarely useful. There are private providers who eat a balanced diet with fruit and vegetables are unlikely to be
deficient in vitamin C. The symptoms of vitamin C deficiency are often similar to other micro-nutrient deficiencies in the diet. Vitamin C is also needed for the absorption of iron from food. Therefore, iron deficiency often occurs in people who are deficient in vitamin C.X-rays or
scans to look at your bones may also be suggested because specific changes to the bones, including 'thinning' of the bones, are often seen in someone with vitamin C deficiency. The treatment for vitamin C deficiency is to replace the vitamin C deficiency is to replace the vitamin C deficiency is to replace the vitamin C deficiency.
vitamin C. After a period of time, vitamin C again. People with vitamin C again. People with vitamin C deficiency usually make a full recovery. Once treatment to replace vitamin C is
started, symptoms usually quickly improve within days or weeks. Vitamin C deficiency can be prevented by ensuring a healthy, balanced diet that contains plenty of fruit and vegetables, including those high in vitamin C that are listed above. As a rough guide, the amount of vitamin C needed daily by an adult is equivalent to that provided by one large
orange. Taking supplements can help if someone has a poor diet but taking too much vitamin C (more than 1000 mg a day) can be harmful, causing abdominal pains and diarrhoea. Scurvy is a disease caused by a significant lack of vitamin C (more than 1000 mg a day) can be harmful, causing abdominal pains and diarrhoea. Scurvy is a disease caused by a significant lack of vitamin C (more than 1000 mg a day) can be harmful, causing abdominal pains and diarrhoea. Scurvy is a disease caused by a significant lack of vitamin C (more than 1000 mg a day) can be harmful, causing abdominal pains and diarrhoea.
can occur due to a diet low in vitamin C. But a deficiency severe enough to cause scurvy is rare in the U.S. because most people are malnourished. What is vitamin C? Vitamin C (ascorbic acid) is a very important nutrient for your body. It's
responsible for the development, growth and healing of your skin, bones and connective tissue. In addition, you need vitamin C for your blood vessels to function properly. Vitamin C also helps maintain your teeth and gums. It helps your blood vessels to function properly. Vitamin C also helps heal burns and other wounds. Vitamin C
is an antioxidant, meaning it protects your cells against damage from free radicals. Free radicals are byproducts of normal cell activity which participate in chemical reactions within cells. Some of these reactions can cause damage over your lifetime. Who does scurvy affect? In the U.S., scurvy most commonly affects babies, children and older adults
who don't get enough vitamin C in their diet. Risk factors for developing the condition include: Not having access to fresh fruits or vegetables. Eating very little due to medical treatments that make you feel sick (such as chemotherapy) or an eating disorder (such as anorexia). Smoking, which reduces the amount of vitamin C your body absorbs from
food. Having a drug or alcohol dependency that affects your diet. Having a poor diet during your pregnancy or while breastfeeding. Having a restrictive diet or food allergies. Other health conditions such as type 1 diabetes and inflammatory bowel disease. How common is scurvy? The rates of vitamin C deficiency around the world vary. In the U.S., 7.1% restrictive diet or food allergies.
of people may develop a deficiency. In north India, the rate is 73.9%. However, severe deficiency (scurvy) is rare. Scurvy is a disease caused by a significant lack of vitamin C deficiency can occur due to a diet low in vitamin C. But a deficiency severe
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from free radicals. Free radicals are byproducts of normal cell activity which participate in chemical reactions within cells. Some of these reactions can cause damage over your lifetime. Who does scurvy affect? In the U.S., scurvy most commonly affects babies, children and older adults who don't get enough vitamin C in their diet. Risk factors for
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