

Fact Sheet

Vitamin C deficiency: identification and mitigation

The Recommended Dietary Intake (RDI) of vitamin C is easily obtained with a general healthy diet containing fruits and vegetables. Recent studies have identified patients with severe vitamin C deficiency in hospital and community settings¹. There are 'at risk' population groups who may present to your practice with low vitamin C, deficiency or scurvy. This can have detrimental effects on their health.

Tips for GPs

- > Ask patients how often and how much fruit and vegetable they consume in relevant health checks and appointments with 'at risk' patients.
- > The Recommended Dietary Intake (RDI) of 45mg/day for men and women (19 years and over) can be easily met by consuming vegetables and fruit daily. Encourage patients to:
 - Have an orange as a snack (84 mg)
 - Make a salad with 1 tomato, ½ cup capsicum and a handful (10 grams) of parsley (110 mg)
 - Have a cup of fresh strawberries for dessert with yoghurt (65 mg)
- > Women who are pregnant or lactating have increased vitamin C requirements. The RDI for pregnant women 19 years and over is 40mg/day. The RDI for lactating women 19 years and over is 60mg/day.
- > As vitamin C cannot be stored or made by the body it must be replaced through food and drinks. Vitamin C is found in a variety of fruits and vegetables (refer to Table 1).
- > Ask your patients how they usually cook and prepare their vegetables. As vitamin C is water soluble, nutrient loss can occur when boiling or steaming. Encourage patients to lightly steam as well as consume fresh fruit and vegetables.
- > Consider testing the vitamin C level in individuals at risk of deficiency, with signs and/or symptoms (see below). While quantification of vitamin C is covered by the Medicare Benefits Schedule (MBS), special collection procedures apply and some laboratories may charge a fee. Please confirm collection procedures and potential fees with your local pathology laboratory before ordering the test.
- > The *RACGP SNAP Guide (Smoking, nutrition, alcohol, physical activity (SNAP) A population health guide to behavioural risk factors in general practice* provides information about healthy eating, dietary guidelines and using the 5As (Ask, Assess, Advise, Agree, Assist and Arrange) to support patients to make changes to their nutritional intake.
- > Provide pamphlets that support the *Australian Guide to Healthy Eating*. These can be ordered for free from www.sahealth.sa.gov.au/healthyliving.
- > Tell patients about the free telephone *Get Healthy Information and Coaching Service* (www.gethealthy.sa.gov.au) to support healthy eating changes.
- > If access to food is an issue, refer to the nearest food relief organisation. Search 'food assistance' on the www.sacommunity.org website to find local organisations.
- > Generate a referral to a local dietitian and/or social worker or mental health worker to address the contributing factors to poor access or intake.

Symptoms of vitamin C deficiency

Vitamin C supports immunity, development of collagen and boosts absorption of iron. Therefore:

- > Individuals with low vitamin C may generally feel unwell, have nausea, loss of appetite and diarrhoea, and their immune system function may become impaired, which may be easily misinterpreted as flu-like symptoms².
- > Clinical signs of vitamin C deficiency occur at intakes of less than 10mg per day (adults).



- > Unresolved vitamin C deficiency (over a period of 60-90 days) can result in scurvy. Dermatological symptoms and signs may occur including petechiae, ecchymoses, hyperkeratosis and cork screw hairs. More progressive scurvy includes gingival signs such as loose teeth and gums prone to bleeding.

Individuals most at risk

- > Any individual who finds it difficult to access or doesn't regularly consume a diet containing fresh, frozen or tinned fruit and vegetables (or their juices) is at risk of vitamin C deficiency³.
- > Population groups at higher risk of vitamin C deficiency include those with poor mental health, a disability, who are older, homeless, or of a lower socioeconomic status.
- > Individuals at risk of vitamin C depletion include individuals who smoke, are post-surgery, have conditions affecting digestion, chronic diarrhoea or recent extended periods of poor appetite¹.

Table 1: Common vitamin C rich foods⁴

Note: *The Australian Guide to Healthy Eating* recommends 5-6 serves of vegetables per day for adult women and men (19-50 years of age) respectively; 1 serve of vegetables = ½ cup cooked vegetables or 1 cup of salad vegetables; 1 serve of fruit = 150g⁵.

Food	Vitamin C/100g	Common serve and Vitamin C content	
Capsicum, red	172 mg	1 cup chopped capsicum (149g)	256 mg
Guava	243 mg	1 guava (90g)	219 mg
Kiwifruit	85 mg	2 kiwifruit (156g)	132 mg
Grapefruit	36 mg	1 grapefruit (258 g)	93 mg
Orange Juice	72 mg	½ cup orange juice (125 ml)	90 mg
Orange	52 mg	1 medium orange (162g)	84 mg
Brussel Sprouts	110 mg	4 Brussel sprouts (76g)	84 mg
Kale	120 mg	1 cup chopped kale (67g)	80 mg
Strawberries	45 mg	1 cup strawberries (144g)	65 mg
Mandarin	28 mg	2 mandarins (150g)	42 mg
Cabbage	45 mg	1 cup chopped cabbage (89g)	40 mg
Broccoli	106 mg	½ cup broccoli (36g)	38 mg
Tomatoes	14 mg	1 tomato (152g)	21 mg

1 Ravindran R et al (2018) 'Vitamin C deficiency in an Australian cohort of metropolitan surgical patients'

2 National Health and Medical Research Council. *Nutrient Reference Values: Vitamin C*
<https://www.nrv.gov.au/nutrients/vitamin-c>

3. Health Direct (2019) 'Vitamin C' <https://www.healthdirect.gov.au/vitamin-c>

4. Australian Food Composition Database. *Food Standards Australia New Zealand*.
<http://www.foodstandards.gov.au/science/monitoringnutrients/afcd/Pages/default.aspx>

5. National Health and Medical Research Council (2013) *Australian Dietary Guidelines Summary*. Canberra: National Health and Medical Research Council.

For more information

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