Low Vegetable and Fruit Intake: Recommendation, Rationale and Supplemental References

Recommendation

Increasing vegetable and fruit intake is a key step to meeting recommendations from Alberta Nutrition Guidelines (https://www.albertahealthservices.ca/assets/info/nutrition/if-nfs-boost-your-vegetable.pdf) and Canada's 2019 Food Guide (Government of Canada, 2019) https://food-guide.canada.ca/en/

*Fill half your plate with vegetables and fruit**

*Canada's Food Guide – Eat vegetables and fruits. Access at: https://food-guide.canada.ca/en/healthy-eating-recommendations/make-it-a-habit-to-eat-vegetables-fruit-whole-grains-and-protein-foods/eat-vegetables-and-fruits/

Rationale for Inclusion of Low Vegetable and Fruit Intake in ASaP+

Impact of Vegetable and Fruit Intake on Cancer and Other Chronic Diseases

- Insufficient vegetable and fruit intake is a risk factor for the development of several types of cancer (i.e., esophagus, oral cavity/pharynx, stomach, larynx) (Aune, et al., 2017; Global Burden of Disease 2015 Risk Factor Collaborators, 2016; IARC Working Group, 2003; Kushi, et al., 2012; Leenders, et al., 2013; Royal Australian College of General Practitioners (RACGP), 2015) and other chronic diseases (i.e., obesity, diabetes, and CVD) (Global Burden of Disease 2015 Risk Factor Collaborators, 2016; IARC Working Group, 2003)
- Five percent of new cancers diagnosed in Alberta were due to not eating enough vegetables (n=288 new cancer cases) and 7% of new cancer cases were due to not eating enough fruit (n=603) (Brenner, et al., 2019; Poirier, et al., 2019)[1]

[1] All data provided by the ComPARe Study (prevent.cancer.ca)

- Vegetable and fruit intake is a key component of the Mediterranean (Kaiser Permanente, 2015) and Dietary Approaches to Stop Hypertension (DASH) (Heart and Stroke Foundation of Canada, 2018) diets, Canada's Food Guide (Government of Canada, 2019), and the International Agency for Research on Cancer (IARC Working Group, 2003) recommendations
- Research based on the Nurses' Health Study and the Health Professionals Follow-up Study concluded that there is evidence that improved diet quality over a preceding 12-year period is associated with a decreased risk of death from any cause (Sotos-Prieto, et al., 2017)
- Over ¾ of Canadians did not meet Canada's Food Guide (2011) recommendations regarding number of daily servings of vegetables and fruits (minimum 7 for adults ages 19+)
- It is estimated that this significant majority of Canadians who did not consume the recommended daily servings resulted in an estimated annual economic burden of $4.39 billion (Krueger, et al., 2017)
- There is a trend toward reduced vegetable and fruit intake in Canada: Intake dropped between 2015 and 2017, from 31.5% to 28.6% of Canadians (aged 12 and older) reporting vegetable and fruit intake five or more times per day (Statistics Canada)

<u>Screening, Brief Intervention and Referral</u>

- Reviewing primary care patients' intake every 2-3 months will help increase the chance of sustaining long-term dietary change (Royal Australian College of General Practitioners (RACGP), 2015)
- Primary care is suitable for conversations with patients about the importance of healthy diets, and the provision of encouragement and support to follow dietary recommendations
- Decision to intervene on dietary choices is ultimately decided based on clinical judgment and patient preference, potentially in conjunction with action planning for weight management
- The US Preventive Services Task Force (USPSTF) concluded that there is evidence that screening for vegetable and fruit intake is indicated at the population level for those who screen positive for cardiovascular risk factors (U.S. Preventive Services Task Force, 2014) (Grade B: Refer to Appendix A for details)
- The USPSTF concluded that behavioural counseling interventions that target improved diet and increased physical activity for cardiovascular disease prevention result in improvements in healthful behaviours including increased vegetables and fruit consumption, total daily caloric intake, salt intake, and physical activity levels (Grade C Recommendation: Refer to Appendix A for details) (Patnode, et al., 2017)
- The USPSTF recommends, for adults without obesity who do not have known CVD risk factors, to individualize the decision to offer or refer adults to behavioural counselling to promote a healthful diet and physical activity (Grade C Recommendation: Refer to Appendix A for details) (Patnode, et al., 2017)
- Evidence supports the effectiveness of behavioural counselling in the promotion of healthful behaviours including vegetable and fruit intake (Patnode, et al., 2017)

Supplemental References

Several reviews and reports related to the health effects of low vegetable and fruit intake have been developed. The highlights below are provided as additional information.

1. Alberta Health Services. (n.d.). *Primary Health Care Resource Centre. Nutrition Guidelines.* Retrieved from Alberta Health Services: https://www.albertahealthservices.ca/info/Page8249.aspx
   (Alberta Health Services, n.d.)
   - Recommendations for the prevention and management of chronic diseases and nutrition across the lifecycle

2. World Cancer Research Fund network. (2018). *Diet, nutrition, physical activity and cancer: A global perspective.* Retrieved from World Cancer Research Fund: https://www.wcrf.org/dietandcancer/recommendations/wholegrains-veg-fruit-beans
   (World Cancer Research Fund network, 2018)
   - Eat at least 5 portions/servings (at least 400G or 14 ounces) of a variety of non-starchy vegetables and of fruits daily (best comprised of various vegetables and fruits of different colors)

3. Kushi, L. H., Doyle, C., McCullough, M., Rock, C. L., Demark-Wahnefried, W., Bandera, E. V., . . . Gansler, T. (2012). American Cancer Society Guidelines on nutrition and physical activity for cancer prevention: reducing the risk of cancer with healthy food choices and physical activity. *CA: A Cancer Journal for Clinicians*, 30-67.
   (Kushi, et al., 2012)
   - Eat at least 2.5 cups of vegetables and fruits each day (include vegetables and fruits at every meal and for snacks; eat a variety of vegetables and fruits each day)
   - Emphasize whole vegetables and fruits; choose 100% juice if you drink vegetable or fruit juices

4. Royal Australian College of General Practitioners (RACGP). (2015). *Smoking, nutrition, alcohol, physical activity (SNAP): A population health guide to behavioural risk factors in general practice, 2nd ed.* Retrieved from THe Royal Australian College of General Practitioners: https://www.racgp.org.au/FSDEDEV/media/documents/Clinical%20Resources/Guidelines/SNAP-guideline.pdf
   (Royal Australian College of General Practitioners (RACGP), 2015)
   - Adults should consume at least five servings of vegetables and two servings of fruit each day (examples of a single serving fruit (~150g): medium apple, banana, or pear, 4 dried apricots or plums, 1 cup canned or fresh fruit salad. Single serving vegetable (~75g): ½ cup cooked vegetables, ½ medium potato, 1 cup of salad vegetables, 1 medium tomato)
   - Patients should be reviewed every 2-3 months to help increase the chance of sustaining long-term dietary change

5. U.S. Preventive Services Task Force. (2017). Behavioural counseling to promote a healthful diet and physical activity for cardiovascular disease prevention in adults without known cardiovascular disease risk factors. US Preventive Services Task Force Recommendation Statement. *The Journal of the American Medical Association*, 167-174.
   (U.S. Preventive Services Task Force., 2017)
   - Behavioural counseling interventions that target improved diet and increased physical activity for cardiovascular disease prevention result in improvements in healthful behaviours including increased vegetables and fruit consumption, total daily caloric intake, salt intake, and physical activity levels (GRADE C Recommendation)
   - For adults without obesity who do not have known CVD risk factors, individualize the decision to offer or refer adults to behavioural counselling to promote a healthful diet and physical activity (GRADE C Recommendation)

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Brenner, D. R., Friedenreich, C. M., Ruan, Y., Poirier, A. E., Walter, S. D., King, W. D., . . . De, P. (2019). The burden of cancer attributable to modifiable risk factors in Canada: Methods overview. *Preventive Medicine*, 3-8.

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Appendix A: **US Preventive Services Task Force (USPSTF) Grades and Levels of Certainty** (U.S. Preventive Services Task Force, 2018)
https://jamanetwork.com/journals/jama/fullarticle/2643315

Describing the strength of a recommendation is an important part of communicating its importance to clinicians and other users.

Grade C recommendations are particularly sensitive to patient values and circumstances. Determining whether or not the service should be offered or provided to an individual patient will typically require an informed conversation between the clinician and patient.

What the USPSTF Grades Mean and Suggestions for Practice

Grade	Definition	Suggestions for Practice
A	The USPSTF recommends the service. There is high certainty that the net benefit is substantial.	Offer or provide this service.
B	The USPSTF recommends the service. There is high certainty that the net benefit is moderate, or there is moderate certainty that the net benefit is moderate to substantial.	Offer or provide this service.
C	The USPSTF recommends selectively offering or providing this service to individual patients based on professional judgment and patient preferences. There is at least moderate certainty that the net benefit is small.	Offer or provide this service for selected patients depending on individual circumstances.
D	The USPSTF recommends against the service. There is moderate or high certainty that the service has no net benefit or that the harms outweigh the benefits.	Discourage the use of this service.
I statement	The USPSTF concludes that the current evidence is insufficient to assess the balance of benefits and harms of the service. Evidence is lacking, of poor quality, or conflicting, and the balance of benefits and harms cannot be determined.	Read the Clinical Considerations section of the USPSTF Recommendation Statement. If the service is offered, patients should understand the uncertainty about the balance of benefits and harms.

USPSTF Levels of Certainty Regarding Net Benefit

Level of Certainty	Description
High	The available evidence usually includes consistent results from well-designed, well-conducted studies in representative primary care populations. These studies assess the effects of the preventive service on health outcomes. This conclusion is therefore unlikely to be strongly affected by the results of future studies.
Moderate	The available evidence is sufficient to determine the effects of the preventive service on health outcomes, but confidence in the estimate is constrained by such factors as the number, size, or quality of individual studies. inconsistency of findings across individual studies. limited generalizability of findings to routine primary care practice. lack of coherence in the chain of evidence. As more information becomes available, the magnitude or direction of the observed effect could change, and this change may be large enough to alter the conclusion.
Low	The available evidence is insufficient to assess effects on health outcomes. Evidence is insufficient because of the limited number or size of studies. important flaws in study design or methods. inconsistency of findings across individual studies. gaps in the chain of evidence. findings not generalizable to routine primary care practice. lack of information on important health outcomes. More information may allow estimation of effects on health outcomes.
The USPSTF defines certainty as "likelihood that the USPSTF assessment of the net benefit of a preventive service is correct." The net benefit is defined as benefit minus harm of the preventive service as implemented in a general, primary care population. The USPSTF assigns a certainty level based on the nature of the overall evidence available to assess the net benefit of a preventive service.	