Update on age-appropriate preventive measures and screening for Canadian primary care providers

Tawnya Shimizu MN NP-PHC Manon Bouchard NP-PHC Cleo Mavriplis MD CCFP FCFP

Abstract

Objective To summarize the best available age-appropriate, evidence-based guidelines for prevention and screening in Canadian adults.

Quality of evidence The Canadian Task Force on Preventive Health Care recommendations are the primary source of information, supplemented by relevant US Preventive Services Task Force recommendations when a Canadian task force guideline was unavailable or outdated. Leading national disease-specific or specialty-specific organizations' guidelines were also reviewed to ensure the most up-to-date evidence was included.

Main message Recommended screening maneuvers by age and sex are presented in a summary table highlighting the quality of evidence supporting these recommendations. An example of a template for use with electronic medical records or paper-based charts is presented.

Conclusion Whether primary care providers use a dedicated preventive health visit or opportunistic preventive counseling and screening in their patient encounters, this summary of evidence-based recommendations can help maximize efficiency and prevent important omissions and unnecessary screening.

EDITOR'S KEY POINTS

- Navigating the many different guidelines and recommendations for preventive care can be a daunting task for primary care providers. The authors of this review completed an updated assessment of the best available evidence for prevention and screening among Canadian adults and provide a summary for primary care practitioners.
- A concise table summarizes age- and sex-appropriate history taking, counseling, investigations, and screening tests. Updated recommendations are provided for cervical cancer, prostate cancer, breast cancer, colon cancer, and dyslipidemia screening, as well as weight management.
- Sample charting tools were also created to aid practitioners with documentation at dedicated preventive health visits or as part of opportunistic screening.

This article is eligible for Mainpro-M1 credits. To earn credits, go to **www.cfp.ca** and click on the Mainpro link.

This article has been peer reviewed.
Can Fam Physician 2016;62:131-8

La traduction en français de cet article se trouve à **www.cfp.ca** dans la table des matières du numéro **de février 2016** à la **page e64.**

Useful charting tools for preventive care have been published in the past[1-4] but not all such resources are regularly updated. There is a lack of recent comprehensive guides to facilitate delivery and charting of appropriate evidence-based primary care. Recommendations for screening come from various organizations and are constantly changing, rendering health promotion and disease prevention a daunting task. Currently, navigating the plethora of available information in a search of prevention guidelines is overwhelming. There is a need for regular updates through systematic literature reviews. Piecing together these guidelines into a single summary table for practical use in a busy clinical setting simplifies access to information and allows practitioners to provide preventive care in an efficient, evidence-based manner.

Chronic disease management is an economic burden to the health care system.[5] Savings through prevention have been explored by several sources, with emphasis on quality of life and increase in years lived.[6,7] The Choosing Wisely movement is publicizing the disadvantages of causing harm with tests that are not evidence based.[8] By facilitating opportunities for prevention through easy access to best-practice guidelines, the incidence of chronic disease might decrease, resulting in improved patient-centred care and savings to the health care system.

We performed a review of the literature and created a concise table summarizing the findings, as well as charting tools to aid in

documentation. After reading this article, providers will be able to list the evidence-based recommendations for preventive maneuvers in healthy adults of different ages and sexes.

Quality of evidence

A review of the literature from 2009 to 2014 was conducted with the assistance of librarians from the Canadian Library of Family Medicine. The PubMed database was searched for articles, in English or French, indexed with a combination of the following sets of medical subject headings: *preventive health services, primary prevention, secondary prevention, osteoporosis, prostatic neoplasms, breast neoplasms, colonic neoplasms, hyperlipidemias, mass screening* or *screening,* and *practice guidelines* as *topic* or *publication type*, or *guideline*, or similar text words or associated text. We also searched the main national guidelines databases CMA Infobase, the US National Guideline Clearinghouse, and the UK National Institute for Health and Care Excellence guidelines for guidelines with combinations of the first 2 sets of terms cited above. The initial search found 289 articles, and articles not relevant to Canadian, office-based preventive primary care and those related to preventive care of children were excluded. A full review of 69 articles was completed using the methods outlined below. The final selection included 40 articles.

Published guidelines from many sources relevant to adult preventive care are developed using various methods. The quality of evidence supporting the recommendations was assessed by applying the methods used by Rourke et al[4] in the development of the Rourke Baby Record, and the approach used by authors of the Preventive Care Checklist Form[2,3] in the development of the last aid for the periodic health examination endorsed by the College of Family Physicians of Canada at the time of writing.[3]

Both of these groups initially used the old Canadian Task Force on Preventive Health Care (CTFPHC) method of grading recommendations in which recommendations with the highest quality of evidence received an *A* and those with fair evidence received a *B*. The US Preventive Services Task Force (USPSTF) is also currently using this method.[9] The new CTFPHC adopted the GRADE (grading of recommendations, assessment, development, and evaluation) method in 2010,[10] making it challenging to present all recommendations in a unified classification system. The GRADE system[11] uses the quality of evidence to evaluate the strength of a recommendation, also taking into account factors in line with family medicine principles: the balance between desirable and undesirable effects, patient values and preferences, and resource allocation. In the GRADE system recommendations are either strong or weak.

The only reference found blending these 2 systems was the 2014 update of the Rourke Baby Record.[12] For the most part they followed the system outlined below, which we adopted.

- A recommendation is classified as **good** (presented in boldface) if according to the older CTFPHC method there is good evidence to recommend the clinical preventive action or if according to the GRADE system it is a strong recommendation.
- A recommendation is classified as *fair* (italic type) if according to the old CTFPHC method there is fair evidence to recommend the clinical preventive action or if according to the GRADE system it is a weak recommendation.
- A recommendation is classified as inconclusive or based on consensus (plain type) if according to the older CTFPHC method the existing evidence is conflicting and does not allow for making a recommendation for or against use of the clinical preventive action (although other factors might influence decision making) or if the recommendation is based on consensus only.

When organizations mentioned using the old CTFPHC or GRADE systems, the methods used were reviewed to see if the process was modified or adapted.

Some sources did not use either of these systems. For these, the methods used were assessed and the recommendations were compared with guidelines from organizations in other countries that target primary care providers, such as the USPSTF or the National Institute for Health and Care Excellence guidelines[13] from the United Kingdom. As well, some of these guidelines have been appraised by the CTFPHC.

Main message

Based on the literature review, we created tools for use during routine primary care visits to support the delivery of evidence-based preventive care to the adult population. The tools can function as lists summarizing potential appropriate preventive care as well as charting aids to be integrated into medical charts in electronic format or printed out for paper charts.

Table 1, the 2015 Primrose Preventive Screening Guidelines, is a 2-page summary of all evidence-based prevention recommendations for adults divided by age and sex.[14-43] This table is to be used as a quick reference. Three age categories were used to divide the recommendations for asymptomatic patients without risk factors. The maneuvers that differ for women and men are listed in the lower portion of the table under the headings "Women" and "Men." For the row "Physical Examination," only elements found in the review that were evidence-based for a healthy patient with no risk factors are listed. Patients' concerns and other considerations might influence the type of physical examination done. Six charting tools were created to allow for succinct documentation that can be adapted to paper-based or electronic charting systems. **Figure 1** offers an

Table 1. The 2015 Primrose Preventive Screening Guidelines: *Recommendations with good evidence are presented in* **boldface;** *those with fair evidence are presented in italic text; consensus recommendations are presented in* plain text. *These recommendations are intended for primary care prevention and screening. Additional testing or physical examination, as required, for pre-existing conditions and presenting complaints might be warranted.*

	RECOMMENDATIONS		
MANEUVER	AGE 21-49 Y	AGE 50-64 Y	AGE ≥ 65 Y
History and counseling			
• Substances	**Smoking**[14] *Alcohol*[15,16]: ≤ 10 drinks/wk for women, ≤ 15 drinks/wk for men Other substances[17]	**Smoking** *Alcohol*: ≤ 10 drinks/wk for women, ≤ 15 drinks/wk for men Other substances	**Smoking** *Alcohol*: ≤ 10 drinks/wk for women, ≤ 15 drinks/wk for men Other substances
• Physical activity	**150 min/wk moderate or vigorous intensity**[18] (cannot say more than a few words without pausing for breath)	**150 min/wk moderate or vigorous intensity** (cannot say more than a few words without pausing for breath)	**150 min/wk moderate or vigorous intensity** (cannot say more than a few words without pausing for breath)
• Diet and nutrition	**Fruit, vegetables, whole grains, healthy fat, ≤ 2000 mg/d of salt**[19]	**Fruit, vegetables, whole grains, healthy fat, ≤ 2000 mg/d of salt**	**Fruit, vegetables, whole grains, healthy fat, ≤ 2000 mg/d of salt**
• Sun exposure	**Protective clothing,** sunscreen[20]	**Protective clothing,** sunscreen	**Protective clothing,** sunscreen
• Sexual activity	**Safe sex and STI counseling**[21] **(Screen for chlamydia and gonorrhea annually until age 25 y if sexually active and beyond age 25 y if high risk)**	Safe sex and STI counseling if **high risk**	Safe sex and STI counseling if **high risk**
• Advance directives			Discuss once[22]
• Supplements	Vitamin D: 400-2000 IU/d[23] Calcium: 1000 mg/d from diet[24]; 1500-2000 mg/d if pregnant or lactating[25]	Vitamin D: 1000-2000 IU/d Calcium: 1200 mg/d mainly from diet	Vitamin D: 1000-2000 IU/d Calcium: 1200 mg/d mainly from diet
• Physical examination*	**BP,**[26] **height, weight, BMI,**[27] **WC**[28] *If obese (30 kg/m² ≤ BMI < 40 kg/m²) offer or refer to structured behavioural interventions aimed at weight loss*	**BP, height, weight, BMI, WC** *If obese (30 kg/m² ≤ BMI < 40 kg/m²) offer or refer to structured behavioural interventions aimed at weight loss*	**BP, height, weight, BMI, WC** *If obese (30 kg/m² ≤ BMI < 40 kg/m²) offer or refer to structured behavioural interventions aimed at weight loss*
Investigations and screening tests			
• Cognitive			Screen if a family member is concerned[29]; memory complaints should be evaluated and followed to assess progression
• Falls			Ask about trips or falls in past year or fear of falling[30]
• STI	*Gonorrhea and chlamydia*[31] VDRL, HIV, and HBV if high risk	Gonorrhea and chlamydia VDRL, HIV, and HBV if high risk	Gonorrhea and chlamydia VDRL, HIV, and HBV if high risk
• Diabetes†	*Assess HbA_{1c} level if FINDRISC score > 14*[32]	*Assess HbA_{1c} level if FINDRISC score > 14*	*Assess HbA_{1c} level if FINDRISC score > 14*
• Lipid levels†	**Risk assessment**[32] **Screen men ≥ 40 y**	**Risk assessment** **Screen women ≥ 50 y or menopausal**	**Risk assessment**
• Vision	19-40 y every 10 y[33]; 41-49 y every 5 y unless high risk (African American, high myopia, diabetes, or hypertension)	50-55 y every 5 y; 56-64 y every 3 y unless high risk (African American, high myopia, diabetes, or hypertension)	Annually
• Colon cancer		**FIT or FOBT every 2 y or flexible sigmoidoscopy every 10 y**[34]	**FIT or FOBT every 2 y or flexible sigmoidoscopy every 10 y until 75 y**
• Osteoporosis		Screen based on risk factors	Screen **women** and *men* once > 65 y[35]
• Immunizations‡	**Td, Tdap, HPV, MMR** Pneumococcal, influenza, varicella, polio, meningococcal conjugate[36-38]	**Td, Tdap,** pneumococcal influenza, **herpes zoster,** varicella, polio	**Td, Tdap, pneumococcal, influenza, herpes zoster,** varicella, polio

Continued on page 134

Table 1 continued from page 133

MANEUVER	RECOMMENDATIONS AGE 21-49 Y	AGE 50-64 Y	AGE ≥65 Y
Women			
• Family planning	**Folic acid: 0.4-1 mg/d at childbearing age**[39] **Rubella serology**[40]		
• Cervical cancer	**Start at age 25 y if sexually active,**‖ **every 3 y if results are normal**[41]	**Every 3 y if results are normal**	**Every 3 y if results are normal; stop at age 69 y if 3 normal results in past 10 y**
• Breast cancer		*Mammogram every 2 y*[42]	*Mammogram every 2 y; stop at age 75 y*
Men			
• AAA screen			*Abdominal ultrasound once at age 65-75 y in patients who have ever smoked*[43]

AAA—abdominal aortic aneurysm; BMI—body mass index; BP—blood pressure; CVD—cardiovascular disease; FINDRISC—Finnish Diabetes Risk Score; FIT—fecal immunochemical test; FOBT—fecal occult blood test; HbA_{1c}—hemoglobin A_{1c}; HBV—hepatitis B virus; HPV—human papillomavirus; MMR—measles-mumps-rubella; STI—sexually transmitted infection; Td—tetanus and diphtheria; Tdap—tetanus toxoid, reduced diphtheria toxoid, and acellular pertussis; VDRL—Venereal Disease Research Laboratory; WC—waist circumference.

*WC measurements should be as follows:

- < 94 cm in men and < 80 cm in women of European, sub-Saharan African, Eastern Mediterranean, or Middle Eastern (Arab) descent;
- < 90 cm in men and < 80 cm in women of South Asian, Japanese, or Chinese descent; and
- <102 cm in men and < 88 cm in women are currently used for all other backgrounds for clinical purposes, but prevalence should be given using both European and North American cutoff points to allow better comparisons in future epidemiologic studies of populations of Europid descent.

From late middle age until ≥80 y there is a decline in the volume of subcutaneous fat and a redistribution of fat from subcutaneous to visceral depots. This might make WC risk factors less valid in older patients.

†FINDRISC rates diabetes risk within the next 10 y:

- 0-14 points = low to moderate risk (1%–17% chance of developing diabetes within 10 y); recommend not screening for type 2 diabetes.
- 15-20 points = high risk (33% chance of developing diabetes within 10 y); recommend screening every 3–5 y with assessment of HbA_{1c}.
- ≥21 points = very high risk (50% chance of developing diabetes within 10 y); recommend annual screening with assessment of HbA_{1c}.

‡Risk assessment: use the Framingham score (multiplied by 2 if there is a family history) or use a cardiovascular age calculator (**www.cvage.ca**).

- If the Framingham risk score is < 5%, screen every 3-5 y; ≥5% repeat screening annually.
- Screen men ≥40 y and women ≥50 y or postmenopausal (consider earlier in ethnic groups at increased risk such as South Asian or First Nations patients) or all patients with any of the following, regardless of age: current smoker, diabetes, arterial hypertension, family history of premature CVD, family history of hyperlipidemia, erectile dysfunction, chronic kidney disease, inflammatory disease, HIV, chronic obstructive pulmonary disease, clinical evidence of atherosclerosis or abdominal aneurysm, clinical manifestation of hyperlipidemia, or obesity (BMI > 27 kg/m^2).
- Framingham risk score only validated to age 74 y.

§The following are the routine adult immunizations for individuals with low risk.

- Td: primary series for previously unimmunized adults; booster dose every 10 y.
- Pertussis: 1 dose of acellular pertussis–containing vaccine (Tdap) in adulthood; adults who will be in close contact with infants should be immunized as early as possible.
- HPV: bivalent (HPV2) or quadrivalent (HPV4) vaccine for women ≤26 y; HPV4 vaccine for men ≤26 y. Can be given at >27 y if high risk of exposure.
- Measles and mumps: 1 dose for susceptible adults born in or after 1970; consider patients born before 1970 to be immune.
- Rubella: 2 doses for travelers, postsecondary students, military personnel, and health care workers; if vaccine is indicated, pregnant women should be immunized after delivery.
- Herpes zoster: 1 dose in those ≥60 y; those 50-59 years of age can be given 1 dose, but immunity wanes after 5 y.
- Influenza: encouraged for adults; recommended for those ≥65 y.
- Pneumococcal 23-valent polysaccharide: 1 dose for those ≥65 y.
- Polio: primary series for previously unimmunized adults when a primary series of tetanus and diphtheria toxoid–containing vaccine is being given or with routine tetanus and diphtheria toxoid–containing vaccine booster doses.
- Varicella: 2 doses in susceptible adults ≤49 y; if patients previously received 1 dose they should receive a second dose; 2 doses in adults ≥50 y who are known to be seronegative.
- Meningococcal conjugate: 1 dose in adults ≤24 y not immunized in adolescence.

‖Sexual activity includes intercourse and digital or oral sexual activity involving the genital area with a partner of either sex.

example of one of these charting tools; the rest are available from **CFPlus**.*

The literature review identified updates for several common preventive maneuvers since the last 2012 update.[3] Key recommendations that have changed recently or are up for debate are highlighted below.

Cervical cancer screening. Guidelines have changed in North America in the past few years.[44] Currently there is a discrepancy between the CTFPHC recommendations on cervical cancer screening[45] and all provincial guidelines on this topic. The CTFPHC recommends starting at 25 years

*The **6 charting tools** are available at **www.cfp.ca**. Go to the full text of the article online and click on **CFPlus** in the menu at the top right-hand side of the page.

Figure 1. Sample charting tool for age-appropriate primary prevention maneuvers for women aged 21 to 49 y*: *Recommendations with good evidence are presented in boldface; those with fair evidence are presented in italic text; consensus recommendations are presented in plain text. These recommendations are intended for primary care prevention and screening. Additional testing or physical examination, as required, for pre-existing conditions and presenting complaints might be warranted.*

Patient concerns:

HISTORY AND COUNSELING

Smoking:
Alcohol:
Other substances:
Physical activity:
Diet and nutrition:
Sun exposure:
Sexual activity (safe sex and STI counseling):

Supplements to consider:
- Vitamin D (400-2000 IU/d)
- Calcium intake (1000 mg/day mainly from diet; pregnant or lactating 1500-2000 mg/d)

EXAMINATION

HT: **WT:** **WC:** **BMI:** **BP:**

Focused review of systems:

Pelvic examination:

INVESTIGATIONS AND SCREENING TESTS

Cervical cancer (start age 25 y if sexually active; repeat every 3 y if results are normal):
STIs
- *gonorrhea and chlamydia:*
- VDRL, HIV, and HBV:

Family planning (rubella serology):
Diabetes *(assess HbA_{1c} level if FINDRISC score is > 14)*:
Lipid screening *(risk assessment):*
Vision screening (aged 19-40 y, every 10 y; 41-49 y, every 5 y unless high risk):

IMMUNIZATIONS

- **Td, TdaP vaccine once in lifetime, HPV, MMR:**
- Influenza:
- Pneumococcal (only if high risk):
- Meningococcal conjugate:
- Varicella and polio:

Implementation plan:

BMI—body mass index; BP—blood pressure; FINDRISC—Finnish Diabetes Risk Score; HbA_{1c}—hemoglobin A_{1c}; HBV—hepatitis B virus; HPV—human papillomavirus; HT—height; MMR—measles-mumps-rubella; STI—sexually transmitted infection; Td—tetanus and diphtheria; Tdap—tetanus toxoid, reduced diphtheria toxoid, and acellular pertussis; VDRL—Venereal Disease Research Laboratory; WC—waist circumference; WT—weight.
*Additional templates for other age and sex categories are available from **CFPlus**.

of age or 3 years after first intercourse, while most provinces recommend starting at 21 years of age. These guidelines are similar in moving away from early screening and increasing the interval between Papanicolaou tests.

Prostate cancer screening. Screening for prostate cancer has been hotly debated since the prostate-specific antigen (PSA) test was developed.[46] The 2014 CTFPHC recommendation states that available evidence does not conclusively show that PSA screening will reduce prostate cancer mortality but that it clearly shows an increased risk of harm.[47] The task force recommends that the PSA test should not be used to screen for prostate cancer.[48] Useful tools to discuss the issue with patients can be found on the CTFPHC website.[49,50] The USPSTF recommends against screening with the PSA test.[51] Both task forces reviewed the evidence provided by 2 randomized controlled trials that studied PSA screening prospectively.[52,53] The reviewers were critiqued by the Canadian Urological Association and the American Urological Association.[54,55] Evans' video on PSA screening[56] provides an interesting discussion of the evidence. In a commentary on the CTFPHC guideline in the *CMAJ,* Krahn suggests the CTFPHC might not have taken patient preferences, social values, and costs to the health care system into account but does conclude there is not enough evidence to recommend population screening with PSA testing.[57]

Breast cancer screening. Screening with mammography is controversial in the 40- to 49-year-old age group. The CTFPHC and USPSTF recommend against screening in this age group.[58,59] The Canadian Association of Radiologists[60] and the American College of Obstetricians and Gynecologists recommend it.[61] We have opted to follow the organizations with a primary care perspective.[58,59] Tools are available on the CTFPHC website to help explain this to patients.[62]

The CTFPHC also recommends not screening by provider physical examination or promoting breast self-examination in asymptomatic women.[58] Information from the CTFPHC website is useful to reassure patients,[62,63] underlining that there is no proof of benefit and that potential harms exist, such as but not limited to the removal of healthy breast tissue.

Colon cancer screening. At the time of our review, guidelines had last been published by the CTFPHC in 2001. Updated recommendations were provided from the 2008 USPSTF[64] and the 2011 Scottish Intercollegiate Guidelines Network recommendations.[65] Currently, cancer screening guidelines related to age, test, and interval of screening vary across Canada[34]; however, most recommendations suggest using the fecal occult blood test or fecal immunochemical test every 2 years for adults aged 50 to 75.[34] The Canadian Association of Gastroenterology's position paper on colon cancer screening from 2010 provides a review of the evidence.[66] It recommends fecal immunochemical testing or fecal occult blood testing every 2 years or flexible sigmoidoscopy every 10 years. Colonoscopy is not recommended because of a current lack of evidence and because of possible harms, as well as a lack of resources in Canada.[66] Updated CTFPHC colon cancer screening guidelines are anticipated and will include diet and lifestyle as part of the risk profiling guide.

Dyslipidemia screening. The CTFPHC has not recently reviewed the screening guidelines for dyslipidemia. The C-CHANGE (Canadian Cardiovascular Harmonization of National Guidelines Endeavour) initiative[67] is very helpful for primary care providers, as it harmonizes recommendations between 8 specialty organizations. Most of the harmonized guidelines use GRADE or a modified version of GRADE. The C-CHANGE initiative has recently updated their harmonized guidelines for screening for cardiovascular disease and associated risk factors.[19] Both C-CHANGE and the Canadian Cardiovascular Society recommend initiating screening of lipid levels at 40 years of age for men and 50 years of age or at the onset menopause for women.[19,32] Earlier screening is recommended for high-risk groups such as aboriginal or Southeast Asian patients. Earlier screening is also suggested for anyone with the risk factors listed in **Table 1**.[14-43]

Weight management. In 2015, the CTFPHC released their first guidelines for the prevention of weight gain and management of patients who are overweight or obese.[27,68] Recommendations include measurement of body mass index (BMI) and offering or referring individuals with BMI greater than 25 kg/m^2 to structured behavioural interventions. The strongest recommendation is for those with a BMI between 30 and 40 kg/m^2 who are at high risk of diabetes. It is suggested that interventions be longer than 12 months, be patient-centred, and include diet, exercise, and lifestyle modification.

Conclusion

The literature review has allowed us to update published recommendations. Synthesized findings in **Table 1** allow easier, more efficient access to evidence-based recommendations.[14-43] An important effect on population health might be achieved by capturing missed screening and health promotion opportunities, avoiding unnecessary diagnostic testing, and decreasing apprehension for patients exposed to the uncertainty and potential harm that further testing can cause. Potential exists to decrease the burden of chronic disease for patients and to decrease health care dollars spent.[6]

It is anticipated that by facilitating access to the current recommendations, delivery of preventive maneuvers will be improved. The USPSTF and CTFPHC websites address the above, but we have expanded upon this by incorporating additional evidence-based sources relevant to and used by Canadian primary care providers. Further research is needed to evaluate the utility and effectiveness of preventive care charting tools. Support for infrastructure to develop and maintain this tool is necessary, as many resources are needed to manage literature reviews, evidence analysis, and expert consensus on final conclusions.

Ms Shimizu is Primary Health Care Nurse Practitioner at the Primrose site of the Bruyère Academic Family Health Team in Ottawa, Ont, Adjunct Professor in the Faculty of Medicine at the University of Ottawa, and Therapeutics Tutor and Preceptor in the Ontario Primary Health Care Nurse Practitioner Program. **Ms Bouchard** is Primary Health Care Nurse Practitioner at the Primrose site of the Bruyère Academic Family Health Team and Guest Lecturer and Preceptor for both the Nurse Practitioner Program and the Department of Family Medicine at the University of Ottawa. **Dr Mavriplis** is a family physician at the Primrose site of the Bruyère Academic Family Health Team and Assistant Professor in the Department of Family Medicine at the University of Ottawa.

Acknowledgment
We thank **Dr Sharon Johnston** for her comments on earlier drafts of this article.

Contributors
All the authors contributed to the literature review and analysis, and to preparing the manuscript for submission.

Competing interests
None declared

Correspondence
Ms Tawnya Shimizu; e-mail **tshimizu@bruyere.org**

References

1. Dubey V, Glazier R. Preventive care checklist form. Evidence-based tool to improve preventive health care during complete health assessment of adults. *Can Fam Physician* 2006;52:48-55.
2. Iglar K, Katyal S, Matthew R, Dubey V. Complete health checkup for adults. Update on the Preventive Care Checklist Form©. *Can Fam Physician* 2008;54:84-8.
3. Duerksen A, Dubey V, Iglar K. Annual adult health checkup. Update on the Preventive Care Checklist Form©. *Can Fam Physician* 2012;58(1):43-7.
4. Rourke L, Leduc D, Constantin E, Carsley S, Rourke J, Li P. Getting it right from birth to kindergarten. What's new in the Rourke Baby Record? *Can Fam Physician* 2013;59:355-9.
5. Public Health Agency of Canada. *Cardiovascular disease—economic burden of illness.* Ottawa, ON: Public Health Agency of Canada; 2012. Available from: **www.phac-aspc.gc.ca/cd-mc/cvd-mcv/cvd_ebic-mcv_femc-eng.php**. Accessed 2015 Jul 8.
6. Institute of Medicine (US) Roundtable on Evidence-Based Medicine; Yong PL, Saunders RS, Olsen L, editors. *The healthcare imperative*. Washington, DC: National Academies Press (US); 2010.
7. Cohen JT, Neumann PJ, Weinstein MC. Does preventive care save money? Health economics and the presidential candidates. *N Engl J Med* 2008;358(7):661-3.
8. Choosing Wisely Canada [website]. *Health checkups: when you need them—and when you don't.* Toronto, ON: Choosing Wisely Canada; 2014. Available from: **www.choosingwiselycanada.org/materials/health-checkups-when-you-need-them-and-when-you-dont**. Accessed 2015 May 20.
9. US Preventive Services Task Force. *Published recommendations.* Rockville, MD: US Preventive Services Task Force; 2015. Available from: **www.uspreventiveservicestaskforce.org/BrowseRec/Index**. Accessed 2014 Nov 25.
10. Canadian Task Force for Preventive Health Care [website]. *Grades of Recommendation, Assessment, Development and Evaluation (GRADE).* Calgary, AB: Canadian Task Force for Preventive Health Care; 2011. Available from: **http://canadiantaskforce.ca/methods/grade**. Accessed 2014 Oct 29.
11. GRADE Working Group [website]. *Grading the quality of evidence and the strength of recommendations*. GRADE Working Group; 2014. Available from: **www.gradeworkinggroup.org/intro.htm**. Accessed 2014 Oct 29.
12. Rourke Baby Record [website]. *Highlights of changes to the 2014 Rourke Baby Record*. St John's, NL: Rourke L, Leduc D, Rourke J; 2014. Available from: **http://rourkebabyrecord.ca/updates.asp**. Accessed 2014 Jul 14.
13. National Institute for Health and Care Excellence [website]. *Guidance list.* London, Engl: National Institute for Health and Care Excellence. Available from: **www.nice.org.uk/guidance/published?type=guidelines**. Accessed 2015 Jul 14.
14. Canadian Task Force on Preventive Health Care. *The periodic health examination: 1985 update.* Calgary, AB: Canadian Task Force for Preventive Health Care; 1985. Available from: **http://canadiantaskforce.ca/ctfphc-guidelines/1986-periodic-health-examination-update**. Accessed 2015 Jul 12.
15. Canadian Centre on Substance Abuse. *Canada's low risk drinking guidelines.* Ottawa, ON: Canadian Centre on Substance Abuse; 2013. Available from: **www.ccsa.ca/Resource Library/2012-Canada-Low-Risk-Alcohol-Drinking-Guidelines-Poster-en.pdf**. Accessed 2014 Nov 5.
16. US Preventive Screening Task Force. *Alcohol misuse: screening and behavioral counseling interventions in primary care*. Rockville, MD: US Preventive Services Task Force; 2013. Available from: **www.uspreventiveservicestaskforce.org/BrowseRec/Search?s=alcohol**. Accessed 2015 Jul 14.
17. US Preventive Screening Task Force. *Drug use, illicit: screening*. Rockville, MD: US Preventive Services Task Force; 2008. Available from: **www.uspreventiveservicestaskforce.org/Page/Topic/recommendation-summary/drug-use-illicit-screening?ds=1&s=illicit**. Accessed 2015 Jul 14.
18. Canadian Society for Exercise Physiology [website]. *Canadian physical activity guidelines and Canadian sedentary behaviour guidelines.* Ottawa, ON: Canadian Society for Exercise Physiology; 2012. Available from: **www.csep.ca/english/view.asp?x=804**. Accessed 2015 Jul 14.
19. Tobe SW, Stone JA, Walker KM, Anderson T, Bhattacharyya O, Cheng AYY, et al. Canadian Cardiovascular Harmonized National Guidelines Endeavour (C-CHANGE): 2014 update. *CMAJ* 2014;186(17):1299-305. Epub 2014 Oct 20.
20. Canadian Task Force on Preventive Health Care. *Clinical practice guidelines for the management of melanoma in Australia and New Zealand*. Calgary, AB: Canadian Task Force for Preventive Health Care; 2008. Available from: **http://canadiantaskforce.ca/appraised-guidelines/2013-melanoma**. Accessed 2015 Jul 14.
21. Meyers D, Wolff T, Gregory K, Marion L, Moyer V, Nelson H, et al. USPSTF recommendations for STI screening. *Am Fam Physician* 2008;77:819-4. Available from: **www.uspreventiveservicestaskforce.org/Page/Name/uspstf-recommendations-for-sti-screening**. Accessed 2014 Nov 5.
22. *Speak up* [website]. Ottawa, ON: Canadian Hospice Palliative Care Association; 2016. Available from: **http://advancecareplanning.ca**. Accessed 2015 Jul 14.
23. Osteoporosis Canada [website]. *Vitamin D: an important nutrient that protects you against falls and fractures.* North York, ON: Osteoporosis Canada. Available from: **www.osteoporosis.ca/osteoporosis-and-you/nutrition/vitamin-d**. Accessed 2015 Jul 14.
24. Osteoporosis Canada. *Calcium: an important nutrient that builds stronger bones.* North York, ON: Osteoporosis Canada. Available from: **www.osteoporosis.ca/osteoporosis-and-you/nutrition/calcium-requirements**. Accessed 2015 Jul 14.
25. World Health Organization. *Calcium supplementation in pregnant women*. Geneva, Switz: World Health Organization. Available from: **http://apps.who.int/iris/bitstream/10665/85120/1/9789241505376_eng.pdf**. Accessed 2014 Nov 5.
26. Canadian Task Force on Preventive Health Care. *Screening for hypertension*. Calgary, AB: Canadian Task Force for Preventive Health Care; 2012. Available from: **http://canadiantaskforce.ca/ctfphc-guidelines/2012-hypertension**. Accessed 2015 Jul 13.
27. Canadian Task Force on Preventive Health Care. *Obesity in adults (2015).* Calgary, AB: Canadian Task Force for Preventive Health Care; 2015. Available from: **http://canadiantaskforce.ca/ctfphc-guidelines/2015-obesity-adults**. Accessed 2015 May 19.
28. Lau DCW, Douketis JD, Morrison KM, Hramiak IM, Sharma AM, Ur E. Canadian clinical practice guidelines on the management and prevention of obesity in adults and children. *CMAJ* 2006;176(8):S1-13.
29. Patterson CJ, Gauthier S, Bergman H, Cohen CA, Feightner JW, Feldman H, et al. The recognition, assessment and management of dementing disorders: conclusions from the Canadian Consensus Conference on Dementia. *Can J Neurol Sci* 1999;160(12 Suppl):S1-15.
30. Guideline for the prevention of falls in older persons. American Geriatrics Society, British Geriatrics Society, and American Academy of Orthopaedic Surgeons Panel on Falls Prevention. *J Am Geriatr Soc* 2001;49(5):664-72.
31. US Preventive Services Task Force. *Chlamydia and gonorrhea: screening*. Rockville, MD: US Preventive Services Task Force; 2014. Available from: **www.uspreventiveservicestaskforce.org/Page/Topic/recommendation-summary/chlamydia-and-gonorrhea-screening?ds=1&s=gon**. Accessed 2016 Jan 6.
32. Anderson TJ, Grégoire J, Hegele RA, Couture P, Mancini GBJ, McPherson R, et al. 2012 update of the Canadian Cardiovascular Society guidelines for the diagnosis and treatment of dyslipidemia for the prevention of cardiovascular disease in the adult. *Can J Cardiol* 2013;29(2):151-67.
33. Delpero W, Beiko G, Casey R, Ells A, Kertes P, Molgat Y, et al. COS evidence-based clinical practice guidelines for the periodic eye examination in adults in Canada. *Can Opthamol J* 2007;42(1):39-45.
34. Canadian Task Force on Preventive Health Care. *Colorectal cancer—protocol.* Calgary, AB: Canadian Task Force for Preventive Health Care; 2013. Available from: **http://canadiantaskforce.ca/ctfphc-guidelines/2015-colorectal-cancer/protocol**. Accessed 2014 Nov 7.
35. Papaioannou A, Morin S, Cheung AM, Atkinson S, Brown JP, Feldman S, et al. 2010 Clinical practice guidelines for the diagnosis and management of osteoporosis in Canada: summary. *CMAJ* 2010;182(17):1864–73.
36. *Publicly funded immunization schedules for Ontario, 2011*. Toronto, ON: Ontario Ministry of Health and Long-Term Care; 2011.
37. *National Advisory Committee on Immunization* [website]. Ottawa, ON: Public Health Agency of Canada. Available from: **www.phac-aspc.gc.ca/naci-ccni/index-eng.php**. Accessed 2015 Jul 10.

38. Public Health Agency of Canada. *Canadian immunization guide. Part 3. Vaccination of specific populations*. Ottawa, ON: Public Health Agency of Canada; 2013. Available from: **www.phac-aspc.gc.ca/publicat/cig-gci/p03-02-eng.php**. Accessed 2015 Jul 14.
39. US Preventive Services Task Force. Folic acid to prevent neural tube defects: preventive medication. Rockville, MD: US Preventive Services Task Force; 2009. Available from: **www.uspreventiveservicestaskforce.org/Page/Topic/recommendation-summary/folic-acid-to-prevent-neural-tube-defects-preventive-medication?ds=1&s=FOLIC ACID**. Accessed 2015 Jul 14.
40. Public Health Agency of Canada. *Rubella*. Ottawa, ON: Public Health Agency of Canada. Available from: **www.phac-aspc.gc.ca/im/vpd-mev/rubella-eng.php**. Accessed 2015 Jul 14.
41. Canadian Task Force on Preventive Health Care. *Screening for cervical cancer.* Calgary, AB: Canadian Task Force on Preventive Health Care; 2013. Available from: **http://canadiantaskforce.ca/ctfphc-guidelines/2013-cervical-cancer**. Accessed 2014 Nov 10.
42. Canadian Task Force on Preventive Health Care. *Screening for breast cancer*. Calgary, AB: Canadian Task Force on Preventive Health Care; 2011. Available from: **http://canadiantaskforce.ca/ctfphc-guidelines/2011-breast-cancer**. Accessed 2014 Nov 7.
43. US Preventive Services Task Force. *Abdominal aortic aneurysm: screening.* Rockville, MD: US Preventive Services Task Force; 2014. Available from: **www.uspreventiveservicestaskforce.org/Page/Topic/recommendation-summary/abdominal-aortic-aneurysm-screening**. Accessed 2014 Dec 22.
44. Weeks C. Cancer experts call for a reduction in Pap tests. *Globe and Mail* 2009 Nov 24. Available from: **www.theglobeandmail.com/life/health-and-fitness/health/conditions/cancer-experts-call-for-reduction-in-pap-tests/article572657**. Accessed 2016 Jan 4.
45. The Society of Obstetricians and Gynaecologists of Canada. *Position statement: recommendations on screening for cervical cancer*. Available from: **http://sogc.org/media_updates/the-sogc-the-scc-and-goc-issue-a-joint-position-statement-in-response-to-new-ctfphc-recommendations-on-screening-for-cervical-cancer**. Accessed 2014 Nov 24.
46. Harvard Men's Health Watch [website]. *The PSA test: what's right for you?* Cambridge, MA: Harvard Health Publications; 2012. Available from: **www.health.harvard.edu/newsletters/Harvard_Mens_Health_Watch/2012/March/the-psa-test-whats-right-for-you**. Accessed 2014 Dec 17.
47. Canadian Task Force on Preventive Health Care [website]. *2014 Prostate cancer—infographic*. Calgary, AB: Canadian Task Force for Preventive Health Care; 2015. Available from: **http://canadiantaskforce.ca/ctfphc-guidelines/2014-prostate-cancer/infographic**. Accessed 2015 May 26.
48. Martínez García L, Sanabria AJ, García Alvarez E, Trujillo-Martín MM, Etxeandia-Ikobaltzeta I, Kotzeva A, et al. The validity of recommendations from clinical guidelines: a survival analysis. *CMAJ* 2014;186(16):1211-9. Epub 2014 Sep 8.
49. Canadian Task Force on Preventive Health Care. *Prostate cancer harms and benefits*. Calgary, AB: Canadian Task Force for Preventive Health Care; 2015. Available from: **http://canadiantaskforce.ca/ctfphc-guidelines/2014-prostate-cancer/harms-and-benefits**. Accessed 2014 Nov 7.
50. Canadian Task Force on Preventive Health Care [website]. *Prostate cancer—patient FAQ*. Calgary, AB: Canadian Task Force for Preventive Health Care; 2015. Available from: **http://canadiantaskforce.ca/ctfphc-guidelines/2014-prostate-cancer/patient-faq**. Accessed 2014 Nov 7.
51. US Preventive Services Task Force. *Prostate cancer: screening*. Rockville, MD: US Preventive Services Task Force; 2012. Available from: **www.uspreventiveservicestaskforce.org/Page/Topic/recommendation-summary/prostate-cancer-screening**. Accessed 2014 Nov 7.
52. Andriole GL, Crawford ED, Grubb RL, Buys SS, Chia D, Church TR, et al. Mortality results from a randomized prostate-cancer screening trial. *N Engl J Med* 2009;360(13):1310-9. Epub 2009 Mar 18. Erratum in: *N Engl J Med* 2009;360(17):1797.
53. Schröder FH, Hugosson J, Roobol MJ, Tammela TL, Ciatto S, Nelen V, et al. Screening and prostate-cancer mortality in a randomized European study. *N Engl J Med* 2009;360(13):1320-8. Epub 2009 Mar 18.
54. Gomella LG, Liu XS, Trabulsi EJ, Kelly WK, Myers R, Showalter T, et al. Screening for prostate cancer: the current evidence and guidelines controversy. *Can J Urol* 2011;18(5):5875-83.
55. Carter HB. American Urological Association (AUA) guideline on prostate cancer detection: process and rationale. *BJU Int* 2013;112(5):543-7.
56. Evans M. *The prostate specific antigen test* [video]. YouTube; 2014. Available from: **https://www.youtube.com/watch?v=bTgS0DuhaUU**. Accessed 2016 Jan 4.
57. Krahn M. Prostate cancer screening: going beyond the clinical evidence. *CMAJ* 2014;186(16):1201-2. Epub 2014 Oct 27.
58. Tonelli M, Connor Gorber S, Joffres M, Dickinson J, Singh H, Lewin G, et al. Recommendations on screening for breast cancer in average-risk women aged 40-74 years. *CMAJ* 2011;183(17):1991-2001. Erratum in: *CMAJ* 2011;183(18):2147.
59. US Preventive Services Task Force. *Final recommendation statement. Breast cancer: screening*. Rockville, MD: US Preventive Services Task Force; 2009. Available from: **www.uspreventiveservicestaskforce.org/Page/Document/RecommendationStatementFinal/breast-cancer-screening#update-of-previous-uspstf-recommendation**. Accessed 2014 Nov 7.
60. Canadian Association of Radiologists [website]. *The Canadian Association of Radiologists supports breast cancer screening for women in their 40s.* Ottawa, ON: Canadian Association of Radiologists; 2011. Available from: **www.car.ca/uploads/news publications/car_nov_2011_news_release.pdf**. Accessed 2014 Nov 24.
61. Agency for Healthcare Research and Quality. *Guideline summary. Breast cancer screening*. Rockville, MD: US Department of Health & Human Services; 2011. Available from: **www.guideline.gov/content.aspx?id=34275**. Accessed 2014 Nov 7.
62. Canadian Task Force on Preventive Health Care [website]. *Breast cancer—risks & benefits, age 40-49.* Calgary, AB: Canadian Task Force for Preventive Health Care; 2015. Available from: **http://canadiantaskforce.ca/ctfphc-guidelines/2011-breast-cancer/risks-and-benefits-age-40-49**. Accessed 2014 Nov 7.
63. Canadian Task Force on Preventive Health Care [website]. *Breast cancer screening guidelines video*. Calgary, AB: Canadian Task Force for Preventive Health Care; 2011. Available from: **http://canadiantaskforce.ca/ctfphc-guidelines/2011-breast-cancer/screening-guideline-video**. Accessed 2016 Jan 4.
64. US Preventive Services Task Force. *Colorectal cancer: screening*. Rockville, MD: US Preventive Services Task Force; 2012. Available from: **www.uspreventiveservicestaskforce.org/Page/Topic/recommendation-summary/prostate-cancer-screening**. Accessed 2016 Jan 4.
65. Scottish Intercollegiate Guidelines Network. *Diagnosis and management of colorectal cancer*. Edinburgh, Scotland: Scottish Intercollegiate Guidelines Network; 2011. Available from: **www.sign.ac.uk/guidelines/fulltext/126**. Accessed 2014 Nov 7.
66. Leddin DJ, Enns R, Hilsden R, Plourde V, Rabeneck L, Sadowski DC, et al. Canadian Association of Gastroenterology position statement on screening individuals at average risk for developing colorectal cancer: 2010. *Can J Gastroenterol* 2010;24:705-14.
67. Tobe SW, Stone JA, Brouwers M, Bhattacharyya O, Walker KM, Dawes M, et al. Harmonization of guidelines for the prevention and treatment of cardiovascular disease: the C-CHANGE initiative. *CMAJ* 2011;183(15):E1135-50. Epub 2011 Sep 12.
68. Brauer P, Connor Gorber S, Shaw E, Singh H, Bell N, Shane AR, et al. Recommendations for prevention of weight gain and use of behavioural and pharmacologic interventions to manage overweight and obesity in adults in primary care. *CMAJ* 2015;187(3):184-95. Epub 2015 Jan 26.