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Periodic Health Examinations: A Rapid Review

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November 2012

Periodic Health Examinations: A Rapid Review. November 2012; pp. 1–26.

Suggested Citation

This report should be cited as follows:

Kaulback K. Periodic health examinations: a rapid review. Toronto, ON: Health Quality Ontario; 2012 Nov. 26 p. Available from: http://www.hqontario.ca/evidence/publications-and-ohtac-recommendations/rapid-reviews.

Conflict of Interest Statement

All reports prepared by the Division of Evidence Development and Standards at Health Quality Ontario are impartial. There are no competing interests or conflicts of interest to declare.

Rapid Review Methodology

Clinical questions are developed by the Division of Evidence Development and Standards at Health Quality Ontario in consultation with experts, end-users, and/or applicants in the topic area. A systematic literature search is then conducted to identify relevant systematic reviews, health technology assessments, and meta-analyses; if none are located, the search is expanded to include randomized controlled trials (RCTs), and guidelines. Systematic reviews are evaluated using a rating scale developed for this purpose. If the systematic review has evaluated the included primary studies using the GRADE Working Group criteria (http://www.gradeworkinggroup.org/index.htm), the results are reported and the rapid review process is complete. If the systematic review has not evaluated the primary studies using GRADE, the primary studies included in the systematic review are retrieved and a maximum of two outcomes are graded. If no well-conducted systematic reviews are available, RCTs and/or guidelines are evaluated. Because rapid reviews are completed in very short timeframes, other publication types are not included. All rapid reviews are developed and finalized in consultation with experts.

Disclaimer

This rapid review is the work of the Division of Evidence Development and Standards at Health Quality Ontario, and is developed from analysis, interpretation, and comparison of published scientific research. It also incorporates, when available, Ontario data and information provided by experts. As this is a rapid review, it may not reflect all the available scientific research and is not intended as an exhaustive analysis. Health Quality Ontario assumes no responsibility for omissions or incomplete analysis resulting from its rapid reviews. In addition, it is possible that other relevant scientific findings may have been reported since completion of the review. This report is current to the date of the literature search specified in the Research Methods section, as appropriate. This rapid review may be superseded by an updated publication on the same topic. Please check the Health Quality Ontario website for a list of all publications: http://www.hqontario.ca/evidence/publications-and-ohtac-recommendations.

About Health Quality Ontario

Health Quality Ontario is an arms-length agency of the Ontario government. It is a partner and leader in transforming Ontario's health care system so that it can deliver a better experience of care, better outcomes for Ontarians, and better value for money.

Health Quality Ontario strives to promote health care that is supported by the best available scientific evidence. Health Quality Ontario works with clinical experts, scientific collaborators, and field evaluation partners to develop and publish research that evaluates the effectiveness and cost-effectiveness of health technologies and services in Ontario.

Based on the research conducted by Health Quality Ontario and its partners, the Ontario Health Technology Advisory Committee (OHTAC)—a standing advisory subcommittee of the Health Quality Ontario Board—makes recommendations about the uptake, diffusion, distribution, or removal of health interventions to Ontario's Ministry of Health and Long-Term Care, clinicians, health system leaders, and policy makers.

Rapid reviews, evidence-based analyses and their corresponding OHTAC recommendations, and other associated reports are published on the Health Quality Ontario website. Visit http://www.hqontario.ca for more information.

About Health Quality Ontario Publications

To conduct its rapid reviews, Health Quality Ontario and/or its research partners reviews the available scientific literature, making every effort to consider all relevant national and international research; collaborates with partners across relevant government branches; consults with clinical and other external experts and developers of new health technologies; and solicits any necessary supplemental information.

In addition, Health Quality Ontario collects and analyzes information about how a health intervention fits within current practice and existing treatment alternatives. Details about the diffusion of the intervention into current health care practices in Ontario can add an important dimension to the review. Information concerning the health benefits, economic and human resources, and ethical, regulatory, social, and legal issues relating to the intervention may be included to assist in making timely and relevant decisions to optimize patient outcomes.

Permission Requests

How to Obtain Rapid Reviews From Health Quality Ontario

All rapid reviews are freely available in PDF format at the following URL:
http://www.hqontario.ca/evidence/publications-and-ohtac-recommendations/rapid-reviews.

Table of Contents

List of Abbreviations

AACE	American Association of Clinical Endocrinologists
AAFP	American Association of Family Physicians
ACOG	American College of Obstetricians and Gynecologists
ACP	American College of Physicians
ADA	American Diabetes Association
AMSTAR	Assessment of Multiple Systematic Reviews
ATA	American Thyroid Association
BMD	Bone mineral density
BMI	Body mass index
CAS	Coronary artery stenosis
CDA	Canadian Diabetes Association
CHD	Coronary heart disease
CTFPHC	Canadian Task Force on Preventive Health Care
CV	Cardiovascular
EBCT	Electron-beam computerized tomography
ECG	Electrocardiography
ETT	Exercise treadmill test
FOBT	Fecal occult blood test
FPG	Fasting plasma glucose
GP	General practitioner
HbA1c	Hemoglobin A1c
HPV	Human papillomavirus
JNC7	Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure
NHS	National Health Service
NSC	National Screening Committee
OGTT	Oral glucose tolerance test
PHE	Periodic health examination
RCT	Randomized controlled trial
TSH	Thyroid-stimulating hormone
USPSTF	United States Preventive Services Task Force
VA/DoD	Veterans Affairs/Department of Defence

Background

Overuse, underuse, and misuse of interventions are important concerns in health care and lead to individuals receiving unnecessary or inappropriate care. In April 2012, under the guidance of the Ontario Health Technology Advisory Committee's Appropriateness Working Group, Health Quality Ontario (HQO) launched its Appropriateness Initiative. The objective of this initiative is to develop a systematic framework for the ongoing identification, prioritization, and assessment of health interventions in Ontario for which there is possible misuse, overuse, or underuse.

For more information on HQO's Appropriateness Initiative, visit our website at www.hqontario.ca.

Objective of Analysis

The objective of this analysis was to determine whether periodic health examinations (PHEs) improve health outcomes in asymptomatic adults, and the optimal frequency at which PHEs should be offered.

Clinical Need and Target Population

Periodic health examinations are conducted in asymptomatic adults, and are defined as 1 or more visits with a heath care provider for the primary purpose of assessing overall health and risk factors for disease. (1) There is no consensus about the components that should be included in a routine PHE, the frequency with which a PHE should occur, or the necessity of a routine PHE.

Rapid Review

Research Questions

1. What is the evidence to support periodic health examinations in asymptomatic adults?
2. What are the recommended screening intervals for the usual components of periodic health examinations?

Research Methods

Literature Search

A literature search was performed on September 28, 2012, using OVID MEDLINE, MEDLINE In-Process and Other Non-Indexed Citations, OVID EMBASE, the Wiley Cochrane Library, and the Centre for Reviews and Dissemination database, for studies published from January 1, 2006, until September 28, 2012. Abstracts were reviewed by a single reviewer and, for those studies meeting the eligibility criteria, full-text articles were obtained. Reference lists were also examined for any additional relevant studies not identified through the search, and a general search of the Internet was conducted.

Inclusion Criteria

- English language
- published between January 1, 2006, and September 28, 2012
- health technology assessments, systematic reviews, or meta-analyses
- adults

Exclusion Criteria

- randomized controlled trials, observational studies, case reports, editorials, letters
- abstracts, conference proceedings

Outcomes of Interest

- improved patient outcomes, optimal screening intervals

Quality of Evidence

The Assessment of Multiple Systematic Reviews (AMSTAR) measurement tool was used to assess the methodological quality of the systematic reviews selected for inclusion. (2)

Results of Literature Search

The database search yielded 428 citations published between January 1, 2006, and September 28, 2012 (with duplicates removed). Articles were excluded based on information in the title and abstract. The full texts of potentially relevant articles were obtained for further assessment. The reference lists of the included reviews were hand searched to identify any additional potentially relevant studies.

Three articles (3 systematic reviews) met the inclusion criteria, and are summarized below. (1;3;4)

Cochrane Systematic Review

Krogsbøll et al (4) evaluated the benefits and harms of general health checks with an emphasis on patient-relevant outcomes such as morbidity and mortality rather than on surrogate outcomes such as blood pressure and serum cholesterol levels. They describe general health checks as a synonym of PHEs, and defined these exams as screening for more than 1 disease or risk factor and in more than 1 organ system, whether performed only once or repeatedly. They included 16 RCTs and rated the quality of evidence using the system developed by the GRADE Working Group (6) with results as shown in Table 1. The risk ratios for total mortality, cardiovascular mortality, and cancer mortality were all insignificant, indicating that the general health check did not have an impact. In terms of other outcomes, the authors did not find an effect on hospitalizations, disability, worry, additional visits to the physician, absence from work, number of referrals to specialists, the number of follow-up tests after positive screening results, or the amount of surgery. The authors concluded general health checks were unlikely to be beneficial given that they did not lead to reductions in morbidity and mortality, even though the number of new diagnoses increased.

The AMSTAR measurement tool was used to assess the methodological quality of this systematic review; the overall score was 10 out of 11.

Table 1: Summary of Outcomes

Outcome[a]	Risk Ratio (CI)	Quality of Evidence (GRADE)	Total Studies/ Participants
Total mortality	0.99 (0.95–1.03)	High	9/155,899
Cardiovascular mortality	1.03 (0.91–1.17)	Moderate	8/152,435
Cancer mortality	1.01 (0.92–1.12)	High	8/139,290

Abbreviation: CI, confidence interval.
[a]Follow-up: 4–22 years.

Agency for Health Quality and Research Systematic Review

Boulware et al (1;5) performed a systematic review on behalf of the Agency for Health Quality and Research to determine the benefits and harms of the PHE and summarize the results of the best available evidence. The included studies evaluated a total of 17 outcomes relevant for PHEs spread across 3 general categories: delivery of clinical preventive services, proximal clinical outcomes, and distal clinical/economic outcomes. Of the 17 outcomes, beneficial effects (in terms of range of magnitude of the PHE) were reported for 4 (Table 2).

Table 2: Summary of Best Available Evidence for Outcomes with Beneficial Effects

Outcomes With Beneficial Effects	Studies	Quality of Evidence[a]
Delivery of Clinical Preventive Services		
Gynecologic exam/Pap smear	RCTs (2)	High
Cholesterol screening	RCTs (1), observational studies (4)	Medium
Colon cancer screening	RCTs (2)	High
Proximal Clinical Outcomes		
Patient attitudes	RCTs (1)	Medium

Abbreviation: RCT, randomized controlled trial.

[a]Quality of evidence was assessed using the GRADE classification system. (6)

Source: Boulware LE, Marinopoulos S, Phillips KA, Hwang CW, Maynor K, Merenstein D et al. Systematic review: the value of the periodic health evaluation. Ann Intern Med.2007;146(4):289-300. (1)

Mixed effects were reported for delivery of other clinical preventive services (counselling, immunizations, mammography) proximal clinical outcomes (disease detection, health habits, health status, blood pressure, serum cholesterol, body mass index) and distal economic and clinical outcomes (costs, disability, hospitalization, mortality).

The authors did not report on the frequency and intensity of any specific components of the PHE, but they did highlight a need for more research in this area.

The AMSTAR measurement tool was used to assess the methodological quality of this systematic review; the overall score was 10 out of 11.

United States Veterans Affairs/Department of Defence Evidence Brief

An October 2011 Evidence Brief from Bloomfield and Wilt (3) for the United States Veterans Affairs/Department of Defence (VA/DoD) evaluated the components of the PHE that were currently recommended by evidence-based guidelines or reports. The authors used the United States Preventive Services Task Force (USPSTF) recommendations to identify common components of the PHE, and for components not included by the USPSTF, they performed a systematic literature search.

Based on their analysis, the authors concluded that PHEs in asymptomatic results could not be recommended due to a lack of evidence. However, they did cite USPSTF recommendations to provide the following:

- blood pressure screening every 1 to 2 years (no evidence for optimal interval, but the VA/DoD recommended annually; a 1 year recommendation was also provided for persons with an initial blood pressure reading of 120 to 139 mm Hg systolic or 80 to 89 mm Hg diastolic by the Joint Committee on Prevention Diagnosis and Treatment of High Blood Pressure)
- periodic (unspecified frequency) body mass index screening
- Pap smears beginning at age 21 for sexually active women with a cervix every 3 years until 65 years of age

The AMSTAR measurement tool was used to assess the methodological quality of this evidence brief; the overall score was 3 out of 11.

Evidence Development and Standards Review

The Evidence Development and Standards branch at Health Quality Ontario expanded on the work of the VA/DoD evidence brief to determine optimal screening intervals for the various components of the typical PHE. Recommendations from the following government preventive services recommendation bodies/websites were reviewed, and the findings are summarized in Appendix 1.

- Canada
  - Canadian Task Force on Preventive Health Care (7)
- United States
  - United States Preventive Services Task Force (8)
  - American Academy of Family Physicians (9)
  - Veterans Affairs/Department of Defence (10)
- United Kingdom
  - UK National Screening Committee (11)
  - National Health Service Health Check (12)
  - National Health Service Cancer Screening Programs (12;13)

No annual or more frequent screening intervals were recommended for healthy, average-risk, asymptomatic adults for any of the health conditions reviewed, with the exception of VA/DoD recommendations (10) for annual screening of body mass index (2006) and blood pressure (2005), both of which are based on expert opinion and are not supported by the other organizations included in the review.

An annual or biennial fecal occult blood test (FOBT) is recommended in adults over 50 years (Canadian Task Force on Preventive Health Care/USPSTF), (7;8) although colonoscopy/sigmoidoscopy every 5 to 10 years is recommended as an alternative.

Conclusions

While the PHE may have a beneficial effect on the delivery of some clinical preventive services and may alleviate patient worry, there is no evidence that it has an impact on other outcomes, including morbidity, mortality, hospitalization, visits to physicians, referrals, or absence from work. Based on a review of the recommendations from large government preventive services organizations in Canada, the United States, and the United Kingdom, there is no consensus on the optimal frequency of screening for the various components of a typical PHE, and there are no recommendations based on evidence to support annual or more frequent screening.

Acknowledgements

Editorial Staff
Jeanne McKane, CPE, ELS(D)

Medical Information Services
Kaitryn Campbell, BA(H), BEd, MLIS

Appendices

Appendix 1: Literature Search Strategies

Search date: September 28, 2012
Databases searched: OVID MEDLINE, MEDLINE In-Process and Other Non-Indexed Citations, EMBASE; Cochrane Library; CRD

Q: Periodic health exams
Limits: 2006-current; English
Filters: health technology assessments, systematic reviews, and meta-analyses

Database: Ovid MEDLINE(R) <1946 to September Week 3 2012>, Ovid MEDLINE(R) In-Process & Other Non-Indexed Citations <September 27, 2012>, Embase <1980 to 2012 Week 38>
Search Strategy:

#	Searches	Results
1	*Physical Examination/	15504
2	*Mass Screening/	59656
3	or/1-2	74720
4	*Primary Health Care/ use mesz	30897
5	*Primary Prevention/	10655
6	*Preventive Health Services/ use mesz	6311
7	exp *General Practice/	73952
8	*Preventive Medicine/ use emez	8600
9	*Preventive Health Service/ use emez	9863
10	exp *Primary Health Care/ use emez	36674
11	or/4-10	171254
12	*Multiphasic Screening/ use mesz	662
13	*Periodic Medical Examination/ use emez	528
14	(periodic adj (physical examination? or health exam? or health examination? or health evaluation? or screening? or check up or checkup or health check up or health checkup)).ti,ab.	2213
15	((annual or yearly) adj (physical examination? or health exam? or health examination? or health evaluation? or screen or screening? or check up or checkup or health check up or health checkup)).ti,ab.	3042
16	((multiphasic or multi-phasic) adj (health exam? or health examination? or health evaluation? or screening? or check up or checkup or health check up or health checkup or health testing)).ti,ab.	716
17	(preventive adj (physical examination? or health exam? or health examination? or health evaluation? or screening? or check up or checkup or health check up or health checkup or service? delivery or service?)).ti,ab.	7296
18	(medical surveillance or primary care screening).ti.	588
19	or/12-18	14433
20	(3 and 11) or 19	16909
21	(2006* or 2007* or 2008* or 2009* or 201*).ed.	5816149
22	(2006* or 2007* or 2008* or 2009* or 201*).em.	12810155
23	or/21-22	12810155

24	Meta Analysis.pt.	36479
25	Meta Analysis/ use emez	65909
26	Systematic Review/ use emez	53173
27	exp Technology Assessment, Biomedical/ use mesz	8853
28	Biomedical Technology Assessment/ use emez	11380
29	(meta analy* or metaanaly* or pooled analysis or (systematic* adj2 review*) or published studies or published literature or medline or embase or data synthesis or data extraction or cochrane).ti,ab.	289908
30	((health technolog* or biomedical technolog*) adj2 assess*).ti,ab.	3641
31	or/24-30	349592
32	20 and 23 and 31	700
33	limit 32 to english language	694
34	remove duplicates from 33	398

Cochrane Library

Line #	Terms	Results
#1	MeSH descriptor: [Physical Examination] this term only	700
#2	MeSH descriptor: [Mass Screening] this term only	3614
#3	#1 or #2	4247
#4	MeSH descriptor: [Primary Health Care] this term only	2412
#5	MeSH descriptor: [Primary Prevention] this term only	593
#6	MeSH descriptor: [Preventive Health Services] this term only	413
#7	MeSH descriptor: [General Practice] explode all trees	2122
#8	#4 or #5 or #6 or #7	5170
#9	#3 and #8	384
#10	MeSH descriptor: [Multiphasic Screening] this term only	16
#11	periodic next (physical examination? or health exam? or health examination? or health evaluation? or screening? or check up or checkup or health check up or health checkup):ti,ab,kw or (annual or yearly) next (physical examination? or health exam? or health examination? or health evaluation? or screen or screening? or check up or checkup or health check up or health checkup):ti,ab,kw or (multiphasic or multi-phasic) next (health exam? or health examination? or health evaluation? or screening? or check up or checkup or health check up or health checkup or health testing):ti,ab,kw or preventive next (physical examination? or health exam? or health examination? or health evaluation? or screening? or check up or checkup or health check up or health checkup or service? delivery or service?):ti,ab,kw or medical surveillance or primary care screening:ti (Word variations have been searched)	447
#12	#9 or #10 or #11	315 from 2006 to present

CRD

Line	Search	Hits
1	MeSH DESCRIPTOR Physical Examination IN DARE,HTA	88
2	MeSH DESCRIPTOR Mass Screening IN DARE,HTA	738
3	#1 OR #2	820
4	MeSH DESCRIPTOR Primary Health Care IN DARE,HTA	326
5	MeSH DESCRIPTOR Primary Prevention IN DARE,HTA	123
6	MeSH DESCRIPTOR Preventive Health Services IN DARE,HTA	55
7	MeSH DESCRIPTOR General Practice EXPLODE ALL TREES	255
8	#4 OR #5 OR #6 OR #7	712
9	#3 AND #8	58
10	MeSH DESCRIPTOR Multiphasic Screening IN DARE,HTA	0
11	(periodic ADJ (physical examination? OR health exam? OR health examination? OR health evaluation? OR screening? OR check up OR checkup OR health check up OR health checkup)):TI OR ((annual OR yearly) ADJ (physical examination? OR health exam? OR health examination? OR health evaluation? OR screen OR screening? OR check up OR checkup OR health check up OR health checkup)):TI OR ((multiphasic OR multi-phasic) ADJ (health exam? OR health examination? OR health evaluation? OR screening? OR check up OR checkup OR health check up OR health checkup OR health testing)):TI OR (preventive ADJ (physical examination? OR health exam? OR health examination? OR health evaluation? OR screening? OR check up OR checkup OR health check up OR health checkup OR service? delivery OR service?)):TI OR (medical surveillance OR primary care screening):TI IN DARE, HTA WHERE PD FROM 01/01/2006 TO 28/09/2012	64
12	#9 OR #10 OR #11	112

DARE & HTA (2006-current)=78

Appendix 2: Recommended Screening Intervals From Major Governmental Preventive Health Organizations[a]

Indication	Screening Interval	Reference (last visited October 10, 2012)
Breast cancer	**CTFPHC** • The CTFPHC (2011) recommends not routinely performing a clinical breast exam alone or in conjunction with mammography to screen for breast cancer, or routinely screening with magnetic resonance imaging • For women aged 40–49, we recommend not routinely screening with mammography • For women aged 50–69, we recommend routinely screening with mammography every 2 to 3 years • For women aged 70–74, we recommend routinely screening with mammography every 2 to 3 years	http://www.canadiantaskforce.ca/docs/CBE_BSE_recommendation_ENG.pdf
	AAFP • The AAFP recommends that the decision to conduct screening mammography before age 50 should be individualized and take into account patient context, including her risks as well as her values regarding specific benefits and harms • The AAFP (2012) recommends biennial (every 2 years) screening mammography for women 50–74	http://www.aafp.org/online/etc/medialib/aafp_org/documents/clinical/CPS/rcps08-2005.Par.0001.File.tmp/June2012CPS.pdf
	UK NSC Women aged 50–70 should be screened every 3 years	http://www.screening.nhs.uk/cms.php?folder=2487
	NHS Breast Cancer Screening Program • Women under 50 are not currently offered routine screening. Research has shown that routine screening in the 40–50 age group is less effective • Digital mammography is better for screening younger women and women with denser breasts, and is as effective as film mammography in older women • The program is being gradually extended to women aged 47–49, as well as to those aged 71–73. The age extension of the program is expected to be complete by 2016. It is important to note that women of any age can ask their GP to refer them to a hospital breast clinic if they are concerned about a specific breast problem or otherwise worried about the risk of breast cancer	http://www.cancerscreening.nhs.uk/breastscreen/under-50.html

Cervical cancer	**CTFPHC** The CTFPHC recommendation is currently in progress	—
	AAFP The AAFP recommends screening for cervical cancer in women age 21–65 years with cytology (Pap smear) every 3 years or, for women age 30–65 years who want to lengthen the screening interval, screening with a combination of cytology and HPV testing every 5 years	http://www.aafp.org/online/etc/medialib/aafp_org/documents/clinical/CPS/rcps08-2005.Par.0001.File.tmp/June2012CPS.pdf
	CancerHelp/UK NSC Every 3–5 years for women aged approximately 20–64 (varies by country)	http://cancerhelp.cancerresearchuk.org/type/cervical-cancer/about/cervical-cancer-screening http://www.screening.nhs.uk/policydb_download.php?doc=219
	NHS Cervical Screening Program All women between the ages of 25–64 are eligible for a free cervical screening test every 3–5 years	http://www.cancerscreening.nhs.uk/cervical/about-cervical-screening.html#eligible
Colorectal cancer	**CTFPHC** The CTFPHC (2001) found that there is good evidence to support the inclusion of annual or biennial FOBT and fair evidence to include flexible sigmoidoscopy in the periodic health examinations of asymptomatic individuals over age 50 years	http://www.canadiantaskforce.ca/recommendations/2001_03_eng.html
	USPSTF The USPSTF (2008) reports that modelling evidence suggests that population screening programs between the ages of 50 and 75 years using any of the following 3 regimens will be approximately equally effective in life-years gained, assuming 100% adherence to the same regimen for that period: 1) annual high-sensitivity FOBT, 2) sigmoidoscopy every 5 years combined with high-sensitivity FOBT every 3 years, and 3) screening colonoscopy at intervals of 10 years; although use of an annual FOBT with a lower sensitivity has been demonstrated to reduce colorectal cancer mortality in randomized, controlled trials, modelling suggests that the number of life-years gained will be greater with the strategies using higher-sensitivity tests	http://www.uspreventiveservicestaskforce.org/uspstf08/colocancer/colors.htm#clinical
	CancerHelp/UK NSC FOBT every 2 years in people aged approximately 50–74 (by 2015)	http://cancerhelp.cancerresearchuk.org/type/bowel-cancer/about/screening/who-is-screened-for-bowel-cancer http://www.screening.nhs.uk/cms.php?folder=2489

Colorectal cancer (cont'd)	**NHS Bowel Cancer Screening Program** The NHS Bowel Cancer Screening Programme offers FOBT screening every 2 years to all men and women aged 60–69. The NHS is introducing flexible sigmoidoscopy (flexi-sig) screening for all men and women when they reach the age of 55. This screening test is an addition to the existing NHS Bowel Cancer Screening Programme (FOBT), and will be offered to people aged 55. People aged over 55 will be able to request flexi-sig screening up to their 60th birthday. At 60, people will be offered the FOBT as now, whether or not they have had flexi-sig screening. Screening interval with flexi-sig not yet available	http://www.cancerscreening.nhs.uk/bowel/flexible-sigmoidoscopy-screening.html
Coronary heart disease, low-risk	**AAFP** The AAFP recommends against routine screening with resting ECG, ETT, or EBCT scanning for coronary calcium for either the presence of severe CAS or the prediction of CHD events in adults at low risk for CHD events	http://www.aafp.org/online/etc/medialib/aafp_org/documents/clinical/CPS/rcps08-2005.Par.0001.File.tmp/June2012CPS.pdf
Coronary heart disease, high-risk	**AAFP** The AAFP found insufficient evidence to recommend for or against routine screening with ECG, ETT, or EBCT scanning for coronary calcium for either the presence of severe CAS or the prediction of CHD events in adults at increased risk for CHD events	http://www.aafp.org/online/etc/medialib/aafp_org/documents/clinical/CPS/rcps08-2005.Par.0001.File.tmp/June2012CPS.pdf
	UK NSC Recommends screening every 5 years in adults aged 40–74. Screening consists of blood pressure, cholesterol, and BMI tests	http://www.screening.nhs.uk/policydb.php
Depression	**CTFPHC** The CTFPHC (2005, update currently in progress) concludes that there is fair evidence to recommend screening adults for depression in primary care settings, since screening improves health outcomes when linked to effective follow-up and treatment, but insufficient evidence to recommend for or against screening adults for depression in primary care settings where effective follow-up and treatment are not available	http://www.canadiantaskforce.ca/recommendations/2005_02_eng.html
	USPSTF Although the optimal interval for screening is unknown, the USPSTF (2009) stated that "recurrent screening may be most productive in patients with past history of depression, unexplained somatic symptoms, comorbid psychological conditions (such as panic disorder or generalized anxiety), substance abuse, or chronic pain"	http://www.aafp.org/online/etc/medialib/aafp_org/documents/clinical/CPS/rcps08-2005.Par.0001.File.tmp/June2012CPS.pdf
	UK NSC Population screening not recommended	http://www.uspreventiveservicestaskforce.org/uspstf09/adultdepression/addeprrs.htm#clinical http://www.screening.nhs.uk/depression

Diabetes, type 2	**CTFPHC** The CTFPHC (2005, update currently in progress) states that there is fair evidence to recommend screening adults with hypertension for type 2 diabetes to reduce the incidence of CV events and mortality. There is fair evidence to recommend screening adults with hyperlipidemia for type 2 diabetes to reduce the incidence of CV events and mortality. CTFPHC states that there is no information regarding optimal screening frequency **CDA** The CDA recommends screening for diabetes with a fasting plasma glucose test every 3 years in people 40 years of age and older (grade: consensus). Screening should be considered at an earlier age or be performed more frequently, or both, using a fasting glucose or 2-hour OGTT in people with additional risk factors for diabetes (grade: consensus)	http://www.canadiantaskforce.ca/recommendations/2005_03_eng.html
	AAFP • The AAFP indicates that the optimal screening interval is not known and recommends screening for type 2 diabetes in asymptomatic adults with sustained blood pressure (either treated or untreated) greater than 135/80 mm Hg • The AAFP concludes that the current evidence is insufficient to assess the balance of benefits and harms of screening for type 2 diabetes in asymptomatic adults with blood pressure of 135/80 mm Hg **ADA** The ADA, on the basis of expert opinion, recommends that patients, particularly those with a BMI of 25 kg/m^2 or greater, be screened with a fasting glucose test every 3 years beginning at the age of 45 years	http://www.aafp.org/online/etc/medialib/aafp_org/documents/clinical/CPS/rcps08-2005.Par.0001.File.tmp/June2012CPS.pdf
	VA/DoD • Screening for prediabetes or diabetes should be considered for all adults age ≥ 45 years • Screening for prediabetes or diabetes should be considered in younger adults who are overweight or obese (BMI > 25 kg/m^2) or are at high risk for diabetes mellitus based upon established risk factors at 1–3 year intervals • Screening for prediabetes or diabetes should occur at a frequency of 1–3 years. More frequent screening can be performed depending upon prior HbA1c or FPG results, and patient or clinician preferences	http://www.uspreventiveservicestaskforce.org/uspstf08/type2/type2summ.htm http://www.healthquality.va.gov/diabetes/DM2010_SUM-v4.pdf
	UK NSC General population screening should not be offered	http://www.screening.nhs.uk/policydb.php
	NHS Health Check (UK) Recommends screening every 5 years in adults aged 40–74. Screening consists of blood pressure, cholesterol, and BMI tests. OGTT offered if high risk for developing diabetes is perceived	http://www.nhs.uk/Planners/NHSHealthCheck/Pages/NHSHealthCheckwhat.aspx

Dyslipidemias	**AAFP** While the AAFP recommends screening for lipid disorders in specified population groups, the optimal interval for screening is uncertain. On the basis of other guidelines and expert opinion, reasonable options include every 5 years, shorter intervals for people who have lipid levels close to those warranting therapy, and longer intervals for those not at increased risk who have had repeatedly normal lipid levels	http://www.uspreventiveservicestaskforce.org/uspstf08/lipid/lipidrs.htm
	VA/DoD All men age 35 years or older and women age 45 years or older, every 5 years	http://www.healthquality.va.gov/lipids/lipid_sum.pdf
	NHS Health Check (UK) Recommended for adults aged 40–74 every 5 years	http://www.nhs.uk/Planners/NHSHealthCheck/Pages/NHSHealthCheckwhat.aspx
Hypertension/ blood pressure	**CTFPHC** Recommendation currently in progress	—
	AAFP The AAFP recommends screening for high blood pressure in adults aged 18 and older, but the optimal interval for screening adults for hypertension is not known	http://www.aafp.org/online/etc/medialib/aafp_org/documents/clinical/CPS/rcps08-2005.Par.0001.File.tmp/June2012CPS.pdf
	JNC7 The JNC7 recommends the following: • Screening every 2 years in patients with blood pressure < 120/80 mm Hg • Screening every year in patients with systolic blood pressure of 120–139 mmHg or diastolic blood pressure of 80–90 mm Hg	http://www.uspreventiveservicestaskforce.org/uspstf07/hbp/hbpsum.htm
	VA/DoD (2005) • Blood pressure screening should occur periodically • Blood pressure screening is recommended annually for adults 50 years of age and older and/or for those who have prehypertension and/or other cardiovascular risk factors • Blood pressure screening is recommended at indeterminate intervals, preferably annually. This may occur at the time of routine preventive care or routine health assessments • "Evidence is lacking to recommend an optimal interval for screening adults for high blood pressure. A reasonable timeframe can be inferred based on age, baseline blood pressure, and cardiovascular risks but as a general recommendation, it seems prudent and most straightforward to assess at yearly intervals since most people, especially those over the age of fifty, require an annual assessment or follow-up for other medical issues"	http://www.ncbi.nlm.nih.gov/books/NBK82767/table/vaphysical.t1/?report=objectonly http://www.healthquality.va.gov/hypertension/htn04_pdf1.pdf
	UK NSC Population screening not recommended	http://www.screening.nhs.uk/policydb.php

	NHS Health Check (UK) Recommended for adults aged 40–74 every 5 years	http://www.nhs.uk/Planners/NHSHealthCheck/Pages/NHSHealthCheckwhat.aspx
Kidney disease	**NHS Health Check (UK)** Recommended for adults aged 40–74 every 5 years	http://www.nhs.uk/Planners/NHSHealthCheck/Pages/NHSHealthCheckwhat.aspx
Obesity/BMI	**AAFP** While the AAFP recommends screening for obesity, no evidence was found regarding appropriate intervals for screening	http://www.aafp.org/online/etc/medialib/aafp_org/documents/clinical/CPS/rcps08-2005.Par.0001.File.tmp/June2012CPS.pdf http://www.uspreventiveservicestaskforce.org/uspstf11/obeseadult/obesers.htm#clinical
	VA/DoD (2006) Screening for overweight and obesity should be performed at least annually (expert opinion)	http://www.ncbi.nlm.nih.gov/books/NBK82767/table/vaphysical.t1/?report=objectonly http://www.healthquality.va.gov/obesity/ObesitySum508.pdf
	NHS Health Check (UK) Recommended for adults aged 40–74 every 5 years	http://www.nhs.uk/Planners/NHSHealthCheck/Pages/NHSHealthCheckwhat.aspx
Osteoporosis	**CTFPHC** The CTFPHC (2002) concluded that there is fair evidence to screen postmenopausal women to prevent fragility fractures, but the recommendation document does not identify recommended screening intervals	http://www.canadiantaskforce.ca/recommendations/2002_03_eng.html
	AAFP The AAFP (2011) recommends screening for osteoporosis in women aged 65 years or older and in younger women whose fracture risk is equal to or greater than that of a 65-year-old white woman who has no additional risk factors. A lack of evidence exists about optimal intervals for repeated screening and whether repeated screening is necessary in a woman with normal BMD. Because of limitations in the precision of testing, a minimum of 2 years may be needed to reliably measure a change in BMD; however, longer intervals may be necessary to improve fracture risk prediction	http://www.aafp.org/online/etc/medialib/aafp_org/documents/clinical/CPS/rcps08-2005.Par.0001.File.tmp/June2012CPS.pdf http://www.uspreventiveservicestaskforce.org/uspstf10/osteoporosis/osteors.htm#clinical

Thyroid disease	**CTFPHC** The CTFPHC recommends maintaining a high index of clinical suspicion for nonspecific symptoms consistent with hypothyroidism when examining perimenopausal and postmenopausal women	—
	AAFP The AAFP concludes that the evidence is insufficient to recommend for or against routine screening for thyroid disease in adults **ATA** The ATA recommends measuring thyroid function in all adults beginning at age 35 years and every 5 years thereafter, noting that more frequent screening may be appropriate in high-risk or symptomatic individuals **ACP** The ACP recommends screening women older than age 50 with 1 or more general symptoms that could be caused by thyroid disease **AACE** The AACE recommends TSH measurement in women of childbearing age before pregnancy or during the first trimester **ACOG** The ACOG recommends that physicians be aware of the symptoms and risk factors for postpartum thyroid dysfunction and evaluate patients when indicated	http://www.aafp.org/online/etc/medialib/aafp_org/documents/clinical/CPS/rcps08-2005.Par.0001.File.tmp/June2012CPS.pdf http://www.uspreventiveservicestaskforce.org/3rduspstf/thyroid/thyrrs.htm
	UK NSC The UK NSC does not recommend thyroid screening	http://www.screening.nhs.uk/policydb.php

Abbreviations: AACE, American Association of Clinical Endocrinologists; AAFP, American Association of Family Physicians; ACOG, American College of Obstetricians and Gynecologists; ACP, American College of Physicians; ADA, American Diabetes Association; ATA, American Thyroid Association; BMD, bone mineral density; BMI, body mass index; CAS, coronary artery stenosis; CDA, Canadian Diabetes Association; CHD, coronary heart disease; CTFPHC, Canadian Task Force on Preventive Health Care; CV, cardiovascular; EBCT, electron-beam computerized tomography; ECG, electrocardiography; ETT, exercise treadmill test; FOBT, fecal occult blood test; FPG, fasting plasma glucose; GP, general practitioner; HbA1c, hemoglobin A1c; HPV, human papillomavirus; JNC7, Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure; NHS, National Health Service; NSC, National Screening Committee; OGTT, oral glucose tolerance test; TSH, thyroid-stimulating hormone; USPSTF, United States Preventive Services Task Force; VA/DoD; Veterans Affairs/Department of Defence.

[a]Recommendations from societies and associations were included where they were reported by the governmental organizations.

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