

**A SELECTION OF TEN CURRENT READINGS ON TOPICS RELATED TO  
CARDIOVASCULAR DISEASE, RISK FACTORS, AND CONSEQUENCES**

**AVAILABLE AS FREE FULL-TEXT**

**Selection of readings made by A/Prof Goh Lee Gan**

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**READING 1 – Cardiovascular risk assessment**

**Gupta R, Stocks NP, Broadbent J. Cardiovascular risk assessment in Australian general practice. Aust Fam Physician. 2009 May;38(5):364-8. PubMed PMID: 19458809.**

URL: <http://www.racgp.org.au/afp/200905/31511>(free full text)

Discipline of General Practice, University of Adelaide, South Australia.

ABSTRACT

**BACKGROUND:** Australian general practitioners are encouraged to assess absolute cardiovascular risk (CVR) using a CVR calculator such as the New Zealand Cardiovascular Risk Calculator. However, overseas research suggests that the use of these tools is problematic. Australian data on CVR calculator use is lacking. **METHODS:** A self administered postal questionnaire exploring GP attitudes toward CVR assessment and management was sent to a random sample of a quarter of South Australian GPs. These GPs were also asked to estimate the absolute CVR for six clinical case scenarios and to provide an outline of their proposed management plan. **RESULTS:** Most GPs surveyed (63%) used a CVR calculator. In their responses, they said they felt successful at managing patients with medical risk factors that could be treated with medication; when it came to their ability to influence lifestyle risk factors however, they were generally pessimistic. Absolute CVR was more likely to be under- or over-estimated by GPs surveyed than estimated correctly. But when asked to prioritise their management strategies, GPs mainly favoured interventions that could result in meaningful reductions in CVR factors. **DISCUSSION:** A better understanding is needed of how to incorporate CVR calculations into every day clinical practice in a way that both estimates risk accurately and engages and educates patients. Ongoing research into effective GP led interventions that can assist patients to reduce lifestyle risk factors is needed.

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**READING 2 – Screening toolkit**

**Shah BR, Bhattacharyya O, Yu C, Mamdani M, Parsons JA, Straus SE, Zwarenstein M. Evaluation of a toolkit to improve cardiovascular disease screening and treatment for people with type 2 diabetes: protocol for a cluster-randomized pragmatic trial. Trials. 2010 Apr 23;11:44. PubMed PMID: 20416080; PubMed Central PMCID: PMC2867980.**

URL: <http://www.trialsjournal.com/content/11/1/44> (free full text)

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ABSTRACT

**BACKGROUND:** The gap between the level of care recommended by evidence-based clinical practice guidelines and the actual care delivered to patients in practice has been well established. The Canadian Diabetes Association (CDA) created an implementation strategy to improve the implementation of its 2008 guidelines. This study will evaluate the impact of the strategy to improve cardiovascular disease (CVD) screening, prevention and treatment for people with diabetes. **DESIGN:** A pragmatic cluster-randomized trial will be conducted to evaluate the CDA's CVD Toolkit. All family physicians in Ontario, Canada were randomly allocated to receive the Toolkit, which includes several printed educational materials targeting CVD screening, prevention and treatment, either in spring 2009 (intervention arm) or in spring 2010 (control arm). Randomization occurred at the level of the practice. Forty family

physicians from each arm will be recruited to participate, and the medical records for 20 of their diabetic patients at high risk for CVD will be retrospectively reviewed. Outcome measures will be assessed for each patient between July 2009 and March 2010. The primary outcome will be that the patient is receiving a statin. Secondary outcomes will include 1) the receipt of an angiotensin converting enzyme inhibitor or angiotensin receptor blocker, 2) various intermediate measures (A1c, blood pressure, LDL-cholesterol, total-/HDL-cholesterol ratio, body mass index and waist circumference), and 3) clinical inertia (the failure to change therapy in response to an abnormal A1c, blood pressure or cholesterol reading). The analysis will be carried out using multilevel hierarchical logistic regression models to account for the clustered nature of the data. The group assignment will be a physician-level variable. In addition, a process evaluation study with six focus groups of family physicians will assess the acceptability of the CDA's Toolkit and will explore factors contributing to any change or lack of change in behaviour, from the perspectives of family physicians. **DISCUSSION:** Printed educational materials for physicians have been shown to exert small-to-moderate changes in patient care. The CDA's CVD Toolkit is an example of a practice guideline implementation strategy that can be disseminated to a wide audience relatively inexpensively, and so demonstrating its effectiveness at improving diabetes care could have important consequences for guideline developers, policy makers and clinicians.

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### READING 3 – Emerging risk factors

**Helfand M, Buckley DI, Freeman M, Fu R, Rogers K, Fleming C, Humphrey LL. Emerging risk factors for coronary heart disease: a summary of systematic reviews conducted for the U.S. Preventive Services Task Force. Ann Intern Med. 2009 Oct 6;151(7):496-507. Review. PubMed PMID: 19805772.**

URL: <http://www.annals.org/content/151/7/496.long> (free full text)

Oregon Evidence-based Practice Center, Veterans Affairs Medical Center, and Oregon Health & Science University, Portland, Oregon 97239, USA.

Summary for patients in:

Ann Intern Med. 2009 Oct 6;151(7):I-38.

#### ABSTRACT

**BACKGROUND:** Traditional risk factors do not explain all of the risk for incident coronary heart disease (CHD) events. Various new or emerging risk factors have the potential to improve global risk assessment for CHD. **PURPOSE:** To summarize the results of 9 systematic reviews of novel risk factors to help the U.S. Preventive Services Task Force (USPSTF) evaluate the factors' clinical usefulness. **DATA SOURCES:** Results from a MEDLINE search for English-language articles published from 1966 to September 2008, using the Medical Subject Heading terms cohort studies and cardiovascular diseases in combination with terms for each risk factor. **STUDY SELECTION:** Studies were included if the participants had no baseline cardiovascular disease and the investigators adjusted for at least 6 Framingham risk factors. **DATA EXTRACTION:** Study quality was evaluated by using USPSTF criteria and overall quality of evidence for each risk factor by using a modified version of the Grading of Recommendations, Assessment, Development, and Evaluation framework. Each factor's potential clinical value was evaluated by using a set of criteria that emphasized the importance of the effect of that factor on the reclassification of intermediate-risk persons. **DATA SYNTHESIS:** 9 systematic reviews were conducted. C-reactive protein (CRP) was the best candidate for use in screening and the most rigorously studied, but evidence that changes in CRP level lead to primary prevention of CHD events is inconclusive. The other evaluated risk factors were coronary artery calcium score as measured by electron-beam computed tomography, lipoprotein(a) level, homocysteine level, leukocyte count, fasting blood glucose, periodontal disease, ankle-brachial index, and carotid intima-media thickness. The availability and validity of the evidence varied considerably across the risk factors in terms of aggregate quality, consistency of findings, and applicability to intermediate-risk persons in the general population. For most risk factors, no studies assessed their usefulness for reclassifying intermediate-risk persons. **LIMITATIONS:** Because of lack of access to original data, no firm conclusions could be drawn about differences in risk prediction among racial and ethnic groups. The review did not emphasize within-cohort comparisons of multiple risk factors. **CONCLUSION:** The current evidence does not support the routine use of any of the 9 risk factors for further risk stratification of intermediate-risk persons.

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#### READING 4 – Emerging risk factors – C reactive protein

**Buckley DI, Fu R, Freeman M, Rogers K, Helfand M. C-reactive protein as a risk factor for coronary heart disease: a systematic review and meta-analyses for the U.S. Preventive Services Task Force. *Ann Intern Med.* 2009 Oct 6;151(7):483-95. Review. PubMed PMID: 19805771.**

URL: <http://www.annals.org/content/151/7/483.long> (free full text)

Oregon Evidence-based Practice Center, Oregon Health & Science University, Portland, Oregon 97239, USA.

Comment in:

*Ann Intern Med.* 2010 Mar 16;152(6):406; author reply 406-7.

Summary for patients in *Ann Intern Med.* 2009 Oct 6;151(7):I-38.

#### ABSTRACT

**BACKGROUND:** C-reactive protein (CRP) may help to refine global risk assessment for coronary heart disease (CHD), particularly among persons who are at intermediate risk on the basis of traditional risk factors alone. **PURPOSE:** To assist the U.S. Preventive Services Task Force (USPSTF) in determining whether CRP should be incorporated into guidelines for CHD risk assessment. **DATA SOURCES:** MEDLINE search of English-language articles (1966 to November 2007), supplemented by reference lists of reviews, pertinent studies, editorials, and Web sites and by expert suggestions. **STUDY SELECTION:** Prospective cohort, case-cohort, and nested case-control studies relevant to the independent predictive ability of CRP when used in intermediate-risk persons. **DATA EXTRACTION:** Included studies were reviewed according to predefined criteria, and the quality of each study was rated. **DATA SYNTHESIS:** The validity of the body of evidence and the net benefit or harm of using CRP for CHD risk assessment were evaluated. The combined magnitude of effect was determined by meta-analysis. The body of evidence is of good quality, consistency, and applicability. For good studies that adjusted for all Framingham risk variables, the summary estimate of relative risk for incident CHD was 1.58 (95% CI, 1.37 to 1.83) for CRP levels greater than 3.0 mg/L compared with levels less than 1.0 mg/L. Analyses from 4 large cohorts were consistent in finding evidence that including CRP improves risk stratification among initially intermediate-risk persons. C-reactive protein has desirable test characteristics, and good data exist on the prevalence of elevated CRP levels in intermediate-risk persons. Limited evidence links changes in CRP level to primary prevention of CHD events. **LIMITATIONS:** Study methods for measuring Framingham risk variables and other covariates varied. Ethnic and racial minority populations were poorly represented in most studies, limiting generalizability. Few studies directly assessed the effect of CRP on risk reclassification in intermediate-risk persons. **CONCLUSION:** Strong evidence indicates that CRP is associated with CHD events. Moderate, consistent evidence suggests that adding CRP to risk prediction models among initially intermediate-risk persons improves risk stratification. However, sufficient evidence that reducing CRP levels prevents CHD events is lacking.

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## READING 5 – Emerging risk factors

**U.S. Preventive Services Task Force. Using nontraditional risk factors in coronary heart disease risk assessment: U.S. Preventive Services Task Force recommendation statement. *Ann Intern Med.* 2009 Oct 6;151(7):474-82. PubMed PMID: 19805770.**

URL: <http://www.annals.org/content/151/7/474.long> (free full text)

Collaborators: Calonge N, Petitti DB, DeWitt TG, Gregory KD, Harris R, Isham G, LeFevre ML, Loveland-Cherry C, Marion LN, Moyer VA, Ockene JK, Sawaya GF, Siu AL, Teutsch SM, Yawn BP.

U.S. Preventive Services Task Force, Agency for Healthcare Research and Quality, Rockville, Maryland, USA

Comment in:

*Ann Intern Med.* 2010 Mar 16;152(6):404-5; author reply 405-6.

*Ann Intern Med.* 2010 Mar 16;152(6):405; author reply 405-6.

*Ann Intern Med.* 2010 Mar 16;152(6):403; author reply 405-6.

*Ann Intern Med.* 2010 Mar 16;152(6):403-4; author reply 405-6.

Summary for patients in:

*Ann Intern Med.* 2009 Oct 6;151(7):I-38.

### ABSTRACT

**DESCRIPTION:** New recommendation from the U.S. Preventive Services Task Force (USPSTF) on the use of nontraditional, or novel, risk factors in assessing the coronary heart disease (CHD) risk of asymptomatic persons. **METHODS:** Systematic reviews were conducted of literature since 1996 on 9 proposed nontraditional markers of CHD risk: high-sensitivity C-reactive protein, ankle-brachial index, leukocyte count, fasting blood glucose, periodontal disease, carotid intima-media thickness, coronary artery calcification score on electron-beam computed tomography, homocysteine, and lipoprotein(a). The reviews followed a hierarchical approach aimed at determining which factors could practically and definitively reassign persons assessed as intermediate-risk according to their Framingham score to either a high-risk or low-risk strata, and thereby improve outcomes by means of aggressive risk-factor modification in those newly assigned to the high-risk stratum. **RECOMMENDATION:** The USPSTF concludes that the current evidence is insufficient to assess the balance of benefits and harms of using the nontraditional risk factors studied to screen asymptomatic men and women with no history of CHD to prevent CHD events. (I statement).

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## READING 6 – Clinical management – a check list

**Insull W Jr, Lewis SJ. Clinical management of atherosclerosis: a checklist. *Am J Med.* 2009 Jan;122(1 Suppl):S60-2. PubMed PMID: 19110089.**

URL: <http://download.journals.elsevierhealth.com/pdfs/journals/0002-9343/PIIS000293430801022X.pdf> (free full text)

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### ABSTRACT

This article provides a checklist designed to aid the busy clinician in organizing and implementing an effective course of atherosclerosis evaluation and treatment, and a compendium highlighting a selection of useful guidelines for the general practitioner.

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## READING 7 – Cardiovascular risk clinic

**Byrnes PD, Mitchell GK, Crawford MV, McGoldrick C. A cardiovascular risk clinic using home BP monitoring. Aust Fam Physician. 2009 Mar;38(3):163-6. PubMed PMID: 19283258.**

URL: <http://www.racgp.org.au/afp/200903/30560> (free full text)

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### ABSTRACT

**BACKGROUND:** Hypertension is the most common chronic condition managed in general practice, but blood pressure (BP) control is often suboptimal. Home blood pressure (HBP) monitoring can be more accurate than office based BP (OBP) monitoring, with HBP readings approximately 10/5 mmHg lower than OBP in the same patients. **METHODS:** Hypertensive patients from a single general practice were invited to a cardiovascular risk review clinic using HBP monitoring. Outcome measures were BP reading, BP meeting adjusted target of 120/80 if aged <65 years or 130/85 if aged >65 years, owning home BP monitor, numbers enrolling and numbers attending 12 month follow up. **RESULTS:** Of 524 eligible patients, 414 (79%) enrolled in the clinic, of whom 89% completed the trial. At 12 months, HBP control rates rose from 29.9% to 44.8%, with mean HBP falling 5.2/3.2 mmHg ( $p<0.001$ ). Home BP monitor ownership rose from 54.3 to 82.9%. **DISCUSSION:** This is the first study in standard Australian general practice using both a comprehensive clinic approach and HBP readings exclusively. This study provided a feasible management protocol and practical clinical performance indicators that could be used for a randomised controlled trial. Significantly better control rates were achieved compared with published studies for BP control.

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## READING 8 – Acquired coronary artery disease

**Wilson JM. Diagnosis and treatment of acquired coronary artery disease in adults. Postgrad Med J. 2009 Jul;85(1005):364-5. Review. PubMed PMID: 19581247.**

URL: <http://pmj.bmj.com/content/85/1005/364.long> (free full text)

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### ABSTRACT

Coronary artery disease evolves, often unnoticed, over decades, often culminating in myocardial infarction. Metabolic and behavioural risk factors affect the development and progression of atherosclerotic lesions. The diagnosis may be arrived at clinically but typically involves confirmatory and prognostic laboratory tests and imaging studies. Treatment measures are aimed at controlling symptoms and preventing disease progression. In patients with clinically stable disease, treatment centres upon preventing disease progression using lifestyle modification, medical therapy and revascularisation for patients in whom medical treatment failure may be imminently fatal. In patients with acute coronary syndrome, urgent treatment is required in order to arrest lesion progression.

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## READING 9 – Hypertension control

**Tan EK, Chung WL, Lew YJ, Chan MY, Wong TY, Koh WP. Characteristics, and disease control and complications of hypertensive patients in primary-care – a community-based study in Singapore. Ann Acad Med Singapore. 2009 Oct;38(10):850-6. PubMed PMID: 19890575.**

URL: <http://www.annals.edu.sg/pdf/38VolNo10Oct2009/V38N10p850.pdf> (free full text)

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### ABSTRACT

**INTRODUCTION:** Hypertension is a common chronic condition usually managed by primary-care practitioners in Singapore. This study assessed the characteristics, control and complications of non-diabetic hypertensive patients managed at government primary healthcare clinics. **MATERIALS AND METHODS:** A cross-sectional study involving 9 clinics was conducted over 1-week in 2006. Five hundred and six non-diabetic hypertensive patients were systematically sampled from all clinic attendees. Data relating to socio-demographic, lifestyle factors, treatment and complications were collected by interviewer-administered questionnaires and review of clinic medical records. Blood pressure (BP) measurements were taken with validated automated sets following a standard protocol. **RESULTS:** The prevalence of good BP control (<140/90 mmHg) was 37.7% (95% CI: 33.6% to 41.8%). Ninety seven percent were on medication with about half on monotherapy. Seventy percent of patients had a body mass index (BMI) of 23.0 kg/m<sup>2</sup> or higher, 64% did not exercise regularly and 8% were current smokers. After adjusting for age and lifestyle factors, male hypertensive patients had poorer BP control compared to females. Nineteen percent of patients reported at least 1 complication of hypertension, especially cardiac disease. After multivariate analysis and duration of disease, age and the male gender were associated with the presence of hypertensive complications. **CONCLUSIONS:** More than half of the patients were not controlled to target levels. Male patients were more likely to have poorer control of hypertension and significantly higher risks of complications. Control of BP could be further improved by lifestyle modifications - weight reduction, promotion of physical activity, healthier eating habits and smoking cessation.

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## READING 10 – Sick fat

**Bays HE. “Sick fat,” metabolic disease, and atherosclerosis. Am J Med. 2009 Jan; 122(1 Suppl):S26-37. Review. PubMed PMID: 19110085.**

URL: <http://www.amjmed.com/article/PIIS000293430801019X/fulltext> (free full text)

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### ABSTRACT

Atherosclerotic coronary heart disease (CHD) is the most common cause of morbidity and mortality among men and women in developed nations. The obesity epidemic contributes to the increasing prevalence of high blood sugar (as may be found in patients with diabetes mellitus and metabolic syndrome), high blood pressure, and dyslipidemia--all CHD risk factors. Metabolic syndrome describes the common clinical finding wherein component CHD risk factors cluster within a single patient, but this term does not identify any unified pathophysiologic process. However, a component of the metabolic syndrome is abdominal obesity, which does reflect an anatomic manifestation of a “common-soil” pathophysiologic process that promotes the onset of CHD risk factors, and thus increases CHD risk. Adiposopathy (“sick fat”) is anatomically characterized by visceral adiposity and adipocyte hypertrophy; it is manifested physiologically by a net increase in release of free fatty acids and by pathogenic adipose tissue metabolic/immune responses that promote metabolic disease and increase CHD risk. Understanding the relation of adiposopathy to CHD risk factors and recognizing the importance of treating both the “cause and effect” of metabolic diseases are critical toward a comprehensive approach in reducing CHD risk. Regarding the “cause,” clinicians and their patients should be diligent regarding appropriate nutritional and lifestyle interventions that may favorably affect health. Regarding the “effect,” clinicians and their patients should be equally diligent toward appropriate pharmaceutical interventions that reduce CHD risk factors when nutritional and lifestyle interventions do not sufficiently achieve desired metabolic treatment goals.

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