

**A SELECTION OF TEN CURRENT READINGS ON TOPICS RELATED TO
RISK FACTORS IN MACROVASCULAR DISEASE**
Selection of readings made by A/Prof Goh Lee Gan

Reading 1 - Patient with Multiple Cardiovascular Risk Factors

Bodenheimer T. A 63-year-old man with multiple cardiovascular risk factors and poor adherence to treatment plans. JAMA. 2007;298(17):2048-2055.

URL: <http://jama.ama-assn.org/cgi/reprint/298/17/2048> (free full text)

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ABSTRACT

Mr P has long-standing hypertension, obesity, and diabetes mellitus and has experienced life-threatening cardiovascular events. Mr P is receiving evidence-based clinical care but has adhered to his medical regimen poorly and remains at considerable risk of future catastrophic cardiovascular events. Practicing evidence-based medicine should be a 5-step process: research uncovers the evidence, clinicians learn the evidence, clinicians use the evidence at every visit for every patient, clinicians make sure patients understand the evidence, and clinicians help patients incorporate the evidence into their lives. Research demonstrates, however, that clinicians do not use the evidence at every visit, patients may misunderstand what took place in the visit, and clinicians are not always effective in helping patients incorporate the evidence into their lives. These failures reflect the difficulty faced by clinicians attempting to address multiple issues while providing sufficient information and engaging in collaborative decision making during a brief clinical visit.

Reading 2 - Coronary Deaths Reduction in the US

Ford ES, Ajani UA, Croft JB, Critchley JA, Labarthe DR, Kottke TE, Giles WH, Capewell S. Explaining the decrease in U.S. deaths from coronary disease, 1980-2000. N Engl J Med. 2007 Jun 7;356(23):2388-98.

URL: <http://content.nejm.org.libproxy1.nus.edu.sg/cgi/content/abstract/356/23/2388> (free full text)

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ABSTRACT

BACKGROUND: Mortality from coronary heart disease in the United States has decreased substantially in recent decades. We conducted a study to determine how much of this decrease could be explained by the use of medical and surgical treatments as opposed to changes in cardiovascular risk factors.

METHODS: We applied a previously validated statistical model, IMPACT, to data on the use and effectiveness of specific cardiac treatments and on changes in risk factors between 1980 and 2000 among U.S. adults 25 to 84 years old. The difference between the observed and expected number of deaths from coronary heart disease in 2000 was distributed among the treatments and risk factors included in the analyses.

RESULTS: From 1980 through 2000, the age-adjusted death rate for coronary heart disease fell from 542.9 to 266.8 deaths per 100,000 population among men and from 263.3 to 134.4 deaths per 100,000 population among women, resulting in 341,745 fewer deaths from coronary heart disease in 2000. Approximately 47% of this decrease was attributed to treatments, including secondary preventive therapies after myocardial infarction or

revascularization (11%), initial treatments for acute myocardial infarction or unstable angina (10%), treatments for heart failure (9%), revascularization for chronic angina (5%), and other therapies (12%). Approximately 44% was attributed to changes in risk factors, including reductions in total cholesterol (24%), systolic blood pressure (20%), smoking prevalence (12%), and physical inactivity (5%), although these reductions were partially offset by increases in the body-mass index and the prevalence of diabetes, which accounted for an increased number of deaths (8% and 10%, respectively).

CONCLUSIONS: Approximately half the decline in U.S. deaths from coronary heart disease from 1980 through 2000 may be attributable to reductions in major risk factors and approximately half to evidence-based medical therapies. Copyright 2007 Massachusetts Medical Society.

Reading 3 - Low Glycemic Load Effective in Weight Loss

Ebbeling CB, Leidig MM, Feldman HA, Lovesky MM, Ludwig DS. Effects of a low-glycemic load vs low-fat diet in obese young adults: a randomized trial. : JAMA. 2007 May 16;297(19):2092-102.

URL: <http://jama.ama-assn.org.libproxy1.nus.edu.sg/cgi/content/full/297/19/2092> (free full text)

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ABSTRACT

CONTEXT: The results of clinical trials involving diet in the treatment of obesity have been inconsistent, possibly due to inherent physiological differences among study participants.

OBJECTIVE: To determine whether insulin secretion affects weight loss with 2 popular diets.

DESIGN, SETTING, AND PARTICIPANTS: Randomized trial of obese young adults (aged 18-35 years; n = 73) conducted from September 2004 to December 2006 in Boston, Mass, and consisting of a 6-month intensive intervention period and a 12-month follow-up period. Serum insulin concentration at 30 minutes after a 75-g dose of oral glucose was determined at baseline as a measure of insulin secretion. Outcomes were assessed at 6, 12, and 18 months. Missing data were imputed conservatively.

INTERVENTIONS: A low-glycemic load (40% carbohydrate and 35% fat) vs low-fat (55% carbohydrate and 20% fat) diet.

MAIN OUTCOME MEASURES: Body weight, body fat percentage determined by dual-energy x-ray absorptiometry, and cardiovascular disease risk factors.

RESULTS: Change in body weight and body fat percentage did not differ between the diet groups overall. However, insulin concentration at 30 minutes after a dose of oral glucose was an effect modifier (group x time x insulin concentration at 30 minutes: P = .02 for body weight and P = .01 for body fat percentage). For those with insulin concentration at 30 minutes above the median (57.5 microIU/mL; n = 28), the low-glycemic load diet produced a greater decrease in weight (-5.8 vs -1.2 kg; P = .004) and body fat percentage (-2.6% vs -0.9%; P = .03) than the low-fat diet at 18 months. There were no significant differences in these end points between diet groups for those with insulin concentration at 30 minutes below the median level (n = 28). Insulin concentration at 30 minutes after a dose of oral glucose was not a significant effect modifier for cardiovascular disease risk factors. In the full cohort, plasma high-density lipoprotein cholesterol and triglyceride concentrations improved more on the low-glycemic load diet, whereas low-density lipoprotein cholesterol concentration improved more on the low-fat diet.

CONCLUSIONS: Variability in dietary weight loss trials may be partially attributable to differences in hormonal response. Reducing glycemic load may be especially important to achieve weight loss among individuals with high insulin secretion. Regardless of insulin secretion, a low-glycemic load diet has beneficial effects on high-density lipoprotein cholesterol and triglyceride concentrations but not on low-density lipoprotein cholesterol concentration.

TRIAL REGISTRATION: clinicaltrials.gov Identifier: NCT00130299.

Reading 4 - Cardiovascular Risk Scoring

Hippisley-Cox J, Coupland C, Vinogradova Y, Robson J, May M, Brindle P. Derivation and validation of QRISK, a new cardiovascular disease risk score for the United Kingdom: prospective open cohort study. BMJ. 2007 Jul 21;335(7611):136. Epub 2007 Jul 5.

URL: <http://www.bmj.com.libproxy1.nus.edu.sg/cgi/content/full/335/7611/136> (free full text)

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ABSTRACT

OBJECTIVE: To derive a new cardiovascular disease risk score (QRISK) for the United Kingdom and to validate its performance against the established Framingham cardiovascular disease algorithm and a newly developed Scottish score (ASSIGN).

DESIGN: Prospective open cohort study using routinely collected data from general practice.

SETTING: UK practices contributing to the QRESEARCH database.

PARTICIPANTS: The derivation cohort consisted of 1.28 million patients, aged 35-74 years, registered at 318 practices between 1 January 1995 and 1 April 2007 and who were free of diabetes and existing cardiovascular disease. The validation cohort consisted of 0.61 million patients from 160 practices.

MAIN OUTCOME MEASURES: First recorded diagnosis of cardiovascular disease (incident diagnosis between 1 January 1995 and 1 April 2007): myocardial infarction, coronary heart disease, stroke, and transient ischaemic attacks. Risk factors were age, sex, smoking status, systolic blood pressure, ratio of total serum cholesterol to high density lipoprotein, body mass index, family history of coronary heart disease in first degree relative aged less than 60, area measure of deprivation, and existing treatment with antihypertensive agent.

RESULTS: A cardiovascular disease risk algorithm (QRISK) was developed in the derivation cohort. In the validation cohort the observed 10 year risk of a cardiovascular event was 6.60% (95% confidence interval 6.48% to 6.72%) in women and 9.28% (9.14% to 9.43%) in men. Overall the Framingham algorithm over-predicted cardiovascular disease risk at 10 years by 35%, ASSIGN by 36%, and QRISK by 0.4%. Measures of discrimination tended to be higher for QRISK than for the Framingham algorithm and it was better calibrated to the UK population than either the Framingham or ASSIGN models. Using QRISK 8.5% of patients aged 35-74 are at high risk (20% risk or higher over 10 years) compared with 13% when using the Framingham algorithm and 14% when using ASSIGN. Using QRISK 34% of women and 73% of men aged 64-75 would be at high risk compared with 24% and 86% according to the Framingham algorithm. UK estimates for 2005 based on QRISK give 3.2 million patients aged 35-74 at high risk, with the Framingham algorithm predicting 4.7 million and ASSIGN 5.1 million. Overall, 53 668 patients in the validation dataset (9% of the total) would be reclassified from high to low risk or vice versa using QRISK compared with the Framingham algorithm.

CONCLUSION: QRISK performed at least as well as the Framingham model for discrimination and was better calibrated to the UK population than either the Framingham model or ASSIGN. QRISK is likely to provide more appropriate risk estimates to help identify high risk patients on the basis of age, sex, and social deprivation. It is therefore likely to be a more equitable tool to inform management decisions and help ensure treatments are directed towards those most likely to benefit. It includes additional variables which improve risk estimates for patients with a positive family history or those on antihypertensive treatment. However, since the validation was performed in a similar population to the population from which the algorithm was derived, it potentially has a "home advantage." Further validation in other populations is therefore required.

Reading 5 - Home Monitoring

Taylor JR, Campbell KM. Home monitoring of glucose and blood pressure. Am Fam Physician. 2007 Jul 15;76(2):255-60.

URL: <http://www.aafp.org/afp/20070715/255.html> (free full text)

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ABSTRACT

Home monitoring of blood glucose and blood pressure levels can provide patients and physicians with valuable information in the management of diabetes mellitus and hypertension. Home monitoring allows patients to play an active role in their care and may improve treatment adherence and clinical outcomes. Glucose meters currently on the market produce results within 15 percent of serum blood glucose readings and offer a variety of features. Although the data are somewhat conflicting, home glucose monitoring has been associated with improved glycemic control and reduced long-term complications from diabetes. These effects are more pronounced in patients who take insulin. Home blood pressure values predict target organ damage and cardiovascular outcomes better than values obtained in the office. Home blood pressure measurements are also effective at detecting borderline hypertension and monitoring the effectiveness of antihypertensive drugs. Validated arm cuffs are the preferred blood pressure devices for home use. Information from home monitoring should always be used in conjunction with that from regular office visits and other data to make appropriate therapeutic decisions.

Reading 6 - Lifestyle Intervention

Wister A, Loewen N, Kennedy-Symonds H, McGowan B, McCoy B, Singer J. One-year follow-up of a therapeutic lifestyle intervention targeting cardiovascular disease risk. CMAJ. 2007 Oct 9;177(8):859-65.

URL: <http://www.cmaj.ca.libproxy1.nus.edu.sg/cgi/content/full/177/8/859> (free full text)

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ABSTRACT

BACKGROUND: In this study, we tested the efficacy of a low-intensity lifestyle intervention aimed at reducing the risk of cardiovascular disease among mid-life individuals.

METHODS: We conducted a randomised controlled trial in which participants were randomly assigned either to receive a health report card with counselling (from a Telehealth nurse) on smoking, exercise, nutrition and stress or to receive usual care. The patients were divided into 2 groups on the basis of risk: the primary prevention group, with a Framingham risk score of 10% or higher (intervention, n = 157; control, n = 158), and the secondary prevention group, who had a diagnosis of coronary artery disease (intervention, n = 153; control, n = 143). The primary outcome was a change in the Framingham global risk score between baseline and 1-year follow-up. Data were analyzed separately for the 2 prevention groups using an intention-to-treat analysis controlling for covariates.

RESULTS: Within the primary prevention group, there were statistically significant changes for the treatment group relative to the controls, from baseline to year 1, in Framingham score (intervention, -3.10 [95% confidence interval (CI) -3.98 to -2.22]; control, -1.30 [95% CI -2.18 to -0.42]; p < 0.01) and scores for total cholesterol (intervention, -0.41 [95% CI -0.59 to -0.23]; control, -0.14 [95% CI -0.32 to 0.04]; p < 0.05), systolic blood pressure (intervention, -7.49 [95% CI -9.97 to -5.01]; control, -3.58 [95% CI -6.08 to -1.08]; p < 0.05), nutrition level (intervention, 0.30 [95% CI 0.13 to 0.47]; control, -0.05 [95% CI -0.22 to 0.12]; p < 0.01), and health confidence (intervention, 0.20 [95% CI 0.09 to 0.31]; control, 0.04 [95% CI -0.07 to 0.15]; p < 0.05), with adjustment for covariates. No significant changes in outcome variables were found for the secondary prevention group.

INTERPRETATION: We found evidence for the efficacy of an intervention addressing multiple risk factors for primary prevention at 1 year using Framingham risk score report cards and telephone counselling. (Requirement for clinical trial registration waived [enrolment completed before requirement became applicable].).

Reading 7 - Smoking Cessation

Millett C, Gray J, Saxena S, Netuveli G, Majeed A. Impact of a pay-for-performance incentive on support for smoking cessation and on smoking prevalence among people with diabetes. CMAJ. 2007 Jun 5;176(12):1705-10.

URL: <http://www.cmaj.ca.libproxy1.nus.edu.sg/cgi/content/full/176/12/1705> (free full text)

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ABSTRACT

BACKGROUND: Many people with diabetes continue to smoke despite being at high risk of cardiovascular disease. We examined the impact of a pay-for-performance incentive in the United Kingdom introduced in 2004 as part of the new general practitioner contract to improve support for smoking cessation and to reduce the prevalence of smoking among people with chronic diseases such as diabetes.

METHODS: We performed a population-based longitudinal study of the recorded delivery of cessation advice and the prevalence of smoking using electronic records of patients with diabetes obtained from participating general practices. The survey was carried out in an ethnically diverse part of southwest London before (June-October 2003) and after (November 2005-January 2006) the introduction of a pay-for-performance incentive.

RESULTS: Significantly more patients with diabetes had their smoking status ever recorded in 2005 than in 2003 (98.8% v. 90.0%, $p < 0.001$). The proportion of patients with documented smoking cessation advice also increased significantly over this period, from 48.0% to 83.5% ($p < 0.001$). The prevalence of smoking decreased significantly from 20.0% to 16.2% ($p < 0.001$). The reduction over the study period was lower among women (adjusted odds ratio 0.71, 95% confidence interval 0.53-0.95) but was not significantly different in the most and least affluent groups. In 2005, smoking rates continued to differ significantly with age (10.6%-25.1%), sex (women, 11.5%; men, 20.6%) and ethnic background (4.9%-24.9%).

INTERPRETATION: The introduction of a pay-for-performance incentive in the United Kingdom increased the provision of support for smoking cessation and was associated with a reduction in smoking prevalence among patients with diabetes in primary health care settings. Health care planners in other countries may wish to consider introducing similar incentive schemes for primary care physicians.

Reading 8 - Interventions to Promote Walking

Ogilvie D, Foster CE, Rothnie H, Cavill N, Hamilton V, Fitzsimons CF, Mutrie N; Scottish Physical Activity Research Collaboration. Interventions to promote walking: systematic review. BMJ. 2007 Jun 9;334(7605):1204. Epub 2007 May 31.

URL: <http://www.bmj.com.libproxy1.nus.edu.sg/cgi/content/full/334/7605/1204> (free full text)

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ABSTRACT

OBJECTIVE: To assess the effects of interventions to promote walking in individuals and populations.

DESIGN: Systematic review.

DATA SOURCES: Published and unpublished reports in any language identified by searching 25 electronic databases, by searching websites, reference lists, and existing systematic reviews, and by contacting experts.

REVIEW METHODS: Systematic search for and appraisal of controlled before and after studies of the effects of any type of intervention on how much people walk, the distribution of effects on walking between social groups, and any associated effects on overall physical activity, fitness, risk factors for disease, health, and wellbeing.

RESULTS: We included 19 randomised controlled trials and 29 non-randomised controlled studies. Interventions tailored to people's needs, targeted at the most sedentary or at those most motivated to change, and delivered either at the level of the individual (brief advice, supported use of pedometers, telecommunications) or household (individualised marketing) or through groups, can encourage people to walk more, although the sustainability, generalisability, and clinical benefits of many of these approaches are uncertain. Evidence for the effectiveness of interventions applied to workplaces, schools, communities, or areas typically depends on isolated studies or subgroup analysis.

CONCLUSIONS: The most successful interventions could increase walking among targeted participants by up to 30-60 minutes a week on average, at least in the short term. From a perspective of improving population health, much of the research currently provides evidence of efficacy rather than effectiveness. Nevertheless, interventions to promote walking could contribute substantially towards increasing the activity levels of the most sedentary.

Reading 9 - Interventions to Promote Physical Activity in Children

van Sluijs EM, McMinn AM, Griffin SJ. Effectiveness of interventions to promote physical activity in children and adolescents: systematic review of controlled trials. BMJ. 2007 Oct 6;335(7622):703. Epub 2007 Sep 20.

URL: <http://www.bmj.com.libproxy1.nus.edu.sg/cgi/reprint/335/7622/703> (free full text)

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ABSTRACT

OBJECTIVE: To review the published literature on the effectiveness of interventions to promote physical activity in children and adolescents.

DESIGN: Systematic review.

DATA SOURCES: Literature search using PubMed, SCOPUS, Psychlit, Ovid Medline, Sportdiscus, and Embase up to December 2006. Review methods Two independent reviewers assessed studies against the following inclusion criteria: controlled trial, comparison of intervention to promote physical activity with no intervention control condition, participants younger than 18 years, and reported statistical analyses of a physical activity outcome measure. Levels of evidence, accounting for methodological quality, were assessed for three types of intervention, five settings, and three target populations.

RESULTS: The literature search identified 57 studies: 33 aimed at children and 24 at adolescents. Twenty four studies were of high methodological quality, including 13 studies in children. Interventions that were found to be effective achieved increases ranging from an additional 2.6 minutes of physical education related physical activity to 283 minutes per week of overall physical activity. Among children, limited evidence for an effect was found for interventions targeting children from low socioeconomic populations, and environmental interventions. Strong evidence was found that school based interventions with involvement of the family or community and multicomponent interventions can increase physical activity in adolescents.

CONCLUSION: Some evidence was found for potentially effective strategies to increase children's levels of physical activity. For adolescents, multicomponent interventions and interventions that included both school and family or community involvement have the potential to make important differences to levels of physical activity and should be promoted. A lack of high quality evaluations hampers conclusions concerning effectiveness, especially among children.

Reading 10 - Management of Hypertriglyceridemia

Oh RC, Lanier JB. Management of hypertriglyceridemia. Am Fam Physician. 2007 May 1;75(9):1365-71.

URL: <http://www.aafp.org/afp/20070501/1365.html> (free full text)

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ABSTRACT

Hypertriglyceridemia is associated with an increased risk of cardiovascular events and acute pancreatitis. Along with lowering low-density lipoprotein cholesterol levels and raising high-density lipoprotein cholesterol levels, lowering triglyceride levels in high-risk patients (e.g., those with cardiovascular disease or diabetes) has been associated with decreased cardiovascular morbidity and mortality. Although the management of mixed dyslipidemia is controversial, treatment should focus primarily on lowering low-density lipoprotein cholesterol levels. Secondary goals should include lowering non-high-density lipoprotein cholesterol levels (calculated by subtracting high-density lipoprotein cholesterol from total cholesterol). If serum triglyceride levels are high, lowering these levels can be effective at reaching non-high-density lipoprotein cholesterol goals. Initially, patients with hypertriglyceridemia should be counseled about therapeutic lifestyle changes (e.g., healthy diet, regular exercise, tobacco-use cessation). Patients also should be screened for metabolic syndrome and other acquired or secondary causes. Patients with borderline-high serum triglyceride levels (i.e., 150 to 199 mg per dL [1.70 to 2.25 mmol per L]) and high serum triglyceride levels (i.e., 200 to 499 mg per dL [2.26 to 5.64 mmol per L]) require an overall cardiac risk assessment. Treatment of very high triglyceride levels (i.e., 500 mg per dL [5.65 mmol per L] or higher) is aimed at reducing the risk of acute pancreatitis. Statins, fibrates, niacin, and fish oil (alone or in various combinations) are effective when pharmacotherapy is indicated.
