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Reducing cardiovascular disease risk in diabetes: a randomised controlled trial of a quality improvement initiative.

Chalasanani S, Peiris DP, Usherwood T, Redfern J, Neal BC, Sullivan DR, Colagiuri S, Zwar NA, Li Q, Patel A.

OBJECTIVES: To describe the management of cardiovascular disease (CVD) risk in Australian patients with diabetes; to compare the effectiveness of a quality improvement initiative for people with and without diabetes.

RESEARCH DESIGN AND METHODS: Subgroup analyses of patients with and without diabetes participating in a cluster randomised trial.

SETTING AND PARTICIPANTS: Indigenous people (≥ 35 years old) and non-Indigenous people (≥ 45 years old) who had attended one of 60 Australian primary health care services at least three times during the preceding 24 months and at least once during the past 6 months.

INTERVENTION: Quality improvement initiative comprising point-of-care electronic decision support with audit and feedback tools.

MAIN OUTCOME MEASURES: Adherence to CVD risk screening and prescribing guidelines.

RESULTS: Baseline rates of guideline-recommended screening were higher for 8829 patients with diabetes than for 44 335 without diabetes (62.0% v 39.5%; $P < 0.001$). Baseline rates of guideline-recommended prescribing were greater for patients with diabetes than for other patients at high risk of CVD (55.5% v 39.6%; $P < 0.001$). The proportions of patients with diabetes not attaining recommended treatment targets for blood pressure, low-density lipoprotein-cholesterol or HbA1c levels who were not prescribed the corresponding therapy at baseline were 28%, 44% and 24% respectively. The intervention was associated with improved screening rates, but the effect was smaller for patients with diabetes than for those without diabetes (rate ratio [RR], 1.14 v 1.28; $P = 0.01$). It was associated with improved guideline-recommended prescribing only for undertreated individuals at high risk; the effect size was similar for those with and without diabetes (RR, 1.63 v 1.53; $P = 0.28$).

CONCLUSIONS: Adherence to CVD risk management guidelines was better for people with diabetes, but there is room for improvement. The intervention was modestly effective in people with diabetes, but further strategies are needed to close evidence-practice gaps. Australian and New Zealand Clinical Trials Registry number: ACTRN12611000478910.

Does the presence of cardiovascular disease risk factors or established disease influence the dietary intake of affected adults and their children residing in the same household? A secondary analysis of the Australian Health Survey (2011-2013)

Thomas J. Chan L. Wray A. Miller J. Mehta K. Yaxley A. Dickinson K. Matwiejczyk L. Jackson K. Miller M.

BACKGROUND: Diet is an important contributor to risk of cardiovascular disease (CVD) and integral in management and delaying progression. Little is known however about whether increased CVD risk or established CVD has any influence on dietary intakes of Australian adults or children residing in the same household. This study aimed to determine whether the presence of CVD or CVD risk factors influences dietary intake of Australian adults and if the presence of an adult with increased CVD risk influences the dietary intake of a child living in the same household.

METHODS: Data were sourced from the 2011-2013 Australian Health Survey for: (1) adults ≥ 18 years with risk factors or established CVD and (2) children 2-17 years residing in the same household as adults with CVD risk factors or established CVD. Selected nutrient intakes (total fat, saturated fat plus trans fat, alpha-linolenic acid, total long chain omega 3 fatty acids, fibre and sodium) collected by repeated 24 h recalls were compared to national dietary recommendations and to the intakes of all other adults and children surveyed. Standard errors of the estimates were calculated using the replicate weights method, and an alpha value of <0.05 considered statistically significant.

RESULTS: Six thousand two hundred sixty five of 9435 adults surveyed were identified as having CVD risk factors or established disease and of these 1609 had a child in the same household that also contributed data in this survey. No differences were observed in adjusted mean dietary intakes between those without risk factors or established CVD and those with, except for total energy and sodium which were significantly lower in the adults with CVD risk factors and/or established disease. However sodium intakes across both groups were higher than recommended targets. There were no differences for selected nutrients between children residing with affected adults and other children surveyed.

CONCLUSIONS: While intakes of Australian adults with CVD risk factors or established disease were favourable for sodium, compared to unaffected adults, there is still scope for improvement as many Australian adults, despite CVD risk, are unable to achieve targets for selected nutrients. Effective dietary behaviour change strategies and resources are urgently needed.

Added sugars and cardiovascular disease risk in children: A scientific statement from the American Heart Association

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BACKGROUND: Poor lifestyle behaviors are leading causes of preventable diseases globally. Added sugars contribute to a diet that is energy dense but nutrient poor and increase risk of developing obesity, cardiovascular disease, hypertension, obesity-related cancers, and dental caries.

METHODS AND RESULTS: For this American Heart Association scientific statement, the writing group reviewed and graded the current scientific evidence for studies examining the cardiovascular health effects of added sugars on children. The available literature was subdivided into 5 broad subareas: Effects on blood pressure, lipids, insulin resistance and diabetes mellitus, nonalcoholic fatty liver disease, and obesity.

CONCLUSIONS: Associations between added sugars and increased cardiovascular disease risk factors among US children are present at levels far below current consumption levels. Strong evidence supports the association of added sugars with increased cardiovascular disease risk in children through increased energy intake, increased adiposity, and dyslipidemia. The committee found that it is reasonable to recommend that children consume ≤ 25 g (100 cal or ≈ 6 teaspoons) of added sugars per day and to avoid added sugars for children < 2 years of age. Although added sugars most likely can be safely consumed in low amounts as part of a healthy diet, few children achieve such levels, making this an important public health target.

Development and validation of QRISK3 risk prediction algorithms to estimate future risk of cardiovascular disease: prospective cohort study.

Hippisley-Cox J, Coupland C, Brindle P.

OBJECTIVES To develop and validate updated QRISK3 prediction algorithms to estimate the 10 year risk of cardiovascular disease in women and men accounting for potential new risk factors. **Design** Prospective open cohort study. **Setting** General practices in England providing data for the Q Research database. **Participants** 1309 Q Research general practices in England: 981 practices were used to develop the scores and a separate set of 328 practices were used to validate the scores. 7.89 million patients aged 25-84 years were in the derivation cohort and 2.67 million patients in the validation cohort. Patients were free of cardiovascular disease and not prescribed statins at baseline.

METHODS: Cox proportional hazards models in the derivation cohort to derive separate risk equations in men and women for evaluation at 10 years. Risk factors considered included those already in QRISK2 (age, ethnicity, deprivation, systolic blood pressure, body mass index, total cholesterol: high density lipoprotein cholesterol ratio, smoking, family history of coronary heart disease in a first degree relative aged less than 60 years, type 1 diabetes, type 2 diabetes, treated hypertension, rheumatoid arthritis, atrial fibrillation, chronic kidney disease (stage 4 or 5)) and new risk factors (chronic kidney disease (stage 3, 4, or 5), a measure of systolic blood pressure variability (standard deviation of repeated measures), migraine, corticosteroids, systemic lupus erythematosus (SLE), atypical antipsychotics, severe mental illness, and HIV/AIDs). We also considered erectile dysfunction diagnosis or treatment in men. Measures of calibration and discrimination were determined in the validation cohort for men and women separately and for individual subgroups by age group, ethnicity, and baseline disease status. **Main outcome measures** Incident cardiovascular disease recorded on any of the following three linked data sources: general practice, mortality, or hospital admission records. **Results** 363565 incident cases of cardiovascular disease were identified in the derivation cohort during follow-up arising from 50.8 million person years of observation. All new risk factors considered met the model inclusion criteria except for HIV/AIDS, which was not statistically significant. The models had good calibration and high levels of explained variation and discrimination. In women, the algorithm explained 59.6% of the variation in time to diagnosis of cardiovascular disease (R^2), with higher values indicating more variation), and the D statistic was 2.48 and Harrell's C statistic was 0.88 (both measures of discrimination, with higher values

indicating better discrimination). The corresponding values for men were 54.8%, 2.26, and 0.86. Overall performance of the updated QRISK3 algorithms was similar to the QRISK2 algorithms.

CONCLUSION: Updated QRISK3 risk prediction models were developed and validated. The inclusion of additional clinical variables in QRISK3 (chronic kidney disease, a measure of systolic blood pressure variability (standard deviation of repeated measures), migraine, corticosteroids, SLE, atypical antipsychotics, severe mental illness, and erectile dysfunction) can help enable doctors to identify those at most risk of heart disease and stroke.

PMCID: PMC5441081

PMID: 28536104 [Indexed for MEDLINE]

JAMA. 2017 May 16; 317(19):2017-2018.

Prevalence of Elevated Cardiovascular Risks in Young Adults: A Cross-sectional Analysis of National Health and Nutrition Examination Surveys.

Patel KK, Taksler GB, Hu B, Rothberg MB.

BACKGROUND: The 2013 cholesterol management guidelines from the American College of Cardiology and American Heart Association (ACC/AHA) recommend lipid screening in all adults older than 20 years to identify those at increased risk for atherosclerotic cardiovascular disease (ASCVD). Statins may be considered for patients with elevated 10-year risk (>5%) or a low-density lipoprotein cholesterol (LDL-C) level of 4.92 mmol/L (190 mg/dL) or greater.

OBJECTIVE: To describe the prevalence of elevated ASCVD risk among nondiabetic adults younger than 50 years.

DESIGN: Cross-sectional. Setting: NHANES (National Health and Nutrition Examination Survey), 1999 to 2000 through 2011 to 2012. Participants: Adults aged 30 to 49 years without known ASCVD or diabetes. Measurements: 10-year ASCVD risk was estimated by using the 2013 ACC/AHA ASCVD risk calculator. Participants were subdivided by age, sex, and history of smoking and hypertension. The percentages of adults in each subgroup with a 10-year ASCVD risk greater than 5% and of those with an LDL-C level of 4.92 mmol/L (190 mg/dL) or greater were estimated. Low-prevalence subgroups were defined as those in which a greater than 1% prevalence of elevated cardiovascular risk could be ruled out (that is, the upper 95% confidence bound for prevalence was $\leq 1\%$).

RESULTS: Overall, 9608 NHANES participants representing 67.9 million adults were included, with approximately half (47.12%, representing 32 million adults) in low-prevalence subgroups. In the absence of smoking or hypertension, 0.09% (95% CI, 0.02% to 0.35%) of adult men younger than 40 years and 0.04% (CI, 0.0% to 0.26%) of adult women younger than 50 years had an elevated risk. Among other subgroups, 0% to 75.9% of participants had an increased risk. Overall, 2.9% (CI, 2.3% to 3.5%) had an LDL-C level of 4.92 mmol/L (190 mg/dL) or greater. Limitation: No information was available regarding cardiovascular outcomes.

CONCLUSION: In the absence of risk factors, the prevalence of increased ASCVD risk is low among women younger than 50 and men younger than 40 years. Primary Funding Source: None.

PMID: 28505660 [Indexed for MEDLINE]

Low socioeconomic status as a risk factor for cardiovascular disease in the years of financial crisis (2002-2012)

Kollia N. Demosthenes D.B. Panagiotakos B. Georgousopoulou E. Chrysohoou C. Tousoulis D. Stefanadis C. Papageorgiou C. Pitsavos C.

BACKGROUND: Introduction: in the shadow of the adverse effects of the undergoing economic crisis in Europe, the expansion of research interest to a socio-economic level (i.e., beyond the established Cardiovascular Disease risk factors) is not only expected but mandatory as well. Purpose: to explore the effect of low socioeconomic status (SES) on 10-year Cardiovascular Disease (CVD) incidence, in apparently healthy individuals at the years of financial crisis. Methods: this is a population-based, health and nutrition prospective survey with 10-year follow-up. During 2001±2002, information from 1528 men (18±87 years old) and 1514 women (18±89 years old) was collected. Educational level and annual income were used to define their SES. At the end of the follow-up period CVD incidence was recorded.

RESULTS: educational level, but not financial status, was inversely associated with 10-year CVD incidence ($p < 0.001$). After adjusting for gender, age, smoking habits, physical activity, adherence to the Mediterranean diet and the presence of Metabolic syndrome at baseline, increased 10-year CVD incidence was recorded among low SES individuals compared to the high SES class [adjusted odds ratio and 95% confidence interval: 2.7 (1.5, 4.9)], but this association was present only among the older participants (i.e., aged above 45 years). Furthermore, low SES individuals scored higher in the depression, anxiety, irrational beliefs and hypochondriasis scales, compared both to those of the middle and the high SES class (all p -values < 0.001), they reported less physical activity ($p = 0.056$) and they had higher prevalence of diabetes mellitus ($p = 0.002$) and obesity ($p = 0.087$).

CONCLUSION: there is evidence for a consistent reverse association between SES and the incidence of CVD, especially in the middle-aged group, as well as for higher CVD risk factors among the most disadvantaged sections of society

Adopting, abandoning, and re-adopting healthy eating patterns sends cardiovascular disease risk factors on a rollercoaster ride

Campbell W.W. O'Connor L.E. Li J. Sayer R.D. Wright A.J.

The 2015-2020 Dietary Guidelines for Americans encourages people to adopt a healthy eating pattern (HEP) for disease prevention. The Dietary Approaches to Stop Hypertension (DASH) diet and the Mediterranean-Style Eating Pattern (Med) are representative of HEPs and are known to improve cardiovascular disease (CVD) risk factors. Unfortunately, for many Americans it is difficult to sustain a HEP long term which may result in alternating HEP periods. The short term impact of this type of dietary rollercoaster on CVD risk factors requires investigation. The objective of this study was to assess changes in CVD risk factors when subjects adopt, abandon, and then re-adopt HEPs using data from two previous randomized crossover controlled feeding studies. We hypothesized that subjects would be less responsive to HEP-induced improvements in CVD risk factors after abandonment of the DASH or Med diet. Subjects in study (S) 1 (n=15) consumed a DASH diet for two 6-wk periods and subjects in S 2 (n=38) consumed a Med diet for two 5-wk periods. The first and second HEP periods of both studies were separated by a washout period (mean=5 wk, median=4 wk). Subjects in both studies consumed the HEP during both periods which differed by the amount of red meat. Clinical measures of CVD risk (fasted and 24-h ambulatory blood pressures (BPs) and blood lipoprotein concentrations) were assessed at baseline and during the last week (post) of each HEP period. The combined age and BMI of subjects (n=53, 19 M, 34 F) was 50 ± 2 y and 31 ± 1 kg/m², respectively. A mixed effects ANOVA with doubly repeated measures was performed with a SAS glimmix procedure. The model assessed the main effect of S (1 vs 2), diet (high vs low red meat), time (pre vs post), period order, and interactions with a random subject effect. Data are shown as LS mean \pm SEM adjusted for age, sex, and body mass. Post hoc analyses were performed using lsestimate statements to compare CVD risk factors at each chronological time point (pre period 1, post period 1, pre period 2, post period 2), and the change magnitude using a Bonferroni adjustment. Only a main effect of time was observed. Adopting, abandoning, and re-adopting HEPs decreased, increased, and then decreased

indexes of CVD risk. Examples include total 24-h systolic BP (-5 ± 2 , 7 ± 3 , and -7 ± 2 mm Hg, respectively) and total cholesterol (TC) (-1.8 ± 0.4 , 26 ± 8 , and -1.3 ± 0.4 mg/dL, respectively). Comparable patterns of change occurred for fasted supine systolic and diastolic BPs and LDL and HDL cholesterol but not TCHDL. The magnitude of changes in CVD risk factors after adopting, abandoning, and re-adopting the healthy eating pattern were not different. These results show that the cardiovascular benefits of adopting HEPs occur quickly, but are short-lived when less HEPs are re-established. Re-adopting a HEP after lapsing from previous consumption does not blunt re-gaining improvements in CVD risk factors. These findings support the importance of consistently consuming a healthy eating pattern for cardiovascular health, in part, because clinical CVD risk factors are sensitive to short-term eating changes.

Knowledge and perception of cardiovascular disease risk among patients with rheumatoid arthritis

Boo S. Oh H. Froelicher E.S. Suh C.-H.

Patients with rheumatoid arthritis are at increased risk for cardiovascular disease. The prerequisites for reducing the risk of cardiovascular disease are adequate levels of knowledge and being aware of the risk. In this study, the levels of knowledge about cardiovascular disease among patients with rheumatoid arthritis and the perception were evaluated in relation to their actual 10-year risk of cardiovascular disease. This cross-sectional study of 200 patients with rheumatoid arthritis was conducted in a university-affiliated hospital in South Korea. The patients' actual risk of cardiovascular disease was estimated using the Framingham Risk Score. The most common risk factor was physical inactivity, with 77% of the patients not engaging in regular exercise. The patients lacked knowledge about the effects of physical inactivity and anti-inflammatory medication on the development of cardiovascular disease. Misperceptions about the risk of cardiovascular disease were common, i.e., 19.5% of the patients underestimated their risk and 41% overestimated. Hypertension, diabetes, obesity, and smoking were the most prevalent among the patients who underestimated their risk, and these same patients had the lowest level of knowledge about cardiovascular disease. This study demonstrated the rheumatoid arthritis patients' lack of knowledge about the effects of physical inactivity and anti-inflammatory medications on the development of cardiovascular disease, and their misperception of cardiovascular risk was common. As a preventive measure, educational programs about cardiovascular disease should be tailored specifically for patients with rheumatoid arthritis, and behavioral interventions, including routine exercise, should be made available at the time of diagnosis.

Sleep Med Clin. 2017 Jun;12(2):167-177.

The Effects of Insomnia and Sleep Loss on Cardiovascular Disease.

Khan MS, Aouad R.

Sleep loss has negative impacts on quality of life, mood, cognitive function, and health. Insomnia is linked to poor mood, increased use of health care resources, decreased quality of life, and possibly cardiovascular risk factors and disease. Studies have shown increase in cortisol levels, decreased immunity, and increased markers of sympathetic activity in sleep-deprived healthy subjects and those with chronic insomnia. The literature shows subjective complaints consistent with chronic insomnia and shortened sleep can be associated with development of diabetes, hypertension, and cardiovascular disease. This article explores the relationship between insufficient sleep and insomnia with these health conditions.

PMID: 28477772 [Indexed for MEDLINE]

Is work stress becoming a cardiovascular disease risk? Psychosocial factors involved

Arenas A. Tabernero C. Luque B. Cuadrado E. Mallén R. Gutiérrez T.

AIM: Previous research has explored the negative effects of work stress on physical health. Performing activities which are increasingly characterised as demanding, constraining and highly stressful elevates blood pressure and other cardiovascular indicators. However, there is no clear evidence of the importance of work stress in coronary heart disease. This research focuses on clarifying the effects of work-related stress on cardiovascular disease risk among men and women exploring the psychosocial factors involved in this relationship.

METHOD: Two different studies were carried out. In study 1 the sample consisted of 374 participants from the general population (46% men, 54% women) with a mean age of 49.24 years (d.t.=18.63). They completed a questionnaire about different psychosocial measures such as labour situation, socioeconomic level, educational level, life satisfaction, social support, self-efficacy for emotion regulation, type D personality profile, work-related stress and coping strategies against anxiety. In study 2 the sample consisted of 200 cardiovascular disease patients of the University Hospital Reina Sofia (Cordoba, Spain) who completed the same measures during a medical revision several months after being diagnosed with cardiovascular disease (85.3% men, 14.7% women; mean age 64.3 years, d.t.=.3).

RESULTS: The results of the structural equation model (SEM) allowed us to determine the weight and interaction of the psychosocial factors and work-related stress on life satisfaction of patients compared to the general population. The predictive model explained 35% for patients and 20% for the general population (fit indexes were excellent in both samples using AMOS). The labour situation (self-employed in the case of men, and home-family care in the case of women), age and type D personality profile (especially negative affectivity dimension) determined the level of work stress and, finally, life satisfaction. In the case of patients, work stress indirectly influenced life satisfaction through the level of self-efficacy for emotion regulation.

CONCLUSIONS: We concluded that work-related stress and other psychosocial factors may determine perceived quality of life (life satisfaction), predictor of the adherence to healthy

behaviours (level of physical activity, type of diet, etc.), which is highly associated with most of cases of cardiovascular disorders. These findings contribute to the current effort of primary prevention of cardiovascular disease by evidencing the psychosocial factors involved. Results point out the need for managing work pressures, promoting social support and adequate coping strategies in order to develop effective prevention programmes.

Cancer as a Risk Factor for Cardiovascular Disease.

Giza DE(1), Iliescu G(2), Hassan S(1), Marmagkiolis K(3)(4), Iliescu C(5).

Improvements in early diagnosis and cancer treatments have contributed to high survival rates for many cancer patients. However, these patients often die of cardiovascular disease rather than recurrence of their cancer. Heart disease manifesting after cancer may be due to several mechanisms: shared cardiovascular risks between cancer and cardiovascular disease, inflammatory states associated with malignancies, and/or cardiotoxic effects of cancer therapy. Cancer treatment increases the risk of cardiovascular diseases directly by damaging critical structures of the heart or indirectly by promoting accelerated atherosclerosis. Estimating cardiovascular risk by using advanced imaging and monitoring of the cardiac biomarkers can be used for early detection and treatment of subclinical cardiac injury. Better knowledge of these early and late cardiac effects in cancer patients will enable adoption of both primary and secondary prevention measures of long-term treatment complications in cancer survivors.

PMID: 28421481 [Indexed for MEDLINE]

Range of Risk Factor Levels: Control, Mortality, and Cardiovascular Outcomes in Type 1 Diabetes Mellitus.

Rawshani A, Rawshani A, Franzén S, Eliasson B, Svensson AM, Miftaraj M, McGuire DK, Sattar N, Rosengren A, Gudbjörnsdóttir S.

BACKGROUND: Individuals with type 1 diabetes mellitus (T1DM) have a high risk of cardiovascular complications, but it is unknown to what extent fulfilling all cardiovascular treatment goals is associated with residual risk of mortality and cardiovascular outcomes in those with T1DM compared with the general population.

METHODS: We included all patients ≥ 18 years of age with T1DM who were registered in the Swedish National Diabetes Register from January 1, 1998, through December 31, 2014, a total of 33333 patients, each matched for age and sex with 5 controls without diabetes mellitus randomly selected from the population. Patients with T1DM were categorized according to number of risk factors not at target: glycohemoglobin, blood pressure, albuminuria, smoking, and low-density lipoprotein cholesterol. Risk of all-cause mortality, acute myocardial infarction, heart failure hospitalization, and stroke was examined in relation to the number of risk factors at target.

RESULTS: The mean follow-up was 10.4 years in the diabetes group. Overall, 2074 of 33333 patients with diabetes mellitus and 4141 of 166529 controls died. Risk for all outcomes increased stepwise for each additional risk factor not at target. Adjusted hazard ratios for patients achieving all risk factor targets compared with controls were 1.31 (95% confidence interval [CI], 0.93-1.85) for all-cause mortality, 1.82 (95% CI, 1.15-2.88) for acute myocardial infarction, 1.97 (95% CI, 1.04-3.73) for heart failure hospitalization, and 1.17 (95% CI, 0.51-2.68) for stroke. The hazard ratio for patients versus controls with none of the risk factors meeting target was 7.33 (95% CI, 5.08-10.57) for all-cause mortality, 12.34 (95% CI, 7.91-19.48) for acute myocardial infarction, 15.09 (95% CI, 9.87-23.09) for heart failure hospitalization, and 12.02 (95% CI, 7.66-18.85) for stroke.

CONCLUSIONS: A steep-graded association exists between decreasing number of cardiovascular risk factors at target and major adverse cardiovascular outcomes among patients with T1DM. However, risks for all outcomes were numerically higher for patients with T1DM compared with controls, even when all risk factors were at target, with risk for acute myocardial infarction and heart failure hospitalization statistically significantly higher.

Unhealthy habits persist: The ongoing presence of modifiable risk factors for disease in women.

Szoeke C, Dang C, Lehert P, Hickey M, Morris ME, Dennerstein L, Campbell S.

OBJECTIVES: Vascular disease remains a leading cause of death. There are several vascular risk factors identified that can mitigate development of disease in ageing. We examine reported rates of modifiable risk factors in women responding to an online health questionnaire advertised by popular media.

METHODS: A sample of 26 620 women aged over 18 was examined in 2015 with a cross-sectional health questionnaire. The questionnaire included self-reported health, mood, lifestyle and vascular risk factors.

RESULTS: There remains high rates of modifiable risk factors present in women. The vast majority of women (80%) reported not eating enough fruit and vegetables. Compared to the guidelines for health, the majority did not perform enough weekly physical activity (70%) and more than half the participants were overweight (54%). Sufficient fruit, vegetables, fish, legumes and physical activity were reported in less than 30% of women!

CONCLUSIONS: Women continue to report low rates of physical activity, fruit and vegetable intake and higher BMI than recommended for good health, despite worldwide health promotion activities aimed at changing these lifestyle factors. Programs to support healthy living need to be reviewed and revised to reduce the burden of vascular disease and dementia in women. Previous guidelines are not having the important impact they should, particularly in women.

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Hypertension. 2017 May;69(5):827-835.

Distinctive Risk Factors and Phenotype of Younger Patients With Resistant Hypertension: Age Is Relevant.

Ghazi L, Oparil S, Calhoun DA, Lin CP, Dudenbostel T.

Resistant hypertension, defined as blood pressure $>140/90$ mmHg despite using ≥ 3 antihypertensive medications, is a well-recognized clinical entity. Patients with resistant hypertension are at an increased risk of cardiovascular disease compared with those with more easily controlled hypertension. Coronary heart disease mortality rates of younger adults are stagnating or on the rise. The purpose of our study was to characterize the phenotype and risk factors of younger patients with resistant hypertension, given the dearth of data on cardiovascular risk profile in this cohort. We conducted a cross-sectional analysis with predefined age groups of a large, ethnically diverse cohort of 2170 patients referred to the Hypertension Clinic at the University of Alabama at Birmingham. Patients ($n=2068$) met the inclusion criteria and were classified by age groups, that is, ≤ 40 years (12.7% of total cohort), 41 to 55 years (32.1%), 56 to 70 years (36.1%), and ≥ 71 years (19.1%). Patients aged ≤ 40 years compared with those aged ≥ 71 years had significantly earlier onset of hypertension (24.7 ± 7.4 versus 55.0 ± 14.1 years; $P < 0.0001$), higher rates of obesity (53.4% versus 26.9%; $P < 0.0001$), and significantly higher levels of plasma aldosterone (11.3 ± 9.8 versus 8.9 ± 7.4 ng/dL; $P = 0.005$), plasma renin activity (4.9 ± 10.2 versus 2.5 ± 5.0 ng/mL per hour; $P = 0.001$), 24-hour urinary aldosterone (13.4 ± 10.0 versus 8.2 ± 6.2 $\mu\text{g}/24$ h; $P < 0.0001$), and sodium excretion (195.9 ± 92.0 versus 146.8 ± 67.1 mEq/24 h; $P < 0.0001$). Among patients with resistant hypertension, younger individuals have a distinct phenotype characterized by overlapping risk factors and comorbidities, including obesity, high aldosterone, and high dietary sodium intake compared with elderly.

PMCID: PMC5402755 [Available on 2018-05-01]

PMID: 28348010 [Indexed for MEDLINE]

Correlation of metabolic syndrome severity with cardiovascular health markers in adolescents.

Lee AM, Gurka MJ, DeBoer MD.

BACKGROUND AND OBJECTIVES: The presence of metabolic syndrome (MetS) in childhood is a significant risk factor for later cardiovascular disease (CVD). Recent data showed temporal decreases in a sex- and race/ethnicity-specific MetS severity z-score among U.S. adolescents. Our goal was to characterize the relationship of this MetS z-score with other CVD risk indicators and assess their temporal trends and lifestyle influences.

METHODS: We analyzed 4837 participants aged 12-20years from the National Health and Nutrition Examination Survey by 2-year waves from 1999 to 2012. We used linear regression to compare MetS z-score and dietary factors with serum levels of low-density lipoprotein (LDL), apolipoprotein-B (ApoB), high-sensitivity C-reactive protein (hsCRP) and uric acid.

RESULTS: MetS severity z-score was positively correlated with LDL, ApoB, hsCRP, and uric acid measurements ($p < 0.0001$ for all). These correlations held true among individual racial/ethnic groups. LDL, ApoB, and hsCRP measurements decreased over time among U.S. adolescents ($p = 0.002$, $p < 0.0001$, and $p = 0.024$, respectively). Saturated fat consumption was positively correlated with LDL ($p = 0.005$) and ApoB ($p = 0.012$) and inversely related to serum uric acid ($p = 0.001$). Total caloric intake was inversely related to LDL ($p = 0.003$) and serum uric acid ($p = 0.003$). Unsaturated fat, carbohydrate, and protein consumption were not related to LDL, ApoB, hsCRP, or serum uric acid.

CONCLUSIONS: There is a positive correlation between MetS severity and all four CVD risk indicators studied. LDL, ApoB, and hsCRP showed favorable temporal trends, which could be related to similar trends in MetS z-score. These data support the importance of considering multiple inter-related factors in clinical CVD risk assessment.

PMCID: PMC5394425 [Available on 2018-04-01]

PMID: 28285655 [Indexed for MEDLINE]

Sex Hormones and Sex Chromosomes Cause Sex Differences in the Development of Cardiovascular Diseases.

Arnold AP, Cassis LA, Eghbali M, Reue K, Sandberg K.

This review summarizes recent evidence concerning hormonal and sex chromosome effects in obesity, atherosclerosis, aneurysms, ischemia/reperfusion injury, and hypertension. Cardiovascular diseases occur and progress differently in the 2 sexes, because biological factors differing between the sexes have sex-specific protective and harmful effects. By comparing the 2 sexes directly, and breaking down sex into its component parts, one can discover sex-biasing protective mechanisms that might be targeted in the clinic. Gonadal hormones, especially estrogens and androgens, have long been found to account for some sex differences in cardiovascular diseases, and molecular mechanisms mediating these effects have recently been elucidated. More recently, the inherent sexual inequalities in effects of sex chromosome genes have also been implicated as contributors in animal models of cardiovascular diseases, especially a deleterious effect of the second X chromosome found in females but not in males. Hormonal and sex chromosome mechanisms interact in the sex-specific control of certain diseases, sometimes by opposing the action of the other.

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Prevalence of cardiovascular risk factors among 28,000 employees.

Scheerbaum M, Langenbach C, Scheerbaum P, Heidemann F, Rieß HC, Heigel H, Debus SE, Behrendt CA.

BACKGROUND: Cardiovascular diseases are the leading cause of death in Germany. The knowledge of causal risk factors and their distribution is of utmost importance to design screening programs.

PROBANDS AND METHODS: In this cross-sectional study design we used STROBE criteria to achieve the highest comparability possible. Anthropometric measures (height and weight), total cholesterol, glucose level, and blood pressure were measured. Probands' history was collected by using a standardized questionnaire. The data was age- and gender-adjusted for the working population 16 to 70 years of age, derived from the micro census, the 1 %-sample census of the German statistical office. For each study year weight factors were calculated. Logistic regression analysis was conducted regarding the cardiovascular risk factors: smoking, arterial hypertension, diabetes, hypercholesterolemia, and obesity.

RESULTS: Between 2006 and 2015 a total of 28,293 employees took part in the ongoing company screenings. The mean age was 42.3 years for both sexes (median: 43 years). The mean body mass index (BMI) was 25.6 kg/m² (men: 26.5 kg/m², women: 24.7 kg/m²). A history of hypertension was present in 16 % of the employees (men: 17.8 %, women: 13.8 %). Of the respondents 2 % suffered from diabetes (men: 2.4 %, women: 1.6 %). Lipid-lowering drugs were taken by 2.8 % of all employees (3.6 % men and 1.9 % women). 23.3 % of the men and women indicated to be active smokers. In the regression analysis obesity was associated with a four times higher risk of hypertension and a three times higher risk of elevated glucose levels, thus manifesting as main contributor for vascular diseases. Meanwhile the risk for obesity was 140 % higher in probands who are former smokers.

CONCLUSIONS: We regard obesity as the number one cardiovascular risk which should be assessed by various medical, legislative, and socio-economic actions to limit future mortality and health-care costs in Germany.

AMERICAN ASSOCIATION OF CLINICAL ENDOCRINOLOGISTS AND AMERICAN COLLEGE OF ENDOCRINOLOGY GUIDELINES FOR MANAGEMENT OF DYSLIPIDEMIA AND PREVENTION OF CARDIOVASCULAR DISEASE - EXECUTIVE SUMMARY **Complete Appendix to Guidelines**

available at <http://journals.aace.com>.

Jellinger PS, Handelsman Y, Rosenblit PD, Bloomgarden ZT, Fonseca VA, Garber AJ, Grunberger G, Guerin CK, Bell DSH, Mechanick JI, Pessah-Pollack R, Wyne K, Smith D, Brinton EA, Fazio S, Davidson M, Zangeneh F, Bush MA.

OBJECTIVE: The development of these guidelines is mandated by the American Association of Clinical Endocrinologists (AACE) Board of Directors and American College of Endocrinology (ACE) Board of Trustees and adheres with published AACE protocols for the standardized production of clinical practice guidelines (CPGs).

METHODS: Each Recommendation is based on a diligent review of the clinical evidence with transparent incorporation of subjective factors.

RESULTS: The Executive Summary of this document contains 87 Recommendations of which 45 are Grade A (51.7%), 18 are Grade B (20.7%), 15 are Grade C (17.2%), and 9 (10.3%) are Grade D. These detailed, evidence-based recommendations allow for nuance-based clinical decision making that addresses multiple aspects of real-world medical care. The evidence base presented in the subsequent Appendix provides relevant supporting information for Executive Summary Recommendations. This update contains 695 citations of which 202 (29.1 %) are evidence level (EL) 1 (strong), 137 (19.7%) are EL 2 (intermediate), 119 (17.1%) are EL 3 (weak), and 237 (34.1%) are EL 4 (no clinical evidence).

CONCLUSION: This CPG is a practical tool that endocrinologists, other healthcare professionals, regulatory bodies and health-related organizations can use to reduce the risks and consequences of dyslipidemia. It provides guidance on screening, risk assessment, and treatment recommendations for a range of patients with various lipid disorders. These recommendations emphasize the importance of treating low-density lipoprotein cholesterol (LDL-C) in some individuals to lower goals than previously recommended and support the measurement of coronary artery calcium scores and inflammatory markers to help stratify risk. Special consideration is given to patients with diabetes, familial hypercholesterolemia, women, and pediatric patients with dyslipidemia. Both clinical and cost-effectiveness data are provided to support treatment decisions.

ABBREVIATIONS: A1C = hemoglobin A1C ACE = American College of Endocrinology ACS = acute coronary syndrome AHA = American Heart Association ASCVD = atherosclerotic cardiovascular disease ATP = Adult Treatment Panel apo = apolipoprotein BEL = best evidence level CKD = chronic kidney disease CPG = clinical practice guidelines CVA = cerebrovascular accident EL = evidence level FH = familial hypercholesterolemia HDL-C = high-density lipoprotein cholesterol HeFH = heterozygous familial hypercholesterolemia HIV = human immunodeficiency virus HoFH = homozygous familial hypercholesterolemia hsCRP = high-sensitivity C-reactive protein LDL-C = low-density lipoprotein cholesterol Lp-PLA2 = lipoprotein-associated phospholipase A2 MESA = Multi-Ethnic Study of Atherosclerosis MetS = metabolic syndrome MI = myocardial infarction NCEP = National Cholesterol Education Program PCOS = polycystic ovary syndrome PCSK9 = proprotein convertase subtilisin/kexin type 9 T1DM = type 1 diabetes mellitus T2DM = type 2 diabetes mellitus TG = triglycerides VLDL-C = very low-density lipoprotein cholesterol.

PMID: 28156151 [Indexed for MEDLINE]

Obesity and cardiovascular diseases.

Kachur S, Lavie CJ, de Schutter A, Milani RV, Ventura HO.

Obesity is increasingly more common in postindustrial societies, and the burden of childhood obesity is increasing. The major effects of obesity on cardiovascular (CV) health are mediated through the risk of metabolic syndrome (insulin-resistance, dyslipidemia, and hypertension), such that an absence of these risk factors in obese individuals may not be associated with increased mortality risk. In individuals already diagnosed with chronic CV disease (CVD), the overweight and class I obese have significant associations with improved survival. However, this effect is attenuated by increases in cardiorespiratory fitness. The negative effects of obesity on CV health manifest as accelerated progression of atherosclerosis, higher rates of ventricular remodeling and a higher risk of associated diseases, including stroke, myocardial infarction, and heart failure. The most effective therapies at reversing CVD risk factors associated with obesity have been dietary changes with exercise, especially through structured exercise programs, such as cardiac rehabilitation.

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Cardiovascular consequences of metabolic syndrome.

Tune JD(1), Goodwill AG(2), Sassoon DJ(2), Mather KJ(3).

The metabolic syndrome (MetS) is defined as the concurrence of obesity-associated cardiovascular risk factors including abdominal obesity, impaired glucose tolerance, hypertriglyceridemia, decreased HDL cholesterol, and/or hypertension. Earlier conceptualizations of the MetS focused on insulin resistance as a core feature, and it is clearly coincident with the above list of features. Each component of the MetS is an independent risk factor for cardiovascular disease and the combination of these risk factors elevates rates and severity of cardiovascular disease, related to a spectrum of cardiovascular conditions including microvascular dysfunction, coronary atherosclerosis and calcification, cardiac dysfunction, myocardial infarction, and heart failure. While advances in understanding the etiology and consequences of this complex disorder have been made, the underlying pathophysiological mechanisms remain incompletely understood, and it is unclear how these concurrent risk factors conspire to produce the variety of obesity-associated adverse cardiovascular diseases. In this review, we highlight current knowledge regarding the pathophysiological consequences of obesity and the MetS on cardiovascular function and disease, including considerations of potential physiological and molecular mechanisms that may contribute to these adverse outcomes.

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Cardiometabolic risk improvement in response to a 3-yr lifestyle modification program in men: contribution of improved cardiorespiratory fitness vs. weight loss.

Borel AL, Nazare JA, Baillot A, Alméras N, Tremblay A, Bergeron J, Poirier P, Després JP.

Our objective was to examine the respective contributions of changes in visceral adiposity, subcutaneous adiposity, liver fat, and cardiorespiratory fitness (CRF) to the improvements in cardiometabolic risk markers in response to a 3-yr healthy eating/physical activity lifestyle intervention. Ninety-four out of 144 viscerally obese healthy men completed a 3-yr lifestyle intervention. Body weight, body composition, and fat distribution were assessed by anthropometry and DEXA/computed tomography. CRF, adipokines, lipoprotein/lipid profile, and 75 g of oral glucose tolerance were assessed. CRF and visceral and subcutaneous adiposity significantly improved over the 3-yr intervention, with a nadir in year 1 and a partial regain in year 3. Liver fat (estimated by insulin hepatic extraction) stabilized from year 1 to year 3, whereas HOMA-IR, ISI-Matsuda index, and adiponectin continued to improve. Multivariate analysis revealed that both visceral adiposity and estimated liver fat reductions contributed to the improved ISI-Matsuda index observed over 3 yr ($r^2 = 0.28$, $P < 0.001$). Three-year changes in fat mass and CRF were independently associated with changes in visceral fat (adjusted $r^2 = 0.40$, $P < 0.001$), whereas only changes in CRF were associated with changes in estimated liver fat (adjusted $r^2 = 0.18$, $P < 0.001$). A long-term (3 yr) healthy eating/physical activity intervention in men improves several cardiometabolic risk markers over the long term (3 yr) despite a partial body weight regain observed between year 1 and year 3. The improvement in CRF contributes to visceral and estimated liver fat losses over the long term, which in turn explain the benefits of the lifestyle intervention on cardiometabolic risk profile.

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Association of Atopic Dermatitis with Cardiovascular Risk Factors and Diseases.

Standl M, Tesch F, Baurecht H, Rodríguez E, Müller-Nurasyid M, Gieger C, Peters A, Wang-Sattler R, Prehn C, Adamski J, Kronenberg F, Schulz H, Koletzko S, Schikowski T, von Berg A, Lehmann I, Berdel D, Heinrich J, Schmitt J, Weidinger S.

Epidemiological studies suggested an association between atopic dermatitis (AD) and cardiovascular disease. Therefore, we investigate associations and potential underlying pathways of AD and cardiovascular disease in large cohort studies: the AOK PLUS cohort (n = 1.2 Mio), the GINIplus / LISAplus birth cohorts (n = 2,286), and the Cooperative Health Research in the Region of Augsburg (KORA) F4 cohort (n = 2,990). In addition, metabolomics in KORA F4 and established cardiovascular risk loci in genome-wide data on 10,788 AD cases and 30,047 controls were analyzed. Longitudinal analysis of patients with AD in AOK PLUS showed slightly increased risk for incident angina pectoris (adjusted risk ratio 1.17 [95% confidence interval 1.12-1.23]), hypertension (1.04 [1.02-1.06]), and peripheral arterial disease (1.15 [1.11-1.19]) but not for myocardial infarction (1.05 [0.99-1.12]) and stroke (1.02 [0.98-1.07]). In KORA F4 and GINIplus / LISAplus, AD was not associated with cardiovascular risk factors and no differences in metabolite levels were detected. There was no robust evidence for shared genetic risk variants of AD and cardiovascular disease. This study indicates only a marginally increased risk for angina pectoris, hypertension, and peripheral arterial disease and no increased risk for myocardial infarction or stroke in patients with AD. Relevant associations of AD with cardiovascular risk factors reported in US populations could not be confirmed. Likewise, patients with AD did not have increased genetic risk factors for cardiovascular disease.

Impact of Individual and Neighborhood Factors on Cardiovascular Risk in White Hispanic and Non-Hispanic Women and Men.

Cohn T, Miller A, Fogg L, Braun LT, Coke L.

Cardiovascular disease (CVD) is the leading cause of mortality for adults in the US, regardless of ethnicity. A cross-sectional correlational design was used to describe and compare CVD risk and cardiac mortality in White Hispanic and non-Hispanic women and men. Data from 3,317 individuals (1,523 women and 1,794 men) hospitalized for non-cardiac causes during 2012-2013, and data from the 2010 United States Census were included. The sex-specific 10-year Framingham General Cardiovascular Risk Score (FRS-10) was used to estimate long-term risk for major cardiac events. Approximately three-quarters of the sample was White Hispanic. FRS-10 scores were generally low, but a high prevalence of risk factors not included in the standard FRS-10 scoring formula was seen. White Hispanic women had significantly lower estimated CVD risk scores compared to White Hispanic and non-Hispanic men despite higher non-FRS-10 risks. Neighborhood median household income had a significant negative relationship and Hispanic neighborhood concentration had a significant positive relationship with cardiac mortality. Hispanic concentration was the only predictor of estimated CVD risk in a multilevel model. CVD risk assessment tools that are calibrated for ethnic groups and socioeconomic status may be more appropriate for Hispanic individuals than the FRS-10. Neighborhood-level factors should be included in clinical cardiac assessment in addition to individual characteristics and behavioral risks. Researchers should continue to seek additional risk factors that may contribute to or protect against CVD in order to close the gap between estimated CVD risk and actual cardiac mortality for Hispanics in the US.

PMID: 27862050 [Indexed for MEDLINE]

Biomarkers. 2017 May - Jun;22(3-4):189-199.

Novel biomarkers with potential for cardiovascular risk reclassification.

Mallikethi-Reddy S, Briasoulis A, Akintoye E, Afonso L.

Precise estimation of the absolute risk for CVD events is necessary when making treatment recommendations for patients. A number of multivariate risk models have been developed for estimation of cardiovascular risk in asymptomatic individuals based upon assessment of multiple variables. Due to the inherent limitation of risk models, several novel risk markers including serum biomarkers have been studied in an attempt to improve the cardiovascular risk prediction above and beyond the established risk factors. In this review, we discuss the role of underappreciated biomarkers such as red cell distribution width (RDW), cystatin C (cysC), and homocysteine (Hcy) as well as imaging biomarkers in cardiovascular risk reclassification, and highlight their utility as additional source of information in patients with intermediate risk.

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Dietary fruits and vegetables and cardiovascular diseases risk.

Alissa EM, Ferns GA.

Diet is likely to be an important determinant of cardiovascular disease (CVD) risk. In this article, we will review the evidence linking the consumption of fruit and vegetables and CVD risk. The initial evidence that fruit and vegetable consumption has a protective effect against CVD came from observational studies. However, uncertainty remains about the magnitude of the benefit of fruit and vegetable intake on the occurrence of CVD and whether the optimal intake is five portions or greater. Results from randomized controlled trials do not show conclusively that fruit and vegetable intake protects against CVD, in part because the dietary interventions have been of limited intensity to enable optimal analysis of their putative effects. The protective mechanisms of fruit and vegetables may not only include some of the known bioactive nutrient effects dependent on their antioxidant, anti-inflammatory, and electrolyte properties, but also include their functional properties, such as low glycemic load and energy density. Taken together, the totality of the evidence accumulated so far does appear to support the notion that increased intake of fruits and vegetables may reduce cardiovascular risk. It is clear that fruit and vegetables should be eaten as part of a balanced diet, as a source of vitamins, fiber, minerals, and phytochemicals. The evidence now suggests that a complicated set of several nutrients may interact with genetic factors to influence CVD risk. Therefore, it may be more important to focus on whole foods and dietary patterns rather than individual nutrients to successfully impact on CVD risk reduction. A clearer understanding of the relationship between fruit and vegetable intake and cardiovascular risk would provide health professionals with significant information in terms of public health and clinical practice.

PMID: 26192884 [Indexed for MEDLINE]

Fruit and vegetable consumption and risk of cardiovascular disease: A meta-analysis of prospective cohort studies.

Zhan J, Liu YJ, Cai LB, Xu FR, Xie T, He QQ.

A meta-analysis of prospective cohort studies was conducted to examine the relation between fruit and vegetables (FV) consumption and the risk of cardiovascular disease (CVD). We searched PubMed and EMBASE up to June 2014 for relevant studies. Pooled relative risks (RRs) were calculated and dose-response relationship was assessed. Thirty-eight studies, consisting of 47 independent cohorts, were eligible in this meta-analysis. There were 1,498,909 participants (44,013 CVD events) with a median follow-up of 10.5 years. The pooled RR (95% confidence interval) of CVD for the highest versus lowest category was 0.83 (0.79-0.86) for FV consumption, 0.84 (0.79-0.88) for fruit consumption, and 0.87 (0.83-0.91) for vegetable consumption, respectively. Dose-response analysis showed that those eating 800 g per day of FV consumption had the lowest risk of CVD. Our results indicate that increased FV intake is inversely associated with the risk of CVD. This meta-analysis provides strong support for the current recommendations to consume a high amount of FV to reduce CVD risk.

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