

# Updates on secondary prevention of atherosclerotic cardiovascular disease in older adults

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## **Secondary Prevention of Atherosclerotic Cardiovascular Disease in Older Adults: A Scientific Statement From the American Heart Association**

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# Introduction

- Greying of the population
- Coronary heart disease (CHD) population has increased, more than half of whom are >65 years of age
  - Increased stroke and peripheral arterial disease (PAD)
- More extensive coronary atherosclerosis
- CHD is the leading cause of cardiovascular death in older adults
- CHD-related complications (heart failure, arrhythmias) are a major source of chronic disability
  - Loss of independence, impaired QoL



# Evidence

- Increasing numbers of RCTs addressing secondary prevention of ASCVD
- Including an increasing amount of older adults
  - But: still few >80 year adults, well below their proportion in the population with ASCVD
- A large proportion of elderly patients are not receiving evidence-based therapies in clinical practice



# Goals in older adults

- Delay the progression of disease and major clinical events
  - MI, CVA, Critical limb ischemia
- Thereby:
  - Increasing longevity, improving QoL, maintaining independence
  - Decreasing yearly healthcare costs
- Taking into consideration:
  - Iatrogenic risks
  - Comorbidities, polypharmacy
  - Socioeconomic stresses
  - Cognitive limitations



# Diagnostic uncertainty

- Different presentation of ACS
  - Chest pain in 77% of patients <65 years, vs 40% of patients >85 years
  - Heart Failure in <20% in patients <65 years vs >40% of patients >85 years
- Diminished activity levels
  - No exertional angina – presentation at a more advanced stage
- Exertional dyspnoea (angina equivalent) could be:
  - Deconditioning
  - Pulmonary disease
  - Heart failure
- Difficulty to obtain reliable history
  - Cognitive impairment and dementia



# Increased cardiogenic shock

- Cardiogenic shock: 2-4 times more common
- Increased HF and shock:
  - Worse prognosis, increased mortality
  - Survival after first MI:
    - 15.1 years in patients 55-64 years
    - 3.2 years in patients >75 years



# Increased risk

- Following incident coronary events
  - Haemorrhagic complications
  - Stroke (5-10%)
  - Re-infarction or fatal CHD event (21-33% within 5 years)
  - Heart Failure (19-31% within 5 years)
  - Readmission





# 2011 AHA/ACCF Secondary Prevention Update

Medication	Indicated	In the elderly
Beta blockers	Post MI	Greater chronotropic incompetence – exercise intolerance
ACE inhibitors / ARB	In all CHD patients with LV EF <40%	Increased falls and syncope
Antiplatelets	In all CHD patients	Antiplatelets more likely to precipitate bleeding
Clopidogrel	For $\geq 12$ months in patients with BMS or DES	
Statins	To lower LDL in patients up to early 80s	Increased myalgia and confusion



***“Despite the Class I indications for these pharmacological therapies, they are underused in the elderly.***

***This underuse extends to nonpharmacological therapies including cardiac rehabilitation”***



# Underuse of Class I medication

- In a cohort of MI survivors aged >65 years, prescription included:
  - Statins - 61%
  - Betablockers – 80%
  - ACE inhibitors / ARB – 58%
- But:
  - **Only 35% had prescription for all 3!**
- Even after adjustment for contraindications, chronic aspirin use among older individuals with a history of CHD was lower.



# Updates

- Cerebrovascular disease
- Peripheral Artery Disease
- Obesity
- Hypertension
- Lipids
- Diabetes
- Tobacco
- Psychosocial factors
- Diet
- Exercise
- Cardiac Rehabilitation
- Coronary revascularisation



# Cerebrovascular disease and stroke in older adults

- 87% are ischemic, usually disruption of atherosclerotic plaque
- 8% one-month case-fatality rate
- Much higher residual disability rates
- Control of **hypertension** and **hyperlipidaemia**
  - strong and continuous reduction in new and recurrent stroke risk.
- **Smoking cessation**
  - Within 5 years, risk of stroke declines to that of lifetime non-smokers



# Peripheral artery disease

- High proportion of asymptomatic PAD in older patients (parallels rate of asymptomatic CHD)
  - Only 5-19% have classic claudication symptoms
- Common
  - 10% of 55-59 year olds
  - 60% in >85 year olds (Rotterdam study)
- Potent risk factors
  - Smoking and Diabetes
- Effective treatment includes
  - Supervised walking programmes
  - Smoking cessation
  - Aggressive treatment of hypertension and hyperlipidaemia
  - Antiplatelets
- ABI is best screening test



***“Those with claudication or atypical leg symptoms and all those with known CHD / previous stroke should undergo ABI testing”***



# Obesity

- Increased overall mortality
- Two thirds of elderly are overweight or obese
  - Metabolic rate declines
  - Changing life-long dietary habits is difficult
  - Decline in physical activity
  - Hypoglycaemic drugs, steroids, antidepressants
- Increased risk
  - Hypertension, hyperlipidaemia, diabetes
  - Significant independent risk factor for nonfatal ASCVD outcomes





# Weight reduction



- Benefits
  - Improved BP control, insulin sensitivity, glucose control
  - ? Hyperlipidaemia (inconsistent evidence)
  - ? Atherosclerotic risk factors or events (lack of evidence in older people)
  - Improved physical function and QoL
- Diet synergistic with exercise
- Strength training to help retain skeletal muscle and function
- Moderate weight loss (3-5%) associated with clinically significant benefits



# Hypertension

- 70% of adults >75 years
  - Increased arterial stiffness
  - High salt diets and sedentary lifestyle
  - Accumulation of arterial calcium
  - Renal disease
  - Medications eg NSAIDS
- sBP rises progressively and dBP plateaus in late middle-age – **widened pulse pressure with age**
- Isolated systolic hypertension in 90% of all hypertensive patients



# Hypertension management

- Increased risk of side effects and compliance issues
- Goal: <140/90mmHg
  - This target in older patients is based on expert opinion (AHA/ACCF expert consensus document)
- Non-pharmacological approach should be tried first
- Excessive drop in diastolic BP should be avoided to prevent excessive reduction in coronary blood flow
- Some studies have shown higher CHD rates when dBP is reduced to <70-75mmHg



# Lipids

- LDL remains strongly associated with CHD events in older adults
- Statins reduce risk of death and recurrent ASCVD events in older patients



# Statins in older patients

- **Benefits:**
  - decreased all-cause mortality, CHD mortality, nonfatal MI, need for revascularisation, and stroke
  - Significantly improved treadmill-walking time before the onset of claudication
  - ??observational studies suggest a reduction in risk and progression of dementia
- **Risks:**
  - Dyspepsia is most commonly reported SE
  - Higher incidence of abnormal LFTs with high dose statins (except in TNT – LFTs increased similarly to statin dose in older and younger patients)
  - Myalgias with / without CK elevation (present late - ?arthritis / aging)
  - ?Worsen cognitive function and memory loss (new advisory labelling)



# Caution

## Statin-related adverse events increased with

- Gender F>M
- Small stature / low BMI
- Concomitant fibrates and drugs using cyt P450
- Use during surgery
- Decreased hepatic / renal function
- Fatty liver disease
- Hypothyroidism
- Diabetes
- Heavy use of alcohol



# To treat or not to treat

- Estimate life-expectancy by using appropriate multimorbid tool
  - Patients with severely compromised life expectancy / QoL may not be suitable candidates
- Patients' opinion
  - May place more emphasis on stroke risk reduction or preventing worsening claudication despite the negligible effect on longevity (quality vs quantity)
- RCT data indicates a 1-3 year time lag until benefit is demonstrable





Science & Quality

Guidelines & Quality Standards

- A to Z Guide
- ACCF Endorsements
- Clinical Statement Definitions
- Methodology
- Pocket Guides
- Relationships with Industry Policy
- CardioCompass™ Beta Version
- Statements in Progress

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# 2013 Prevention Guideline Tools and Risk Calculator



## 2013 Prevention Guidelines Tools CV RISK CALCULATOR

The American Heart Association and the American College of Cardiology are excited to provide a series of new cardiovascular prevention guidelines for the assessment of cardiovascular risk, lifestyle modifications that



reduce risk, management of elevated blood cholesterol, and management of increased body weight in adults. To support the implementation of these guidelines, the new Pooled Cohort Equations CV Risk Calculator and additional Prevention Guideline Tools are available below. Other tools may be developed and available in the near future.

### Clinical Vignettes



This downloadable spreadsheet is a companion tool to the 2013 ACC/AHA Guideline on the Assessment of Cardiovascular Risk<sup>1</sup>. The spreadsheet enables health care providers and patients to estimate 10-year and lifetime risks for atherosclerotic cardiovascular disease (ASCVD), defined as coronary death or nonfatal myocardial infarction, or fatal or nonfatal stroke, based on the Pooled





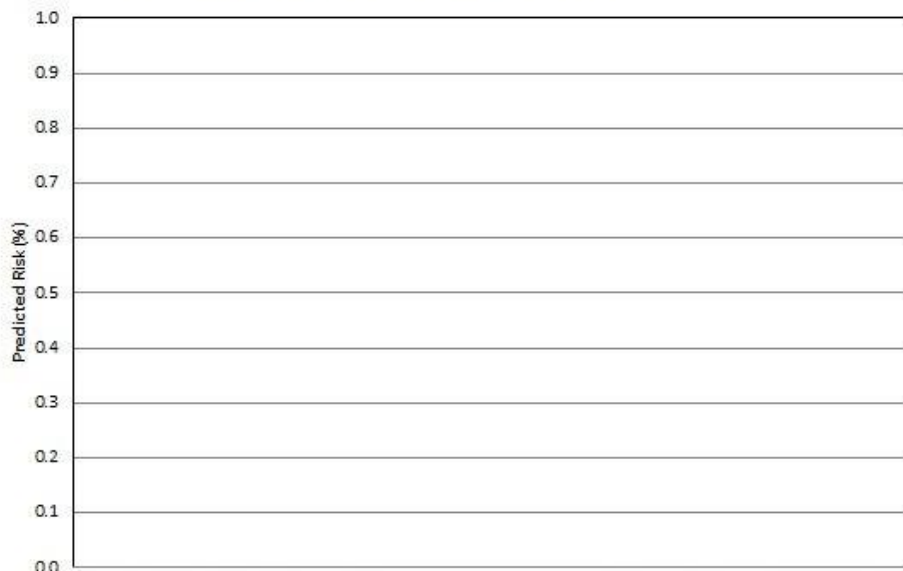
Risk Factor	Units	Value	Acceptable range of values	Optimal values
Sex	M (for males) or F (for females)		M or F	
Age	years		20-79	
Race	AA (for African Americans) or WH (for whites or others)		AA or WH	
Total Cholesterol	mg/dL		130-320	170
HDL-Cholesterol	mg/dL		20-100	50
Systolic Blood Pressure	mm Hg		90-200	110
Treatment for High Blood Pressure	Y (for yes) or N (for no)		Y or N	N
Diabetes	Y (for yes) or N (for no)		Y or N	N
Smoker	Y (for yes) or N (for no)		Y or N	N

Your 10-Year ASCVD Risk (%)	This calculator only provides 10-year risk estimates for individuals 40 to 79 years of age Enter M or F for Gender Enter WH or AA for race Enter 130-320 for TC value Enter 20-100 for HDL value Enter 90-200 for SBP value Enter Y or N for treatment for hypertension Enter Y or N for Diabetes Enter Y or N for Smoker
10-Year ASCVD Risk (%) for Someone Your Age with Optimal Risk Factor Levels (shown above in column E)	Enter M or F for Gender This calculator only provides 10-year risk estimates for individuals 40 to 79 years of age Enter WH or AA for race
Your Lifetime ASCVD Risk* (%)	This calculator only provides lifetime risk estimates for individuals 20 to 59 years of age Enter M or F for Gender Enter 130-320 for TC value Enter 90-200 for SBP value Enter Y or N for treatment for Hypertension Enter Y or N for Diabetes Enter Y or N for Smoker
Lifetime ASCVD Risk (%) for Someone at Age 50 with Optimal Risk Factor Levels (shown above in column E)	Enter M or F for gender

\*This is the lifetime ASCVD risk for an individual at age 50 years with your risk factor levels. In rare cases, 10-year risks may exceed lifetime risks given that the estimates come from different approaches. While 10-year risk estimates are derived from methods and data using continuous variables, the reported estimate of lifetime risk is based on assigning each person into one of 5 mutually exclusive sex-specific groups, as per Lloyd-Jones et al., Circulation 2006; 113(6):791-8. Within each of the 5 groups, each person receives the same lifetime risk estimate. In other words, using this approach, there are only 5 possible

**For patients and the public:** \*This is the lifetime risk of cardiovascular diseases, including stroke, for an individual at age 50 years with your risk factor levels. In rare cases, 10-year risks may exceed lifetime risks given that the estimates

### 10-Year and Lifetime ASCVD Risks



Your 10-Year ASCVD Risk (%)    10-Year ASCVD Risk (%) for Someone Your Age with Optimal Risk Factor Levels (shown above in column E)    Your Lifetime ASCVD Risk\* (%)    Lifetime ASCVD Risk (%) for Someone at Age 50 with Optimal Risk Factor Levels (shown above in column E)



# LDL Goal

- Goal:
  - LDL < 2.59 mmol/l as for younger patients with CHD
  - LDL < 1.8 mmol/l in very-high risk older patients (with caution)
- A 30-40% relative decrease from baseline LDL may provide greater risk reduction



# Hyperlipidaemia - treatment

- **Statins still first line**
  - Under-prescribed and under-dosed despite higher risk of recurrent events
  - Only 24% of patients >65 years of age and 15% of patients >80 years of age received a statin at discharge after an MI (23013 patients)
- **Nicotinic acid added to statins**
  - May further reduce LDL and TG, and raise HDL
  - AIM-HIGH results have shown negative results
- **Ezetimibe (cholesterol absorption inhibitor)**
  - Safe in older patients
  - Effective in lowering LDL when added to statins
  - Hard ASCVD outcome data lacking



# ? Fibrates

- Effective in lowering TG and LDL, and raising HDL
- Recent metaanalysis does not support the use of fibrates as primary use for ASCVD risk reduction
- Extreme caution in the elderly with combined statin and fibrate use
  - Increased risk of myopathy



# Alternatives

- Cardiac Rehabilitation in >75 year olds
  - Significant decline in TC, LDL, depression score
  - Increased HDL and QoL



# Diabetes mellitus in older patients

- Increased insulin resistance and impaired insulin secretion
- Underdiagnosed in older patients
  - Presentation with non-classical and nonspecific symptoms
- Increases morbidity and mortality
- Routine screening strongly recommended
  - Particularly for older patients with diagnosed ASCVD
- Treatment must be specifically tailored for each individual
  - Managing hyperglycaemia
  - Reducing risk of hypoglycaemia and adverse clinical outcomes



***“Trials have consistently observed either no effect or even increased mortality in older patients receiving intensive glycaemic therapy”***



# Treatment goals in diabetes

- Goals:
  - HbA1c <7% for adults <65 years or very healthy older patients
  - HbA1c of 7-7.9% for most older adults (especially with chronic comorbidities including ASCVD)
- Even higher targets for older patients
  - Frailty
  - Increased risk for hypoglycaemia
  - Short life expectancy





# Smoking

- Leading preventable cause of death worldwide
- Strong consistent evidence of increased rate of recurrent coronary and vascular events in all patients with known ASCVD
- Benefits also in patients >80 years



# Smoking cessation

- Reduced cardiovascular event rates
  - 36% lower crude mortality risk
  - 32% lower rate of nonfatal MI
  - Reduced SCD risk
  - Reduced risk of stroke
  - Improves claudication symptoms



# Smoking cessation

- Class 1A recommendation  
(AHA/ACCF Secondary Prevention guidelines)
- Despite this, success rates for smoking cessation remain modest
- Patient counselling and pharmacological therapies eg NRT
  - Can improve rates by 2-3 fold vs non-aided attempts



# Psychosocial issues

- Personality
  - Type A behaviour pattern – hostility component
- Depression
  - Common
  - Increases **adverse events, mortality**
  - Depression should be routinely assessed and treated when indicated in patients with CHD
- Anxiety
  - >40% in hospitalised MI patients
  - 15-20% still report anxiety 1 year after hospital discharge
  - Lower rates in older patients



# Psychosocial issues



- Stress
  - Can trigger fatal cardiovascular events
  - Adverse prognostic value
- Socioeconomic status and Social support
  - 5 year mortality rate 1.9 times higher in lower income patients, independent of social isolation and disease severity
  - **Emotional support before MI was the most powerful and significant predictor of survival after MI**



# Addressing psychosocial issues

- Health benefits of reducing stress in CHD patients is not well-established
  - Data lacking on effect on clinical outcomes
- Aerobic exercise as a treatment for depression
  - Improvement comparable to antidepressant medication in reducing symptoms



# Diet

- Assess dietary habits of older patients
- Mediterranean diet and Flavanoids (fruit, vegetables, nuts, cocoa, tea, wine)
  - Lower risk of cardiovascular events
  - Daily portion of nuts: reduction of 29% in deaths from heart disease
- Vitamin D
  - Deficiency is an independent risk factor for cardiovascular mortality in older adults
  - Ongoing trials on effects of Vit D supplementation on ASCVD
- Omega-3 fatty acids
  - Conflicting evidence



# Exercise

- **Benefits**
  - Serum lipids, Blood pressure, Insulin sensitivity, Body weight, Muscular strength, Functional capacity
  - Cognitive and psychological functioning
- **Should include: aerobic, muscular strengthening, endurance, balance and flexibility**





# Exercise in older patients

- Symptom-limited exercise test before initiating an exercise program
- Instruct patient to report symptoms of chest pain / SOB
- High intensity aerobic interval training
  - Can elicit greater improvement in exercise capacity than continuous exercise at lower intensity



# Cardiac Rehabilitation



- Older patients benefit greatly
- 21-34% lower mortality over the subsequent 5 years independent of other risk factors, and 19% less likely to die
- Despite this, the vast majority do not participate (overall 12% participation in older patients)
  - Lack of referral (key determinant)
  - Patient-related factors
  - Societal / economic barriers
  - Current smoking, BMI  $>30\text{kg}/\text{m}^2$ , diabetes, cognitive dysfunction



# Coronary revascularisation

- CABG and PCI being used more frequently in older patients
  - Two thirds of PCIs performed in patients >60 years
  - 11% are >80 years
- Improved general well-being, functional status, QoL, mortality
- More calcified, tortuous, and multivessel coronary disease, and peripheral vessels more often abnormal
  - PAD in 25% of patients >80 years
- More challenging procedures
  - May lead to suboptimal results and more complications



# PCI

- Procedural success >90% in older patients
- Reduced in-hospital mortality for patients >80 years undergoing elective PCI
  - Declined from 3.5% to 3% between 2001-2006
- Reduction in major adverse cardiac events in invasive (vs medical) approach
  - Decreased duration of hospitalisation for ACS
  - Improved QoL, angina severity, health status
  - Differences persisted at 4 years



# PCI complications

- Vascular and bleeding complications are more frequent particularly in very advanced age
- Still uncertain whether radial approach may reduce complications in older adults
- Therefore individualised decision whether to perform PCI in older patients or not



# CABG

- Older patients at higher risk of morbidity and mortality after CABG
- Increased postop complications, but improving outcomes
  - In-hospital mortality fell from 7.1% to 3.2% in octagenarians between 1990-2005
  - Postop complication rates also fell considerably



# PCI vs CABG

- Metaanalysis on octagenarians showed similar outcomes
- Another metaanalysis (but with few patients >75 years) suggested an advantage for CABG with increasing age
- The decision must be individualised, taking into account fact that coronary revascularisation may improve symptoms, QoL and function at least short-term.



# Summary

- Similar treatment advice but with caution
- Aim: improving function, QoL and independence (vs longevity)
- Smoking cessation
  - Most likely to reduce mortality
- Exercise training
  - Most likely to improve function, mood, blood pressure control





# Summary

- A move away from hard treatment targets: focus is on identifying appropriate intensity of therapy for a particular patient
- ABI testing
  - Patients with known CHD / previous stroke
  - Claudication or atypical leg symptoms
- Cardiac rehabilitation: unequivocal utility but remains underused
- Consider PCI/CABG in older patients: individualised decision



***“Those who think they have no time for exercise, will sooner or later have to find time for illness”***

**-Edward Stanley**



