Dear Reader,

We are grateful to present you the 8th issue of "The State of the Heart", which explores the clinical evidence supporting the new understandings and happenings in the field of cardiology.

In India, the epidemiological transition from predominantly infectious disease conditions to non-communicable diseases has occurred over a rather succinct period of time. Despite wide heterogeneity in the prevalence of cardiovascular risk factors across different regions, CVD has emerged as the leading cause of death in all parts of India, including poorer states and rural areas. In this research driven time, management of these disorders is also constantly evolving towards the betterment whether it's pharmacological or non-pharmacological.

Being a healthcare custodian of the society, clinicians are constantly thriving to be abreast with the novel understandings of disease and its management. In this context, this is our initiative to provide you a compiled and to the point information.

Present booklet comprises of recent and latest deeds in the field of cardiovascular diseases like dyslipidemia, coronary artery disease, heart failure and its management. We hope that it will facilitate increased cooperation and innovation, and enthuse commitment to prevent these life-threatening and disabling disorders and providing the best possible care for people who suffer from these conditions.

Editor in chief

Dr. Dixit Patel (MBBS, MD)

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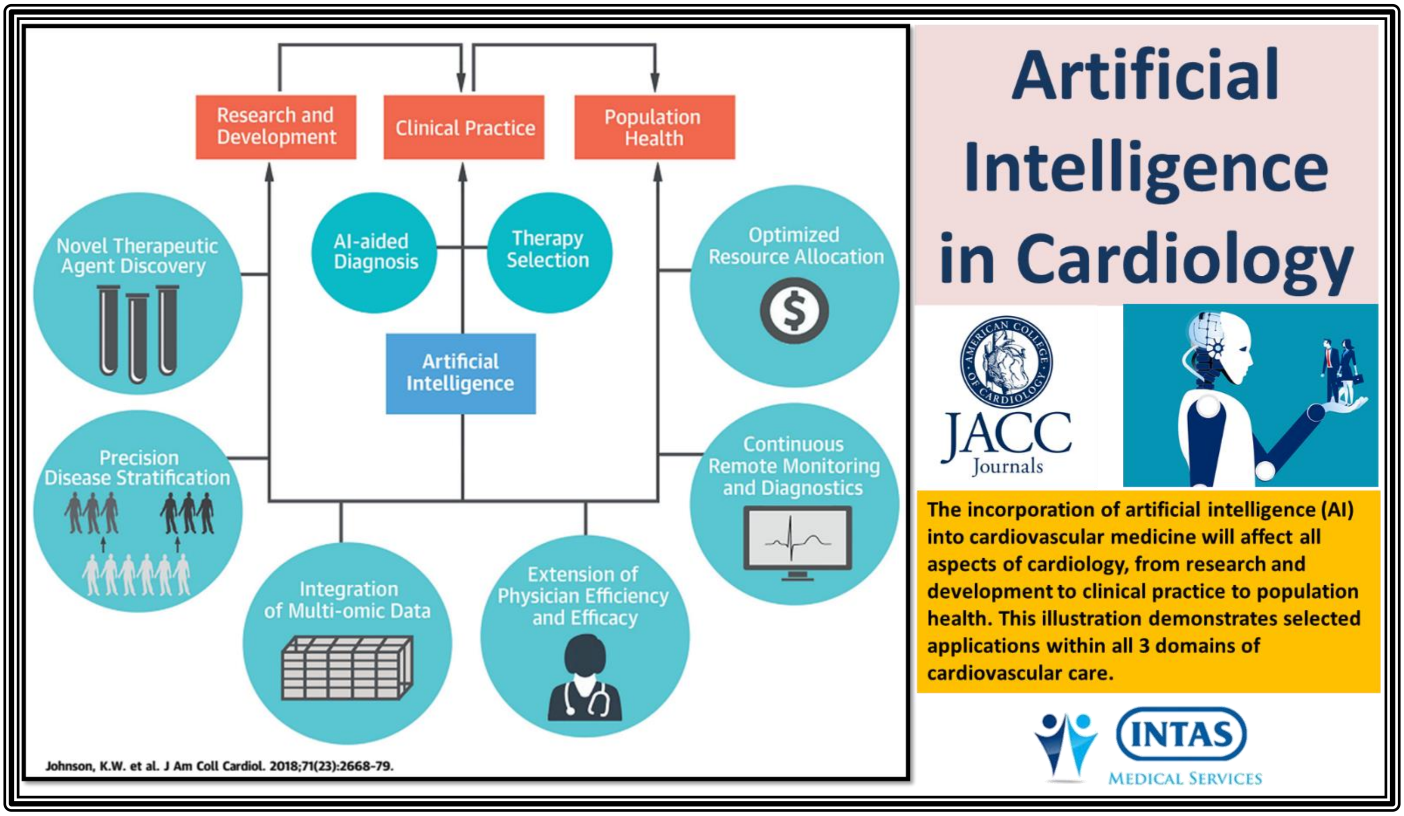
1. Artificial Intelligence in Cardiology



Artificial intelligence and machine learning are poised to influence nearly every aspect of the human condition, and cardiology is not an exception to this trend. This paper provides a guide for clinicians on relevant aspects of artificial intelligence and machine learning, reviews selected applications of these methods in cardiology to date, and identifies how cardiovascular medicine could incorporate artificial intelligence in the future.

In particular, the paper first reviews predictive modeling concepts relevant to cardiology such as feature selection and frequent pitfalls such as improper dichotomization. Second, it discusses common algorithms used in supervised learning and reviews selected applications in cardiology and related disciplines. Third, it describes the advent of deep learning and related methods collectively called unsupervised learning, provides contextual examples both in general medicine and in cardiovascular medicine, and then explains how these methods could be applied to enable precision cardiology and improve patient outcomes.

WHAT WILL CARDIOVASCULAR MEDICINE GAIN FROM MACHINE LEARNING AND ARTIFICIAL INTELLIGENCE?

Cardiologists make decisions for patient care from data, and they tend to have access to richer quantitative data on patients compared with many other specialties.

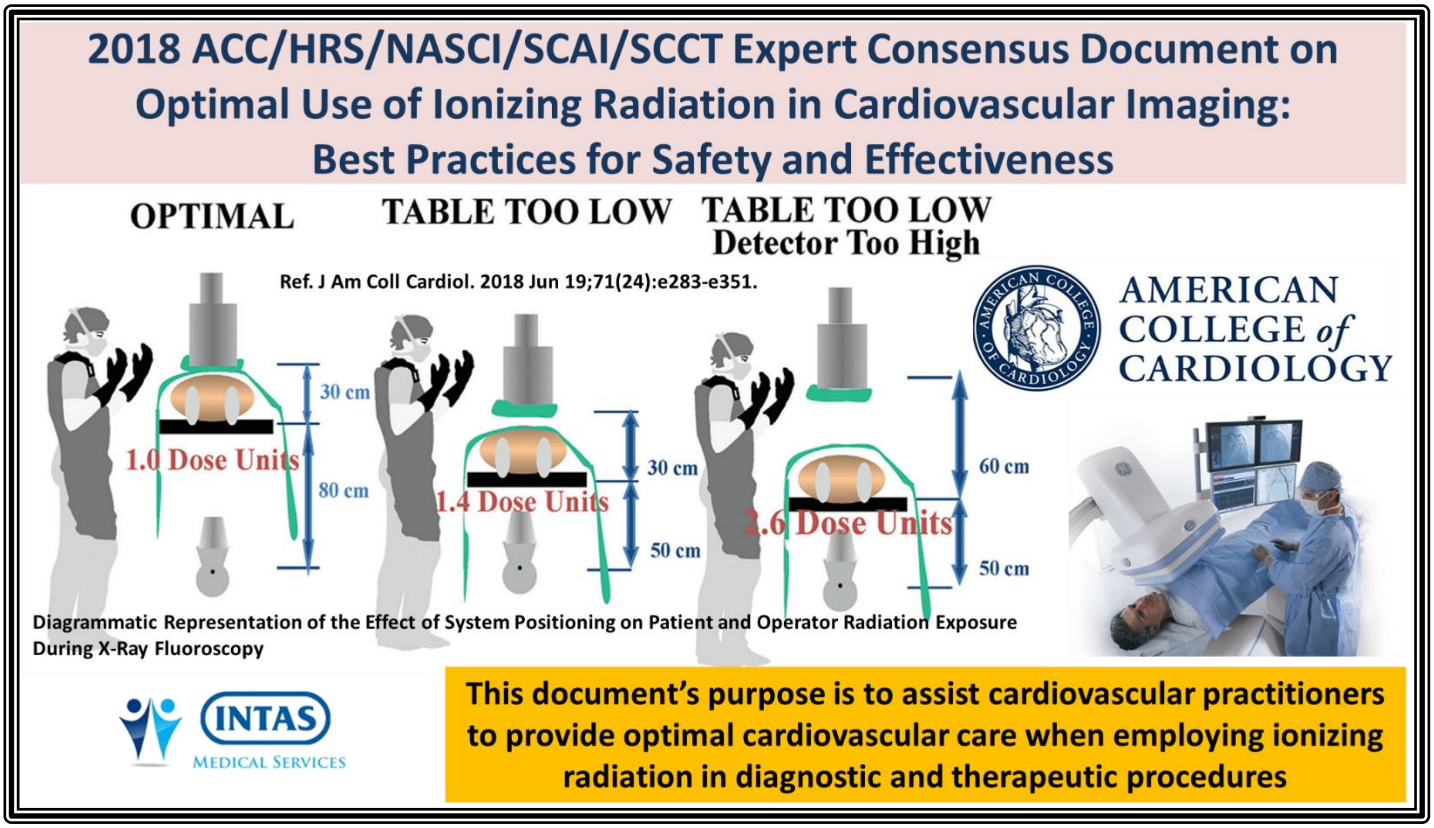
Despite some potential pitfalls, it is becoming evident that the best way to make decisions on the basis of data is through the application of techniques drawn from AI. Cardiologists will thus need to incorporate AI and machine learning into the clinic. Indeed, as the amount of available patient level data continues to increase and they continue to incorporate new streams of complex biomedical data into the clinic, it is likely that AI will become essential to the practice of clinical medicine. This will probably happen sooner rather than later, as exemplified by the rapid adoption of automated algorithms for computer vision in radiology and pathology.

However, the incorporation of AI into cardiology is not something that clinicians should fear, but is instead a change that should be embraced. AI will drive improved patient care because physicians will be able to interpret more data in greater depth than ever before. Reinforcement learning algorithms will become companion physician aids, unobtrusively assisting physicians and streamlining clinical care. Advances in unsupervised learning will enable far greater characterization of patients' disorders and ultimately lead to better treatment selection and improved outcomes.

Indeed, AI may obviate much of the tedium of modern-day clinical practice, such as interacting with EHRs and billing, which will likely soon be intelligently automated to a much greater extent. Although currently machine learning is often performed by personnel with specialized training, in the future deploying these methods will become increasingly easy and commoditized.

The expert knowledge of pathophysiology and clinical presentation that physicians acquire over their training and career will remain vital. Physicians should therefore take a lead role in deciding where to apply and how to interpret these models.

2. 2018 ACC/HRS/NASCI/SCAI/SCCT Expert Consensus Document on Optimal Use of Ionizing Radiation in Cardiovascular Imaging: Best Practices for Safety and Effectiveness



This document has been developed as an Expert Consensus Document by the American College of Cardiology (ACC) in collaboration with the American Society of Nuclear Cardiology, Heart Rhythm Society, Mended Hearts, North American Society for Cardiovascular Imaging, Society for Cardiovascular Angiography and Interventions, Society for Cardiovascular Computed Tomography, and Society of Nuclear Medicine and Molecular Imaging. Expert Consensus Documents are intended to inform practitioners, payers, and other interested parties of the opinion of ACC and document cosponsors concerning evolving areas of clinical practice and/or technologies that are widely available or new to the practice community.

Expert Consensus Documents are intended to provide guidance for clinicians in areas where evidence may be limited or new and evolving, or insufficient data exist to fully inform clinical decision making. These documents therefore serve to complement clinical practice guidelines, providing practical guidance for transforming guideline recommendations into clinically actionable information.

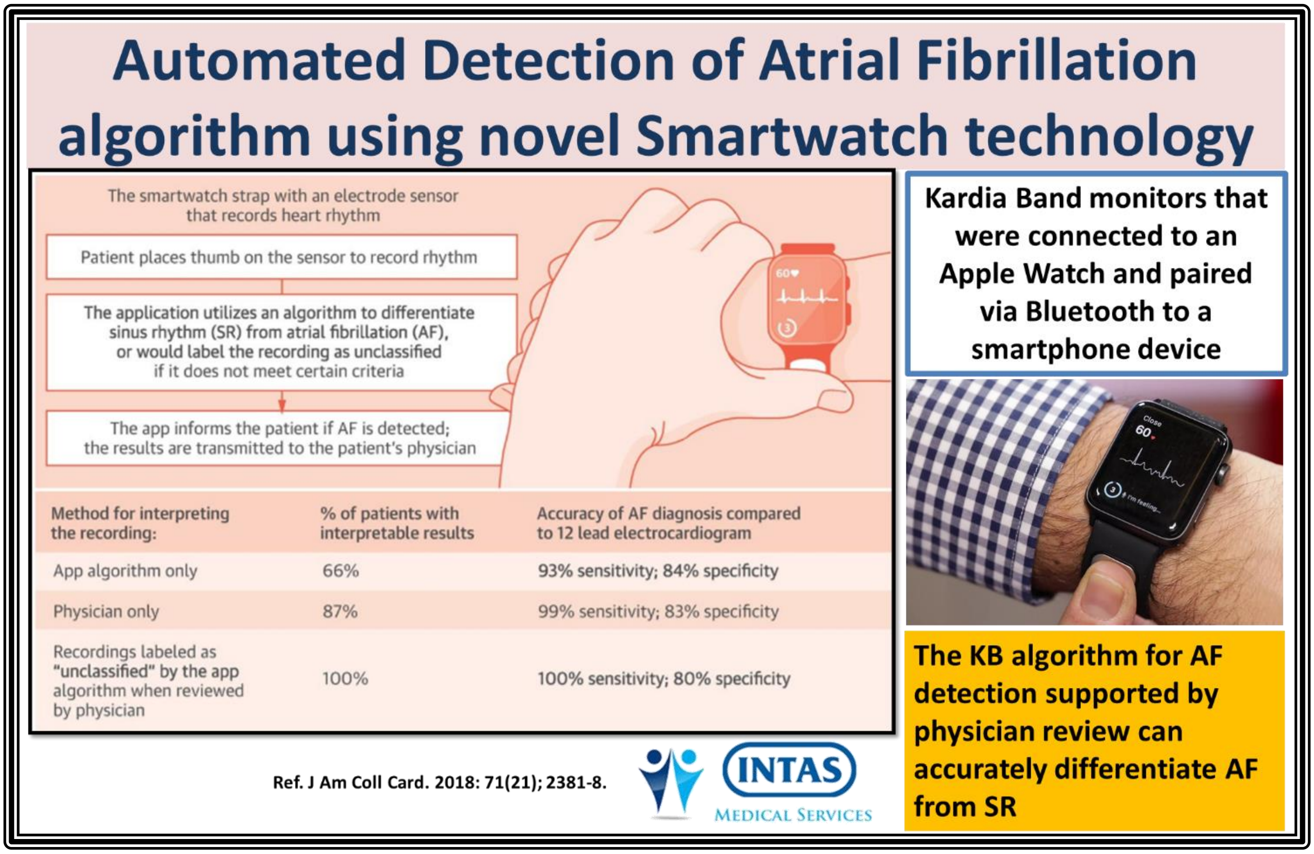
The stimulus to create this document was the recognition that ionizing radiation-based cardiovascular procedures are being performed with increasing frequency. This leads to greater patient radiation exposure and, potentially, to greater exposure for clinical personnel. Although the clinical benefit of these procedures is substantial, there is concern about the implications of medical radiation exposure both to patients and to medical personnel. The ACC leadership concluded that it is important to provide practitioners with an educational resource that assembles and interprets the current radiation knowledge base relevant to cardiovascular imaging procedures that employ ionizing radiation. By applying this knowledge base, cardiovascular practitioners will be able to select and perform procedures optimally, and, accordingly, minimize radiation exposure to patients and to personnel.

This online published document is a more comprehensive treatment of the knowledge base covered in 2 print published documents published under this document's title with subtitles "Part 1: Radiation Physics and Radiation Biology" and "Part 2: Radiological Equipment Operation, Dose-Sparing Methodologies, Patient and Medical Personnel Protection." In addition, this online document contains 3 sections that are not included in the print-published documents: Modality-Specific Operator Education and Certification, Quality Assurance, and Patient and Medical Personnel Radiation Dose Monitoring and Tracking: Programmatic and Individual Considerations.

To avoid actual, potential, or perceived conflicts of interest that may arise as a result of industry relationships or personal interests among the writing committee, all members of the writing committee, as well as peer reviewers of the document, are asked to disclose all current healthcare-related relationships, including those existing 12 months before initiation of the writing effort. The ACC Task Force on Expert Consensus Decision Pathways (formerly the ACC Task Force on Clinical Expert Consensus Documents) reviews these disclosures to determine which companies make products (on the market or in development) that pertain to the document under development. Based on this information, a writing committee is formed to include a majority of members with no relevant relationships with industry (RWI), led by a chair with no relevant RWI. Authors with relevant RWI are not permitted to draft or vote on text or recommendations pertaining to their RWI. RWI is reviewed on all conference calls and updated as changes occur. Author and peer reviewer RWI pertinent to this document are disclosed in Appendixes 1 and 2, respectively. Additionally, to ensure complete transparency, authors' comprehensive disclosure information—including RWI not pertinent to this document—is available online (see Online Appendix). Disclosure information for the ACC Task Force on Expert Consensus Decision Pathways is also available online, as well as the ACC disclosure policy for document development.

The work of the writing committee was supported exclusively by the ACC without commercial support. Writing committee members volunteered their time to this effort. Conference calls of the writing committee were confidential and were attended only by committee members and ACC staff.

3. Automated Detection of Atrial Fibrillation algorithm using novel Smartwatch technology



Background The Kardia Band (KB) is a novel technology that enables patients to record a rhythm strip using an Apple Watch (Apple, Cupertino, California). The band is paired with an app providing automated detection of atrial fibrillation (AF).

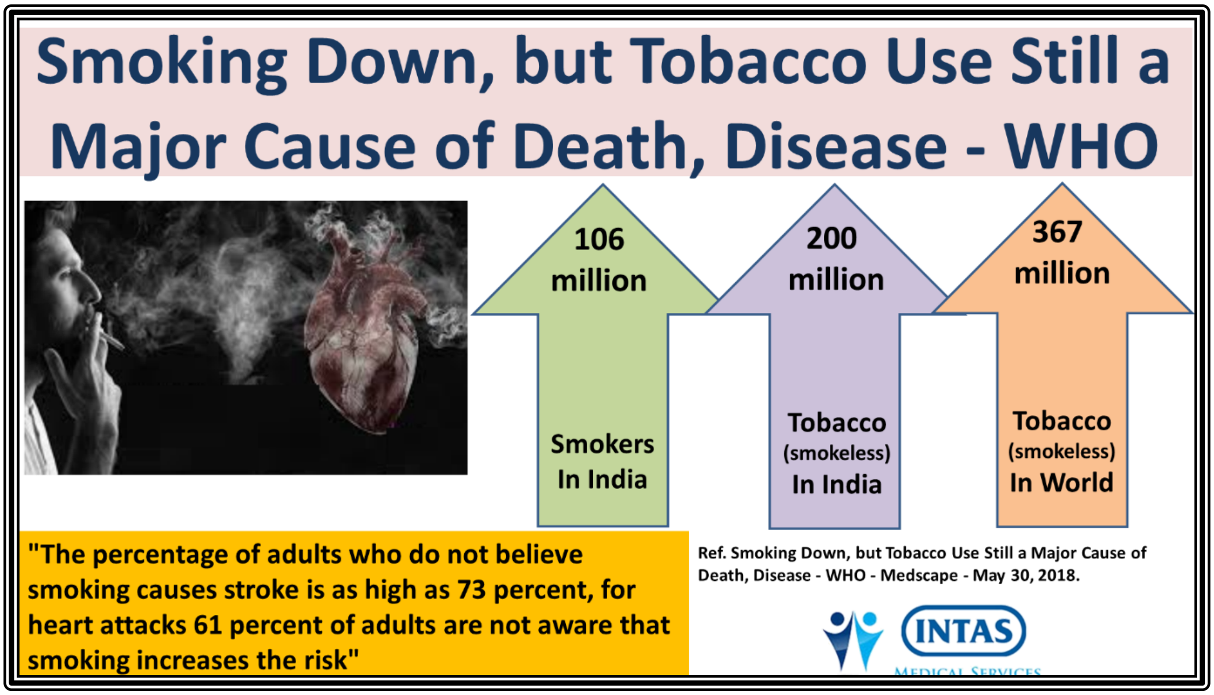
Objectives The purpose of this study was to examine whether the KB could accurately differentiate sinus rhythm (SR) from AF compared with physician-interpreted 12-lead electrocardiograms (ECGs) and KB recordings.

Methods Consecutive patients with AF presenting for cardioversion (CV) were enrolled. Patients underwent pre-CV ECG along with a KB recording. If CV was performed, a post-CV ECG was obtained along with a KB recording. The KB interpretations were compared to physician-reviewed ECGs. The KB recordings were reviewed by blinded electrophysiologists and compared to ECG interpretations. Sensitivity, specificity, and K coefficient were measured.

Results A total of 100 patients were enrolled (age 68 ± 11 years). Eight patients did not undergo CV as they were found to be in SR. There were 169 simultaneous ECG and KB recordings. Fifty-seven were noninterpretable by the KB. Compared with ECG, the KB interpreted AF with 93% sensitivity, 84% specificity, and a K coefficient of 0.77. Physician interpretation of KB recordings demonstrated 99% sensitivity, 83% specificity, and a K coefficient of 0.83. Of the 57 noninterpretable KB recordings, interpreting electrophysiologists diagnosed AF with 100% sensitivity, 80% specificity, and a K coefficient of 0.74. Among 113 cases where KB and physician readings of the same recording were interpretable, agreement was excellent (K coefficient = 0.88).

Conclusions The KB algorithm for AF detection supported by physician review can accurately differentiate AF from SR. This technology can help screen patients prior to elective CV and avoid unnecessary procedures.

4. Smoking Down, but Tobacco Use Still a Major Cause of Death, Disease – WHO



GENEVA (Reuters) - Fewer people are smoking worldwide, especially women, but only one country in eight is on track to meet a target of reducing tobacco use significantly by 2025, the World Health Organization (WHO). Three million people die prematurely each year due to tobacco use that causes cardiovascular diseases such as heart attacks and stroke, the world's leading killers, it said, marking World No Tobacco Day. They include 890,000 deaths through second-hand smoke exposure.

The WHO clinched a landmark treaty in 2005, now ratified by 180 countries, that calls for a ban on tobacco advertising and sponsorship, and taxes to discourage use. "The worldwide prevalence of tobacco smoking has decreased from 27 percent in 2000 to 20 percent in 2016, so progress has been made," Douglas Bettcher, director of the WHO's prevention of non-communicable diseases department, told a news briefing.

Launching the WHO's global report on trends in prevalence of tobacco smoking, he said that industrialised countries are making faster progress than developing countries. China and India have the highest numbers of smokers worldwide, accounting for 307 million and 106 million, respectively, of the world's 1.1 billion adult smokers, followed by Indonesia with 74 million, WHO figures show. India also has 200 million of the world's 367 million smokeless tobacco users.

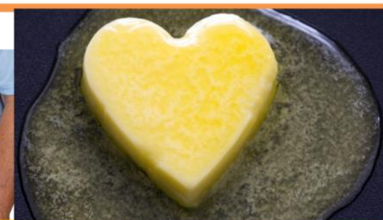
5. What to measure BMI/Waist Circumference/Waist to Hip Ratio or Percentage Body Fat?

What to measure BMI/Waist Circumference/Waist to Hip Ratio or Percentage Body Fat?

Exposures	Population (n)	Events (n)	Hazard ratio (95% CIs)	P-value
BMI				
<22 kg m^{-2}				
Women	19 854	470	0.52 (0.34–0.78)	0.002
Men	5313	312	0.62 (0.40–0.96)	0.03
≥22 kg m^{-2}				
Women	148 490	5048	1.13 (1.10–1.17)	<0.001
Men	117 735	6686	1.13 (1.10–1.17)	<0.001
Waist circumference				
Women	168 480	5529	1.16 (1.13–1.19)	<0.001
Men	123 155	7009	1.10 (1.08–1.13)	<0.001
Waist-to-hip ratio				
Women	168 465	5526	1.10 (1.07–1.13)	<0.001
Men	123 133	7009	1.09 (1.06–1.12)	<0.001
Waist-to-height ratio				
Women	168 420	5523	1.14 (1.11–1.18)	<0.001
Men	123 091	7004	1.09 (1.06–1.12)	<0.001
Percentage body fat				
Women	166 644	5459	1.12 (1.09–1.15)	<0.001
Men	121 791	6920	1.06 (1.03–1.09)	<0.001

Table: Adiposity markers and cardiovascular events (fatal and non-fatal) for individuals without pre-existing CVD at baseline

The HRs correspond to 1 SD increase in each adiposity marker. HR are fully adjusted for age, diabetes, systolic blood pressure, moderate to vigorous physical activity



Increasing adiposity has a detrimental association with CVD health in middle-aged men and women. Any public misconception of a potential protective' effect of fat on CVD risk should be challenged

Ref,. European Heart Journal (2018)39, 1514–1520

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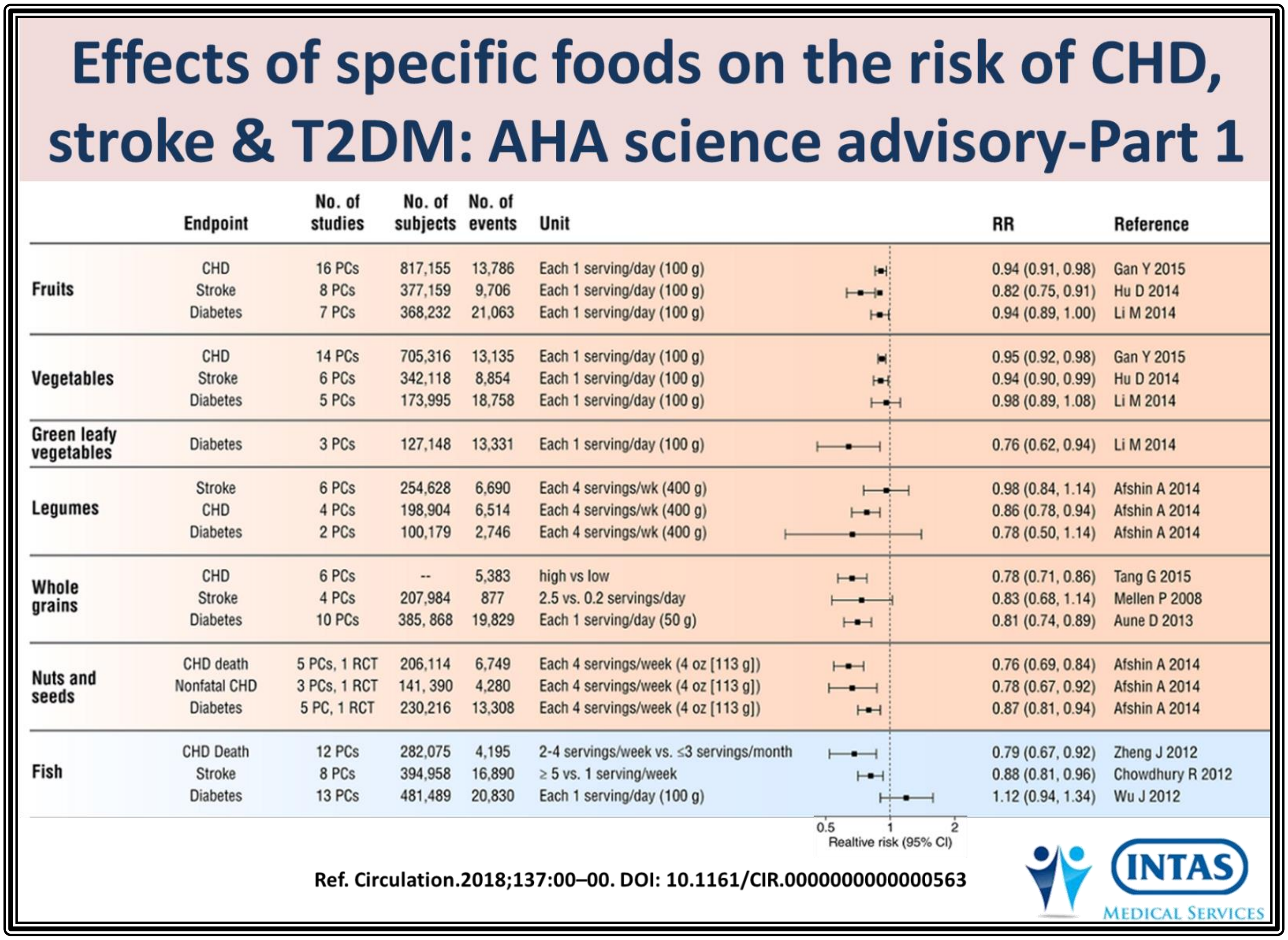
Aims: The data regarding the associations of body mass index (BMI) with cardiovascular (CVD) risk, especially for those at the low categories of BMI, are conflicting. The aim of our study was to examine the associations of body composition (assessed by five different measures) with incident CVD outcomes in healthy individuals.

Methods and results: A total of 296 535 participants (57.8% women) of white European descent without CVD at baseline from the UK biobank were included. Exposures were five different measures of adiposity. Fatal and non-fatal CVD events were the primary outcome. Low BMI (≤18.5 kg m−2) was associated with higher incidence of CVD and the lowest CVD risk was exhibited at BMI of 22–23 kg m−2 beyond, which the risk of CVD increased. This J-shaped association attenuated substantially in subgroup analyses, when they excluded participants with comorbidities. In contrast, the associations for the remaining adiposity measures were more linear; 1 SD increase in waist circumference was associated with a hazard ratio of 1.16 [95% confidence interval (CI) 1.13–1.19] for women and 1.10 (95% CI 1.08–1.13) for men with similar magnitude of associations for 1 SD increase in waist-to-hip ratio, waist-to-height ratio, and percentage body fat mass.

Conclusion: Increasing adiposity has a detrimental association with CVD health in middle-aged men and women. The association of BMI with CVD appears more susceptible to confounding due to pre-existing comorbidities when compared with other adiposity measures. Any public misconception of a potential 'protective' effect of fat on CVD risk should be challenged.

6. Effects of specific foods on the risk of CHD, stroke & T2DM: AHA science advisory



Effects of specific foods on the risk of CHD, stroke & T2DM: AHA science advisory-Part 1

	Endpoint	No. of studies	No. of subjects	No. of events	Unit	RR	Reference
Fruits	CHD	16 PCs	817,155	13,786	Each 1 serving/day (100 g)	0.94 (0.91, 0.98)	Gan Y 2015
	Stroke	8 PCs	377,159	9,706	Each 1 serving/day (100 g)	0.82 (0.75, 0.91)	Hu D 2014
	Diabetes	7 PCs	368,232	21,063	Each 1 serving/day (100 g)	0.94 (0.89, 1.00)	Li M 2014
Vegetables	CHD	14 PCs	705,316	13,135	Each 1 serving/day (100 g)	0.95 (0.92, 0.98)	Gan Y 2015
	Stroke	6 PCs	342,118	8,854	Each 1 serving/day (100 g)	0.94 (0.90, 0.99)	Hu D 2014
	Diabetes	5 PCs	173,995	18,758	Each 1 serving/day (100 g)	0.98 (0.89, 1.08)	Li M 2014
Green leafy vegetables	Diabetes	3 PCs	127,148	13,331	Each 1 serving/day (100 g)	0.76 (0.62, 0.94)	Li M 2014
Legumes	Stroke	6 PCs	254,628	6,690	Each 4 servings/wk (400 g)	0.98 (0.84, 1.14)	Afshin A 2014
	CHD	4 PCs	198,904	6,514	Each 4 servings/wk (400 g)	0.86 (0.78, 0.94)	Afshin A 2014
	Diabetes	2 PCs	100,179	2,746	Each 4 servings/wk (400 g)	0.78 (0.50, 1.14)	Afshin A 2014
Whole grains	CHD	6 PCs	--	5,383	high vs low	0.78 (0.71, 0.86)	Tang G 2015
	Stroke	4 PCs	207,984	877	2.5 vs. 0.2 servings/day	0.83 (0.68, 1.14)	Mellen P 2008
	Diabetes	10 PCs	385, 868	19,829	Each 1 serving/day (50 g)	0.81 (0.74, 0.89)	Aune D 2013
Nuts and seeds	CHD death	5 PCs, 1 RCT	206,114	6,749	Each 4 servings/week (4 oz [113 g])	0.76 (0.69, 0.84)	Afshin A 2014
	Nonfatal CHD	3 PCs, 1 RCT	141, 390	4,280	Each 4 servings/week (4 oz [113 g])	0.78 (0.67, 0.92)	Afshin A 2014
	Diabetes	5 PC, 1 RCT	230,216	13,308	Each 4 servings/week (4 oz [113 g])	0.87 (0.81, 0.94)	Afshin A 2014
Fish	CHD Death	12 PCs	282,075	4,195	2-4 servings/week vs. ≤3 servings/month	0.79 (0.67, 0.92)	Zheng J 2012
	Stroke	8 PCs	394,958	16,890	≥ 5 vs. 1 serving/week	0.88 (0.81, 0.96)	Chowdhury R 2012
	Diabetes	13 PCs	481,489	20,830	Each 1 serving/day (100 g)	1.12 (0.94, 1.34)	Wu J 2012

Ref. Circulation.2018;137:00–00. DOI: 10.1161/CIR.0000000000000563

Growing scientific evidence of the benefits of heart-healthy dietary patterns and of the massive public health and economic burdens attributed to obesity and poor diet quality have triggered national calls to increase diet counseling in outpatients with atherosclerotic cardiovascular disease or risk factors.

However, despite evidence that physicians are willing to undertake this task and are viewed as credible sources of diet information, they engage patients in diet counseling at less than desirable rates and cite insufficient knowledge and training as barriers. These data align with evidence of large and persistent gaps in medical nutrition education and training in the United States.

Now, major reforms in undergraduate and graduate medical education designed to incorporate advances in the science of learning and to better prepare physicians for 21st century healthcare delivery are providing a new impetus and novel ways to expand medical nutrition education and training. This science advisory reviews gaps in undergraduate and graduate medical education in

	Endpoint	No. of studies	No. of subjects	No. of events	Unit	RR	Reference
Unprocessed red meats	CVD death	13 PCs	1,070,215	24,241	high vs low	1.12 (0.95, 1.33)	Abete I 2014
	Stroke	5 PCs	239,251	9,593	Each 1 serving/day (100 g)	1.13 (1.03, 1.23)	Chen G 2013
	Diabetes	9 PCs	447,333	28,206	Each 1 serving/day (100 g)	1.19 (1.04, 1.37)	Pan A 2011
Processed red meats	CVD death	6 PCs	1,186,761	35,537	Each 1 serving/day (50 g)	1.24 (1.09, 1.40)	Abete I 2014
	Stroke	5 PCs	239,251	9,593	Each 1 serving/day (50 g)	1.11 (1.02, 1.20)	Chen G 2013
	Diabetes	8 PCs	372,391	26,234	Each 1 serving/day (50 g)	1.51 (1.25, 1.83)	Pan A 2011
White meat (poultry, rabbit)	CVD death	5 PCs	1,197,805	31,535	Each 1 serving/day (100 g)	1.00 (0.87, 1.15)	Abete I 2014
Total dairy	CHD	10 PCs	253,260	8,792	high vs low	0.94 (0.82, 1.07)	Qin L 2015
	Stroke	16 PCs	764,635	28,138	high vs low	0.88 (0.82, 0.94)	Hu D 2014
	Diabetes	14 PCs	459,790	35,863	Each 1 serving/day	0.98 (0.96, 1.01)	Chen M 2014
Milk	CHD	6 PCs	259,162	4,391	Each 1 serving/day (200 ml)	1.00 (0.96, 1.04)	Soedamah-Muthu S 2011
	Stroke	9 PCs	525,609	22,382	high vs low	0.91 (0.82, 1.01	Hu D 2014
	Diabetes	7 PCs	167,982	15,149	Each 1 serving/day (200 g)	0.87 (0.72, 1.04)	Aune D 2013
Cheese	CHD	7 PCs	--	--	high vs low	0.84 (0.71, 1.00)	Qin L 2015
	Stroke	5 PCs	282,439	9,919	high vs low	0.94 (0.89, 0.995)	Hu D 2014
	Diabetes	8 PCs	242,960	17,620	Each 1 serving/day (50 g)	0.92 (0.86, 0.99)	Aune D 2013
Butter	CHD	5 PCs	--	--	high vs low	1.02 (0.88, 1.20)	Qin L 2015
	Stroke	3 PCs	173,853	5,299	high vs low	0.95 (0.85, 1.07)	Hu D 2014
Yogurt	CHD	5 PCs	--	--	high vs low	1.06 (0.90, 1.34)	Qin L 2015
	Diabetes	9 PCs	408,096	32,995	Each 1 serving/day (½ cup)	0.82 (0.70, 0.96)	Chen M 2014
Eggs	CHD	7 PCs	263,938	5,847	Each 1 serving/day (1 egg)	0.99 (0.85, 1.15)	Rong Y 2013
	Stroke	6 PCs	210,404	7,579	Each 1 serving/day (1 egg)	0.91 (0.81, 1.02)	Rong Y 2013
	Diabetes	5 PCs	69,297	4,889	≥1 egg/day vs. never or <1 egg/week	1.42 (1.09, 1.86)	Shin J 2013
100% fruit juice	Diabetes	11 PCs	407,288	34,549	Each 1 serving/day (8 oz.)	1.06 (0.98, 1.14)	Imamura F 2015
Sugar-sweetend beverages	Diabetes, non-BMI adjusted	13 PCs	421,973	36,492	Each 1 serving/day (8 oz.)	1.42 (1.19, 1.69)	Imamura F 2015
	Diabetes, BMI adjusted	17 PCs	464,937	38,253	Each 1 serving/day (8 oz.)	1.27 (1.10, 1.46)	Imamura F 2015
	CHD	4 PCs	194,664	7,396	Each 1 serving/day (8 oz.)	1.17 (1.10, 1.24)	Xi B 2015
Coffee—	CVD	29 PCs	--	--	3 vs. 0 cups/day, nonlinear	0.89 (0.85, 0.93)	Ding M 2014
Caffeneited	Diabetes	11 PCs	--	--	Each 1 serving/day (1 cup)	0.91 (0.89, 0.94)	Ding M 2014
Decaffeneited	Diabetes	11 PCs	--	--	Each 1 serving/day (1 cup)	0.94 (0.91, 0.98)	Ding M 2014
Tea	CHD	7 PCs	235,368	8,328	Each 1 serving/day (1 cup)	0.90 (0.81, 0.996)	Zhang C 2015
	Diabetes	14 PCs	503,165	35,574	Each 1 serving/day (1 cup)	0.98 (0.96, 0.995)	Yang W 2014
	Stroke	8 PCs	307,968	11,329	Each 1 serving/day (1 cup)	0.94 (0.90, 0.973)	Zhang C 2015

nutrition in the United States, summarizes reforms that support and facilitate more robust nutrition education and training, and outlines new opportunities for accomplishing this goal via multidimensional curricula, pedagogies, technologies, and competency-based assessments. Real-world examples of efforts to improve undergraduate and graduate medical education in nutrition by integrating formal learning with practical, experiential, inquiry-driven, inter professional, and population health management activities are provided.

The authors conclude that enhancing physician education and training in nutrition, as well as increasing collaborative nutrition care delivery by 21st century health systems, will reduce the health and economic burdens from atherosclerotic cardiovascular disease to a degree not previously realized.

7. Seafood (Polyunsaturated Fatty Acids) and CVD : A Science Advisory From AHA

Seafood (Polyunsaturated Fatty Acids) and CVD : A Science Advisory From AHA

Common Seafood Varieties	EPA+DHA, mg/4 oz
Salmon: Atlantic, Chinook, coho	1200–2400
Anchovies, herring, and shad	2300–2400
Mackerel: Atlantic and Pacific (not king)	1350–2100
Tuna: bluefin and albacore	1700
Sardines: Atlantic and Pacific	1100–1600
Oysters: Pacific	1550
Trout: freshwater	1000–1100
Tuna: white (albacore) canned	1000
Mussels: blue	900
Salmon: pink and sockeye	700–900
Squid	750
Pollock: Atlantic and walleye	600
Crab: blue, king, snow, queen, and Dungeness	200–550
Tuna: skipjack and yellowfin	150–350

Table: Seafood Long-Chain Polyunsaturated Fatty Acid Composition of Commonly Consumed Seafood Varieties

American Heart Association

1 to 2 seafood meals per week be included to reduce the risk of CHF, CAD, ischemic stroke, and sudden cardiac death, especially when it replaces the intake of less healthy foods

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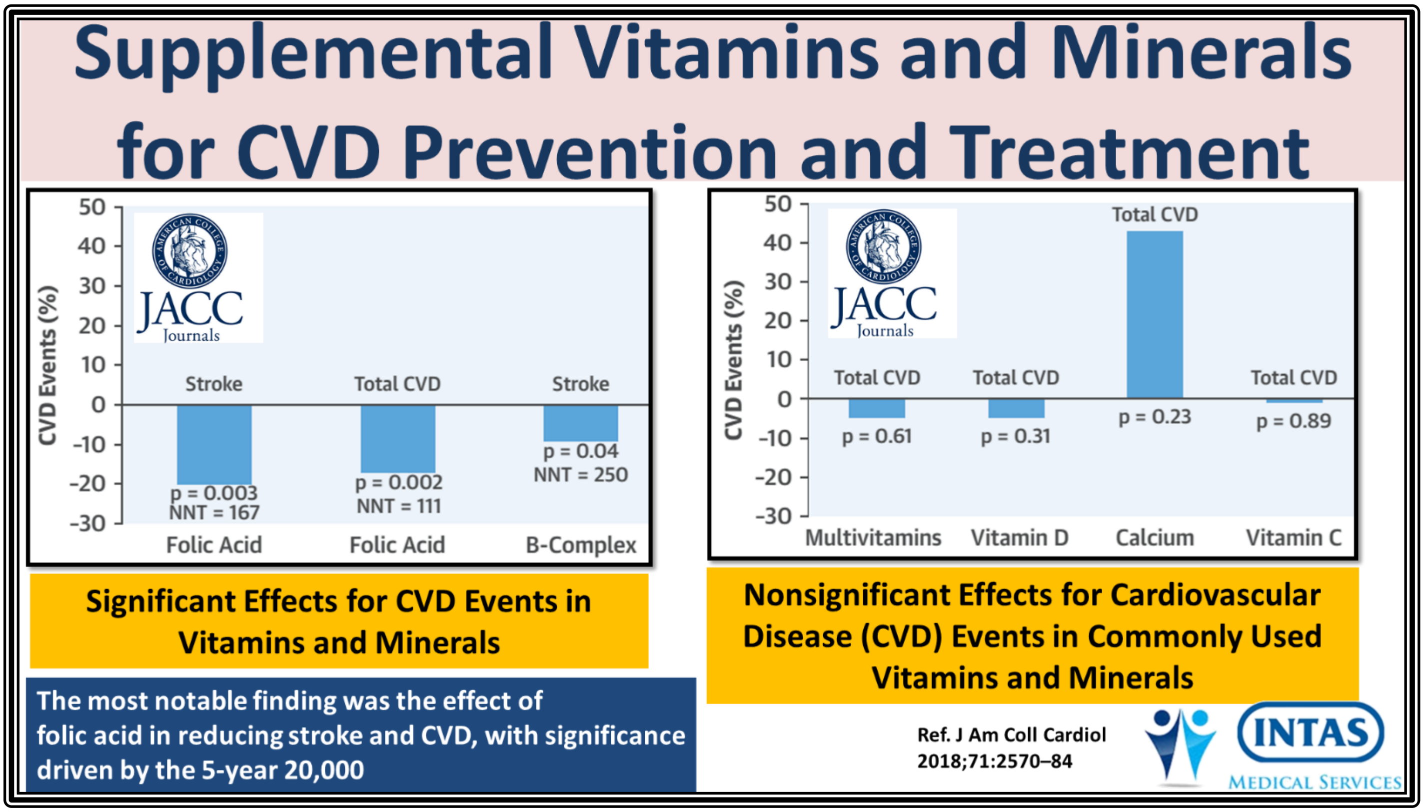
Since the 2002 American Heart Association scientific statement "Fish Consumption, Fish Oil, Omega-3 Fatty Acids, and Cardiovascular Disease," evidence from observational and experimental studies and from randomized controlled trials continues to emerge to further substantiate the beneficial effects of seafood long-chain n-3 polyunsaturated fatty acids and cardiovascular disease. A recent American Heart Association science advisory addressed the specific effect of n-3 polyunsaturated fatty acid supplementation on clinical cardiovascular events.

This American Heart Association science advisory extends that review and offers further support to include n-3 polyunsaturated fatty acids from seafood consumption. Several potential mechanisms have been investigated, including antiarrhythmic, anti-inflammatory, hematologic, and endothelial, although for most, longer-term dietary trials of seafood are warranted to substantiate the benefit of seafood as a replacement for other important sources of macronutrients. The present science advisory reviews this evidence and makes a suggestion in the context of the *2015–2020 Dietary Guidelines for Americans* and in consideration of other constituents of seafood and the impact on sustainability. They conclude that 1 to 2 seafood meals per week be included to reduce the risk of congestive heart failure, coronary heart disease, ischemic stroke, and sudden cardiac death, especially when seafood replaces the intake of less healthy foods.

8. Supplemental Vitamins and Minerals for CVD Prevention and Treatment

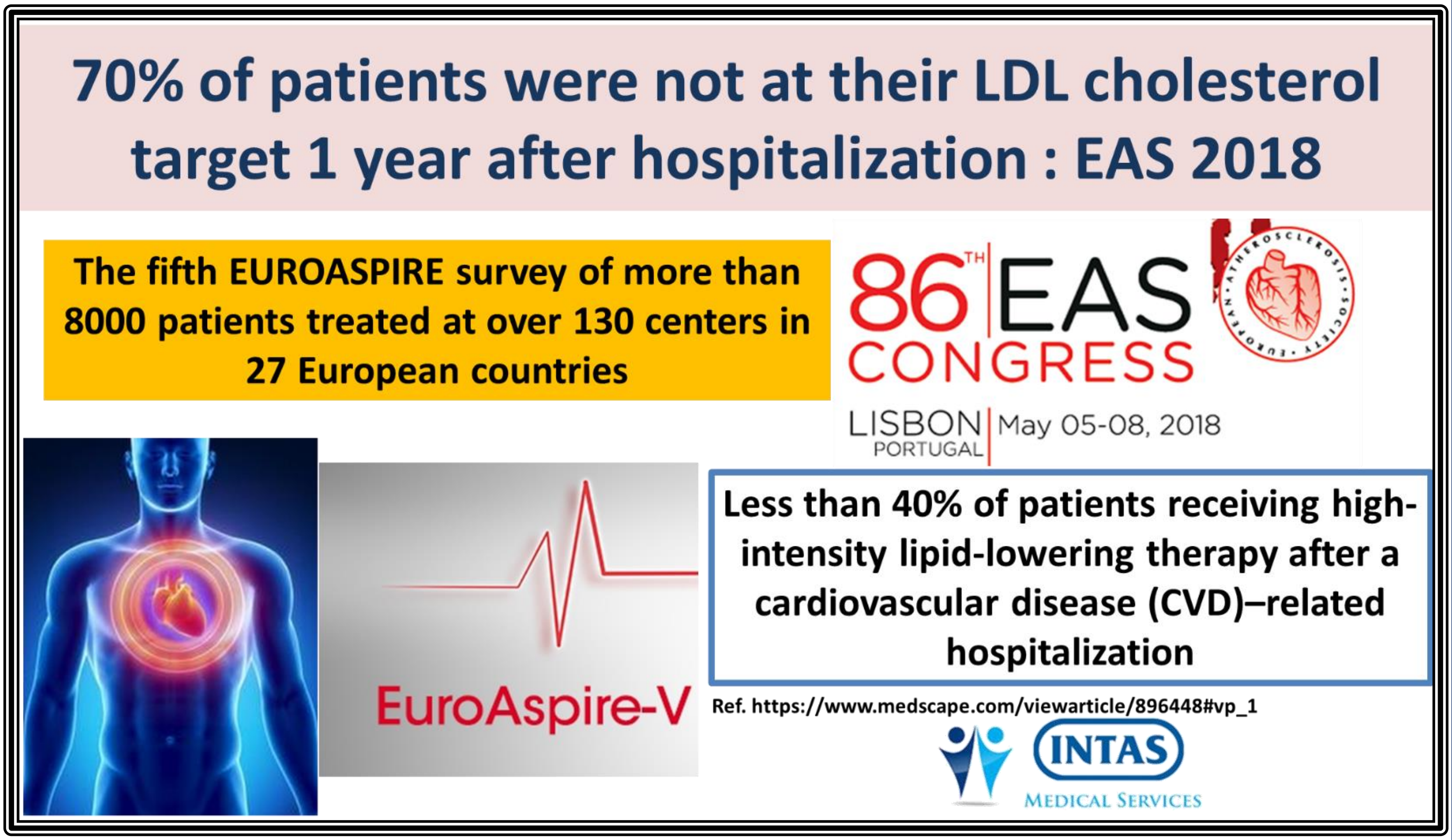


The authors identified individual randomized controlled trials from previous meta-analyses and additional searches, and then performed meta-analyses on cardiovascular disease outcomes and all-cause mortality. The authors assessed publications from 2012, both before and including the U.S. Preventive Service Task Force review. Their systematic reviews and meta-analyses showed generally moderate- or low-quality evidence for preventive benefits (folic acid for total cardiovascular disease, folic acid and B-vitamins for stroke), no effect (multivitamins, vitamins C, D, β-carotene, calcium, and selenium), or increased risk (antioxidant mixtures and niacin [with a statin] for all-cause mortality).

Since the 2013 to 2014 assessment and report of the USPSTF, the most notable finding was the effect of folic acid in reducing stroke and CVD, with significance driven by the 5-year 20,000 Chinese CSPPT RCT, which was supported by the reduction in stroke seen in RCTs of B-complex vitamins in which folic acid was a component. Vitamin B3 (or niacin) might increase all-cause mortality, which was possibly related to its adverse effects on glycemic response.

Conclusive evidence for the benefit of any supplement across all dietary backgrounds (including deficiency and sufficiency) was not demonstrated; therefore, any benefits seen must be balanced against possible risks.

9. 70% of patients were not at their LDL cholesterol target 1 year after hospitalization : EAS 2018



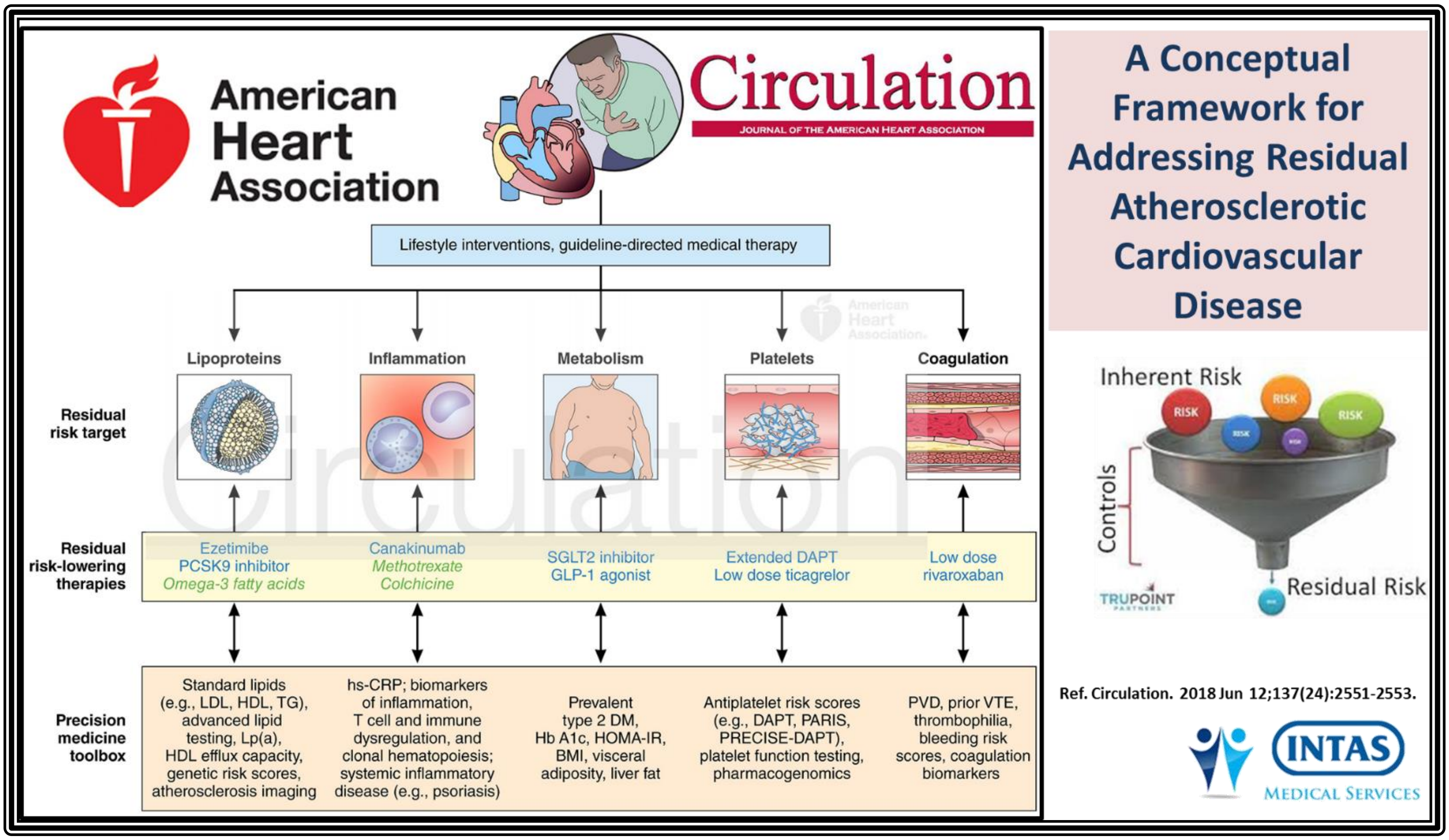
LISBON, Portugal — Less than 40% of patients receiving high-intensity lipid-lowering therapy after a cardiovascular disease (CVD)–related hospitalization are at target for their low-density lipoprotein (LDL) cholesterol levels, the results of a major European survey reveal. The survey also found large variations between countries.

The fifth EUROASPIRE survey of more than 8000 patients treated at over 130 centers in 27 European countries showed that, overall, 70% of patients were not at their LDL cholesterol target and almost 70% had below-guideline levels of high-density lipoprotein (HDL) cholesterol 1 year after hospitalization.

The findings, presented at the European Atherosclerosis Society (EAS) 2018 meeting, also showed that although 84% of patients across Europe took lipid-lowering therapy, only 32% had achieved the LDL cholesterol target of less than 1.8 mmol/L.

Among the 60% of patients who were taking high-intensity lipid-lowering therapy, only 36% met the target. Worryingly, a substantial proportion of patients had their lipid-lowering therapy downgraded between discharge and follow-up.

10. A Conceptual Framework for Addressing Residual Atherosclerotic Cardiovascular Disease



Until recently, therapies to mitigate atherosclerotic cardiovascular disease (ASCVD) risk have been limited to lifestyle interventions, blood pressure lowering medications, high intensity statin therapy, antiplatelet agents, and in select patients, coronary artery revascularization.

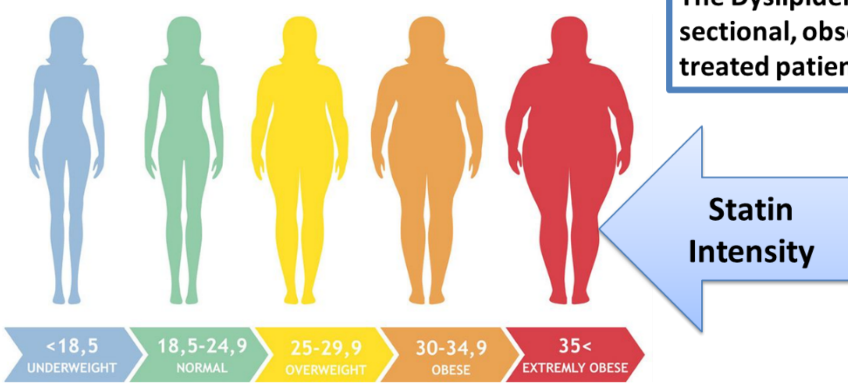
Despite administration of these evidence-based therapies, substantial residual risk for cardiovascular events persists, particularly among individuals with known ASCVD. Moreover, the current guideline-based approach does not adequately account for patient-specific, causal pathways that lead to ASCVD progression and complications. In the past few years, multiple new pharmacological agents, targeting conceptually distinct pathophysiological targets, have been shown in large and well-conducted clinical trials to lower cardiovascular risk among patients with established ASCVD receiving guideline directed medical care.

These evidenced-based therapies reduce event rates, and in some cases all-cause and cardiovascular mortality; these benefits confirm important new disease targets and challenge the adequacy of the current "standard of care" for secondary prevention.

11. BMI impacts the choice of statin intensity with no correlation to blood cholesterol -DYSIS Study (n=52,916 patients)

BMI impacts the choice of statin intensity with no correlation to blood cholesterol -DYSIS Study (n=52,916 patients)

The Dyslipidemia International Study (DYSIS) is a cross-sectional, observational, multicenter study in statin-treated patients≥45 years of age from 30 countries.



BMI	Atorvastatin Dosage
Total	16.88 ± 12.38
<25 kg/m²	14.98 ± 10.15
25-30 kg/m²	16.91 ± 12.38
30-35 kg/m²	19.27 ± 14.30
>35 kg/m²	20.08 ± 15.1

Ref. Diabetes Obes Metab. 2018 Jun 11. doi: 10.1111/dom.13415.

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Statin intensity increased with increasing BMI (ρ: 0.13; p<0.001), an association that held after adjustment for comorbidities (OR: 2.4; 95% CI: 2.0-3.0) on BMI ≥30 kg/m2 for atorvastatin equivalent ≥40mg/day.

A high body mass index (BMI) is associated with increased cardiovascular risk. They sought to identify whether BMI influences the choice of lipid lowering treatment in a large, real world cohort of 52,916 patients treated with statins.

The Dyslipidemia International Study (DYSIS) is a cross-sectional, observational, multicenter study in statin-treated patients≥45 years of age from 30 countries. 1.1% were underweight (BMI<18.5 kg/m^2), 33.1% had normal weight (BMI 18.5 to 24.9 kg/m^2), 41.5% were overweight (BMI 25 to 29.9 kg/m^2), 17.1% had class I obesity (BMI 30.0 to 34.9 kg/m^2), 5.0% had class II obesity (BMI 35 to 39.9 kg/m^2), and 2.1% had class III obesity (≥40 kg/m^2).

BMI correlated with high-density lipoprotein cholesterol (HDL-C) and triglycerides (Spearman's ρ: -0.147 and 0.170, respectively; $p < 0.0001$ for both); however, there was no correlation with low-density lipoprotein cholesterol (LDL-C; ρ: 0.003; p=0.51). Statin intensity increased with increasing BMI (ρ: 0.13; p<0.001), an association that held after adjustment for comorbidities (OR: 2.4; 95% CI: 2.0-3.0) on BMI ≥30 kg/m^2 for atorvastatin equivalent ≥40mg/day.

12. Synergistic Effect of Atorvastatin and Folic Acid on Cardiac Function and Ventricular Remodeling

Synergistic Effect of Atorvastatin and Folic Acid on Cardiac Function and Ventricular Remodeling

Item	Routine group (n=62)	Routine + atorvastatin group (n=62)	Routine + folic acid group (n=62)	Routine + atorvastatin + folic acid group (n=62)
6MWD (m)				
Before treatment	219.42±34.14	223.77±35.26	217.37±34.66	224.37±33.20
After treatment	342.68±54.36*	427.60±52.22*#&	408.34±49.66*#	497.81±56.13*#&@
NT-proBNP (pg/ml)				
Before treatment	6253.41±203.67	6241.56±211.35	6268.74±201.58	6247.85±206.94
After treatment	3219.65±208.73*	3008.51±118.62*#&	3054.68±119.35*#	2818.76±104.65*#&@

6MWD – 6-minute walk distance; NT-proBNP – N-Terminal pro Brain Natriuretic Peptide; * $P<0.05$ compared with before treatment; # $P<0.05$ compared with the routine group before treatment; & $P<0.05$ compared with the routine + folic acid group before treatment; @nP<0.05 compared with the routine + atorvastatin group before treatment.

Ref. Med Sci Monit, 2018; 24: 3744-3751

The results indicated that the combination of atorvastatin and folic acid improved the cardiac function and inhibited ventricular remodeling of elderly CHF patients

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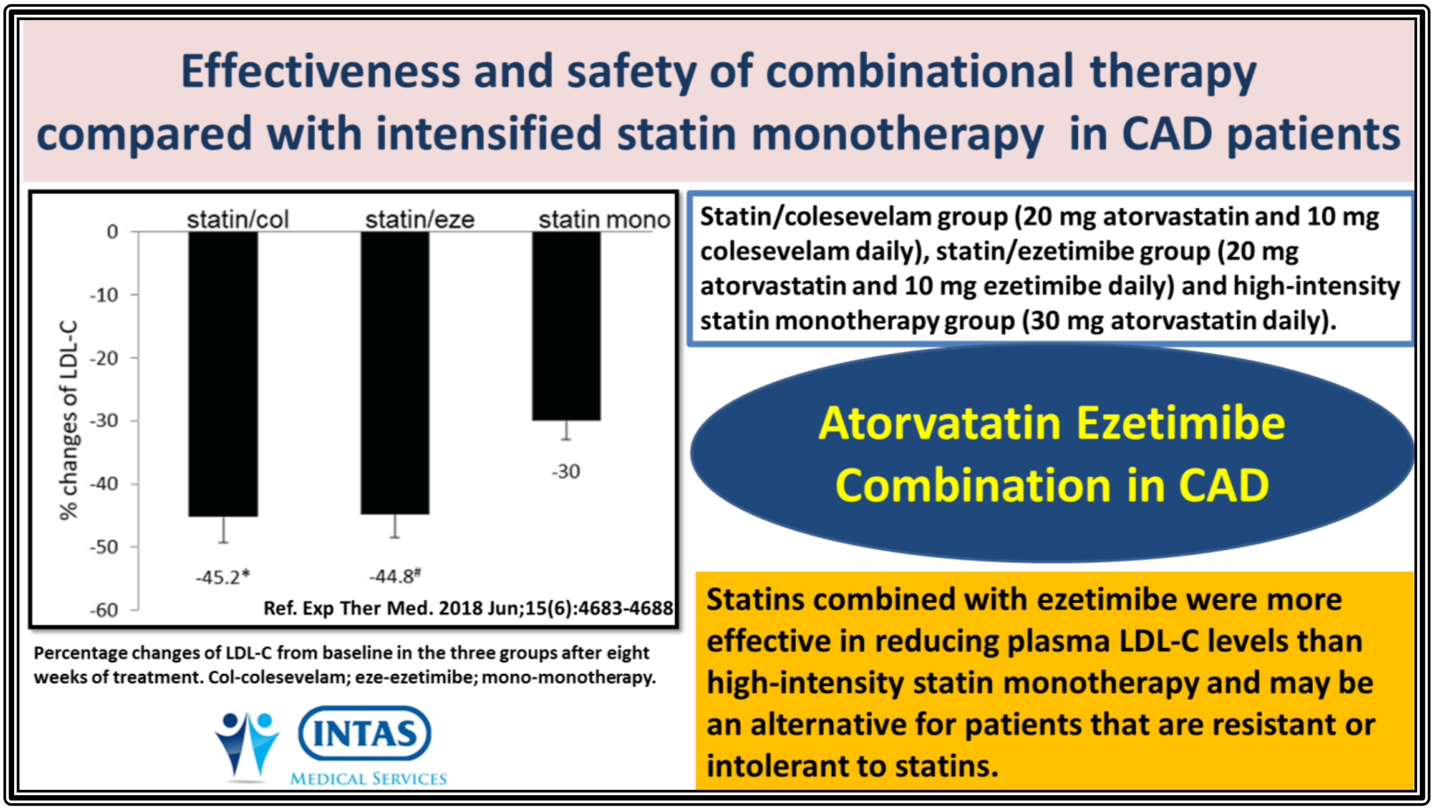
BACKGROUND: At present, a constant progress in pathophysiology understanding and treatment of the chronic heart failure (CHF) is arising. Meanwhile, hyperhomocysteinemia (HHcy) has been linked to impaired left ventricular function and clinical class in patients with CHF. Atorvastatin therapy can reduce the incidence of sudden cardiac death in patients with advanced CHF. Folic acid could enhance endothelial function in vascular disease states. The present study aims to investigate the effect of atorvastatin and folic acid combined on the cardiac function and ventricular remodeling in CHF patients with HHcy.

MATERIAL AND METHODS: Elderly CHF patients with HHcy were divided into four groups: routine, routine + atorvastatin, routine + folic acid, and routine + atorvastatin + folic acid groups. Serum homocysteine (Hcy) level was detected using enzymatic cycling methods, and N-terminal pro brain natriuretic peptide (NT-proBNP) level by ELISA. The cardiac function indexes and left ventricular early diastolic peak flow velocity/atrial systolic peak flow velocity (E/A) ratio were evaluated. The six-minute walk test was performed to measure the six-minute walk distance (6MWD).

RESULTS: 6MWD increased, the serum Hcy and NT-proBNP levels decreased, and cardiac function was improved compared with before treatment, which was the most significant in the routine + atorvastatin + folic acid group, followed by the routine + atorvastatin group, then the routine + folic acid group, and lastly, the routine group.

CONCLUSIONS The results indicated that the combination of atorvastatin and folic acid improved the cardiac function and inhibited ventricular remodeling of elderly CHF patients with HHcy.

13. Effectiveness and safety of combinational therapy compared with intensified statin monotherapy in CAD patients



The present study evaluated the effectiveness and safety of combining statin with another lipid-lowering agent in the management of dyslipidemia in CHD patients.

A total of 180 patients with CHD were divided into three therapeutic groups (n=60 in each): Statin/colesevelam group (20 mg atorvastatin and 10 mg colesevelam daily), statin/ezetimibe group (20 mg atorvastatin and 10 mg ezetimibe daily) and high-intensity statin monotherapy group (30 mg atorvastatin daily). The baseline plasma lipid levels were measured. The duration of the treatment was eight weeks and the side effects were noted at one year's follow-up. After eight weeks' treatment, the mean plasma level of LDL-C was reduced by 45.2, 44.8 and 30.0% in the statin/colesevelam, statin/ezetimibe and statin monotherapy group, respectively. The reduction of LDL-C in the combinational therapy groups was greater than that in the statin monotherapy group ($P<0.05$).

The proportion of patients achieving the goal of lowering LDL-C in the combinational therapy groups was higher than that in the statin monotherapy group. The effectiveness of reducing lipids was similar in the two combinational statin/colesevelam and statin/ezetimibe groups. Rates of adverse events were not significantly different among the three groups. In conclusion, statins combined with colesevelam or ezetimibe were more effective in reducing plasma LDL-C levels than high-intensity statin monotherapy. This combinational therapeutic strategy may be an alternative for patients that are resistant or intolerant to statins.

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