28.ª EDIÇÃO
CARDIO SANTARÉM

SANTARÉM HOTEL | 22 E 23 DE SETEMBRO 2023

Sal na hipertensão e insuficiência cardíaca, ovos na dislipidémia e café nas arritmias – respostas definitivas ou dúvidas persistentes?

Nuno Cotrim

IFE Cardiologia HDS

Salt in arterial hypertension and heart failure

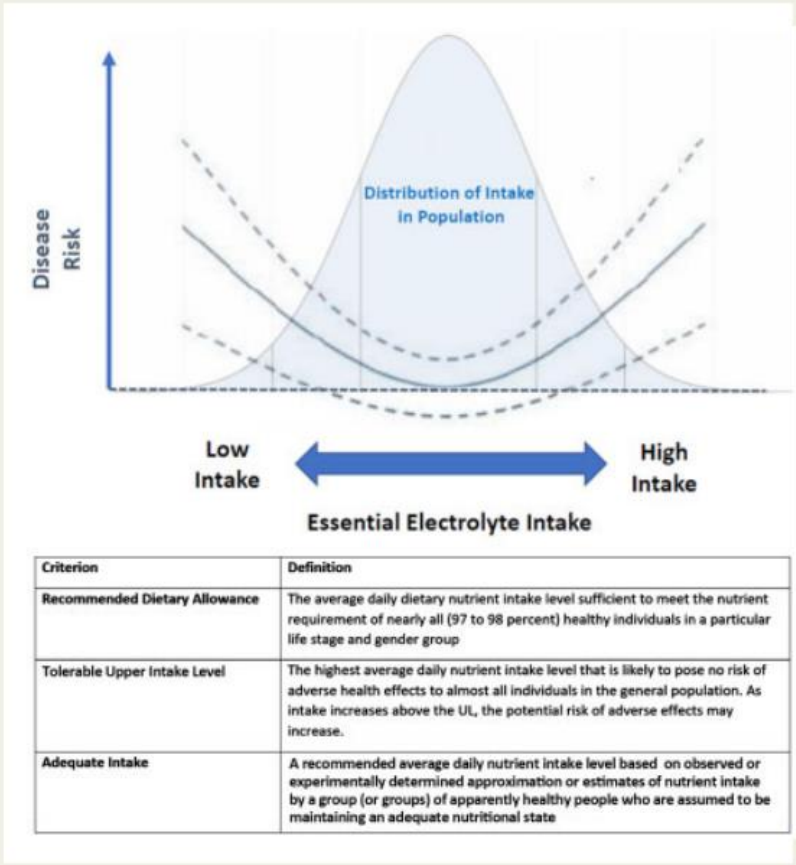
- **Usual sodium intake** is between **3.5–5.5 g** per day (equivalent to 9 - 12 g of daily salt).

- Most **guidelines** suggest a **low salt intake**, defined as **<2-2.3 g** of **sodium** (equivalent to <5-5.75 g of sodium chloride) per day to **reduce high blood pressure** and to **improve cardiovascular outcomes.**

- **Sodium** is an essential nutrient, required for **normal cardiovascular physiology** and **health**, as is the case for other essential electrolytes.

Table I **Categories of sodium (salt) intake**

Sodium intake categories	Sodium (salt) g/day	Sodium (mmol/day)	~Teaspoons of salt
Low sodium intake	Sodium <2.3 g/day (salt <5.75 g/day)	Sodium <100 mmol	<1 teaspoon of salt
Moderate sodium intake	Sodium 2.3–4.6 g/day (salt 5.75–11.5 g/day)	Sodium 100–200 mmol/day	1–2 teaspoons of salt
High sodium intake	Sodium >4.6 g/day (Salt 11.5 g/day)	Sodium >200 mmol/day	>2 teaspoons of salt

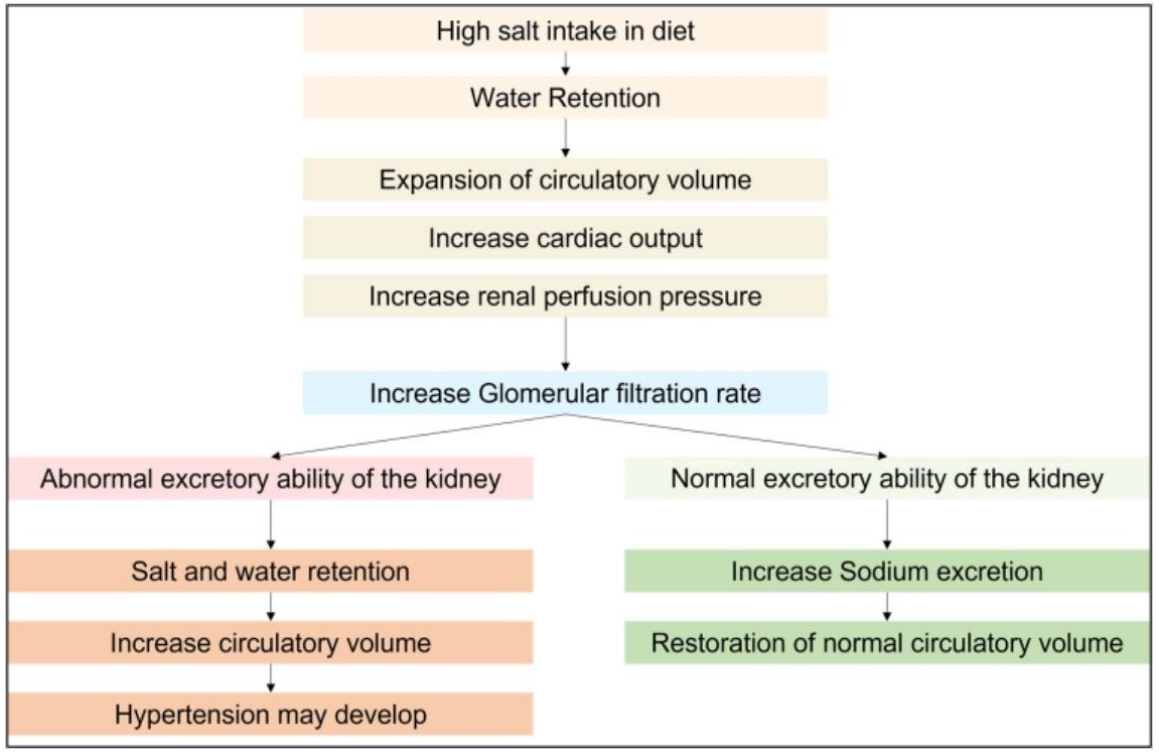


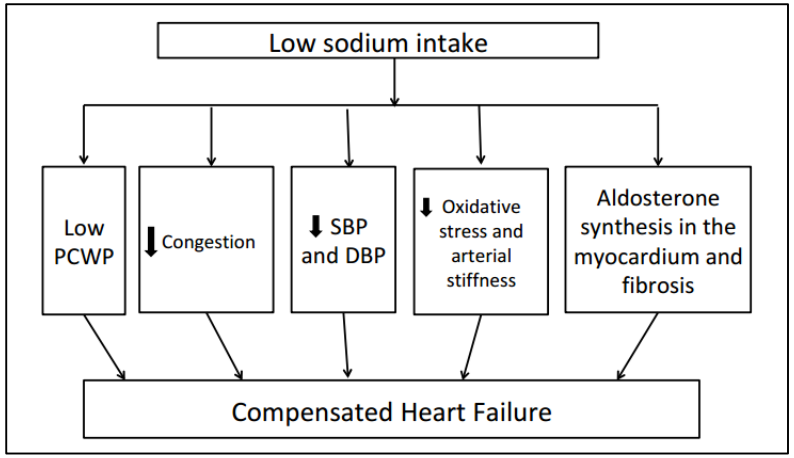
Criterion	Definition
Recommended Dietary Allowance	The average daily dietary nutrient intake level sufficient to meet the nutrient requirement of nearly all (97 to 98 percent) healthy individuals in a particular life stage and gender group
Tolerable Upper Intake Level	The highest average daily nutrient intake level that is likely to pose no risk of adverse health effects to almost all individuals in the general population. As intake increases above the UL, the potential risk of adverse effects may increase.
Adequate Intake	A recommended average daily nutrient intake level based on observed or experimentally determined approximation or estimates of nutrient intake by a group (or groups) of apparently healthy people who are assumed to be maintaining an adequate nutritional state

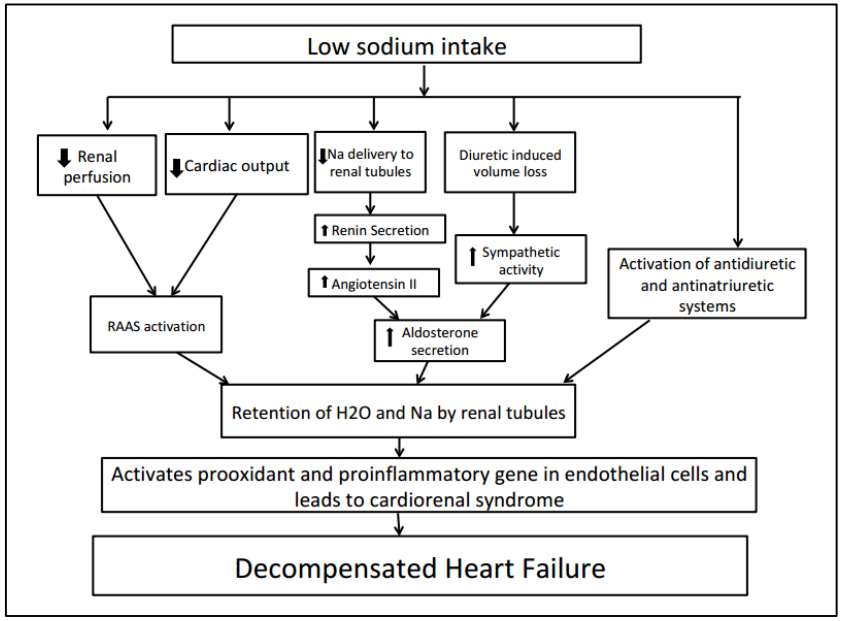
Figure I Relationship of essential electrolyte with health.

O'Donnell M, Mente A, Alderman MH, et al. Salt and cardiovascular disease: insufficient evidence to recommend low sodium intake. *Eur Heart J*. 2020;41(35):3363-3373. doi:10.1093/eurheartj/ehaa586

Salt in arterial hypertension and heart failure – High vs Low







Patel Y, Joseph J. Sodium Intake and Heart Failure. *Int J Mol Sci*. 2020;21(24):9474. Published 2020 Dec 13. doi:10.3390/ijms21249474

Salt in arterial hypertension and heart failure

- *Graudal et al* found a **J-shaped** association of **sodium intake with mortality and cardiovascular events**, with an **increased risk above 4.6 g/day** and **below 2.7 g/day**.

- The **PURE study** reported a **J-shaped association** between **sodium excretion and cardiovascular event incidence and mortality**, with the **lowest risk** between **3 and 5 g of sodium per day**.

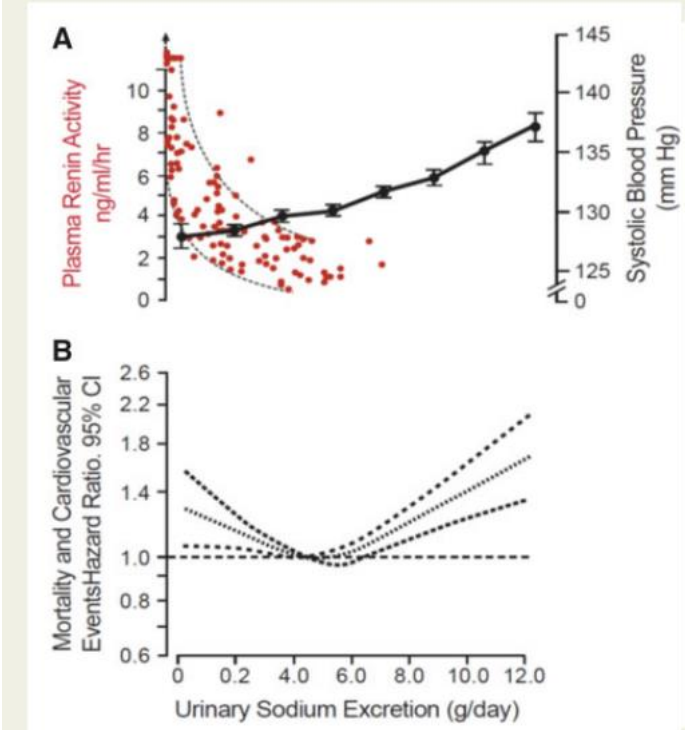


Figure 2 (*A* and *B*) Association of sodium intake with (*A*) plasma renin activity and systolic blood pressure; and (*B*) mortality and cardiovascular events (adapted from and O'Donnell *et al.*[51] and Brunner and Gavras[52]).

Compared With Usual Sodium Intake, Low- and Excessive-Sodium Diets Are Associated With Increased Mortality: A Meta-Analysis

Niels Graudal,[1] Gesche Jürgens,[2] Bo Baslund,[1] and Michael H. Alderman[3]

O'Donnell M, Mente A, Alderman MH, et al. Salt and cardiovascular disease: insufficient evidence to recommend low sodium intake. *Eur Heart J*. 2020;41(35):3363-3373. doi:10.1093/eurheartj/ehaa586

Salt in heart failure

- An analysis of **HART** reported a **higher risk of death and hospitalization** for **HF** among those randomized to **restricted sodium intake**.

- A **meta-analysis** evaluating **reduced sodium intake** in patients with **HF** found **no evidence to support or refute benefit or harm**.

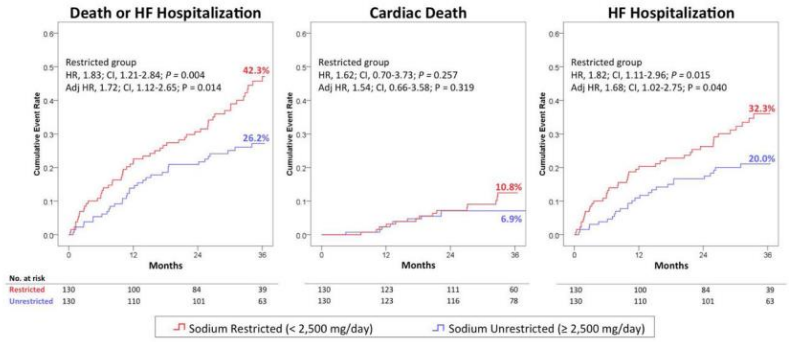


Figure 2. Impact of Sodium Restriction on Heart Failure Outcomes in the Propensity Matched Cohort

HR, hazard ratio; **CI,** 95% confidence interval; **Adj HR**, adjusted hazard ratios for covariates with >10% absolute standardized difference between the propensity-matched groups.

Table 1. Summary of Included Studies

Source	Country	No. of Participants	Population Inclusion Criteria	Mean Age of Participants, y	Intervention	Comparator	Duration of Study
Inpatient Studies							
Aliti et al,[15] 2013	Brazil	75	Adult patients with a diagnosis of acute decompensated HF defined as LVEF ≤45%; Boston criteria score of ≥8 points; and LOS ≤36 h after hospital admission	60	2 g/d salt and 800 mL/d water	7.5-12.5 g/d salt and estimated ≥2500 mL/d water	Outcomes assessed until hospital day 7 or until discharge in patients with LOS <7 d; some assessments at day 30
Velloso et al,[21] 1991	Brazil	32	Adult patients admitted to hospital with acute illness due to underlying chronic HF	54	2 g/d salt	≤10 g/d salt	Unclear, although appears time taken for patients to compensate
Outpatient Studies							
Alvelos et al,[16] 2004	Portugal	24	Adult patients with mild to moderate chronic HF (euvolemic) defined as LVEF ≤40% with no exacerbations or therapeutic changes in the previous 2 mo	70	100 mmol/d sodium	Maintenance of a diet with usual salt intake	15 d
Colín-Ramírez et al,[17] 2004	Mexico	65	Adult patients with a confirmed diagnosis of HF defined as decreased systolic and/or diastolic function as determined by ECG criteria	62	Aim of 2.0-2.4 g/d sodium (5-6 g/d salt)	Traditional management of HF, including common dietary advisories regarding decreased sodium and fluid intakes but no specific prescription	6 mo
Colín- Ramírez et al,[18] 2015	Canada	38	Adult patients with a confirmed diagnosis of HF (reduced and preserved systolic function), NYHA classes II and III, and receiving optimally tolerated medical therapy according to CCS guidelines	66	Aiming for 65 mmol/d or 1.5 g/d sodium (3.75 g/d salt)	Moderate intake of sodium aiming for 100 mmol/d or 2.3 g/d (5.75 g/d salt)	6 mo
Hummel et al,[22] 2017	United States	66	Adults aged ≥55 y with history of systemic hypertension and acutely decompensated HF as primary diagnosis for admission or secondary diagnosis after hospitalization for another reason followed by discharge into the community	72	Daily sodium intake of 1.5 g/2100 kcal; compliant meals for 4 wk after hospital discharge in addition to pamphlet "How to Eat a Low Sodium Diet" and telephone call from study staff at 2 and 3 wk	Usual care including pamphlet, "How to Eat a Low Sodium Diet" and telephone call from study staff at 2 and 3 wk	12 wk
Philipson et al,[19] 2010	Sweden	30	Adult patients with a history of CHF in NYHA classes II and IV[a]	74	Aiming for a maximum of 2-3 g/d sodium (5.0-7.5 g/d salt) and to restrict fluids to 1.5 L/d	General diet information in accordance with ESC guidelines for heart failure	12 wk
Philipson et al,[20] 2013	Sweden	97	Adult patients with a history of CHF, in NYHA classes II and IV[b]	75	Advice to reduce sodium intake to 2-3 g/d (5 g/d salt) and to limit fluid intake to a maximum of 1.5 L/d	Dietician- or nurse-led standard advice (eg, be aware not to drink too much and use salt with caution)	12 wk; Patients were also contacted by telephone after 10-12 mo by a dietician
Welsh et al,[23] 2013	United States	52	Adult patients who had a confirmed diagnosis of HF due to left ventricular systolic dysfunction or with preserved systolic function and NYHA classes II and IV[c]	63	6-wk Education intervention with instruction and advice on restriction of sodium diet adherence from the intervention nurse during home visits and telephone calls (no set salt goal set)	Usual care and visited at 3 data collections	6 mo

Mahtani KR, Heneghan C, Onakpoya I, et al. Reduced Salt Intake for Heart Failure: A Systematic Review. *JAMA Intern Med*. 2018;178(12):1693-1700. doi:10.1001/jamainternmed.2018.4673

Salt in heart failure

SODIUM-HF

Study of Dietary Intervention Under 100 MMOL in Heart Failure

Ezekowitz et al. Lancet 2022

Aim To evaluate the effect of a low-sodium diet vs usual care on the outcomes of patients with HF, regardless of LVEF

Background

- HF is associated with sodium & water retention, causing volume overload.
- HF treatment has emphasized restricting sodium & water intake to reduce volume overload.
- But there is little evidence to support this.

Trial Design

- Multicenter, open label, randomized trial of diet with Na <1500 mg/d vs Usual care
- *Primary outcome*: composite of All-cause mortality, CV hosp, CV ED visits
- *Secondary outcomes*: Quality of life (by KCCQ), exercise capacity (by 6MWT), NYHA class

Inclusion Criteria
- 18 years or older
- HF (regardless of LVEF)
- NYHA Class II-III
- On optimal GDMT

Key Exclusion Criteria
- Patients consuming <1500 mg/d of Na
- Serum Na <130 mmol/L

Results

Primary Endpoint

Composite of all-cause mortality, CV hosp/ED visits: HR 0.89, 95% CI 0.63-1.26, p = 0.53

- Low-sodium diet resulted in Na reduction of 415/d.
- Lower than anticipated event rate.
- Trial stopped early

Secondary Endpoints

All-cause mortality	HR 1.38, 95% CI 0.73-2.60, p = 0.32	*Change in NYHA Class*	OR 0.59, 95% CI 0.40-0.86, p = 0.006
CV-related hospitalizations	HR 0.82, 95% CI 0.54-1.24, p = 0.36	*Change in KCCQ OSS*	Difference 3.38, CI 0.79-5.96, p = 0.011
CV-related ED visits	HR 1.21, 95% CI 0.60-2.41, p = 0.60	*Change in 6MWT*	Difference 6.60, CI -9.0-22.2, p = 0.405

Conclusion

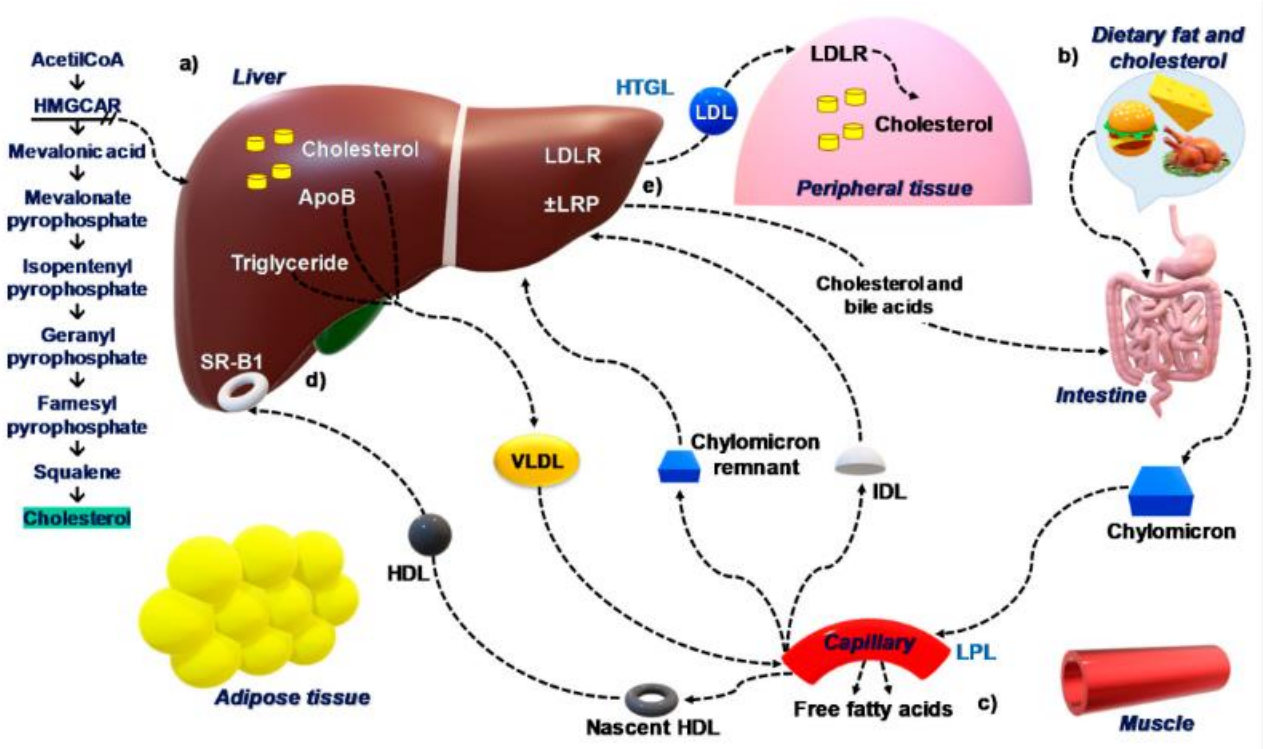
In the largest randomized trial on dietary sodium intervention, it was found that a low-sodium diet did not reduce clinical events but did result in an improvement in quality of life in terms NYHA Class and KCCQ scores.

Created by Ashish Correa, MD & Anu Lala, MD for CARDIO NERDS

Eggs and dyslipidemia

- **Egg consumption** is one of the **main dietary sources** of **cholesterol**, but whether individuals who **eat more eggs** have a **worse blood lipid profile** remains **controversial**.

- The association between **egg consumption and blood lipid parameters** has been explored in **several meta-analyses of RCTs**, and the **results were contradictory.**



Eggs and dyslipidemia

nutrients

MDPI

Journal of Food Biochemistry — WILEY

Article

Association between Egg Consumption and Cholesterol Concentration: A Systematic Review and Meta-A

Man-Yun Li

Table 1. Characteristics of patients in the included studies.

Trial	Male/Female	Age Range	Intervention		Duration	Result (↑: increased concentration; ↓: decreased concentration)
			Egg Group	Control		
Missimer et al. (2017) [7]	24/26	18–30	2 eggs/day	Oatmeal	28 days	LDL-c↑; HDL-c↑
Baumgartner et al. (2013) [40]	34/63	18–65	One extra egg	Regular diet	84 days	TC↑; LDL-c↑
Rueda et al. (2013) [54]	27/46	17–20	1 egg/day	No egg	28 days	Statistically insignificant change
Harman et al. (2008) [47]	14/31	18–55	2 eggs/day	No egg	84 days	Statistically insignificant change
Mutungi et al. (2008) [53]	28/0	40–70	3 eggs/day	No egg	84 days	HDL-c↑
Wal et al. (2008) [56]	10/63	25–60	2 eggs/day	Regular diet	56 days	Statistically insignificant change
Waters et al. (2007) [57]	0/22	50–77	3 eggs/day	No egg	30 days	TC↑; HDL-c↑; LDL-c↑
Herron et al. (2006) [48]	40/51	21–43	3 eggs/day	Egg substitute	30 days	TC↑; HDL-c↑; LDL-c↑
Greene et al. (2006) [46]	13/29	50–80	3 eggs/day	Egg substitute	30 days	HDL-c↑; LDL-c↑
Goodrow et al. (2006 [45])	7/26	60–96	1 egg/day	Egg substitute	35 days	Statistically insignificant change
Katz et al. (2005) [51]	30/19	36–73	2 eggs/day	Oatmeal	42 days	Statistically insignificant change
Ballesteros et al. (2004) [36]	25/29	8–12	2 eggs/day	Egg white	30 days	LDL-c↑; HDL-c↑
Chakrabarty et al. (2004) [41]	22/12	19–32	1 egg/day	No egg	56 days	TC↑; LDL-c↑; TC/HDL-c↑
Ginsberg et al. (1995) [43]	0/13	22–31	3 eggs/day1 egg/day	No egg	56 days	TC↑; HDL-c↑; LDL-c↑
Ginsberg et al. (1994) [44]	24/0	22–31	1 egg/day2 eggs/day4 eggs/day	No egg	56 days	TC↑; LDL-c↑
Garwin et al. (1992) [42]	42/56	41–48	12 eggs/week	No egg	42 days	TC↓; HDL-c↓; LDL-c↓
Sacks et al. (1984) [55]	4/13	18–24	1 egg/day	No egg	21 days	LDL-c↑

ıses of different dosages of egg consumption on profile: An updated systematic review and ysis of randomized clinical trials

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SYSTEMATIC REVIEWS AN

Impact of whole e
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Randomized Clinical Trials

Mohammad Hossein Rouhani, Nafiseh Rashidi-Pourfard, Amin Salehi-Abargouei, Majid Karimi & Fahimeh Haghighatdoost

Eggs and dyslipidemia

Circulation
Volume 140, Issue 11, 10 September 2019; Pages e596-e646
https://doi.org/10.1161/CIR.0000000000000678

ACC/AHA CLINICAL PRACTICE GUIDELINE

2019 ACC/AHA Guideline on the Primary Prevention of Cardiovascular Disease: A Report of the American College of Cardiology/American Heart Association Task Force on Clinical Practice Guidelines

European Heart Journal (2021) **42**, 3227–3337
doi:10.1093/eurheartj/ehab484

ESC GUIDELINES

Guidelines on cardiovascular disease
actice

Guidelines for the
Prevention of
Adults

European Heart Journal (2020) **41**, 111–188
doi:10.1093/eurheartj/ehz455

ESC/EAS GUIDELINES

2019 ESC/EAS Guidelines for the management of dyslipidaemias: *lipid modification to reduce cardiovascular risk*

Table 9 Food choices to lower low-density lipoprotein cholesterol and improve the overall lipoprotein profile

	To be preferred	To be used in moderation	To be chosen occasionally in limited amounts
Cereals	Wholegrains	Refined bread, rice, and pasta, biscuits, corn flakes	Pastries, muffins, pies, croissants
Vegetables	Raw and cooked vegetables	Potatoes	Vegetables prepared in butter or cream
Legumes	Lentils, beans, fava beans, peas, chickpeas, soybean		
Fruit	Fresh or frozen fruit	Dried fruit, jelly, jam, canned fruit, sorbets, ice lollies/popsicles, fruit juice	
Sweets and sweeteners	Non-caloric sweeteners	Sucrose, honey, chocolate, sweets/candies	Cakes, ice creams, fructose, soft drinks
Meat and fish	Lean and oily fish, poultry without skin	Lean cuts of beef, lamb, pork, and veal, seafood, shellfish	Sausages, salami, bacon, spare ribs, hot dogs, organ meats
Dairy food and eggs	Skimmed milk and yoghurt	Low-fat milk, low-fat cheese and other milk products, eggs	Regular cheese, cream, whole milk and yoghurt
Cooking fat and dressings	Vinegar, mustard, fat-free dressings	Olive oil, non-tropical vegetable oils, soft margarines, salad dressing, mayonnaise, ketchup	Trans fats and hard margarines (better to avoid them), palm and coconut oils, butter, lard, bacon fat
Nuts/seeds		All, unsalted (except coconut)	Coconut
Cooking procedures	Grilling, boiling, steaming	Stir-frying, roasting	Frying

Coffee and arrhythmias

- **Coffee** is one of the **most widely consumed beverages in the world**, representing the **liquid extract of coffee beans**.

- **Anti-oxidant** and **anti-inflammatory properties.**

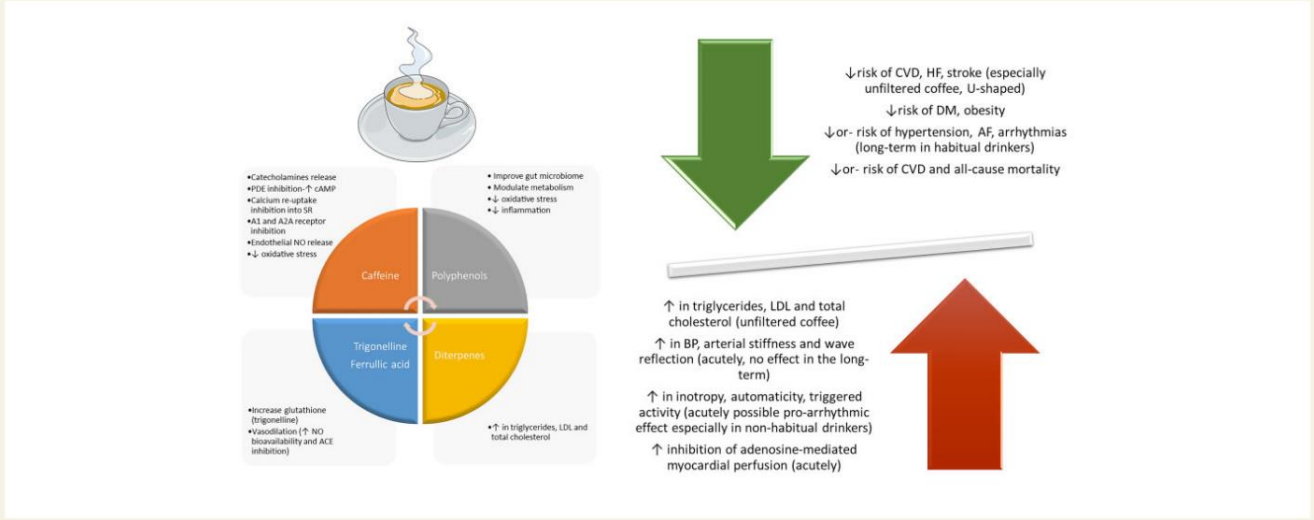
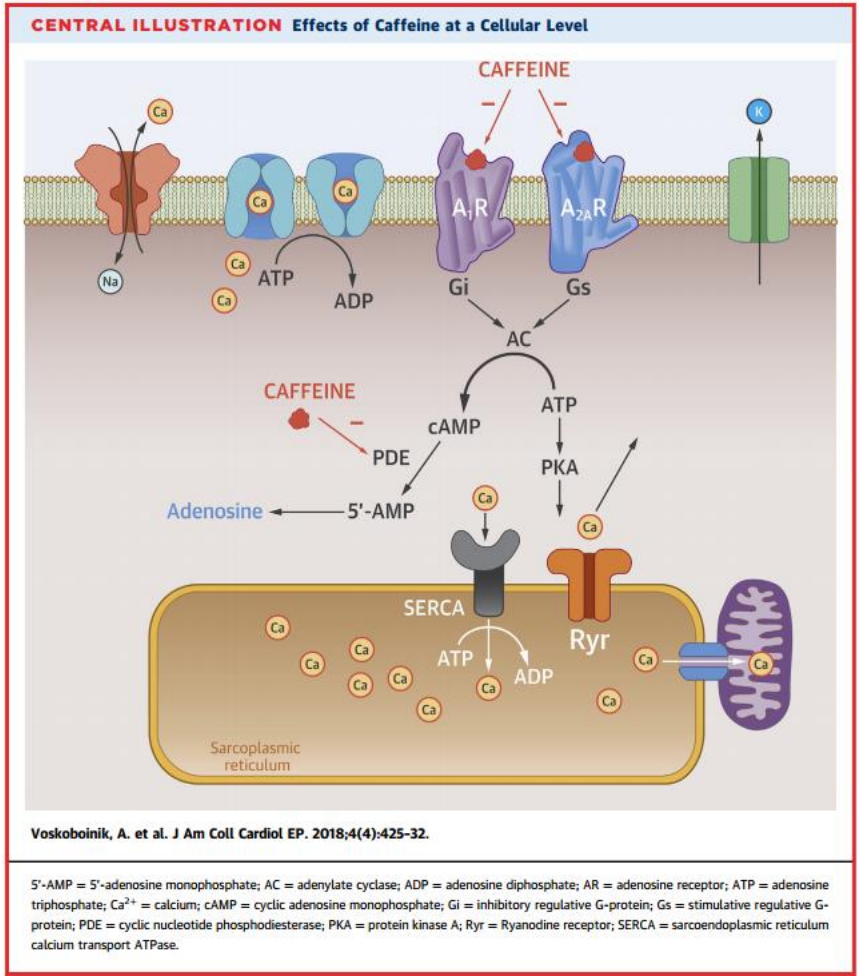


Figure 1 The balance between the beneficial and potentially harmful effects of coffee consumption on cardiovascular risk factors, cardiovascular disease, and death. ACE: Angiotensin-converting enzyme, AF: Atrial fibrillation; BP: Blood pressure; cAMP: cyclic adenosine monophosphate, CVD: Cardiovascular disease, DM: Diabetes mellitus; HF: Heart failure: LDL: Low-density lipoprotein, NO: Nitric oxide, PDE: Phosphodiesterase, SR: Sarcoplasmic reticulum.

Terentes-Printzios D, Vlachopoulos C. Coffee and cardiovascular health: looking through the steaming cup. *Cardiovasc Res*. 2022;118(7):e51-e53. doi:10.1093/cvr/cvac045



Coffee and arrhythmias

JAMA Internal Medicine | Original Investigation

Coffee Consumption and Incident Tachyarrhythmias
Reported Behavior, Mendelian Randomization, and Their Interactions

Eun-jeong Kim, MD; Thomas J. Hoffmann, PhD; Gregory Nah, MA; Eric Vittinghoff, PhD; Francesca Delling, MD; Gregory M. Marcus, MD, MAS

Figure 2. Risks of Incident Arrhythmias for Each Category Increase in Daily Coffee Intake

Group	HR (95% CI)	*P* value
All arrhythmia (n = 16 979)		
Unadjusted	0.99 (0.98-1.00)	.004
Adjusted	0.97 (0.96-0.98)	<.001
Atrial fibrillation/flutter (n = 12 811)		
Unadjusted	0.99 (0.98-1.00)	.01
Adjusted	0.97 (0.96-0.98)	<.001
Supraventricular tachycardia (n = 1920)		
Unadjusted	0.97 (0.95-0.99)	.007
Adjusted	0.96 (0.94-0.99)	.002
Ventricular tachycardia (n = 909)		
Unadjusted	0.99 (0.96-1.02)	.57
Adjusted	0.97 (0.94-1.01)	.14
Premature atrial complex (n = 97)		
Unadjusted	0.97 (0.88-1.07)	.56
Adjusted	0.98 (0.88-1.10)	.72
Premature ventricular complex (n = 632)		
Unadjusted	1.02 (0.98-1.06)	.36
Adjusted	1.01 (0.97-1.06)	.57

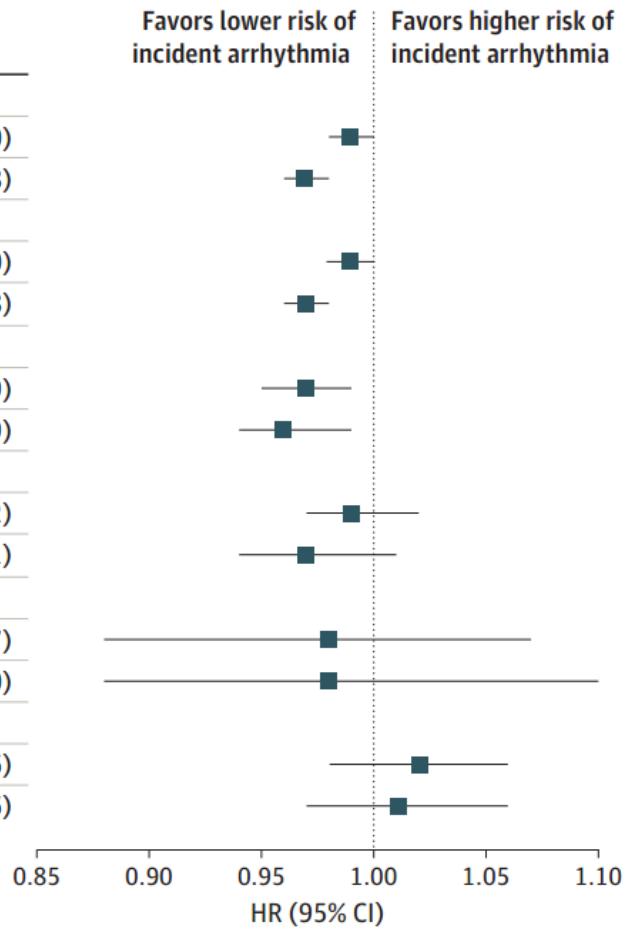
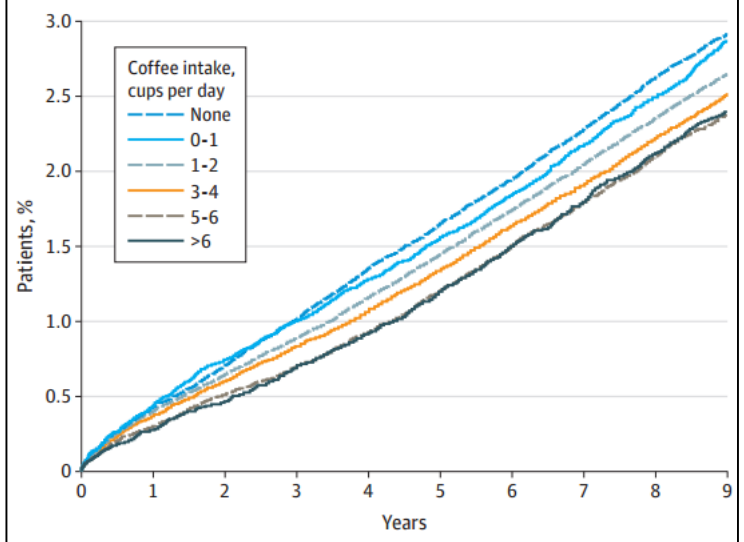


Figure 1. Cumulative Incidence of Any Arrhythmia by Coffee Consumption



Kaplan-Meier curves for the cumulative incidence of any arrhythmia according to daily coffee intake after adjusting for basic demographic characteristics (age, sex, and ethnicity), body mass index, educational level, other comorbid conditions (hypertension, diabetes, hyperlipidemia, coronary heart disease, congestive heart failure, valvular heart disease, cerebrovascular disease, peripheral artery disease, chronic kidney disease, and cancer), smoking habits, alcohol consumption, tea consumption, and physical activity.

Coffee and arrhythmias

GLOBAL CARDIOLOGY SCIENCE & PRACTICE

Lessons from the trials

Long-term outcomes from the UK Biobank on the impact of coffee on cardiovascular disease, arrhythmias, and mortality: Does the future hold coffee prescriptions?

Kotit Susy*

- **449,563 participants** (median age 58 years; 55% women), who were **free of arrhythmias or other CVD at baseline**, reported their level of **daily coffee intake** and **preferred type of coffee on questionnaires**.

- **Drinking 1-5 cups/day of ground or instant coffee** was associated with a **significant reduction in incident arrhythmia**.

- The **lowest risk** was with **4 to 5 cups/day** for **ground coffee** (hazard ratio [HR] 0.83; 95% CI, 0.76 - 0.91; *P* < .0001) and **2 to 3 cups/day for instant coffee** (HR, 0.88; 95% CI, 0.85 - 0.92; *P* < .0001).

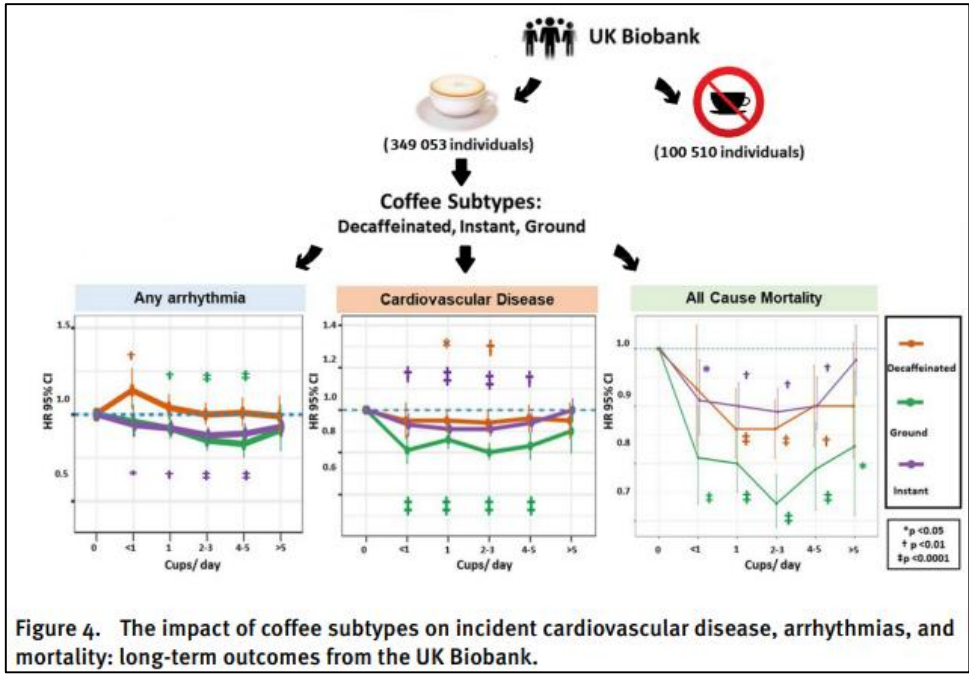


Figure 4. The impact of coffee subtypes on incident cardiovascular disease, arrhythmias, and mortality: long-term outcomes from the UK Biobank.

Coffee beyond arrhythmias

GLOBAL CARDIOLOGY SCIENCE & PRACTICE

Lessons from the trials

Long-term outcomes from the UK Biobank on the impact of coffee on cardiovascular disease, arrhythmias, and mortality: Does the future hold coffee prescriptions?

Kotit Susy*

- **Coffee drinking of up to 5 cups/day** was associated with **significant reductions** in the **risk of incident CVD**.
- **Significant reductions** in the **risk of incident CAD** were associated with **habitual coffee intake of up to 5 cups/day**, with the **lowest risk** observed in those who consumed **2 to 3 cups/day** (HR 0.89; 95% CI, 0.86 - 0.91; *P* < .0001).
- **Significant reduction** in the **risk of HF** and **ischemic stroke**. **Lowest risks** in those who consumed **2 to 3 cups/day**, with HR 0.83 (95% CI, 0.79 - 0.87; *P* < .0001) for CCF and HR 0.84 (95% CI, 0.78 - 0.90; *P* < .0001) for ischemic stroke.

Table 1 Cardiovascular outcomes and risk reduction in different coffee subtypes and overall coffee intake.

Cardiovascular Outcomes	Ground Coffee		Instant Coffee		Decaffeinated Coffee		Overall Coffee Intake
	n = 82575	%	*n* = 198062	%	*n* = 68416	%	*n* = 349053
Arrhythmia	5872	7.0	16696	8.4	6737	9.8	
AF/flutter	3269	3.9	9273	4.7	3889	5.7	
CVD	8670	10.5	29751	15	9904	14.5	
CHD	7154	8.6	25051	12.6			
CCF	1976	2.3	7029	3.5	2263	3.3	
Stroke	1114	1.3	3707	1.8	1224	1.7	
Mortality	4511	5.5	15365	7.7	7434	10.9	
Risk reduction effect							
Arrhythmia	1–5 cups/day		2–3 cups/day 0.85–0.92 (HR 0.88, CI [0.85–0.92]				2–3 cups/day (HR 0.91, CI [0.88–0.94], *P* < 0.0001)
AF/flutter	1–5 cups/day		4–5 cups/day (HR 0.85, CI [0.79–0.91], *P* < 0.0001)				4–5 cups/day (HR 0.88, CI [0.83–0.94], *P* < 0.0001)
SVT	2–5 cups/day		4–5 cups/day (HR 0.75, CI [0.63–0.88], *P* = 0.0005)				
VT/VF	2–5 cups/day						4–5 cups/day (HR 0.83, CI [0.70–0.97], *P* = 0.0201)
CVD	up to 5 cups/day		2–3 cups/day (HR 0.91, CI [0.88–0.94], *P* < 0.0001)		2–3 cups/day (HR 0.94, CI [0.90–0.99], *P* = 0.0093)		5 cups/day
CHD	up to 5 cups/day		2–3 cups/day (HR 0.91, CI [0.88–0.94], *P* < 0.0001)		2–3 cups/day (HR 0.94, CI [0.89–0.99], *P* = 0.0127)		2–3 cups/day (HR 0.89, CI [0.86–0.91], *P* < 0.0001).
CCF	up to 5 cups/day				2–3 cups/day (HR 0.86, CI [0.79–0.94], *P* = 0.0004)		2–3 cups/day (HR 0.83, (CI [0.79–0.87], *P* < 0.0001)
All-cause mortality	2–3 cups/day (HR 0.73, CI [0.69–0.78], *P* < 0.0001)		2–3 cups/day (HR 0.89, CI [0.86–0.93], *P* < 0.0001)		2–3 cups/day (HR 0.86, CI [0.80–0.91], *P* < 0.0001)		2–3 cups/day (HR 0.86, CI [0.83–0.89], *P* < 0.0001)
CV mortality	4–5 cups/day (HR 0.65, CI [0.51–0.83], *P* < 0.0001)				1–3 cups/day (HR 0.74, CI [0.61–0.89], *P* = 0.0012)		1 cup/day (HR 0.82, CI [0.74–0.90], P 0.0001)

Take-Home Messages

Dietary clinical trials are **challenging to perform** and **interpret** due to the **high number of inherent limitations**.

To date, **evidence** to support, or dispute, **low sodium intake** as a strategy to **reduce cardiovascular outcomes is inconsistent**.

Recent data on the associations between **egg consumption** and **risk of CVD mortality**, **incidence**, and **risk factors** is **mixed**.

Coffee intake shouldn't be **discouraged** by **physicians** but rather considered part of a **healthy lifestyle**, even in the **presence** or **newly development of cardiovascular disease**.

28.ª EDIÇÃO
CARDIO SANTARÉM

SANTARÉM HOTEL | 22 E 23 DE SETEMBRO 2023

Sal na hipertensão e insuficiência cardíaca, ovos na dislipidémia e café nas arritmias – respostas definitivas ou dúvidas persistentes?

Nuno Cotrim

IFE Cardiologia HDS