



Società Italiana per l'Ipertensione Arteriosa
Lega Italiana contro l'Ipertensione Arteriosa

**CONGRESSO
INTERREGIONALE
SIIA**

PIEMONTE

LIGURIA

VALLE D'AOSTA

9 OTTOBRE 2021 - TORINO

Aula Magna Ospedale Molinette
Città della Salute e della Scienza di Torino

PRESSIONE NORMALE ALTA: COSA FARE?

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COMITATO SCIENTIFICO

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GG 50 anni maschio

Viene in visita per disturbi intestinali, verosimile lieve tossinfezione. Vista la rarità delle visite presso l'ambulatorio (il paziente riferisce di godere di buona salute) ne approfittiamo per misurare la pressione arteriosa.

Posso rassicurare completamente il paziente o devo dargli qualche consiglio?

135/87 mmHg (media di 3 misurazioni) fc **80** bpm ritmico.

Dalla scheda e dall'anamnesi apprendiamo che GG ha familiarità ipertensiva, fuma 6 sigarette al giorno, è un sedentario ed ha un BMI di 28.

Gli esami di 5 anni fa evidenziavano una colesterolemia totale di 220 mg/dl.

L'ultima volta che ha misurato la pressione arteriosa (4 anni fa) era al di sotto di 140/90 mmHg.

2018 ESC/ESH Guidelines for the management of arterial hypertension

The Task Force for the management of arterial hypertension of the European Society of Cardiology (ESC) and the European Society of Hypertension (ESH)

Authors/Task Force Members: Bryan Williams* (ESC Chairperson) (UK), Giuseppe Mancia* (ESH Chairperson) (Italy), Wilko Spiering (The Netherlands), Enrico Agabiti Rosei (Italy), Michel Azizi (France), Michel Burnier (Switzerland), Denis L. Clement (Belgium), Antonio Coca (Spain), Giovanni de Simone (Italy), Anna Dominiczak (UK), Thomas Kahan (Sweden), Felix Mahfoud (Germany), Josep Redon (Spain), Luis Ruilope (Spain), Alberto Zanchetti[†] (Italy), Mary Kerins (Ireland), Sverre E. Kjeldsen (Norway), Reinhold Kreutz (Germany), Stephane Laurent (France), Gregory Y. H. Lip (UK), Richard McManus (UK), Krzysztof Narkiewicz (Poland), Frank Ruschitzka (Switzerland), Roland E. Schmieder (Germany), Evgeny Shlyakhto (Russia), Costas Tsioufis (Greece), Victor Aboyans (France), Ileana Desormais (France)

Guideline for the pharmacological treatment of hypertension in adults



**International
Society of
Hypertension**

2020 ISH Global Hypertension Practice Guidelines

6th May 2020

Classificazione della pressione arteriosa e definizione dei gradi di ipertensione (misurazione tradizionale «Office»)

Category	Systolic (mmHg)		Diastolic (mmHg)
Optimal	<120	and	<80
Normal	120–129	and/or	80–84
High normal	130–139	and/or	85–89
Grade 1 hypertension	140–159	and/or	90–99
Grade 2 hypertension	160–179	and/or	100–109
Grade 3 hypertension	≥180	and/or	≥110
Isolated systolic hypertension ^b	≥140	and	<90

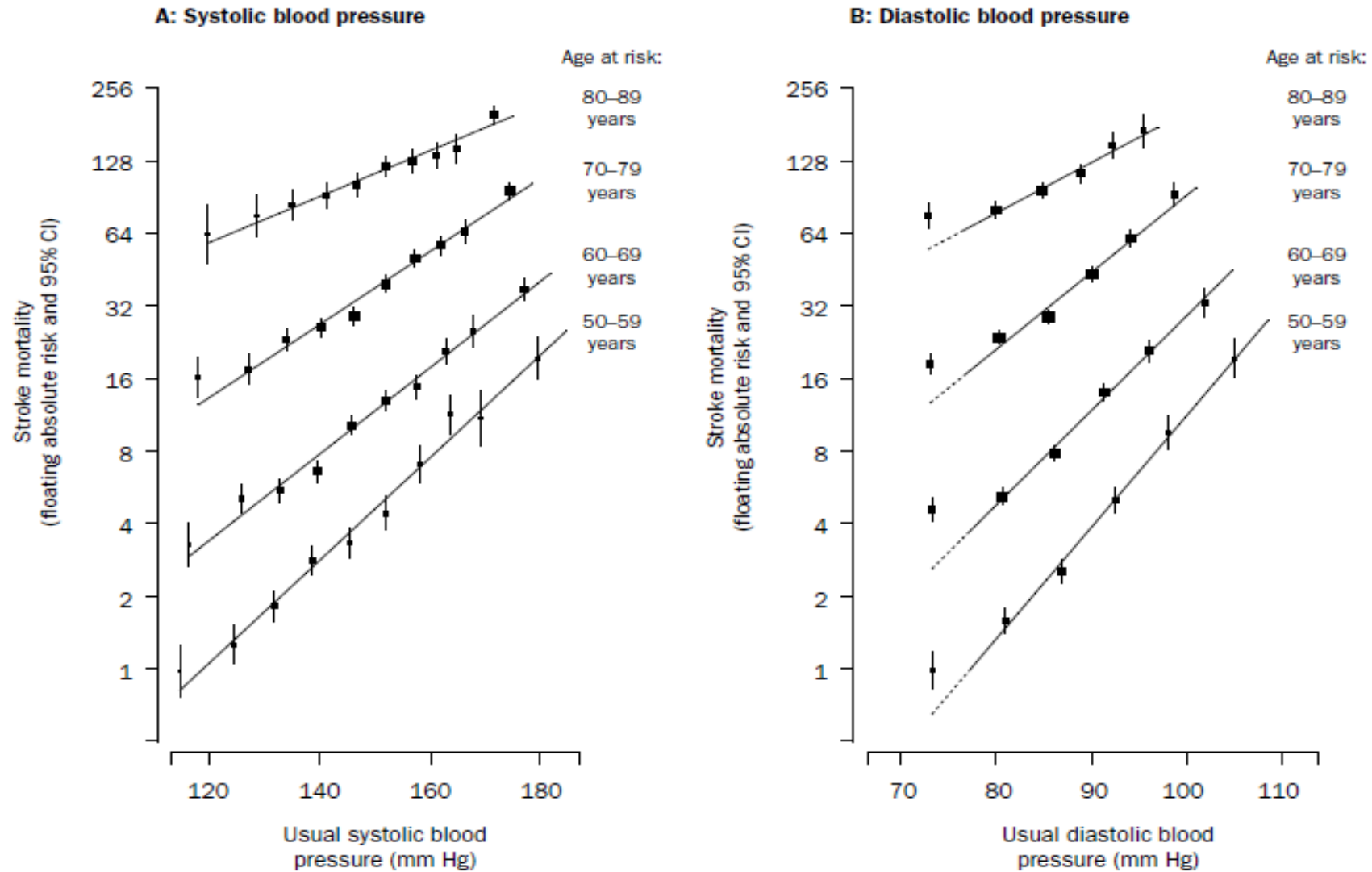
BP = blood pressure; SBP = systolic blood pressure.

^aBP category is defined according to seated clinic BP and by the highest level of BP, whether systolic or diastolic.

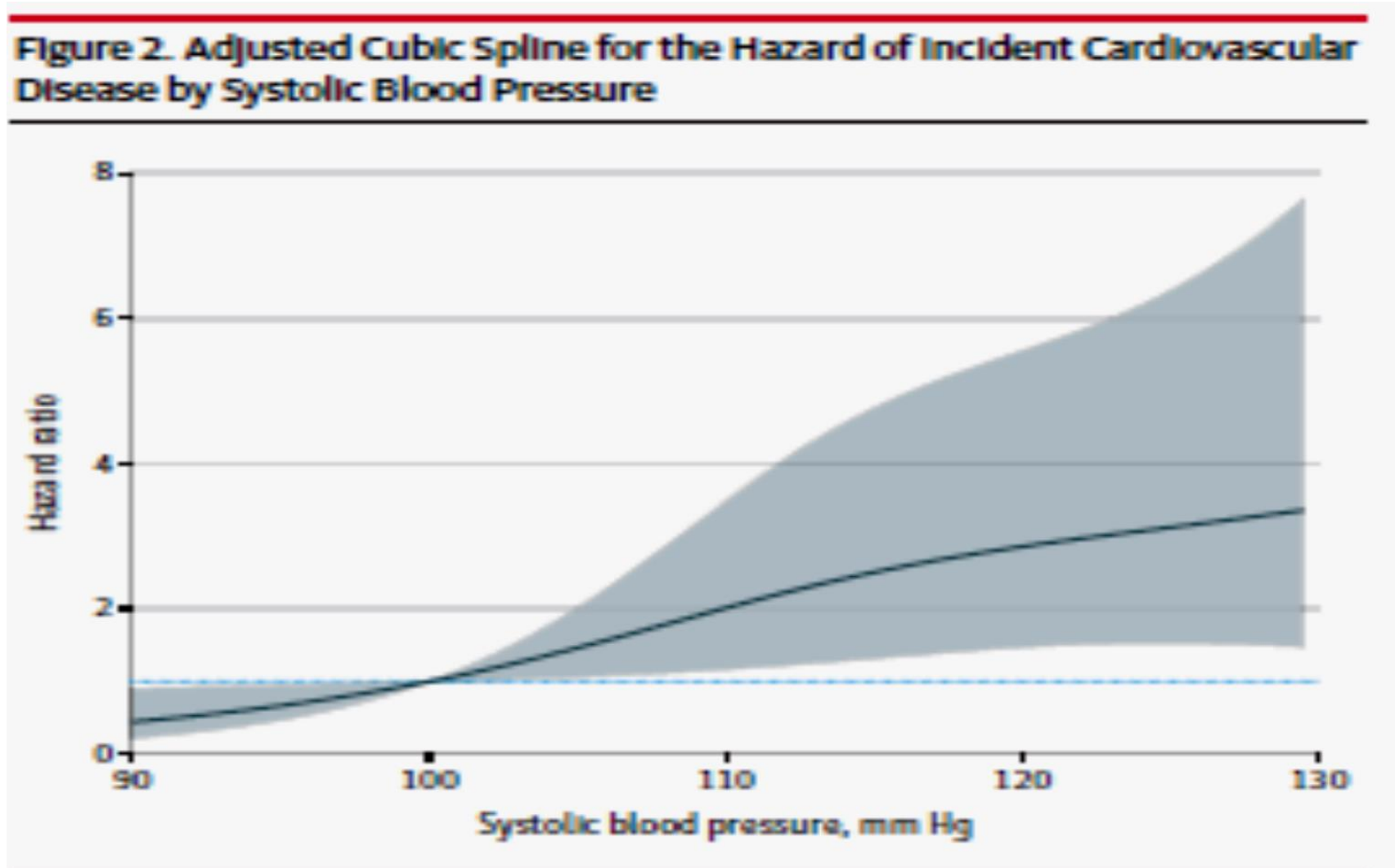
^bIsolated systolic hypertension is graded 1, 2, or 3 according to SBP values in the ranges indicated.

The same classification is used for all ages from 16 years.

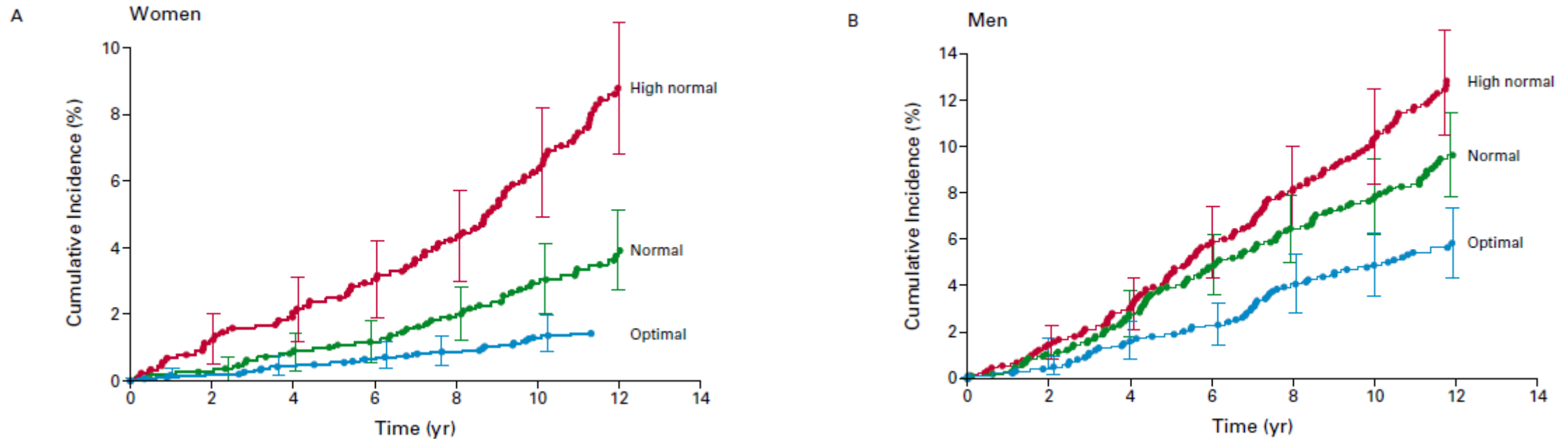
Age-specific relevance of usual blood pressure to vascular mortality: a meta-analysis of individual data for one million adults in 61 prospective studies



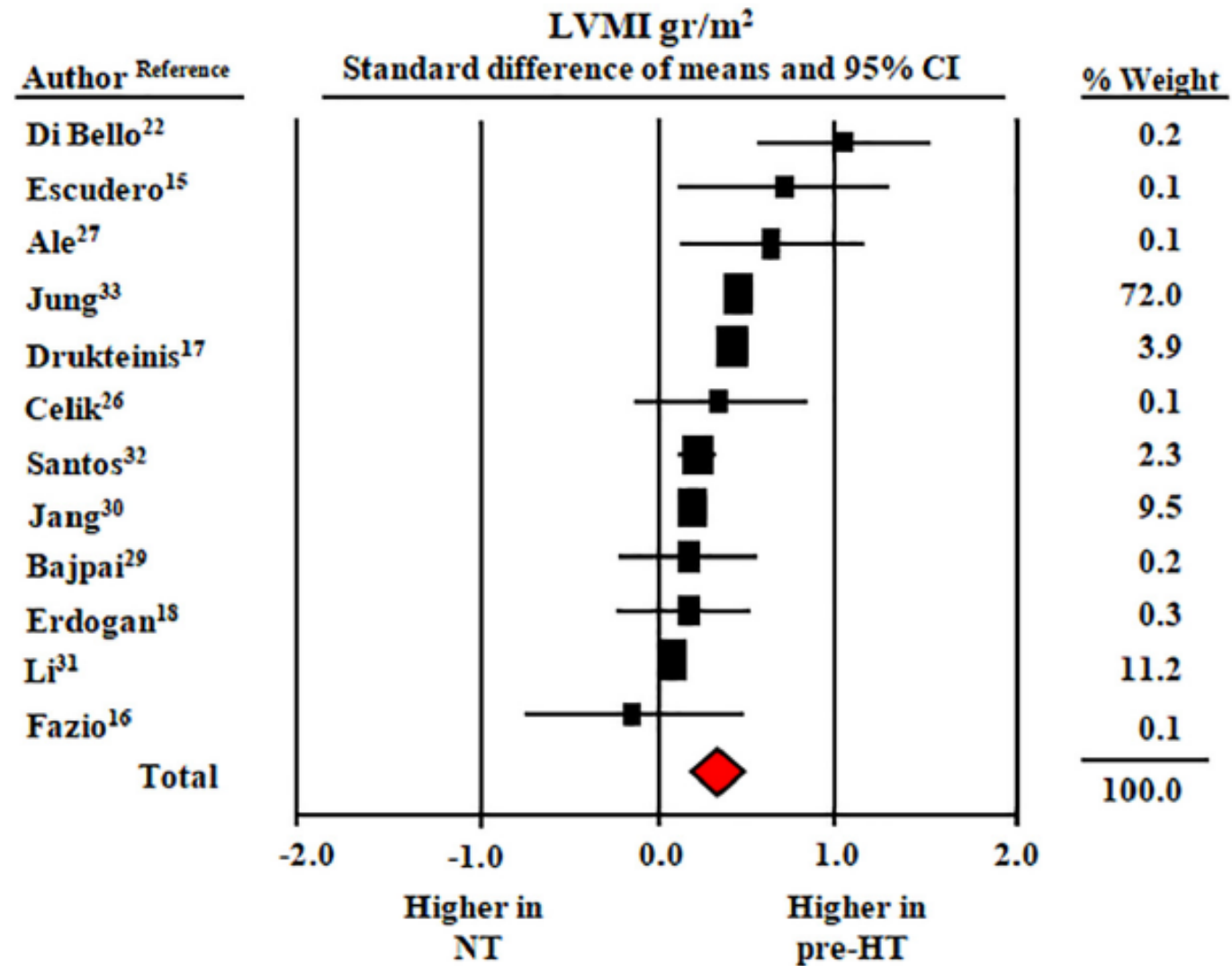
Association of Normal Systolic Blood Pressure Level With Cardiovascular Disease in the Absence of Risk Factors

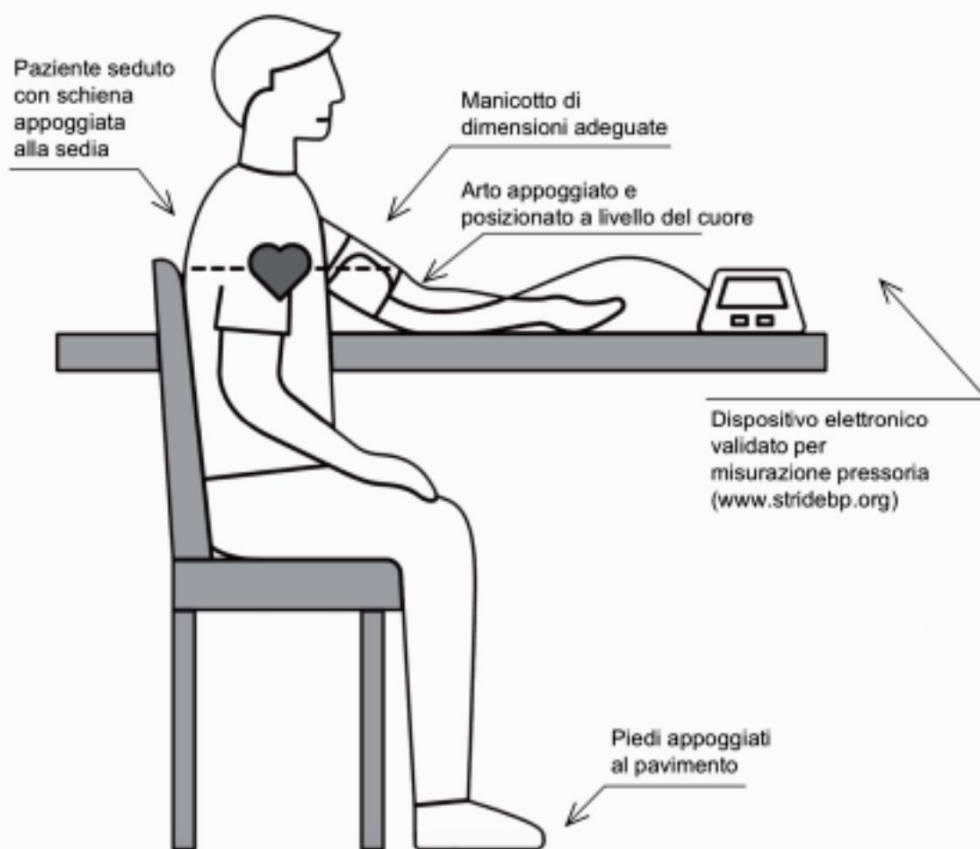
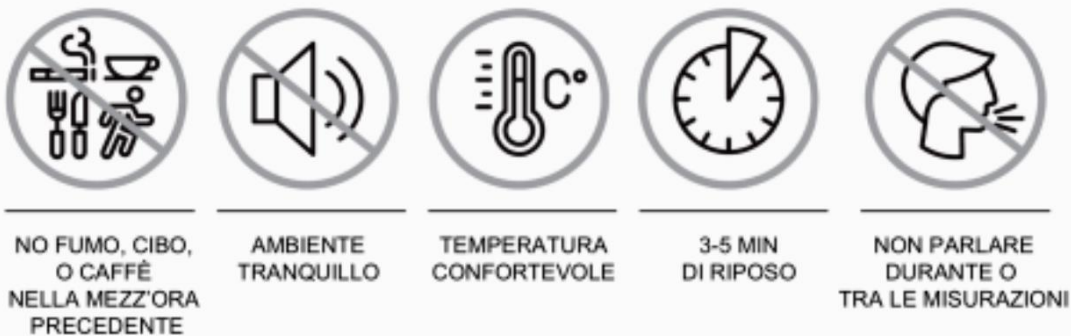


Incidenza Cumulativa di Eventi Cardiovascolari in Maschi e Femmine con PA normale alta in rapporto PA Basale



Pressione normale alta e danno cardiaco subclinico: metanalisi

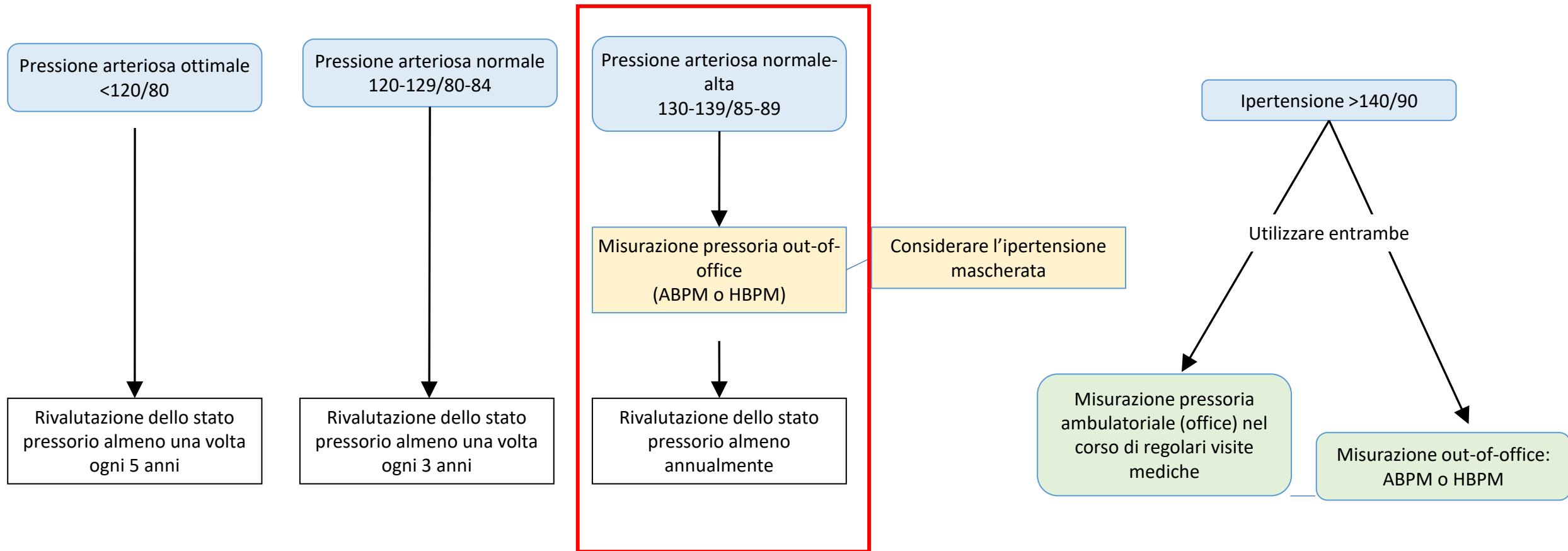




Misurazione in ambulatorio

- 2-3 visite in ambulatorio a distanza di 1-4 settimane
- La diagnosi non dovrebbe essere fatta sulla base di una singola visita (a meno che la PA sia $\geq 180/110$ mmHg e coesista patologia cardiovascolare)
- Quando possibile la diagnosi di ipertensione dovrebbe essere confermata da misurazioni out of office

SCREENING E DIAGNOSI DELL'IPERTENSIONE



Definizione di Ipertensione arteriosa in base a misurazione tradizionale (office) e non office (ABPM e domicilio)

Category	Systolic (mmHg)		Diastolic (mmHg)
Office BP	≥ 140	and/or	≥ 90
Ambulatory BP			
Daytime (or awake) mean	≥ 135	and/or	≥ 85
Night-time (or asleep) mean	≥ 120	and/or	≥ 70
24-h mean	≥ 130	and/or	≥ 80
Home BP mean	≥ 135	and/or	≥ 85

(www.stridebp.org)

Ipertensione mascherata

Valori persistentemente normali alla misurazione tradizionale, ma elevati con metodiche out of office in pazienti non in trattamento farmacologico

PA clinica **< 140/90**

e

ABPM 24 h **> 130/80 e/o**

ABPM day time **≥ 135/85 e/o**

ABPM night time **≥ 120/70**

oppure

HOME BP **≥ 135/85**

Fattori che influenzano il rischio cardiovascolare - 1

Demographic characteristics and laboratory parameters
Sex (men > women)
Age
Smoking – current or past history
Total cholesterol and HDL-C
Uric acid
Diabetes
Overweight or obesity
Family history of premature CVD (men aged < 55 years and women aged < 65 years)
Family or parental history of early onset hypertension
Early onset menopause
Sedentary lifestyle
Psychosocial and socioeconomic factors
Heart rate (resting values > 80 beats per min)

Fattori che influenzano il rischio cardiovascolare -2

Asymptomatic HMOD
Arterial stiffening: Pulse pressure (in older people) ≥ 60 mmHg Carotid–femoral PWV > 10 m/s
ECG LVH
Echocardiographic LVH
Microalbuminuria or elevated albumin–creatinine ratio
Moderate CKD with eGFR 30–59 mL/min/1.73 m ² (BSA)
Ankle–brachial index < 0.9
Advanced retinopathy: haemorrhages or exudates, papilloedema

Fattori che influenzano il rischio cardiovascolare -3

Established CV or renal disease
Cerebrovascular disease: ischaemic stroke, cerebral haemorrhage, TIA
CAD: myocardial infarction, angina, myocardial revascularization
Presence of atheromatous plaque on imaging
Heart failure, including HFpEF
Peripheral artery disease
Atrial fibrillation
Severe CKD with eGFR < 30 mL/min/1.73 m ²

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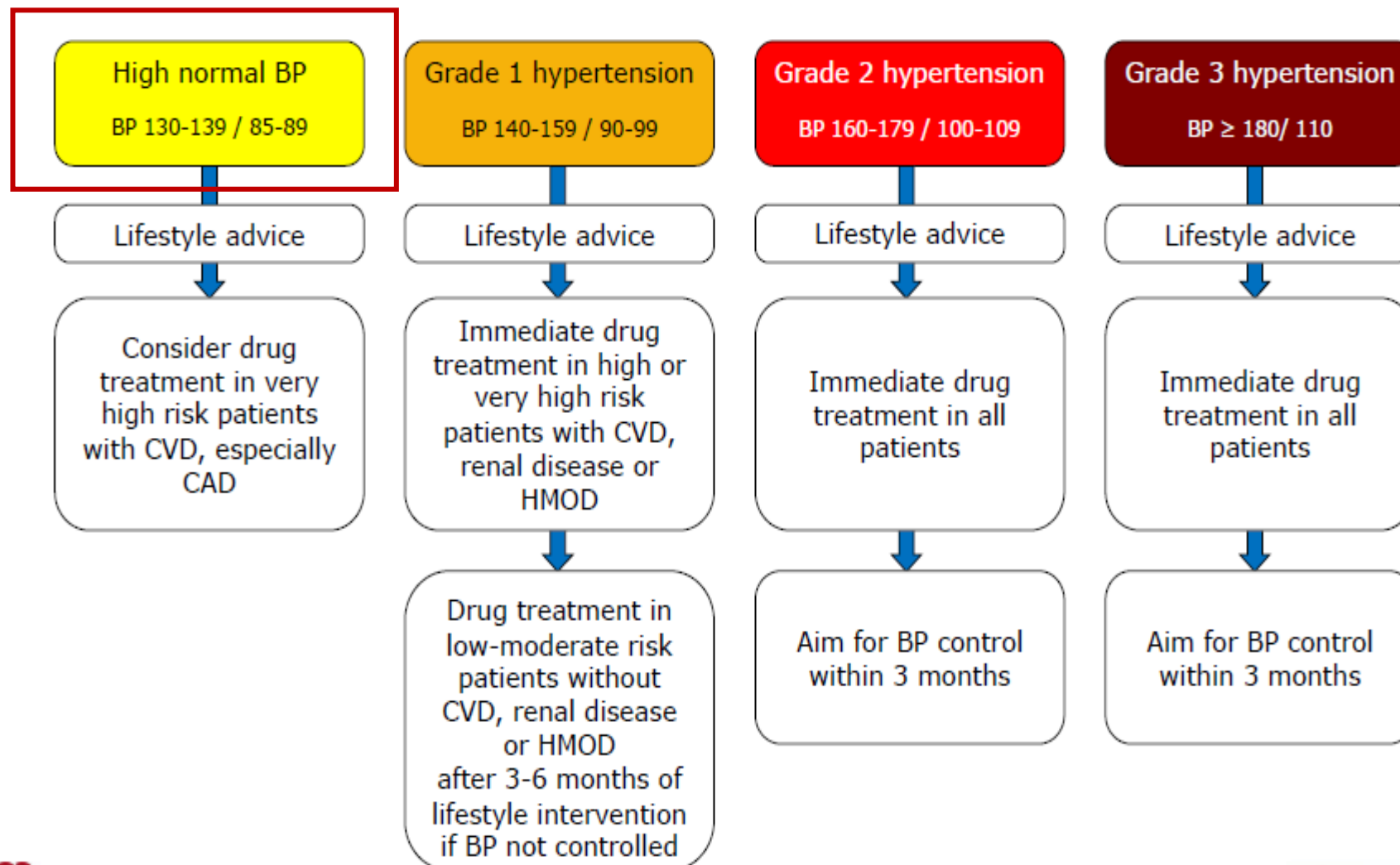
Gli esami di 5 anni fa evidenziavano una colesterolemia totale di 240 mg/dl.

L'ultima volta che ha misurato la pressione arteriosa (4 anni fa) era al di sotto di 140/90 mmHg

Classification of hypertension stages according to BP levels, presence of CV risk factors, HMOD, or comorbidities

Hypertension disease staging	Other risk factors, HMOD, or disease	BP (mmHg) grading			
		High-normal SBP 130–139 DBP 85–89	Grade 1 SBP 140–159 DBP 90–99	Grade 2 SBP 160–179 DBP 100–109	Grade 3 SBP ≥ 180 DBP ≥ 110
Stage 1 (uncomplicated)	No other risk factors	Low risk	Low risk	Moderate risk	High risk
	1 or 2 risk factors	Low risk	Moderate risk	Moderate to high risk	High risk
	≥ 3 risk factors	Low to moderate risk	Moderate to high risk	High risk	High risk
Stage 2 (asymptomatic disease)	HMOD, CKD grade 3, or diabetes mellitus without organ damage	Moderate to high risk	High risk	High risk	High to very high risk
Stage 3 (established disease)	Established CVD, CKD grade ≥ 4, or diabetes mellitus with organ damage	Very high risk	Very high risk	Very high risk	Very high risk

Initiation of BP-lowering treatment (lifestyle changes and medication) at different initial office BP levels



International Guidelines

Non- Pharmacological Approach to Hypertension-High-Normal Blood Pressure



ESC-ESH 2018

ESH 2020

ISH-2020

OMS 2021

Adoption of lifestyle changes in patients with hypertension

Recommendations	Class	Level
Salt restriction to < 5 g per day is recommended.	I	A
It is recommended to restrict alcohol consumption to: • Less than 14 units per week for men. • Less than 8 units per week for women.	I	A
It is recommended to avoid binge drinking.	III	C
Increased consumption of vegetables, fresh fruits, fish, nuts, unsaturated fatty acids (olive oil), low consumption of red meat, and consumption of low-fat dairy products are recommended.	I	A
Body-weight control is indicated to avoid obesity (BMI > 30 kg/m ² or WC > 102 cm in men and > 88 cm in women) and aim at a healthy BMI (about 20–25 kg/m ²) and WC values (< 94 cm in men and < 80 cm in women) to reduce BP and CV risk.	I	A
Regular aerobic exercise (e.g. at least 30 min of moderate dynamic exercise on 5–7 days per week) is recommended.	I	A
Smoking cessation and supportive care and referral to smoking cessation programs are recommended.	I	B

2020 International Society of Hypertension global hypertension practice guidelines

TABLE 8. Lifestyle modifications

Salt reduction	There is strong evidence for a relationship between high salt intake and increased blood pressure [47]. Reduce salt added when preparing foods, and at the table. Avoid or limit consumption of high salt foods, such as soy sauce, fast foods, and processed food including breads and cereals high in salt.
Healthy diet	Eating a diet that is rich in whole grains, fruits, vegetables, polyunsaturated fats and dairy products, and reducing food high in sugar, saturated fat and trans fats, such as DASH diet (http://www.dashforhealth.com) [48]. Increase intake of vegetables high in nitrates known to reduce BP, such as leafy vegetables and beetroot. Other beneficial foods and nutrients include those high in magnesium, calcium, and potassium, such as avocados, nuts, seeds, legumes, and tofu [49].
Healthy drinks	Moderate consumption of coffee, green, and black tea [50]. Other beverages that can be beneficial include Karkadé (Hibiscus) tea, pomegranate juice, beetroot juice, and cocoa [49].
Moderation of alcohol consumption	Positive linear association exists between alcohol consumption, blood pressure, the prevalence of hypertension, and CVD risk [51]. The recommended daily limit for alcohol consumptions is two standard drinks for men and 1.5 for women (10 g alcohol/standard drink). Avoid binge drinking.
Weight reduction	Body weight control is indicated to avoid obesity. Particularly abdominal obesity should be managed. Ethnic-specific cut-offs for BMI and waist circumference should be used [52]. Alternatively, a waist-to-height ratio <0.5 is recommended for all populations [53,54].
Smoking cessation	Smoking is a major risk factor for CVD, COPD, and cancer. Smoking cessation and referral to smoking cessation programs are advised [55].
Regular physical activity	Studies suggest that regular aerobic and resistance exercise may be beneficial for both the prevention and treatment of hypertension [56–58]. Moderate intensity aerobic exercise (walking, jogging, cycling, yoga, or swimming) for 30 min on 5–7 days per week or HIIT (high intensity interval training), which involves alternating short bursts of intense activity with subsequent recovery periods of lighter activity. Strength training also can help reduce blood pressure. Performance of resistance/strength exercises on 2–3 days per week.
Reduce stress and induce mindfulness	Chronic stress has been associated to high blood pressure later in life [59]. Although more research is needed to determine the effects of chronic stress on blood pressure, randomized clinical trials examining the effects of Transcendental Meditation/mindfulness on blood pressure suggest that this practice lowers blood pressure [60]. Stress should be reduced and mindfulness or meditation introduced into the daily routine.
Complementary, alternative or traditional medicines	Large proportions of hypertensive patients use complementary, alternative, or traditional medicines (in regions, such as Africa and China) [61,62] yet large-scale and appropriate clinical trials are required to evaluate the efficacy and safety of these medicines. Thus, use of such treatment is not yet supported.
Reduce exposure to air pollution and cold temperature	Evidence from studies support a negative effect of air pollution on blood pressure in the long-term [63,64].

Quantitative blood pressure–lowering effects of selected dietary patterns

Diet	BP-lowering effect
Dietary Approach to Stop Hypertension (DASH)	–11 mm Hg in SBP and –3 mm Hg in DBP compared with the control group ^{7,8} –5.5 mm Hg in SBP and –3 mm Hg in DBP in normotensive patients; –11.4 mm Hg in SBP and –5.5 mm Hg in DBP in the hypertensive population compared with controls ⁸
Mediterranean	–2.5 mm Hg in SBP and –1.3 mm Hg in DBP compared with the control diet ¹³
Vegetarian	–4.8 mm in SBP and –2.2 mm Hg in DBP compared with the omnivorous diets ³⁸ –4.1 mm Hg in SBP and –4.01 mm Hg in DBP in patients with baseline SBP $\geq$ 130 mm Hg ³⁹
Severe energy restriction	A mean reduction of 37 / 13 mm Hg in BP; the greatest reduction of 60 / 17 mm Hg (in patients with arterial hypertension stage 3) ⁷¹ –9.9 mm Hg in SBP and –5.8 mm Hg in DBP ⁷²
Paleolithic	–3.1 mm Hg in SBP compared with the control group ⁷⁴
Atkins	–5.1 mm Hg in SBP and –3.3 mm Hg in DBP ⁷⁵

Dietary supplements and nutraceuticals with a clinically relevant blood pressure-lowering effect in humans

Dietary supplement/ nutraceutical	Level of evidence	Potential mechanisms involved in blood pressure regulation
Aged garlic extract	Meta-analysis of randomized controlled trials	↑ NO production; ↑ H ₂ S; ↑ bradykinin; ↓ catecholamine sensitivity; ACE inhibition; calcium channel blocking
Beetroot juice	Meta-analysis of randomized controlled trials	↑ NO availability
Calcium (in pregnancy)	Meta-analysis of randomized controlled trials	Unknown
Chelated magnesium	Meta-analysis of randomized controlled trials	Calcium channel blocking; ↑ PGE; ↑ NO synthesis
Cocoa flavonoids	Meta-analysis of randomized controlled trials	Antioxidation; free radical scavenging; ↑ NO production and endothelial function; ↓ inflammation; ↓ ROS production (NADPH oxidase inhibition)
Coenzyme Q10 (high dosage in hypertensive patients)	Meta-analysis of randomized controlled trials	Antioxidation; free radical scavenging; ↑ vitamin and antioxidant regeneration; acts as a cofactor and coenzyme in mitochondrial oxidative phosphorylation; ↑ LDL and lipid oxidation
Controlled-release melatonin (night hypertension)	Meta-analysis of randomized controlled trials	↑ NO production; protection of vessels from oxidation; regulation of circadian rhythms
Fish peptides	Various small randomized controlled trials	ACE inhibition
Isoflavones	Meta-analysis of randomized controlled trials	ACE inhibition?
L-arginine (high dosages)	Meta-analysis of randomized controlled trials	↑ NO availability
Lactotripeptides	Meta-analysis of randomized controlled trials	ACE inhibition?
Lycopene	Meta-analysis of randomized controlled trials	Antioxidation; free radical scavenging
Polyunsaturated fatty acids (high dosages)	Meta-analysis of randomized controlled trials	↓ TXA ₂ and inflammation; ↑ vasodilator PGs; ↑ NO synthase; ↓ insulin resistance; ↓ RAAS
Potassium	Different randomized controlled trials	↑ Natriuresis; ↑ baroreflex sensitivity modulation; ↑ Na ⁺ -K ⁺ -ATPase; ↑ insulin sensitivity; ↓ ATII; ↓ catecholamine sensitivity; ↓ ADMA; ↓ oxidative stress; ↓ TGF-β production
Probiotics	Meta-analysis of randomized controlled trials	ACE inhibition?
Pycnogenol	Meta-analysis of randomized controlled trials	↑ NO production; ↓ ACE; ↑ endothelial function; ↓ myeloperoxidase activity; ↓ urinary albumin excretion
Resveratrol	Meta-analysis of randomized controlled trials	↑ NO production; protection of vessels from oxidation; ↓ vascular inflammation; ↓ platelet aggregation
Vitamin C	Meta-analysis of randomized controlled trials	↓ adrenal steroid production and serum aldehydes; ↓ binding affinity of the AT1R for ATII; ↑ Na ⁺ -K ⁺ -ATPase; ↑ natriuresis; ↑ superoxide dismutase; ↑ cyclic GMP; ↑ NO and PGI ₂

Nutraceuticals and blood pressure control: a European Society of Hypertension position document

	Expected effect on office BP	Main mechanisms of action	Clinical evidence	Concerns
Foods				
Nonroasted green coffee	−3/−2 mmHg	Antioxidant, ↑ NO bioavailability, ↓ endothelial dysfunction	Meta-analysis of 9 RCTs (n=501)	No major one
Pomegranate juice	−5/−2 mmHg	Antioxidant, ↓ endothelial dysfunction	Meta-analysis of 8 RCTs (n=574)	Tested on mid-east people only
Tea	−2/−1 mmHg	Antioxidant	Meta-analysis of 25 RCTs (n=1476)	No major one
Karkadè tea	−7/−3 mmHg	Antioxidant	Meta-analysis of 5 RCTs (n=390)	Tested on mid-east people only
Beetrooth juice	−4/1 mmHg	No donor	Meta-analysis of 16 RCTs (n=254)	Not tasty
Sesame	−8/−6 mmHg	Antioxidant	Meta-analysis of 8 RCTs (n=843)	Tested on mid-east people only

Nutraceuticals and blood pressure control: a European Society of Hypertension position document

	Expected effect on office BP	Main mechanisms of action	Clinical evidence	Concerns
Nutrients				
Omega–3 polyunsaturated fatty acids	–2/–1 mmHg	↓ Endothelial dysfunction	Meta-analysis of 70 RCTs (n=2250)	High dosages needed, high cost, fishy aftertaste
Proteins, peptides and amino-acids (L-arginine)	–3/–2 mmHg (LTPs)	ACE-inhibition	Meta-analysis of 18 RCTs (n=904)	High cost, most active in Asians
	–5/–3 mmHg (L-Arg)	NO precursor	Meta-analysis of 11 RCTs (n=400)	High dosages needed
Calcium	–1/–1 mmHg	Direct effect on artery wall	Mainly epidemiological data	Larger effect in pregnant, increased risk of myocardial infarction when not associated with vitamin D
Magnesium	–3/–3 mmHg	↑ NO synthesis, ↓ endothelial dysfunction	Meta-analysis of 34 RCTs (n=2028)	No major one
Potassium	–4/–3 mmHg	Balance of negative effect of sodium on blood pressure	Meta-analysis of 33 RCTs (n=1829)	Risk of hyper-kaliemina in patients with advanced chronic kidney disease
Vitamin C	–4/1 mmHg	NO and PGI ₂ release, diuresis and natriuresis, ↓ adrenal steroid production, ↑ cyclic GMP increase, potassium channels activation, cytosolic calcium reduction	Meta-analysis of 21 RCTs (n=1407)	No major one
Prebiotics and soluble fibres	–3/–2 mmHg	Improvement of microbiota	Meta-analysis of 15 RCTs (n=1302)	No major one

Nutraceuticals and blood pressure control: a European Society of Hypertension position document

	Expected effect on office BP	Main mechanisms of action	Clinical evidence	Concerns
Nonnutrient nutraceuticals				
Resveratrol and grape seed extracts	−9/−1 mmHg	Antioxidant, ↓ insulin-resistance	Meta-analysis of 17 RCTs (n=782)	High dosages needed, high cost, efficacy limited to insulin-resistant individuals
Cocoa flavonoids	−2/−2 mmHg	Antioxidant, ↑ NO synthesis, ↓ endothelial dysfunction	Meta-analysis of 40 RCTs (n=1804)	High dosages needed, high cost
Soy isoflavones	−5/−2 mmHg	Antioxidant, hormone-replacement therapy like effect	Meta-analysis of 12 RCTs (n=1551)	Effective in postmenopausal women only
Aged garlic extract	−9/4 mmHg	Antioxidant, ↑ NO synthesis, ↓ endothelial dysfunction	Meta-analysis of 9 RCTs (n=482)	Aftertaste, increased of bleeding time
Lycopene	−5/−1 mmHg	Antioxidant, ↓ endothelial dysfunction	Meta-analysis of 6 RCTs (n=482)	High dosages needed, high cost
Pycnogenol	−3/−3 mmHg	Antioxidant, ↓ Endothelial dysfunction, angiotensin-converting enzyme inhibitor	Meta-analysis of 9 RCTs (n=549)	High dosages needed, high cost
Alpha lipoic acid	−8/−7 mmHg	Antioxidant	Meta-analysis of 7 RCTs (n=478)	Gastric intolerance
Slow-release melatonin	−6/−3 mmHg	Antioxidant, ↑ NO synthesis, ↓ endothelial dysfunction	Meta-analysis of 7 RCTs (n=221)	Efficacy limited to night hypertension
Taurine	−7/−5 mmHg	GABA _A receptors activation	Single large RCT (n=120)	High dosages needed, high cost
Probiotics	−4/−2 mmHg	Improvement of microbiota	Meta-analysis of 9 RCTs (n=543)	Effective doses $\geq 10^{11}$ colony-forming units

Consigli al sig.GG 50 anni maschio

- Al momento le linee guida non indicano necessità di terapia farmacologica
- Modificazione stile di vita: **si**
- Rivalutazione esami ematochimici di routine
- Utilizzo della misurazione out of office
- rivalutazione in ambulatorio a 6 mesi