AMORE E PSICHE
AI TEMPI DEL DIABETE

La sessualità nella persona con diabete: evidenze cliniche e pratica quotidiana

"La disfunzione erettile: indicatore di rischio cardiovascolare"

Paolo Falasca

UOC di Medicina interna

Servizio di Endocrinologia e Diabetologia

Ospedale "San Sebastiano Martire" – Frascati (Roma)

Disfunzione erettile

Gruppo Italiano Studio Deficit Erettile

identificazione random eseguita da 143 MMG

uomini con età superiore a 18 anni

gennaio 96 - febbraio 97

numerosità del campione: 2010 uomini

prevalenza della DE: 12.8%

Parazzini F et al, Eur Urol, 37:43-49, 2000

Francesco, 58 anni

Anamnesi Fisiologica

- Familiarità per ipertensione, malattie cardiovascolari e DM2
- Sedentario
- Fumatore ≈ 20 sig/die da 30 anni
- Riferisce libido normale
- Da circa 3 anni difficoltà ad ottenere e mantenere l'erezione

Anamnesi Patologica Remota

- Ipertensione arteriosa da 5 anni in terapia con perindopril 10 mg + indapamide 2.5 mg + amlodipina 5 mg

- Alterata glicemia a digiuno da alcuni anni

Anamnesi Patologica Prossima

- Riferisce incremento ponderale di circa 6 kg negli ultimi 10 mesi in seguito a sospensione dell'attività fisica (trauma ginocchio destro)
- Da tre mesi astenia ingravescente, dispnea per sforzi di media entità con episodica precordialgia che regredisce con il riposo

Anamnesi sessuologica

Riferisce normale desiderio sessuale. Da circa tre anni progressiva difficoltà ad ottenere, ma soprattutto a mantenere una normale erezione tale da poter concludere il rapporto sessuale.

Fa coincidere l'inizio di tale sintomatologia a difficoltà lavorative (Cassa integrazione) intervenute circa 3 anni e mezzo fa.

Spesso va a dormire presto al fine evitare contatti fisici con la partner.

EO:

- Peso 79 kg, altezza 167 cm (BMI = 28.3 kg/m^2)
- Obesità centrale, circonferenza addominale 109 cm
- Obiettività cardiaca: Azione cardiaca ritmica (≅ 90 bpm) compenso cardiocircolatorio, PA 140/85 mmHg
- Polsi periferici isosfigmici
- Obiettività toracica e addominale nella norma
- Non ginecomastia
- Tono dell'umore depresso

Esami ematochimici

Profilo metabolico ed ormonale:

- Glicemia a digiuno: 117 mg/dL
- HbA1c: 5.7%
- Uricemia: 5.5 mg/dL
- TSH reflex: 1.2 µUI/mL
- PRL: 9 ng/mL
- Testosterone: 3.5 ng/mL
- LH: 12 U/L
- PSA totale: 3.8 ng/mL con normale rapporto L/T
- Colesterolo totale: 169 mg/dL
- Colesterolo HDL: 50 mg/dL
- Trigliceridi: 150 mg/dL

Esami ematochimici:

- Funzione epatica e renale nella norma
- Emocromo
- Elettroforesi proteica normale
- Microalbuminuria: 14 µg/min (v.n. < 20 µg/min)
- VES nella norma

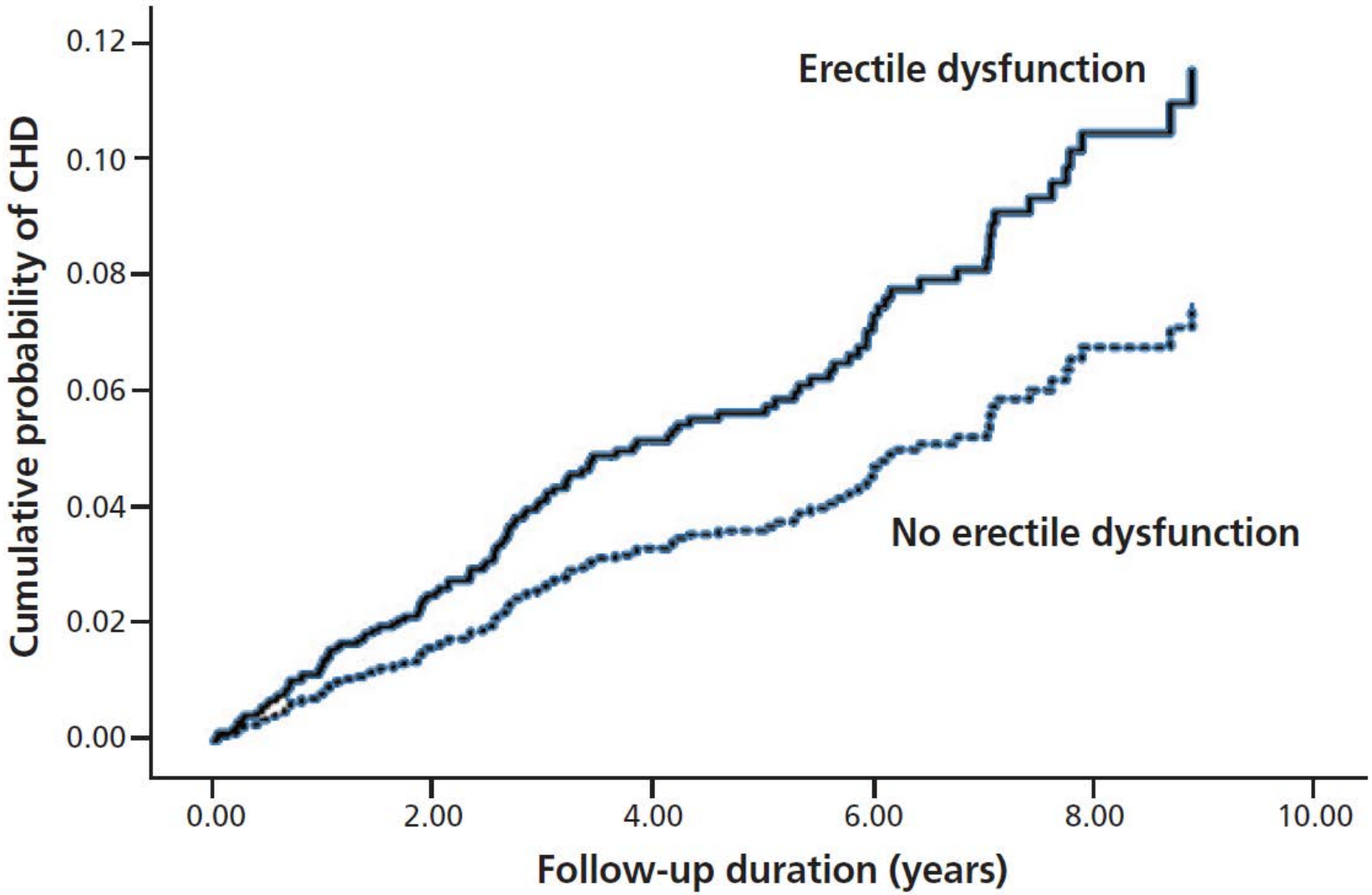
Esami strumentali:

- ECG: Ritmo sinusale. Anomalie aspecifiche del tratto ST.
- Ecocardiogramma: Modesta ipertrofia della parete posteriore. Massa ventricolare sinistra aumentata. Buona cinesi globale e segmentaria. Ridotta compliance ventricolare sinistra.
- ECD dei tronchi sovraortici: Ispessimento medio-intimale diffuso a carico delle carotidi comuni; placca fibrosa alla biforcazione sinistra.
- Esame fundus oculi: Quadro di retinopatia ipertensiva di I - II grado.

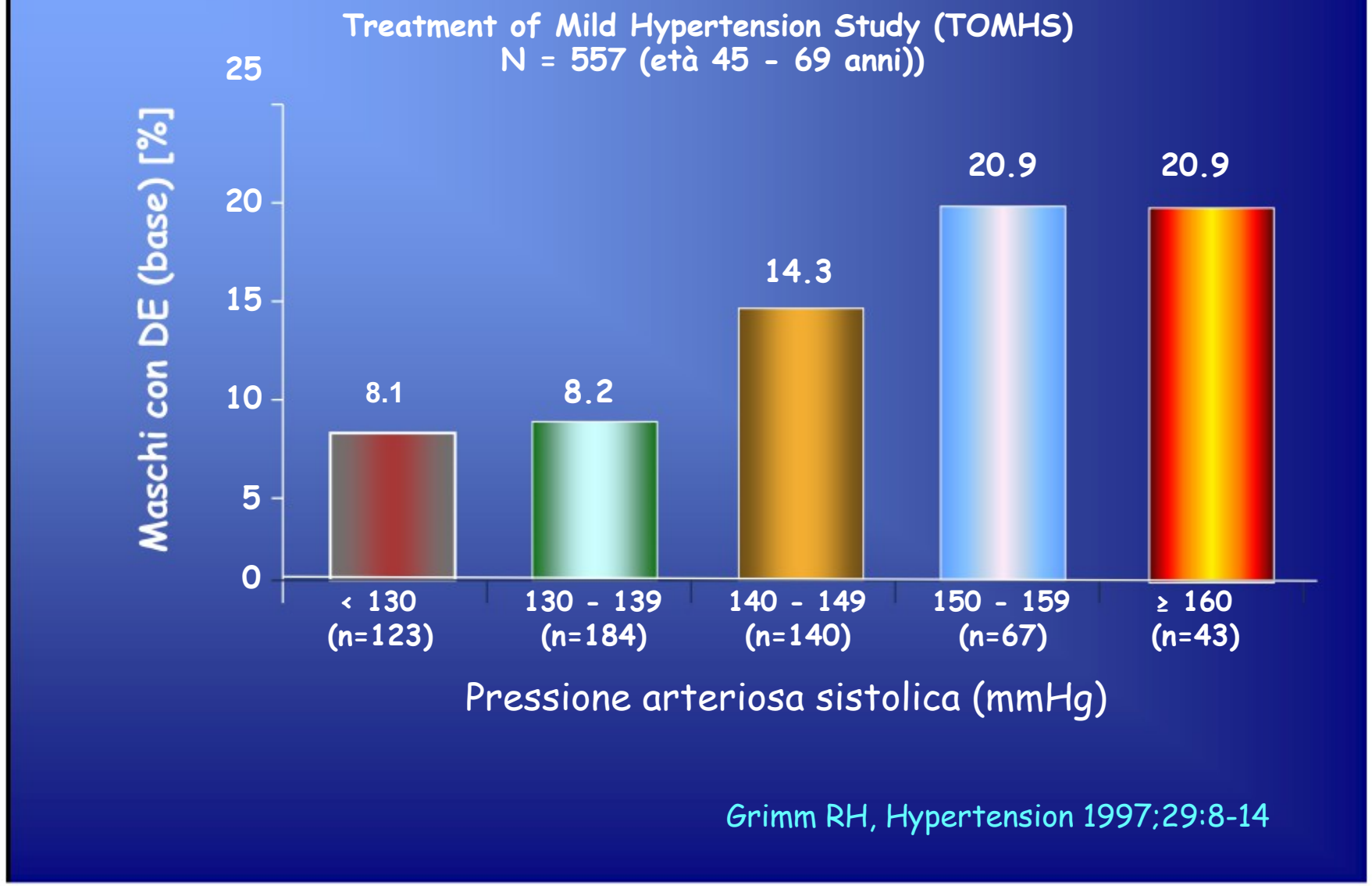
In seguito alla comparsa di angor da sforzo mentre saliva le scale, effettua un test ergometrico che risulta positivo per ischemia.

Viene sottoposto a coronarografia con riscontro di lesione critica sul ramo intermedio, trattata con PTCA + stent medicato.

Figure 4. Cumulative hazard ratio of coronary heart disease (CHD) events stratified by erectile dysfunction

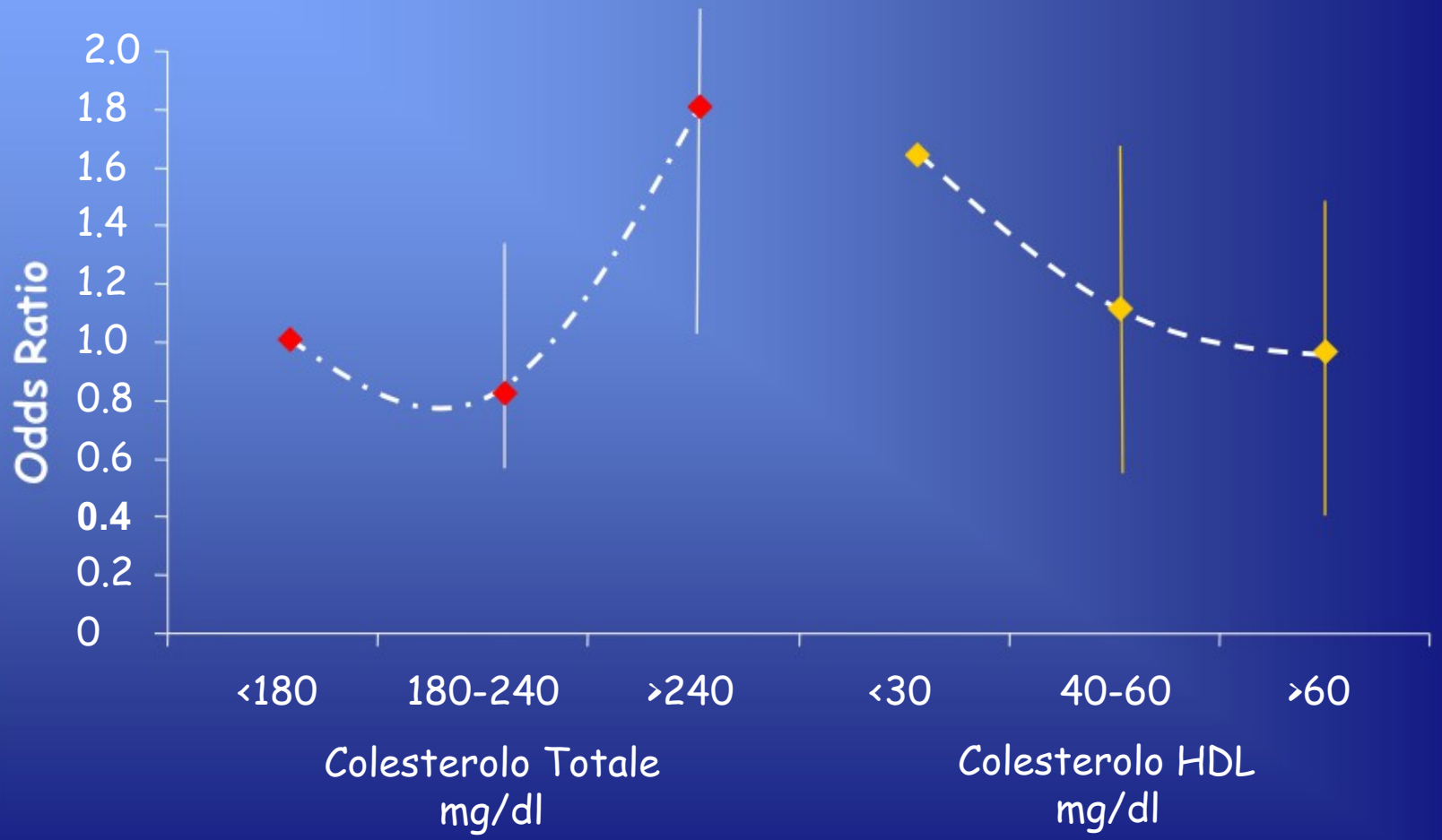


Ipertensione e DE



Grimm RH, Hypertension 1997;29:8-14

Odds Ratio del DE in rapporto ai livelli di Colesterolo Totale e Colesterolo HDL



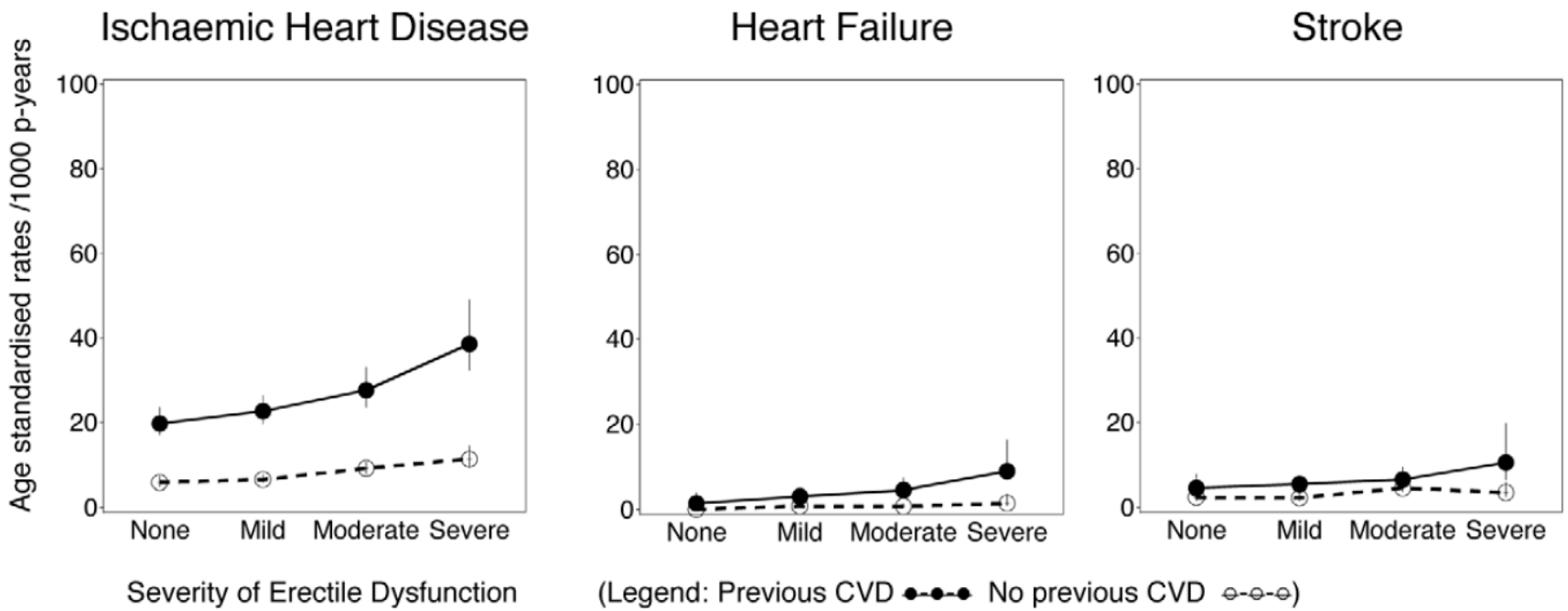
Braun M, J Impot Res 2001; 12: 305-11

OPEN ACCESS Freely available online

PLOS | MEDICINE

Erectile Dysfunction Severity as a Risk Marker for Cardiovascular Disease Hospitalisation and All-Cause Mortality: A Prospective Cohort Study

Emily Banks[1,2]*, Grace Joshy[1], Walter P. Abhayaratna[3], Leonard Kritharides[4], Peter S. Macdonald[5], Rosemary J. Korda[1], John P. Chalmers[6]



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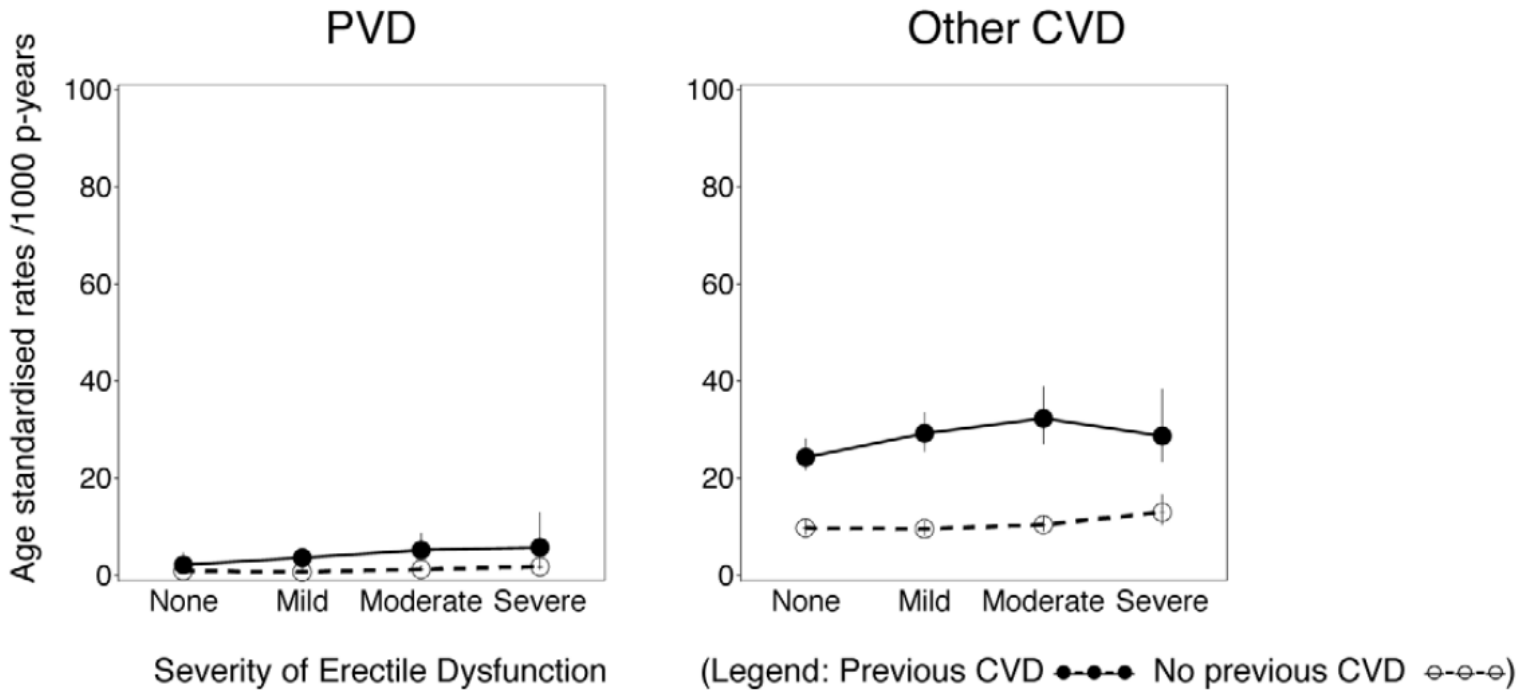

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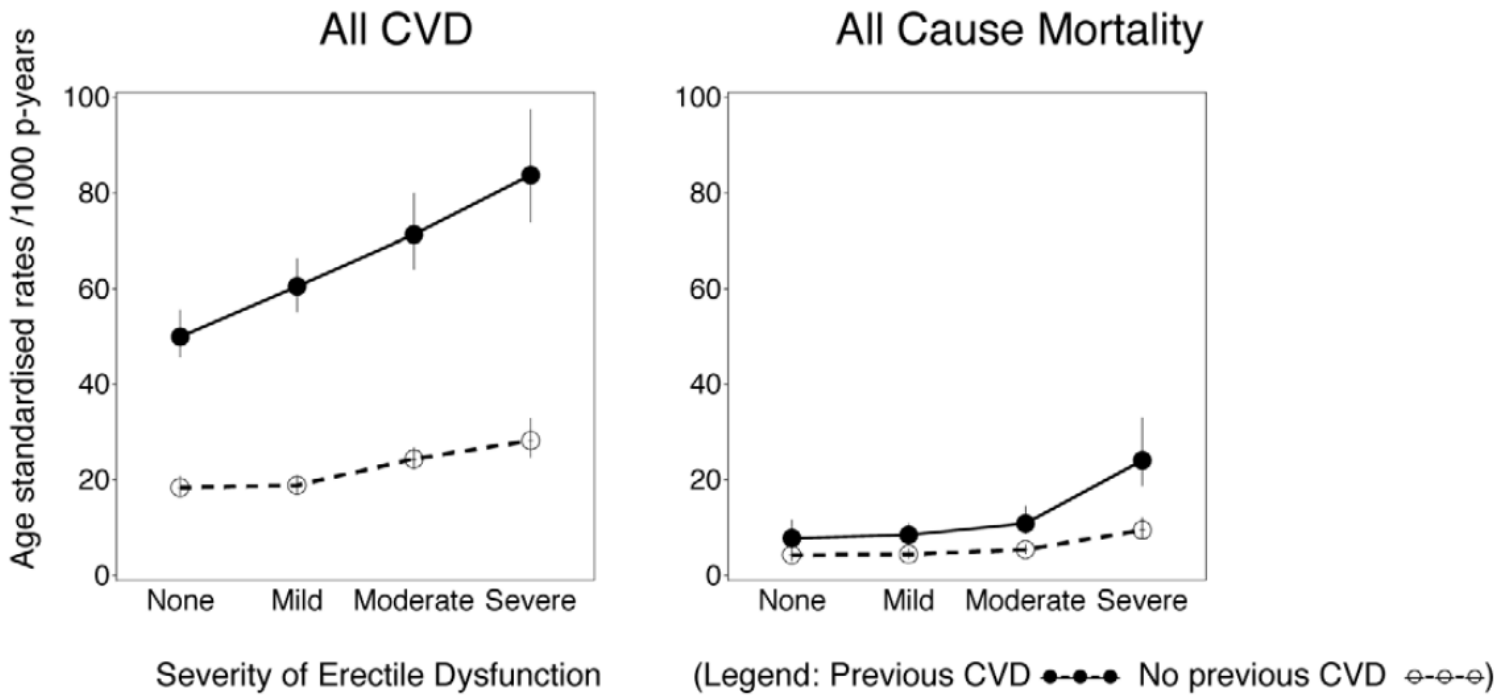
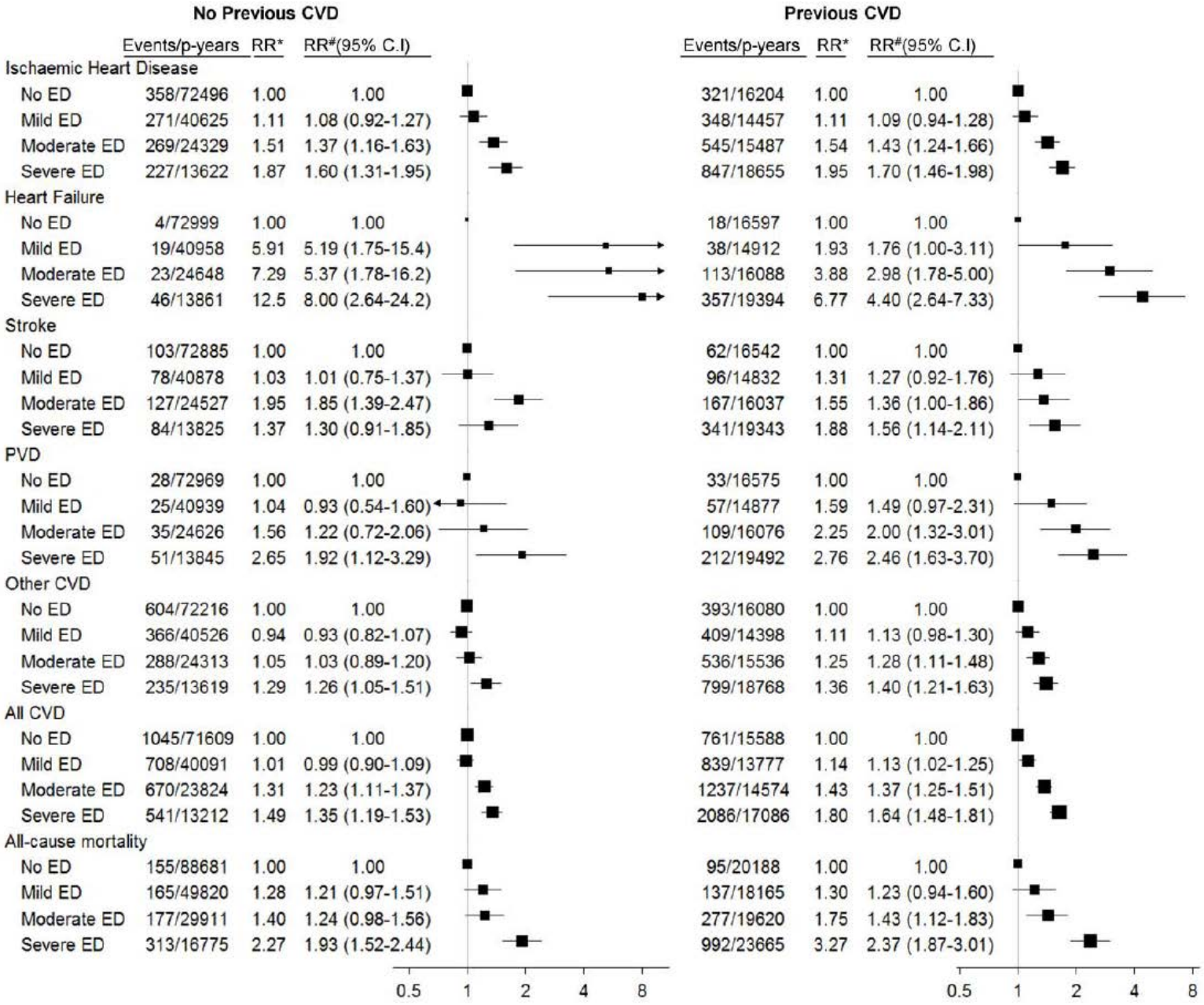


Rischio relativo di ricoveri per malattie cardiovascolari e mortalità per tutte le cause in funzione della severità della DE



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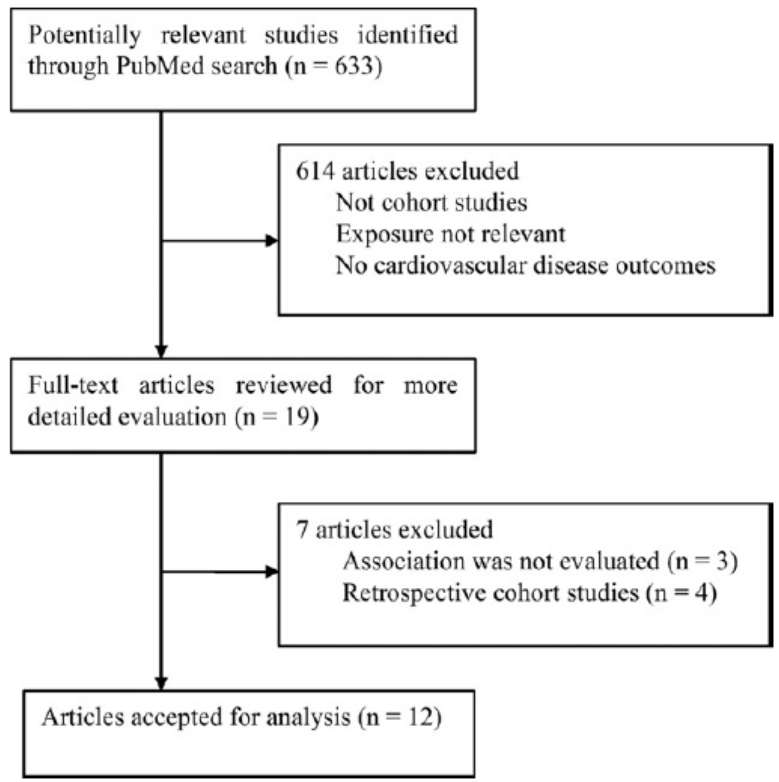
Erectile Dysfunction and Risk of Cardiovascular Disease

Meta-Analysis of Prospective Cohort Studies

Jia-Yi Dong, BSc,* Yong-Hong Zhang, MD, PhD,† Li-Qiang Qin, MD, PhD*

Suzhou, China



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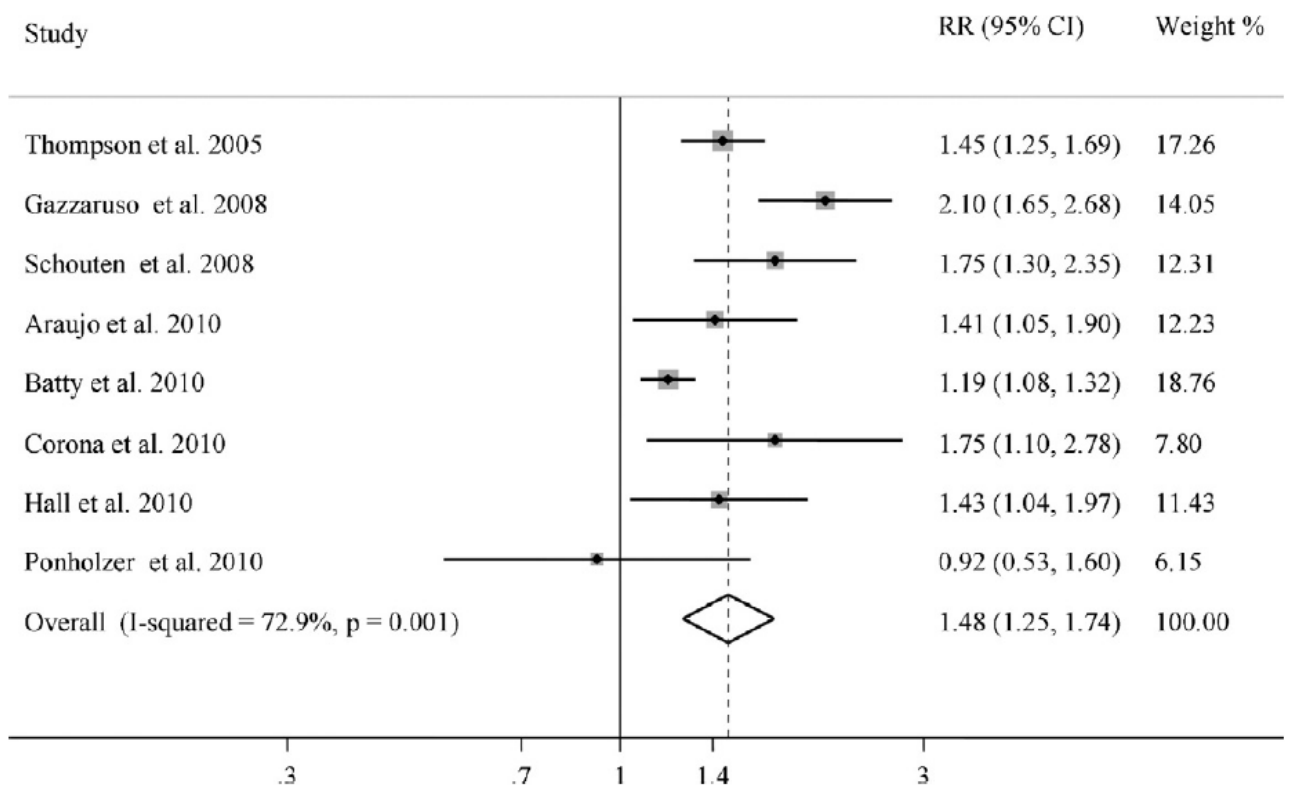

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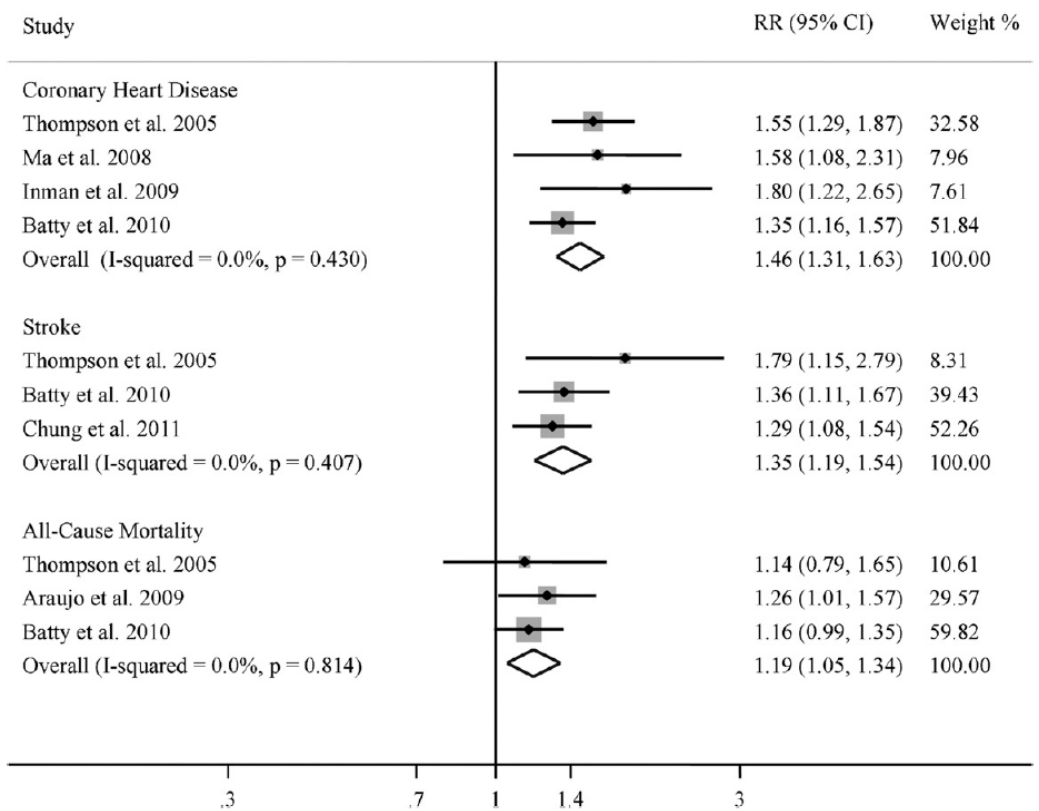

JACC Vol. 56, No. 23, 2010
November 30, 2010:1908–13

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Vol. 56, No. 23, 2010
ISSN 0735-1097/$36.00
doi:10.1016/j.jacc.2010.04.067

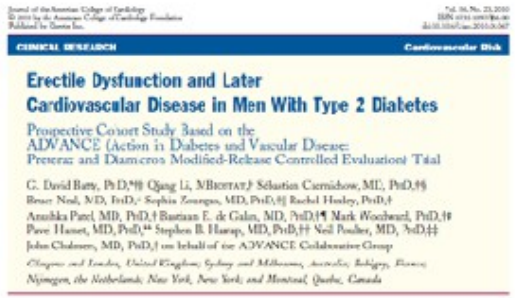
CLINICAL RESEARCH **Cardiovascular Risk**

Erectile Dysfunction and Later Cardiovascular Disease in Men With Type 2 Diabetes

Prospective Cohort Study Based on the ADVANCE (Action in Diabetes and Vascular Disease: Preterax and Diamicron Modified-Release Controlled Evaluation) Trial

G. David Batty, PhD,*†‡ Qiang Li, MBiostat,† Sébastien Czernichow, MD, PhD,†§ Bruce Neal, MD, PhD,† Sophia Zoungas, MD, PhD,†‖ Rachel Huxley, PhD,† Anushka Patel, MD, PhD,† Bastiaan E. de Galan, MD, PhD,†¶ Mark Woodward, PhD,†# Pavel Hamet, MD, PhD,** Stephen B. Harrap, MD, PhD,†† Neil Poulter, MD, PhD,‡‡ John Chalmers, MD, PhD,† on behalf of the ADVANCE Collaborative Group

Glasgow and London, United Kingdom; Sydney and Melbourne, Australia; Bobigny, France; Nijmegen, the Netherlands; New York, New York; and Montreal, Quebec, Canada



CLINICAL RESEARCH — Cardiovascular Risk

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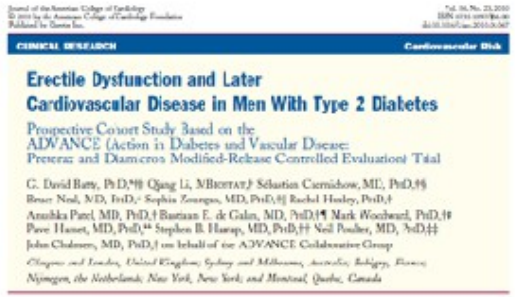
JACC Vol. 56, No. 23, 2010
November 30, 2010:1908–13

Table 3 Multiple Adjusted Hazard Ratios (95% Confidence Intervals) for the Relation of Change in ED Status Between Baseline and 24-Month Follow-Up With Selected Health Outcomes in Men in the ADVANCE Trial (n = 5,427)

ED at Baseline	ED at 24 Months	n	Total Mortality (n = 388)	CVD (n = 965)	CHD (n = 399)	Cerebrovascular Disease (n = 221)	Dementia (n = 48)	Cognitive Decline (n = 913)
No	No	1,964	1.00 (reference)	1.00	1.00	1.00	1.00	1.00
Yes	No	814	1.05 (0.75–1.48)	1.24 (1.01–1.52)	1.13 (0.81–1.56)	1.18 (0.76–1.83)	1.30 (0.34–5.00)	1.34 (1.10–1.65)
No	Yes	618	1.08 (0.74–1.56)	0.98 (0.78–1.25)	1.07 (0.74–1.56)	1.05 (0.65–1.70)	3.70 (1.19–11.46)	1.07 (0.85–1.36)
Yes	Yes	2031	1.29 (1.00–1.66)	1.28 (1.09–1.50)	1.45 (1.13–1.85)	1.44 (1.04–2.01)	3.11 (1.18–8.18)	1.32 (1.12–1.55)
p value for trend	—		0.0419	0.0081	0.0032	0.0365	0.0089	0.0051

Multiple adjustment as in Table 2. Analytical sample was based on a subgroup of men who did not develop any of the health outcomes of interest between baseline and follow-up at 24 months. Abbreviations as in Table 2.



CLINICAL RESEARCH — Cardiovascular Risk

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Table 3 Multiple Adjusted Hazard Ratios (95 … Between Baseline and 24-Month Fo… n ED Status … e ADVANCE Trial (n = 5,427)

ED at Baseline	ED at 24 Months	n	Total M… (n =	…scular …se …21)	Dementia (n = 48)	Cognitive Decline (n = 913)
No	No	1,964	1.00 (ref	0	1.00	1.00
Yes	No	814	1.05 (0.7	…-1.83)	1.30 (0.34–5.00)	1.34 (1.10–1.65)
No	Yes	618	1.08 (0.7	…-1.70)	3.70 (1.19–11.46)	1.07 (0.85–1.36)
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Dementia (n = 48)
1.00
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3.70 (1.19–11.46)
3.11 (1.18–8.18)
0.0089

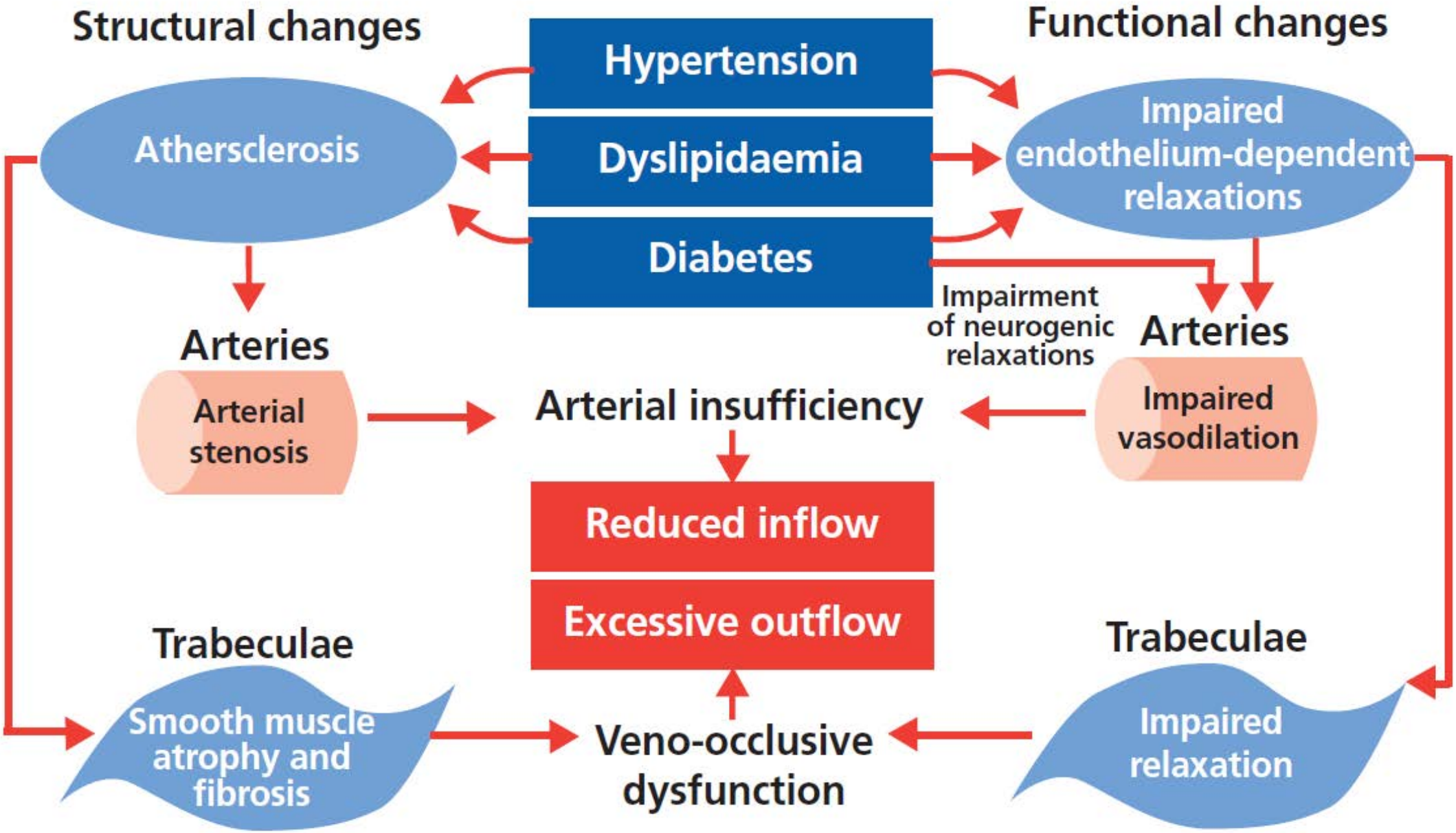
ORIGINAL ARTICLE

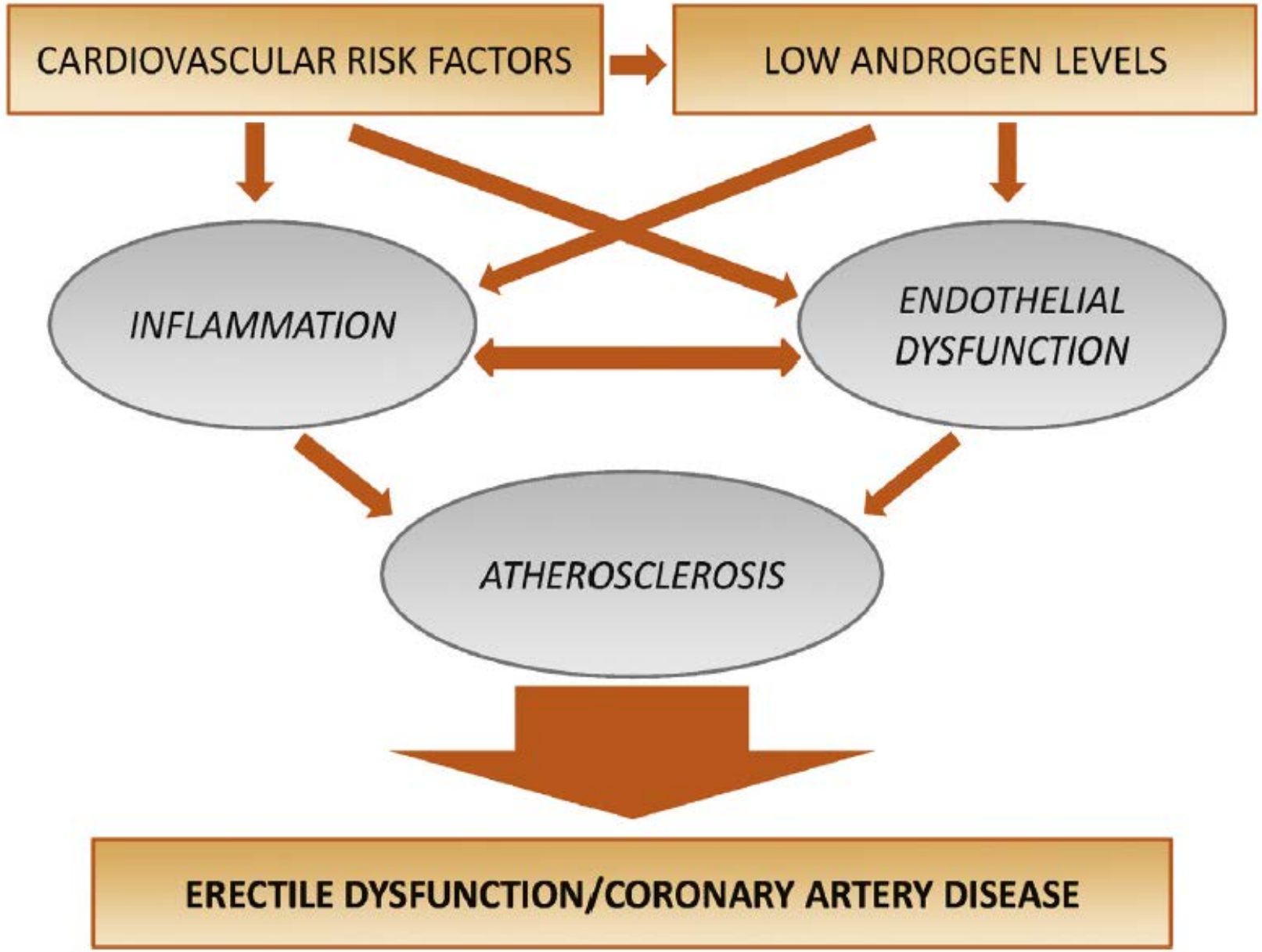
Is penile atherosclerosis the link between erectile dysfunction and cardiovascular risk? An autopsy study

A Ponholzer[1,5], J Stopfer[2,5], G Bayer[3], M Susani[3], F Steinbacher[1], F Herbst[2], P Schramek[1], S Madersbacher[4] and J Maresch[3]

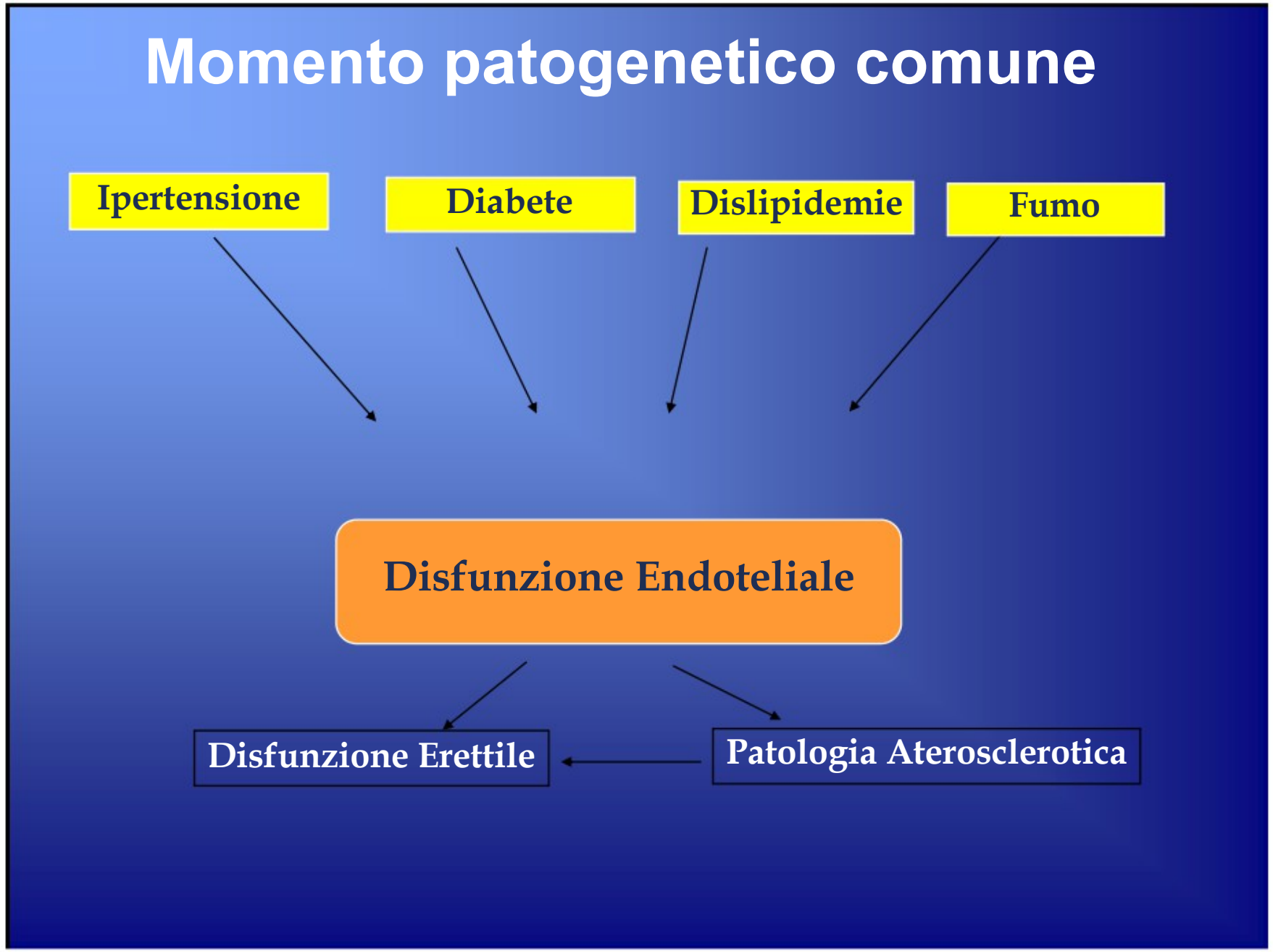
Erectile dysfunction (ED) is increasingly linked to coronary heart disease risk. Aim of this study was to test the hypothesis whether this association is due to penile atherosclerosis. We evaluated the prevalence and severity of penile atherosclerosis in relation to coronary and peripheral atherosclerosis. Between January and June 2010, a consecutive series of 31 men underwent an autopsy at the Department of Pathology at the Medical University Vienna. Atherosclerosis at the following localizations were histologically classified: right coronary artery, left coronary artery, left circumflex artery, internal iliac artery, dorsal penile artery and deep penile artery (bilateral). Coronary and peripheral atherosclerosis was present in 87.1 and 77.4% of cases. Atherosclerosis of penile arteries was detectable in only 4 men (12.9%). The only factor linked to penile atherosclerosis was diabetes ($P = 0.03$). All other parameters as assessed according to medical history, general finding from autopsy or histological results regarding arterial lesions in general were not correlated to penile arterial lesions. In contrast to the high prevalence of atherosclerosis in general, penile arterial lesions are rarely present.

International Journal of Impotence Research. 2012; 24: 137-140.


Structural changes
Functional changes
Hypertension
Dyslipidaemia
Diabetes
Atherosclerosis
Impaired endothelium-dependent relaxations
Impairment of neurogenic relaxations
Arteries
Arteries
Arterial stenosis
Arterial insufficiency
Impaired vasodilation
Reduced inflow
Excessive outflow
Trabeculae
Trabeculae
Smooth muscle atrophy and fibrosis
Veno-occlusive dysfunction
Impaired relaxation


CARDIOVASCULAR RISK FACTORS
LOW ANDROGEN LEVELS
INFLAMMATION
ENDOTHELIAL DYSFUNCTION
ATHEROSCLEROSIS
ERECTILE DYSFUNCTION/CORONARY ARTERY DISEASE

Momento patogenetico comune



Disunzione erettile e patologia cardiovascolare

Le arterie pudende

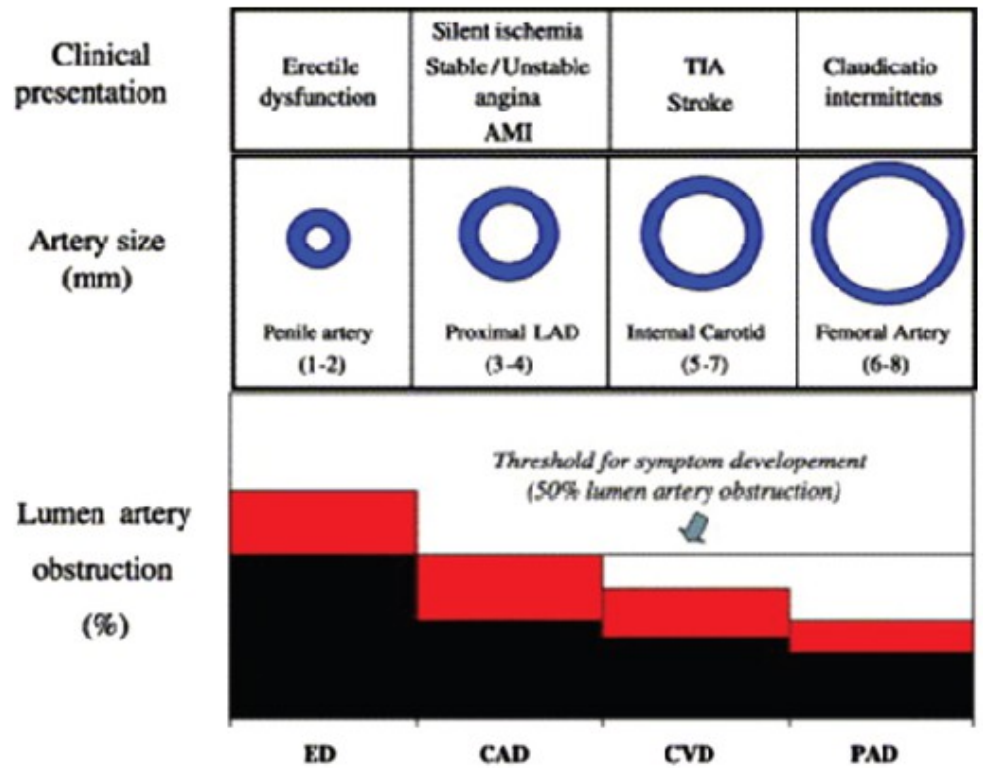
Table 1 Artery size and atherothrombosis. A significant restriction to flow in the penile arteries may be subclinical in larger vessels.

Artery	Diameter (mm)	Clinical Event
Penile	1–2	ED
Coronary	3–4	Ischaemic heart disease
Carotid	5–7	TIA/stroke
Femoral	6–8	Claudication

Erectile Dysfunction

A Disease Marker for Cardiovascular Disease

David Shin, MD, Gerard Pregenzer, Jr., MA,† and Julius M. Gardin, MD‡*



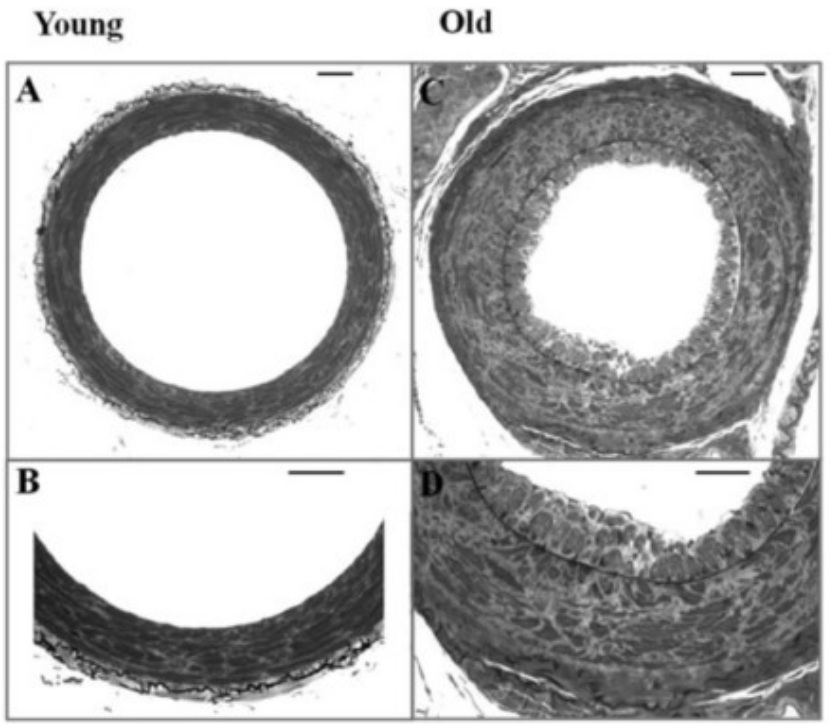
(*Cardiology in Review* 2011;19: 5–11)

Impact of Hypertension, Aging, and Antihypertensive Treatment on the Morphology of the Pudendal Artery

Johanna L. Hannan, PhD,* Mark C. Blaser, BEng,* Judith J. Pang, Med Tech (Dip),*†
Stephen M. Adams, BEng,* Stephen C. Pang, PhD,† and Michael A. Adams, PhD*‡

*Department of Pharmacology & Toxicology, Queen's University, Kingston, Ontario, Canada; †Department of Anatomy, Queen's University, Kingston, Ontario, Canada; ‡Department of Urology, Queen's University, Kingston, Ontario, Canada

DOI: 10.1111/j.1743-6109.2010.02191.x



J sex med feb 2011

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DOI: 10.1111/j.1743-6109.2010.02151.x

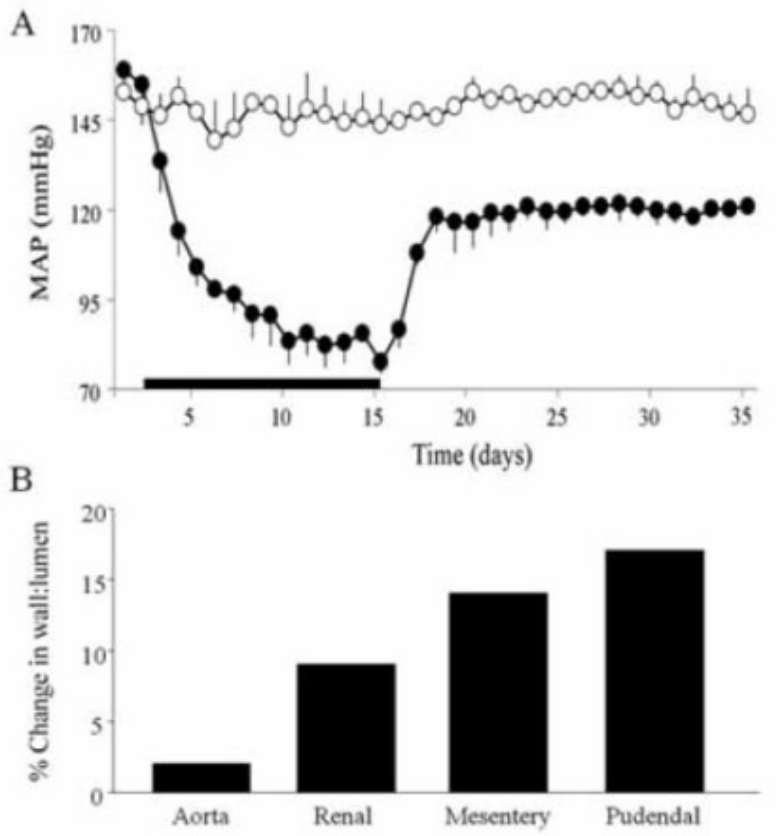

Figure 4 (A) Treatment with enalapril and hydrochlorothiazide (closed circles) induced a significant reduction in mean arterial pressure (MAP) during treatment compared with controls (open circles) that persisted when treatment was withdrawn. The black bar represents the 2-week treatment period. Data is presented as 24-hour mean ± standard deviation. (B) Percent changes in the wall-to-lumen ratio of aorta, left renal, first order mesenteric, and distal pudendal arteries after treatment was withdrawn.

J sex med feb 2011

Internal Pudendal Artery Stenoses and Erectile Dysfunction: Correlation with Angiographic Coronary Artery Disease

Jason H. Rogers,[1*] MD, Houshang Karimi,[1] MD, John Kao,[1] MD, Daniel Link,[1] MD, Javid Javidan,[2] MD, Dwayne S. Yamasaki,[3] PhD, Mark Dolan,[3] BS, John R. Laird,[1] MD, and Reginald I. Low,[1] MD

TABLE III. Pelvic and Coronary Angiographic Findings

Pelvic Arteries	Stenosis (%)	Diameter (mm)
Distal Aorta	8 ± 14	16.0 ± 2.5
Common iliac		
Left	25 ± 31	10.4 ± 1.4
Right	10 ± 13	10.8 ± 1.4
Internal iliac		
Left	15 ± 6.5	6.7 ± 1.7
Right	25 ± 19	6.4 ± 1.3
Internal pudendal		
Left	60 ± 32	2.7 ± 0.5
Right	52 ± 30	2.7 ± 0.4
Coronary Arteries		
Left main	15 ± 17	4.6 ± 0.9
Left anterior descending	56 ± 28	3.0 ± 0.9
Circumflex	55 ± 33	2.8 ± 0.7
Right coronary artery	65 ± 29	3.5 ± 0.6

Catheterization and Cardiovascular Interventions 76:882–887 (2010)

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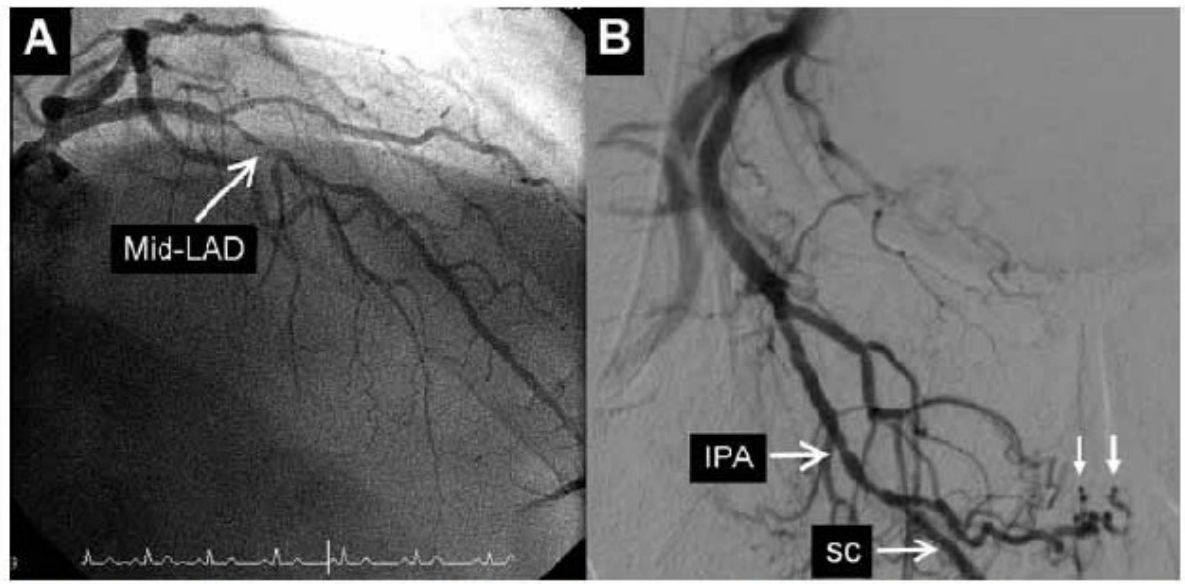
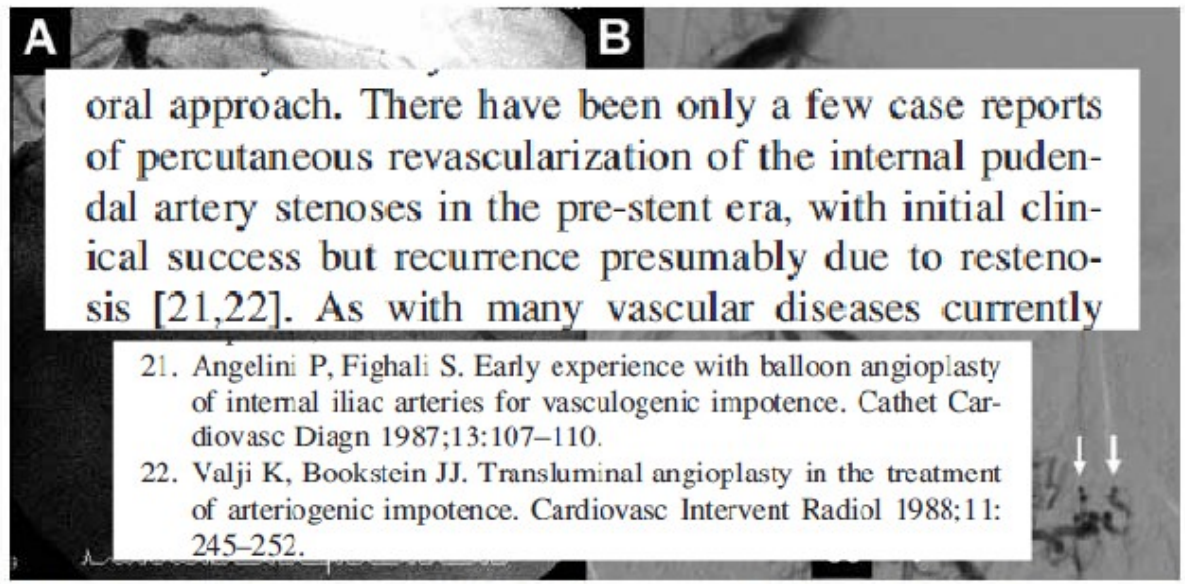


Fig. 2. Representative angiographic findings. A: Severe mid-left anterior descending coronary artery stenosis (arrow). B: In the same subject, severe focal unilateral distal right internal pudendal artery (IPA) stenosis before bifurcation into scrotal (sc) and cavernosal branches (double arrows) at the base of the penis.

Catheterization and Cardiovascular Interventions 76:882–887 (2010)

Internal Pudendal Artery Stenoses and Erectile Dysfunction: Correlation with Angiographic Coronary Artery Disease

Jason H. Rogers,[1*] MD, Houshang Karimi,[1] MD, John Kao,[1] MD, Daniel Link,[1] MD, Javid Javidan,[2] MD, Dwayne S. Yamasaki,[3] PhD, Mark Dolan,[3] BS, John R. Laird,[1] MD, and Reginald I. Low,[1] MD



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Catheterization and Cardiovascular Interventions 76:882–887 (2010)

DIAGNOSIS AND TREATMENT GUIDELINES

MAYO CLINIC

The Princeton III Consensus Recommendations for the Management of Erectile Dysfunction and Cardiovascular Disease

Ajay Nehra, MD; Graham Jackson, FRCP, FESC; Martin Miner, MD; Kevin L. Billups, MD; Arthur L. Burnett, MD, MBA; Jacques Buvat, MD; Culley C. Carson, MD; Glenn R. Cunningham, MD; Peter Ganz, MD; Irwin Goldstein, MD; Andre T. Guay, MD; Geoff Hackett, MD; Robert A. Kloner, MD, PhD; John Kostis, MD; Piero Montorsi, MD; Melinda Ramsey, PhD; Raymond Rosen, PhD; Richard Sadovsky, MD; Allen D. Seftel, MD; Ridwan Shabsigh, MD; Charalambos Vlachopoulos, MD; and Frederick C. W. Wu, MD

Mayo Clin Proc. 2012; 87(8): 766-778

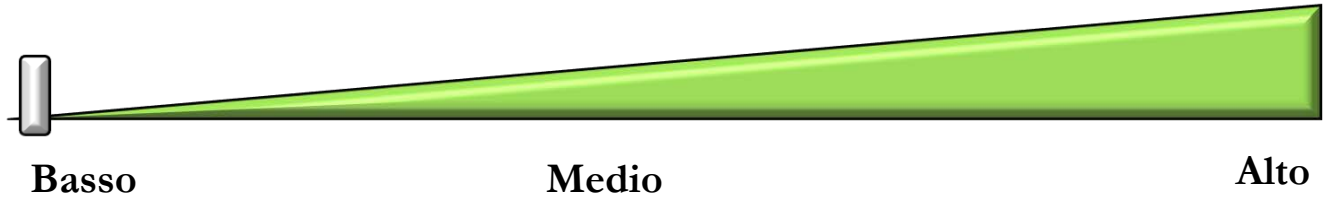
TABLE 1. Relative Risks for Men With Erectile Dysfunction

	Relative risk	95% Confidence interval	*P* value
Overall	1.48	1.25-1.74	<.001
Coronary heart disease	1.46	1.31-1.63	<.001
Stroke	1.35	1.19-1.54	<.001
All-cause mortality	1.19	1.05-1.34	.005

Adapted from *J Am Coll Cardiol*.[15]

Mayo Clin Proc. 2012; 87(8): 766-778

Basso rischio



- ✓ Ipertensione ben controllata
- ✓ Angina stabile lieve
- ✓ Malattia coronarica stabile (ad esempio pazienti sottoposti con successo a precedente rivascolarizzazione)
- ✓ Infarto miocardico non complicato (> 6 – 8 settimane)
- ✓ Valvulopatie lievi
- ✓ Pazienti asintomatici con meno di tre fattori di rischio cardiovascolare (genere escluso)
- ✓ Insufficienza cardiaca congestizia lieve (NYHA I)
- ✓ Vasculopatia periferica

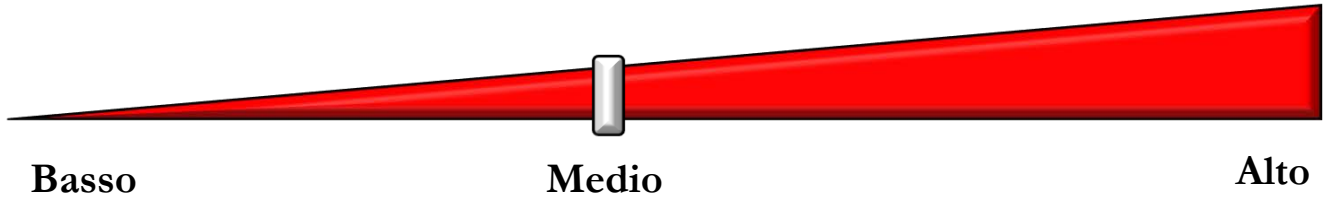
Mayo Clin Proc. 2012; 87(8): 766-778

Basso Intermedio

- ✓ Angina stabile moderata
- ✓ Recente infarto miocardico o stroke (2 - 6 settimane)
- ✓ Aritmia da cause non note
- ✓ Pazienti asintomatici con ≥ tre fattori di rischio cardiovascolare (genere escluso)
- ✓ Insufficienza cardiaca congestizia lieve - moderata (NYHA II)
- ✓ Malattia aterosclerotica non cardiaca (vasculopatia periferica o stroke)

Mayo Clin Proc. 2012; 87(8): 766-778

Alto rischio

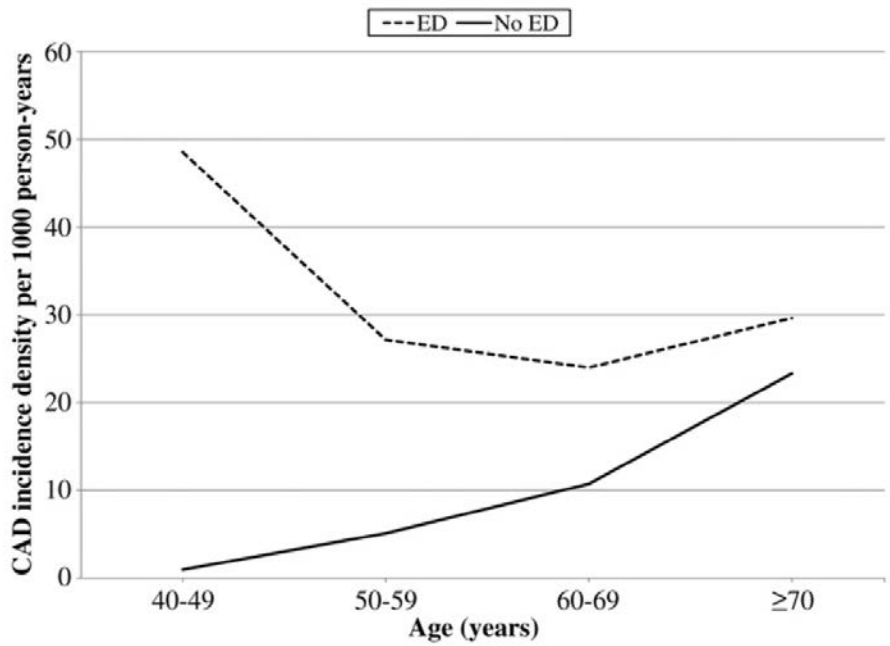


- ✓ Angina instabile o refrattaria
- ✓ Ipertensione non controllata
- ✓ Recente infarto miocardico o stroke (< 2 settimane)
- ✓ Aritmie ad alto rischio
- ✓ Cardiomiopatia ipertrofica od altre cardiomiopatie
- ✓ Valvulopatie moderato - severe
- ✓ Insufficienza cardiaca congestizia moderata - severa (NYHA III - IV)

Mayo Clin Proc. 2012; 87(8): 766-778

Prognostic utility of erectile dysfunction for cardiovascular disease in younger men and those with diabetes

Martin Miner, MD,[a] Allen D. Seftel, MD, FACS,[b] Ajay Nehra, MD,[c] Peter Ganz, MD,[d] Robert A. Kloner, MD, PhD,[e] Piero Montorsi, MD,[f] Charalambos Vlachopoulos, MD,[g] Melinda Ramsey, PhD,[h] Mark Sigman, MD,[i] Peter Tilkemeier, MD,[j] and Graham Jackson, MD, FRCP[k] *Providence, RI; Camden, NJ; Chicago, IL; San Francisco, and Los Angeles, CA; IRCCS, Italy; Athens, Greece; Philadelphia, PA; and London, United Kingdom*



Coronary artery disease incidence densities in patients with and without erectile dysfunction.[14]

Table III. Prognostic markers of cardiovascular disease in the patient with erectile dysfunction[52]

Biomarkers	Association with vasculogenic ED	Overall CVD predictive value	Association with CV prevalence in ED	CVD predictive value in ED	Response to treatment	Availability	Cost
Testosterone	+++	++	+	+	+	++++	+
hsCRP	++	+++	+	–	+	++++	+
Fibrinogen, IL-6	+++	++	+	–	+	++	++
IMT	+++	+++	+	–	+	++	++
Aortic stiffness	++	+++	+	–/+	+	++	++
ABI	++	+++	+	–	–	+++	+
CCTA	++	+++	+	–	–	+	+++ +
CAC	++	++	+	–	–	+	+++ +
Endothelial dysfunction	+++	++	+	–	++	++	++
Albuminuria (micro- or macro-)	+	+++	+	+	–	++++	+
Penile color Doppler	++++	–	+	+	++	+	+++

Association with ED, availability, response to treatment, prognostic value and cost of biomarkers (scored from 0 to 4+).
ABI, Ankle-brachial index; *CAC*, Coronary artery calcium.

Should patients with erectile dysfunction be evaluated for cardiovascular disease?

Kenneth A Ewane[1], Hao-Cheng Lin[1,2] and Run Wang[1,3]

Table 1 Relationship between erectile dysfunction (ED) and early vascular endothelial dysfunction

Author (year)	*Study design*	*No. with/no. without ED*	*Evaluation*	*Intervention*	*Results*
Kaiser *et al.* [13] (2004)	Case–control	30/27	Systemic vascular parameters penile Doppler IIEF	Carotid/brachial artery compliance/ distensibility Aortic pulse wave velocity Coronary calcification Brachial artery vasodilation	Brachial artery FMD (1.3% *vs.* 2.4%, $P=0.014$) Vasodilation to NTG (13.0% *vs.* 17.8%, $P<0.05$)
Kaya *et al.* [15] (2006)	Case–control	32/25	Penile Doppler US and IIEF	Endothelial-dependent BFMV and brachial artery response to 0.4 mg NTG	Endothelial BFMV: 6.01±2.9 *vs.* 12.3±3.5 Brachial artery response to NTG: 12.8±4.2 *vs.* 17.8±5.2
Uslu *et al.* [16] (2006)	Case–control	30/25	IIEF and penile Doppler US	Aortic strain and distensibility, endothelial-dependent brachial artery FMD	Aortic strain: 3.7%±2.7% *vs.* 9.5%±3.2% Aortic distensibility: 1.5%±1.0% *vs.* 4.7%±2.9% Brachial artery FMD: 4.1%±3.1% *vs.* 9.7%±3.5%; $P<0.001$
Baumhakel and Bohm [17] (2007)	Cohort	154/38	IIEF High-risk CVD	MRI or angiography to determine LVEF	Decreased LVEF (EF ⩽40%) associated with ED
Lojanapiwat and Weerusawin [18] (2009)	Case–control	41/38	IIEF-5	Brachial artery FMD	Brachial artery FMD change: 8.7%±1.0% *vs.* 5.1%±0.6% ($P=0.007$)
Polonsky *et al.* [19] (2009)	Prospective cohort	310/380	IIEF	ABI to screen for PAD	PAD prevalence 32% *vs.* 16%

Should patients with erectile dysfunction be evaluated for cardiovascular disease?

Kenneth A Ewane[1], Hao-Cheng Lin[1,2] and Run Wang[1,3]

Table 2 Association between erectile dysfunction (ED) and other known cardiovascular disease (CVD) risk factors

Author (year)	*Study design*	*Patients (age)*	*ED (%)*	*Risk factor correlate*	*Results*
Feldman *et al.* [3] (2000)	Prospective cohort	513 (40–70)	18	Smoking BMI $\geqslant$28 kg m^{-2}	Baseline smoking almost doubled the likelihood of moderate/severe ED
Kloner *et al.* [21] (2003)	Cohort	76 (40–82)	70	Chronic stable CAD	ED common in patient with chronic stable CAD
Roumeguere *et al.* [22] (2003)	Prospective cohort	315 (35–75)	68.3	Hyperlipidemia	70.6% prevalence of hypercholesterolemia in the ED group
Sesayama *et al.* [23] (2003)	Population	6112 (30–70)	81	CVD Diabetes	65% CVD and DM among patients with severe/moderate ED
Mittawae *et al.* [24] (2006)	Cohort	800 (28–75)	43.2	Hypertension	Statistical correlation between duration of HTN and ED
Montorsi *et al.* [25] (2006)	Cohort	285 (53.6±8.5)	22–65	Coronary syndrome	Age, multiple vessels and chronic coronary syndrome as opposed to acute predicted ED
Selvin *et al.* [4] (2007)	Cross-sectional	2126 ($\geqslant$20)	18.4	Diabetes Hypertension	51.3% prevalence among men in the ED group with DM
Chang *et al.* [26] (2009)	Prospective cohort	141 (54±10.3)	100	Metabolic syndrome	The presence of MS and number of MS components influence the severity of ED
Lee *et al.* [27] (2011)	Randomized control trial	176 (mild ED) 14 537 (database) (18–89)	100	Hypertension, diabetes, dyslipedemias and hypercholesterolemia	The two groups were very similar in terms of risk factors

Should patients with erectile dysfunction be evaluated for cardiovascular disease?

Kenneth A Ewane[1], Hao-Cheng Lin[1,2] and Run Wang[1,3]

Table 3 Association between erectile dysfunction (ED) and future cardiovascular disease (CVD)

Author (year)	*Study design*	*Patients (age)*	*ED (%)*	*ED timing/results*
Montorsi *et al.* [28] (2003)	Prospective cohort	300 (33–86)	49	Angina preceded ED in >70% patients
El-Sakka and Morsy [29] (2004)	Cohort	303 (59.8±7.3)	76.2	31.4% of IHD Association between IHD and arterigenic ED Higher grade IHD correlated with decreasing PSV ($P<0.05$)
Thompson *et al.* [11] (2005)	Prospective randomized control trial	4247 (62±6)	65 at 7 years	11% CVE at 5 years in men with incident ED
Min *et al.* [30] (2006)	Prospective cohort	221 (23–88)	54.8	ED patient showed severe CHD (MPS summed stress score >8): 43.0% *vs.* 17.0%
Hodges *et al.* [31] (2007)	Case–control	207 *vs.* 165 (61±9)	66 *vs.* 37	ED may precede CVD by as much as 5 years
Stuckey *et al.* [32] (2007)	Case–control	49 *vs.* 50 (40–70)	50	Standing pulse pressure and flow debt repayment were both lower in the ED group
Ma *et al.* [33] (2008)	Cohort	2306 (54.2±12.7)	26.7	Incidence of CHD higher in ED than non-ED group
Gazzaruso *et al.* [34] (2008)	Prospective cohort	291 (54.8±7)	40.5	61.2% *vs.* 36.4% between ED and non-ED patients in experiencing major adverse cardiac event
Schouten *et al.* [35] (2008)	Population cohort	1248 (50–75)	31.5	11.7% population attributable risk fraction for ED
Chew *et al.* [36] (2010)	Retrospective cohort	2318 (20–89)	100	Men with ED had a higher incidence of atherosclerotic cardiovascular event

Should patients with erectile dysfunction be evaluated for cardiovascular disease?

Kenneth A Ewane[1], Hao-Cheng Lin[1,2] and Run Wang[1,3]

Table 4 Erectile dysfunction (ED) as an independent risk predictor for cardiovascular disease (CVD)

Author (year)	*Patients (age)*	*Study design*	*Evaluations*	*Results*	*Comments*
Ponholzer *et al.* [38] (2005)	2495 (30–69)	Cohort	IIEF-5 10-year CHD risk estimate using the Framingham risk profile algorithm	CHD within 10 years: 13.2% *vs.* 8.0% for moderate/severe ED *vs.* no ED	Moderate/severe ED is associated with increased risk for CHD within 10 years unlike mild ED
Salem *et al.* [39] (2009)	183 with CAD and 134 without CAD (40–69)	Case–control	Logistic regression analysis to assess the effects of classic risk factors and ED severity on CAD	ED prevalence was 88.5% in the CAD group and 64.2% in non-CAD group Significant association between severe ED and CAD (OR: 2.22; 95% CI: 1.11–6.03; $P<0.05$)	ED associated with CAD, severe ED an independent risk predictor
Inman *et al.* [7] (2009)	1402 (40–79)	Prospective cohort	Brief male sexual function inventory (BMSFI) Biennial screening Incidence densities for CAD calculated	Association between ED and incident CAD declined with age; 48.52 (40–49) *vs.* 27.15 (50–59) *vs.* 23.97 (60–69) *vs.* 29.63 ($\geqslant$70)	ED associated with marked increase in the risk of future cardiovascular event in young men; no prognostic value in older men
Araujo *et al.* [8] (2010)	1057 (40–70)	Prospective population-based	23-item questionnaire on sexual activity CVD: self-report, MMAS linkage to NDI and medical records	261 new cases of CVD ED associated with CVD after controlling for age, FRS, *etc.* ED did not improve prediction for CVD	ED does not improve prediction for CVD beyond the traditional risk factors

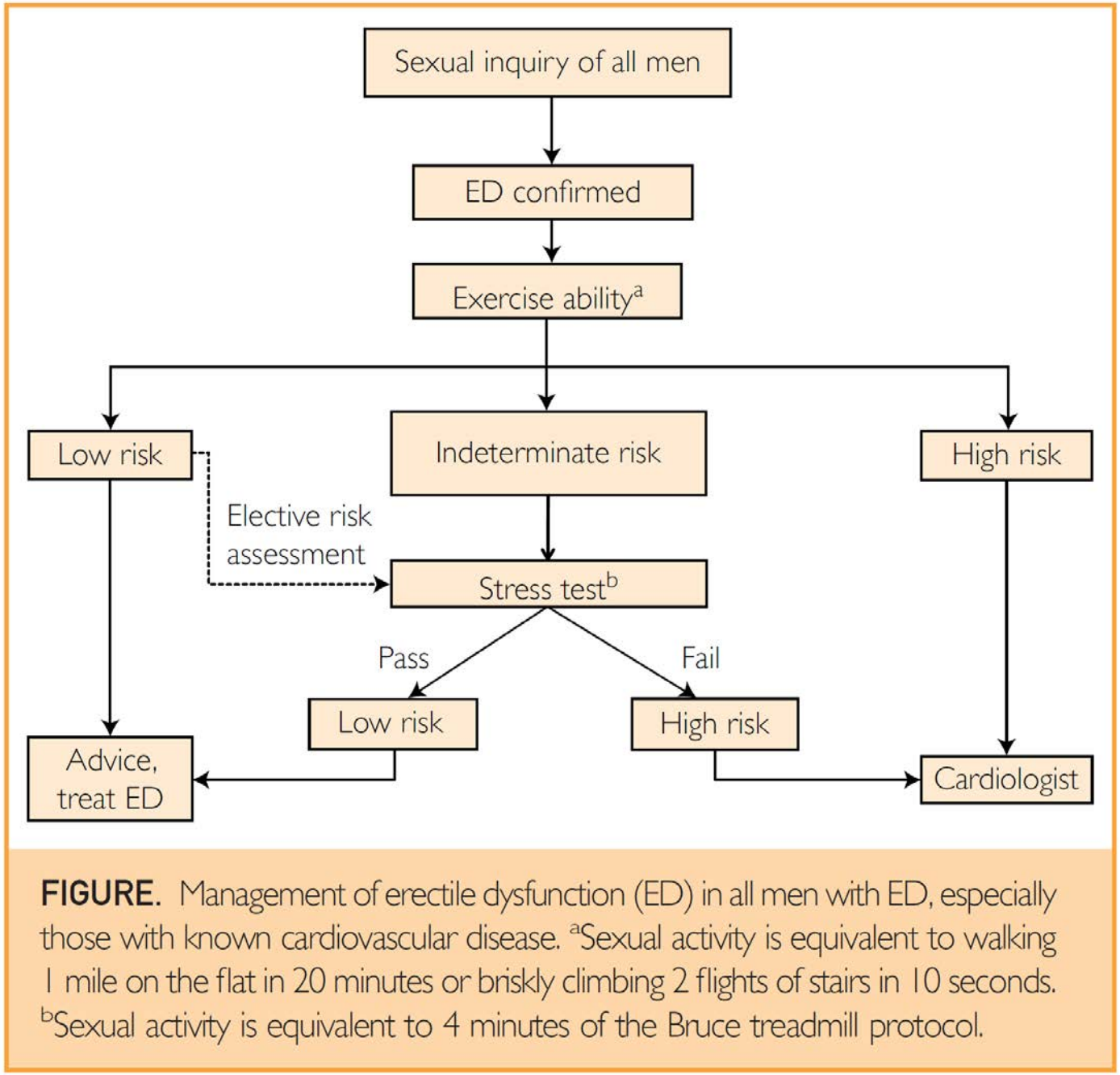


FIGURE. Management of erectile dysfunction (ED) in all men with ED, especially those with known cardiovascular disease. [a]Sexual activity is equivalent to walking 1 mile on the flat in 20 minutes or briskly climbing 2 flights of stairs in 10 seconds. [b]Sexual activity is equivalent to 4 minutes of the Bruce treadmill protocol.

Mayo Clin Proc. 2012; 87(8): 766-778


Disfunzione Erettile
Anamnesi
Esame obiettivo
Gravità della DE
ECG a riposo
Glicemia
Creatinina sierica
Albuminemia
Testosterone totale
Trigliceridemia
Valutazione cardiologica iniziale
Basso rischio
Intermedio rischio
Alto rischio
L'attività sessuale non rappresenta un rischio
Test da sforzo
L'attività sessuale aumenta in maniera significativa il rischio di eventi
Può fare in maniera sicura attività sessuale
Inibitori della fostodiesterasi 5 possono essere somministrati (Sildenafil, Vardenafil, Tadalafil, Avanafil)
Negativo
Positivo
Sospendere attività sessuale
Eliminazione dei fattori di rischio
Identificazione e trattamento di patologie cardiologiche sottostanti

REVIEW

THE AMERICAN JOURNAL of MEDICINE®

All Men with Vasculogenic Erectile Dysfunction Require a Cardiovascular Workup

Martin Miner, MD,[a] Ajay Nehra, MD,[b] Graham Jackson, MD,[c] Shalender Bhasin, MD,[d] Kevin Billups, MD,[e,f] Arthur L. Burnett, MD,[f] Jacques Buvat, MD,[g] Culley Carson, MD,[h] Glenn Cunningham, MD,[i] Peter Ganz, MD,[j] Irwin Goldstein, MD,[k] Andre Guay, MD,[l] Geoff Hackett, MD,[m] Robert A. Kloner, MD, PhD,[n] John B. Kostis, MD,[o] K. Elizabeth LaFlamme, PhD,[p] Piero Montorsi, MD,[q] Melinda Ramsey, PhD,[p] Raymond Rosen, PhD,[r] Richard Sadovsky, MD,[s] Allen Seftel, MD,[t] Ridwan Shabsigh, MD,[u] Charalambos Vlachopoulos, MD,[v] Frederick Wu, MD[w]

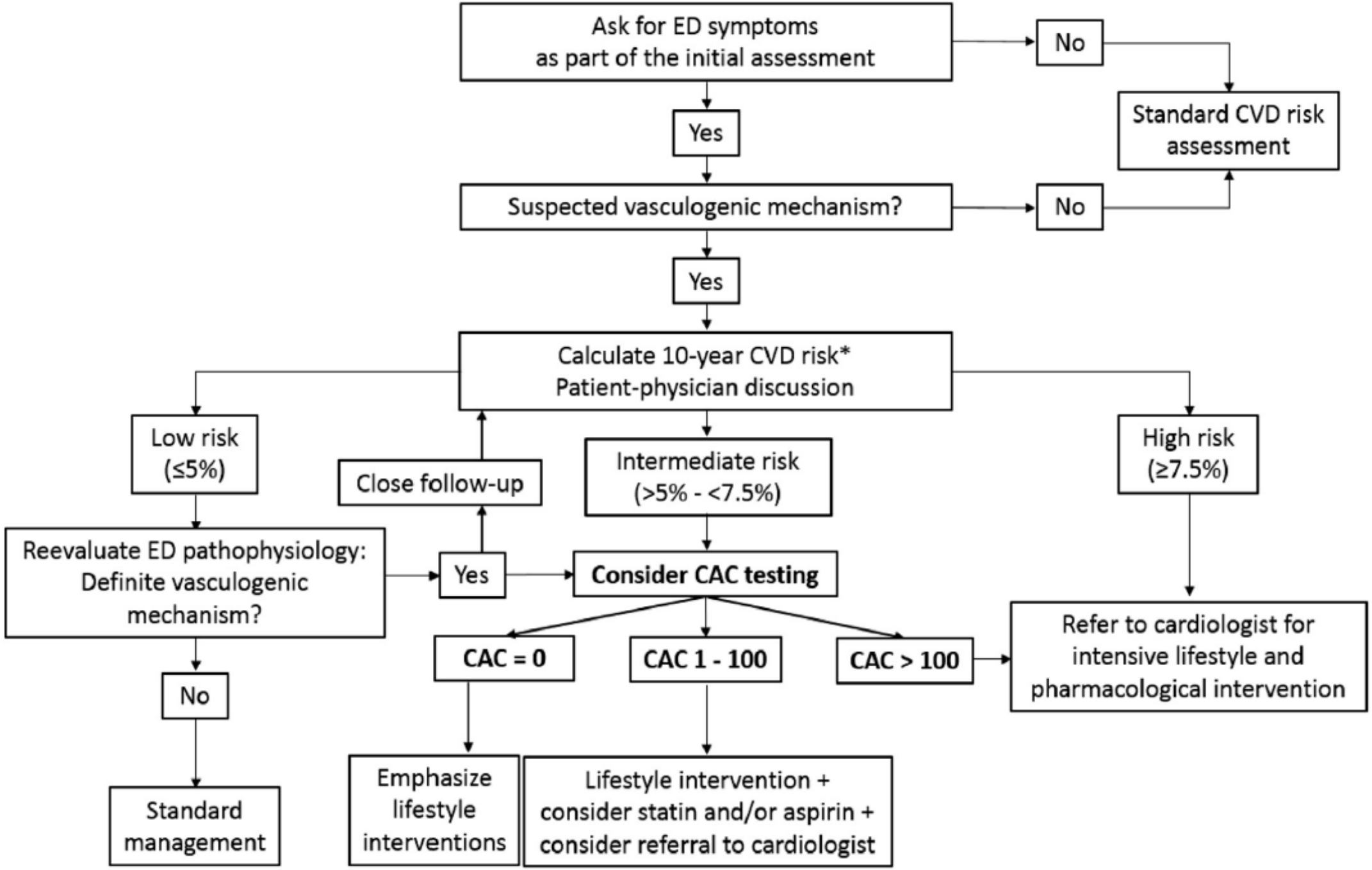
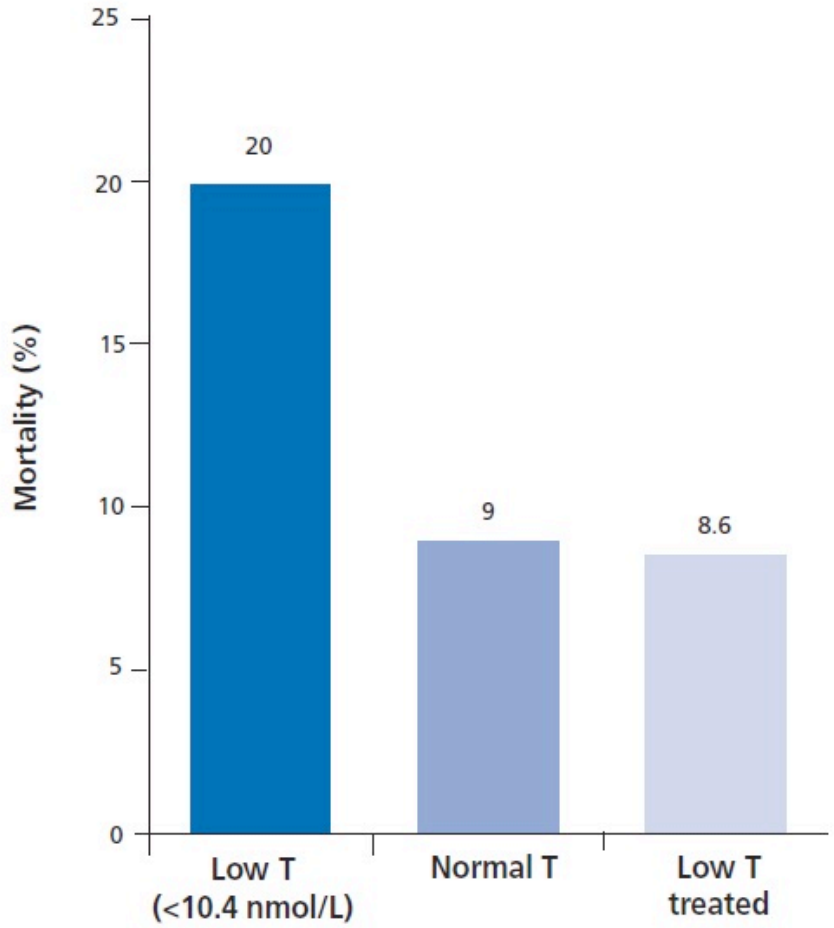
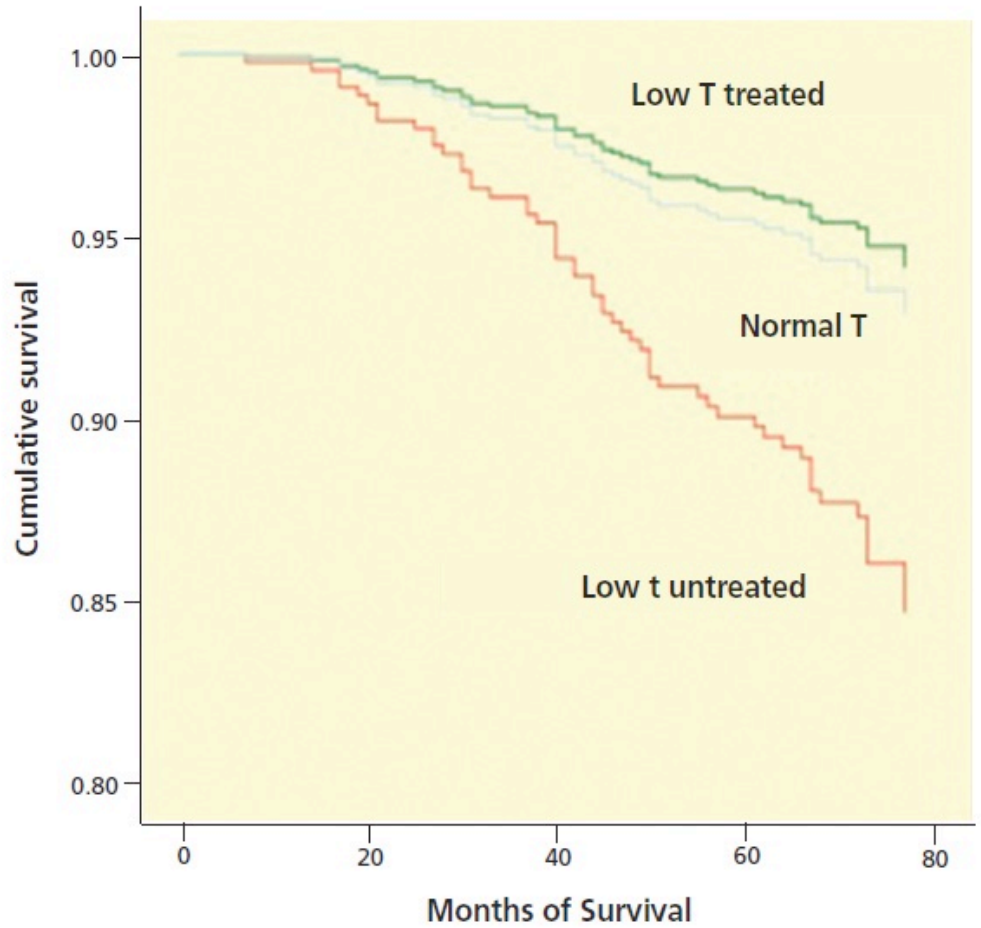

Ask for ED symptoms
as part of the initial assessment
No
Standard CVD risk
assessment
Yes
Suspected vasculogenic mechanism?
No
Yes
Calculate 10-year CVD risk*
Patient-physician discussion
Low risk
(≤5%)
Close follow-up
Intermediate risk
(>5% - <7.5%)
High risk
(≥7.5%)
Reevaluate ED pathophysiology:
Definite vasculogenic
mechanism?
Yes
Consider CAC testing
CAC = 0
CAC 1 - 100
CAC > 100
Refer to cardiologist for
intensive lifestyle and
pharmacological intervention
No
Standard
management
Emphasize
lifestyle
interventions
Lifestyle intervention +
consider statin and/or aspirin +
consider referral to cardiologist

Figure 6. Testosterone replacement therapy and mortality in UK men with type 2 diabetes mellitus





PDE5 inibitori e polifarmacoterapia: interazioni nel paziente con comorbilità

Use of Sildenafil for Safe Improvement of Erectile Function and Quality of Life in Men With New York Heart Association Classes II and III Congestive Heart Failure

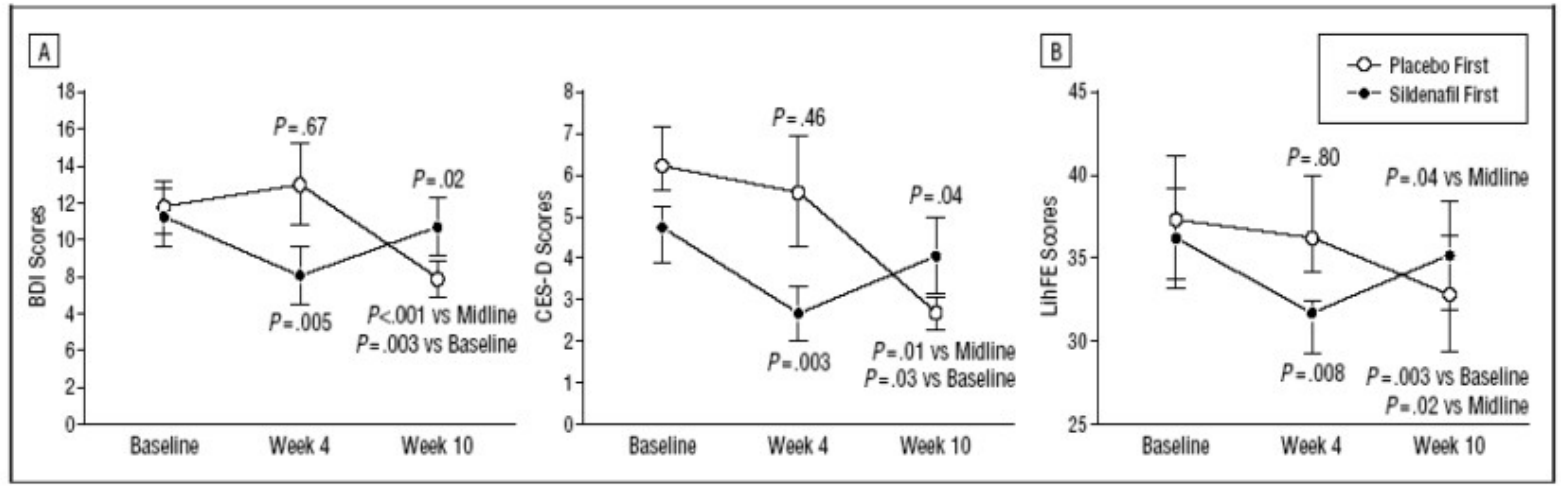


Figure 3. Depression (A) and quality-of-life scores (B) at baseline and 6 and 12 weeks for the placebo–sildenafil citrate crossover protocol. BDI indicates Beck Depression Inventory; CES-D, Center for Epidemiological Studies–Depression Scale; LihFE, Minnesota Living With Heart Failure Questionnaire.

Conclusion: Sildenafil is a safe and effective treatment for ED in men with New York Heart Association classes II and III CHF and provides relief of depressive symptoms, explaining an improvement in the perception of quality of life.

PDE 5 inibitori e terapia antiipertensiva:

Hypertension and erectile dysfunction

Erectile dysfunction is a prevalent condition in hypertensive patients and a predictor of future cardiovascular events. Screening and treatment of erectile dysfunction improves management of cardiovascular risk factors. After initiating therapy with phosphodiesterase (PDE) 5 inhibitors, patients are more likely to take antihypertensive medication and BP control is improved [272].

Older antihypertensive drugs (diuretics, β-blockers, centrally acting drugs) exert negative effects, whereas newer drugs have neutral or beneficial effects (calcium antagonists, ACE inhibitors, angiotensin receptor antagonists, nebivolol) [273].

Reappraisal of European guidelines on hypertension management: a European Society of Hypertension Task Force document

Journal of Hypertension 2009, 27:2121–2158

Erectile Dysfunction Drugs Safe After MI.
Outcomes actually better among users in Swedish database

43.145 uomini (età ≤ 80 anni) con primo evento ischemico cardiac (inclusi in un database svedese dal 2007 al 2013 collegato a registri nazionali di prescrizione cardiaca e cause di morte).

Riduzione del 40% del rischio di ospedalizzazione per scompenso cardiaco e una incidenza significativamente minore di MACE (major adverse cardiovascular events) nei pazienti che assumevano farmaci inibitori delle fosfodiesterasi di tipo 5

Andersson D. Data presented at the American College of Cardiology annual meeting. Washington, March 2017

Table 2 – Association between erectile dysfunction and cardiovascular disease: practice points

- ED is common, especially with advancing age.
- ED and CVD share the same risk factors.
- ED and CVD have a common pathophysiologic background.
- ED is highly prevalent in CAD patients.
- ED is a marker of generalized vascular disease.
- ED precedes a CVD event by 2–5 yr (average: 3 yr).
- ED predicts cardiovascular events and all-cause mortality.
- ED patients with an intermediate-risk score need further evaluation of CV risk.
- ED treatment should include CVD risk reduction.

Table 3 – Association between erectile dysfunction and cardiovascular disease: issues to be addressed

- How can young ED patients be stratified appropriately?
- Why do some patients with multivessel coronary disease not have ED?
- Is ED a target of organ damage in hypertensive patients?
- Is development of ED after CAD onset a marker of CAD progress?
- Can ED meaningfully reclassify patients that have been characterized with SCORE/FRS to higher or lower risk categories?
- Does aggressive risk reduction in men with asymptomatic CVD and concomitant/preceding ED lead to a reduction of the CVD event rate?
- What are the dose-dependent effects of statins (intensive vs nonintensive use) on erectile function?
- Can testosterone replacement therapy improve the cardiac event rate over time?
- Does long-term PDE-5 inhibition reduce the CVD event rate?

'A man with erectile dysfunction and no cardiac symptoms is a cardiac patient until proven otherwise' (Jackson, 2006)

- Erectile dysfunction is common
- It is an independent risk factor for cardiovascular disease, equivalent to a current moderate smoker
- Men presented with ED for 38 months on average before developing acute chest pain
- The penile arteries are smaller in diameter than the coronary arteries

Grazie per l'attenzione