Single-pill with CCB +Statin in SBP & LDL Control- Low Cardiovascular Risk , Increase Compliance, and Cost-effectiveness

Yi-Jing Sheen

Topics

- Introduction
- Synergy of Hypertension & Lipid Therapy
- Optimization of Therapy Effects by Improving Adherence
- Updated HTN and Lipid Guidelines
- Summary

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2019年國人十大死因死亡人數

十大死因	死亡人數	死亡人數結構比%
惡性腫瘤	50,232	28.6
心臟疾病（高血壓性疾病除外）	19,859	11.3
肺炎	15,185	8.7
腦血管疾病	12,176	6.9
糖尿病	9,996	5.7
事故傷害	6,640	3.8
慢性下呼吸道疾病	6,301	3.6
高血壓性疾病	6,255	3.6
腎炎、腎病症候群及腎病變	5,049	2.9
慢性肝病及肝硬化	4,240	2.4

表1-2-1　20歲以上國人三高盛行率

Table 1-2-1　The Prevalence of Hypertension, Hyperglycemia/Diabetes and Hyperlipidemia among the Population Aged 20 and Over

單位：百分比　Unit：%

高血壓盛行率

The Prevalence of Hypertension

		有效樣本數 Sample Size	依性別分 by sex		
			計 Both	男 Male	女 Female
民國94-97年	2005-2008	1,703	18.3	21.6	15.2
民國102-105年	2013-2016	5,051	25.7	29.2	22.4
20-39歲	20-39	1,326	5.7	8.1	3.3
40-64歲	40-64	2,016	29.7	36.4	23.1
65歲以上	above 65 ages	1,709	62.6	61.5	63.5

高血糖/糖尿病盛行率

The Prevalence of Hyperglycemia/Diabetes

		有效樣本數 Sample Size	依性別分 by sex		
			計 Both	男 Male	女 Female
民國94-97年	2005-2008	1,577	8.5	10.4	6.6
民國102-105年	2013-2016	2,863	11.6	12.9	10.5
20-39歲	20-39	667	2.3	3.8	1.0
40-64歲	40-64	1,206	12.4	12.9	11.9
65歲以上	above 65 ages	990	29.8	32.9	27.0

高血脂盛行率

The Prevalence of Hyperlipidemia

		有效樣本數 Sample Size	依性別分 by sex		
			計 Both	男 Male	女 Female
民國94-97年	2005-2008	1,582	21.7	27.9	15.5
民國102-105年	2013-2016	3,090	22.8	25.6	20.2
20-39歲	20-39	728	11.4	17.1	5.9
40-64歲	40-64	1,296	28.7	30.8	26.7
65歲以上	above 65 ages	1,066	32.0	30.3	33.4

資料來源：前行政院衛生署食品藥物管理局民國94-97年國民營養健康狀況變遷調查、本署民國102-105年國民營養健康狀況變遷調查。

備註：百分比經加權調整。

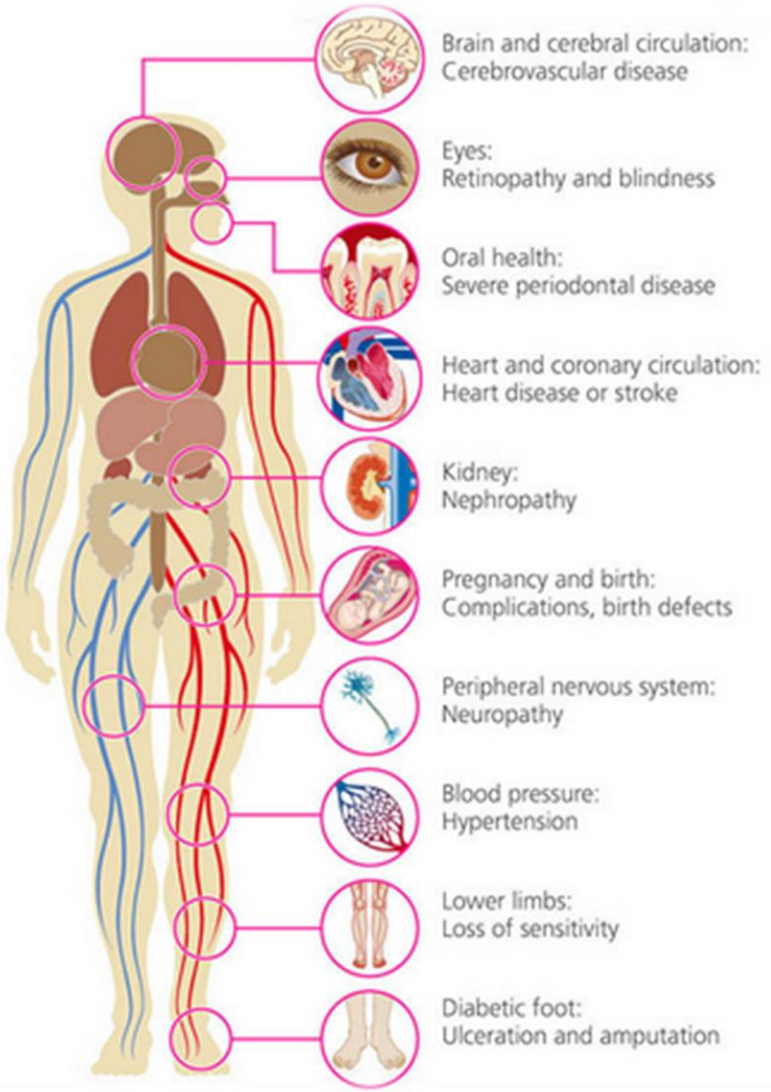
Source：2005-2008 Nutrition and Health Survey in Taiwan by the former Food and Drug Administration, Department of Health, Executive Yuan and 2013-2016 Nutrition and Health Survey in Taiwan by HPA.

Note：All percentages were weighted.

International Diabetes Federation

IDF DIABETES ATLAS

Ninth edition 2019



INTRODUCTION

In 2019, IDF estimates that:

1 in 11 adults (20-79 years) have diabetes
463 million people

1 in 2 adults with diabetes are undiagnosed
232 million people

Over 3 in 4 people with diabetes live in low- and middle-income countries

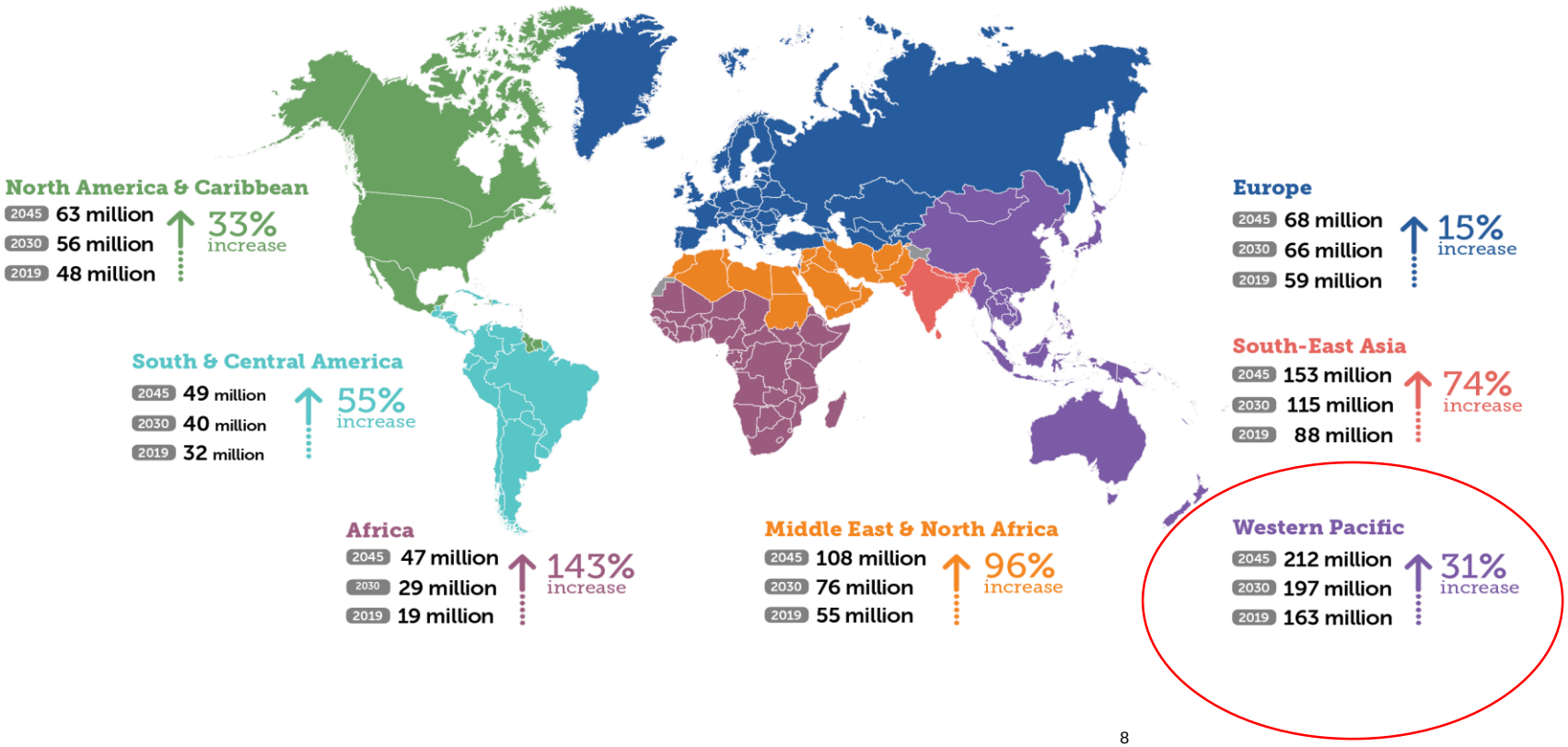
10% of global health expenditure is spent on diabetes
USD 760 billion

1 in 13 adults (20-79 years) have impaired glucose tolerance 374 million people

1 in 5 people with diabetes are above 65 years old
136 million people

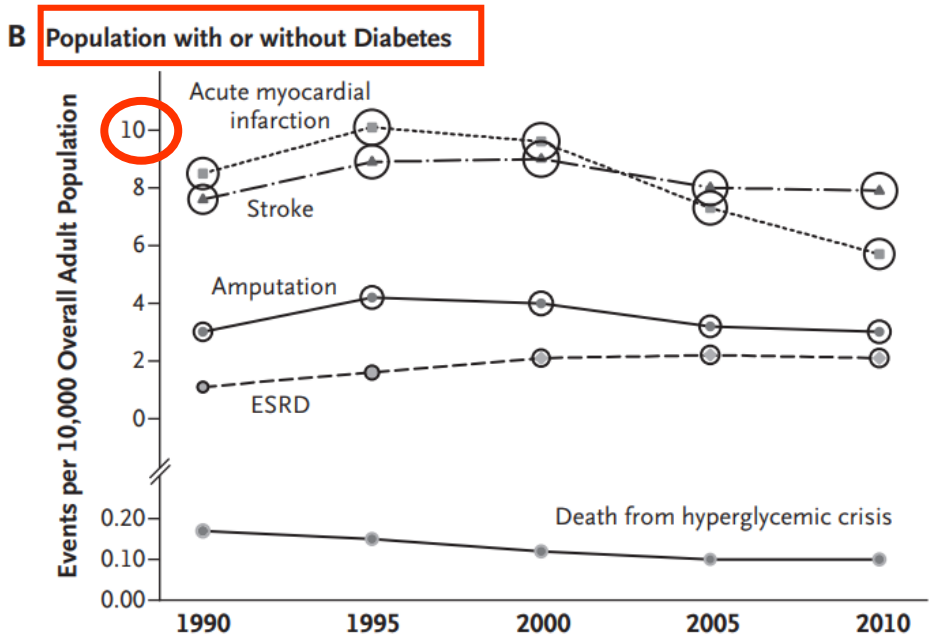
1,110,100 children and adolescents below 20 years have type 1 diabetes.

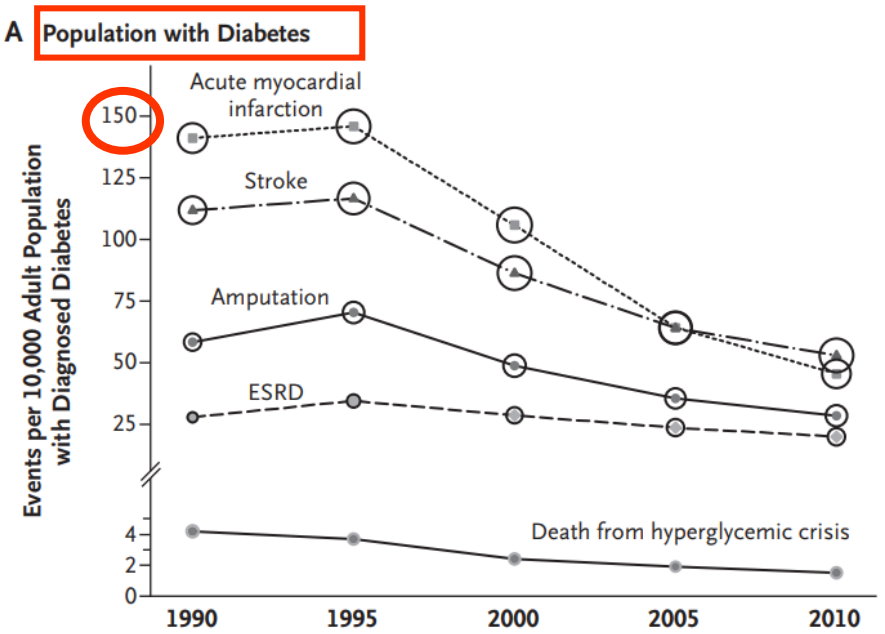
1 in 6 live births (20 million) are affected by hyperglycaemia in pregnancy
84% of which is due to gestational diabetes


North America & Caribbean
2045 63 million
2030 56 million
2019 48 million
33% increase
South & Central America
2045 49 million
2030 40 million
2019 32 million
55% increase
Africa
2045 47 million
2030 29 million
2019 19 million
143% increase
Middle East & North Africa
2045 108 million
2030 76 million
2019 55 million
96% increase
Europe
2045 68 million
2030 66 million
2019 59 million
15% increase
South-East Asia
2045 153 million
2030 115 million
2019 88 million
74% increase
Western Pacific
2045 212 million
2030 197 million
2019 163 million
31% increase

Trends in Age-Standardized Rates of Diabetes-Related Complications among U.S. 1990-2010

AMI and stroke even occur 10 fold more often in patients with DM



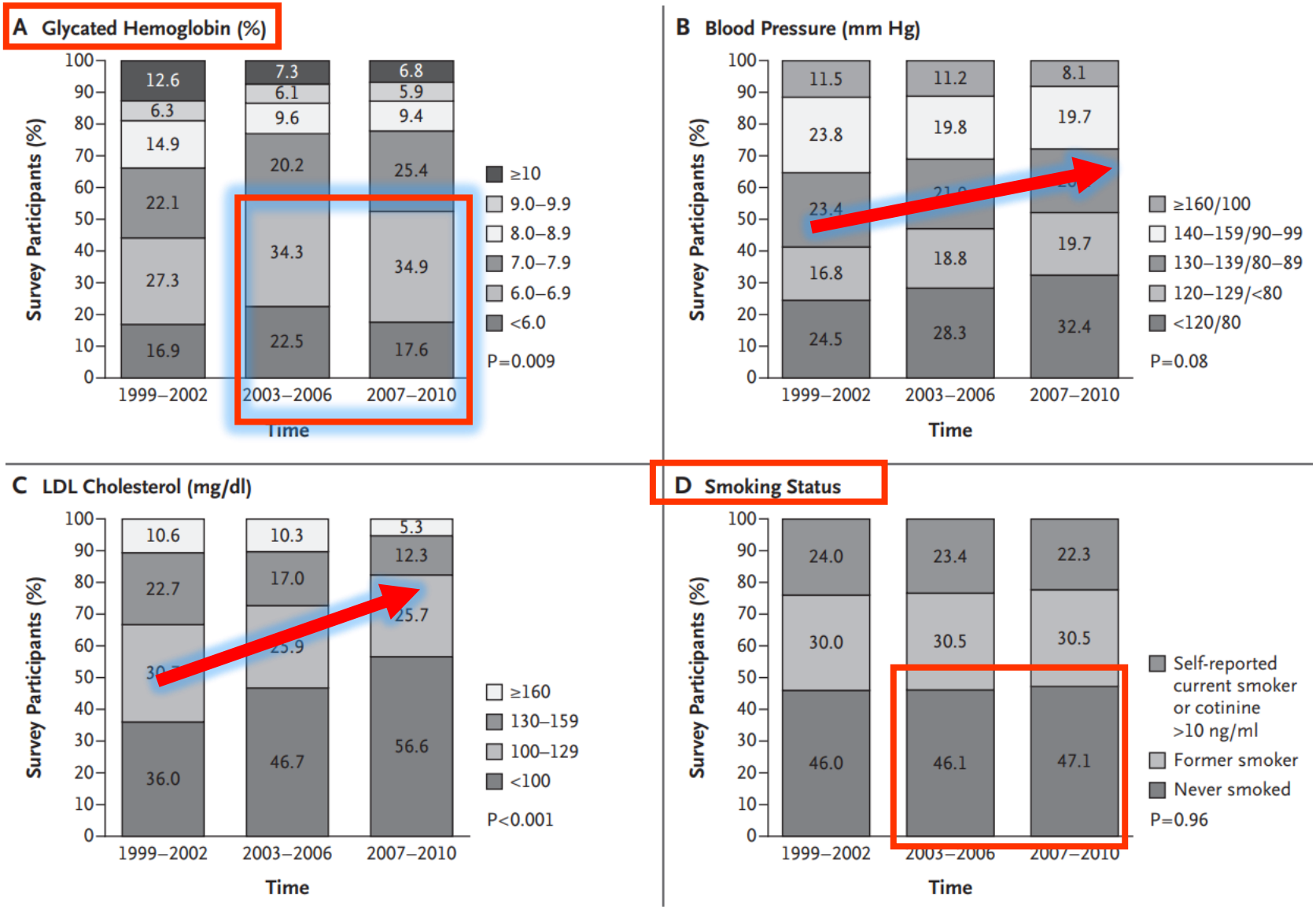


Database:

- ✓ National Hospital Discharge Survey
- ✓ U.S. Renal Data System
- ✓ U.S. National Vital Statistics System

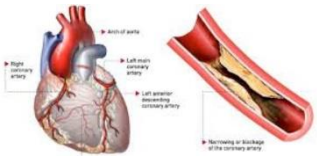
N Engl J Med. 2014 Apr 17;370(16):1514-23. doi: 10.1056/NEJMoa1310799.

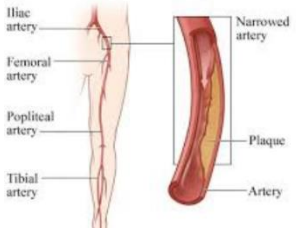
Distribution of Risk Factors for Microvascular and Macrovascular Complications among U.S. Adults with Diabetes, 1999–2010

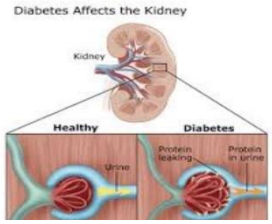


N engl j med 368;17 nejm.org april 25, 2013

Improved, But Unresolved items!





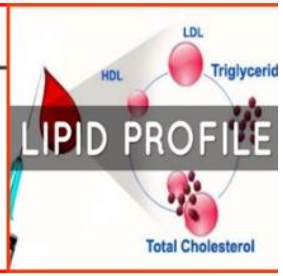


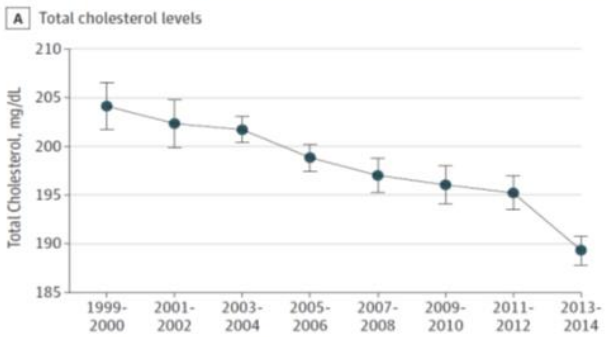
Complication	1990	2000	2010	Percent Change, 1990–2010
Acute myocardial infarction				
Among adults with diabetes — no. of events/10,000 (95% CI)	141.1 (125.3–156.8)	105.7 (96.1–115.2)	45.5 (34.6–56.4)	–67.8
Among adults without diabetes — no. of events/10,000 (95% CI)	37.5 (35.1–40.0)	37.1 (34.7–39.6)	25.8 (21.6–30.1)	–31.2
Relative risk (95% CI)	3.8 (3.3–4.2)	2.8 (2.5–3.2)	1.8 (1.3–2.3)	
Stroke				
Among adults with diabetes — no. of events/10,000 (95% CI)	111.8 (98.9–124.7)	86.2 (78.8–93.7)	52.9 (41.1–64.7)	–52.7
Among adults without diabetes — no. of events/10,000 (95% CI)	36.3 (33.8–38.9)	35.0 (32.9–37.1)	34.3 (27.5–41.1)	–5.5
Relative risk (95% CI)	3.1 (2.7–3.5)	2.5 (2.2–2.7)	1.5 (1.1–2.0)	
Lower-extremity amputation				
Among adults with diabetes — no. of events/10,000 (95% CI)	58.4 (49.3–67.4)	48.7 (41.6–55.9)	28.4 (19.4–37.3)	–51.4
Among adults without diabetes — no. of events/10,000 (95% CI)	3.1 (2.7–3.5)	2.7 (2.3–3.1)	2.7 (1.9–3.5)	–12.9
Relative risk (95% CI)	18.8 (15.1–22.6)	18.0 (14.3–21.7)	10.5 (6.0–15.0)	
End–stage renal disease				
Among adults with diabetes — no. of events/10,000 (95% CI)	27.9 (25.7–30.0)	28.6 (27.6–29.7)	20.0 (19.1–20.9)	–28.3
Among adults without diabetes — no. of events/10,000 (95% CI)	2.0 (2.0–2.1)	3.0 (3.0–3.1)	3.3 (3.3–3.4)	65.0
Relative risk (95% CI)	13.7 (12.6–14.9)	9.5 (9.2–9.9)	6.1 (5.7–6.3)	

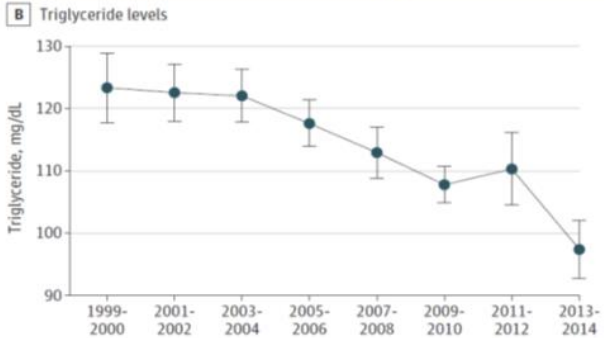
N Engl J Med. 2014 Apr 17;370(16):1514-23. doi: 10.1056/NEJMoa1310799.

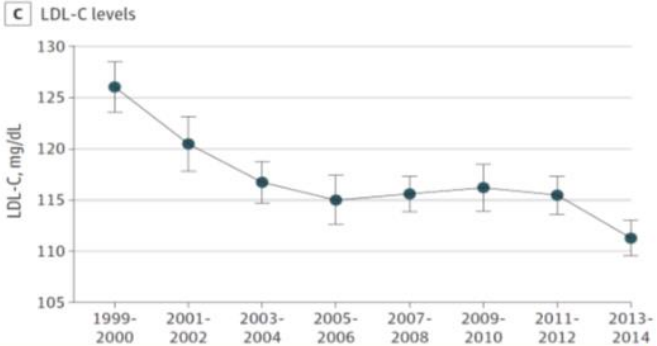
RESEARCH LETTER

Trends in Total Cholesterol, Triglycerides, and Low-Density Lipoprotein in US Adults, 1999-2014





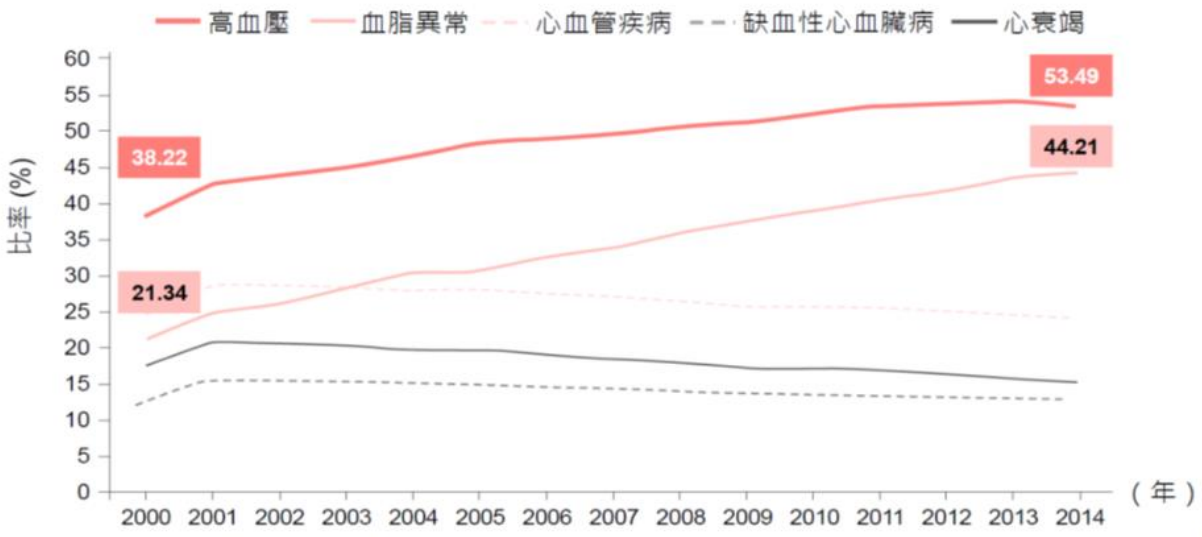




JAMA Cardiology Published online November 30, 2016

新發生個案的共病症中
高血壓與高血脂的比例持續上升

第 2 型糖尿病新發生個案於前一年伴隨的相關共病症

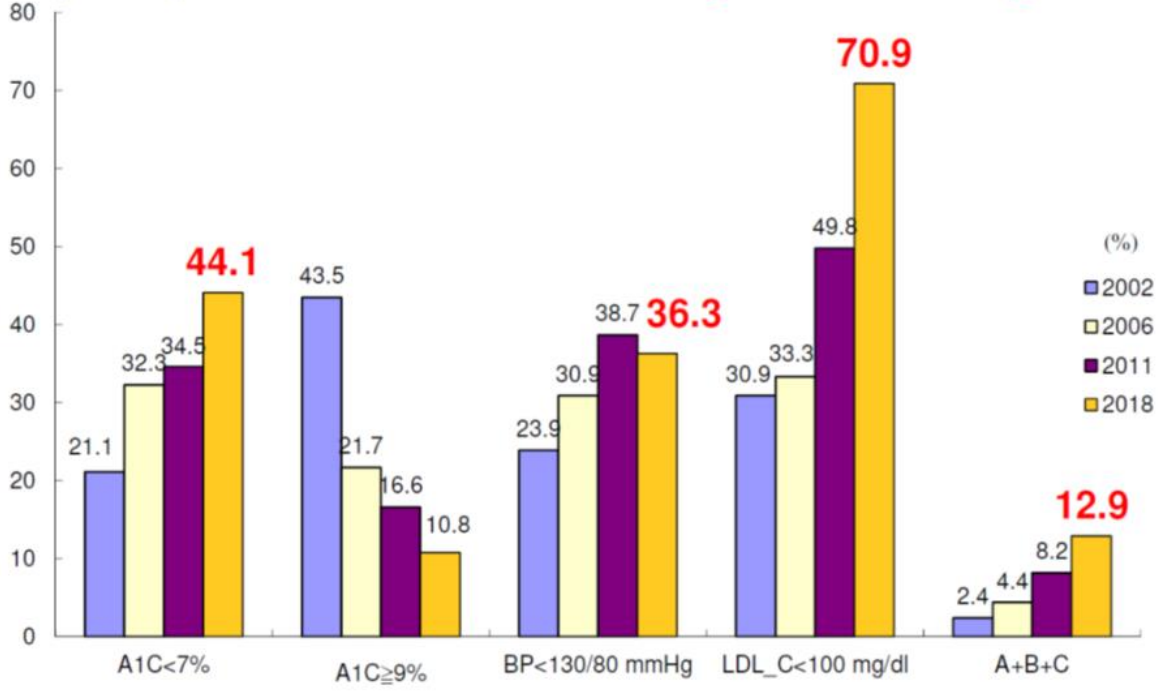


*共病症比率 = (當年)疾病個數/(當年)新發第2型糖尿病個案數*100%
**ICD-9-CM 代碼：高血壓 = 401-405; 血脂異常 = 270; 心血管疾病 = 398.91, 422, 425, 428, 402, 404, 410-414; 缺血性心臟病 = 410-414; 心衰竭 = 398.91, 422, 425, 428, 420, 404

台灣糖尿病健康促進機構之品管調查研究

三高控制狀況 -TADE 2002/2006/2011/2018調查

(N=5855) A：A1C <7%、B：BP<130/80 mmHg、C：LDL-C<100 mg/dL



Diabetes and Cardiovascular Disease

Long-term outcomes associated with triple-goal achievement in patients with type 2 diabetes mellitus (T2DM)

Check for updates

After calculating the BP, HbA1c and LDL-C levels for each cycle, we determined the goal achievement status based on[a], *Vivian Fonseca*[c], the standard of HbA1c < 7.0%, LDL-C < 100 mg/dl and BP < 140/90 mmHg. Patients with T2DM who reached one and only

A retrospective cohort of 53,120 patients with T2DM were identified (97.51% male, 61.49% whites) from the Veterans Affairs (VA) electronic medical records VISN 16 data warehouse (2004–2010) over an average of 4 years of

Goal Achievement:

1. HbA1C <7%
2. LDL< 100 mg/dl
3. BP< 140/90 mmHg

LDL是否達標 有顯著的影響　LDL is the Causative Factor

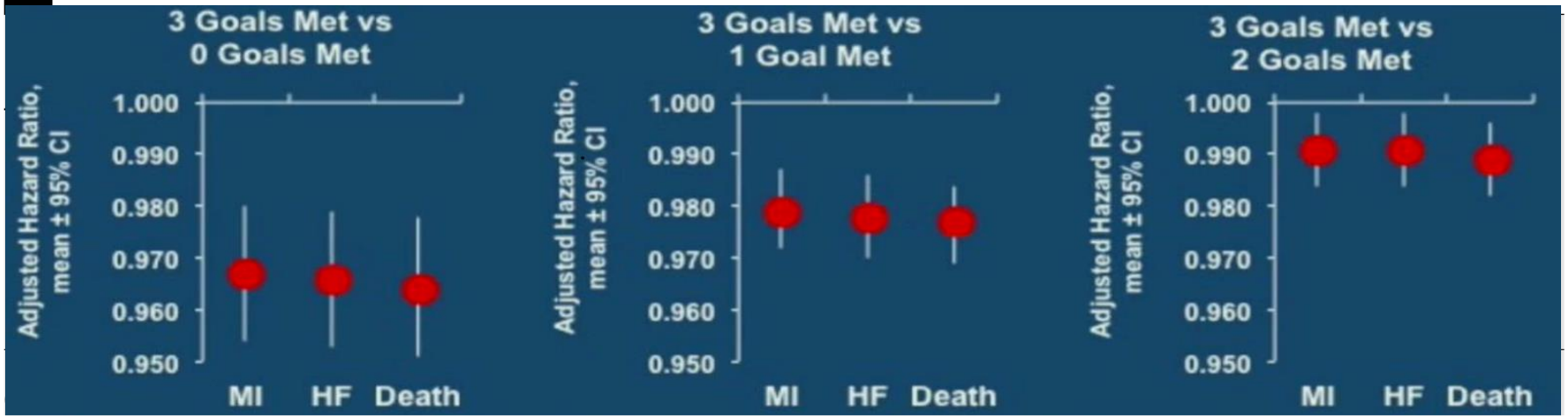
Table 3 – Propensity score weighted multivariate analysis of long-term clinical outcomes compared with triple-goal and dual-goal achievers.

Complications/death	Triple-goal vs. A1c+BP			Triple-goal vs. A1c+LDL-C			Triple-goal vs. LDL-C+BP		
	aHR*	95% CI		aHR*	95% CI		aHR*	95% CI	
Microvascular complications	0.978	0.967	0.988	0.996	0.984	1.008	1.001	0.992	1.009
Macrovascular complications	0.979	0.969	0.990	1.002	0.990	1.014	0.992	0.983	1.000
Myocardial infarction	0.978	0.968	0.988	0.994	0.983	1.006	0.997	0.989	1.005
Cerebrovascular disease	0.978	0.968	0.988	0.999	0.988	1.011	0.995	0.987	1.004
Acute coronary syndromes	0.978	0.967	0.987	0.994	0.983	1.006	0.997	0.989	1.005
Congestive heart failure	0.977	0.966	0.986	0.995	0.983	1.007	0.998	0.990	1.007
All-cause death	0.976	0.966	0.986	0.993	0.981	1.005	0.995	0.987	1.004

* aHR: Adjusted Hazard Ratio; compared with Triple-goal achievers to other goal achievement which were associated with higher risk for complications/all-cause mortality.

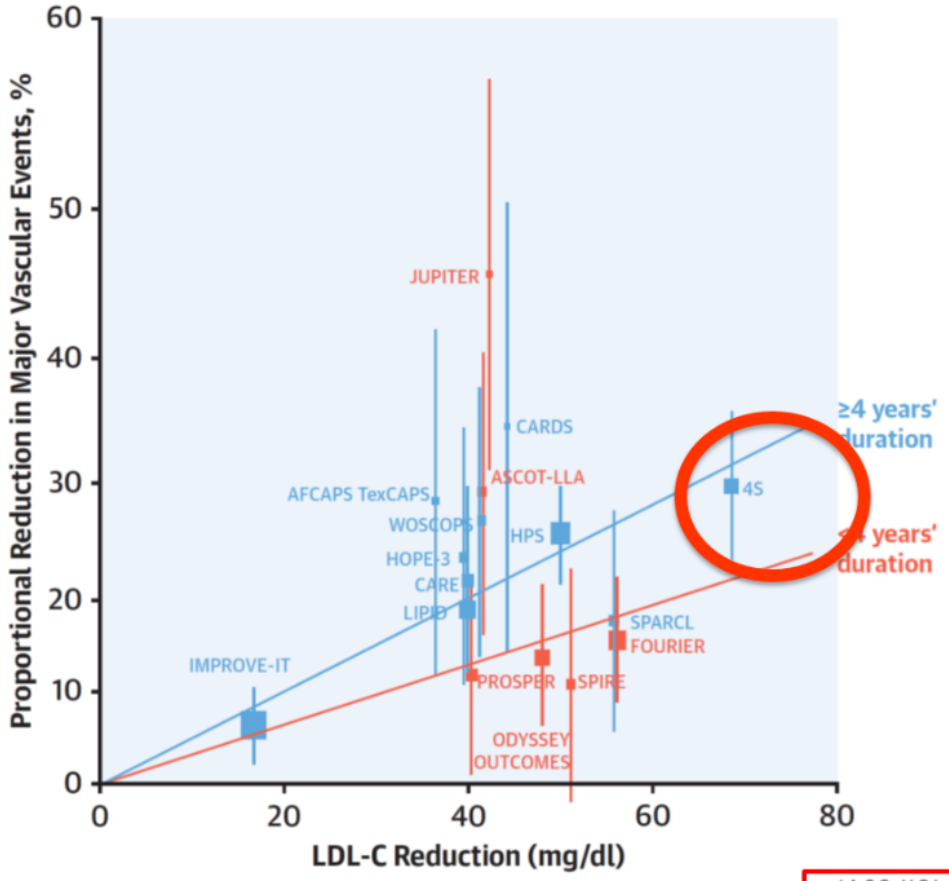
Tabl
Stat

達標數　3:0　3:1　3:2

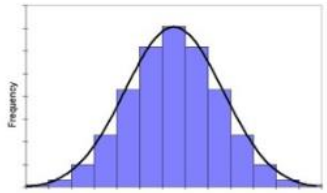


無論血壓 血糖 或血脂 達標數越多 能顯著減少心血管疾病風險

FIGURE 2 The Effect of Lowering LDL Cholesterol on Major Cardiovascular Events, Stratified by the Duration of Treatment



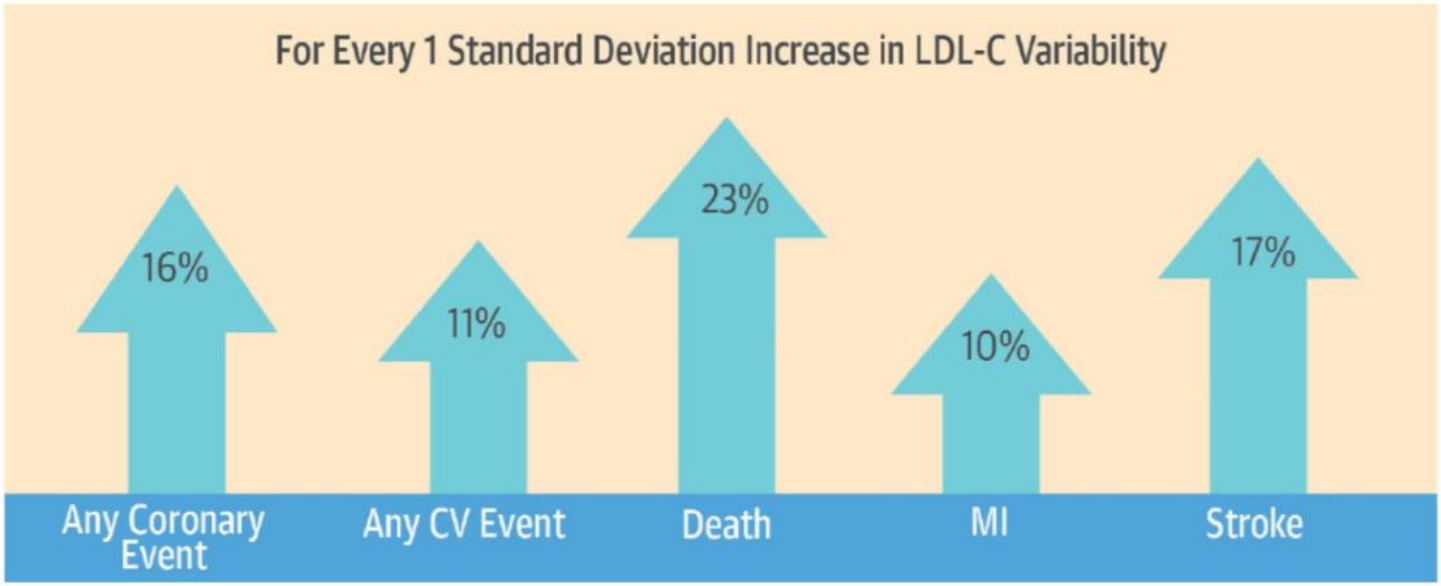
JACC VOL. 75, NO. 16, 2020
APRIL 28, 2020:1945–55



Visit-to-Visit Low-Density Lipoprotein Cholesterol Variability and Risk of Cardiovascular Outcomes

Insights From the TNT Trial

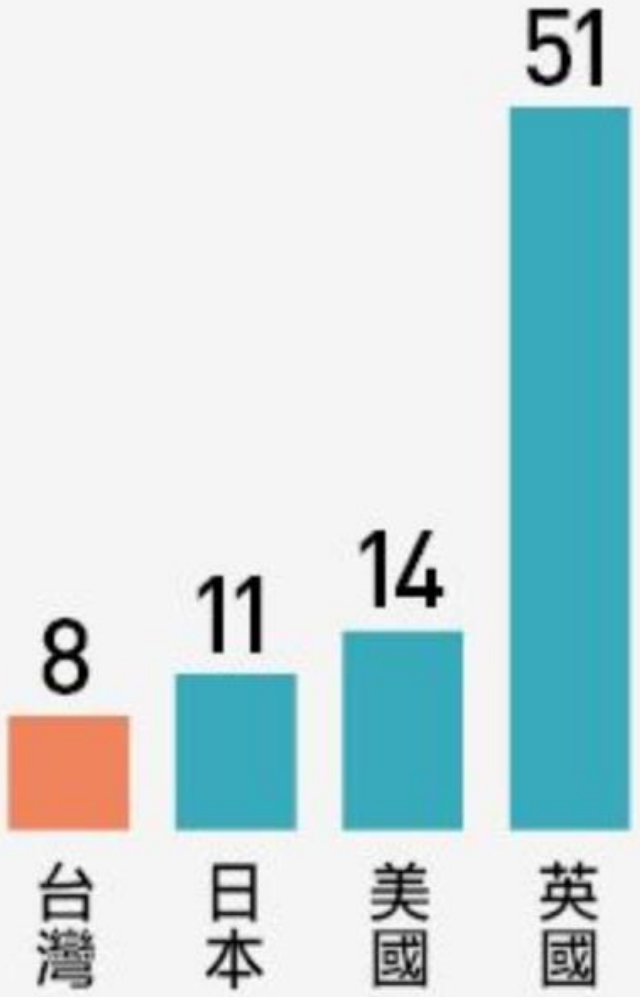
atorvastatin 80 mg/day versus 10 mg/day



Bangalore, S. et al. J Am Coll Cardiol. 2015; 65(15):1539–48.

台灣高齡化速度世界第一

從高齡社會到超高齡社會*所需時間（年）



註：*超高齡社會指老年人口超過總人口20%。

台灣將於10年內邁入超高齡社會

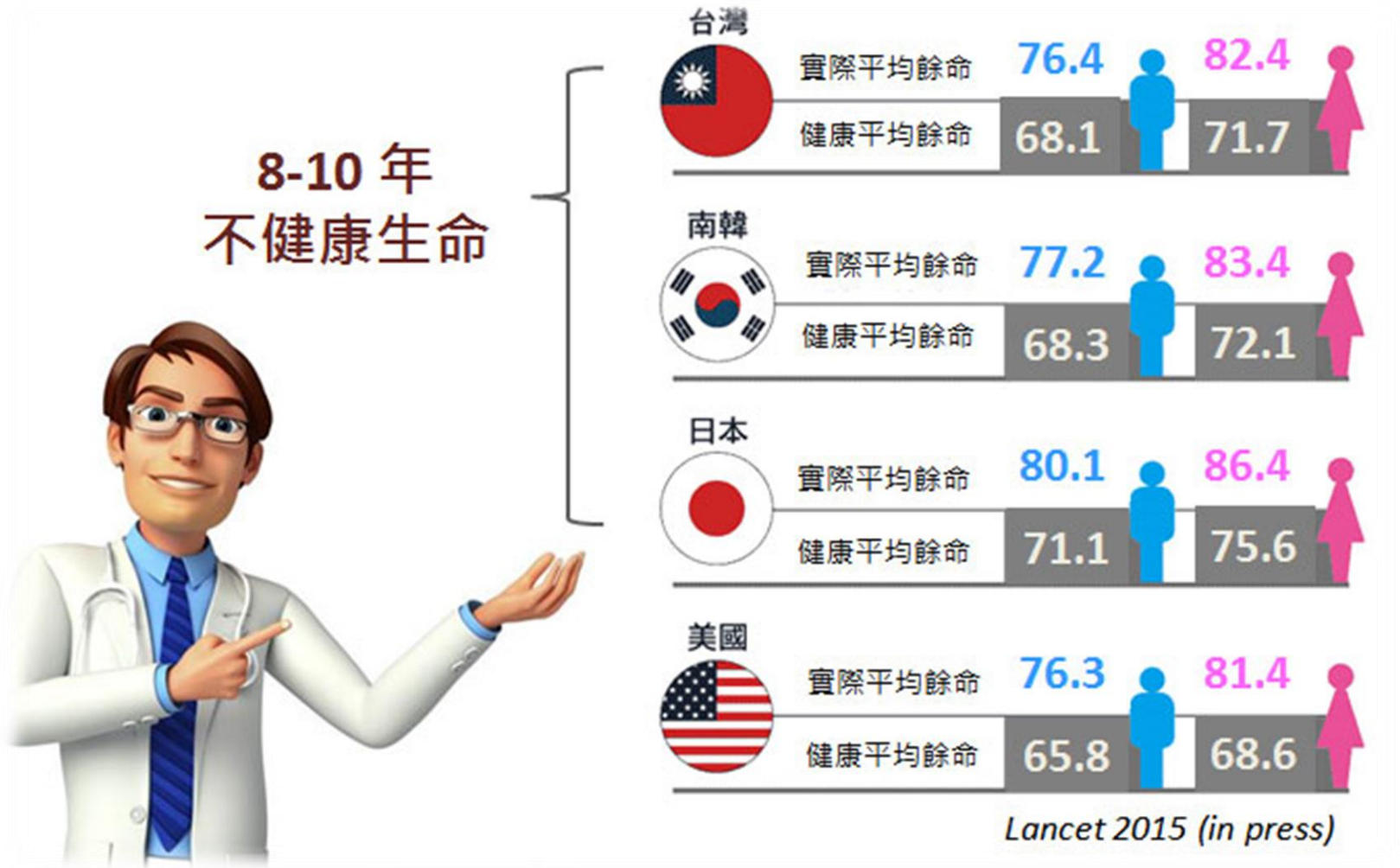
但是 長命=好命??

高齡化	高齡	超高齡
1993	2018	2025
7%	14%	20%

WHO定義：65歲以上人口比例佔總人口比例

人生馬拉松的最後 1/7

平均餘命-失能年數=健康餘命



多重共病

Polypharmacy in the oldest old (≥80 years of age) patients in China: a cross-sectional study

Table 2 Distribution of chronic diseases

Rank	Chronic disease	*n*	%
1	Hypertension	160	62.0
2	Hyperlipidemia	112	43.4
3	Atherosclerosis	111	43.0
4	Chronic gastritis	106	41.1
5	Coronary heart disease	105	40.7
6	Diabetes mellitus	98	38.0
7	Skin and tissue disease	87	33.7
8	Chronic low back pain	75	29.1
9	Respiratory diseases	69	26.7

Table 4 Number of drug types, drug numbers, frequencies of adverse drug reactions, and use of Chinese traditional medicines and health care products

Index	Stratification	*n*	%
Drug types	< 10	143	55.4
	10–15	59	22.9
	> 15	56	21.7
Number of drug types	≤10	9	3.5
	11–20	119	46.1
	21–30	81	31.4
	> 30	49	19.0
Adverse drug reactions	Yes	104	40.3
	No	95	36.8
	Uncertain	59	22.9
Use of Chinese tradi	Yes	156	60.5
	No	102	39.5
Use of over-the-coun cts	Yes	167	64.7
	No	91	35.3

Lai et al. BMC Geriatrics (2018) 18:64

我吃過的藥 比你們吃過的飯多!

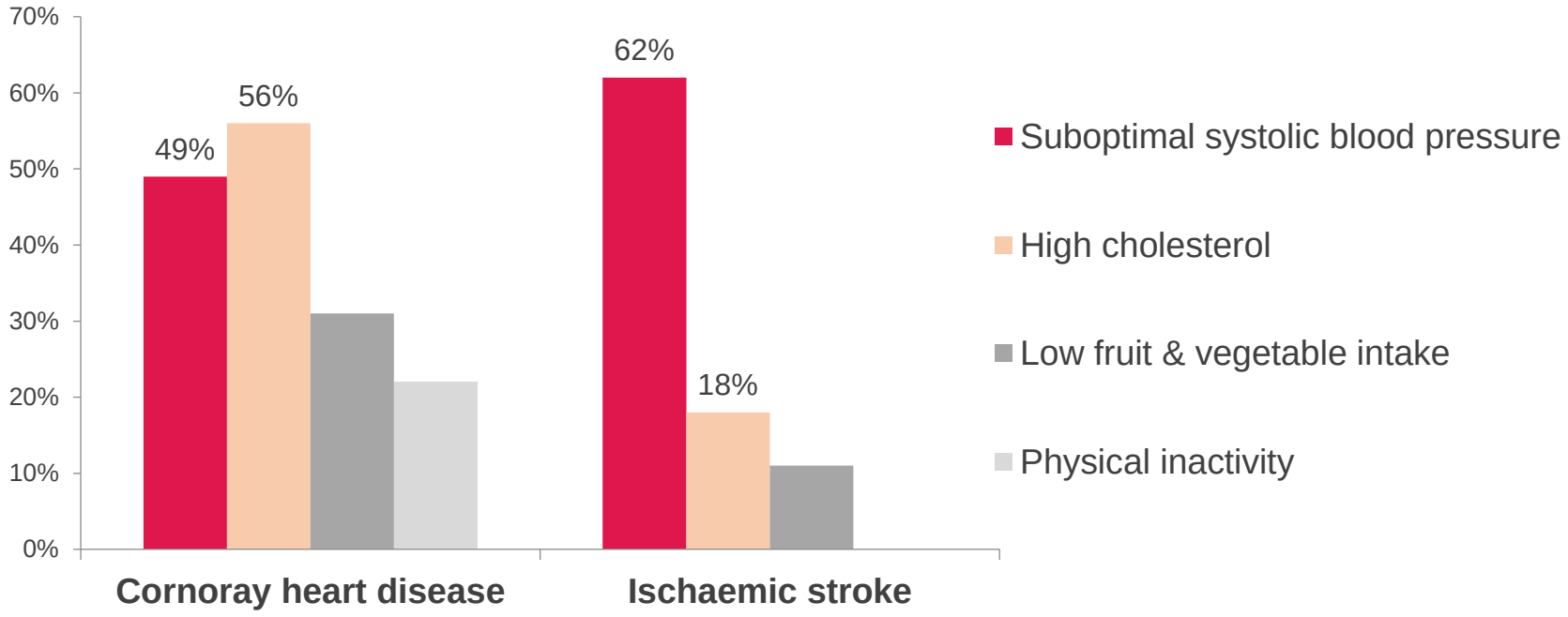
Topics

- Introduction
- **Synergy of Hypertension & Lipid Therapy**
- Optimization of Therapy Effects by Improving Adherence
- Updated HTN and Lipid Guidelines
- Summary

Key Factors for CVD: Suboptimal BP & High Cholesterol

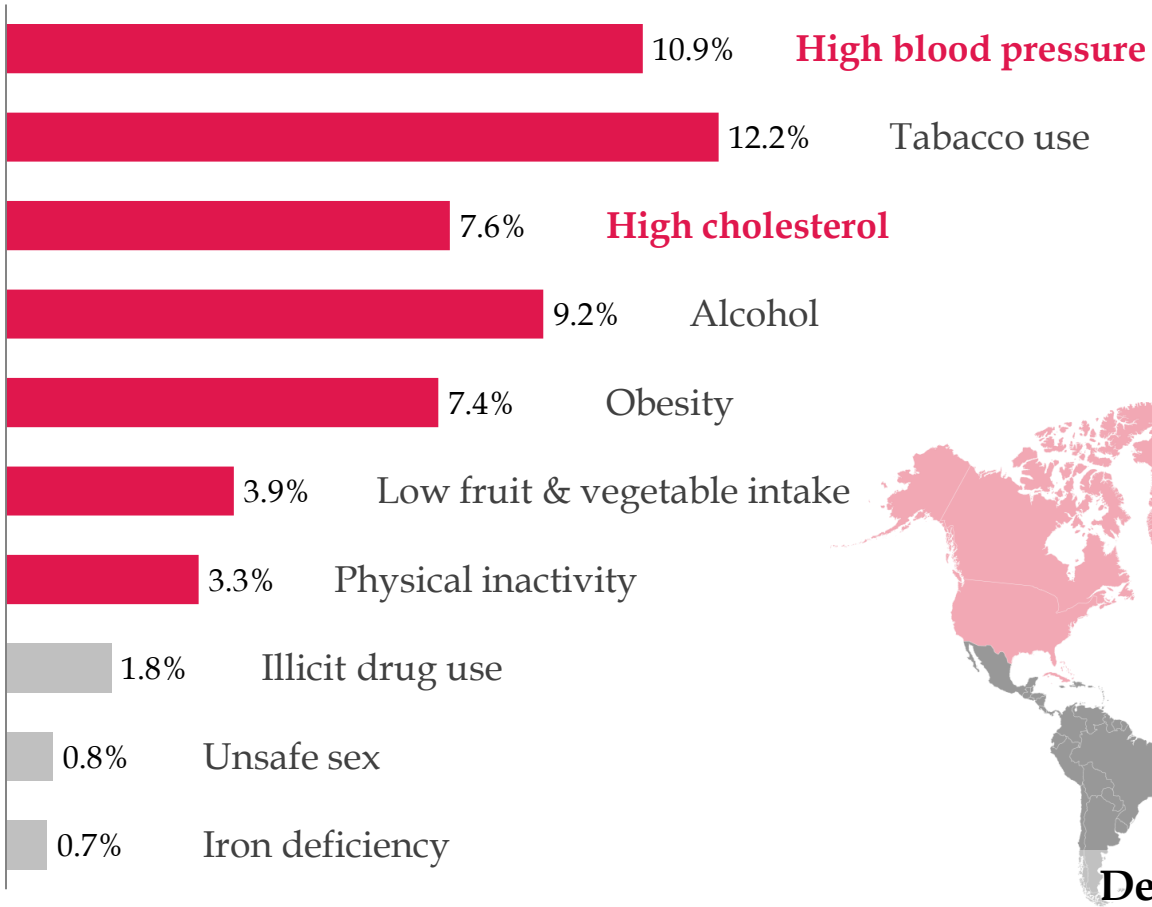
Contributory factors:

Percentage contribution of selected risk factors to coronary heart disease and ischaemic stroke (2002)



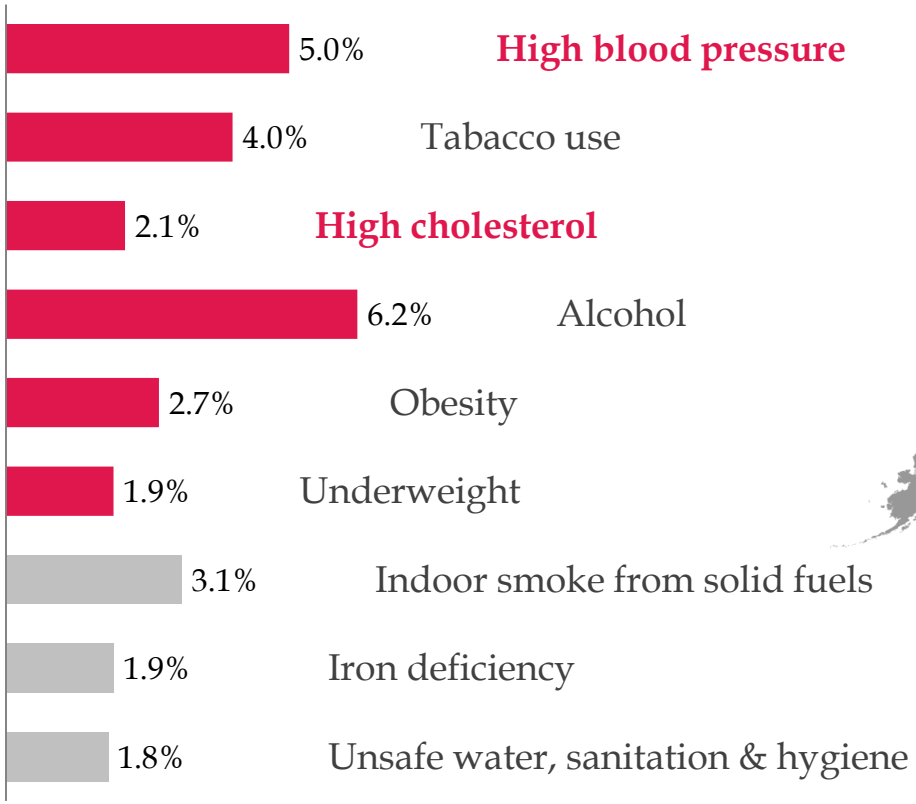
Mackay,J., Mensah,G., The Atlas of Heart Disease and Stroke. Geneva, WHO, 2004.

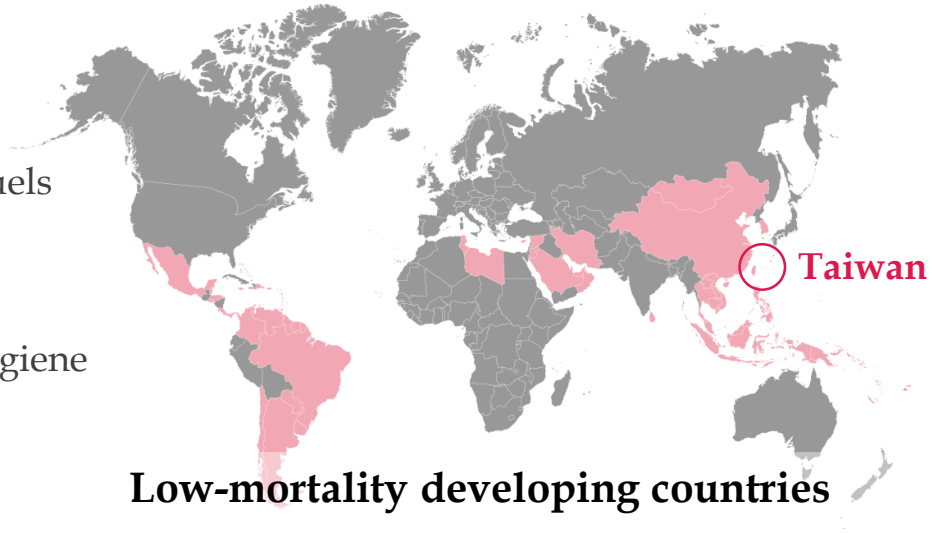
Leading Risk Factors for Coronary Heart Disease and Stroke in Developed Countries



Mackay,J., Mensah,G., The Atlas of Heart Disease and Stroke. Geneva, WHO, 2004.

Leading Risk Factors for Coronary Heart Disease and Stroke in Low-mortality Developing Countries

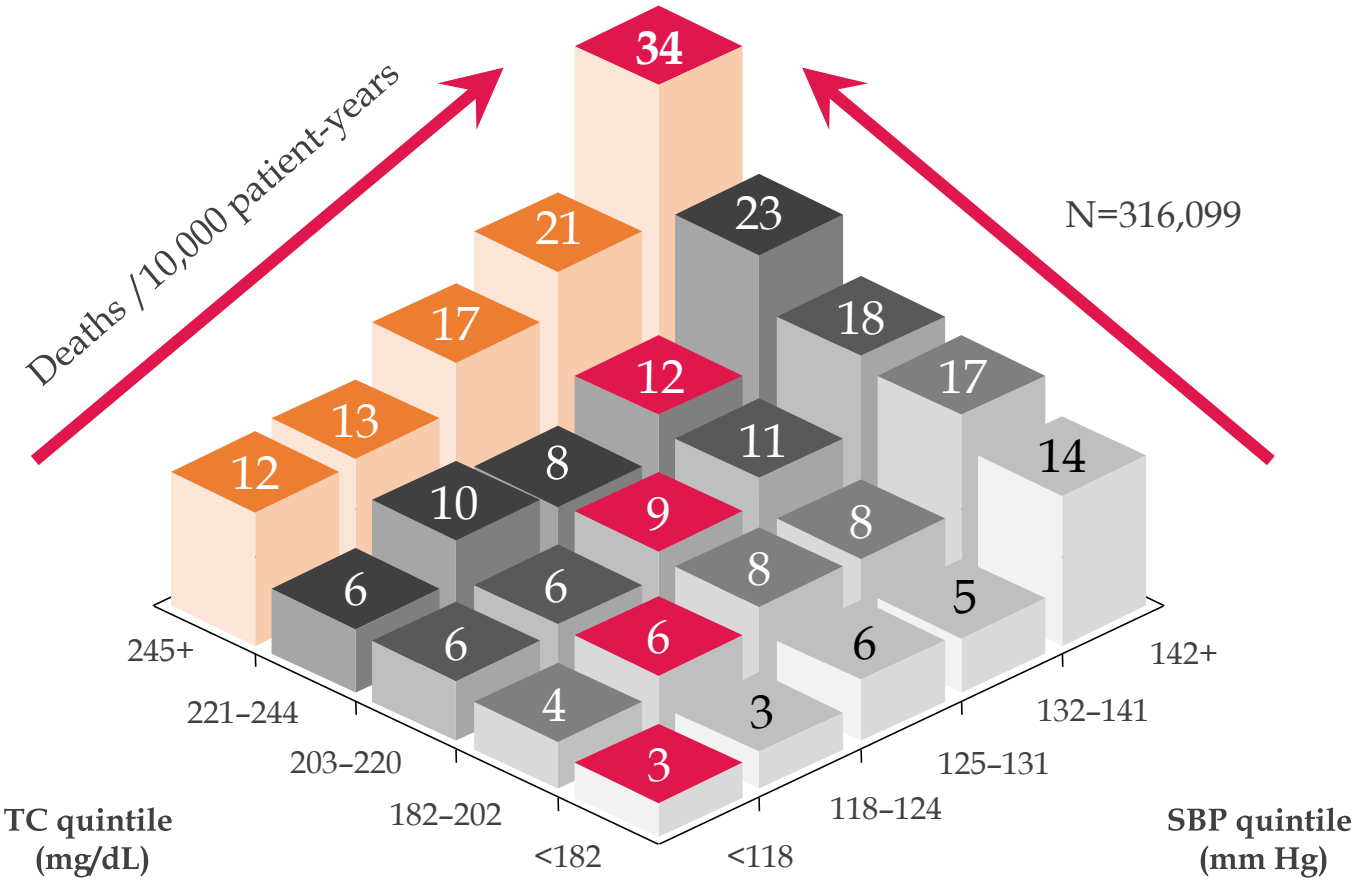




Mackay,J., Mensah,G., The Atlas of Heart Disease and Stroke. Geneva, WHO, 2004.

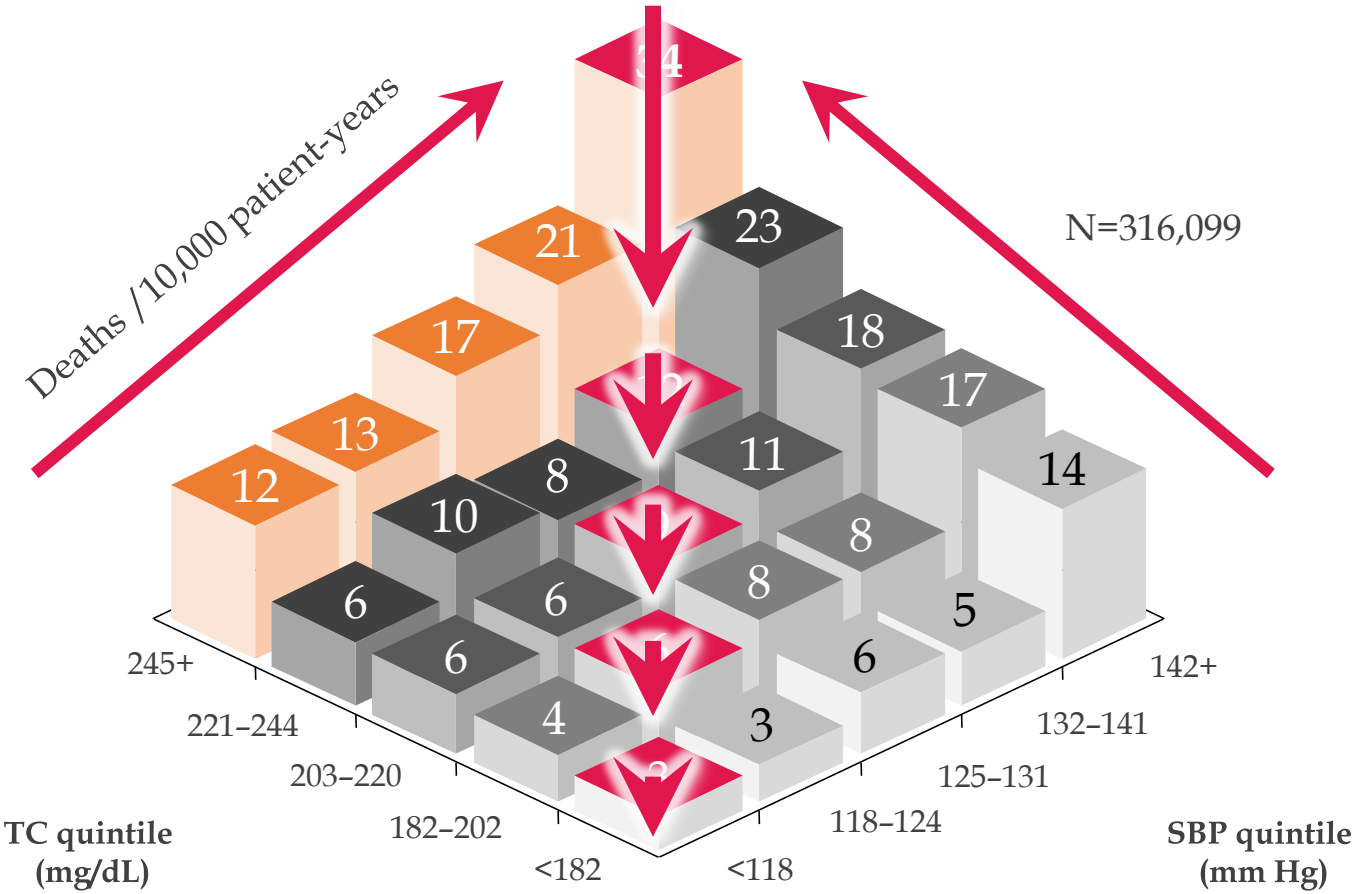
NCDs-noninfectious chronic disease in Asia Country

Interaction of Cholesterol and Systolic BP and Risk of CHD Death



Neaton JD, et al. Arch Intern Med 1992;152:56-64.

Interaction of Cholesterol and Systolic BP and Risk of CHD Death

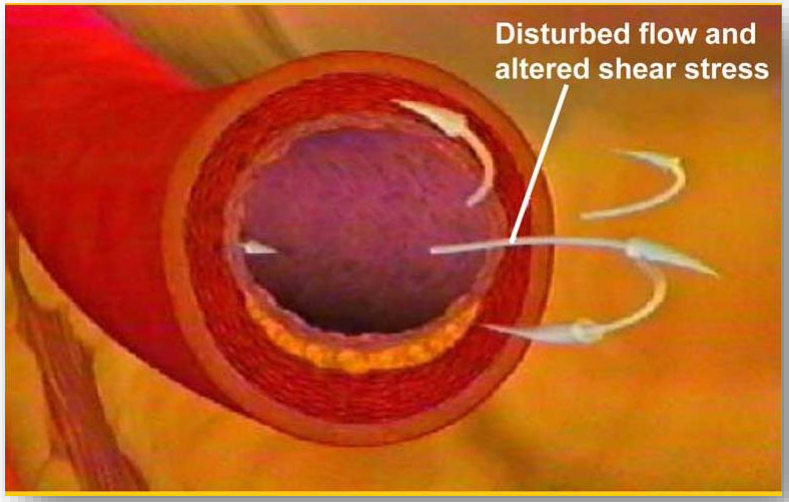


Neaton JD, et al. Arch Intern Med 1992;152:56-64.

Interplay Between Dyslipidemia and Hypertension

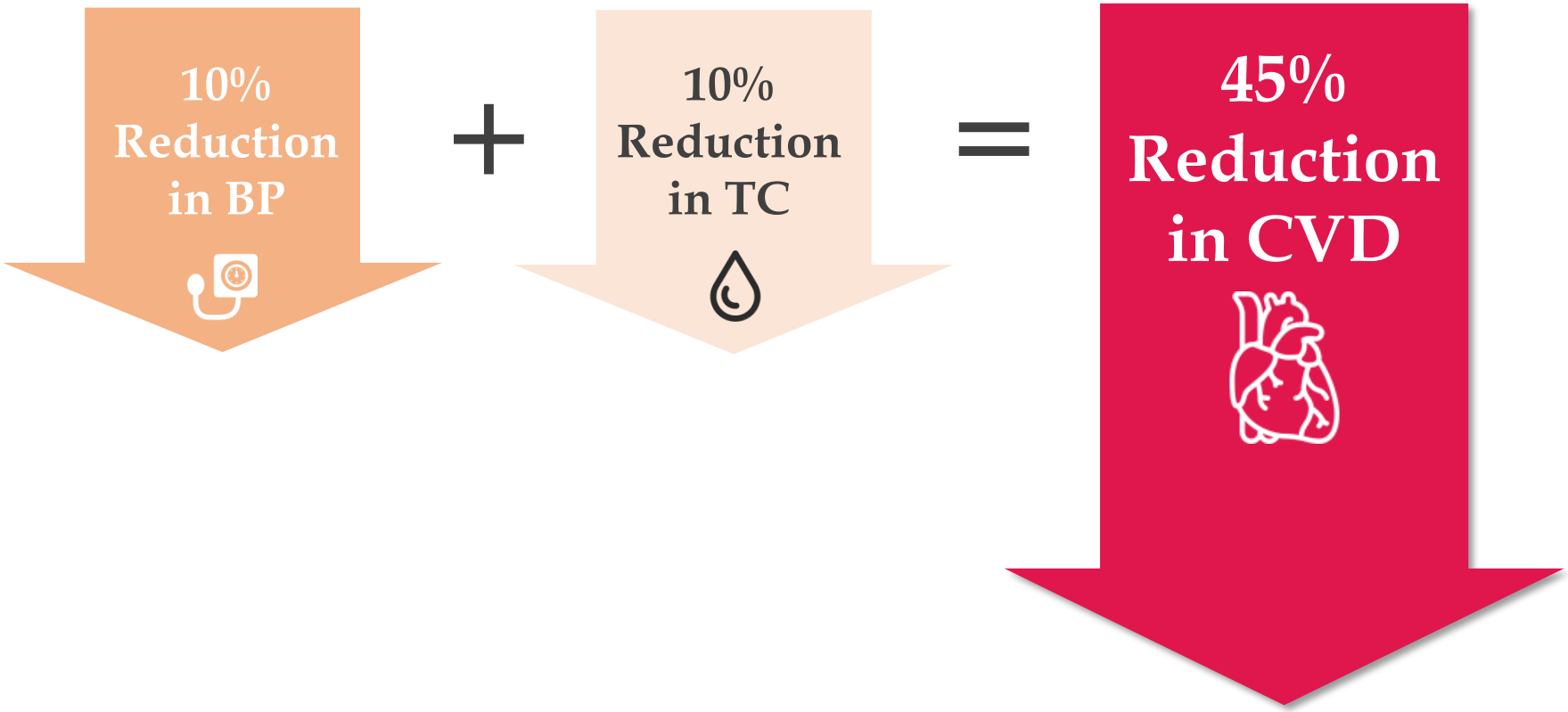
- It has been hypothesized that hypertension causes disturbed flow, altering shear stress and biomechanical strain in the arterial wall [1, 2]

- These altered biomechanical forces may lead to LDL-c accumulation in the arterial wall and promote LDL-c oxidation [3]



1. Taylor. Curr Hypertens Rep. 1999;1:96-101;
2. Gimbrone Jr et al. Ann NY Acd Sci. 2000;902:230-240
3. Lee et al. J Biol Chem. 2001; 276:13847-13851

Effect of Long-Term Modest Reductions in CV Risk Factors



Emberson J, et al. Eur Heart J 2004;25:484-91.

GEMINI AALA (Australia, Asia, Latin America, Africa/Middle East) - Study Design

Single-pill amlodipine/atorvastatin helps patients of diverse ethnicity attain recommended goals for blood pressure and lipids (the Gemini-AALA study)

Pre-enrolment: patients previously taking medication for hypertension and/or dyslipidemia must have been receiving stable doses of medication for at least 6 weeks

At each visit:
- Safety and concomitant medications assessed
- **Patients instructed on NCEP Step 1 diet**
- **Patients counselled on lifestyle modification**

Enrolment

Follow-up and analysis

為期14週的前瞻性試驗，共收入來自27個國家1657人，可以使用Caduet (5/10, 5/20, 5/40, 5/80, 10/10, 10/ 20, 10/40, 10/80)共八種劑量做調整，Primary Point為血壓血脂達標率

NJC 7

ATPIII

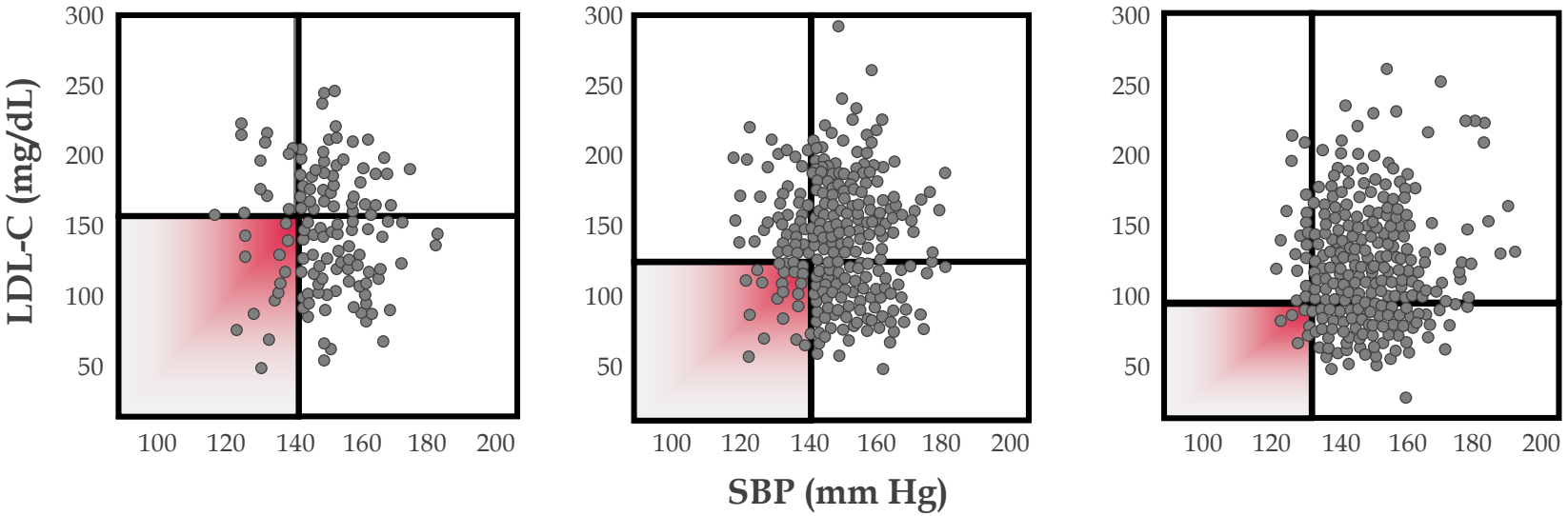
Assigned to treatment (n=1657)
Treated (n=1649)
SAFETY POPULATION: 1649

Titrated as per protocol

Erdine S, et al. J Hum Hypertens 2009;23:196-210.

GEMINI AALA – Criteria

LDL-C and SBP Levels at Baseline, by CV Risk Group



CV Risk Group 1

Patients with HTN, DYS, and no additional CV risk factors

CV Risk Group 2

Patients with HTN, DYS, and ≥1 additional CV risk factor (not DM or CHD)

CV Risk Group 3

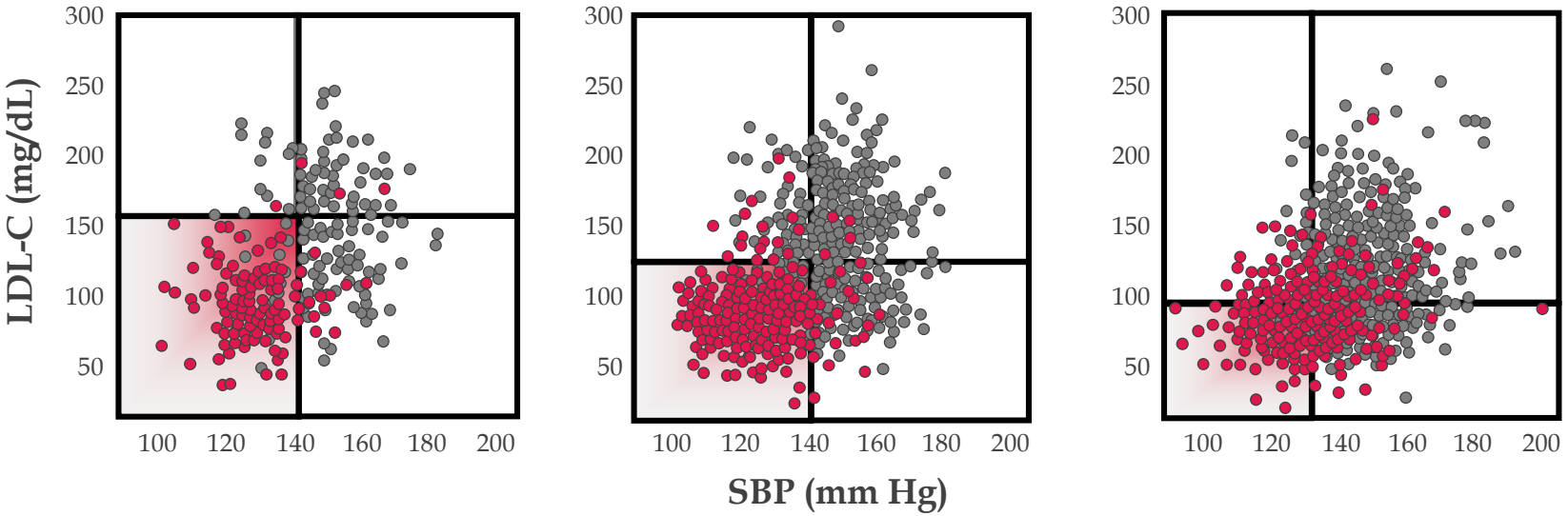
Patients with HTN, DYS, and CHD or CHD risk equivalent

Patients at increasing CV risk

Blank R, et al. J Clin Hypertens (Greenwich) 2005;7:264-73.

GEMINI AALA – Results

LDL-C and SBP Levels for All CV Risk Groups at Baseline and End Point



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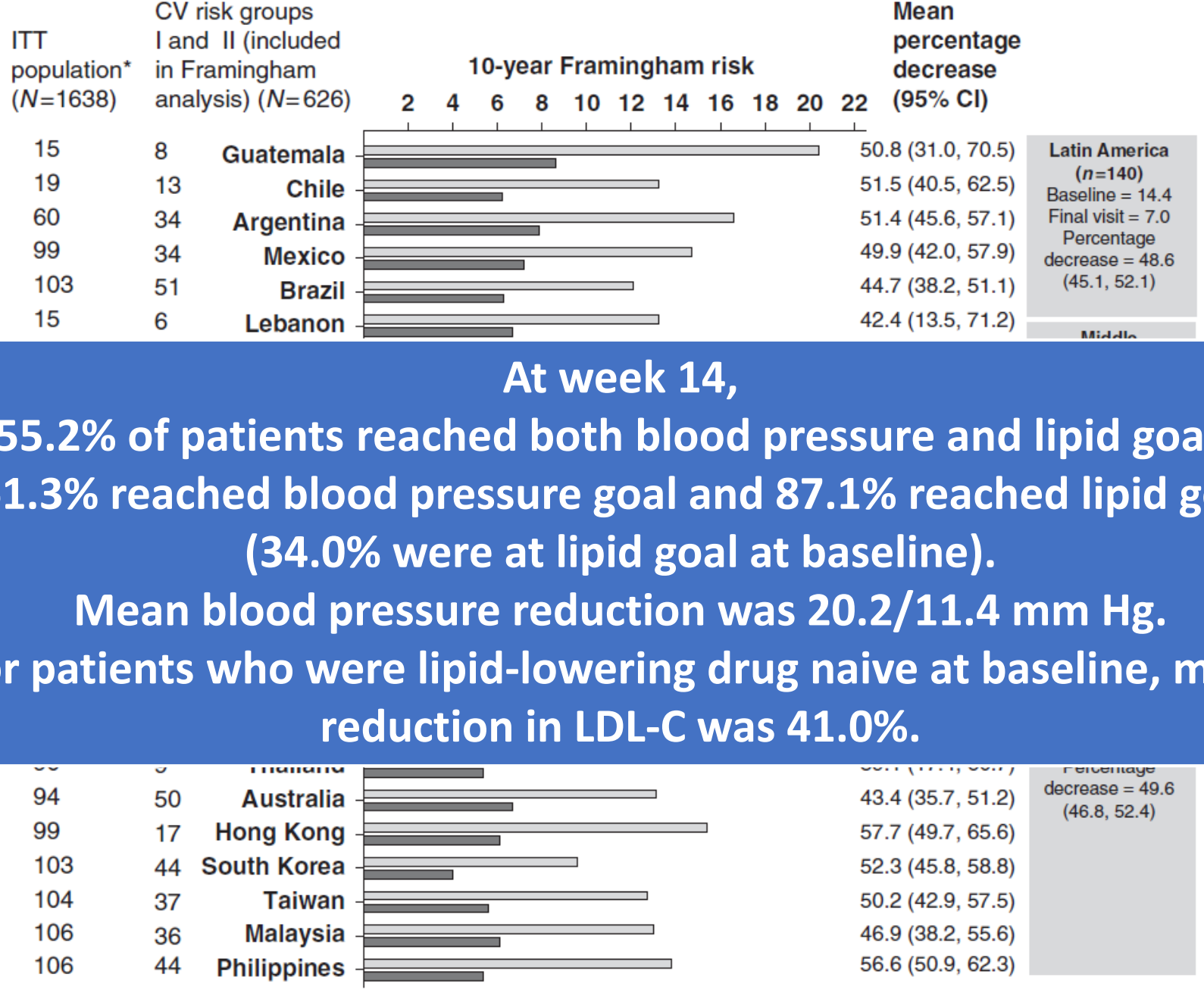
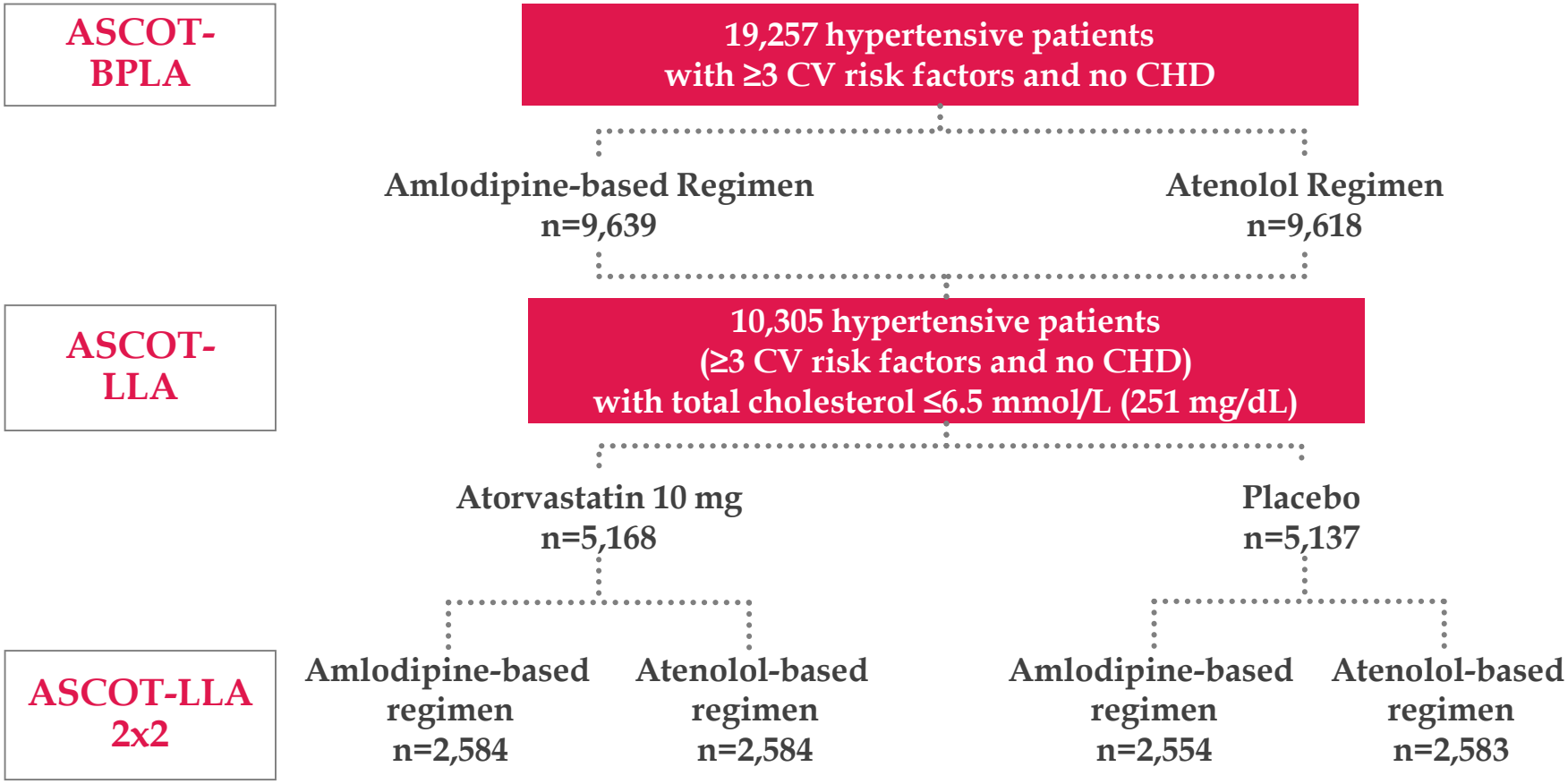
Patients with HTN, DYS, and CHD or CHD risk equivalent

Blank R, et al. J Clin Hypertens (Greenwich) 2005;7:264-73.



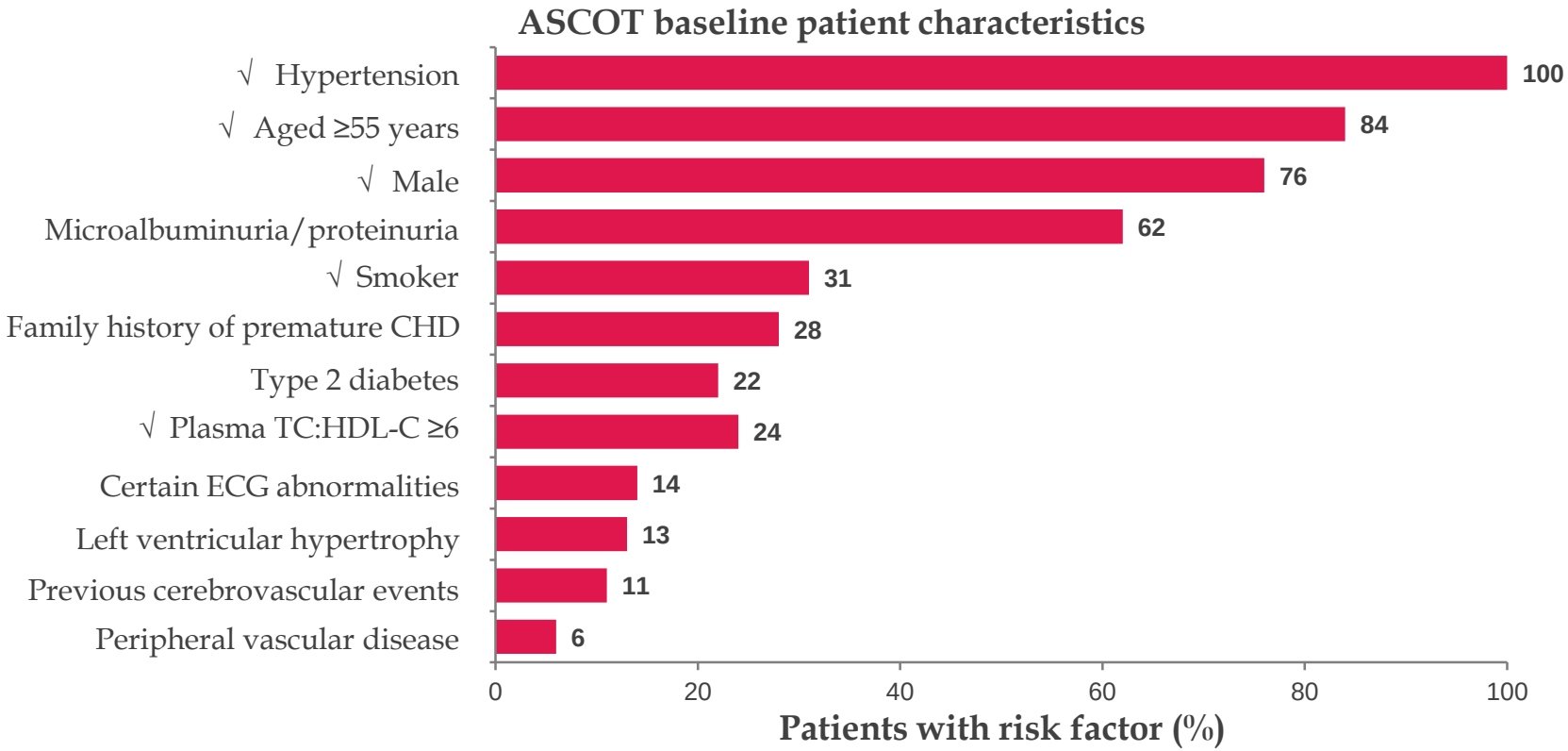
At week 14,
55.2% of patients reached both blood pressure and lipid goals,
61.3% reached blood pressure goal and 87.1% reached lipid goal
(34.0% were at lipid goal at baseline).
Mean blood pressure reduction was 20.2/11.4 mm Hg.
For patients who were lipid-lowering drug naive at baseline, mean reduction in LDL-C was 41.0%.

ASCOT Study Design



1. Sever PS, et al. Lancet 2003;361:1149-58
2. Björn Dahlöf, et al. Lancet 2005;366:895-906.
3. Sever P, et al. Eur Heart J 2006;27:2982-8.

ASCOT Trial Focused on Lowering CV Risk in Typical Hypertensive Patients

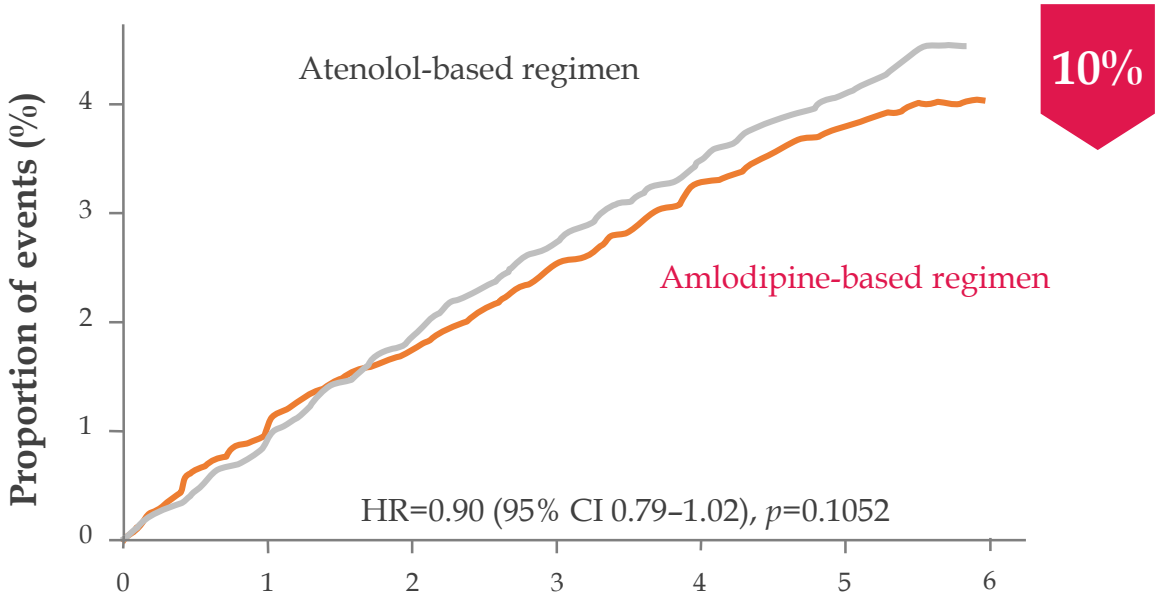


ASCOT patients had 3 or more common risk factors, such as male sex, aged 55 and older, and smoking.

Peter Sever et al. for the ASCOT investigators J Hypertens. 2001 Jun;19(6):1139-47.

ASCOT-BPLA Analysis:

Amlodipine-based Regimen has Trend to Reduce Risks of Nonfatal MI and Fatal CHD

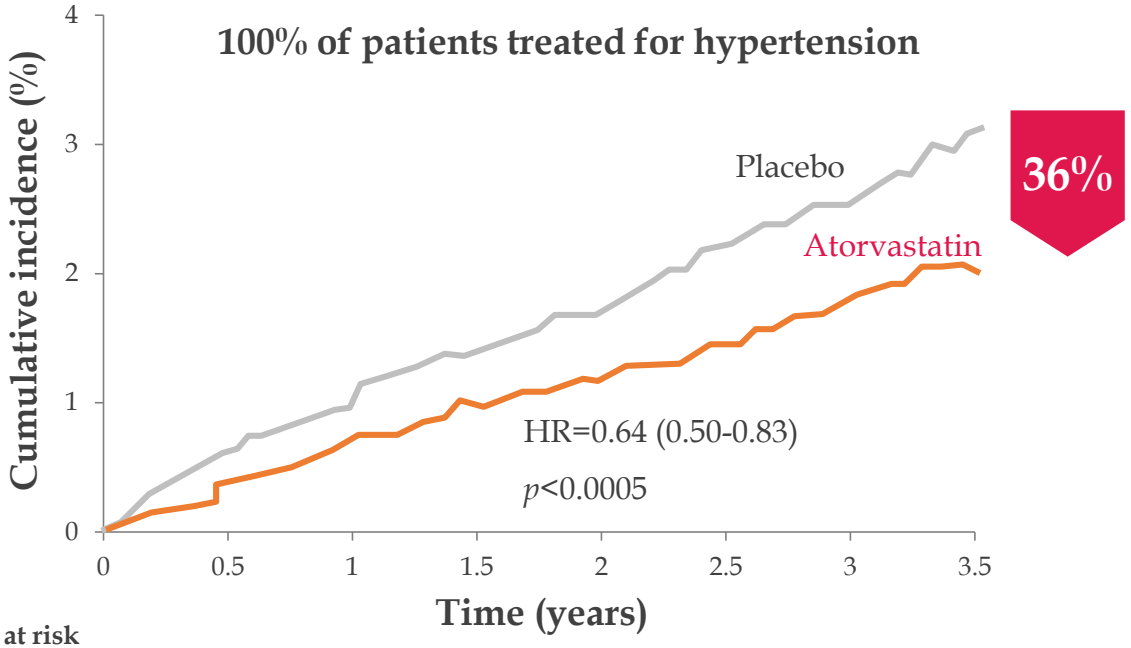


Number at risk						
Amlodipine	9639	9475	9337	9168	8966	7863
Atenolol	9618	9470	9290	9083	8858	7743

Dahlöf B, et al. Lancet 2005;366:895-906.

ASCOT-LLA Analysis:

Adding Atorvastatin to an Antihypertensive Regimen Significantly Reduces Risks of Nonfatal MI and Fatal CHD



Number at risk								
Placebo	5137	5085	5042	5007	4964	4603	3259	1801
Atorvastatin	5108	5134	5103	5063	5035	4679	3263	1801

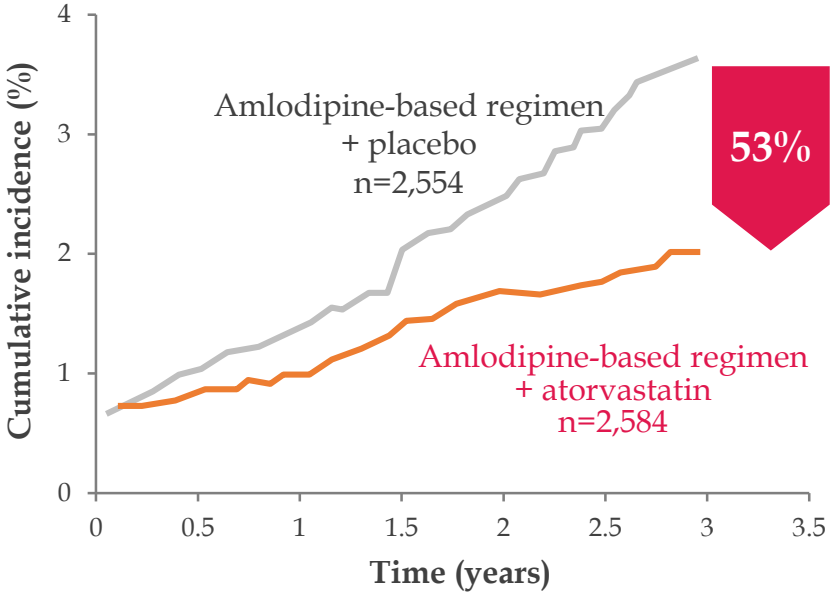
Study description: ASCOT-LLA assessed the effect of LIPITOR 10 mg vs placebo on fatal and nonfatal CHD in 10,305 treated hypertensive patients without clinically evident CHD and with TC ≤251 mg/dL. All patients had ≥3 CV risk factors such as age ≥55 years, smoking, low HDL-C, or family history of CHD. The primary end point demonstrated a 36% relative risk reduction of nonfatal MI and fatal CHD (P=0.0005). Although the reduction of fatal and nonfatal stroke did not reach a predefined significance level (P=0.033), a favorable trend was observed. All patients were treated with antihypertensive therapy, either amlodipine-based or atenolol-based therapy.

Sever PS, et al. Lancet 2003;361:1149-58.

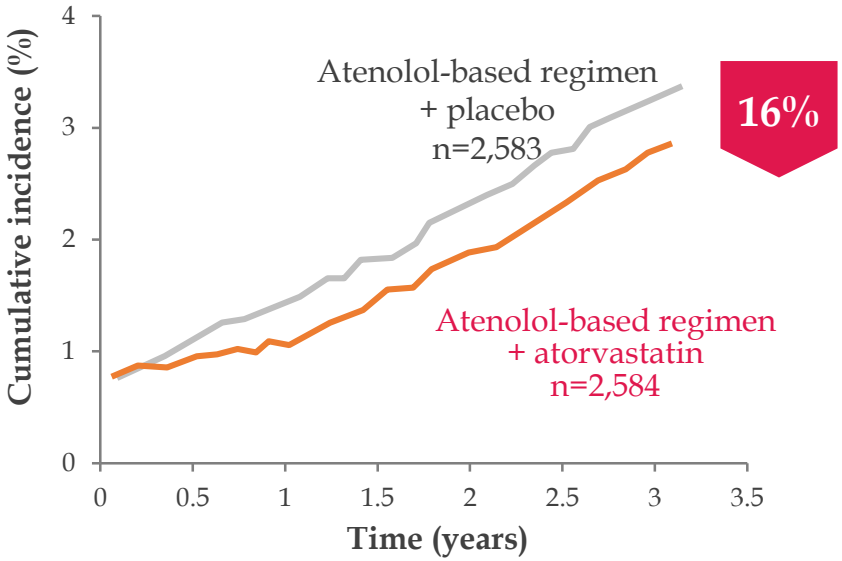
ASCOT-LLA 2x2 Analysis:

The Specific Combination of an Amlodipine-based Regimen and Atorvastatin Delivered an Even Greater Relative Risk Reduction

Cumulative incidence for non-fatal myocardial infarction and fatal coronary heart disease.



HR=0.47 (0.32-0.69)
p<0.001



HR=0.84 (0.60-1.17)
p=0.30

Sever P, et al. Eur Heart J 2006;27:2982-8.

Topics

- Introduction
- Synergy of Hypertension & Lipid Therapy
- **Optimization of Therapy Effects by Improving Adherence**
- Updated HTN and Lipid Guidelines
- Summary

LIFESTYLE

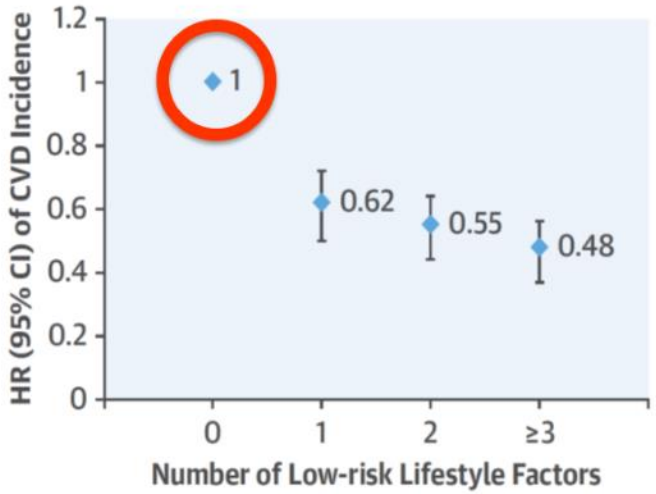
Influence of Lifestyle on Incident Cardiovascular Disease and Mortality in Patients With Diabetes Mellitus

*Diet+ Nonsmoking+ Exercise+ Alcohol

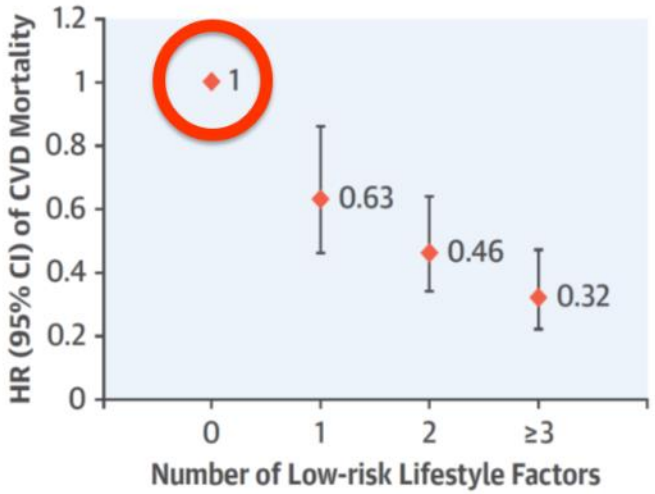
CENTRAL ILLUSTRATION Healthy Lifestyle and Cardiovascular Disease (CVD) Events Among Diabetic Patients

11,527 participants with T2D

CVD Incidence



CVD Mortality



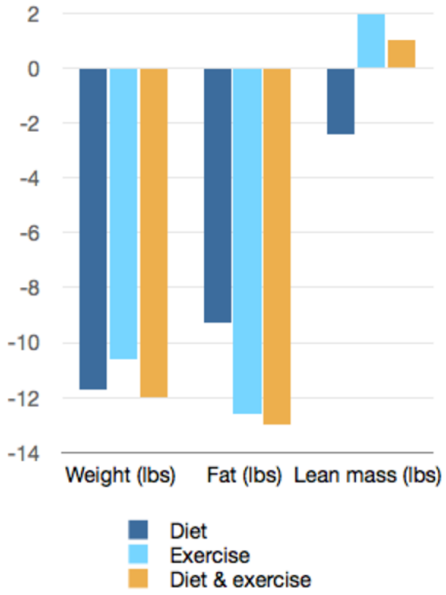
JACC VOL. 71, NO. 25, 2018
JUNE 26, 2018:2867-76

Harvard Medical School


不能吃太胖喔，会被杀掉的

Changing Lifestyle isn't Easy

《尚書·說命》：「非知之艱，行之惟艱」
《左傳·昭公十年》：「非知之實難，將在行之」



Zuti, W.B. & Golding, L.A. Effect of Diet and Exercise on Weight Loss and Body Composition of Adult Women. The Physician and Sports Medicine. 4 (1): 49-53, 1976.

Reference	Intervention	Body composition method	ΔBody Mass (kg ± SD)	ΔLean Mass (kg ± SD)	% Lean Mass Loss	ΔFat Mass (kg ± SD)	Fat Mass:Lean Mass loss ratio
Villareal et al. [36]	Diet only	DXA	-9.7 (5.4)§	-3.2 (2.0)§[a]	33	-7.1 (3.9)§	2.2:1
	Diet plus combined aerobic and resistance training		-8.6 (3.8)§	-1.8 (1.7)§[a]	21	-6.3 (2.8)§	3.5:1
Goodpaster et al. [33]	Diet only	DXA~	-8.2 (0.87)§[b]	-2.1 (NR)	26	-5.9 (NR)§[c]	2.8:1
	Diet plus aerobic training		-10.9 (0.9)§[b]	-2.4 (NR)	22	-8.7 (NR)§[c]	3.6:1
Frimel et al. [35]	Diet only	DXA	-10.7 (4.5)§	-3.5 (2.1)§[b]	33	-6.8 (3.7)§	1.9:1
	Diet plus combined aerobic and resistance training		-9.7 (4.0)§	-1.8 (1.5)[b]	19	-7.7 (2.9)§	4.3:1
Wadden et al. [34]	Diet only	UWW	-14.4 (6.2) §	-2.8 (3.0)	19	-11.6 (NR)	4.1:1
	Diet plus aerobic training		-13.7 (8.7) §	-3.1 (2.7)	23	-10.6 (NR)	3.4:1
	Diet plus resistance training		-17.2 (9.4) §	-3.2 (3.4)	19	-14 (NR)	4.4:1
	Diet plus combined aerobic and resistance training		-15.2 (9.1) §	-1.8 (3.9)	12	-13.4 (NR)	7.4:1
Wycherley et al. [37]	Diet only	DXA	-9.0 (4.8)§[a]	-1.9 (1.5)	21	-7.1 (4.0)§[b]	3.8:1
	Diet plus resistance training		-13.8 (6.0)§[a]	-2.4 (3.1)	17	-11.4 (3.9)§[b]	4.8:1

% Lean mass loss = the calculated change in lean mass as a proportion of total mass loss; DXA: Dual X-ray Absorptiometry; UWW: Under Water Weighing; M: Male; F: Female; NR: Not Reported; ~Air displacement plethysmography used if weight >136kg; [a]between group difference ($p<0.05$), [b]between group difference ($p \leq 0.02$), [c]between group difference ($p=0.008$), §within group difference ($p<0.05$)

Table 2: Changes in Body Composition.

Miller et al., J Diabetes Metab 2013, 4:6
http://dx.doi.org/10.4172/2155-6156.1000281

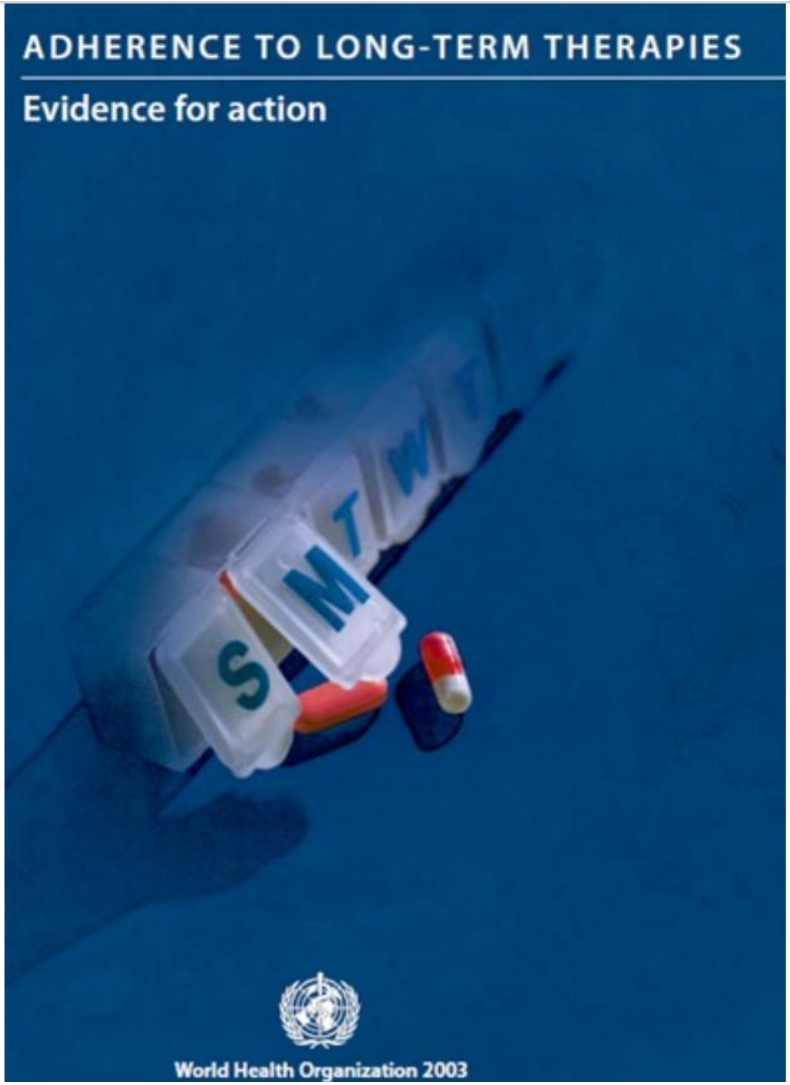
Poor Adherence Increases the Burden of Chronic Disease

"…The risk of poor adherence increases with the duration and complexity of treatment regimens…

Both long duration and complex treatment are inherent to chronic illnesses. Across diseases, adherence is the single most important modifiable factor that compromises treatment outcome."

- World Health Organization, 2003

WHO. Adherence to long-term therapies: evidence for action. WHO; Geneva, Switzerland. 2003.



50% adherence to long-term therapy for chronic illnesses

Section III – Disease-specific reviews

Chapter VII – Asthma

Chapter VIII – Cancer (palliative care)

Chapter IX – Depression

Chapter X – Diabetes

Chapter XI – Epilepsy

Chapter XII – HIV/AIDS

Chapter XIII – Hypertension

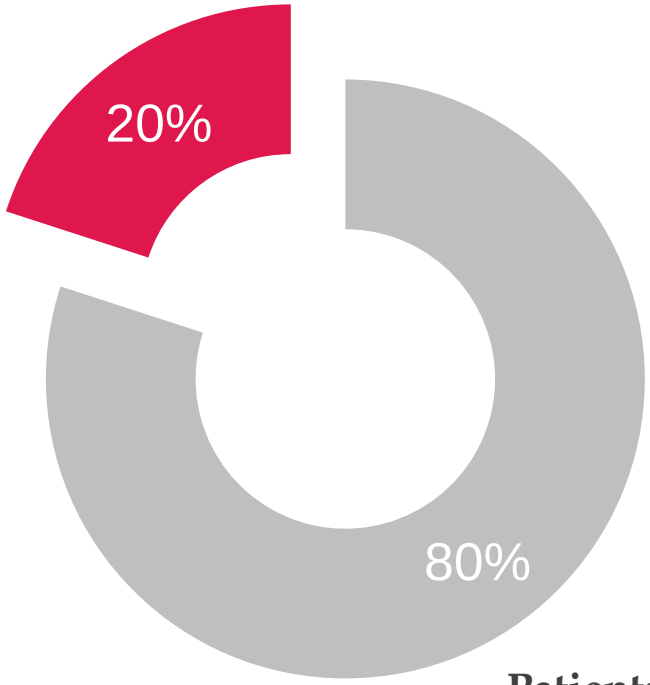
Chapter XIV – Tobacco smoking cessation

Chapter XV – Tuberculosis

Compliance with Therapy was Less than Optimal

New Jersey Medicaid and Medicare programs

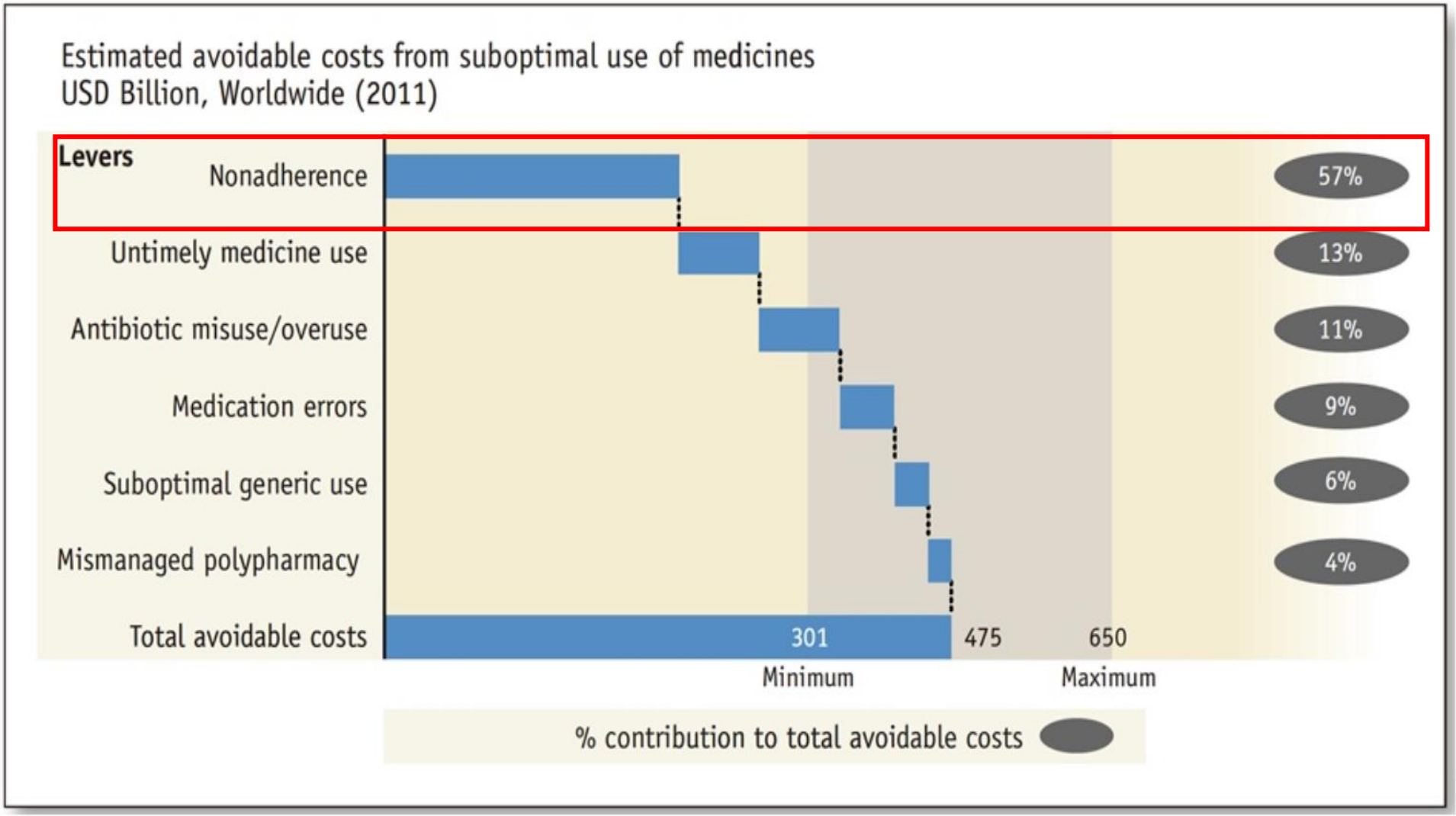
Patients achieving ≥ 80% adherence



Patients achieving < 80% adherence

Retrospective analysis of claims data from the New Jersey Medicaid and Medicare Programs (N=8643).
Compliance was defined by the proportion of days a patient had medication on hand, based on the length of the prescription.

Monane M, et al. Am J Hypertens 1997;10(7 Pt 1):697-704.



IMS Institute for Healthcare Informatics, 2012

National Medication Adherence Week

93% of pharmacy staff believe patients don't understand the impact of medication adherence

93% of staff feel that media scare stories about drugs and side effects stop patients taking medication

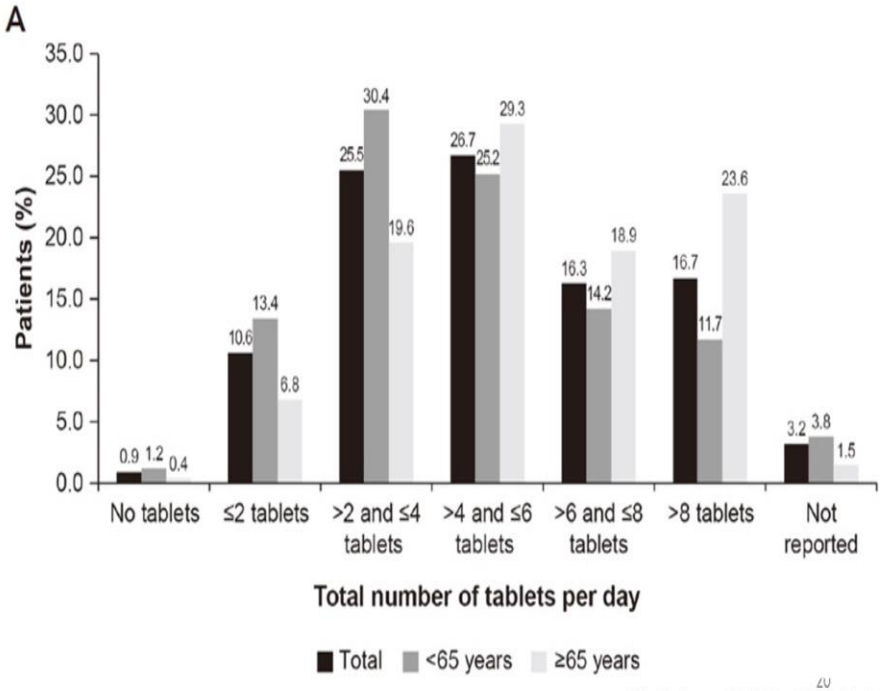
60% felt parking restrictions were to blame for their patients being distracted

77% of pharmacy staff believed their patients were distracted by their mobile phones

Medication wastage costs the NHS **£300 million** each year

The cost to the NHS of people not taking their medicines properly is **£500 million** a year

As part of National Medication Adherence Week (3-9 July 2017), Rowlands Pharmacy will be teaming up with medications management company Omnicell UK to launch the **'Let's Take Care of It'** campaign. The campaign will be supported by specially produced educational leaflets and display posters for both patients and carers in all Rowlands Pharmacies.



Clin Diabetes. 2015 Apr;33(2):55-61

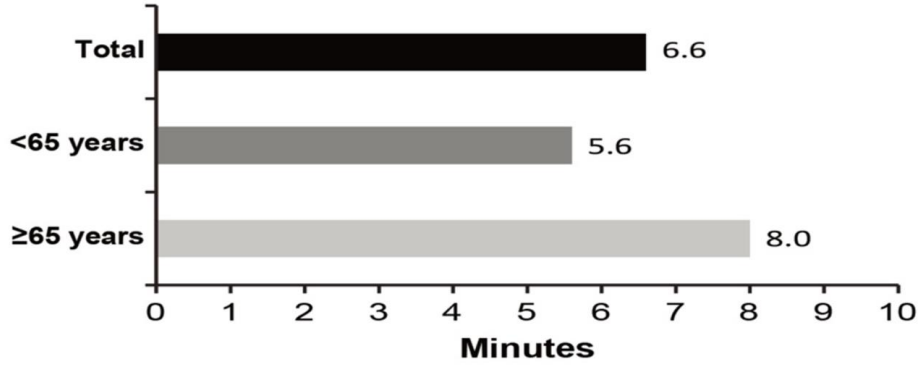


FIGURE 3. Average time needed for tablet preparation.

Clin Diabetes. 2015 Apr;33(2):55-61

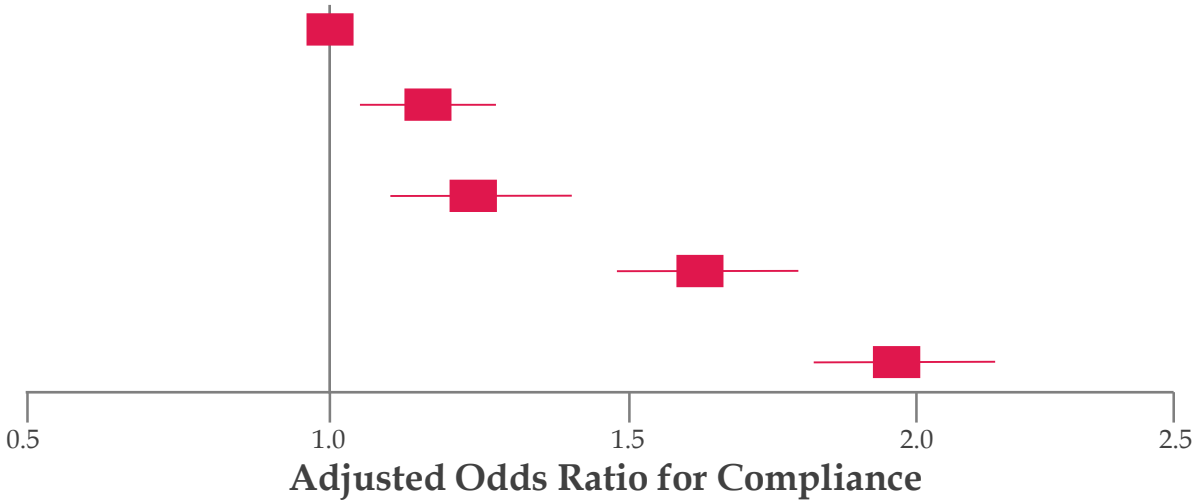
The Fewer Pills Patients Take, the More Compliant They are

No. of Additional Prescription Medications

Less Pills

6+
3-5
2
1
0

Relative likelihood of compliance based on No. of Additional Medications



Baseline medication: concomitant antihypertensive and lipid lowering therapy

Increasing Levels of Compliance

Chapman RH, et al. Arch Intern Med 2005;165:1147-52.

Most Hypertension and Its Concomitant Risk Factors Remained Uncontrolled

Essential hypertension

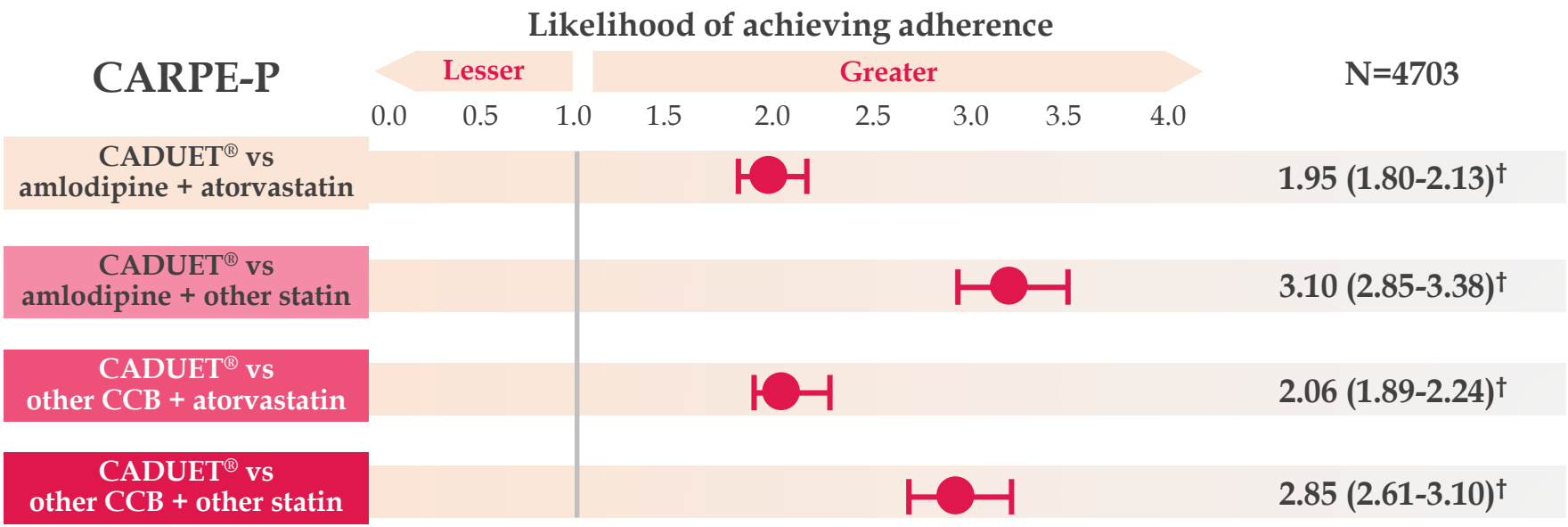
Most hypertensive patients need two or more drugs for blood-pressure control and concomitant statin treatment for risk factor reduction. Despite the availability of effective and safe antihypertensive drugs, hypertension and its concomitant risk factors remain uncontrolled in most patients.

and dementia usually happen after long periods of uncontrolled hypertension only. All antihypertensive drugs lower blood pressure (by definition) and this decline is the predominant determinant of cardiovascular risk reduction. However, differences between drugs exist with respect to reduction of target-organ disease and prevention of major cardiovascular events. Most hypertensive patients need two or more drugs for blood-pressure control and concomitant statin treatment for risk factor reduction. Despite the availability of effective and safe antihypertensive drugs, hypertension and its concomitant risk factors remain uncontrolled in most patients.

Messerli FH, et al. Lancet 2007;370:591-603.

CARPE - Caduet Adherence Research Program and Education Result:
CADUET® Patients vs Patients on 2-pill Regimens: More Likely to Achieve Adherence

Adjusted odds ratios of achieving PDC ≥80% during **6-month** follow-up (95% CI)*



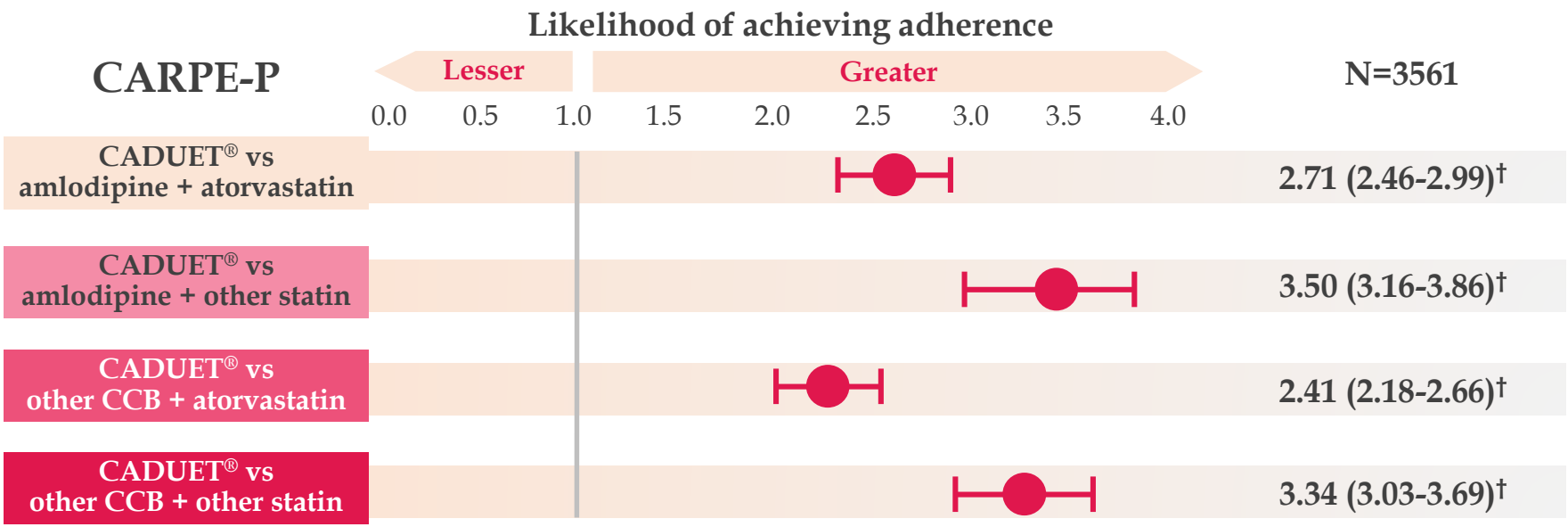
Patients using CADUET® are 2 to 3 times more likely to achieve adherence.
CADUET® patients are more likely to achieve adherence than patients on 2-pill regimens.

Due to the retrospective nature of the study, adverse event data were not collected.
*Logistic regression model analysis adjusting for covariates including age, gender, business type, formulary type, baseline AHT, CVD meds, DM med, antidepressant, number of drugs, copayments, Maintenance med refill percentage.; †P<0.0001.

Patel BV, et al. Vasc Health Risk Manag 2008;4:673-81.

CARPE Result: CADUET® Patients vs Patients on 2-pill Regimens: Adherence Sustained and Improved Up to One Year

Adjusted odds ratios of achieving PDC ≥80% during **1-year** follow-up (95% CI)*



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Patel BV, et al. Vasc Health Risk Manag 2008;4:673-81.

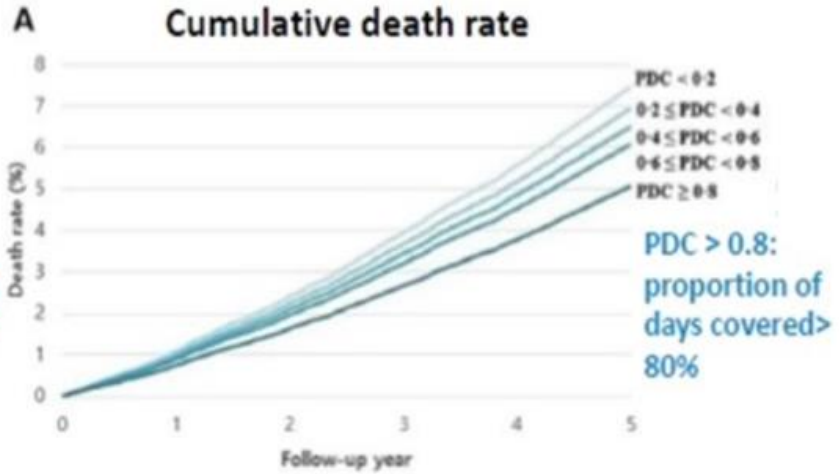
Together, CARPE and ASCOT-LLA 2x2 Demonstrate that Physicians can have More Control Over Adherence and Outcomes

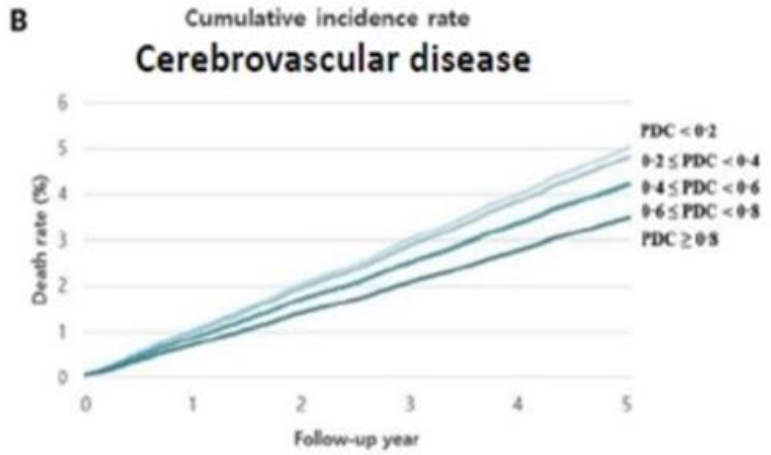
- CARPE-P tested adherence in typical hypertensive patients who were taking the same medications tested in ASCOT: amlodipine and atorvastatin, both separately and as single-pill CADUET®

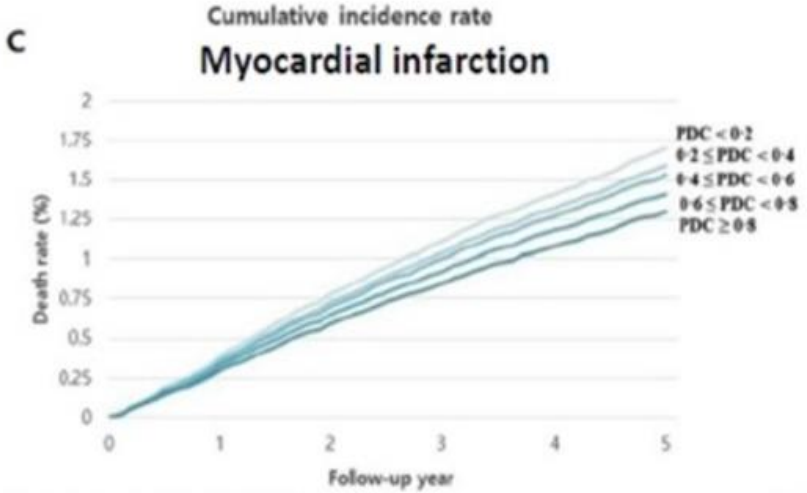
- Patients taking CADUET® were 2 times more likely to be adherent than those taking amlodipine and atorvastatin separately

Does adherence matter?

- ***The Less non-adherence***
  The More risk reduction



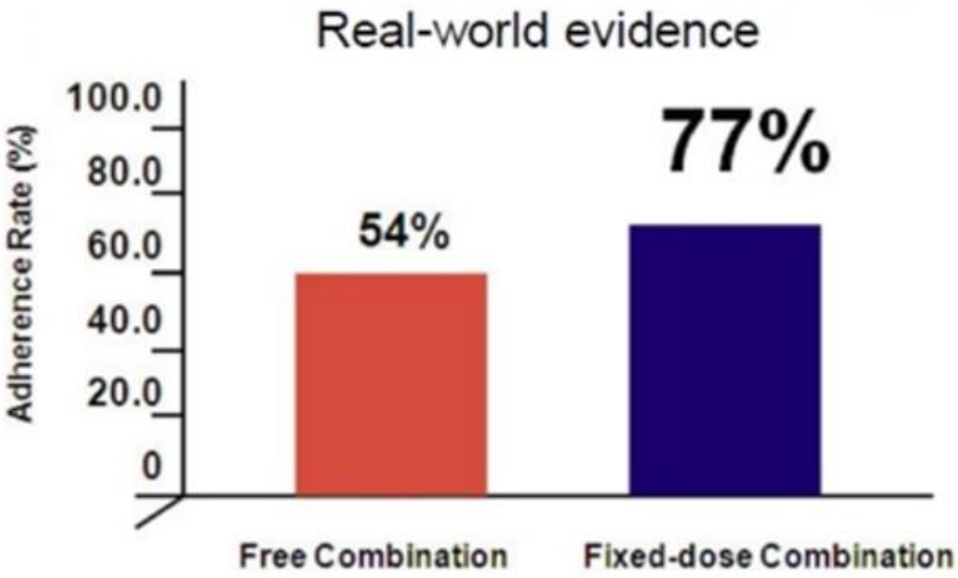




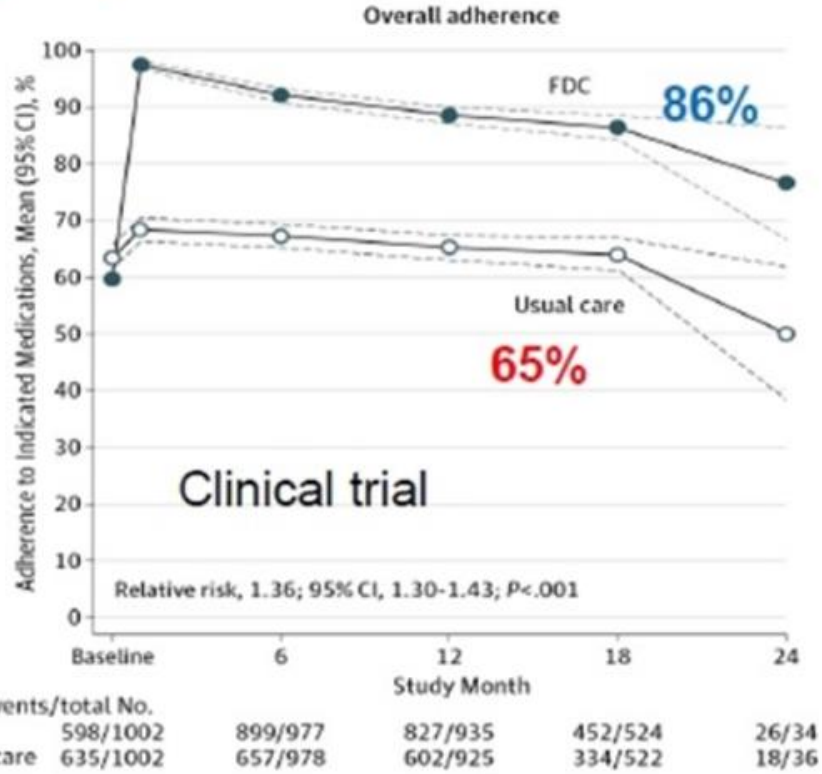
PDC: proportion of days covered, the recently preferred method of measuring medication adherence.

Sci Rep. 2018; 8: 12190.

Fixed-dose combinations (FDC) improve adherence



Retrospective analysis, 6502 patients, glyburide/metformin, 180 days[1] The adherence rate was defined as the sum of the days' supply of oral antidiabetic medication obtained by the patient during the follow-up period divided by the total number of days in the designated follow-up period



No. of events/total No.					
FDC	598/1002	899/977	827/935	452/524	26/34
Usual care	635/1002	657/978	602/925	334/522	18/36

Randomized, open-label trial, 2004 patients with established CVD or at risk of CVD, aspirin/simvastatin/lisinopril/ hydrochlorothiazide, 15 months[2] *P<0.001

1. Melikian C et al. Clin Ther. 2002 Mar;24(3):460-7
2. Simon Thom et al. JAMA. 2013;310(9):918-929. doi:10.1001

Scientific Rationale for Synergy with Amlodipine and Atorvastatin: “Opposites Attract”

Atorvastatin

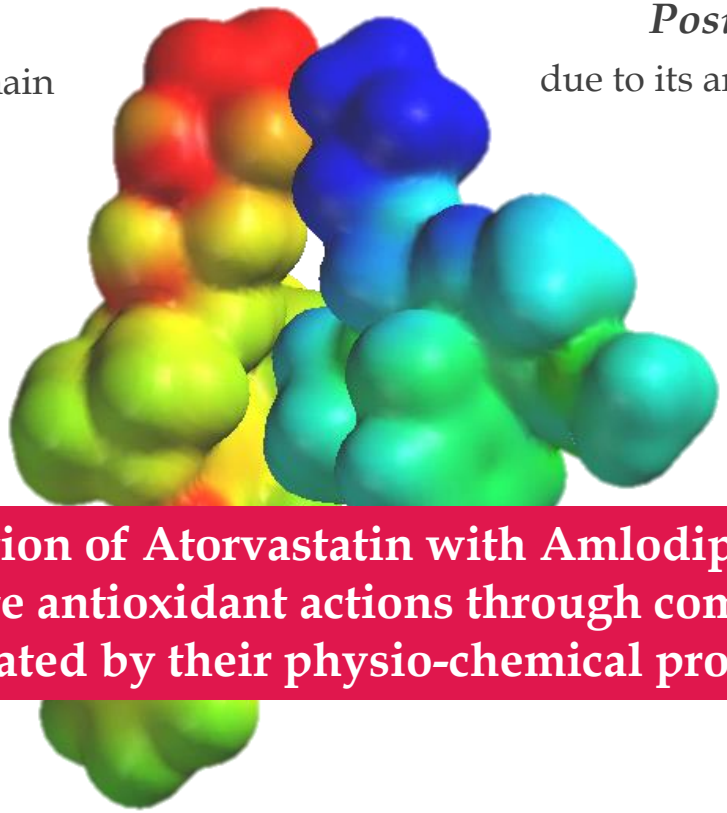
Negative Polarity

mediated by its heptenoic acid side chain

Amlodipine

Positive Charge

due to its amino ethoxy function



Thus, the combination of Atorvastatin with Amlodipine may potentiate their separate antioxidant actions through complementary mechanisms mediated by their physio-chemical properties.

Mason RP, et al. Pharm Res 2008;25:1798-806.

Norvasc®
(amlodipine besylate)

+

Lipitor®
(atorvastatin calcium)

A SYNERGISTIC *tool for CVD prevention as* A Single Pill

Topics

- Introduction
- Synergy of Hypertension & Lipid Therapy
- Optimization of Therapy Effects by Improving Adherence
- **Updated HTN and Lipid Guidelines**
- Summary

2017 ACC/AHA HTN Guidelines

Categories of BP in Adults*

BP Category	SBP**		DBP**
Normal	<120 mmHg	and	<80 mmHg
Elevated	120-129 mmHg	and	<80 mmHg
Hypertension			
Stage 1	130-139 mmHg	or	80-89 mmHg
Stage 2	≥140 mmHg	or	≥90 mmHg

*Individuals with SBP and DBP in 2 categories should be designated to the higher BP category.
**Blood pressures are base on an average of ≥2 careful readings obtained on ≥2 occasions
BP, blood pressure**; DBP,** diastolic blood pressure; **SBP,** systolic blood pressure.

J Am Coll Cardiol. 2018;71:2199-269.

2017 ACC/AHA HTN Guidelines

BP Thresholds and BP Goals

Clinical Condition(s)	BP Threshold, mm Hg	BP Goal, mm Hg
General		
Clinical CVD or 10-year ASCVD risk ≥10%	≥130/80	<130/80
No clinical CVD and 10-year ASCVD risk <10%	≥140/90	<130/80
Older persons (≥65 years of age; noninstitutionalized, ambulatory, community-living adults)	≥130 (SBP)	<130 (SBP)
Special comorbidities		
Diabetes mellitus	≥130/80	<130/80
Chronic kidney disease	≥130/80	<130/80
Chronic kidney disease after renal transplantation	≥130/80	<130/80
Heart failure	≥130/80	<130/80
Stable ischemic heart disease	≥130/80	<130/80
Secondary stroke prevention	≥140/90	<130/80
Secondary stroke prevention (lacunar)	≥130/80	<130/80
Peripheral arterial disease	≥130/80	<130/80

ASCVD, atherosclerotic cardiovascular disease**; BP**, blood pressure; **CVD**, cardiovascular disease; and **SBP**, systolic blood pressure.

J Am Coll Cardiol. 2018;71:2199-269.

2015 Taiwan HTN Guidelines

Definition of HTN

Category	SBP**		DBP**
Office BP	≥140 mmHg	or	≥90 mmHg
HBPM	≥135 mmHg	or	≥85 mmHg
ABPM	≥130 mmHg	or	≥80 mmHg
Daytime	≥135 mmHg	or	≥85 mmHg
Nighttime	≥120 mmHg	or	≥70 mmHg

*Individuals with SBP and DBP in 2 categories should be designated to the higher BP category.
**Blood pressures are base on an average of ≥2 careful readings obtained on ≥2 occasions
ABPM, ambulatory blood pressure monitoring**; BP,** blood pressure**; HBPM,** home blood pressure monitoring.

J Chin Med Assoc 2015;78:1-47.

2017 Taiwan HTN Guidelines

Traditional Office BP targets

Categories	Targets (mmHg)	COR	LOE
Primary prevention	<140/90	I	B
Secondary prevention			
Diabetes	<130/80	I	B
CHD	<130/80	I	B
Stroke	<140/90	I	A
CKD	<140/90	I	A
CKD with proteinuria	<130/80	IIb	C
Elderly (age ≥75 years)	<140/90	I	B
Patients receiving antithrombotics for stroke prevention	<130/80	I	B

BP, blood pressure; **CHD,** coronary heart disease; **CKD,** chronic kidney disease; **COR,** class of recommendation; **LOE,** level of evidence.

Acta Cardiol Sin 2017;33:213-25.

2017 Taiwan HTN Guidelines

New BP Targets

Categories	Targets (mmHg)	COR	LOE
Primary prevention	<140/90	I	B
Secondary prevention			
Diabetes	<130/80	I	B
CHD	<120/NA^{AOBP}	I	B
Stroke	<140/90	I	A
CKD	<120/NA^{AOBP}	I	B
CKD with proteinuria	<120/NA^{AOBP}	I	B
Elderly (age ≥75 years)	<130/80	I	B
Patients receiving antithrombotics for stroke prevention	<140/90	I	B

AOBP, unattended automated office blood pressure measurement**; BP,** blood pressure**; CHD,** coronary heart disease**; CKD,** chronic kidney disease; **COR**, class of recommendation; **LOE,** level of evidence**; NA,** not available.

Acta Cardiol Sin 2017;33:213-25.

2017 Taiwan Lipid Guidelines

For High Risk Patients

High-intensity statins daily dosage ↓ ≥LDL-C 50%	Moderate-intensity statins daily dosage LDL-C ↓ 30% to <50%
Atorvastatin, 40-80 mg Rosuvastatin, 20-40 mg[a]	Atorvastatin, 10-20 mg Fluvastatin XL, 80 mg Lovastatin, 40 mg Pitavastatin, 2-4 mg Pravastatin, 40-80 mg Rosuvastatin, 5-10 mg Simvastatin, 20-40 mg

LDL-C, low-density lipoprotein cholesterol.

[a]The maximal dose approved for rosuvastin in Taiwan is 20 mg once daily. The 40 mg dose of rosuvastatin is reserved only for those patients who have familial hypercholesterolemia (FH).

Statins are the first-line therapy, and moderate- or high-intensity statins are preferred, unless not tolerated, for high-risk patients.

J Formos Med Assoc 2017;116:217-48.

2017 Taiwan Lipid Guidelines

ACS Recommendation

Recommendations	COR	LOE
Statin or statin plus ezetimibe should be used for all ACS patients if there is no contraindication.	I	A
The LDL-C target should be **<70 mg/dL** in ACS patients.	I	B
Statin or statin plus ezetimibe should be used before discharge and usually **within the first few days** of ACS before PCI.	I	B

J Formos Med Assoc 2017;116:217-48.

2017 Taiwan Lipid Guidelines

ACS Recommendation

Recommendations	COR	LOE
In ACS patients with diabetes, a lower target of LDL-C **<55 mg/dL** can be considered.	IIa	B

J Formos Med Assoc 2017;116:217-48.

2017 Taiwan Lipid Guidelines

Stable CAD Recommendation

Recommendations	COR	LOE
The LDL-C target should be **<70 mg/dL** in stable CAD patients.	I	B
Statin-benefit CAD included patients with history of MI or UA (>6M), history of coronary revascularization, presence of ischemic symptoms with positive stress tests, or suspected ischemic heart disease by EKG or echocardiography, or CAG diagnosis of significant coronary stenosis (50% luminal narrowing).	I	A

J Formos Med Assoc 2017;116:217-48.

2017 Taiwan Lipid Guidelines

For High Risk Patients

Disease category	LDL-C target
Primary target	
ACS	LDL-C < 70 mg/dL
ACS + DM	LDL-C < 55 mg/dL can be considered
Stable CAD	LDL-C < 70 mg/dL
PAD	LDL-C <100 mg/dL
PAD + CAD	LDL-C < 70 mg/dL
Secondary target	
ACS, stable CAD, PAD with TG > 200 mg/dL	Non-HDL-C < 100 mg/dL

ACS, acute coronary syndrome; **CAD,** coronary artery disease; **DM**, diabetes mellitus; **HDL-C,** high-density lipoprotein cholesterol; **LDL-C,** low-density lipoprotein cholesterol; **PAD,** peripehral artery disease; **TG,** triglyceride.

J Formos Med Assoc 2017;116:217-48.

降血糖用藥對血壓可能的影響

Effects of Anti-Hyperglycemic Drugs on Blood Pressure

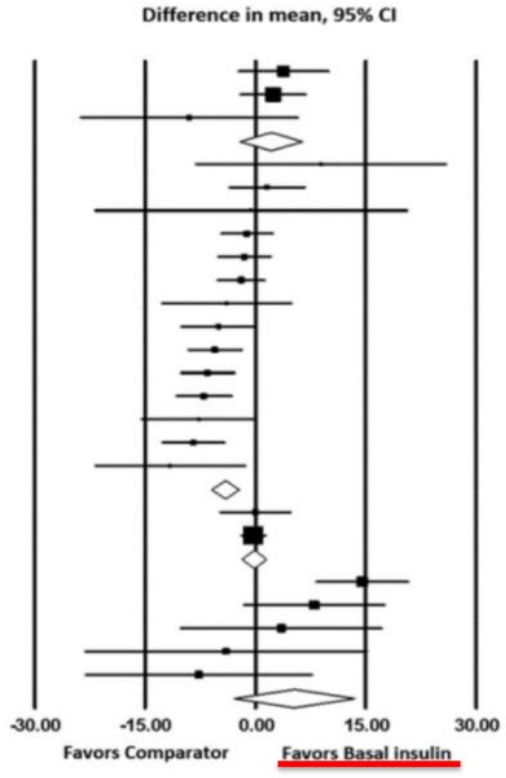
Drug Class	Effect on Blood Pressure
Insulin[a]	Small increases
Biguanides, metformin[b]	No effect
Sulfonylureas[c]	No effect
DPP-4 inhibitors[d]	Small reductions or no effect
GLP-1 agonists[e]	May reduce BP
SGLT-2 inhibitors[f]	Reduces BP

a. Randeree H, et al. *Diabetes Care.*1992;15:1258-1263[14]; b. Kantola I, et al. *Clin Drug Invest.* 2002;22:347-354[15]; c. Melander A, et al. *Diabetes Care.*1990;13(suppl 3):53-58[16]; d. White WB, et al. *N Engl J Med.* 2013;369:1327-1335[17]; e. Ferdinand KC, et al. *Hypertension.* 2014 [Epub ahead of print][18]; f. Baker WH, et al. *J Am Soc Hypertens.* 2014;8:262-275.[19]

Effects of Basal Insulin on Lipid Profile Compared to Other Classes of Antihyperglycemic Agents in Type 2 Diabetic Patients

B. LDL cholesterol

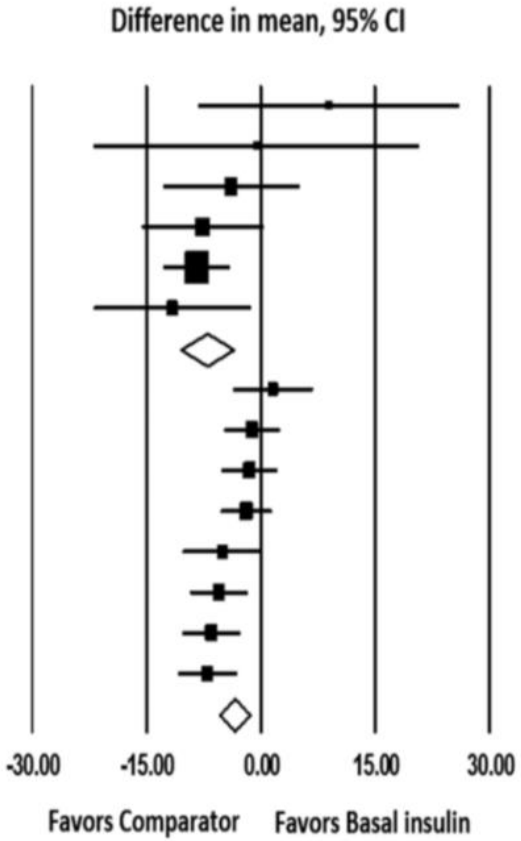
	Study name	Difference in means	Lower limit	Upper limit	*P*-Value
	Aschner et al. 2012	3.800	-2.436	10.036	.232
	Ji et al. 2016	2.400	-2.171	6.971	.303
	Da Silva et al. 2016	-9.000	-23.906	5.906	.237
DPP4-I	**(I^2 17.6, *P*=.29)**	2.031	-2.192	6.253	.346
	Bunck et al. 2010	8.900	-8.247	26.047	.309
	Diamant et al. 2014	1.580	-3.689	6.849	.557
	Gurkan et al. 2014	-0.600	-21.946	20.746	.956
	Giorgino et al. 2015 HD	-1.160	-4.845	2.525	.537
	Weissman et al. 2014	-1.500	-5.217	2.217	.429
	Giorgino et al. 2015 LD	-1.930	-5.272	1.412	.258
	Nomoto et al. 2015	-3.900	-12.846	5.046	.393
	Davies et al. 2013	-5.020	-10.226	0.186	.059
	Aroda et al. 2017 LD	-5.500	-9.278	-1.722	.004
	Aroda et al. 2017 HD	-6.500	-10.284	-2.716	.001
	Inagaki et al. 2012	-7.010	-10.902	-3.118	.000
	Davies et al. 2009	-7.660	-15.643	0.323	.060
	D'Alessio et al. 2015	-8.420	-12.782	-4.058	.000
	Tang et al. 2015	-11.600	-21.927	-1.273	.028
GLP-1 RA	**(I^2 44.9, *P*=.03)**	-4.176	-6.049	-2.304	.000
	Gerstein et al. 2006	0.000	-4.933	4.933	1.000
	Origin Inv. 2012	-0.300	-2.073	1.473	.740
SU±Met	**(I^2 0.0, *P*=.91)**	-0.266	-1.934	1.403	.755
	Rosenstock et al. 2006	14.500	8.094	20.906	.000
	Reynolds et al. 2007	8.000	-1.731	17.731	.107
	Ko et al. 2006	3.500	-10.290	17.290	.619
	Aljabri et al. 2004	-4.000	-23.301	15.301	.685
	Dorkhan et al. 2008	-7.700	-23.201	7.801	.330
Glitazones	**(I^2 58.6, *P*=.04)**	5.196	-3.002	13.394	.214



J Clin Endocrinol Metab, July 2020, 105(7):1–11

B. LDL cholesterol

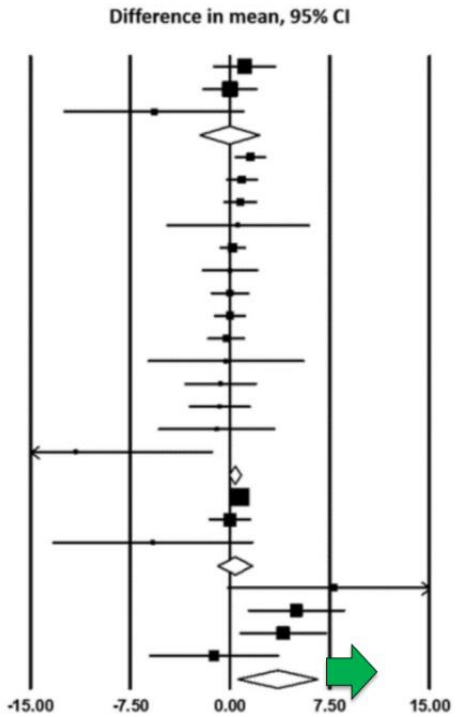
GLP-1 RA	Study name	Difference in means	Lower limit	Upper limit	*P*-Value
	Bunck et al. 2010	8.900	-8.247	26.047	.309
	Gurkan et al. 2014	-0.600	-21.946	20.746	.956
	Nomoto et al. 2015	-3.900	-12.846	5.046	.393
	Davies et al. 2009	-7.660	-15.643	0.323	.060
	D'Alessio et al. 2015	-8.420	-12.782	-4.058	.000
	Tang et al. 2015	-11.600	-21.927	-1.273	.028
Daily	(I^2 5.4, *P*=.38)	-7.086	-10.554	-3.618	.000
	Diamant et al. 2014	1.580	-3.689	6.849	.557
	Giorgino et al. 2015 HD	-1.160	-4.845	2.525	.537
	Weissman et al. 2014	-1.500	-5.217	2.217	.429
	Giorgino et al. 2015 LD	-1.930	-5.272	1.412	.258
	Davies et al. 2013	-5.020	-10.226	0.186	.059
	Aroda et al. 2017 LD	-5.500	-9.278	-1.722	.004
	Aroda et al. 2017 HD	-6.500	-10.284	-2.716	.001
	Inagaki et al. 2012	-7.010	-10.902	-3.118	.000
Once Weekly	(I^2 50.0, *P*=.05)	-3.472	-5.471	-1.472	.001



J Clin Endocrinol Metab, July 2020, 105(7):1–11

C. HDL cholesterol

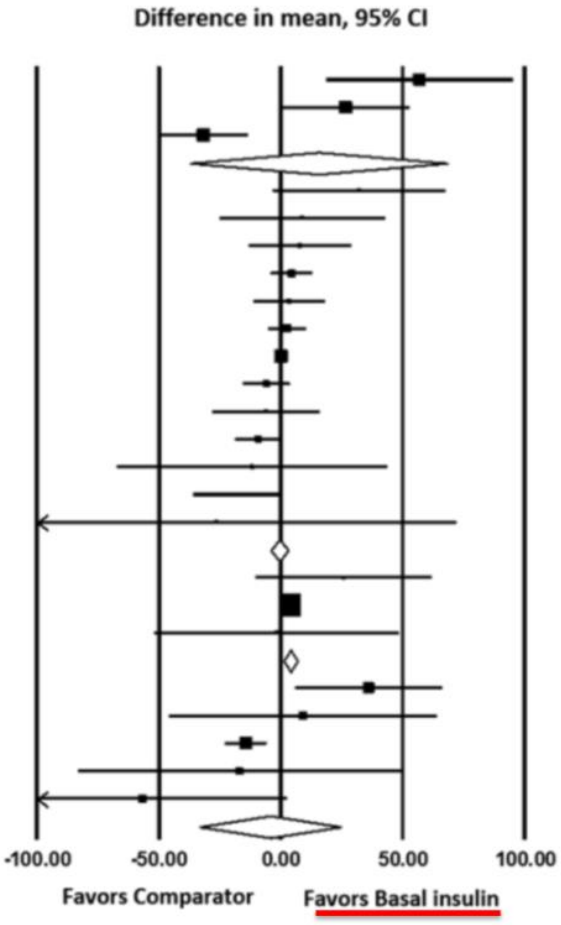
	Study name	Difference in means	Lower limit	Upper limit	*P*-Value
	Ji et al. 2016	1.100	-1.259	3.459	.361
	Aschner et al. 2012	0.000	-2.079	2.079	1.000
	Da Silva et al. 2016	-5.700	-12.497	1.097	.100
DPP4-I	**(I^2 42.6, *P*=.17)**	-0.083	-2.340	2.174	.942
	Giorgino et al. 2015 HD	1.550	0.366	2.734	.010
	Aroda et al. 2017 HD	0.900	-0.313	2.113	.146
	Giorgino et al. 2015 LD	0.780	-0.499	2.059	.232
	Gurkan et al. 2014	0.600	-4.805	6.005	.828
	Weissman et al. 2014	0.200	-0.787	1.187	.691
	Diamant et al. 2014	0.000	-2.135	2.135	1.000
	D'Alessio et al. 2015	0.000	-1.454	1.454	1.000
	Aroda et al. 2017 LD	0.000	-1.211	1.211	1.000
	Inagaki et al. 2012	-0.280	-1.697	1.137	.698
	Bunck et al. 2010	-0.300	-6.184	5.584	.920
	Davies et al. 2009	-0.700	-3.416	2.016	.614
	Davies et al. 2013	-0.770	-3.101	1.561	.517
	Nomoto et al. 2015	-1.000	-5.395	3.395	.656
	Tang et al. 2015	-11.600	-21.934	-1.266	.028
GLP-1 RA	**(I^2 11.9, *P*=.32)**	0.340	-0.112	0.792	.140
	Origin Inv. 2012	0.800	0.238	1.362	.005
	Gerstein et al. 2006	0.000	-1.604	1.604	1.000
	Nathan et al. 1988	-5.800	-13.365	1.765	.133
SU±Met	**(I^2 45.7, *P*=.15)**	0.343	-0.949	1.634	.603
	Dorkhan et al. 2008	7.800	-0.216	15.816	.056
	Reynolds et al. 2007	5.000	1.353	8.647	.007
	Aljabri et al. 2004	4.000	0.708	7.292	.017
	Ko et al. 2006	-1.200	-6.103	3.703	.631
Glitazones	**(I^2 44.4, *P*=.14)**	3.555	0.550	6.560	.020



J Clin Endocrinol Metab, July 2020, 105(7):1–11

D. Triglycerides

	Study name	Difference in means	Lower limit	Upper limit	*P*-Value
	Da Silva et al. 2016	56.800	18.438	95.162	.004
	Aschner et al. 2012	26.600	0.485	52.715	.046
	Ji et al. 2016	-31.800	-50.132	-13.468	.001
DPP4-I	**(I^2 91.5, *P*<.01)**	15.299	-37.453	68.052	.570
	Nomoto et al. 2015	32.100	-3.412	67.612	.076
	Bunck et al. 2010	8.800	-25.222	42.822	.612
	Davies et al. 2013	7.920	-13.235	29.075	.463
	Giorgino et al. 2015 HD	4.420	-4.190	13.030	.314
	Weissman et al. 2014	3.400	-11.467	18.267	.654
	Giorgino et al. 2015 LD	2.650	-5.241	10.541	.510
	Inagaki et al. 2012	0.000	-2.806	2.806	1.000
	Aroda et al. 2017 LD	-6.000	-15.687	3.687	.225
	Davies et al. 2009	-6.100	-28.240	16.040	.589
	Aroda et al. 2017 HD	-9.200	-18.900	0.500	.063
	Gurkan et al. 2014	-11.850	-67.388	43.688	.676
	D'Alessio et al. 2015	-17.700	-36.003	0.603	.058
	Tang et al. 2015	-26.500	-125.054	72.054	.598
GLP-1 RA	**(I^2 18.7, *P*=.25)**	-0.713	-4.256	2.829	.693
	Gerstein et al. 2006	25.700	-10.504	61.904	.164
	Origin Inv. 2012	3.700	0.864	6.536	.011
	Nathan et al. 1988	-1.700	-51.983	48.583	.947
SU±Met	**(I^2 0.0, *P*=.48)**	3.817	0.994	6.639	.008
	Reynolds et al. 2007	36.000	5.839	66.161	.019
	Dorkhan et al. 2008	9.000	-45.935	63.935	.748
	Rosenstock et al. 2006	-14.400	-22.941	-5.859	.001
	Aljabri et al. 2004	-17.000	-83.346	49.346	.616
	Ko et al. 2006	-56.700	-115.946	2.546	.061
Glitazones	**(I^2 68.6, *P*=.01)**	-4.496	-33.545	24.553	.762



J Clin Endocrinol Metab, July 2020, 105(7):1–11

Topics

- Introduction
- Synergy of Hypertension & Lipid Therapy
- Optimization of Therapy Effects by Improving Adherence
- Updated HTN and Lipid Guidelines
- **Summary**

Epidemiologic risk factors for ASCVD	Pathophysiologic reclassification	Evidence from human RCTs or human MRS
Elevated plasma co cholesterol, LDL-c C-TRL remnants,		d in MRS; Other
Tobacco smoking		unusual lifestyles
Diabetes mellitus		tect patients with
Hypertension		sion still causes other
Male sex (age)		ger develop clinically
Elevated plasma gl		MRS detectably ant plasma apoB-
Low plasma HDLc concentrations	Exacerbating or bystander	No benefit yet in RCTs of HDLc-raising treatments; no benefit of higher HDLc in MRS

Curr Opin Lipidol 2016;27:473-83.

2015 Taiwan HTN Guidelines

Single-pill Combination (SPCs)

Compared with free-drug combinations…

SPCs of antihypertensive agents

- **Improvement in compliance**
- **Reduce pill burden**

In UMPIRE trial…

SPCs of antihypertensive drugs, statin, and aspirin

- **Improved medication adherence**

Effects of a Fixed-Dose Combination Strategy on Adherence and Risk Factors in Patients With or at High Risk of CVD
The UMPIRE Randomized Clinical Trial

J Chin Med Assoc 2015;78:1-47.

2017 ACC/AHA HTN Guidelines

Recommendations for Adherence Strategies

Recommendations	COR	LOE
In adults with hypertension, dosing of antihypertensive medication **once daily** rather than multiple times daily is beneficial to improve adherence.	I	B-R
Individual components can be useful to improve adherence to antihypertensive therapy.	IIa	B-NR

J Am Coll Cardiol. 2018;71:2199-269.

血壓
血糖
心跳

Symptoms and signs

Lab data
Biomarker

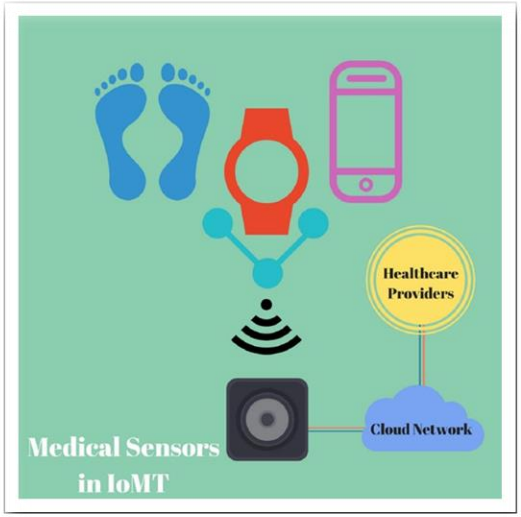


Figure 3. Future direction for IoMT in the care of the diabetic foot.

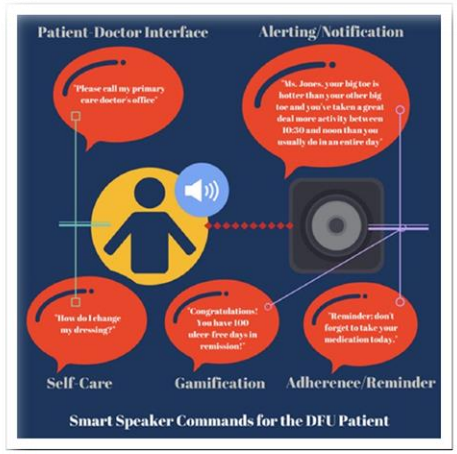


Figure 2. Schema of potential application of smart speaker commands for management of DFU.

醫療諮詢

回診提醒
醫療建議

照護需求

關懷
回應

照相紀錄
營養建議

提醒用藥
提示回診

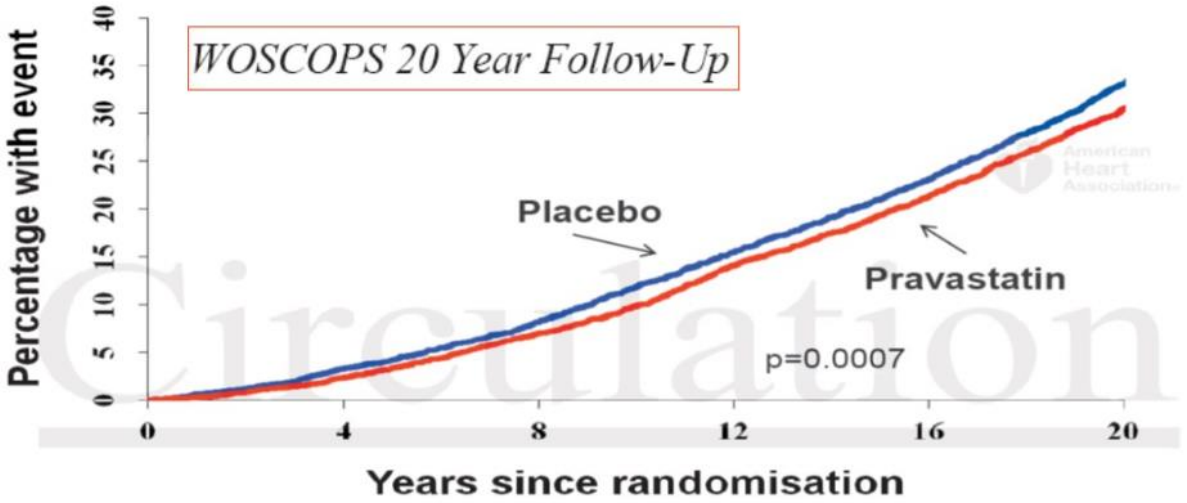
運動處方
運動紀錄
過度警訊


Thank you for your Attention
and
Consideration

Long Term Safety and Efficacy of Lowering LDL Cholesterol With Statin Therapy: 20-Year Follow-Up of West of Scotland Coronary Prevention Study

(Primary CHD Prevention Trial)

1a) All-cause mortality



Numbers at risk:

Placebo	3293	3185	3021	2785	2501	2203
Pravastatin	3302	3223	3069	2838	2598	2295

EVIDENCE-BASED MEDICINE

ESC European Society of Cardiology
European Heart Journal (2018) 0, 1–18
doi:10.1093/eurheartj/ehy182

REVIEW

Clinical update

European Atherosclerosis Society Consensus Panel

Adverse effects of statin therapy: perception vs. the evidence – focus on glucose homeostasis, cognitive, renal and hepatic function, haemorrhagic stroke and cataract

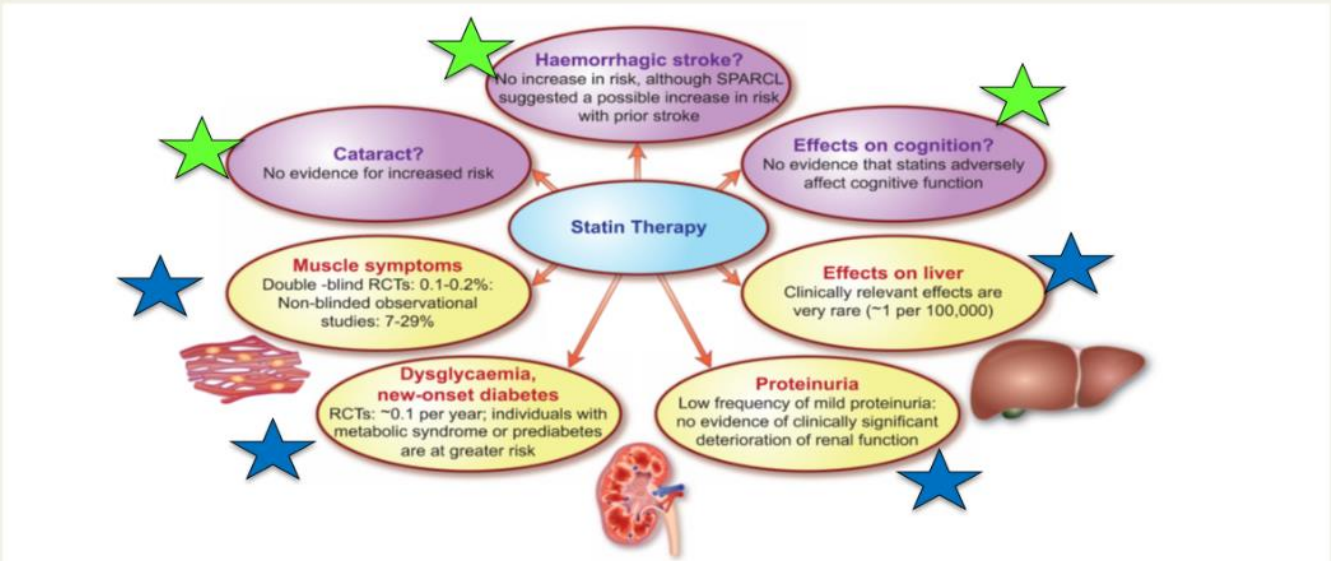


Figure 1 Overview of the relative prevalence of the main types of adverse effects reported with statin therapy. RCT, randomized controlled trial; SPARCL, Stroke Prevention by Aggressive Reduction in Cholesterol Levels.