Hypertension - 2010

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The Problem

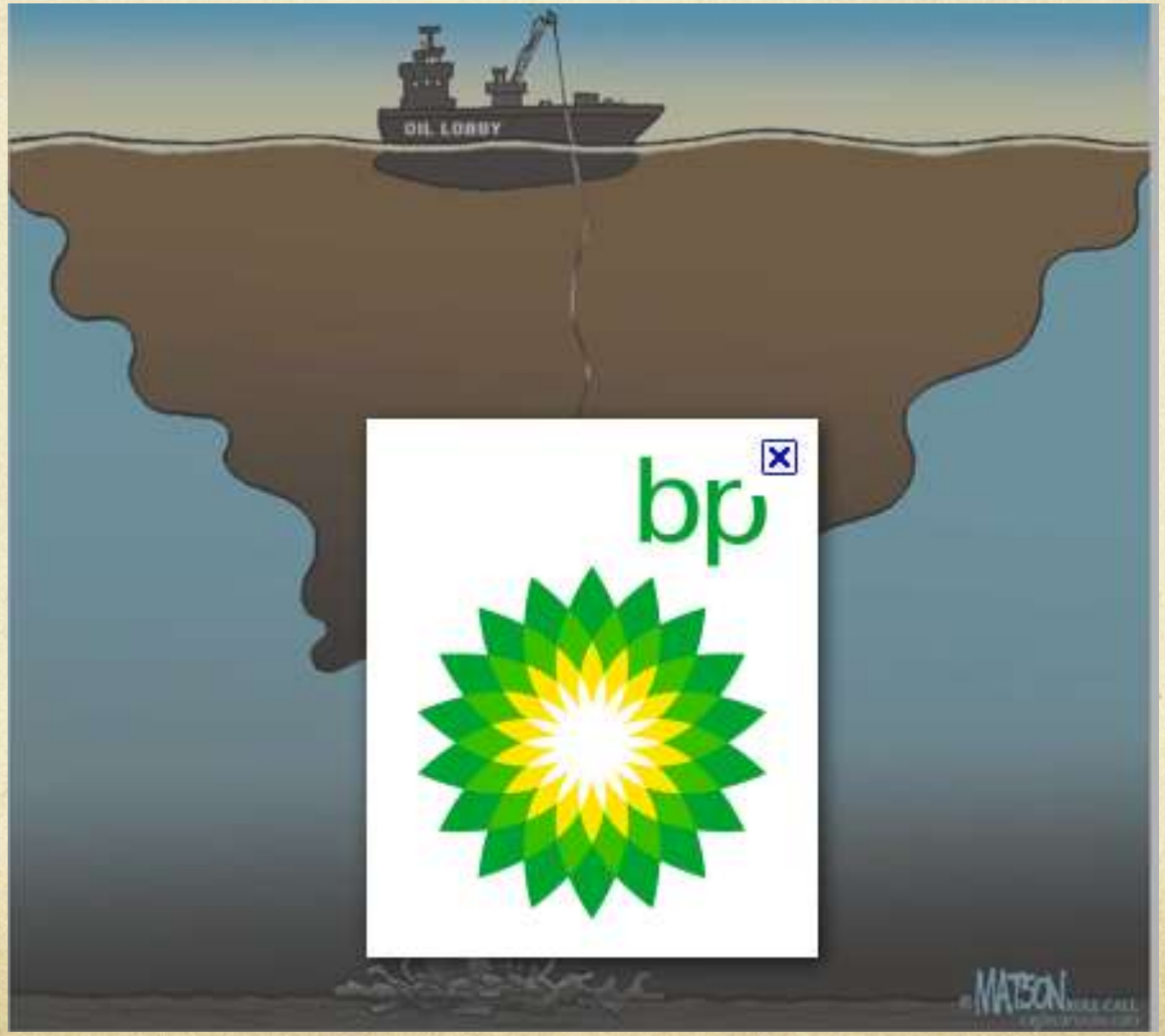
cardiovascular disease in primary care

- For every **10,000 primary care patients, each year** there are about:

	**10 deaths from coronary heart disease (CHD) and stroke**
	1 death from diabetes
	1 death from breast cancer
	1 death from prostate cancer
	1 death from suicide
	1 death from road traffic accidents
	(1 death from cervical cancer every 5 years)

Source: Mortality and Demographic Data 2000, New Zealand Health Information Service, 2004.

BP is the Problem



Why ?

- *"The greatest danger to a man with high blood pressure lies in its discovery, because then some fool will try to reduce it."*

Hay, BMJ 1931

- **Professional non-compliance**
- **J-shaped curve**
- **Side effects**
- **Bureaucratic Schizophrenia**

Issue # 1

It is difficult to make an asymptomatic patient feel better

- Changing Focus in Hypertension
- Numbers and Beyond – SBP/ DBP/ PP ??
- The Concept of CVS Risk

Ignore Symptoms !!

Assessment of Absolute Risk

- Metabolic Risk Factors and Subclinical organ damage are common in Hypt patients.
- Classify all patients in regard to level of HT *and* Absolute CVS Risk [organ damage, other risk factors, and disease].
- Decisions on treatment strategies based on Absolute Risk
- Risk classified as Low (<5%)/ Average/ High/Very High(>20%)
- Total Risk usually expressed as likelihood of event in 10 yrs
- Because of large age effect on Abs Risk use RR for young patients

Issue # 2

Thinking Beyond the Numbers

Definition of Hypertension is Variable

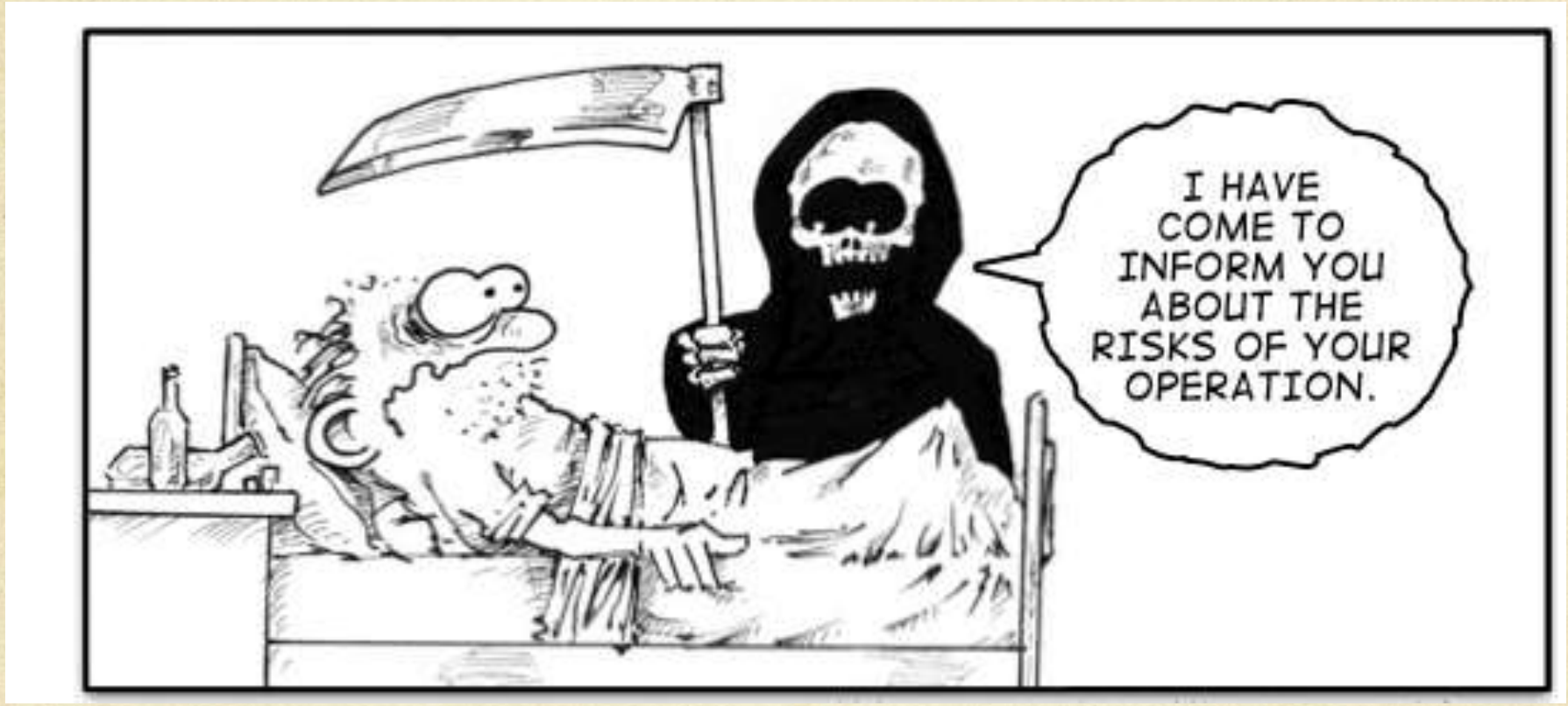
Blood pressure (mmHg)					
Other risk factors, OD or Disease	Normal SBP 120–129 or DBP 80–84	High normal SBP 130–139 or DBP 85–89	Grade 1 HT SBP 140–159 or DBP 90–99	Grade 2 HT SBP 160–179 or DBP 100–109	Grade 3 HT SBP ≥180 or DBP ≥110
No other risk factors	Average risk	Average risk	Low added risk	Moderate added risk	High added risk
1–2 risk factors	Low added risk	Low added risk	Moderate added risk	Moderate added risk	Very high added risk
3 or more risk factors, MS, OD or Diabetes	Moderate added risk	High added risk	High added risk	High added risk	Very high added risk
Established CV or renal disease	Very high added risk	Very high added risk	Very high added risk	Very high added risk	Very high added risk

Can personalize Risk

'It will never happen to me'- ' I hate pills etc'- types

- Echocardiography for LVH, Systolic and Diastolic Function, FU
- Microalbuminuria
- CT Coronary Calcium Score

Discuss Risk Sympathetically!!



Numbers-really for treatment targets

Blood Pressure Guidelines			
Category	**Systolic**		**Diastolic**
Normal	<120	AND	< 80
Pre-Hypertension	121-139 OR	OR	80-89
Hypertension Stage I	140-159	OR	90-99
Hypertension Stage II	> 160	OR	>100

Remember – All the science of BP ology is based on 'Office Sphygmo BP Measurements

"Heart Forecast"

"**Cardiovascular absolute risk assessment** is a simple tool that can enhance your clinical judgement, and improve your ability to educate and motivate patients. Single risk factors (like cholesterol level) provide a poor estimate of a patient's CVD risk. Absolute risk assessment provides a more accurate estimate of overall, individualised CVD risk, thereby allowing the clinician to best tailor pharmaceutical and lifestyle management to the patient."

– **Professor Mark Harris**, Royal Australian College of General Practitioners, University of New South Wales

ABSOLUTE and RELATIVE RISK

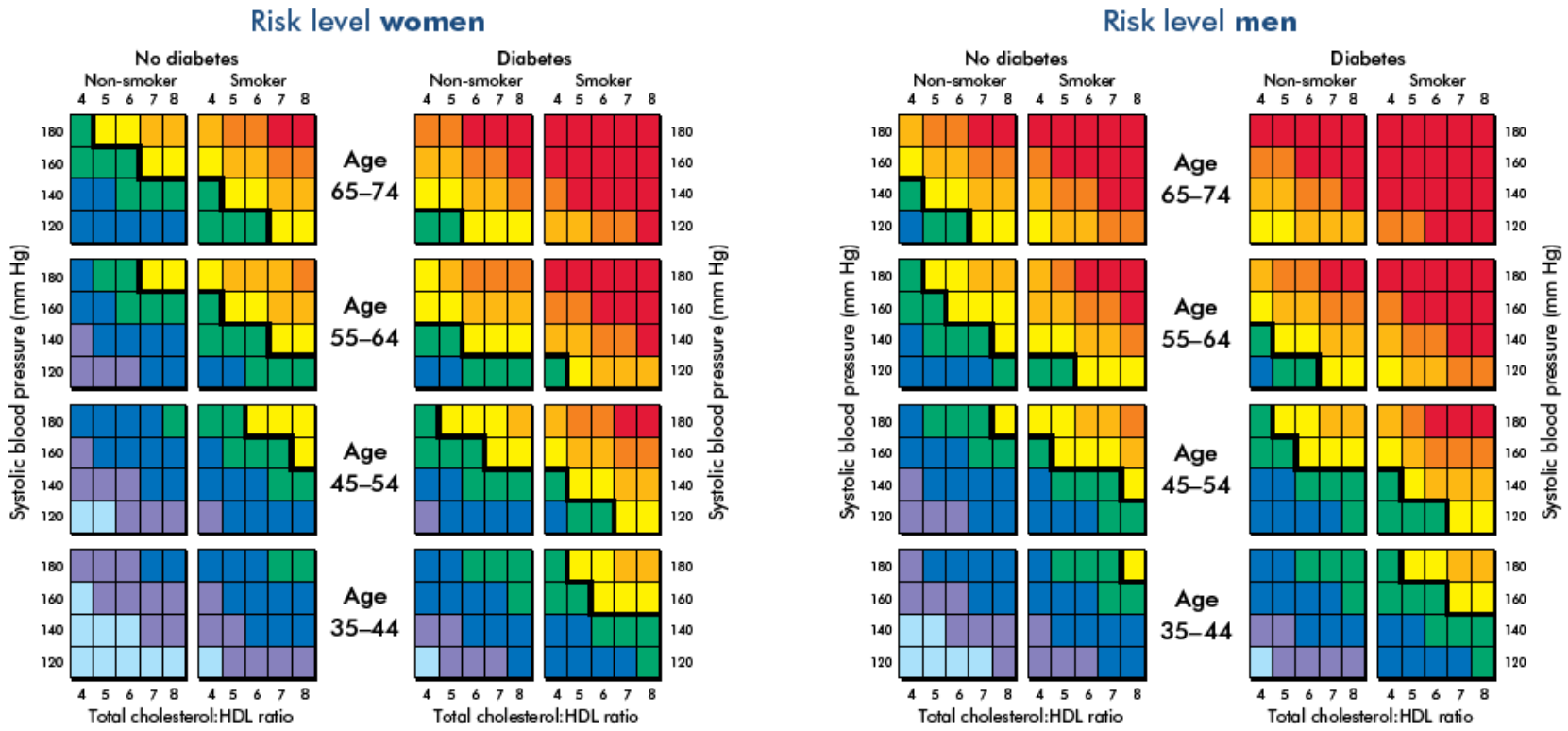
Your patient's absolute risk – what it means

Absolute risk is the **numerical probability** of an event occurring within a specified period, expressed as a percentage. For example, if your patient's risk is 15%, there is a 15% probability that they will experience a cardiovascular event within 5 years.

Relative risk is a ratio of the rate of events in the population exposed to a risk factor compared with the rate among the population not exposed to this risk factor. Relative risk tells you little about your patient's actual risk.

New Zealand Cardiovascular Risk Charts

www.nzgg.org.nz



Key

5-year cardiovascular disease (CVD) risk (fatal and non-fatal)

- Very high: >30%, 25–30%, 20–25%
- High: 15–20%
- Moderate: 10–15%
- Mild: 5–10%, 2.5–5%, <2.5%

Using the Charts

- Identify the chart relating to the person's sex, diabetic status, smoking history and age.
- Within the chart choose the cell nearest to the person's age, systolic blood pressure (SBP) and total cholesterol (TC) TC:HDL ratio. People who fall exactly on a threshold between cells are placed in the cell indicating higher risk.

Note: The risk charts now include values for SBP alone, as this is the most informative of conventionally measured blood pressure parameters for cardiovascular risk. Diastolic pressures may add some predictive power, especially at younger ages (eg, a diastolic pressure consistently >100 mm Hg in a patient with SBP values between 140 and 170 mm Hg).

Certain groups may have CVD risk underestimated using these charts. See Cardiovascular Guidelines Handbook (2009 Edition) for details.

Risk level: 5-year CVD risk (fatal and non-fatal)	Benefits: NNT for 5 years to prevent one event (CVD events prevented per 100 people treated for 5 years)		
	1 intervention (25% risk reduction)	2 interventions (45% risk reduction)	3 interventions (55% risk reduction)
30%	13 (7.5 per 100)	7 (14 per 100)	6 (16 per 100)
20%	20 (5 per 100)	11 (9 per 100)	9 (11 per 100)
15%	27 (4 per 100)	15 (7 per 100)	12 (8 per 100)
10%	40 (2.5 per 100)	22 (4.5 per 100)	18 (5.5 per 100)
5%	80 (1.25 per 100)	44 (2.25 per 100)	36 (3 per 100)

NNT = Number needed to treat

Based on the conservative estimate that each intervention: aspirin, BP treatment (lowering SBP by 10 mm Hg) or lipid modification (lowering LDL-C by 20%) reduces cardiovascular risk by about 25% over 5 years.

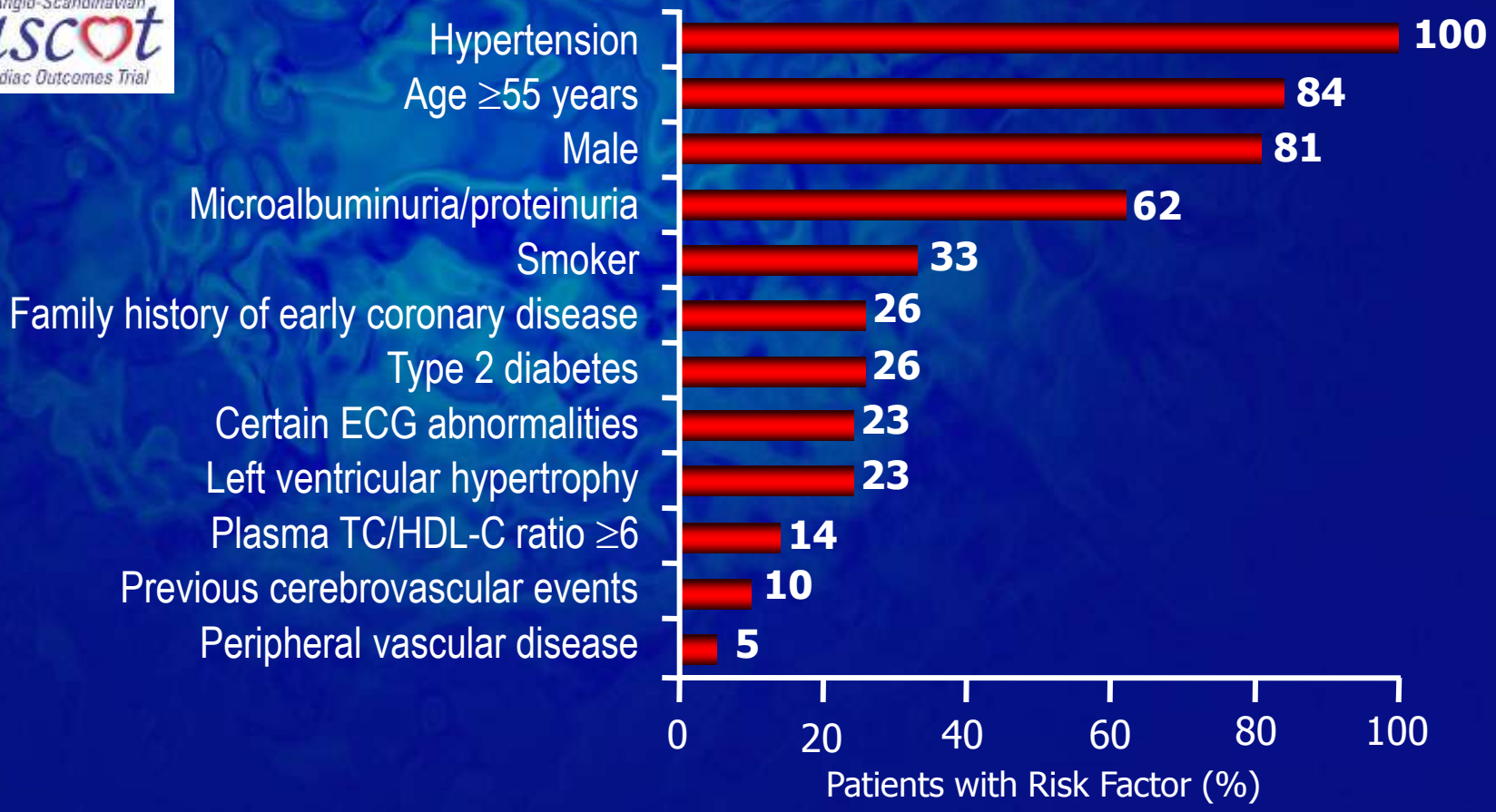
Note: Cardiovascular events are defined as myocardial infarction, new angina, ischaemic stroke, transient ischaemic attack (TIA), peripheral vascular disease, congestive heart failure and cardiovascular-related death.

Kidney Health

Source: New Zealand Guidelines Group. New Zealand Cardiovascular Guidelines Handbook: A summary resource for primary care practitioners. 2nd ed. Wellington: New Zealand Guidelines Group; 2009.

ASCOT-LLA: Patient Population Routinely Seen in Clinical Practice

(Hypertension Plus ≥3 Risk Factors for CHD)*



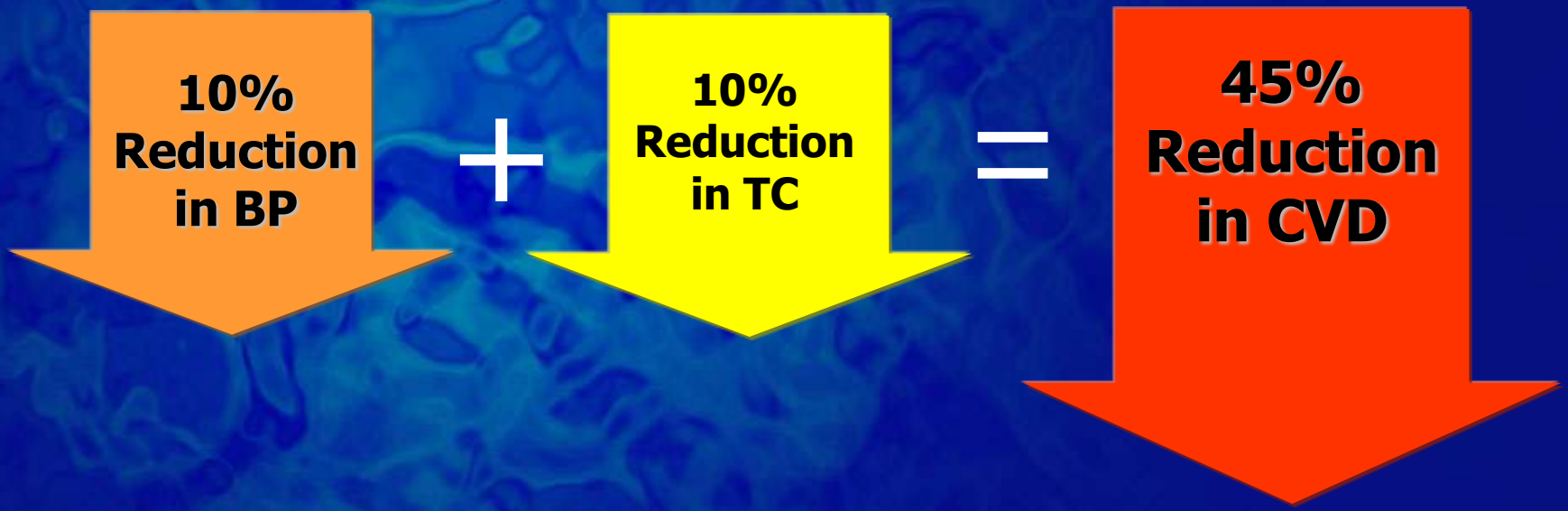
Two of the most common additional risk factors were male sex and age ≥55 years—representative of patients frequently seen in practice

*These risk factors were used as inclusion criteria for the study.

The ASCOT Investigators. Available at: http://www.ascotstudy.org/get_doc.php?id=56. Accessed: April 6, 2006. Data on file. Pfizer Inc, New York, NY.

Please see prescribing information at the end of this slide presentation.

Multiple CV Risk Management Results in Dramatic Reductions in CVD



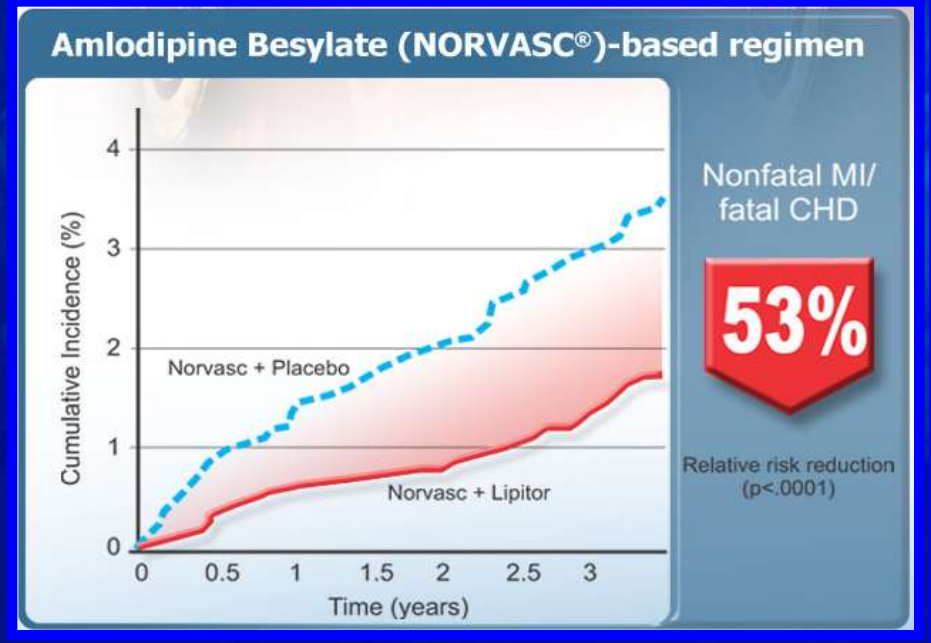
"Attention should be moved from knowing one's BP and cholesterol concentrations to knowing one's absolute CV risk and its determinants."

– J. Emberson et al and Jackson et al

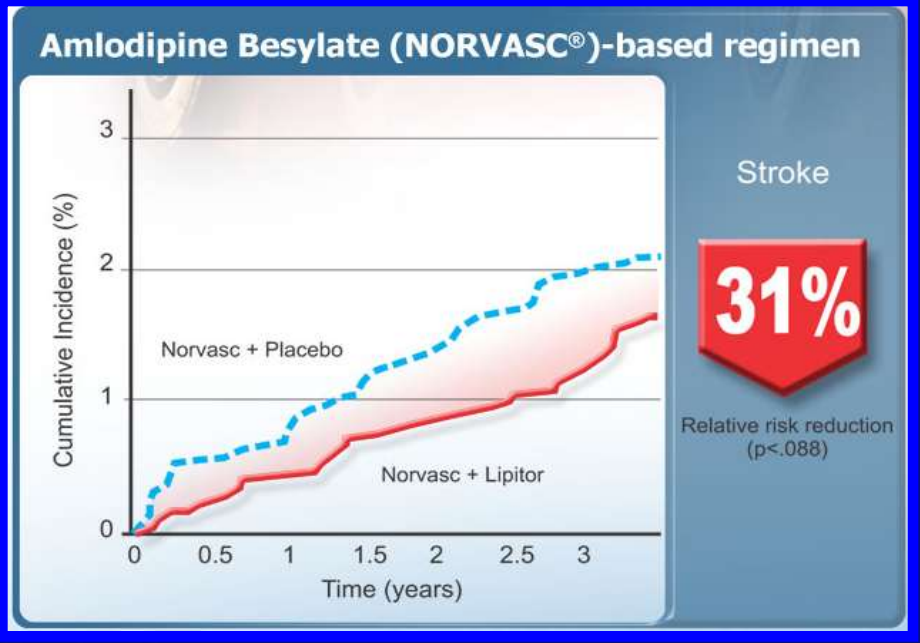
Emberson J et al. *Eur Heart J.* 2004;25:484-491. Jackson R et al. *Lancet.* 2005;365:434-441.

ASCOT-BPLA and -LLA Combined: Insight Into Optimal CVD Prevention

ASCOT-LLA Primary End Point: Nonfatal MI and Fatal CHD



ASCOT-LLA Secondary End Point: Fatal and Non-Fatal Stroke



ASCOT-LLA demonstrates that adding Lipitor® (atorvastatin calcium) to an effective BP regiman results in impressive CV event reductions.

Sever PS et al. *Lancet*. 2003;361:1149-1158.

BHS Guidelines 2004
Risk Assessment

BP 140 – 159/90 – 99 mmHg

Target organ damage

or

CV complications

or

DM

or

10 year CV risk ≥ 20%

↓

Treat

No target organ damage

and

No CV complications

and

No DM

and

10 year CV risk < 20%

↓

Observe

Reassess CV risk yearly

Issue # 3

How low to go ?

Potential Benefits of Additional BP Reductions

Meta-analysis of 61 cohort studies, supported by a meta-analysis of 147 randomised trials suggests that in a 65 year old where a single BP lowering drug, at standard dose reduces diastolic BP by approximately 5 mm Hg results in a reduction of :-

- **25% in risk of CHD events (relative risk 0.75)**
- **35% in stroke (relative risk 0.65)**

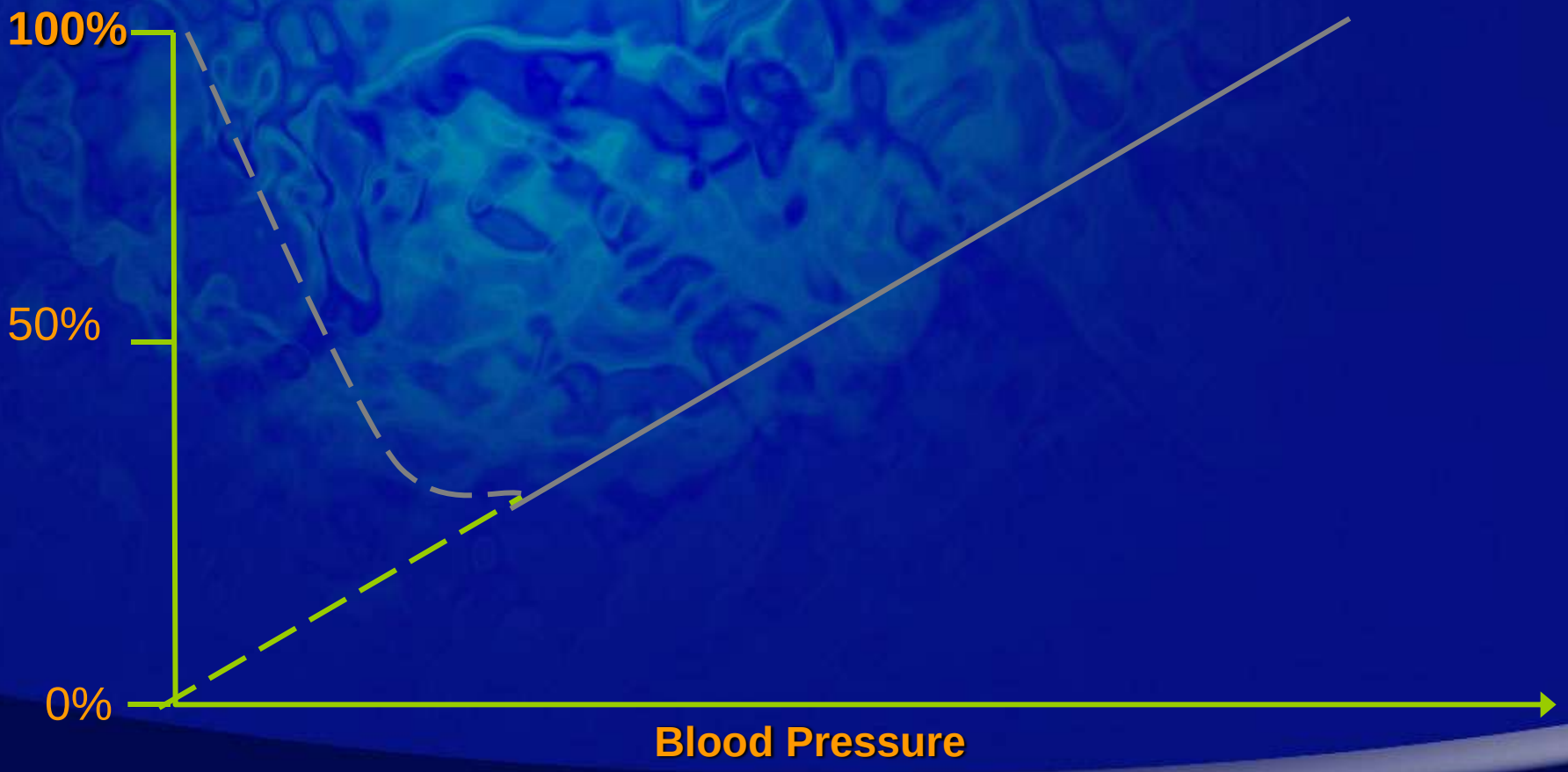
Law MR et al, BMJ 2009

An additional 1.8 mm Hg reduction in diastolic BP can be predicted to reduce :-

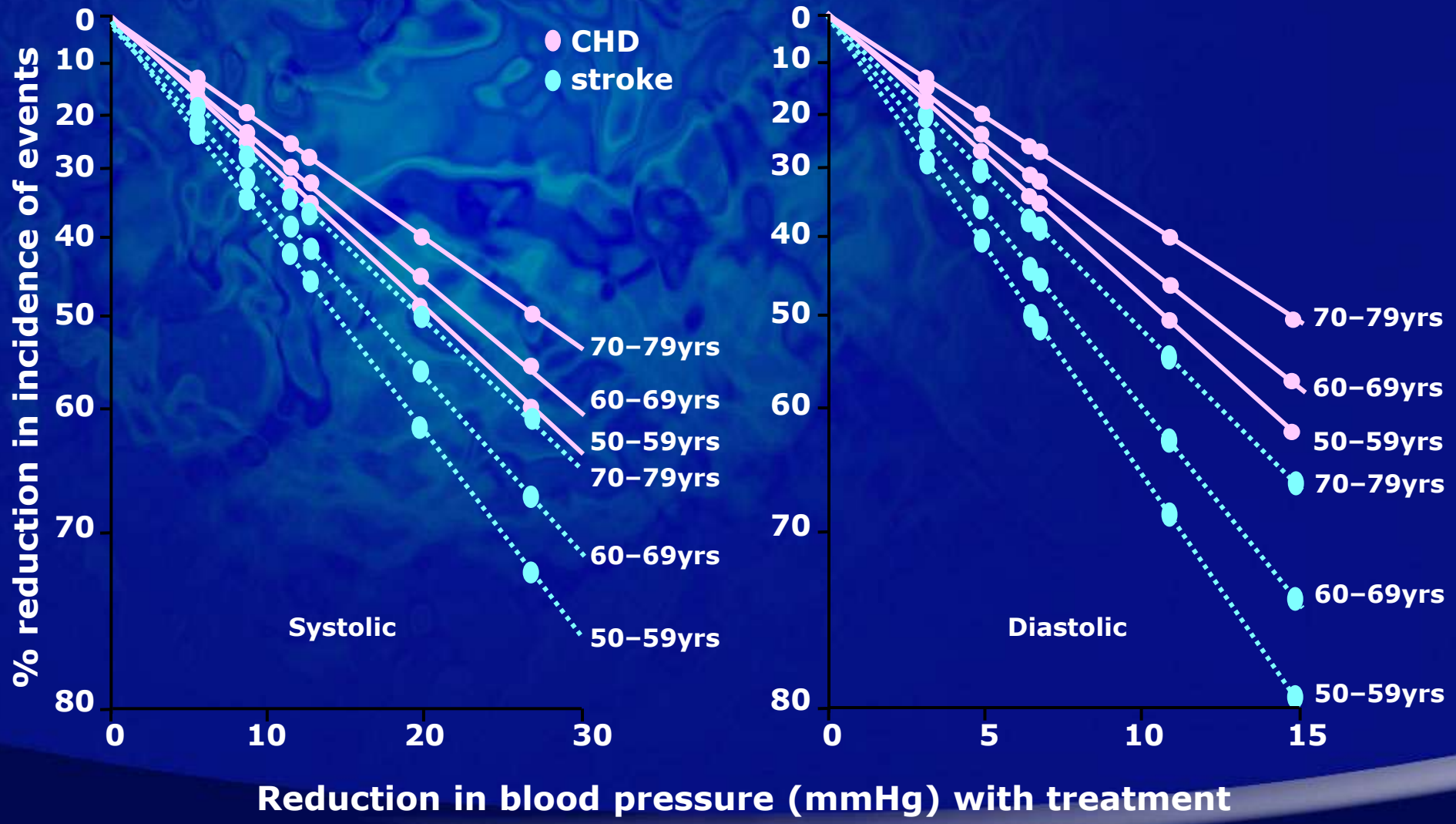
- **CHD events by 32% ($0.75^{6.8/5} = 0.68$)**
- **stroke by 44% ($0.65^{6.8/5} = 0.56$)**

❑ *Targets lower for diabetics and those with evidence of TOD*

BP and Mortality



Reduction in Incidence of CHD Events and Stroke in Relation to Reduction in BP and Age



Law et al 2009

Different targets for hypertension treatment according to accompanying risk factors

Uncomplicated HT	<140/90 mmHg
Diabetes mellitus	<130/80 mmHg
Target Organ Disease*	<130/80 mmHg
Proteinurea >1 gr	<125/75 mmHg

*LV Hypertrophy, Angina, MI, PTCA, Bypass; Sroke or TIA, Peripheral Arterial Disease, retinopathy, carotid plaque, microalbuminurea

2007 Guidelines for the Management of Arterial Hypertension: The Task Force for the Management of Arterial Hypertension of the European Society of Hypertension (ESH) and of the European Society of Cardiology (ESC). J Hypertens. 2007;25(6):1105-87

Outcome- Based Treatment Targets in Patients with TOD

Numbers are not the be all

- Regression of LVH on Echocardiogram
- Reduction of Microalbuminuria

Blood pressure lowering after Stroke

- **Antihypertensive therapy should be started in all patients with stroke or TIA unless contraindicated**

  Grade A, Level I evidence, Australian Stroke Guidelines 2007

- **In general aim for <140/90 mmHg; if diabetic, aim for <130/85 mmHg**

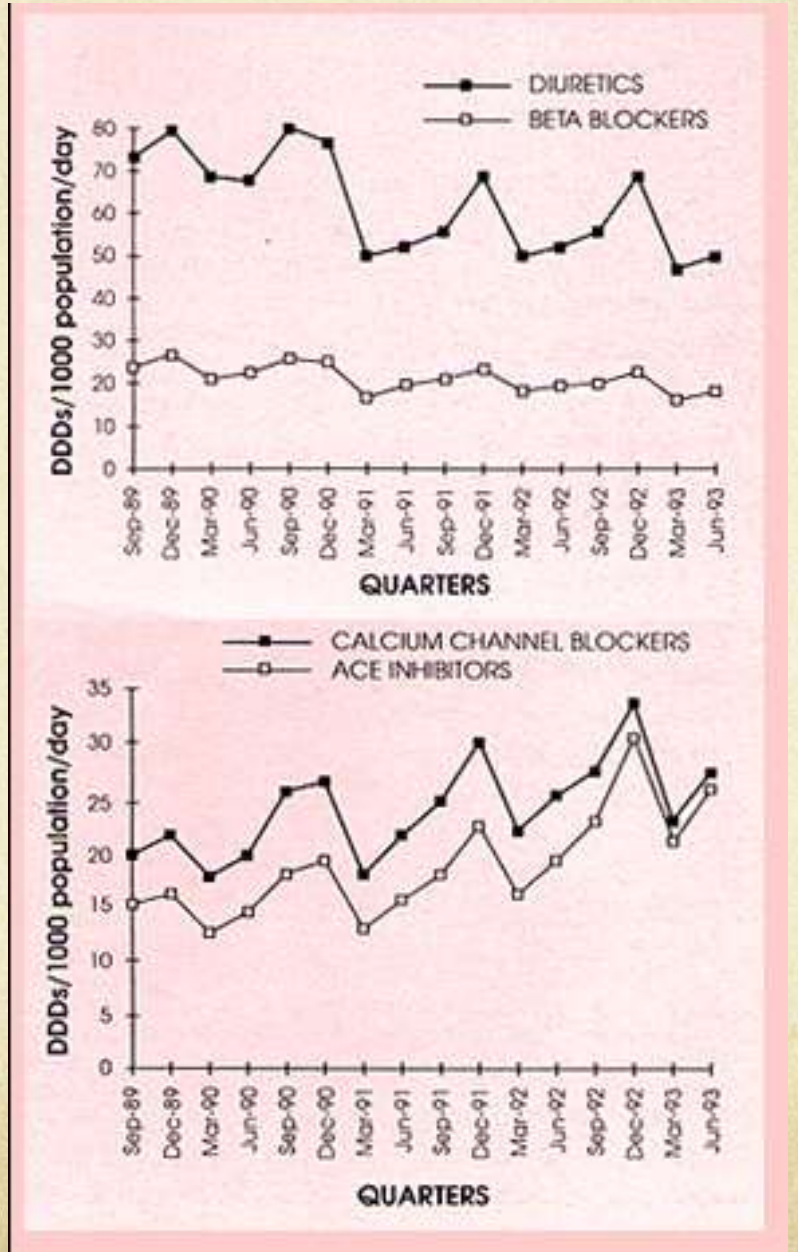
- **Most direct evidence for ACE inhibitor (± diuretic)**

  Rashid et al. Stroke.2003;34:2741-8

- **More recent evidence of benefit of angiotensin receptor blockers**

  Schrader et al. Stroke 2005;36:1218

Community Prescribing of Anti-Hypertension in Australia



GAPS

- Significant treatment 'gaps' exist in the general population
  - The Bold Promise Project[a] (2006): among individuals with CV risk ≥15%, only 40% were prescribed statins
  - GPs and PNs have a major role in 'narrowing' such treatment gaps

[a] Sinclair & Kerr. N Z Med J 2006; 119 (1245): U2312

Issue # 4

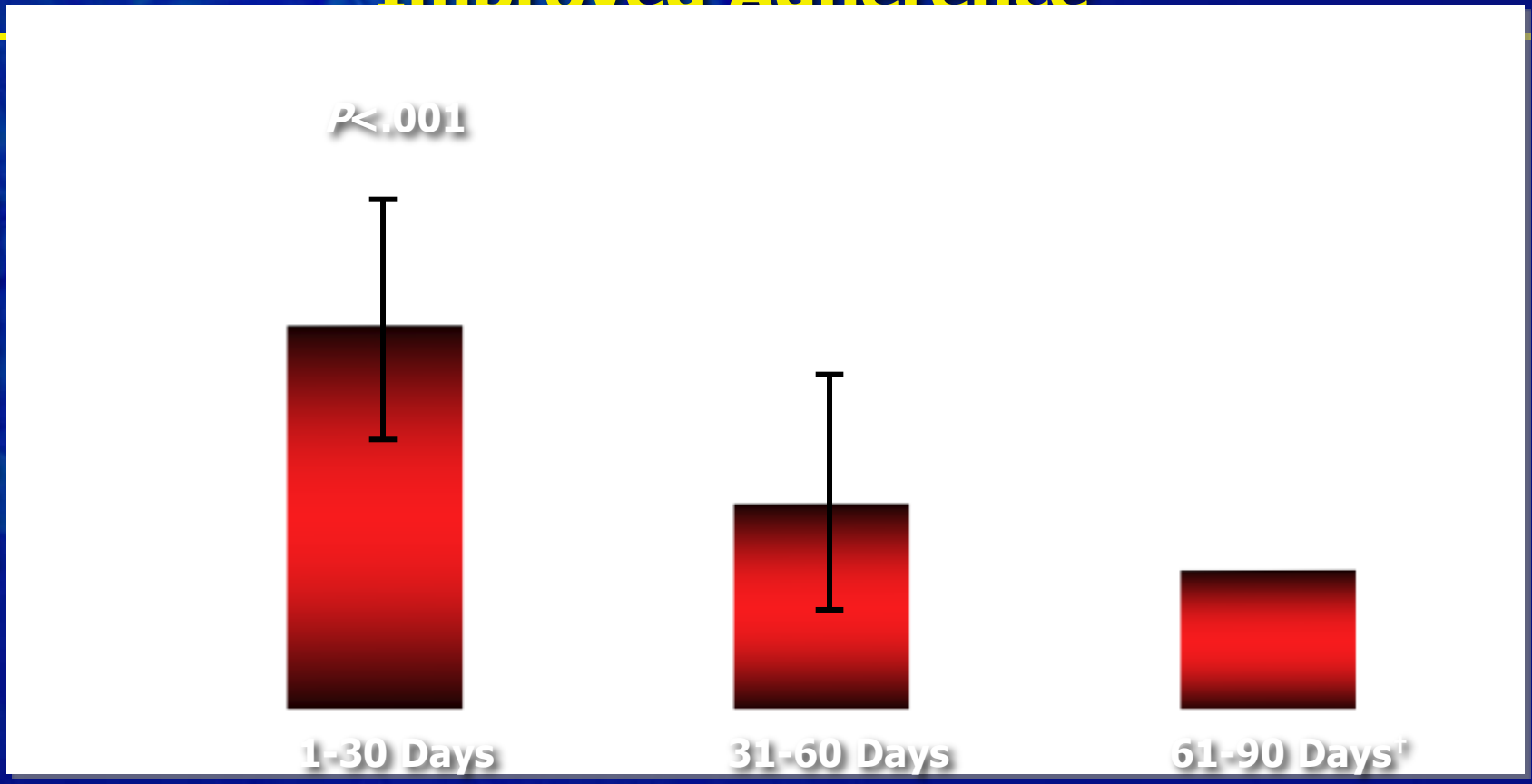
Patient Compliance with Treatment Regimens

- Adherence to long-term therapy for chronic illnesses averages only 50%
- If adherence poor, health outcomes cannot be accurately assessed
- However, low-cost strategies to improve adherence:
  - increase efficacy of interventions
  - produce significant cost savings

Is Poor Adherence an Essential CV Risk Factor?

- Increasing pill burden decreases adherence
- In clinical trials, worse outcomes were attained when adherence was lower
- Patients need to adhere to their medications in order to effectively treat their CV risk factors
  - Improved adherence when starting 2 medications concurrently
  - Combination therapy reduces pill burden
  - Reduced pill burden improves adherence
- Nonadherence to medication increases CV risk

Concurrently Starting 2 Medications Improved Adherence



Retrospective cohort study in a large managed-care population (N=8406).
*Relative odds of being adherent with both antihypertensive and lipid-lowering therapy at any point in time. †Reference group.
Chapman RH et al. *Arch Intern Med.* 2005;165:1147-1152.

Choosing appropriate drug combinations

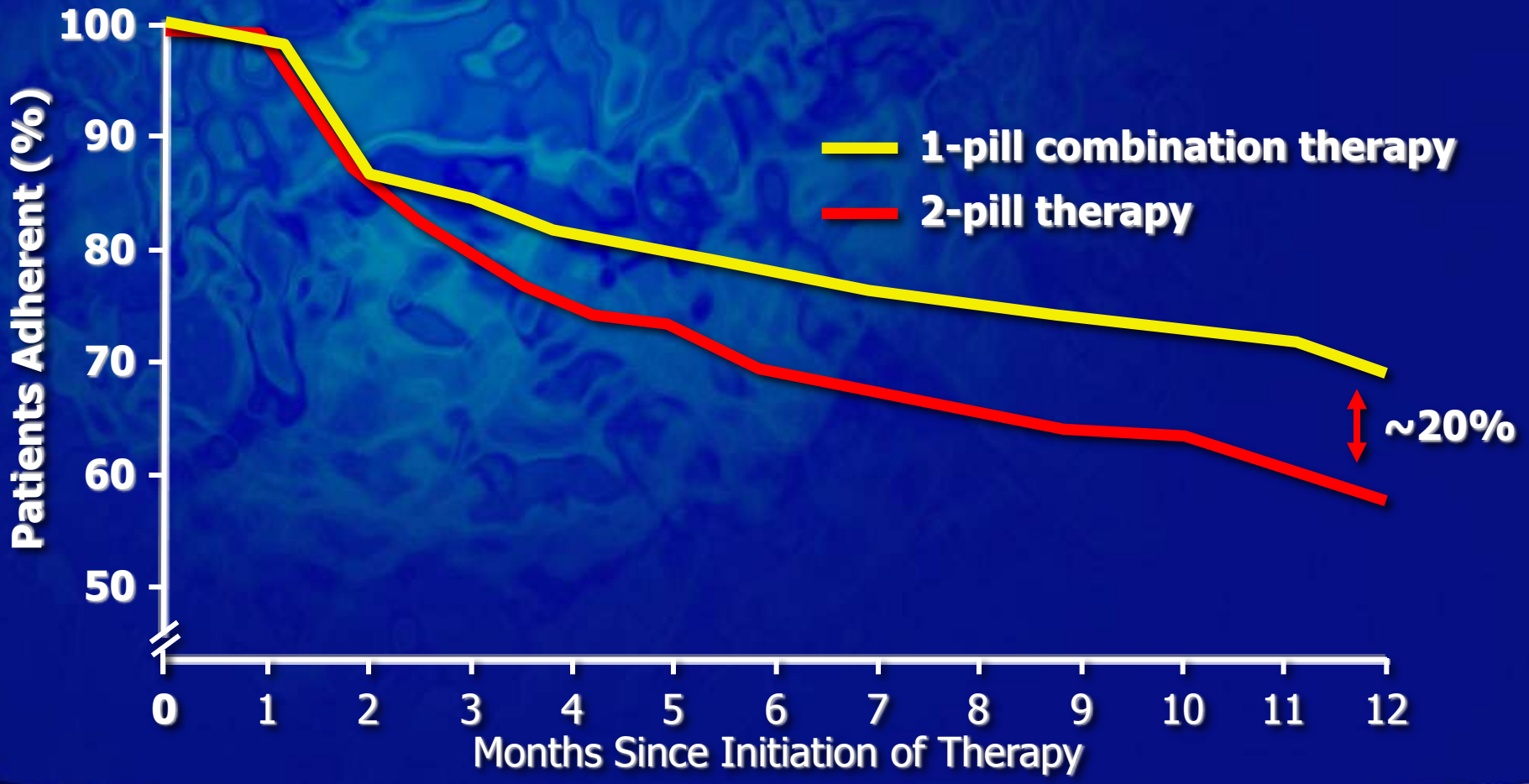
In hypertension:

- Thiazide plus CCB
- Thiazide plus β-blocker
  - Not recommended if glucose intolerance, metabolic syndrome, or 'frank' diabetes

For lipid management when high CV risk:

- consider atorvastatin if simvastatin inadequate to meet target, or
- consider combination of statin with ezetimibe

Simplified Medication Regimen Improved Persistence



Dezii CM. *Manag Care*. 2000;9(suppl):S2-S6.

Asprin

Antiplatelet therapy

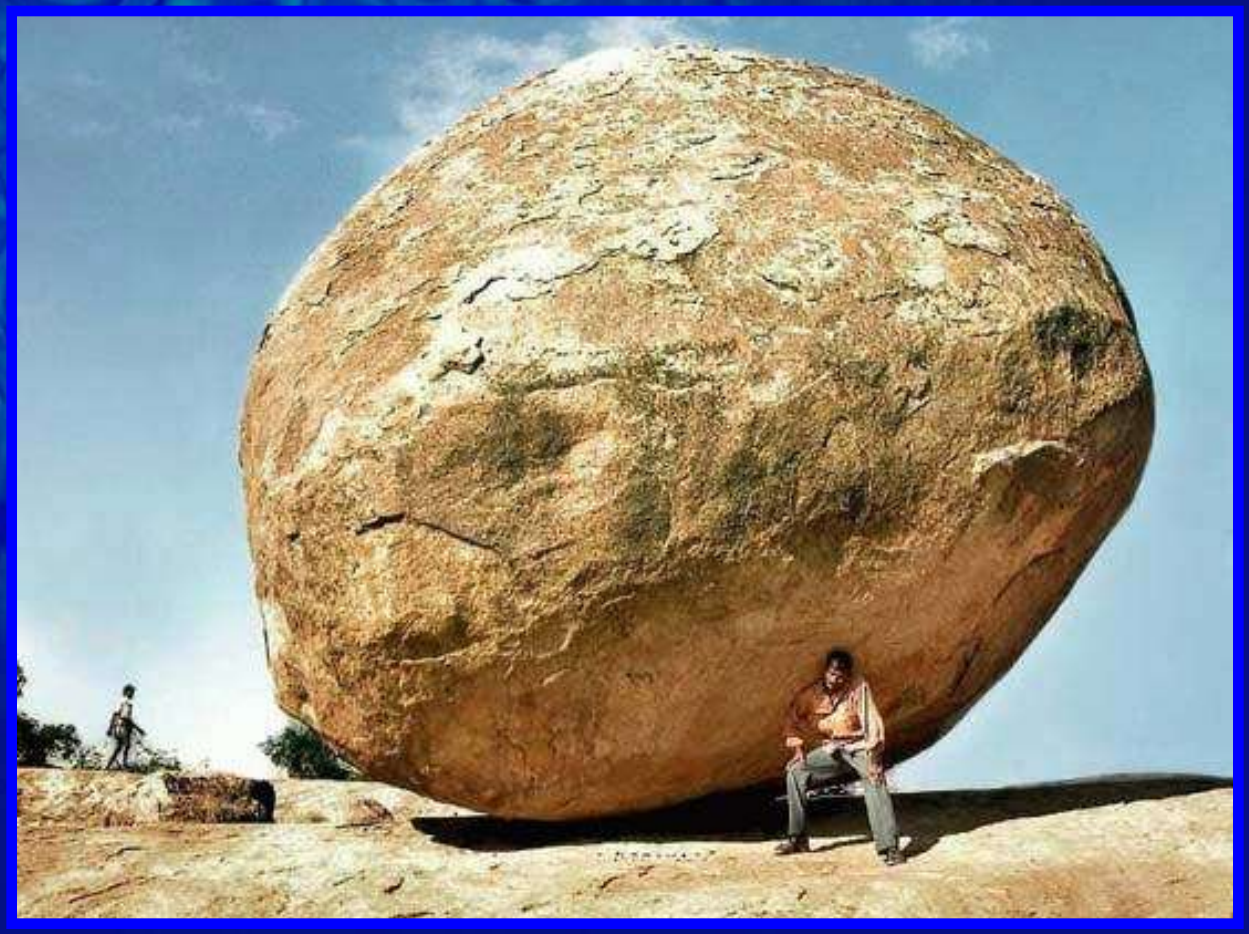
- Antiplatelet therapy, in particular low-dose aspirin, should be prescribed to hypertensive patients with previous cardiovascular events, provided that there is no excessive risk of bleeding.
- Low-dose aspirin should also be considered in hypertensive patients without a history of cardiovascular disease if older than 50 years, with a moderate increase in serum creatinine or with a high cardiovascular risk. In all these conditions, the benefit-to-risk ratio of this intervention (reduction in myocardial infarction greater than the risk of bleeding) has been proven favourable.
- To minimize the risk of haemorrhagic stroke, antiplatelet treatment should be started after achievement of BP control.

Statins

Lipid lowering agents

- All hypertensive patients with established cardiovascular disease or with type 2 diabetes should be considered for statin therapy aiming at serum total and LDL cholesterol levels of, respectively, <4.5 mmol/l (175 mg/dl) and <2.5 mmol/l (100 mg/dl), and lower, if possible.
- Hypertensive patients without overt cardiovascular disease but with high cardiovascular risk ($\geq 20\%$ risk of events in 10 years) should also be considered for statin treatment even if their baseline total and LDL serum cholesterol levels are not elevated.

Can a Polypill prevent stroke?



Initiating Anti HT Treatment

Blood pressure (mmHg)					
Other risk factors OD or disease	Normal SBP 120–129 or DBP 80–84	High normal SBP 130–139 or DBP 85–89	Grade 1 HT SBP 140–159 or DBP 90–99	Grade 2 HT SBP 160–179 or DBP 100–109	Grade 3 HT SBP ≥180 or DBP ≥110
No other risk factors	No BP intervention	No BP intervention	Lifestyle changes for several months then drug treatment if BP uncontrolled	Lifestyle changes for several weeks then drug treatment if BP uncontrolled	Lifestyle changes + Immediate drug treatment
1–2 risk factors	Lifestyle changes	Lifestyle changes	Lifestyle changes for several weeks then drug treatment if BP uncontrolled	Lifestyle changes for several weeks then drug treatment if BP uncontrolled	Lifestyle changes + Immediate drug treatment
≥3 risk factors, MS or OD	Lifestyle changes	Lifestyle changes and consider drug treatment	Lifestyle changes + Drug treatment	Lifestyle changes + Drug treatment	Lifestyle changes + Immediate drug treatment
Diabetes	Lifestyle changes	Lifestyle changes + Drug treatment			
Established CV or renal disease	Lifestyle changes + Immediate drug treatment	Lifestyle changes + Immediate drug treatment	Lifestyle changes + Immediate drug treatment	Lifestyle changes + Immediate drug treatment	Lifestyle changes + Immediate drug treatment

Box 6 Laboratory investigations

Routine tests

- Fasting plasma glucose
- Serum total cholesterol
- Serum LDL-cholesterol
- Serum HDL-cholesterol
- Fasting serum triglycerides
- Serum potassium
- Serum uric acid
- Serum creatinine
- Estimated creatinine clearance (Cockroft-Gault formula) or glomerular filtration rate (MDRD formula)
- Haemoglobin and haematocrit
- Urinalysis (complemented by microalbuminuria via dip-stick test and microscopic examination)
- Electrocardiogram

Recommended tests

- Echocardiogram
- Carotid ultrasound
- Quantitative proteinuria (if dipstick test positive)
- Ankle-brachial BP Index
- Fundoscopy
- Glucose tolerance test (if fasting plasma glucose >5.6 mmol/L (100 mg/dL)
- Home and 24 h ambulatory BP monitoring
- Pulse wave velocity measurement (where available)

Diabetics

Glycaemic control

- Effective glycaemic control is of great importance in patients with hypertension and diabetes.
- In these patients dietary and drug treatment of diabetes should aim at lowering plasma fasting glucose to values $\leq$ 6 mmol/l (108 mg/dl) and a glycated haemoglobin of $<$ 6.5%.

Box 1 Position statement: Total cardiovascular risk

- Dysmetabolic risk factors and subclinical organ damage are common in hypertensive patients.
- All patients should be classified not only in relation to the grades of hypertension but also in terms of the total cardiovascular risk resulting from the coexistence of different risk factors, organ damage and disease.
- Decisions on treatment strategies (initiation of drug treatment, BP threshold and target for treatment, use of combination treatment, need of a statin and other non-antihypertensive drugs) all importantly depend on the initial level of risk.
- There are several methods by which total cardiovascular risk can be assessed, all with advantages and limitations. Categorization of total risk as low, moderate, high, and very high added risk has the merit of simplicity and can therefore be recommended. The term 'added risk' refers to the risk additional to the average one.
- Total risk is usually expressed as the absolute risk of having a cardiovascular event within 10 years. Because of its heavy dependence on age, in young patients absolute total cardiovascular risk can be low even in the presence of high BP with additional risk factors. If insufficiently treated, however, this condition may lead to a partly irreversible high risk condition years later. In younger subjects treatment decisions should better be guided by quantification of relative risk, i.e. the increase in risk in relation to average risk in the population.