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Dunedin

Managing Diabetic Complications - Concurrent workshop repeated

Saturday, 30 July 2011	Start 11:00am	Duration: 55mins	Skeggs Rooms
	Start 12:05pm	Duration: 55mins	Skeggs Rooms



Managing Diabetic Complications

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NEW ZEALAND

Complications of Diabetes

Microvascular:	
Retinopathy ***Nephropathy*** ***Neuropathy*** **Distal symmetric polyneuropathy** **Acute painful neuropathy** **Cranial nerve palsies** **Truncal neuropathy** **Diabetic amyotrophy** **Antonomic neuropathy**	
Macrovascular:	Other complications:
Increased risk of: *coronary artery disease*	*foot problems* *bone & rheumatic disease*
cerebrovascular disease	*GI manifestations,* *skin problems*
peripheral vascular disease	*Sexual dysfunction, psychological issues*
heart failure	*infections*

In Practice:

1. Early identification of those at high risk
2. Achieve glycaemic control as close as possible to target (50-55mmol/mol)
3. Early & aggressive management of other modifiable risk factors: *smoking, blood pressure & lipids*
4. Prevention & management of diabetic foot problems
5. Awareness of other complications

Determining level of risk for diabetes-related complications

Low risk

- HbA1c 50–55 mmol/mol*
- BP <130/80 mm Hg*
- ACR <2.5 mg/mmol in men or <3.5 mg/mmol in women
- eGFR ≥60 ml/min/1.73m²*
- Lipids: triglycerides <1.7 mmol/L, total cholesterol <4.0 mmol/L
- Non-smoker
- Attends at least 6-monthly review of HbA1c and blood pressure; annual review of lipids, ACR, eGFR and foot check. Two-yearly retinal screening

Moderate to high risk

High risk = 3 or more risk factors
Moderate risk = 2 risk factors

- HbA1c >55 mmol/mol.* Risk increases incrementally with increasing HbA1c
- BP ≥130/80 mm Hg*
- ACR ≥2.5 mg/mmol men, or ≥3.5 mg/mmol in women
- eGFR <60 ml/min/1.73m²*
- Lipids: triglycerides ≥1.7 mmol/L, total cholesterol ≥4.0 mmol/L
- Current smoker
- Ethnicity (Māori, Pacific Islander, South Asian)
- Moderate retinopathy (R3), mild maculopathy (M3) – in either eye
- More than one year since diabetes last reviewed or poor adherence or attendance

* Consider patient age. In younger people, tighter control should be considered given their higher lifetime risk of diabetes-related complications. Evidence suggests that a blood pressure target <120 mm Hg may be harmful. Care should be taken to estimate likely treatment response for patients when BP approaches the target of <130 mm Hg.

Increasing risk for diabetes-related complications

Existing complications

These place the person at **high risk** of developing more severe and/or additional complications:

- previous cardiac event or stroke/TIA
- eGFR <45 ml/min/1.73m² and/or ACR >30 mg/mmol
- severe retinopathy (R4), moderate maculopathy (M4) – in either eye
- previous amputation/ulceration
- peripheral arterial disease or previous leg vascular surgery

Management of glycaemic control

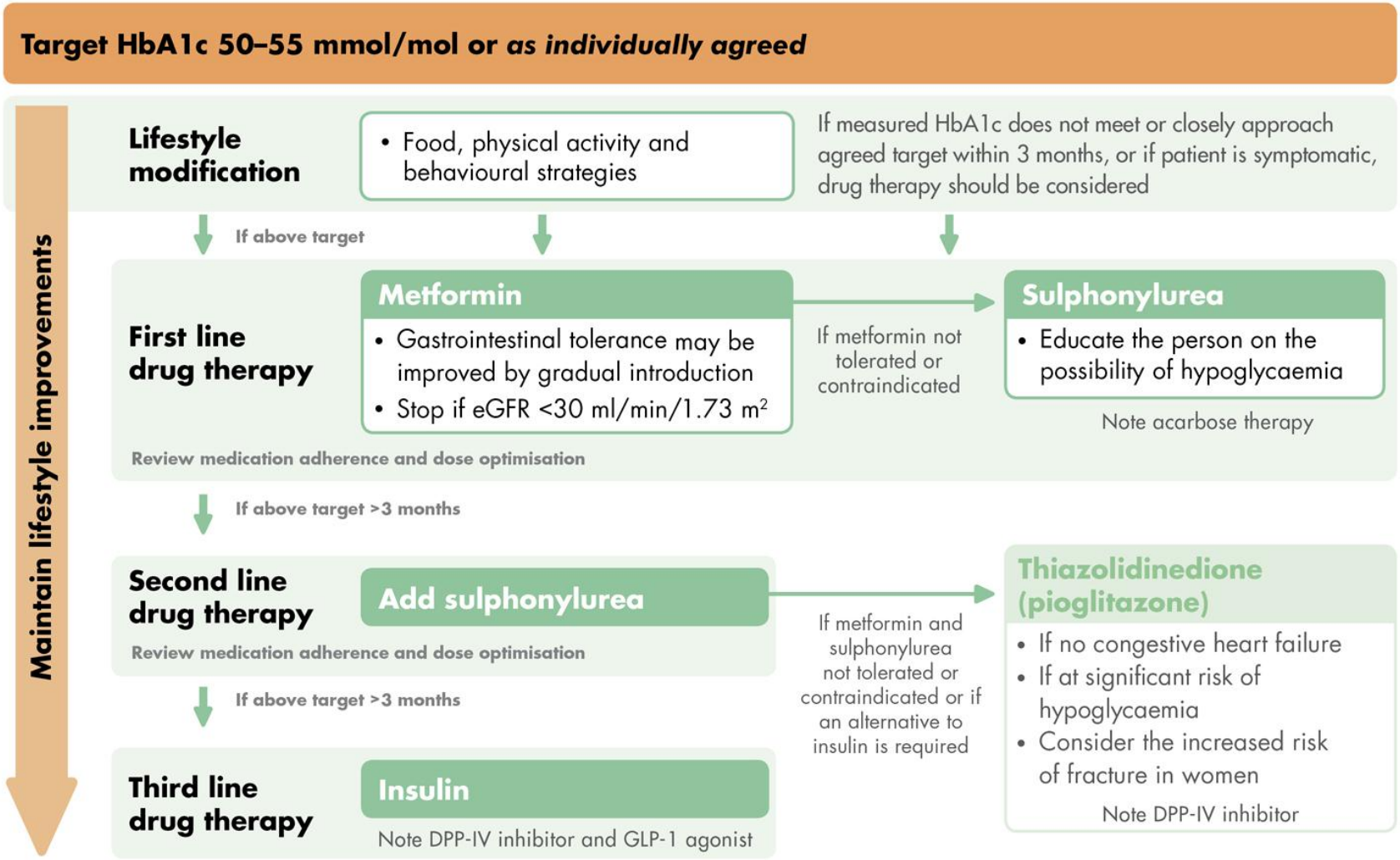
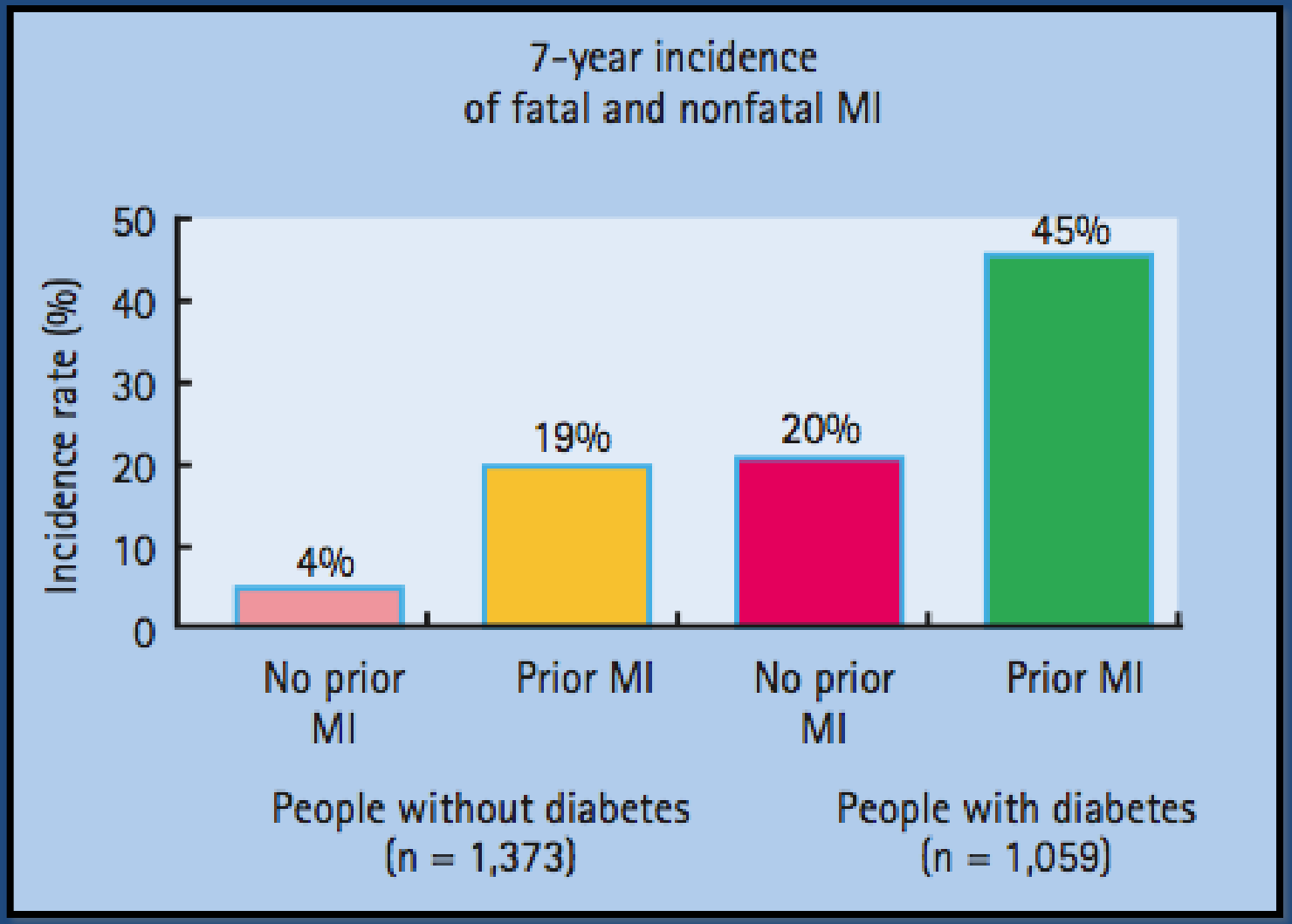


Fig 40.10: Equivalence of cardiovascular risk in patients with previous coronary heart disease and those with diabetes



Textbook of Diabetes 4e(eds Holt & Cockram), 2010

Management of raised blood pressure

Target BP <130/80 mm Hg

Hypertension should be treated aggressively with lifestyle modification including dietary salt restriction and drug therapy. Evidence suggests a blood pressure target <120 mm Hg may be harmful. Care should be taken to estimate likely treatment response for patients when BP approaches the target of <130 mm Hg.

Start drug therapy — BP >130/80 mm Hg consistently for 3 months despite attempts at lifestyle modification

Maintain lifestyle improvements

Start
- ACE inhibitor (and titrate dose) or ARB if intolerant

If above target

Add one of
- CCB
- Thiazide type diuretic

If above target

Add another of
- Thiazide type diuretic
- CCB

If above target

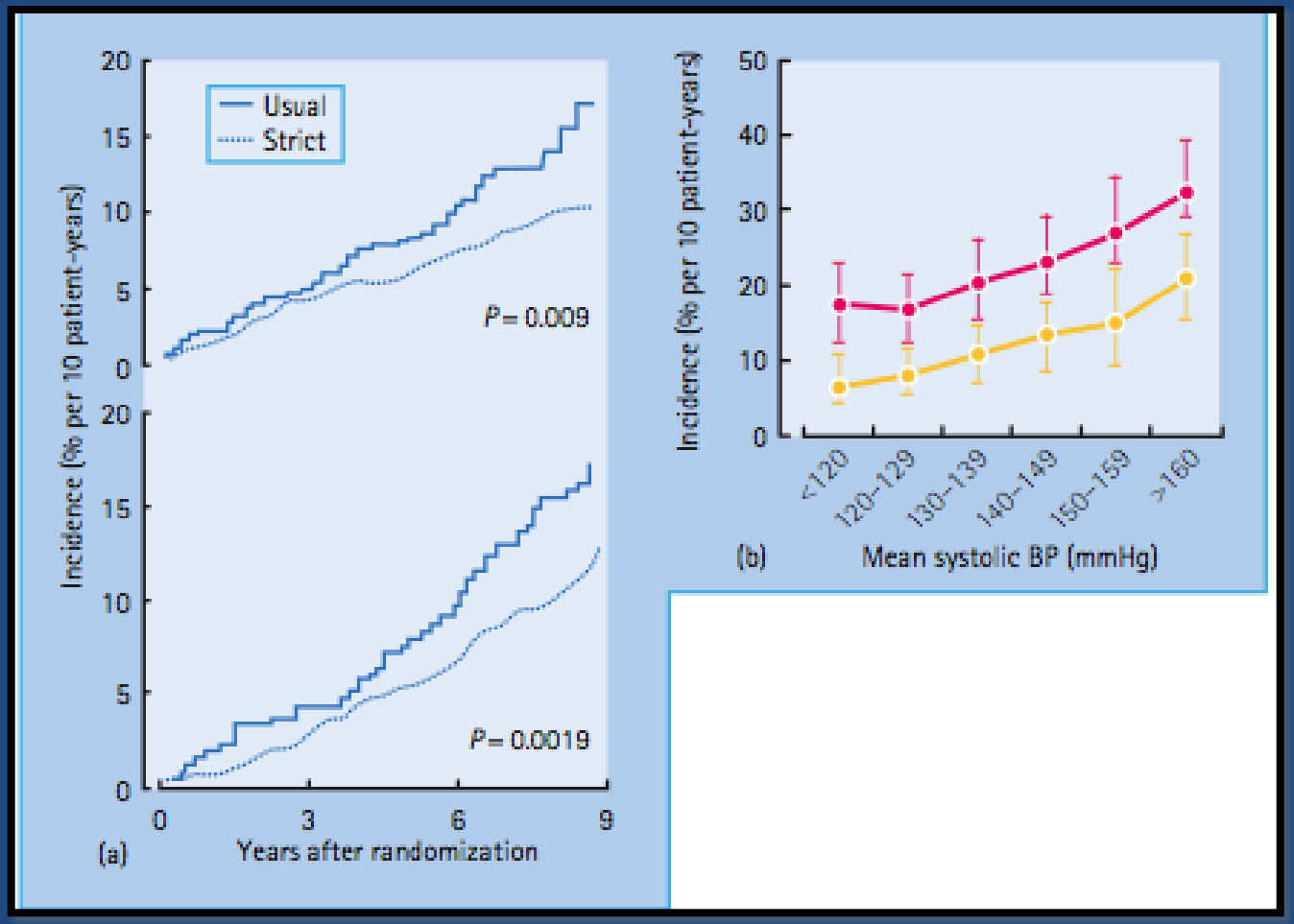
Add one of
- Alpha-blocker
- Beta-blocker
- Further diuretic therapy (potassium sparing)

If above target

Add another of
- Alpha-blocker
- Beta-blocker
- Further diuretic therapy (potassium sparing)

Or refer to specialist

Fig 40.9: Treating hypertension improves the prognosis in T2DM



Textbook of Diabetes 4e(eds Holt & Cockram), 2010

Dyslipidaemia of type 2 diabetes/metabolic syndrome:

↑ Triglycerides (triglyceride rich remnant lipoproteins)

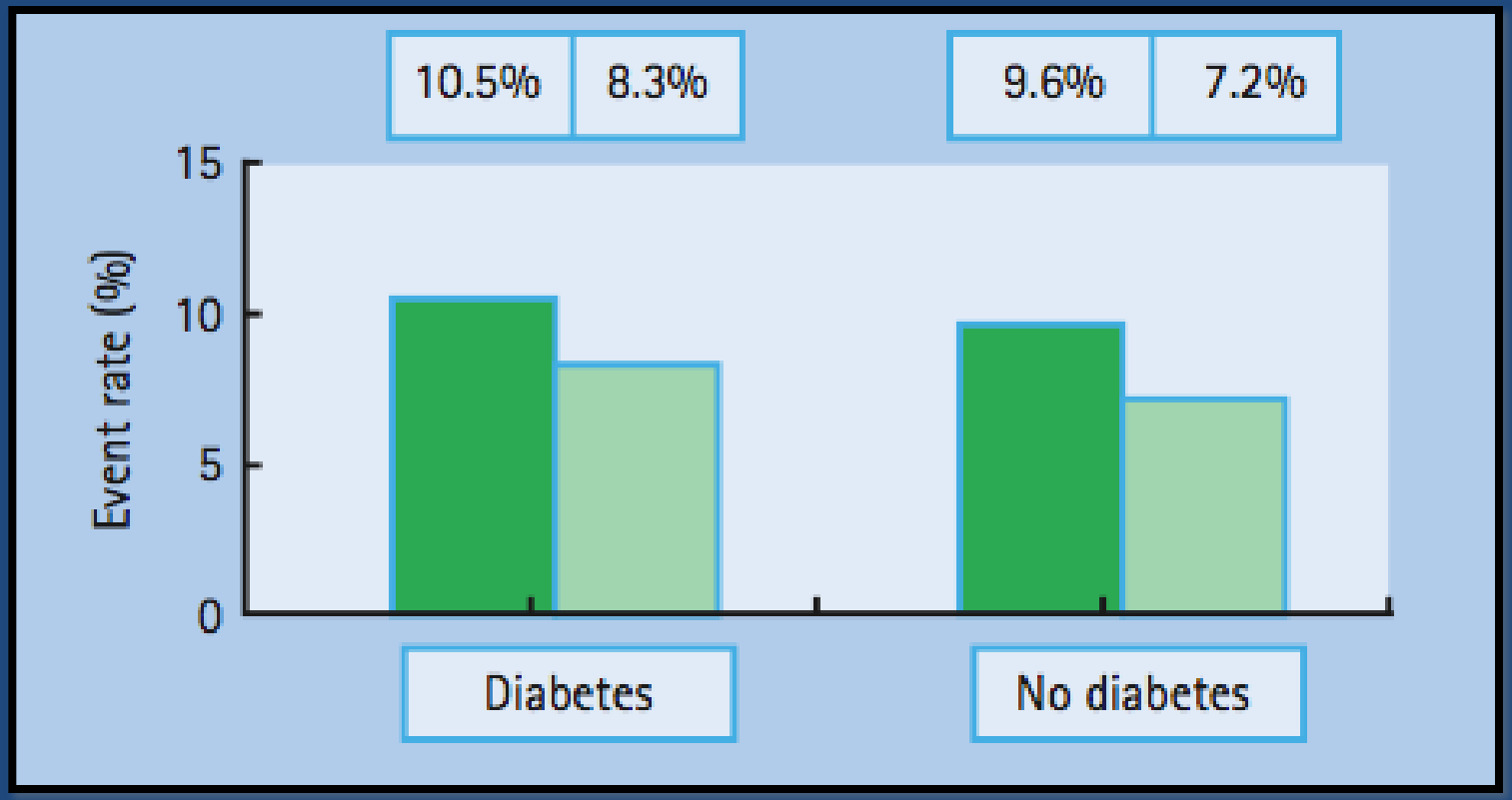
↓HDL

Small dense LDL particles

LDL reduction in people with diabetes

4 S Trial **(started with 20mg Simvastatin)**	**55% reduction in major CHD in people with diabetes** **32% reduction in those without diabetes**
CARDS: (10mg Atarvastatin)	40% reduction in LDL 37% reduction in all CVD
HPS: (40mg Simvastatin)	33% reduction in LDL 31% reduction in all CVD

Fig 40.13: Comparison of the effects of reducing low density lipoprotein cholesterol on cardiovascular events in patients with & without diabetes



Textbook of Diabetes 4e(eds Holt & Cockram), 2010

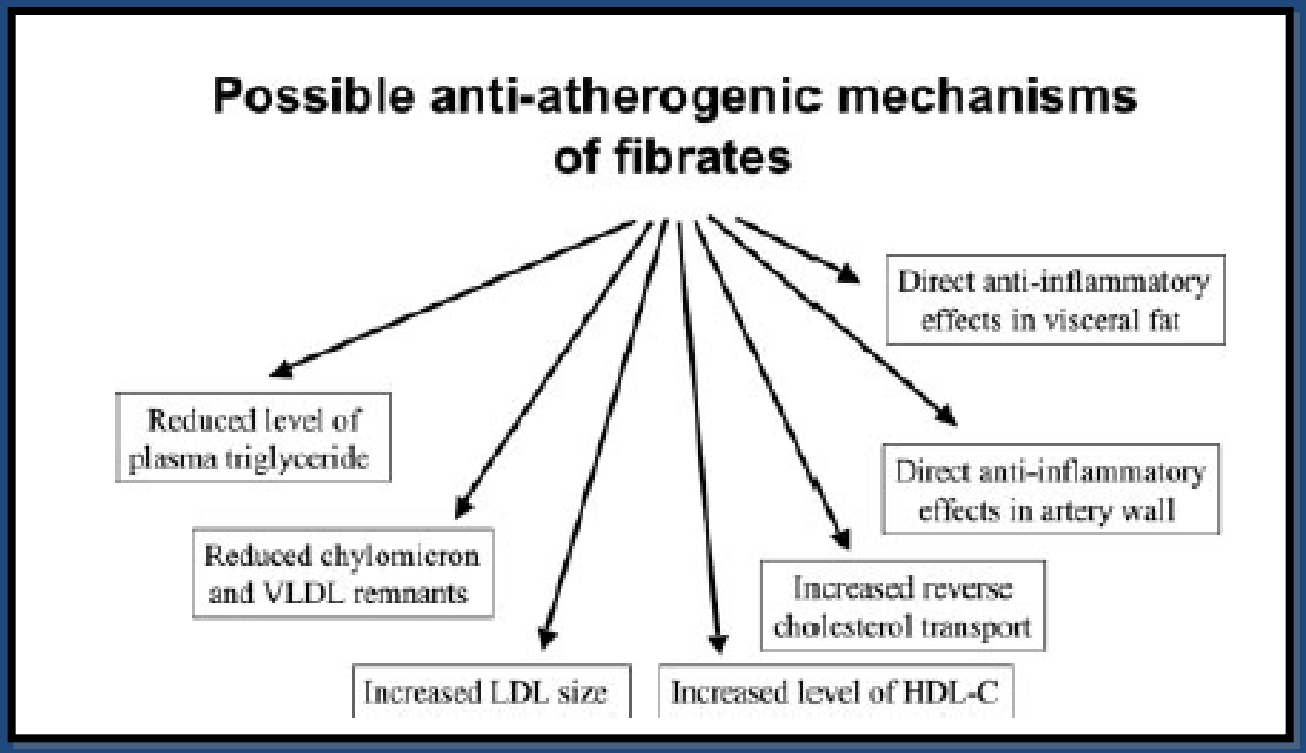
Drugs modifying Triglyceride& HDL Levels:

Fibrates:

bezafibrate, gemfibrozil,

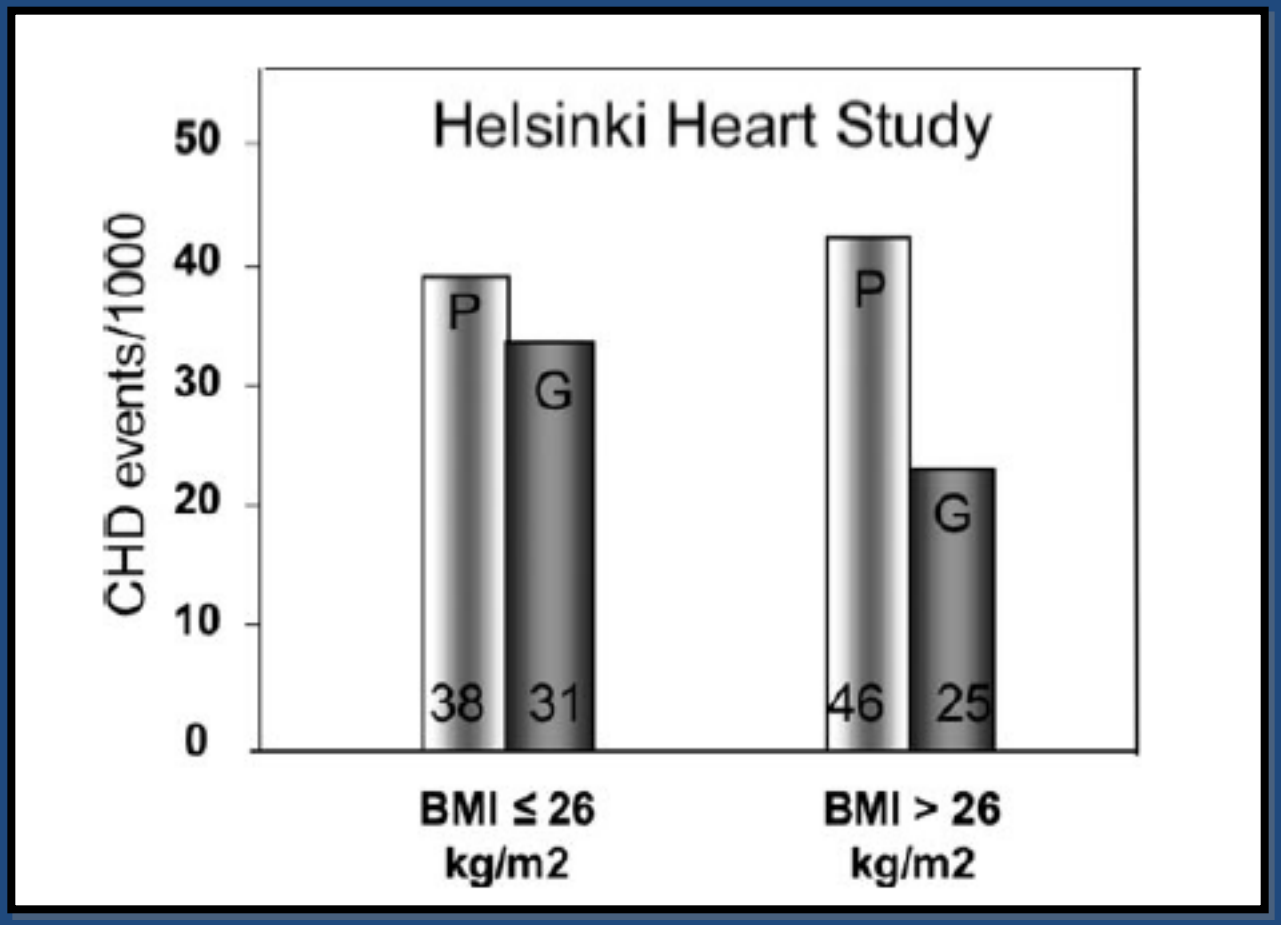
nicotinic acid (niacin)

Fig 3. Effects of fibrates with the potential to protect against cardiovascular disease



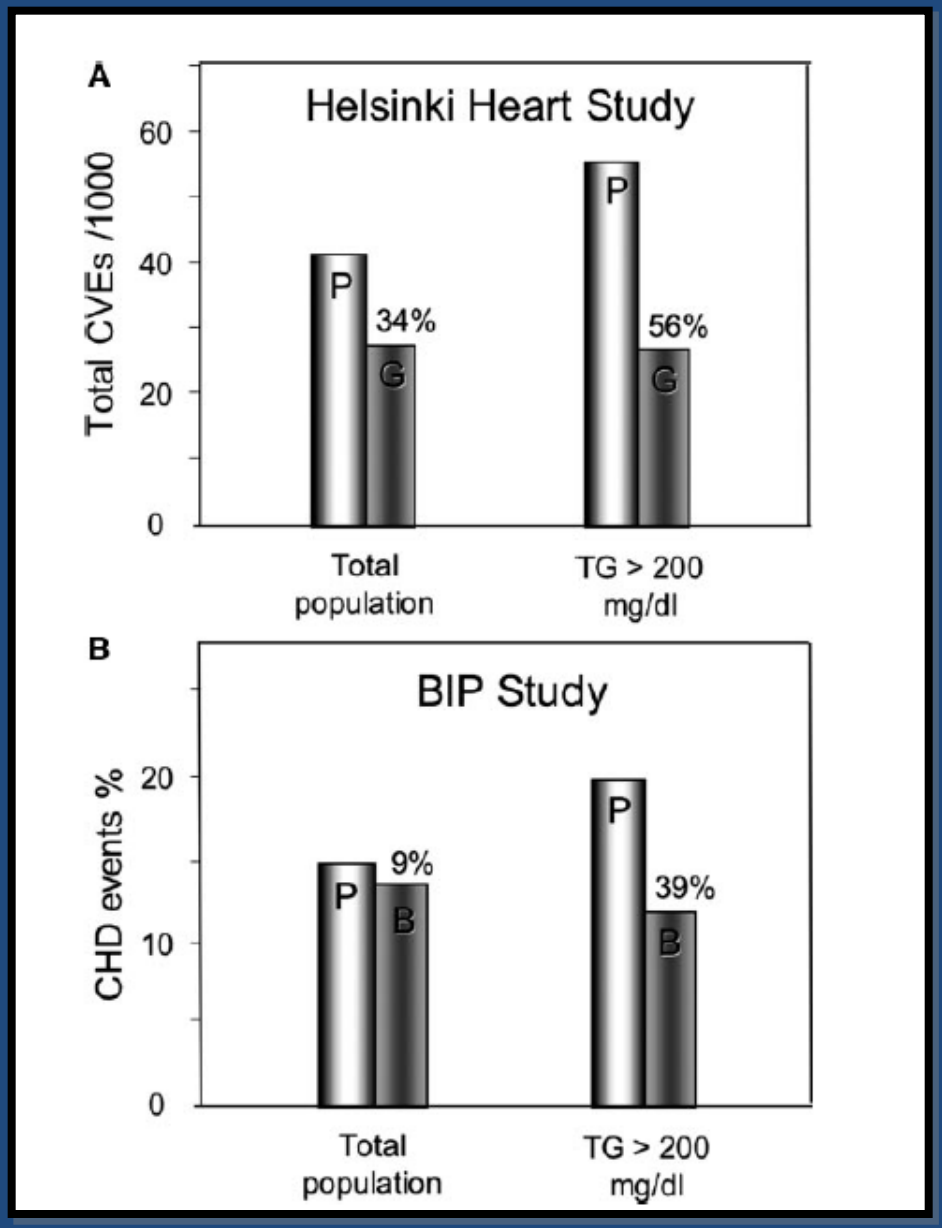
Barter et al, Arterioscler Thromb Vasc Biol, 2008

Fig 1. Reduction of CHD events by Gemfibrozil in Helinksi Heart Study



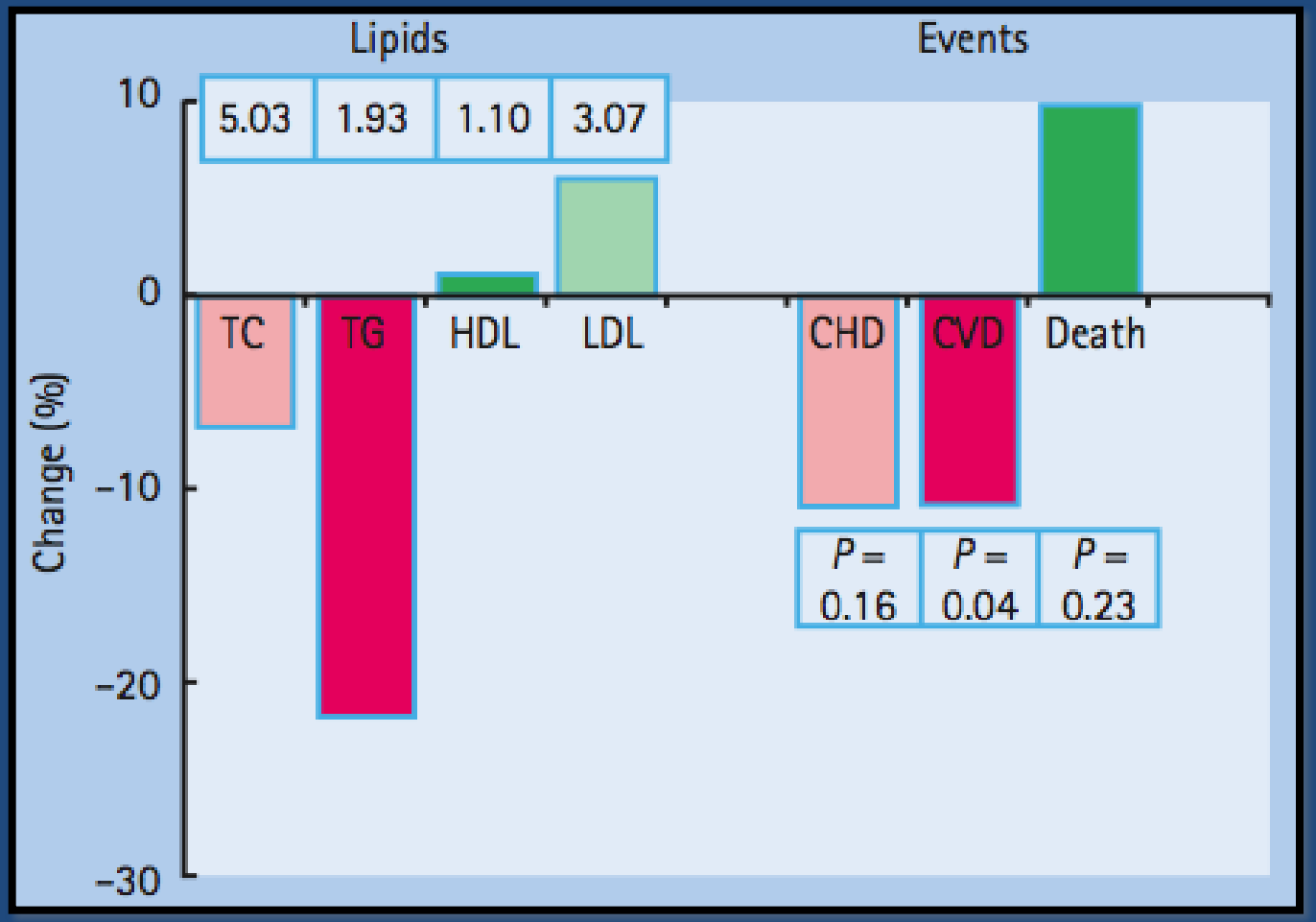
Barter et al, Arterioscler Thromb Vasc Biol, 2008

Fig 2. Reduction of CHD events by Fibrates



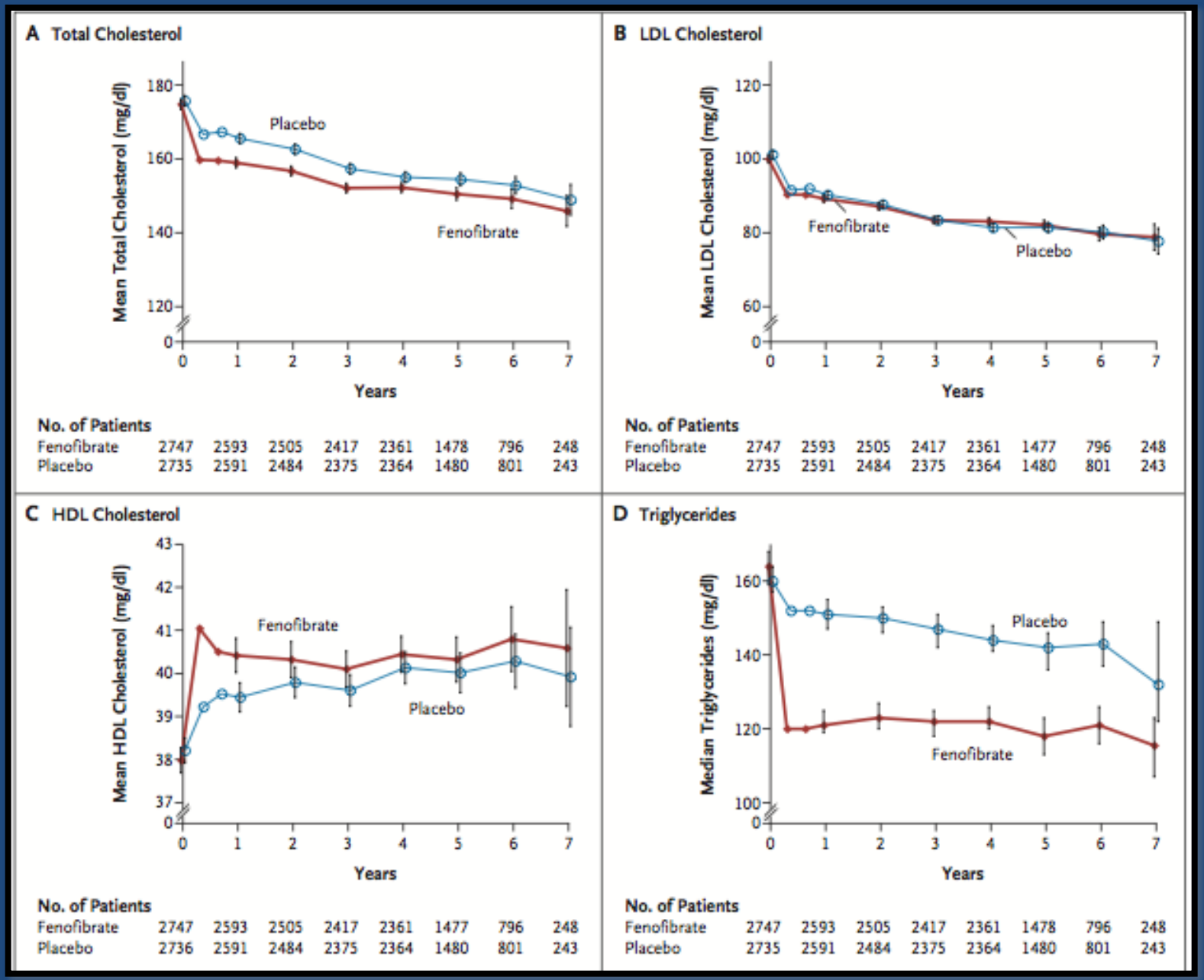
Barter et al, Arterioscler Thromb Vasc Biol, 2008

Fig 40.14: Reductions in mortality, coronary heart disese & cardiovascular events with Fenofibrate therapy in the FIELD study



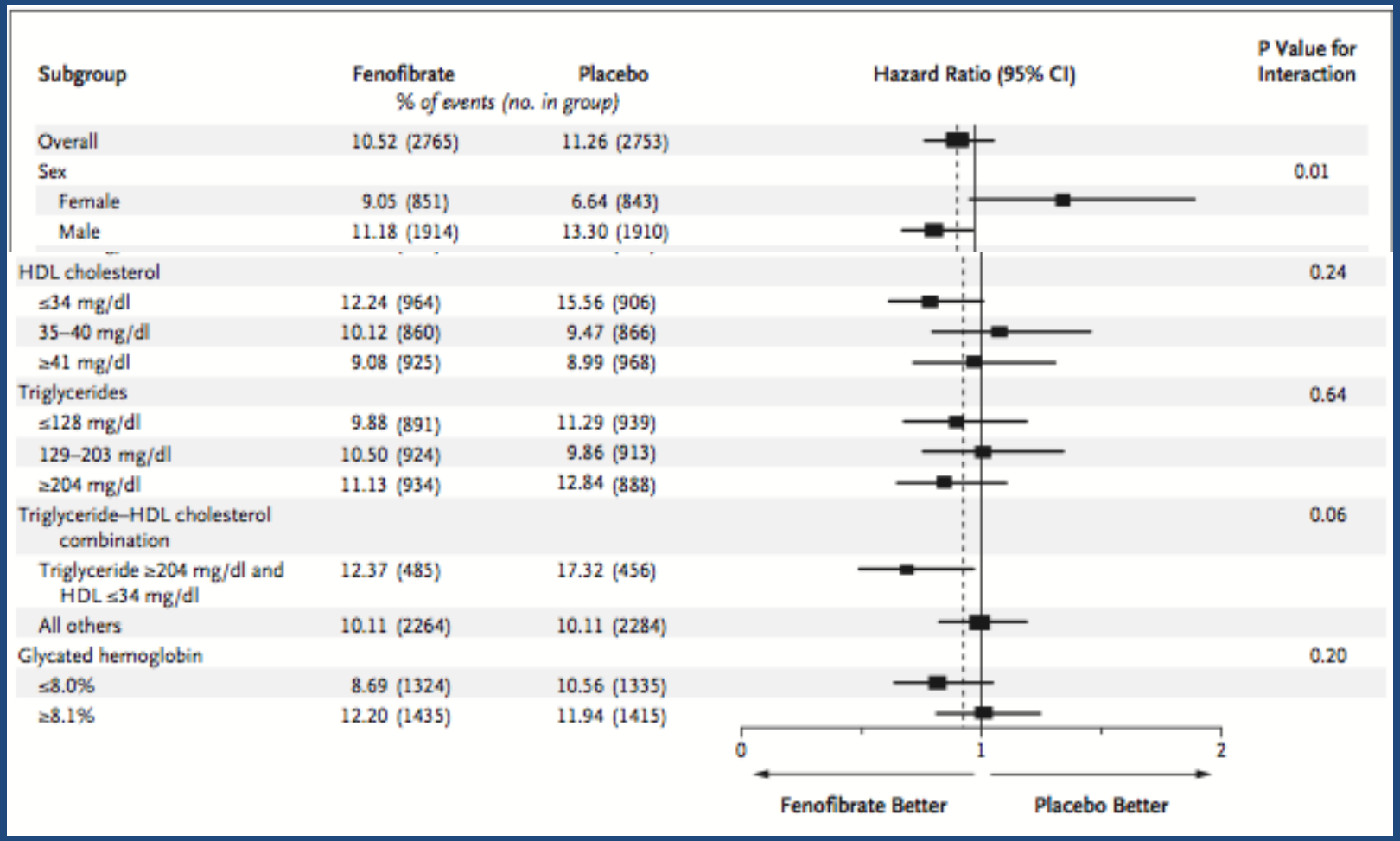
Textbook of Diabetes 4e(eds Holt & Cockram), 2010

Fig 1. Lipid Values



The ACCORD Study Group
N Engl J Med 362: 156-74

Fig 3: Hazard Ratios For the PrimaryOutcome in Prespecified Subgroups



The ACCORD Study Group

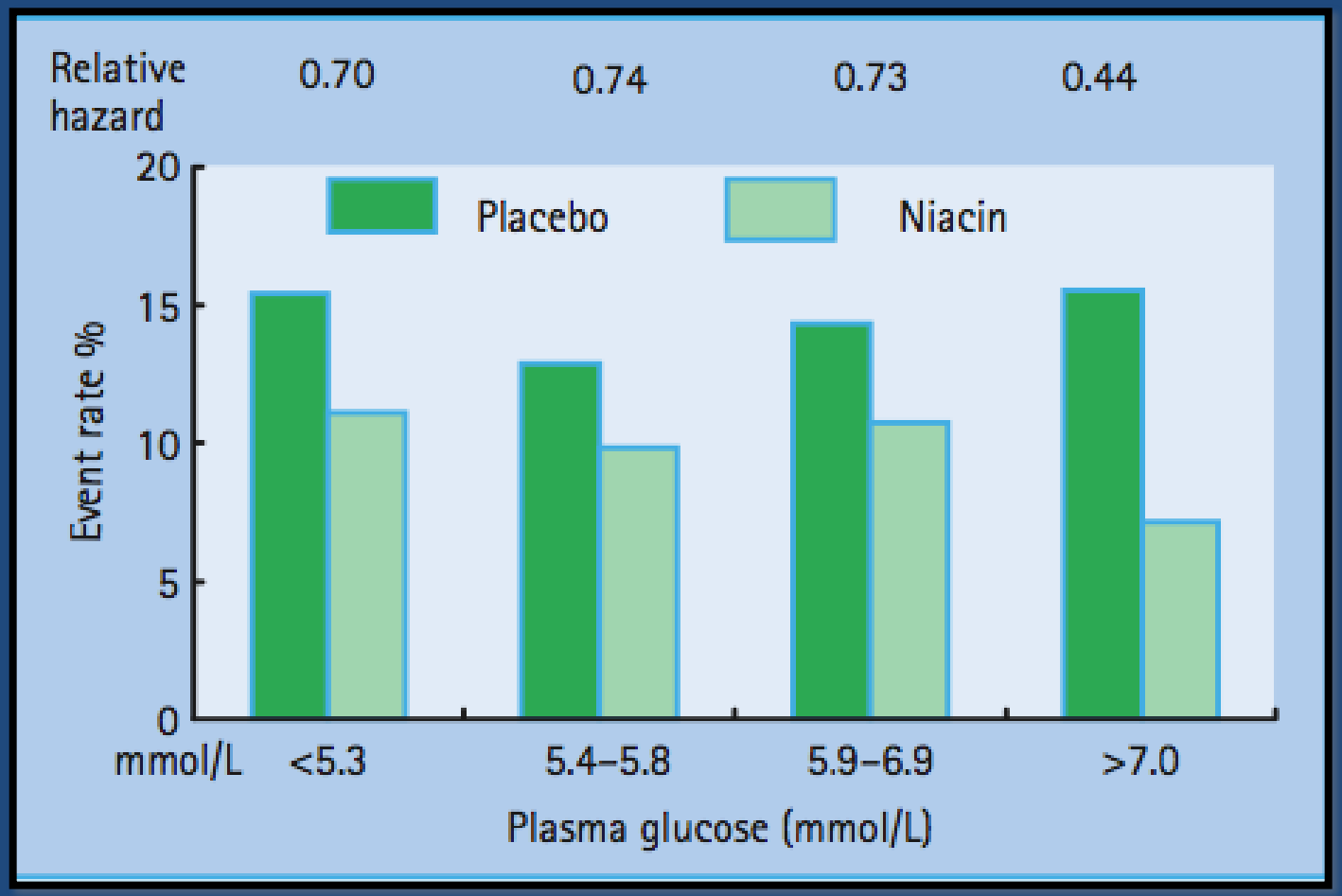
N Engl J Med 362: 156-74

Table 3. Summary of the effects of nicotinic acid on plasma lipoprotein classes

LIPOPROTEIN	EFFECT
Chylomicrons	↓
VLDL	↓
β-VLDL	↓
IDL	↓
LDL	↓
sdLDL	↓
HDL	↑
HDL_2	↑
LP(a)	↓

Carlson, Journal of Internal Medicine, 2005

Fig 40.15: Reduction in coronary heart disease in patients with a fasting plasma glucose >7mmol/l from a post hoc analysis of the Coronary Drug Project

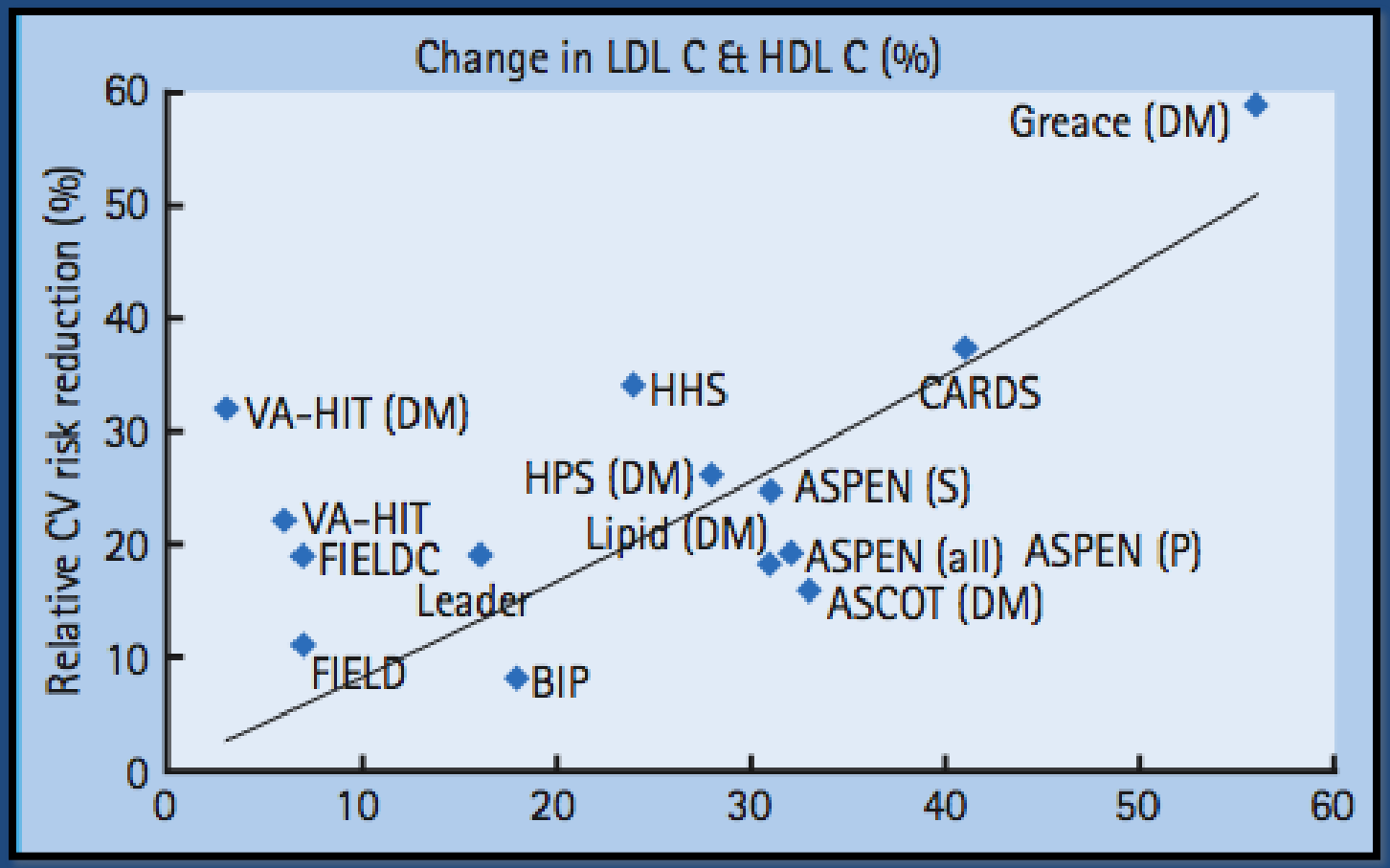


Textbook of Diabetes 4e(eds Holt & Cockram), 2010

Niacin trials in Progress:

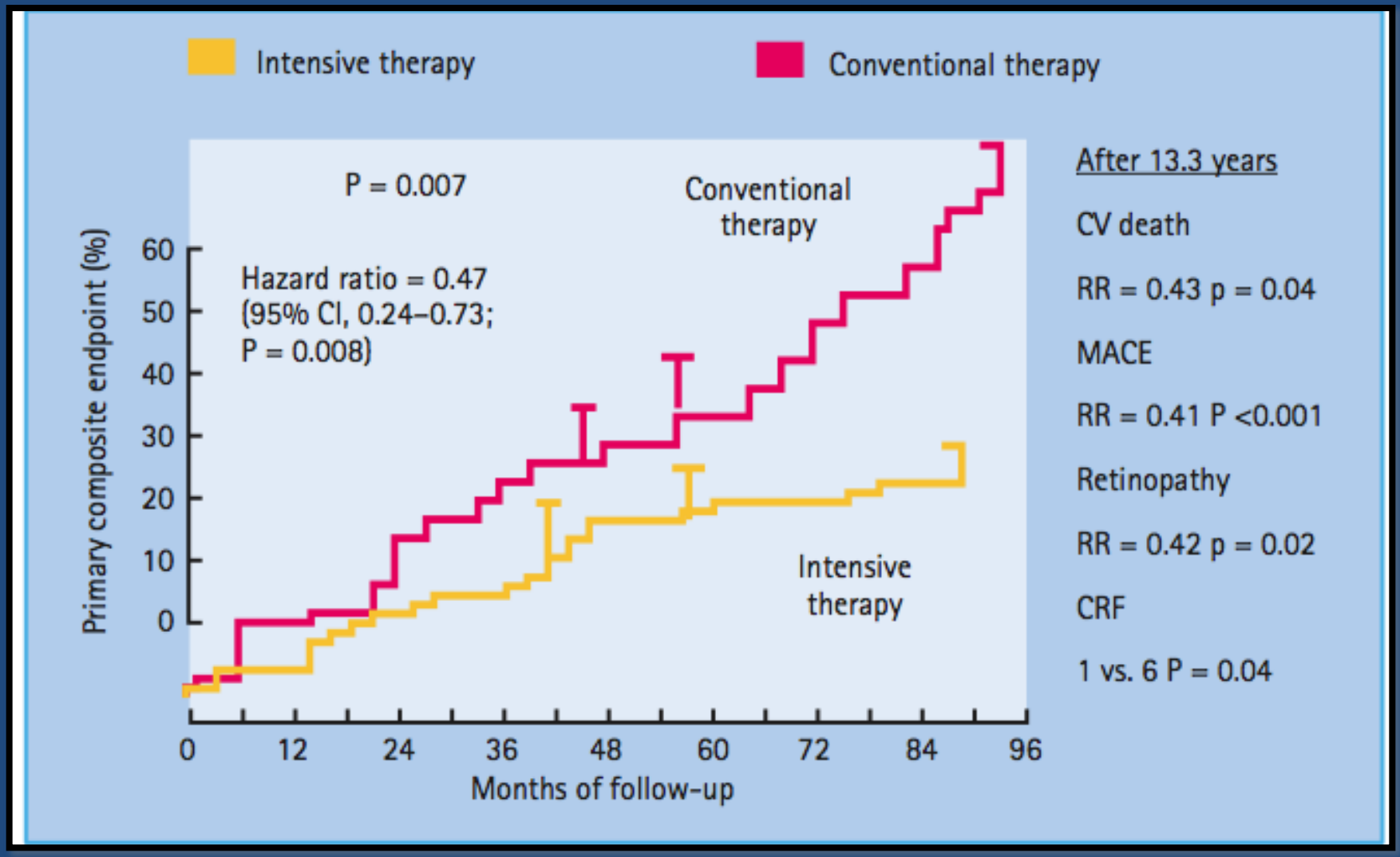
AIM-HIGH	**Atherothrombosis Intervention in Metabolic Syndrome with low HDL/high triglycerides (2011, expected)**
HPS2 – THRIVE:	Treatment of HDL to reduce incidence of vascular events (2013, expected) (Niacin/ laropiprant(Tredaptive)

Fig 40.17: Comparative effects of different lipid lowering drugs on cardiovascular disease in patients with with diabetes



Textbook of Diabetes 4e(eds Holt & Cockram), 2010

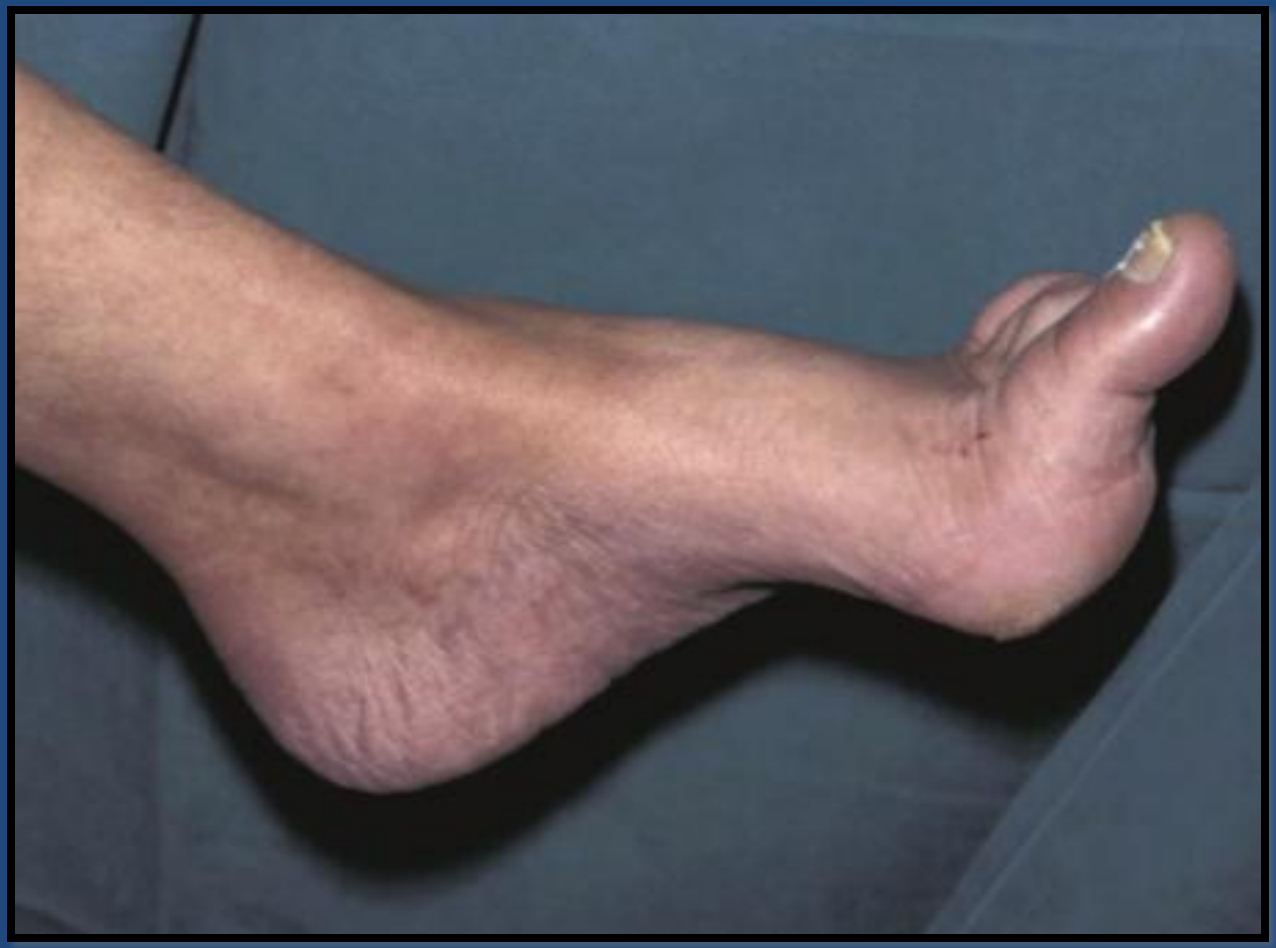
Fig 40.18: Effects of improved multiple risk factor intervention on mortality & cardiovascular events in diabetes



Textbook of Diabetes 4e(eds Holt & Cockram), 2010

Foot problems in patients with diabetes

Diabetic foot problems commonest causes of hospital admission amongst patients with diabetes
50% of older people with diabetes have risk factors for foot problems
85% of lower limb amputations preceded by foot ulcers
Screening should be at least once a year
Risk factors present: podiatry & instruction in self-foot care
Most ulcers heal if pressure removed, arterial circulation sufficient & infection managed
Warm unilateral swelling without ulceration: Charcot neuropathy unless proved otherwise



Textbook of Diabetes 4e(eds Holt & Cockram), 2010

Table 44.3 Key components of the diabetic foot examination.

Inspection

Evidence of past/present ulcers?

Foot shape?

- Prominent metatarsal heads/claw toes
- Hallux valgus
- Muscle wasting
- Charcot deformity

Dermatologic?

- Callus
- Erythema
- Sweating

Neurologic

10-g monofilament at four sites on each foot + 1 of the following:

- Vibration using 128 Hz tuning fork
- Pinprick sensation
- Ankle reflexes
- Vibration perception threshold

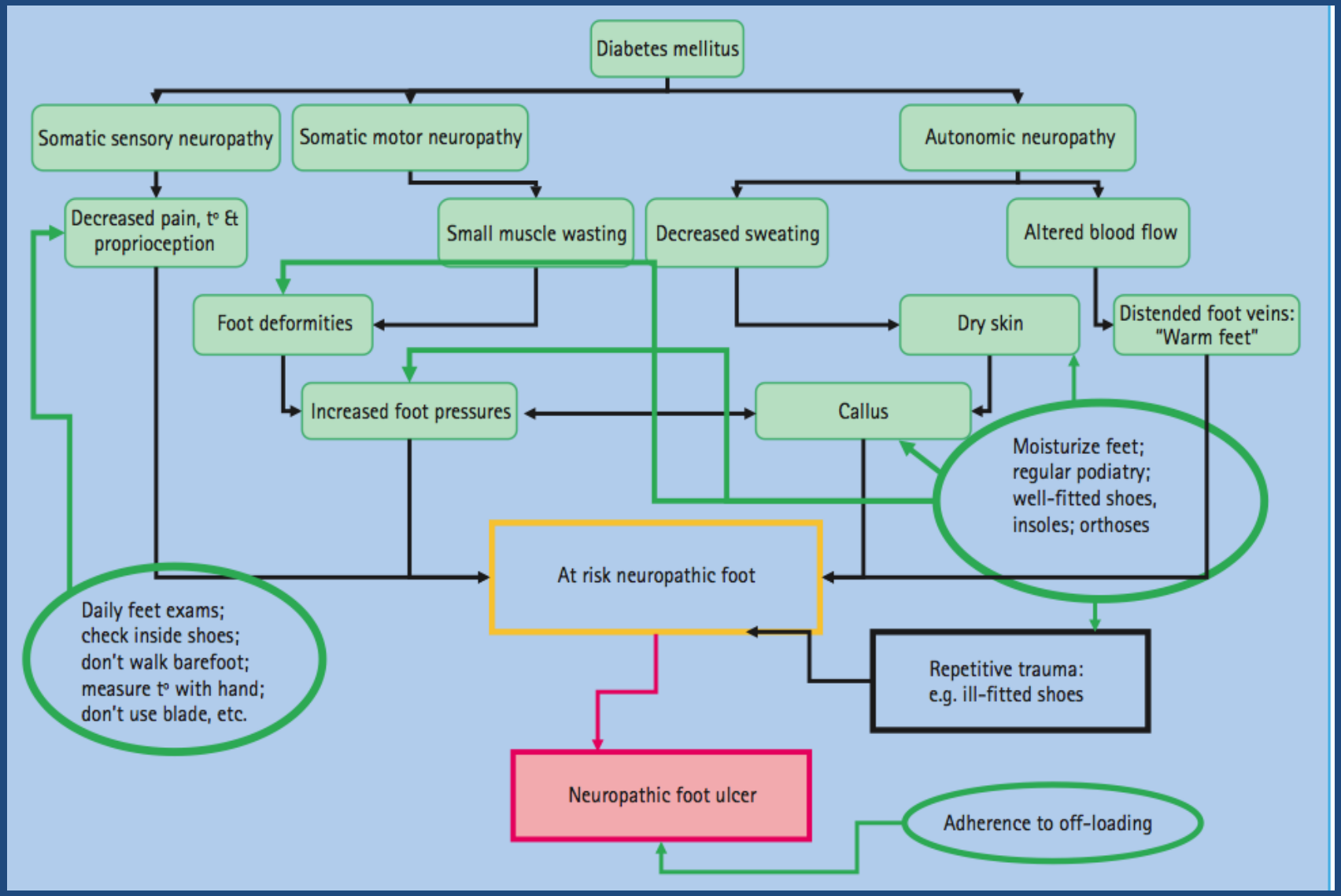
Vascular

Foot pulses

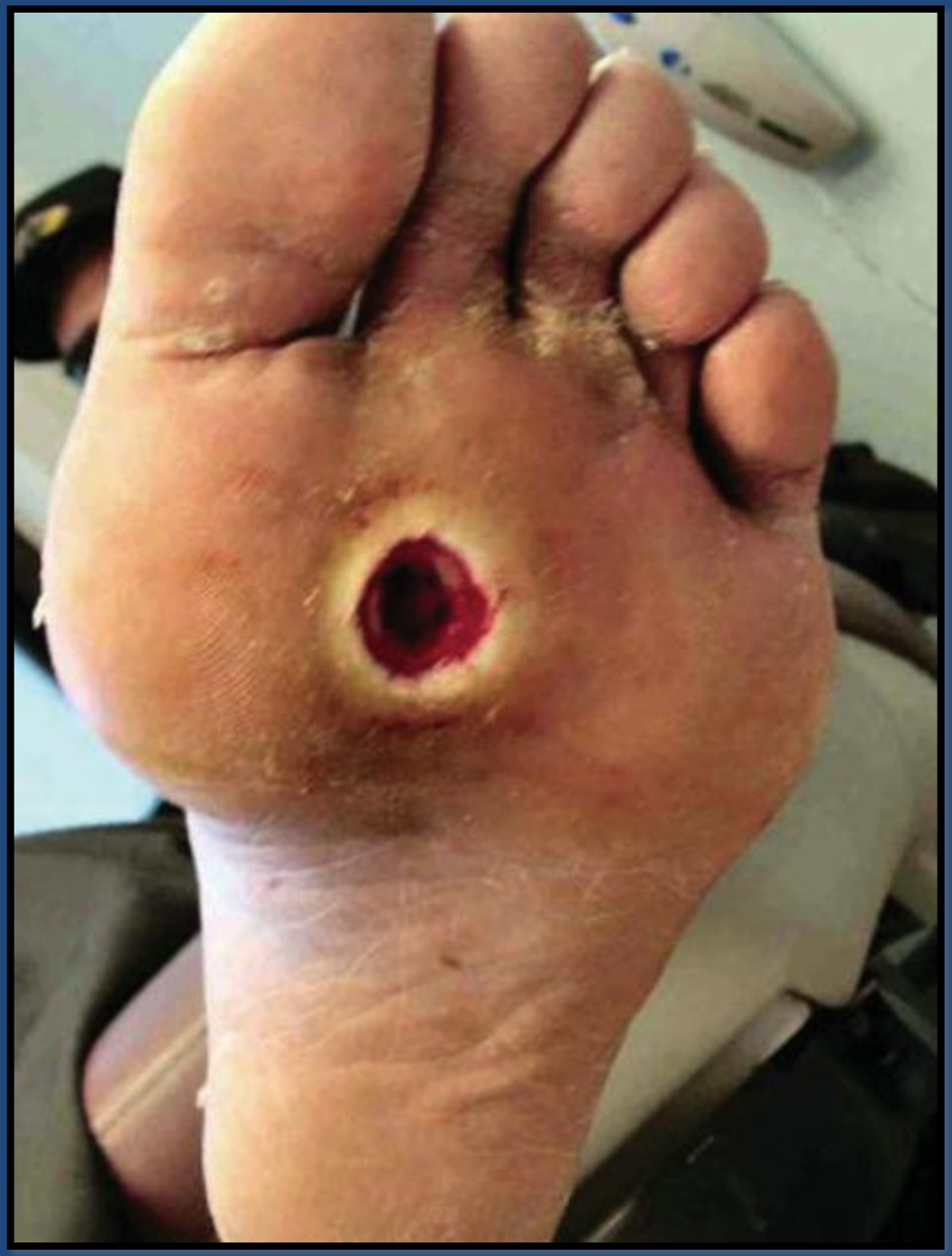
Ankle brachial index, if indicated

Textbook of Diabetes 4e(eds Holt & Cockram), 2010

Fig 44.3: The potential for education and self-care in prevention of neuropathic foot ulcers



Textbook of Diabetes 4e(eds Holt & Cockram), 2010



Textbook of Diabetes 4e(eds Holt & Cockram), 2010

Treatment of ulcers:

Offloading	
Dressings:	Protect from local trauma Reduce infection risk & optimise wound environment (moist)
Prevent & treat infection	Debridement & callus removed Predominant neuropathic ulcer, not infected, close observation
	Clinical signs of infection: Amoxicillin - Clavulanate, Clindamycin
	Ischaemic component: probably antibiotics

Case Studies

Case Study (1)

CR 57 year old male. T2DM 13 years. Nonsmoker. Strong family history of T2DM & early CHD.

Gliclazide 160mg bd. Metformin 850mg tid, Pioglitazone 45mg

Inhibace plus, Simvastatin 80mg/day, Aspirin 75mg/day
(has been on all the above medications for over a year)

BMI = 31 kg/m^2, 106kg, **waist circumference 105cm,** **BP: 142-154/88-94**	
HbA_{1c}	68 mmol/mol, 8.4%
Lipids:	Total cholesterol 5.3mmol/l, LDL cholesterol 3.4mmol/l
	HDL cholesterol 0.8mmol/l Triglyceride 3.9 mmol/l