

# Treating-to-risk

## An approach to managing absolute CVD risk and hypertension

How can you accurately assess a patient's risk of cardiovascular disease (CVD)? When do you decide to treat a patient's blood pressure? What about younger patients with raised blood pressure, and what about the elderly? This article looks at CVD risk calculation and issues about hypertension treatment in general practice.

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We know that high blood pressure is common, and leads to increased risk of cardiovascular disease (CVD), such as stroke and myocardial infarction. But how do we integrate our understanding of the many CVD risk factors with the treatment of blood pressure in the community? A great deal of literature discusses this point, some of it controversial. Until recently, there were no simple consensus statements to guide GPs in their assessment of patients' overall risk of developing CVD. With the release of the 1999 WHO/ISH Guidelines for the Management of Hypertension<sup>1</sup> and the discussion that followed, the 'grey areas' of hypertension management have become somewhat clearer.

The community prevalence of hypertension is 15 to 20% in people aged 45 to 55 years, rising to 60 to 70% in those over 75 years. The cost of

hypertension is enormous, both to governments in terms of treatment and to the community in terms of complications. The evidence in favour of intensive treatment of hypertension is overwhelming. It has been shown clearly that each reduction of 10 to 14 mmHg systolic blood pressure can result in a 40% relative reduction in stroke and 16% reduction in coronary heart disease. The difficult issues are:

- how does blood pressure relate to all the other CVD risk factors?
- in practice, which risk factors should we be targeting treatment at first?

### CVD risk

The purpose of treating hypertension, hyperlipidaemia, diabetes and other risk factors is to reduce

#### IN SUMMARY

- The use of absolute risk calculations allows us to identify patients at high cardiovascular disease (CVD) risk who will benefit most from antihypertensive treatment.
- Identify and treat all risk factors; the combined risk from multiple risk factors is greater than would be expected from simply adding them up, even if each risk factor is relatively minor.
- Recent trial evidence shows that intensive blood pressure control is beneficial, especially for groups at high CVD risk.
- Absolute risk charts are a useful source of information to help patients understand their CVD risk profile.
- Remember nonpharmacological approaches to reducing CVD risk: a structured plan may involve referral to other health professionals, with therapy tailored to the individual patient's needs.

each patient's risk of CVD, such as myocardial infarction, stroke, heart failure and unstable angina. The important point is that all risk factors are related, and they combine to form a complex interaction that contributes to CVD. We are beginning to realise that no one risk factor is more important than the other, and that although treating just one factor helps in reducing the overall risk of disease, the combined risk conferred by multiple risk factors can be considerably greater than the sum of the individual risks. In other words, their joint effect on risk is greater than would be expected from adding them up, even if each risk factor is relatively minor. This realisation has prompted a change in approach for the best prevention of CVD.

### Relative and absolute risk

There are two ways of looking at CVD risk: relative risk and absolute risk. Relative risk is used to compare one patient with another (or one group of patients with another group, as occurs in drug studies). One patient or group has a relatively lower or higher risk compared with the other. The problem with relative risk is that it may not tell you anything about the context of their risk. For example, a treatment that gives a 50% risk reduction sounds impressive, but in fact it means very little if the absolute risk was small in the first place. A drop from 2 to 1% is still a 50% relative reduction in risk, but in real terms the overall change in risk is minimal.

Absolute risk, on the other hand, enables us to place an individual patient's risk in context with the overall, wider population risk. Absolute risk is calculated using large clinical databases, such as the Framingham and Münster Heart (PROCAM) studies, with hundreds of thousands of patients for comparison. This can be very useful in determining which patients really are at high risk and which, therefore, will benefit most from treatment.

### Guidelines for risk assessment

Recently, tables for rapid assessment of absolute risk for use in clinical decision making have been developed by large organisations, such as the WHO, the New Zealand Heart Foundation and the British Hypertension Society. These tables have been published as part of new guidelines that take into account all risk factors at once. The WHO guidelines emphasise that a decision to treat a patient with high blood pressure 'is not based on the blood pressure alone but on assessment of the total cardiovascular risk in that individual'.<sup>1</sup>

These guidelines are important as they are backed by good evidence from large clinical trials, and force us to reconsider how we look at a patient with raised blood pressure. For most of us, a blood pressure of 150/90 mmHg might be high enough to consider treating a patient; however, we must consider this patient's actual risk of disease before we consider starting medications that can be expensive and possibly unpleasant for the patient. Remember, 'treating the numbers' is no longer good enough (see below). We need to look beyond just the blood pressure measurement, and widen our view to take into account a patient's entire set of risk factors at once. This is where the use of absolute risk measurements can be very helpful.

### Treating-to-risk

How can we determine a patient's absolute risk, how accurate is it, and what does it mean? The box on page 39 shows the most recent version of the New Zealand risk calculator, a simple to use and accurate method of assessing absolute risk.<sup>2</sup> It was developed using Framingham data and allows on-the-spot assessment of a patient's five-year risk of CVD. It combines age, gender, blood pressure, cholesterol level, diabetes status and smoking status, and calculates a risk range for each patient. If a patient has a risk of greater than 10% in

five years, the guidelines suggest considering blood pressure lowering treatment to reduce this risk – that is, treating-to-risk.

The risk calculator can be used to educate patients on their own risk and help them decide themselves whether they think they need treatment. It can be useful also for charting changes in risk as risk factors are modified. If target organ (end-organ) damage is present or patients are symptomatic from any CVD process, they are calculated as having additionally high risk (greater than 20%) and will benefit from antihypertensive treatment despite other risk factors.

### How accurate is the risk calculator?

The New Zealand risk calculator has been described as the best compromise between accuracy and ease of use. It enables rapid, in-clinic assessment, but still allows for clinical judgement. It involves patients in decision making, which may help to increase understanding and compliance.

Framingham data have been shown conclusively to be applicable to most people in western nations; however, they may be less specific for Asian, other non-western and indigenous populations. In Aboriginal populations the CVD risk is almost certainly higher than would be calculated using Framingham data. Framingham data are also less accurate for secondary prevention – that is, for those patients who already have had a cardiovascular event. However, as mentioned above, these patients are already at high risk by definition, and will benefit from intensive treatment of all risk factors.

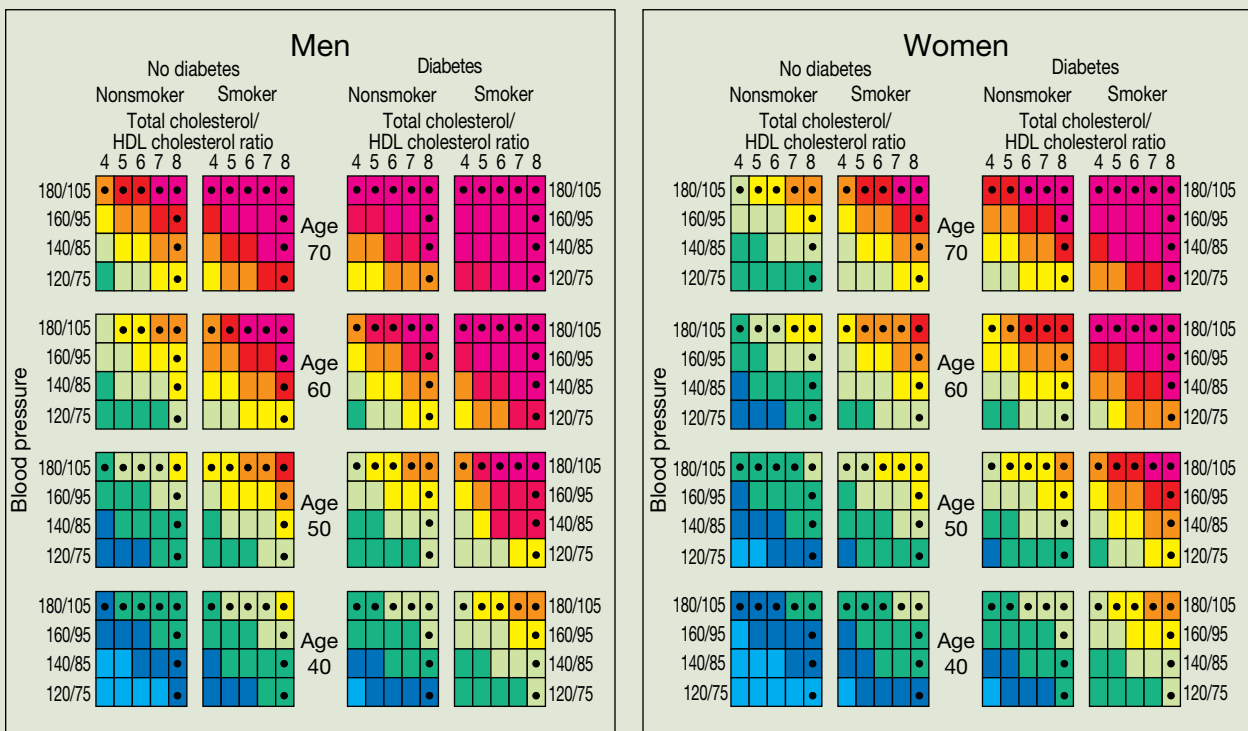
### Importance of calculating risk

Evidence shows that treating patients with the highest CVD risk results in the greatest benefits from treatment, and the lowest numbers needed to treat (NNT) to prevent a cardiovascular event. An important basis for this is the well documented linear relation between blood pressure and death from coronary heart disease.<sup>3</sup> As blood

## Estimating the absolute CVD risk of men and women

To estimate a patient's absolute five-year risk of a cardiovascular event, locate the colour block in the figure below that best describes the patient's gender, age, smoking status, diabetes status, blood pressure and total cholesterol/HDL cholesterol ratio. Determine the five-year risk from the colour code in the key below the figure.

Note that patients with symptomatic CVD or ECG-diagnosed left ventricular hypertrophy are assumed already to have a CVD risk >20% in five years. Patients with a strong family history of CVD (that is, male or female with CVD before the age of 55 or 65 years, respectively, or with a first degree relative with CVD) or who are obese are likely to be at a greater risk than the figure below indicates. In this case, consider determining the risk using the next higher colour category.



### Key to risk

#### Prognosis: 5-year CVD risk (nonfatal and fatal)

>30%	Red
25–30%	Orange
20–25%	Yellow
15–20%	Light Green
10–15%	Green
5–10%	Light Blue
2.5–5%	Blue
<2.5%	Dark Blue

#### Benefit 1: CVD events prevented per 100 patients treated for 5 years\*

>10
9
7.5
6
4
2.5
1.25
<0.8

#### Benefit 2: Numbers needed to treat for 5 years (NNT) to prevent one CVD event\*

<10
11
13
16
25
40
80
>120

Suggested starting point for discussion with patient about drug treatment

\* Coloured blocks with this marker indicate that in patients with very high levels of cholesterol (>8.5–9 mmol/L) or blood pressure (>170/100 mmHg) the risk equations may underestimate the true risk. It is therefore recommended that treatment be considered at lower absolute CVD risks than in other patients.

\* These benefits assume a blood pressure reduction of about 12/6 mmHg in patients with a blood pressure >140–150/90 mmHg, or a cholesterol reduction of about 20% in patients with a total cholesterol level >5.0–5.5 mmol/L, produces about a 30% reduction in CVD risk regardless of the pretreatment absolute risk.

Adapted with permission of the New Zealand Guidelines Group <http://www.nzgg.org.nz>.

pressure rises so does risk, and, conversely, as blood pressure falls (for example, from treatment) risk falls too, independent of other risk factors. This implies that any reduction in blood pressure in patients at high absolute risk will reduce their risk regardless of their initial blood pressure.<sup>3</sup> This is a major concept and changes the way we must view the treatment of blood pressure, as discussed below.

## So who should we treat?

### The elderly?

According to the New Zealand risk calculator, almost all elderly patients qualify for antihypertensive treatment. This is not surprising given the high risk of older people for CVD, and the high number of events in that population.

Some practitioners may think it 'too late' or unnecessary to begin antihypertensive treatment in a 70-year-old patient, but the efficacy of blood pressure treatment in preventing CVD in the elderly has now been shown beyond doubt. It cannot be argued that the impact of strokes or myocardial infarctions is any less in the elderly, and the nonfatal complications of these events are enormous. For example, in England the total cost of hospital care for patients who have had a stroke is four times that of managing hypertension in the community.<sup>4</sup> Importantly, new evidence suggests that blood pressure management may also lower the rate of cognitive decline and the incidence of dementia. A 60-year-old man whose absolute risk is reduced by antihypertensive treatment may easily live another 20 years; if cardiovascular events (including dementia) are prevented or reduced, this patient's quality of life may be maintained.

### Young patients with raised blood pressure?

At the other end of the spectrum, treatment of younger patients is reduced by the use of absolute risk guidelines. This is a difficult area in which to change our thought patterns as many practitioners intuitively

**Table. Target blood pressures\***

Patient group	Blood pressure (mmHg)
Young and middle aged patients (<65 years)	<130/85
Diabetic patients	<130/85
Patients with renal insufficiency	<130/85
Elderly people (>65 years)	<140/90

\* According to the National Heart Foundation of Australia's 1999 *Guide to Management of Hypertension for Doctors*.<sup>5</sup>

feel that 'catching things early' will result in fewer events in the future; however, evidence does not support this approach.

A 40-year-old patient might have a blood pressure of 150/90 mmHg, which looks high. Most of us are used to looking at the number and deciding whether to treat. This is referred to as the 'threshold-based' approach, or 'treating the numbers', which was supported by previous teachings and some guidelines.

The evidence supported by absolute risk calculations suggests a slightly different approach. A 40-year-old man with moderately raised blood pressure who does not smoke, is not diabetic and has no other risk factors has a calculated five-year absolute CVD risk of about 2.5% – that is, almost the lowest risk on the calculator. Despite the patient's moderately raised blood pressure above what we consider as 'normal', any extra reduction in risk from antihypertensive treatment will be very small. In such a low-risk, young patient the rate of atherosclerotic or hypertensive

damage is extremely slow, if it is occurring at all, and any effect of drug therapy on disease progression *at this stage* would be marginal at best. The optimum treatment for such a patient may be to pursue the appropriate lifestyle changes. This may include structured approaches that involve monitoring by other health professionals, such as nurse-educators, dietitians and clinical psychologists (especially in helping patients to quit smoking if relevant).

The important point in such cases is to be able to show patients their risk on the calculator, and to help them understand that they are at low risk. In five years' time their risk profile may be different enough to warrant treatment. Thus the onus is switched to follow-up as the essential form of treatment, as patients age and other risk factors change over time. In the meantime, we may have saved five years of expensive, and possibly harmful, drug therapy. Medications do have side effects, as well as incurring financial and, in some cases,

## Useful websites

New Zealand Risk Guidelines

[http://www.nzgg.org.nz/library/gl\\_complete/bloodpressure/index.cfm#contents](http://www.nzgg.org.nz/library/gl_complete/bloodpressure/index.cfm#contents)

Joint British Societies' Risk Prediction Chart

<http://www.hyp.ac.uk/bhs/management.html>

Framingham Risk Equations

<http://www.hbroussais.fr/scientific/fram.html>

American Heart Association statements (search under 'risk')

<http://www.americanheart.org/scientific/statements>

psychological and social costs to the patient.

A 40-year-old, otherwise healthy, person may not wish to start therapy that will continue for the rest of his or her life. Some patients may wish to begin treatment early, others may elect to wait, continue with lifestyle measures, and reassess their risk in time. The use of the absolute risk calculator allows patients to make an informed decision on whether they are treated. Any intervention requires a good therapeutic alliance; communication with the patient is the key to establishing an effective relationship. The calculator forms a useful tool to communicate medical information to patients in a way that they can appreciate, and act on with the guidance of their doctor. In some ways, teaching patients when they don't need to be treated is as important as writing a prescription.

### The 'young age premium'

The section above may be difficult to swallow for many practitioners. Certainly it conflicts with previous teaching on what constitutes hypertension; however, there is evidence that many practitioners overestimate the CVD risk of their younger patients and underestimate the risk of their older patients. This can result in a 'young age premium' on blood pressure treatment. There is no evidence that the blanket treatment of young patients with moderately raised blood pressure and no other risk factors will result in the long term prevention of disease. Such an approach risks falling into the 'mass treatment trap' where in a community with a fixed health budget, large numbers of patients take expensive medication to prevent a small number of events (that is, a large NNT). This occurs at the expense of the patients at high risk (in this case the elderly) who would benefit conclusively from treatment (and who have a small NNT).

It is fair to say, however, that presently there is no real evidence in young, low risk patients for either the efficacy of early treatment or the safety of delaying

treatment.<sup>5</sup> As mentioned above, some practitioners will feel intuitively that early treatment will prevent later events, and it is possible that long term treatment may lead to larger risk reductions over time. In the end this decision should be centred around the patient: the forming of a 'therapeutic alliance' and, using absolute risk calculations, working out if the patients themselves want to be treated at this stage.

### Patients at high CVD risk?

The flip-side of the section above is the treatment of patients with relatively mild hypertension but high absolute risk. Fortunately, for patients at high CVD risk, the evidence becomes much clearer and involves considering the linear relation between blood pressure and risk. Evidence shows that even in patients with a relatively low blood pressure of 140/80 mmHg, if they have other risk factors amounting to a five-year absolute risk of greater than 10%, reducing their blood pressure will significantly reduce their CVD risk. This is an important point and strong reasoning behind expecting a large benefit from treating patients at high risk, whether or not they are hypertensive. Several trials are currently addressing this point. In short, the evidence supports aggressive antihypertensive treatment of all patients at high absolute CVD risk.

### Treatment goals

Target levels of blood pressure based on new data from the HOT study are shown in the Table.<sup>6</sup> These targets are much lower than previous levels, and are supported by the recent WHO guidelines. Note that these are only the target levels for blood pressure in patients who are hypertensive or at high risk of CVD, and they should be considered in terms of that patient's absolute risk as discussed above. Modification of other risk factors is essential. Remember that smoking is the single most significant lifestyle risk factor affecting CVD risk. Modifying

dietary and other lifestyle factors can also make a huge impact on CVD risk.

### Conclusion

The evidence for treating-to-risk is becoming stronger, and is backed by large organisations such as the WHO, International Society of Hypertension, British Hypertension Society, and Australian and New Zealand Heart Foundations. We believe that the New Zealand risk calculator will be useful in clinical practice, both for identifying patients at high CVD risk who need treatment and for educating patients about their own risk of CVD. We live and practise in interesting times where new evidence is constantly forcing us to question our thought paradigms. We hope this article has helped to clarify the sometimes conflicting messages of how we can best prevent CVD. **MT**

### Acknowledgement

This article was prepared with the help of the DATIS group at the Repatriation General Hospital, South Australia; the National Prescribing Service; and Professor Norman Sharpe, Department of Medicine, University of Auckland, Auckland, New Zealand.

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