

Blood pressure and stroke:

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Hypertension is the most important modifiable risk factor for stroke. General practitioners play a pivotal role in stroke risk reduction by screening patients for hypertension, accurately diagnosing hypertension and monitoring the blood pressure lowering response of anti-hypertensive drugs.

Most hypertensive patients will need more than one drug (combination therapy) and the general practitioner is instrumental in updating the script to ensure effective anti-hypertensive therapy to reach goal blood pressure.

This health advertorial emphasises the importance of blood pressure control in stroke risk reduction.

Definition of Hypertension (HT)¹

	SBP (mmHg)	DBP (mmHg)
Optimal Blood Pressure	<120	<80
Office or clinic HT	140	90
24h ABP HT	125	80
Home (self) HT	135	85

Death from both ischaemic heart disease and stroke increases progressively and linearly only from blood pressure levels as low as 115 mmHg systolic and 75 mmHg diastolic upward. For every 20 mmHg systolic or 10 mmHg diastolic increase in blood pressure there is a **doubling of mortality from both ischaemic heart disease and stroke**.

Stroke risk may be closely related to sleep blood pressure more so than to awake blood pressure. (Blood pressure usually falls 10-20 mmHg during sleep.) In elderly hypertensives, non-dipper status (blood pressure that does not fall during sleep) predicts strokes.²

Anti-hypertensive therapy should therefore be extended to be taken as an evening dose if a short acting drug is taken and patients should be compliant on a regimen that will ensure blood pressure lowering for the whole 24-hour period. Trough/peak ratio of >50% may indicate that a drug can be taken once a day and it may be sufficient for 24 hour reduction of blood pressure.

Home blood pressure measuring is becoming increasingly popular for diagnostic and monitoring purposes. The recently published South African Hypertension guidelines also includes guidelines on home-measurement and recommends a list of devices that may be used for this purpose. Patients may already

own blood pressure machines and they often require advice on how to increase the accuracy of their measurements (e.g. positioning, caffeine avoidance etc.). The European Society of Hypertension recommends that if home blood pressure (HBP) measurements are used, duplicate morning and evening pressures are used for 7 days (28 measurements) but that the measurements of the first day are discarded and that the remaining 24 measurements be averaged to get a **Diagnostic Home Blood Pressure**.³

Stroke risk of hypertension:

On a population basis, hypertension is the most important modifiable risk factor for stroke. The risk ratios are larger for stroke, although coronary artery disease is the most common complication of hypertension. It remains difficult to predict who will definitely have a stroke if blood pressure is elevated. Both DBP and SBP contribute to the risk of stroke.⁴

In a meta-analysis of 9 observational studies, on 420,000 patients (96% males), the risk of stroke doubled for each 10 mmHg increment of DBP above 76 mmHg.⁵

Cardiovascular (CV) mortality of poorly controlled treated hypertension is two times that of the cardiovascular mortality in well-controlled treated hypertension.⁶

Benefits of lowering blood pressure:

In general, trials demonstrated **reductions** in stroke averaging 35% to 40%, myocardial infarction 20% to 25%, and heart failure of ±50%. It is estimated that in hypertension with additional risk factors, achieving a **sustained 12 mmHg reduction of SBP over 10 years will prevent 1 death for every 11 patients** treated. If there is cardiovascular disease or target organ damage, 1 death would be prevented for every 9 patients treated.

Effect of treatment on risk of stroke

Treatment effect of hypertension on stroke:

The relative risk reduction (RRR) for stroke in general 42% (95% CI: 33 to 50 %) for a DBP decrease of 5-6 mmHg. (both fatal and non-fatal strokes).⁷

When low-dose diuretics are used, the absolute risk reduction vs placebo in reducing strokes is 2.4%. This equates to NNT of 42 i.e. 42 hypertensives need to be treated to prevent 1 stroke⁸. This may become more efficient if the patient's baseline risk is higher.

Treatment effect of Isolated Systolic hypertension (ISH):

In the SHEP-study the RRR for stroke was 37% [95% CI: 18 to 51%]⁹.

Treatment effect of Intensive blood Pressure control strategies:

In an overview of 3 trials, 20,408 patients, the relative risk reduction (RRR) of stroke was 20% [95% CI: 2 to 35%] with more intensive therapy¹⁰.

Treatment of normotensive patients with previous stroke:

In the Progress trial: Perindopril 4mg, plus 2-5 mg indapamide (combination drug) were administered daily. The RRR of subsequent stroke was 44% [95% CI: 28 to 57%] for hypertensives patients. This further emphasised the importance of adequate blood pressure control in reducing the risk of stroke.

Goal of Blood Pressure control¹¹:

- (i) BP < 140/90 mmHg for most patients.
- (ii) BP < 130/85 mmHg if renal impairment or heart failure is present.
- (iii) BP < 130/80 mmHg if Diabetes Mellitus is present.

How to evaluate control:

- (i) Regular office measurements.
- (ii) Home measurements.
- (iii) 24H ABP: refer to the algorithm on Page. 44.

Further reductions in stroke:

Apart from adequate blood pressure control, there are other modifiable factors in stroke reduction include:

- (i) Anti-platelet therapy like aspirin for patients with optimal control of blood pressure.
- (ii) Cholesterol levels should be controlled with statins [LDL < 2.6 mmol/l].
- (iii) Patients with TIA's should also be examined thoroughly and urgently referred to identify the risk for stroke and treatment started to reduce that risk.
- (iv) Warfarin for patients with atrial fibrillation.
- (v) Cessation of smoking.

References

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How to evaluate if control is adequate using 24 ABP¹²: