

# Consensus Conference Report

## Recommendations from the Consensus Conference on Hypertension in the Elderly\*

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One of the main demographic changes occurring in Canada, as in other Western nations, is the rapid growth of the elderly segment of the population. Although people over the age of 65 years now constitute 10% of our population,<sup>1</sup> the proportion will probably increase to 16% by 2030. The most rapidly increasing group consists of people over the age of 85 years, whose numbers are expected to double by 2020. Any impact physicians can have on illness in this age group will enhance the quality of life and reduce the costs of health care.

Because hypertension and cardiovascular disease are closely associated and common in the elderly, there is substantial potential for reducing the rates of illness and death due to cardiovascular disease. A large population survey carried out in the United States between 1971 and 1974 revealed that 42.3% of white women and 35.0% of white men had systolic blood pressure greater than 160 mm Hg or diastolic pressure greater than 90 mm Hg.<sup>2</sup> There is no reason to believe that the prevalence of such blood pressure elevation is significantly lower in the Canadian population. Although

it is popularly believed that increased systolic blood pressure is normally associated with aging, the clear relation between systolic pressure greater than 140 mm Hg and increased risk of cardiovascular illness has established that even a modest elevation in blood pressure is detrimental and is a possible target for disease prevention measures.<sup>3,4</sup>

In treating a person with hypertension one must take into account both the possible benefits and the risks. The elderly are more prone to experience adverse drug reactions because of changes in drug pharmacokinetics and pharmacodynamics and because of nonspecific effects such as confusion, weakness, loss of balance and incontinence.<sup>5</sup> Few clinical trials have specifically examined the benefits of treating hypertension in the elderly. However, some of the larger trials of antihypertensive therapy have included subjects over the age of 60 years.

The Veterans Administration trial on mild hypertension (diastolic pressure of 90 to 114 mm Hg) recruited 380 men, of whom 21.3% were over 60 years and 7.9% were between 70 and 75 years.<sup>6,7</sup> Among those over 60 years there was a reduction of 54% in the incidence of both fatal and nonfatal cardiovascular events. Congestive heart failure was eliminated in the group treated with medication, while nine episodes occurred in those treated with placebo. Cerebrovascular accidents occurred in 10 control patients and 3 treated patients.

The Hypertension Detection and Follow-Up Program included 10 940 people, of whom 21.7% were aged between 60 and 69 years at the time of entry.<sup>8-10</sup> After a 5-year follow-up period, the mortality rate among the older patients in the

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special care group was 16.4% lower than the rate in the control group, which consisted of patients referred to their own doctors for regular treatment. The incidence of stroke in the special treatment group was 45.5% lower than that in the control group.

The findings of the Australian therapeutic trial in mild hypertension were reported in 1980.<sup>11</sup> In this trial 16.9% of the 3427 subjects were aged between 60 and 69 years at the time of entry and were followed up for 5 years. The older subjects benefited as much as the younger ones and had a similar mean reduction, 26%, of all target measures.

Only one large study was specifically designed to examine hypertension in the elderly. In the European Working Party on High Blood Pressure in the Elderly trial, the incidence of cardiovascular events in life-table analyses was 36% lower in the 416 patients who received medication than in the 424 patients who received placebo.<sup>12</sup> Also, for the first time in the elderly, treatment of hypertension produced a significant reduction in the incidence of fatal cardiovascular events. However, there was no significant difference between the two groups in overall mortality.

Since there have been few large studies of the efficacy of antihypertensive treatment in reducing the rates of illness and death in elderly patients, there are few studies of the value of specific hypotensive drugs in this age group. However, several reports of experts have been published on the topic.<sup>13-18</sup>

The purpose of the Consensus Conference on Hypertension in the Elderly was to critically examine evidence that the treatment of various degrees of elevation of blood pressure (systolic or diastolic or both) is beneficial to the elderly patient with hypertension and to make recommendations to assist the clinician. Participants included representatives from various fields of medicine: family practice, geriatrics, cardiology, nephrology, epidemiology and clinical pharmacology. They were assigned to one of three committees: diagnosis, efficacy of therapy and treatment. Reports were prepared by each committee and circulated to all members. Recommendations were discussed and voted on at a general meeting held at the Clinical Research Institute of Montreal on Apr. 18-19, 1985.

## Diagnosis

The recommendations from the diagnosis committee represent a compromise between a diagnostic approach based on a clinically relevant increase in risk and one related to demonstration of sufficient benefit from treatment. The criteria identify patients in need of follow-up but not necessarily treatment. All patients who meet these criteria should not necessarily be told of their increased risk; rather, individual clinical judgement

should be used in combination with the recommendations from the efficacy of therapy committee.

In preparing its recommendations the committee was faced with a major problem: the paucity of methodologically sound research, especially in people over 75 years of age. In the absence of high-quality data, we chose not to extrapolate results from younger groups since physiologic changes and the selected nature of people who live to age 75 make extrapolating a possibly erroneous approach.

## Recommendations

- For reasons of accuracy and dependability, the use of a mercury sphygmomanometer is recommended for the diagnosis of hypertension in the elderly. All physicians should have at least one and maintain it in good working order. Aneroid sphygmomanometers can be used for preliminary investigation, but the readings should be calibrated with a mercury sphygmomanometer twice yearly. Aneroid sphygmomanometers should not have a stop pin at 0 mm Hg.

- Elevated blood pressure readings from automatic blood pressure recording devices should be verified with a regular mercury sphygmomanometer by a skilled technician.

- Blood pressure should be measured according to the procedure outlined in Table I, which is a modification of the recommendations of the American Heart Association.<sup>20</sup> Routine measurement of blood pressure in all elderly patients seen in a physician's office would be appropriate.

- When possible, blood pressure should also be measured with the patient standing; allow for 2 minutes of standing beforehand.

- Laboratory investigations for secondary hypertension should be done only in patients in whom invasive intervention is possible and in patients who either have had a rapid and high blood pressure elevation or are resistant to standard treatment.

- The search for target organ damage should proceed as follows. When elevated blood pressure (systolic pressure greater than 160 mm Hg or diastolic pressure greater than 90 mm Hg or both) is first detected, the patient's medical history should be obtained. If the patient has had myocardial infarction, angina pectoris, transient ischemic attacks, stroke, peripheral arteriovascular insufficiency, renal insufficiency or congestive heart failure a physical examination and appropriate diagnostic tests should be done, and the period of observation of the blood pressure should be compressed according to the severity of the condition(s) discovered.

If the blood pressure is still elevated on the second visit, a physical examination to detect target organ damage should be performed if not already done. Urinalysis, measurement of serum

levels of creatinine and glucose, electrocardiography and a regular physical examination should also be performed. The committee agreed that radiography of the chest and measurement of the serum uric acid level were of possible value but did not reach a consensus on their inclusion in the standard group of tests. Measurement of the hemoglobin concentration, hematocrit and cholesterol level as well as echocardiography should not be considered as routine tests. If target organ damage is detected during the second visit, the period of observation of the blood pressure should be compressed. Measurement of serum levels of potassium and uric acid would also be appropriate as a guide to therapy if a thiazide is to be used.

- The presence of very high diastolic pressure (greater than 120 mm Hg) and retinal exudates, hemorrhages or papilledema, with or without encephalopathy, is a medical emergency and requires immediate diagnosis and management. In the absence of these clinical findings, a cautious approach to diagnosis should be taken, with the clinician obtaining blood pressure measurements on at least three occasions over 1 to 2 months. In the presence of target organ damage or other relevant clinical information, the diagnostic process should be accelerated. Patients should not be told

**Table 1 — Protocol for determination of blood pressure with a sphygmomanometer**

Use a mercury sphygmomanometer, with mercury column at eye level.

Choose a cuff with appropriate bladder width<sup>19</sup> (approximately 40% of arm circumference).

Place lower edge of cuff 3 cm above crease of elbow and centre bladder over brachial artery; patient should be comfortable and arm bared and well supported.

Raise pressure rapidly to 30 mm Hg above level of extinction of radial pulse (to exclude possibility of auscultatory gap).

Place head of stethoscope (preferably bell) gently but firmly over brachial artery.

Open control valve so that rate of drop in vicinity of systolic and diastolic level is 2 mm Hg per beat.

Record systolic level as 2 mm Hg above first appearance of clear tapping sound (phase I Korotkoff) and diastolic level as 2 mm Hg above point at which sounds disappear (phase V Korotkoff); record which arm used and whether patient is supine, sitting or standing.

If sounds persist to near 0 mm Hg use point of muffling of sound (phase IV Korotkoff) to indicate diastolic pressure.

In presence of arrhythmias perform additional readings if needed to estimate average systolic and diastolic pressure. Ignore isolated extra beats when estimating blood pressure. Note rhythm and pulse rate.

To avoid venous congestion do not leave cuff partially inflated too long and allow at least 1 minute to elapse between readings. If sounds are difficult to hear initially, veins can be emptied and sound magnified by raising patient's arm over head with cuff deflated; milk forearm down and inflate cuff with arm still raised, then quickly return arm to usual position and take reading.

Blood pressure readings should be taken at least once in both arms, and arm with higher pressure subsequently used.

that they have hypertension until the diagnosis is established and a decision to treat has been reached.

- If at the first visit the blood pressure is found to be elevated in an elderly person not previously known to have hypertension, at least three blood pressure measurements should be taken in each arm. It is acceptable to use either the average of these readings or the lowest reading in the arm with the higher pressure as a guide to the need for further assessment.

- In people aged 65 to 74 years, diastolic pressure greater than 90 mm Hg is associated with a significantly increased risk of cardiovascular disease. The term diastolic hypertension should be used for patients with sustained diastolic pressure greater than 90 mm Hg.

- Although it is reasonable to expect that elevated diastolic pressure would also be a risk factor in people aged 75 years or older, there are no published data showing that elevated diastolic pressure is or is not a risk factor for cardiovascular disease in this group. In the absence of other clinical findings, therapeutic and diagnostic decisions should reflect this uncertainty.

- In people aged between 65 and 74 years, systolic pressure greater than 140 mm Hg is associated with a significantly increased risk of cardiovascular disease. The term systolic hypertension should be reserved for patients with sustained systolic pressure greater than 160 mm Hg.

### Efficacy of therapy

It is not easy to determine whether treatment of hypertension in the elderly is efficacious. Despite the difficulty in obtaining adequate data, the question of whether the benefits outweigh the risks is a critical one to answer. Elevated arterial blood pressure is a continuously distributed variable associated with an increased risk of illness and death, the risk increasing as the blood pressure rises.<sup>18,21-24</sup> Any discussion of which blood pressure level must be reached before treatment is begun represents an attempt to strike a balance between the costs of not treating high blood pressure (e.g., death, stroke, myocardial infarction, congestive heart failure and renal failure) and the costs of treatment (e.g., inconvenience, disability from adverse drug effects, being labelled as hypertensive and financial costs). The following recommendations can be made from the available evidence.

### Recommendations

- The efficacy of therapy is similar in people aged 65 to 74 years and those under 65 years. The recommendations for patients in the former group concur with those made by the consensus conference on mild hypertension.<sup>19</sup> In patients with target organ damage or associated problems, an-

tihypertensive therapy should be started when the diastolic pressure is greater than 90 mm Hg and may be of value when the systolic pressure is 180 mm Hg or greater; no treatment is recommended when the systolic pressure is below 160 mm Hg, and the decision to treat is left to the physician when the systolic pressure is between 160 and 179 mm Hg because of lack of convincing evidence on the value of treatment. Target organ damage and associated problems include angina pectoris; diabetes mellitus; transient ischemic attack or stroke; proven myocardial infarction; left ventricular hypertrophy demonstrated by electrocardiography (a consensus could not be reached on the role of echocardiography in making management decisions); clinical evidence of congestive heart failure (basilar rales or S<sub>3</sub> gallop) or radiologic evidence of pulmonary congestion; thoracic or abdominal aneurysm; and a serum creatinine level greater than 150  $\mu$ mol/L. In patients with no target organ damage or associated problems, treatment is recommended when the diastolic pressure is 100 mm Hg or greater and may be of value when the systolic pressure is 200 mm Hg or greater; no treatment is recommended when the systolic pressure is 179 mm Hg or lower, and the decision to treat is left to the physician when the systolic pressure is between 180 and 199 mm Hg.

- For patients who are 75 years of age or older, those with target organ damage or associated problems may benefit from treatment when the diastolic pressure is 100 mm Hg or greater or when the systolic pressure is 180 mm Hg or greater; no treatment is recommended when the systolic pressure is lower than 160 mm Hg, and the decision to treat is left to the physician when the diastolic pressure is between 90 and 99 mm Hg or the systolic pressure is between 160 and 179 mm Hg. In those with no target organ damage or associated problems, treatment may be of value when the diastolic pressure is 120 mm Hg or greater; no treatment is recommended when the systolic pressure is 179 mm Hg or lower, and the decision to treat is left to the physician when the diastolic pressure is between 90 and 119 mm Hg or the systolic pressure is 180 mm Hg or greater.

- If treatment is started the goal is to reduce systolic blood pressure by 30 mm Hg and diastolic pressure by 10 to 15 mm Hg.

- The general approach in treating the elderly should be to minimize short-term side effects, because long-term benefits are unclear, and to classify patients on the basis of their biologic rather than chronologic age.

## Treatment

After a decision has been made to treat an elderly patient with hypertension, the physician must select the most appropriate drug. At one time or another virtually all antihypertensive agents have been recommended for use in the elderly.

However, as in the evaluation of the efficacy of treatment, there have been few well-designed clinical trials in elderly patients with hypertension. The following recommendations are based on a combination of data from the medical literature and experiences in clinical practice of the consensus conference participants. In many instances only preliminary conclusions are possible because of insufficient information on the relative effects of currently available antihypertensive drugs.

### General recommendations

- Antihypertensive therapy in the elderly should generally be started at one half the usual recommended dosage; increments should be made gradually, with special attention given to the change in blood pressure and the development of adverse effects.

- Factors such as altered physiologic states (e.g., impaired renal function), coexisting diseases and concurrent drug therapy should be considered in selecting an antihypertensive agent. These factors may preclude attainment of the desired blood pressure level.

- In the absence of well-designed controlled clinical trials, systolic hypertension should be treated in the same way as combined systolic-diastolic hypertension.

- The number of doses, tablets and different drugs should be kept to a minimum to avoid the problems associated with polypharmacy in the elderly.

### Specific recommendations

- A thiazide diuretic is the preferred drug for initial antihypertensive therapy in the elderly.

- Potassium-sparing diuretics should not be used initially but should be considered if thiazide-induced hypokalemia develops. Potassium supplements are not recommended.

- Daily doses of 25 to 50 mg of hydrochlorothiazide, or the equivalent, are usually effective in reducing blood pressure, even in the presence of moderately impaired renal function, which is often seen in the elderly.

- Loop diuretics (e.g., furosemide and ethacrynic acid) are not recommended for the treatment of hypertension in the absence of congestive heart failure or severe renal insufficiency.

- In patients in whom diuretics are contraindicated or certain conditions (e.g., angina pectoris) coexist,  $\beta$ -blockers, initially in small doses, are recommended as alternative initial therapy. However, the presence of such conditions as congestive heart failure, chronic obstructive lung disease and peripheral vascular disease may limit the use of these agents.

- When elevated blood pressure cannot be adequately controlled by diuretics or  $\beta$ -blockers or when these drugs are contraindicated, methyl dopa may be effective but may affect the central nervous

system. Other drugs such as hydralazine hydrochloride, prazosin hydrochloride, clonidine hydrochloride and reserpine should be selected on the basis of coexisting diseases, concurrent drug therapy and possible side effects.

• Other drugs such as captopril, minoxidil and calcium-channel blockers may be useful in treating hypertension, but further study is required before they can be recommended for the elderly.

• The effectiveness of nonpharmacologic therapies for hypertension in the elderly is unknown, and such therapy should be used only as an adjunct to drug therapy or as a general health measure in a life-style modification program. The use of added salt to maximize the effects of diuretics in lowering blood pressure and to minimize potassium loss must be discouraged.

## Conclusion

Our recommendations are based on the best clinical evidence available in 1985. The main handicap in making the recommendations was the lack of properly designed clinical trials on the management of hypertension in the elderly. The risk of both systolic and diastolic hypertension to subjects over the age of 75 years needs to be evaluated. We must also define the implications of blood pressure readings that are falsely elevated owing to rigidity of the brachial artery under the cuff, which causes the systolic pressure to seem higher with indirect sphygmomanometry than it is intra-arterially. Basic scientists and clinicians will have to investigate the cause of loss of aortic elasticity in patients with systolic hypertension as well as the risks and benefits of treating this subgroup, which is increasing in numbers. There have been no studies on the risks or the benefits of treatment associated with onset of hypertension after age 65 compared with before age 65. The long-term effect on brain function of lowering blood pressure has also not been studied. Properly controlled, well-designed clinical trials are needed to investigate almost all antihypertensive drugs; emphasis should be given to the comparison of such drugs as diuretics,  $\beta$ -blockers and calcium-channel blockers. At the moment our knowledge is limited, and the final recommendation is for more research into hypertension in the elderly.

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