

# Office management of elderly hypertensive patients

## *Focusing on cognition and function*

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### ABSTRACT

**OBJECTIVE** To review office management of elderly hypertensive patients and to focus on cognition and function both as ways to stratify who gets treated and as end points for treatment.

**QUALITY OF EVIDENCE** Relevant papers were identified through a MEDLINE search from January 1994 to March 2000, using the MeSH terms hypertension, aged, aged 80 and over, cognition, activities of daily living, therapeutics, hypotension orthostatic, and dementia. Many well conducted randomized controlled trials were found and are included.

**MAIN MESSAGE** Treatment of combined and systolic hypertension up to age 80 is clearly worthwhile; beyond age 85, other factors (chiefly cognitive and functional impairment) mitigate most routine recommendations. Successful treatment is individualized, taking into account comorbid conditions and their effect on cognition and function. Age is useful for thinking about groups, not individuals: as people age, risk of cognitive and functional impairment increases, but even very elderly people (>85 years) with no impairment should be treated as younger patients are. Elderly people with signs of having a "brain at risk" should be managed with special vigilance.

**CONCLUSION** Good evidence supports treating elderly people, who are otherwise well and are cognitively and functionally intact, when their blood pressure is >160 mm Hg systolic or >105 mm Hg diastolic. There is insufficient evidence for carrying out routine recommendations for frail elderly people. Treatment of comorbid illnesses dictates choice of therapeutic agent.

### RÉSUMÉ

**OBJECTIF** Passer en revue la prise en charge en cabinet de patients âgés hypertendus, et insister sur la cognition et le fonctionnement servant à la fois de moyens pour stratifier qui doit être traité et d'événements cibles du traitement.

**QUALITÉ DES DONNÉES** Des articles pertinents ont été relevés à la suite d'une recension dans MEDLINE de janvier 1994 à mars 2000, à l'aide des termes MeSH en anglais pour hypertension, âgé, âgé de plus de 80 ans, cognition, activités de la vie quotidienne, thérapeutique, hypotension orthostatique et démence. Plusieurs essais aléatoires contrôlés bien exécutés ont été trouvés et inclus dans l'étude.

**PRINCIPAL MESSAGE** Le traitement de l'hypertension combinée et systolique jusqu'à l'âge de 80 ans est manifestement utile; après l'âge de 85 ans, d'autres facteurs (principalement des incapacités cognitives et fonctionnelles) contingentent la majorité des recommandations systématiques. Un traitement fructueux doit être individualisé et prendre en compte les états pathologiques concomitants ainsi que leurs effets sur la cognition et le fonctionnement. L'âge est un facteur utile quand on examine un groupe mais ce n'est pas le cas pour les personnes individuelles: à mesure que les personnes vieillissent, le risque d'incapacités cognitives et fonctionnelles augmente mais même les personnes très âgées (>85 ans) n'ayant pas d'incapacités devraient être traitées comme les patients plus jeunes. Les personnes âgées présentant des «risques cérébraux» devraient être prises en charge avec une vigilance spéciale.

**CONCLUSION** De bonnes données probantes préconisent le traitement des personnes âgées qui sont autrement en bonne santé et sans incapacité cognitive ni fonctionnelle, si leur tension artérielle systolique est >160 mm Hg et diastolique de >105 mm Hg. Les données probantes sont insuffisantes pour justifier le recours aux recommandations systématiques chez les personnes âgées fragiles. Le traitement de maladies concomitantes dicte le choix de l'agent thérapeutique.

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**F**ew conditions better illustrate the difficulties of keeping up-to-date than hypertension. This common condition (prevalence 50% to 60% among elderly people<sup>1</sup>) has many controversial aspects; even its definition is under debate. New medications for its treatment appear regularly, but most trials of therapy have not included very elderly or frail people with serious comorbidity. Even the most up-to-date physicians have to extrapolate from presumably valid data that have uncertain generalizability. Even in this evidence-based era, we must often rely on expert judgment to interpret how the evidence is best applied.

This article reviews recent relevant literature on hypertension in elderly people and pays attention to indications for treating and not treating in individual cases. We summarize current Canadian guidelines and move beyond them for special groups of patients, such as frail and cognitively impaired elderly people.

### Quality of evidence

This paper is not intended to be a meta-analysis. There are many valid trials of treating hypertension in elderly people, but there are few valid trials of treating hypertension in very elderly people and fewer still in frail elderly people. We present a synthesis of available data, expert opinion, and our own views. MEDLINE was searched from January 1994 to March 2000, using the MeSH terms hypertension, aged, aged 80 and over, cognition, activities of daily living, therapeutics, hypotension orthostatic, and dementia. Only English-language articles were reviewed. Reference lists of relevant articles were searched. Articles selected included cohort, cross-sectional, and randomized controlled trials (RCTs). No RCTs known to us were excluded. Controversial points are noted and referenced. Expert opinion is presented when evidence is lacking.

### Defining hypertension and types of hypertension

Hypertension is often defined as blood pressure (BP) readings at three successive visits (five if no target organ damage) higher than 90 mm Hg diastolic or 140 mm Hg systolic.<sup>2</sup> Prevalence increases with age. With increasing age and increasing BP, risk of death, heart attacks, and strokes also rises, but risk of death in relation to hypertension and age is controversial. Van den Hoogen et al<sup>3</sup> report worldwide increases

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in mortality from coronary heart disease caused by increasing systolic and diastolic BP. The highest increases in death rates occurred after readings of 140 mm Hg systolic and 85 mm Hg diastolic. In contrast, Port et al<sup>4</sup> found both age- and sex-dependent variability in the threshold for risk of death due to systolic hypertension. The threshold for men aged 65 to 74 was 159 mm Hg; for women, 167 mm Hg. Beyond age 74, reliable data were not available.

Knowing when hypertension is an attribute and not an illness is difficult; not everyone with hypertension has a stroke or heart attack, and not everyone with a stroke or heart attack has had hypertension. One approach is to look for indices of target organ damage. Interestingly, pulse pressures higher than 90 mm Hg might be especially associated with risk of adverse health outcomes.<sup>5</sup>

Up to age 80 (the age at which the data are most secure, and also an age at which there are still more fit than frail people<sup>6</sup>), it appears that the default should be to treat.<sup>2</sup> Beyond age 85, things become less clear. It might be that heterogeneity in risk reflects heterogeneity in treatment effectiveness, even in the relatively homogenous subjects who get enrolled in clinical trials. In consequence, it is important to formulate an approach to heterogeneity that is based on something other than chronological age.

Hypertension can be classified as primary or secondary. Primary hypertension is most common among elderly people. A search for secondary causes beyond those that can be detected on examination (**Table 1**) or by routine laboratory tests is rarely justified in elderly people unless some factor (unexplained hypokalemia, signs and symptoms very suggestive of renovascular disease)<sup>7</sup> implicates a specific cause.

### Defining treatment goals

The treatment goals of the Canadian Consensus Conference on Hypertension<sup>2</sup> suggest a higher tolerance of high BP in older patients. The guidelines recommend treating if:

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#### Table 1. Evidence of atherosclerotic disease on physical examination

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Arterial calcification (detected by Osler's sign)
Retinal changes: tortuosity, narrowing, silver wiring, arteriovenous crossing changes
Bruits: carotid, abdominal, femoral
Abdominal aortic aneurysm
Diminished peripheral pulses or stigmata of peripheral vascular disease

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- systolic blood pressure is > 160 mm Hg,
- diastolic blood pressure is >105 mm Hg, or
- there is target organ damage.

The issue of whether some level of systolic BP reduction is harmful is unclear. Although a causal relationship has not been established, low BP in elderly people has been associated with increased risk of death,<sup>8,9</sup> cognitive impairment,<sup>10</sup> and depression.<sup>11</sup> At the same time, good evidence indicates that treating elderly people's hypertension is associated with decreased risk of death<sup>5,12</sup> and cognitive impairment.<sup>10,13</sup>

#### Deciding whom to treat

Treatment must be individualized. Between the extremes of treating everyone and treating no one older than 65 is the view that, while the tendency should be to treat, adjudication of burden versus benefit sometimes indicates not treating. This is often the decision for elderly institutionalized patients with advanced dementia.<sup>14</sup>

Many patients with advanced dementia are very elderly (> 85 years), and many very elderly people have dementia or a level of frailty that has resulted in dependence for personal care.<sup>6,15,16</sup> **Table 2**<sup>6</sup> gives representative levels of fitness and frailty of elderly people.

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#### Table 2. Clinical classification of fitness and frailty in elderly people

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**MOST FIT:** Engages in regular physical activity more vigorous than walking at least three times weekly

**FIT:** Engages in regular exercise equivalent to walking three times weekly

**SEDENTARY WELL:** Functionally independent, cognitively unimpaired, but does not exercise regularly

**AT RISK:** As above, but has urinary incontinence

**MILDLY FRAIL:** Either mildly cognitively impaired or dependent in handling more complex tasks, using the telephone, or taking medications

**MODERATELY FRAIL:** Mildly demented or needs assistance with bathing, walking outside, housework, or shopping

**TOTALLY DEPENDENT:** More than mildly demented or requires assistance in toileting, dressing, grooming, transferring, or eating

**TERMINALLY ILL:** Dying

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*Adapted from Rockwood et al.<sup>6</sup>*

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Chronological age helps only a little in treatment decisions: knowing what to do based on available evidence is not clear beyond age 80.<sup>5</sup> Beyond about 85, age itself becomes a convenient shorthand on a population basis for cognitive impairment and frailty.<sup>17</sup> So while we are attempting not to ignore age, we are

indicating that matters of functional and cognitive capacity—not age itself—are important in treatment decisions. It is our opinion that up to age 80, the default should be to treat hypertension. Past age 85, the default should be to treat those without cognitive or functional impairment and those for whom treatment of comorbid conditions necessarily involves treating hypertension.

#### Nonpharmacologic treatment

Even very elderly people can benefit from stopping smoking.<sup>18</sup> Exercise also seems to have benefits into old age and is often additive to pharmacologic treatment.<sup>19</sup> Although risk of death increases with body weight, mortality due to obesity declines with age.<sup>20</sup> Nevertheless, for elderly people, it has been shown that reduced sodium intake and weight loss can help in managing hypertension.<sup>21</sup>

#### Choosing antihypertensive medications

The Canadian Consensus Conference on the Treatment of Hypertension suggests beginning with a low-dose thiazide diuretic (eg, 12.5 mg daily of hydrochlorothiazide) or a long-acting dihydropyridine calcium channel blocker (CCB) (eg, amlodipine, felodipine, nimodipine) for patients with uncomplicated hypertension.<sup>5</sup> After this, either can be added to the other, or another drug, such as a  $\beta$ -blocker, angiotensin-converting enzyme (ACE) inhibitor, or angiotensin-II (AT-II) receptor antagonist, can be used as monotherapy. Sequential monitoring and addition or substitution is carried out until target goals are achieved.

Two meta-analyses of treatment of hypertension in older people support this view.<sup>5,12</sup> It is interesting to note that, after thiazide diuretics and long-acting dihydropyridine CCBs, a large number of antihypertensive agents, including reserpine, methyldopa, guanethidine, as well as more-likely-to-be-used  $\beta$ -blockers (notwithstanding a meta-analysis questioning the role of  $\beta$ -blockers<sup>22</sup>) and ACE inhibitors, have all been shown to be effective.

Recent single reports have found comparable first-line treatment efficacy between diltiazem (ultimately in the long-acting formulation) and diuretics or  $\beta$ -blockers,<sup>23</sup> between long-acting nifedipine and diuretics,<sup>24</sup> and also between ACE inhibitors, CCBs, diuretics, and  $\beta$ -blockers.<sup>25</sup> Two recent meta-analyses<sup>26,27</sup> comparing CCBs with other first-line agents, however, suggest caution in recommending CCBs as initial antihypertensive therapy for those at high risk of coronary heart disease and heart failure. Differing formulations of the same drug (eg, short-acting versus long-acting

dihydropyridine CCBs<sup>28</sup>) can have different effects. It seems prudent to stay with compounds that have been shown in clinical trials to reduce adverse primary end points, with which physicians have clinical experience, and that minimize costs.

It is also wise to recall that hypertension is important as an index of other illnesses. The Heart Outcomes Prevention Evaluation study<sup>29</sup> showed that, in patients on otherwise optimal therapy, addition of ramipril reduced rates of death, stroke, and heart attack beyond what would have been expected by additional BP reduction. Similarly, using diuretics for elderly hypertensive patients with renal impairment<sup>30</sup> results in relatively greater risk reductions. These data affirm the important role of diuretics in treatment of elderly hypertensive patients.<sup>31</sup>

Most elderly patients' hypertension treatment is guided by the presence of concomitant disease (Table 3<sup>2,26,32</sup>). In general, the rules of "geriatric prescribing" should be followed: start with a small dose,

**Table 3. Antihypertensive medications for patients with common comorbid conditions**

CONDITION	FIRST-LINE	SECOND-LINE	AVOID
Ischemic heart disease	$\beta$ -Blockers, ACE inhibitors	Diuretics	CCBs if heart disease <sup>26</sup>
Congestive heart failure (CHF)	ACE inhibitors, $\beta$ -blockers	Diuretics, AT-II receptor blockers	$\beta$ -Blockers if unstable CHF, CCBs
Diabetes mellitus	ACE inhibitors	CCBs, * $\alpha$ -blockers, AT-II receptor blockers, $\beta$ -blockers	Thiazide diuretics
Peripheral vascular disease			$\beta$ -Blockers if severe
Gout			Thiazide diuretics
Asthma			$\beta$ -Blockers
Mild cognitive impairment ("brain at risk")	Thiazide diuretics, CCBs	ACE inhibitors, AT-II receptor blockers	
Prostatic hypertrophy	$\alpha$ -Blockers		

ACE—angiotensin-converting enzyme, AT—angiotensin, CCB—calcium channel blocker.

Data from Feldman et al<sup>2</sup> and the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure.<sup>32</sup>

\*Long-acting dihydropyridine CCBs.

avoid polypharmacy (use drugs with dual indications when possible), remember interactions, and monitor.

### Elderly "brain at risk"

Hypertension is now known to be a risk factor for all types of cognitive impairment in late life, including mild cognitive decline,<sup>33</sup> Alzheimer disease,<sup>34</sup> and vascular dementia.<sup>35</sup> Cognition should, therefore, be a special concern. Careful management of hypertension should be part of a "brain at risk" approach for patients with mild cognitive impairment and early dementia.

Whether treating hypertension prevents dementia is controversial. As dementia becomes more severe, autonomic failure is widespread, and many patients suffer from hypotension.<sup>36</sup> There is concern that cognitive decline in hypertensive patients could actually be a result of BP-lowering medication.<sup>37</sup> Few prospective trials have incorporated sensible cognitive end points. One trial used a long-acting CCB as initial therapy and found that incidence of all types of dementia was halved.<sup>13</sup> Guo and colleagues<sup>10</sup> found in a cohort study of community-dwelling elderly patients that CCBs (and  $\beta$ -blockers) protected against development of dementia in those with hypertension (>160/>95 mm Hg) at baseline. In that study, diuretics were also found to protect against dementia, regardless of baseline BP.

In contrast, Maxwell et al found, in a secondary analysis of data from the Canadian Study of Health and Aging,<sup>15</sup> that CCBs were associated with higher risk of cognitive impairment.<sup>38</sup> Whether these divergent results reflect selection bias, variable effects between populations, differences in short- or long-acting formulations of CCBs, or the pitfalls of secondary analyses is unclear. We see no reason to avoid long-acting CCBs, although they might not be the best choice for those at high risk of coronary artery disease or heart failure.<sup>26</sup>

By contrast, a recent meta-analysis indicates that CCBs should be first choice for patients at high risk of stroke, but low risk of coronary heart disease.<sup>27</sup> We endorse a strategy of preventing cognitive impairment through careful attention to vascular risk factors.<sup>10,13,33-35</sup> For more definitive information, we await results of several large ongoing RCTs investigating the effect of BP control on cognitive function.

### Orthostatic hypotension

Elderly people with hypertension often also have orthostatic hypotension (30% to 50% of those >75 years<sup>39,40</sup>). Guidelines and data for treating both conditions jointly are lacking. Successful treatment with antihypertensive drugs has been associated with a lower prevalence of orthostatic hypotension,<sup>40,41</sup> so

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having that disease does not contraindicate treatment for hypertension. We usually avoid  $\alpha$ -blockers and diuretics for such patients; we have found that AT-II receptor blockers work best in controlling hypertension while minimizing or even improving orthostasis. No data support these observations. If patients have severe, symptomatic orthostatic hypotension, we generally avoid treating hypertension if it exacerbates the hypotension.

### Changing and monitoring therapy

Many elderly patients' BP readings show considerable fluctuation in the office. For these patients and for those with symptoms suggesting hypotension or apparent treatment resistance, the Canadian Consensus<sup>2</sup> recommends home BP monitoring. We advise not changing BP medication under such circumstances until results of at least a dozen readings are available. There might be particular benefit in using ambulatory BP monitoring to detect isolated systolic hypertension.<sup>42</sup>

### Conclusion

Treatment of hypertension in elderly people, although challenging, can prevent debility and death. Treatment decisions must be individualized and take into account comorbidity and frailty. In general, diuretics, ACE inhibitors, or long-acting dihydropyridine CCBs are appropriate as initial monotherapy. Concomitant illness has a strong influence on who to treat and what therapy to use. We usually follow Canadian Consensus recommendations for elderly people of any age who are not demonstrably frail. Good evidence supports treating cognitively and functionally unimpaired elderly people with BP levels >160 mm Hg systolic or >105 mm Hg diastolic. Lower thresholds should be used if target organ damage exists and patients are otherwise well.

### Bottom line

- Treating elderly people's hypertension must be individualized based on comorbidity and frailty.
- Good evidence indicates that most elderly (up to age 80) hypertensive patients with systolic BP >160 mm Hg or diastolic BP >105 mm Hg should be treated.
- Evidence for treatment past age 85 is less certain, but treatment might be beneficial if patients have no serious functional impairment.
- No evidence supports treating hypertensive patients with advanced dementia or frailty that has resulted in dependence in personal care, irrespective of age. No evidence suggests stopping treatment either.
- Antihypertensive medications should be chosen based on comorbidity and started at low doses.

### Editor's key points

- This article reviews the most recent therapeutic recommendations and focuses on the benefits and drawbacks of treating hypertension in elderly people with various comorbid conditions.
- For healthy elderly people, pharmacologic treatment should be started if systolic and diastolic blood pressure levels are higher than 160 and 105 mm Hg, respectively, or if there is target organ damage.
- Most trials of treatment of hypertension do not include very old people or people with serious comorbid conditions. Hence, the recommendations that arise from these trials do not necessarily apply to frail elderly patients.

### Points de repère du rédacteur

- Cet article résume les plus récentes recommandations thérapeutiques et fait le point sur les bénéfices et les inconvénients du traitement de l'hypertension chez les personnes âgées et présentant différents problèmes.
- Chez les aînés en bonne santé, on devrait amorcer le traitement pharmacologique si les tensions systoliques et diastoliques sont respectivement supérieures à 160 et 105 ou s'il y a une atteinte des organes cibles.
- La plupart des études sur le traitement de l'hypertension n'incluent pas de personnes très âgées et ayant une co-morbidité significative. Par conséquent, les recommandations thérapeutiques qui en découlent ne sont pas nécessairement généralisables chez les aînés vulnérables.

- Treating elderly people's hypertension results in decreased risk of stroke and cardiovascular morbidity and mortality.
- Hypertension is an established risk factor for cognitive impairment, and mounting evidence indicates that treating hypertension can prevent development and progression of dementia. ❀

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