Under Pressure
The latest on managing hypertension

The Canadian Hypertension Education Program (CHEP) recently released their 2005 Canadian Recommendations for the Management of Hypertension (http://www.hypertension.ca). The CHEP recommendations are updated annually according to an evidenced-based review of the latest international research. Although there have not been any recent studies on how well we are doing in detecting and managing hypertension, previous research suggests that there is a lot of room for improvement. Around 43% of people who have hypertension do not know they have it. Only 13% of those with hypertension are both treated and controlled.

STEP 1 Diagnosis

Previous guidelines recommended up to six office visits over a six-month period before making a diagnosis of hypertension. Recognizing the impracticability of this process, the CHEP task force has outlined new criteria for diagnosing hypertension with the hope of reducing unnecessary delays in diagnosis and treatment. Office, ambulatory or home measurements can be used to diagnose hypertension.

The new criteria are as follows:
• 1 Visit: Hypertension is diagnosed immediately in hypertension emergencies or urgencies.
• 2 Visits: Sustained blood pressures ≥140/90 mm Hg or sustained blood pressures ≥140/90 mm Hg in the presence of diabetes, chronic kidney disease, or target organ damage (affecting brain, heart, eyes, kidneys and peripheral arteries).
• 3 Visits: Sustained blood pressure ≥160/100 mm Hg.
• 5 Visits: Sustained blood pressure ≥140/90 mm Hg.
• Home/self measurement: Duplicate home readings in the morning and evening for one week (excluding day 1) ≥135/85 mm Hg.
• Ambulatory blood pressure monitoring: Average daytime pressure ≥135/85 mm Hg or 24 hour average ≥130/80 mm Hg.

A diagnosis of hypertension can be made if either the systolic or diastolic blood pressure is elevated. Although CHEP has added criteria for home and ambulatory blood pressure measurement, the authors caution that these readings must be done on internationally validated equipment. Assessment of self-measurement blood pressure devices can be found at http://www.dableducational.com/sphygmomanometers/devices_2_sbpmm.html.

STEP 2 Initial investigations

Patients diagnosed with hypertension should have the following laboratory tests:

• Urinalysis.
• Complete blood count.
• Blood chemistry (sodium, potassium, creatinine).
• Fasting blood glucose.
• Fasting total cholesterol, high density lipoprotein (HDL), low density lipoprotein (LDL), triglycerides.
• Standard 12-lead electrocardiogram.

Further investigations should be guided by the laboratory results, physical examination and history.

STEP 3 Risk assessment

A thorough cardiovascular (CV) risk assessment is important in managing patients with hypertension, as over 90% of patients with hypertension have other CV risks. It is useful in managing the identified risk factors, as well as in choosing specific drug therapies and target blood pressures. Simply adding together risk factors underestimates a person’s risk. Although there are several algorithms available, CHEP endorses the WHO/ISH evaluation of risk based on hypertension readings and CV risk factors (see table below).

Association of blood pressure, risk factors and target organ damage

<table>
<thead>
<tr>
<th>Blood Pressure (MM HG)</th>
<th>Other risk factors and disease history</th>
<th>Normal (SBP 120–129 or DBP 80–84)</th>
<th>High normal (SBP 130–139 or DBP 85–89)</th>
<th>Grade 1 (SBP 140–159 or DBP 90–99)</th>
<th>Grade 2 (SBP 160–179 or DBP 100–109)</th>
<th>Grade 3 (SBP &gt; 180 or DBP &gt;110)</th>
</tr>
</thead>
<tbody>
<tr>
<td>I. No other risk factors</td>
<td>Average risk</td>
<td>Average risk</td>
<td>Low added risk</td>
<td>Moderate added risk</td>
<td>High added risk</td>
<td></td>
</tr>
<tr>
<td>II. 1–2 risk factors</td>
<td>Low added risk</td>
<td>Low added risk</td>
<td>Moderate added risk</td>
<td>Moderate added risk</td>
<td>Very high added risk</td>
<td></td>
</tr>
<tr>
<td>III. ≥ 3 risk factors or target organ damage or diabetes</td>
<td>Moderate added risk</td>
<td>High added risk</td>
<td>High added risk</td>
<td>High added risk</td>
<td>Very high added risk</td>
<td></td>
</tr>
<tr>
<td>IV. Associated clinical conditions</td>
<td>High added risk</td>
<td>Very high added risk</td>
<td>Very high added risk</td>
<td>Very high added risk</td>
<td>Very high added risk</td>
<td></td>
</tr>
</tbody>
</table>

Adapted from CHEP. Canadian Recommendations for the Management of Hypertension. 2005.

STEP 4 Target blood pressure

It is important to treat to target blood pressures. These targets vary depending on associated conditions (see table below).

Target values for blood pressure

<table>
<thead>
<tr>
<th>Condition</th>
<th>Target blood pressure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diastolic +/- systolic hypertension</td>
<td>&lt;140/90</td>
</tr>
<tr>
<td>Isolated systolic hypertension</td>
<td>&lt;140</td>
</tr>
<tr>
<td>Diabetes</td>
<td>&lt;130/80</td>
</tr>
<tr>
<td>Renal disease</td>
<td>&lt;130/80</td>
</tr>
<tr>
<td>Proteinuria &gt;1 g/day</td>
<td>&lt;125/75</td>
</tr>
</tbody>
</table>

Adapted from CHEP. Canadian Recommendations for the Management of Hypertension. 2005.

Cardiovascular risk factors include:
✓ Male gender.
✓ Increasing age.
✓ Previous stroke or transient ischemic attack (TIA).
✓ Microalbuminuria or proteinuria.
✓ Diabetes mellitus.
✓ Smoking.
✓ Family history of premature CV disease (age ≥45 years for men; age ≥55 years for women).
✓ Left ventricular hypertrophy.
✓ Total cholesterol to HDL (high density lipoprotein) ratio ≥5 in men, ≥6 in women.
✓ Chronic kidney disease (glomerulosclerosis rate <60 mL/min/1.73m2).
✓ Sedentary lifestyle.

Continued → 2
STEP 5 Lifestyle modifications
All patients with hypertension should be counseled on lifestyle modification. Changes in lifestyle have been shown to reduce blood pressure (see table above).

STEP 6 First-line drug therapy
CHEP recommends that pharmacotherapy be strongly considered if the average diastolic blood pressure is:

- ≥80 in a person with diabetes.
- ≥90 in a person with hypertensive end organ damage/CV disease or independent CV risk factors.

The 2005 CHEP recommendations emphasize that reducing hypertension-associated complications in the "general" population of those with hypertension is more dependent on the extent of blood pressure lowering than on the choice of drug. Based on efficacy data alone, they endorse five categories of antihypertensive agents as suitable first-line therapy. See table right with drug categories and costs.

ALLHAT was an international landmark randomized controlled trial comparing amlodipine, chlorthalidone, doxazosin and lisinopril in preventing fatal coronary artery disease or nonfatal myocardial infarction in high-risk patients with hypertension. During the trial, the doxazosin arm was dropped due to a 25% higher rate of combined CV outcomes. In the end, they found no difference in chlorthalidone compared to amlodipine or lisinopril in preventing major coronary events or increasing overall survival. The authors concluded that thiazide-type diuretics should be the drugs of choice for first-line therapy in uncomplicated hypertension because of their superior prevention of CV disease and lower cost (see box left for comparative costs).

When choosing a first-line medication for an individual patient, associated risk factors, target end-organ damage/complications and concomitant diseases/conditions should be considered. For more information on individualization of therapy, see http://www.hypertension.ca/recommendations_2005/execsummary2005.pdf.

The Bottom Line
- The diagnosis of hypertension can be expedited and include office, home or ambulatory blood pressure measurements.
- Thiazide diuretics (e.g. hydrochlorothiazide) should be the drugs of choice for first-line therapy, as they are both effective and inexpensive.
- Many patients will require at least two drugs to achieve their target blood pressures.