1. When to start a drug and what to aim for?

The threshold to start a drug may be different from the blood pressure goal for a patient on drug therapy.

<table>
<thead>
<tr>
<th>Who is included</th>
<th>Primary Prevention &amp; Lower Risk</th>
<th>Secondary Prevention &amp; Higher Risk</th>
<th>Diabetes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No history of heart disease, heart attack, heart failure, or stroke</td>
<td>History of heart attack/stroke OR 10-year Framingham CV risk score &gt;15%</td>
<td>Type 1 OR Type 2</td>
</tr>
</tbody>
</table>

- When to start a drug (threshold):
  - >160/100 mmHg (Grade A) | >140/90 mmHg (SBP Grade C, DBP Grade A) | >130/80 mmHg (Grade C) |

- What to aim for (goal):
  - <140/90 mmHg (Grade A) | <140/90 mmHg (Grade A) | <130/80 mmHg (Grade C) |

Some patients with specific cardiovascular risk factors may opt for a more intensive systolic BP goal of 120 mmHg (Grade B).

Help patients choose a threshold and goal based on their preferences, medical history, and frailty.

Consider waiting if there is a short-term cause of hypertension (e.g., pain, stress, trauma).

### Intervention

- Antihypertensive drug
- Modify diet (e.g., DASH diet)
- Reduce alcohol intake (men ≤2 drinks/day; women ≤1 drinks/day)
- Exercise more (90-150 min/week of aerobic + resistance training)
- Lose weight

Decrease in Systolic Blood Pressure

- ~10 mmHg
- ~11 mmHg
- 4 mmHg
- 4 - 8 mmHg
- 1 mmHg / kg lost

Table is adapted from the American College of Cardiology 2017 Guideline for the Prevention, Detection, Evaluation, and Management of High Blood Pressure in Adults.

2. What drug to start first?

There’s no rush to lower BP. Start with a low dose.

### First Line Drugs

<table>
<thead>
<tr>
<th>First Line Drugs</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thiazide-like diuretics</td>
<td>Chlorthalidone†</td>
</tr>
<tr>
<td>ACE-inhibitors</td>
<td>Ramipril</td>
</tr>
<tr>
<td>ARBs</td>
<td>Candesartan</td>
</tr>
<tr>
<td>Long-acting calcium channel blockers</td>
<td>Amlodipine</td>
</tr>
<tr>
<td>Beta-blockers (under age 60)</td>
<td>Bisoprolol</td>
</tr>
</tbody>
</table>

**Note:** ACE-inhibitors are not first line for black patients because they are less effective than diuretics and CCBs and have more side effects (angioedema and cough).

3. When to add another drug?

- If BP is above goal at the maximum tolerated dose
- If BP is above goal in a series of readings at a single office visit or at home

Expert opinion suggests patients respond best when a drug is used from A and B.

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACE-inhibitors/ARBs</td>
<td>Thiazide/Thiazide-like diuretics</td>
</tr>
<tr>
<td>Beta-blockers</td>
<td>Calcium channel blockers</td>
</tr>
</tbody>
</table>

Table is based on the 2018 Hypertension Canada guidelines and the 2001 Canadian Hypertension Recommendations.
4 Measuring Blood Pressure in Clinic

Tips for healthcare professionals:

Take ≥3 readings/visit every 4 weeks after starting or changing a drug.

Once stable, recheck blood pressure every 6 months and ask about side effects.

Educate patients on proper home blood pressure monitoring if:

- Clinic readings are different from home readings.
- An antihypertensive drug has been started, changed, or stopped.

Monitoring for Side Effects

Thiazide-like diuretics, ACE-inhibitors, ARBs:
Check electrolytes and serum creatinine at baseline, 1 week after starting, and 1 week after a dose increase.

<table>
<thead>
<tr>
<th>Drug Class</th>
<th>Side effects that may require a change in dose</th>
<th>Side effects that may require a change in drug</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thiazide-like diuretics</td>
<td>Symptomatic hypotension</td>
<td>Recurrent gout attacks, hyponatremia</td>
</tr>
<tr>
<td>ACE-inhibitors, ARBs</td>
<td>Symptomatic hypotension</td>
<td>Hyperkalemia &gt;5.6 mmol/L or increase in SCr &gt;30% from baseline, angioedema, Dry cough (switch from ACE-inhibitor to ARB)</td>
</tr>
<tr>
<td>Calcium channel blockers</td>
<td>Symptomatic hypotension, ankle edema, headache</td>
<td>If side effects are not tolerated by patient</td>
</tr>
<tr>
<td>Beta-blockers</td>
<td>Exercise intolerance, symptomatic bradycardia</td>
<td>If side effects are not tolerated by patient, advanced heart block (i.e. 2nd degree or greater)</td>
</tr>
</tbody>
</table>

5 Special Situations

Resistant Hypertension
def. Patient meets the following criteria:

- Blood pressure above goal;
- Taking at least 3 antihypertensive drug classes (i.e., diuretic, CCB, ACE-inhibitor/ARB);
- Drugs are at maximally tolerated doses;
- Patient is adherent.

When to Refer to Hospital
If BP is markedly elevated, refer to hospital if any of these occur:

- Nausea, vomiting, confusion
- Sudden shortness of breath, heavy chest pain
- Sharp, tearing chest and back pain

More effective to add spironolactone than a beta-blocker or an alpha-blocker for patients with resistant hypertension. Monitor for hyperkalemia. (PATHWAY-2 2016)

Hypertensive emergencies occur when patients have markedly elevated blood pressure that causes acute target organ damage (kidney, heart, brain).