

## HYPERTENSIVE URGENCY (ASYMPTOMATIC SEVERE HYPERTENSION): CONSIDERATIONS FOR MANAGEMENT

Hypertension is one of the most common chronic medical conditions in Canada. More than one in five Canadians has hypertension and the lifetime risk of developing hypertension is 90%.<sup>1</sup> With the addition of comorbid conditions and other risk factors, hypertensive cases can quickly become even more complex. Hypertensive crises include *hypertensive urgencies & emergencies*. Optimal management lacks conclusive evidence. The rate of associated major adverse cardiovascular events in asymptomatic patients seen in the office are very low.<sup>13</sup> Since rapid treatment of *hypertensive urgency* is not required, some prefer to call it *asymptomatic severe hypertension*.

### WHAT IS HYPERTENSIVE URGENCY & HOW DOES IT COMPARE TO HYPERTENSIVE EMERGENCY?<sup>1,2,3,4,5,6,7,8,9</sup>

The term hypertensive crises can be further divided into hypertensive urgency and hypertensive emergency. The distinction between these two conditions is outlined below.<sup>8</sup> Differentiating between these scenarios is essential before initiating treatment.

	URGENCY <sup>2,9</sup>	EMERGENCY <sup>2-9</sup>
Blood Pressure (mmHg)		>180 systolic &/or >120 - >130 <sup>CHEP</sup> diastolic
Target Organ Damage*	No	Yes: currently experiencing (e.g. aortic dissection, angina/ACS, stroke, encephalopathy, acute renal failure, pulmonary edema, eclampsia)
Symptoms	Asymptomatic; or severe headache, shortness of breath, nosebleeds, severe anxiety	Shortness of breath, chest pain, numbness/weakness, change in vision, back pain, difficulty speaking

\*Note: Signs of end-organ damage/dysfunction may occur at a lower blood pressure in **pregnant** & **pediatric** patients

### Initial Patient Work-Up to Differentiate between Urgency and Emergency:

- Verify **blood pressure (BP) reading(s)**. Ensure proper technique for measuring BP (e.g. patient's feet flat on the floor & arm supported) (Please refer to [Hypertension Canada's Blood Pressure Measurement Information Sheet](#) for more detailed guidance).
- Obtain medical history & current medication list (prescription, OTC, recreational)
- Physical exam - focus on any signs of target organ damage (e.g. shortness of breath, chest pain, numbness/weakness)
- Lab tests & investigations may be required (e.g. CBC, ECG, urinalysis, renal function; ultrasound for aortic dissection if very high BP)
- **Hypertensive urgency is not an emergency and its management is much less aggressive** (see below). Diagnosis of a **hypertensive emergency** requires **rapid intervention** to lower BP in the emergency department (e.g. IV nitroprusside, IV labetalol, or IV nicardipine).<sup>2-12</sup>

### WHAT CAUSES HYPERTENSIVE URGENCY?

- Most patients presenting with hypertensive urgency have been previously diagnosed with hypertension. Severe BP elevations may result from inadequate control on or poor adherence to current antihypertensive drug regimens.<sup>2-8</sup> Another cause for patients reaching hypertensive urgency or emergency is previous inaccurate BP measurements that underestimate or do not detect increased BP at all (e.g. poor patient technique for self-monitoring).
- **A patient's BP can also be elevated by other factors, including:**
  - **Drugs**<sup>1</sup>
    - **Prescription:** ADHD medications (e.g. methylphenidate), antidepressants (e.g. venlafaxine, bupropion, desipramine), calcineurin inhibitors (e.g. cyclosporine, tacrolimus), corticosteroids, estrogens, midodrine, **NSAIDs** (e.g. ASA, ibuprofen, naproxen, diclofenac, celecoxib), testosterone, triptans
    - **Non-Prescription:** decongestants (e.g. pseudoephedrine, phenylephrine), NSAIDs (ibuprofen, naproxen), topical ASA or diclofenac  
Cautions: a) often these are not on a patient's profile; b) use of combination products may result in inadvertent use
    - **Herbal:** black licorice root, ginkgo biloba, St. John's Wort. Consider potential for undeclared ingredients/adulterants.
    - **Recreational:** stimulants (e.g. amphetamines like crystal meth or ecstasy), anabolic steroids, caffeine, cocaine, phencyclidine. Energy drinks containing taurine, guarana root, yerba mate, glucuronolactone, etc.
  - **Lifestyle**<sup>1</sup> - High **salt** diet, excessive alcohol use.
  - **Comorbid Conditions**<sup>2</sup>
    - Thyroid storm, trauma, renovascular disease, acute ischemic stroke or adrenal dysfunction
- Some population groups are more likely to experience hypertensive urgency<sup>10</sup>: **Elderly**; African Americans; Men > Women

### HOW SHOULD HYPERTENSIVE URGENCY BE MANAGED?<sup>1-11</sup>

**Overall Goal of Management:** reduce SBP by ~ 25% over 24-48 hours. More conservative BP lowering reduces the risk of potential adverse effects (i.e. perfusion complications worsening incidence of MI, stroke, and death) associated with more aggressive BP lowering.<sup>10</sup> All treatment strategies should consider the patient's comorbidities and risk of adverse events.<sup>11</sup> Don't just "treat the number"!!!

- 1) All patients should be provided with a **quiet room to rest**. This will be adequate for >30%, leading to a **fall in BP of ≥10-20 mmHg**.
- 2) Tilt the head of the bed 15 degrees up. This may also help to decrease BP.
- 3) If BP remains above 180/100 mmHg for ≥3 hours, consider antihypertensives.
- 4) General drug treatment options differ depending on whether the patient was previously diagnosed with & treated for hypertension.

**Previously Treated Hypertension:** trying one the following **may** be appropriate interventions (in no particular order)

- Restart/resume medications in non-adherent patients
- Increase the dose of current antihypertensive medications
- Add another antihypertensive agent from another class






Adjust & optimize hypertensive regimen!

**Untreated Hypertension:** Choice of treatment depends on patient and the setting (e.g. emergency room versus doctor's office)

- Temporary use of fast acting oral antihypertensives (e.g. clonidine, labetalol, captopril) may be used to gradually reduce BP over several hours, depending on the condition of the patient. The following page highlights potential options.
- However, reduction of BP over 24-48 hours with longer acting agents (e.g. ramipril 10 mg, metoprolol SR (or XL<sup>USA</sup>) 100 mg, or nifedipine XL 30 mg) is usually preferred over temporary use of short-acting agents.

Continued on next page.

[NOTE: OFTEN ADJUSTING OR INITIATING LONGER ACTING MEDS IS PREFERRED OVER USING ACUTE MEDS FOR SHORT TERM MANAGEMENT ]

DRUG	DOSE/ PHARMACOKINETICS	ADVANTAGES	CONTRAINDICATIONS (CI)/ ADVERSE EFFECTS (AE)/ DRUG INTERACTIONS (DI)/ COMMENTS
<b>Captopril CAPOTEN, g</b>  6.25, 12.5, 25 <sup>s</sup> , 50 <sup>s</sup> , 100 <sup>s</sup> mg tablets  -chosen above other ACE-I because fast acting; others are suitable alternatives (e.g. ramipril)	<b>Acute Dose:</b> 3.125-12.5 mg po/sl (repeat 1-2 times at a 30-60min interval) <b>Max:</b> 150mg TID for hypertension (but seldom used at this dose) <b>Onset:</b> fastest of all ACE-I 10-15 minutes (sl); 15-30 minutes (po) <b>Peak Effect:</b> 1 hour (sl); 1-2 hours (po) <b>Duration:</b> 4-8 hours	? Benefits for cerebral autoregulation & blood flow ? Favorable effect on regional myocardial perfusion - Reduces pre- and afterload - No fluid retention - OK in chronic management of HF & scleroderma - Can use sl, but unlikely any therapeutic advantage	<b>CI:</b> bilateral renal artery stenosis; immune-mediated diseases; pregnancy <b>AE:</b> cough, rash, dizzy, fatigue; angioedema, ↑K <sup>+</sup> , dysgeusia <b>DI:</b> diuretic K <sup>+</sup> sparing ↑K <sup>+</sup> ; gold injection nitritoid reaction, lithium ↑ Li <sup>+</sup> level, NSAID ↓ BP effect & K <sup>+</sup> / BACTRIM/ Spirinolactone ↑K <sup>+</sup> - Caution in volume depleted patients & high renin states (patients on diuretics) - One reviewer suggests <b>captopril not be recommended in volume depleted patients</b> due to profound decrease in BP that may lead to complications - Fine control of BP <b>not possible</b> - <b>If &gt;65 years old, consider a low starting dose and titrate</b> - For chronic therapy switch to an ACE-I requiring less frequent dosing is often advantageous (See RxFiles: ACE-I Comparison Chart p2)
<b>Clonidine CATAPRES, g</b> 0.1 <sup>s</sup> , 0.2 <sup>s</sup> , 0.3 <sup>s</sup> mg tablets 	<b>Acute Dose:</b> 0.05-0.2 mg po (can repeat q 1-2 hour) <b>Maximum:</b> 0.6-0.8 mg/day for acute use <b>Onset:</b> 30-60 minutes <b>Peak Effect:</b> 2-4 hour <b>Duration:</b> 3-12 hour	- Decreases heart rate (in ~4% of patients) - No increase in myocardial oxygen consumption	<b>CI:</b> 2 <sup>nd</sup> /3 <sup>rd</sup> degree heart block; caution in HF (due to potential ↓ cardiac output) <b>AE:</b> Sedation (up to 50%); orthostatic hypotension; dramatic ↓ cerebral blood flow <b>DI:</b> cyclosporine increased cyclosporine levels?, mirtazapine, TCAs ↑ BP, beta blockers rebound hypertension. (Bradycardia only ~4% incidence.) - Fine control of BP not possible; ↑ risk of falls reported - <b>Decrease dose if: &gt;65 years old (on Beer's criteria for potentially inappropriate medication use in older patients), recent antihypertensives, volume depletion</b>
<b>Labetalol TRANDATE, g</b>  100 <sup>s</sup> , 200 <sup>s</sup> mg tablets; 5mg/mL vial 	<b>Acute Dose:</b> 200-400 mg po (can repeat q 6-12 hr PRN) <b>Maximum:</b> 1200 mg/day po for hypertension <b>Onset:</b> variable (30-120 minutes) <b>Peak Effect:</b> 3-4 hours <b>Duration:</b> 8-12 hours	- Favorable cardiac and possible central nervous system effects - <b>Mixed alpha/beta antagonist</b> - Used in pregnancy	<b>CI:</b> HF; reactive airway disease; 2 <sup>nd</sup> /3 <sup>rd</sup> degree heart block <b>AE:</b> fatigue, insomnia, ↓ HR, impotence, ↓ exercise tolerance, dizzy, cold extremity, bronchospasm tx: ipratropium, HA, mask & delay sx hypoglycemia, ↑TG, ↓HDL <b>DI:</b> antiarrhythmics; CCB synergistic & ↓ HR; clonidine hypertension crisis; digoxin ↓ HR; fluconazole, insulins, NSAIDs ↑ BP & ↓ renal fx; & phenobarbital, cimetidine ↓ effect. - A standard dose that reliably & quickly lowers BP has not been firmly established - Beta blockers, in general, may have <b>decreased efficacy in the elderly</b>

After a few hours of observation, & ~20-30 mmHg reduction in BP, the patient should be prescribed a **longer acting agent** in accordance with **treatment of essential hypertension** (i.e. ACE-I/ARB, thiazide diuretic, beta blocker, calcium channel blocker). The choice of agent should include consideration for what is most appropriate long term. See RxFiles Hypertension Chart for more information (p6; link below). For example:

Comorbid Conditions	Initial Therapy Options
Heart Failure	ACE Inhibitor (or ARB), Beta Blocker <small>bisoprolol, carvedilol</small> , Aldosterone Antagonist <small>spironolactone</small> ; Thiazide
Post-Myocardial Infarction	ACE Inhibitor (or ARB), Beta Blocker
Isolated Systolic Hypertension	Thiazide, Calcium Channel Blocker; ACE Inhibitor or ARB
Diabetes	ACE Inhibitor (or ARB), Beta Blocker <small>cardioselective</small> (if age ≤60), Thiazide, Calcium Channel Blocker
Chronic Kidney Disease	ACE Inhibitor (or ARB)

**WHAT ARE THE FOLLOW-UP & MONITORING PARAMETERS FOR HYPERTENSIVE URGENCY? <sup>2-11</sup>**

- The patient should be observed for a few hours to confirm that they are stable/improving & asymptomatic
- Once stable, the patient can be sent home with close follow-up (every 1-2 days) involving:
  - Evaluation for signs of hypertension or hypotension
  - Attainment of BP goals with the help of antihypertensives and lifestyle interventions (e.g. low salt diet, increased physical activity)
    - BP goals may vary depending on the patient and any existing comorbid conditions. For example, **elderly patients** (especially those >80 years old) may do better on less aggressive therapy (See RxFiles Chart: [Drug Treatment in the Elderly & Long Term Care](#))<sup>12</sup>
  - Assessment of medication adherence (consider simplified dosing schedules, & adherence aides, if appropriate)
- If there are concerns about patient adherence to follow up, especially if there is high risk of cerebrovascular or cardiovascular disease, hospital admission may be warranted for **initial management**

**WHAT ABOUT IMMEDIATE RELEASE NIFEDIPINE?**

Immediate release nifedipine **ADALAT** (5, 10mg capsules) is **not typically used** for the management of hypertension because of increased MI, stroke and mortality risk. It is listed in the Beers criteria for potentially inappropriate medication use in older adults. See Geri-RxFiles for details. It is considered in some lower risk populations (e.g. treatment of severe hypertension during pregnancy, i.e. ≥160mmHg systolic or ≥110mmHg diastolic). See On-line Extras for use in pregnancy.

**RELATED RESOURCES:**

- Hypertension Canada: [Blood Pressure Measurement Information Sheet](#); [www.hypertension.ca/images/2013\\_EducationalResources/2013\\_MeasureBPPoster\\_EN\\_HCP1040.pdf](#)
- RxFiles Charts: Management of Hypertension <http://www.rxfiles.ca/rxfiles/uploads/documents/members/cht-HTN-1page%20summary.pdf>  
 Peri-Pregnancy Drug Treatment Considerations <http://www.rxfiles.ca/rxfiles/uploads/documents/members/CHT-Peri-Pregnancy-DrugTx.pdf>  
 Drug Treatment in the Elderly & Long Term Care <http://www.rxfiles.ca/rxfiles/uploads/documents/members/CHT-LTC-Eldely-Pearls.pdf>
- RxFiles Energy Drinks Q&A (source of caffeine): <http://www.rxfiles.ca/rxfiles/uploads/documents/Energy-Drinks-Q-and-A-Oct-2010.pdf>
- Hypertension Management Guidelines:
  - Canadian (CHEP 2013): <http://www.hypertension.ca/cheep-resources-and-downloads>
  - American (JNC-7 2004): <http://www.nhlbi.nih.gov/guidelines/hypertension/jnc7full.pdf>
  - British (NICE 2011): <http://www.nice.org.uk/CG127>
  - Australian (NPS 2010): [http://www.nps.org.au/\\_data/assets/pdf\\_file/0011/111422/Clinical\\_guidance\\_Final\\_hypertension.pdf](http://www.nps.org.au/_data/assets/pdf_file/0011/111422/Clinical_guidance_Final_hypertension.pdf)

↓dose for renal dysfunction ↓dose for liver dysfunction c=scored ACE-I=angiotensin converting enzyme inhibitors ACS=acute coronary syndrome ADHD=attention deficit hyperactivity disorder ARB=angiotensin II receptor blocker BP=blood pressure CBC=complete blood count CCB=calcium channel blocker CV=cardiovascular ECG=electrocardiogram g=generic HA=headache HDL=high density lipoprotein HF=heart failure hr=hour HR=heart rate e.g.=example i.e.=that is IV=intravenous K+=potassium Li+=lithium MI=myocardial infarction mg=milligrams mmHg=millimeters of mercury NSAIDs=non-steroidal anti-inflammatory drugs OTC=over the counter po=orally q=every sbp= systolic BP sl=sublingual sx=symptoms TCA=tricyclic antidepressant TG=triglycerides tx=treatment


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### On-line Extra:

Nifedipine does not appear on the main chart because it is not regularly used for hypertensive urgencies. The immediate release formulation has been associated with increased MI, stroke & mortality risk. This treatment option is still considered for certain indications in low risk populations (e.g. severe hypertension {>160mmHg systolic or ≥110mmHg diastolic} in pregnancy). For this reason, specific information has been included in this on-line extra. However, this agent should not be routinely used.

### HYPERTENSIVE URGENCY IN PREGNANCY:

Other sources should be sought for discussion of this area. Concerns have been raised regarding the fetus. If pre-eclampsia or eclampsia, successful delivery is of primary importance.

<p>Nifedipine ADALAT, g Regular 5, 10mg capsules XL 20, (30, 60mg) g tablets</p> 	<p><b>See "Caution" at right!</b> <b>Acute Dose: 5-10 mg po/bite &amp; swallow</b>  <b>Onset:</b> 5-20 minutes <b>Peak Effect:</b> 30-60 minutes <b>Duration:</b> 2-6 hours</p>	<p>- <b>rapid onset;</b> dilates coronary arteries and relieves spasm; usually does not decrease cardiac output</p>	<p><b>CI:</b> angina with high grade stenosis <b>Caution:</b> possible increase risk of MI, stroke, &amp; mortality with <b>immediate release nifedipine</b> (not usually recommended due to risk, except in severe hypertension in pregnancy) <b>AE:</b> reflex tachycardia lasting 1 hr; nonhomogenous cerebral perfusion - Fine control of BP <u>not</u> possible; large falls in BP after 10mg dose - <b>In the elderly, consider a low starting dose and titrate (on Beer's criteria for potentially inappropriate medication use in older patients)</b></p>
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-Labetalol & hydralazine IV are also treatment options (see RxFiles Peri-Pregnancy Drug Treatment Considerations Chart p91a-b)

### REVISION WORK, 2013-14, KAITLYN KRAHN, RXFILES STUDENT.

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