

Hypertensive Crises

Core Knowledge
JNC 7 Definitions for Hypertension

<table>
<thead>
<tr>
<th>Normal</th>
<th>sbp &lt; 120 or dbp &lt; 80</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-Hypertension</td>
<td>sbp 121-139 with dbp 81-89</td>
</tr>
<tr>
<td>Stage 1</td>
<td>sbp 140-159 with dbp 90-99</td>
</tr>
<tr>
<td>Stage 2</td>
<td>sbp &gt;160 or dbp &gt; 100</td>
</tr>
</tbody>
</table>

Hypertensive Crises
- **HTN Crisis**: SBP > 179 or DBP > 109
- **Urgency**: either of the above without evidence of end organ damage
  - Treat with oral antihypertensive agents
- **Emergency**: elevated pressure with evidence of end organ damage
  - Treat with short-acting IV antihypertensive agents

Pathophysiology
Some precipitant which leads to vasoconstriction $\rightarrow$ mechanical stress and endothelial injury $\rightarrow$ increased vascular permeability as well as activation of coagulation factors and platelets $\rightarrow$ ischemia $\rightarrow$ RAS and sympathetic activation $\rightarrow$ further vasoconstriction as well as a pressure natriuretic at the level of the kidney which can lead to volume depletion and worsening perfusion

Evaluation
Clinical manifestations/Relevant Aspects of History/Exam
- CNS:
  - Encephalopathy: problems with cerebral autoregulation with increased permeability/edema
  - Stroke: Hemorrhagic/Ischemic
- Cardiac:
  - Myocardial Ischemia
  - HF/Pulmonary Edema
  - Aortic Dissection: check BP in both arms
- Renal:
  - Acute Kidney Injury
- Heme:
  - Microangiopathic Hemolytic Anemia
Management
Evaluation for Precipitants
- Medication non-compliance/Anti-Hypertensive withdrawal
- Progression of renal disease
- Endocrine: pheo, cushing’s, renin secreting tumors
- Drugs: cocaine, amphetamines, EPO, cyclosporine
- CNS: CVA, brain tumors
- Pregnancy

Medications
- 1st question: IV or PO
- 2nd question: is an arterial line necessary?
- 3rd question: agent

Medications in Hypertensive Emergency

<table>
<thead>
<tr>
<th>Medication</th>
<th>MOA</th>
<th>Indications</th>
<th>Adverse Effects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Labetalol</td>
<td>Alpha and Beta Blocker</td>
<td>ACS</td>
<td>Heart Block, bronchospasm</td>
</tr>
<tr>
<td>Esmolol</td>
<td>Beta 1 selective</td>
<td>Aortic Dissection</td>
<td></td>
</tr>
<tr>
<td>Nicardipine</td>
<td>CCB</td>
<td>Renal Failure</td>
<td>Reflex Tachycardia</td>
</tr>
<tr>
<td>Nitroprusside</td>
<td>Arterial/Venous Dilator</td>
<td>Pulmonary Edema, ACS</td>
<td>Cyanide Toxicity, Tachyphylaxis</td>
</tr>
<tr>
<td>Nitroglycerin</td>
<td>ACS</td>
<td>ACS</td>
<td></td>
</tr>
<tr>
<td>Fenoldopam</td>
<td>Dopamine 1 agonist</td>
<td>Add after B Blocker for Dissection if not at goal</td>
<td>Inc intraocular pressure, Hepatic Metabolism</td>
</tr>
<tr>
<td>Hydralazine</td>
<td>Direct venodilator</td>
<td></td>
<td>Reflex Tachycardia</td>
</tr>
</tbody>
</table>

Suggested Reading