Health Care Guideline

Hypertension Diagnosis and Treatment

The November 2014, Fifteenth Edition of ICSI’s Hypertension Diagnosis and Treatment Health Care Guideline incorporates a revision of our previous diagnosis content (2012) as well as an endorsement of the 2014 Evidence Based Guideline for the Management of High Blood Pressure in Adults Report from the Panel Members Appointed to the Eighth Joint National Committee (JNC 8).

To access the Diagnosis content, click here.

How to cite this document:

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ICSI has endorsed with qualifications the 2014 Evidence-Based Guideline for the Management of High Blood Pressure in Adults Report From the Panel Members Appointed to the Eighth Joint National Committee (JNC 8). This has been reviewed by the 2014 ICSI Hypertension Diagnosis and Treatment Work Group: I. Kenning, H. Maranga Kerandi, D. Luehr, K. Margolis, P. O’Connor, C. Pereira, A. Schlichte and T. Woolley. Additional work group information including the members declared conflicts of interest.

Each screening topic listed below includes the benefits and potential harms of all relevant recommendations. For certain recommendations, the ICSI work group has added qualifications.

Access the 2014 Evidence-Based Guideline for the Management of High Blood Pressure in Adults Report From the Panel Members Appointed to the Eighth Joint National Committee (JNC 8) through the links below to view the abstract.

The 2014 Evidence-Based Guideline for the Management of High Blood Pressure in Adults Report From the Panel Members Appointed to the Eighth Joint National Committee (JNC 8) is not a sponsor of, affiliated with, nor does it endorse ICSI or the ICSI Hypertension Diagnosis and Treatment Work Group. 2014 Evidence-Based Guideline for the Management of High Blood Pressure in Adults Report From the Panel Members Appointed to the Eighth Joint National Committee (JNC 8) has not reviewed ICSI’s process for endorsement of guidelines. The following ICSI endorsement and conclusions are solely the consensus of the ICSI Hypertension Diagnosis and Treatment Work Group using the ICSI Endorsement Process.

THE ICSI HYPERTENSION DIAGNOSIS AND TREATMENT WORK GROUP ENDORSED WITH QUALIFICATIONS THE FOLLOWING RECOMMENDATION

**Topic: Management**

<table>
<thead>
<tr>
<th>JNC 8 Recommendation (1) is endorsed by the ICSI Hypertension Diagnosis and Treatment Work Group with qualifications.</th>
<th>Quality of Evidence and Strength of Recommendation as evaluated by JNC 8</th>
</tr>
</thead>
<tbody>
<tr>
<td>“In the general population aged ≥ 60 years, initiate pharmacologic treatment to lower BP at systolic blood pressure (SBP) ≥ 150 mmHg or diastolic blood pressure (DBP) ≥ 90 mmHg and treat to a goal SBP &lt; 150 mmHg and goal DBP &lt; 90 mmHg.”</td>
<td>Quality of Evidence: GRADE A</td>
</tr>
<tr>
<td>Strength of Recommendation: Strong</td>
<td></td>
</tr>
</tbody>
</table>

Benefits: There is moderate- to high-quality evidence from RCTs that in the general population aged ≥ 60 years, treating HBP to a goal of < 150/90 mmHg reduces stroke, heart failure and coronary heart disease (CHD).

Harms: The side effects and costs of treatment and overtreatment should be considered.

Benefits-Harms Assessment: There is strong evidence from RCTs that the benefit of treatment exceeds the risks.

ICSI Hypertension Diagnosis and Treatment Work Group qualifications: The cardiovascular and renal benefits of treatment outweigh the risks for most patients. Careful attention should be given to monitoring for side effects, medication interactions and avoiding overtreatment. There is also evidence (albeit low-quality) that setting a goal SBP < 140 mmHg in this age group provides no additional benefit compared with a higher goal. In fit elderly patients, SBP values < 140 mmHg may be considered, whereas in the fragile elderly population, SBP goals should be adapted to individual tolerability.

In patients without diabetes or chronic kidney disease (CKD), a clinician may initiate treatment for hypertension in patients in the general population aged ≥ 60 years or older with a blood pressure ≥ 140/90 mmHg and treat to a goal of < 140/90 mmHg. See JNC 8 recommendations (5) and (6) for patients with diabetes or CKD.
QUALIFICATION FOR ENDORSEMENT:
The cardiovascular and renal benefits of treatment outweigh the risks for most patients. Careful attention should be given to monitoring for side effects, medication interactions and avoiding overtreatment. In fit elderly patients SBP values < 140 mmHg may be considered, whereas in the fragile elderly population, SBP goals should be adapted to individual tolerability.

In patients without diabetes or CKD, a clinician may initiate treatment for hypertension in patients in the general population aged ≥ 60 years or older with a blood pressure ≥ 140/90 mmHg and treat to a goal of < 140/90 mmHg.

JNC 8 Recommendation: Corollary to Recommendation (1) is endorsed by the ICSI Hypertension Diagnosis and Treatment Work Group with qualifications

<table>
<thead>
<tr>
<th>Quality of Evidence and Strength of Recommendation as evaluated by JNC 8</th>
</tr>
</thead>
<tbody>
<tr>
<td>“In the general population aged ≥ 60 years, if pharmacologic treatment for high BP results in lower achieved SBP (e.g., &lt; 140 mmHg) and treatment is well tolerated and without adverse effects on health or quality of life, treatment does not need to be adjusted.”</td>
</tr>
<tr>
<td>Quality of Evidence: GRADE E</td>
</tr>
<tr>
<td>Strength of Recommendation: Expert Opinion</td>
</tr>
</tbody>
</table>

Benefits:
Many patients in RCTs of patients aged ≥ 60 years achieved SBP < 140 mmHg without evidence of harmful effects.

Harms:
The side effects and costs of treatment and overtreatment should be considered.

Benefits-Harms Assessment:
There is also evidence (albeit low-quality) that setting a goal SBP < 140 mmHg in this age group provides no additional benefit compared with a higher goal.

ICSI Hypertension Diagnosis and Treatment Work Group Supplement:
N/A

THE ICSI HYPERTENSION DIAGNOSIS AND TREATMENT WORK GROUP ENDORSED THE FOLLOWING RECOMMENDATIONS

JNC 8 Recommendation (2) is fully endorsed by the ICSI Hypertension Diagnosis and Treatment Work Group

<table>
<thead>
<tr>
<th>Quality of Evidence and Strength of Recommendation as evaluated by JNC 8</th>
</tr>
</thead>
<tbody>
<tr>
<td>“In the general population &lt; 60 years, initiate pharmacologic treatment to lower BP at DBP ≥ 90 mmHg and treat to a goal DBP &lt; 90 mmHg. (For ages 30-59 years)”</td>
</tr>
<tr>
<td>Quality of Evidence: GRADE A (30-59 years)</td>
</tr>
<tr>
<td>Strength of Recommendation: Strong</td>
</tr>
<tr>
<td>Quality of Evidence: GRADE E (18-29 years)</td>
</tr>
<tr>
<td>Strength of Recommendation: Expert Opinion</td>
</tr>
</tbody>
</table>

Benefits:
There is high-quality evidence from RCTs that treating DBP to a goal of < 90 mmHg reduces stroke, heart failure and total mortality. There are no high or moderate-quality RCTs that assess the benefits of BP treatment for age < 30 years.

Harms:
The side effects and costs of treatment and overtreatment should be considered.

Benefits-Harms Assessment:
There is high-quality evidence from RCTs that the benefit of treatment exceeds the risks.

ICSI Hypertension Diagnosis and Treatment Work Group Supplement:
ICSI work group recommends that a trial of lifestyle modification may be utilized in a low-risk patient population.
<table>
<thead>
<tr>
<th>JNC 8 Recommendation (3) is fully endorsed by the ICSI Hypertension Diagnosis and Treatment Work Group</th>
<th>Quality of Evidence and Strength of Recommendation as evaluated by JNC 8</th>
</tr>
</thead>
</table>
| “In the general population < 60 years, initiate pharmacologic treatment to lower BP at SBP ≥ 140 mmHg and treat to a goal SBP < 140 mmHg.” | Quality of Evidence: GRADE E  
Strength of Recommendation: Expert Opinion |

**Benefits:**
Many of the patients in the RCTs that established the benefit of lowering DBP < 90 mmHg achieved SBP < 140 mmHg; however, the studies were designed to test DBP goals.

**Harms:**
The side effects and costs of treatment and overtreatment should be considered.

**Benefits-Harms Assessment:**
Based on expert opinion, the benefit of treatment exceeds the risks.

<table>
<thead>
<tr>
<th>ICSI Hypertension Diagnosis and Treatment Work Group Supplement:</th>
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<tr>
<td>N/A</td>
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<tr>
<th>JNC 8 Recommendation (4) is fully endorsed by the ICSI Hypertension Diagnosis and Treatment Work Group</th>
<th>Quality of Evidence and Strength of Recommendation as evaluated by JNC 8</th>
</tr>
</thead>
</table>
| “In the population aged ≥ 18 years with chronic kidney disease (CKD), initiate pharmacologic treatment to lower BP at SBP ≥ 140 mmHg or DBP ≥ 90 mmHg and treat to goal SBP < 140 mmHg and goal DBP < 90 mmHg.” | Quality of Evidence: GRADE E  
Strength of Recommendation: Expert Opinion |

**Benefits:**
There is moderate-quality evidence from RCTs that lowering BP to a lower BP goal (for example, < 130/80 mmHg) does not result in improved cardiovascular or renal outcomes compared with a goal < 140/90 mmHg. There is low-quality evidence that lowering BP < 130/80 mmHg improves renal outcomes in patients with proteinuria > 3 g/24hr.

**Harms:**
The side effects and costs of treatment and overtreatment should be considered.

**Benefits-Harms Assessment:**
There is moderate-quality evidence from RCTs that the benefit of treatment exceeds the risks.

<table>
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<tr>
<th>ICSI Hypertension Diagnosis and Treatment Work Group Supplement:</th>
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</table>
| This recommendation applies to patients with CKD < 70 years with an estimated GFR or measured GFR less than 60 ml/min/1.73 m2 and in people of any age with albuminuria defined as a greater than 30 mg of albumin/g of creatinine at any level of GFR.  
There is insufficient evidence to recommend a specific BP goal for patients with CKD aged ≥ 70 years. In the fragile elderly population, SBP goals should be adapted to individual tolerability. | |

<table>
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<tr>
<th>JNC 8 Recommendation (5) is fully endorsed by the ICSI Hypertension Diagnosis and Treatment Work Group</th>
<th>Quality of Evidence and Strength of Recommendation as evaluated by JNC 8</th>
</tr>
</thead>
</table>
| “In the population aged ≥ 18 years with diabetes, initiate pharmacologic treatment to lower BP at SBP ≥ 140 mmHg or DBP ≥ 90 mmHg and treat to a goal SBP < 140 mmHg and goal DBP < 90 mmHg.” | Quality of Evidence: GRADE E  
Strength of Recommendation: Expert Opinion |

**Benefits:**
There is high-quality evidence from RCTs that patients with diabetes and hypertension benefit from treatment. No RCTs specifically addressed whether treatment to an SBP goal < 140 mmHg compared with a higher goal (for example, < 150 mmHg) improves health outcomes in adults with diabetes and hypertension. However, one high-quality treatment trial found achieved SBP < 140 mmHg lowered mortality compared with an achieved SBP < 150 mmHg. No RCTs provide sufficient support for an even lower SBP goal (for example, < 130 mmHg or < 120 mmHg).

**Harms:**
The side effects and costs of treatment and overtreatment should be considered.

**Benefits-Harms Assessment:**
Based on expert opinion, the benefit of treatment exceeds the risks.
In the fragile elderly population, SBP goals should be adapted to individual tolerability.

### JNC 8 Recommendation (6) is fully endorsed by the ICSI Hypertension Diagnosis and Treatment Work Group

#### Benefits:
There is moderate-quality evidence that beta-blockers and alpha-blockers are inferior to thiazide-type diuretic, calcium channel blocker (CCB), angiotensin-converting enzyme inhibitor (ACEI) or angiotensin receptor blocker (ARB) for the initial treatment of hypertension. There are no RCTs comparing other drug classes to thiazide-type diuretic, calcium channel blocker, angiotensin-converting enzyme inhibitor or angiotensin receptor blocker for the initial treatment of hypertension.

#### Harms:
The side effects and costs of treatment and overtreatment should be considered.

#### Benefits-Harms Assessment:
There is moderate-quality evidence from RCTs that the benefit of treatment with these classes of drugs exceeds the benefit of alternative classes.

### JNC 8 Recommendation (7) is fully endorsed by the ICSI Hypertension Diagnosis and Treatment Work Group

#### Benefits:
There is moderate-quality evidence from a large RCT (ALLHAT) that a thiazide diuretic was superior to an ACEI in preventing heart failure, cerebrovascular and combined cardiovascular outcomes in the black patient subgroup. This subgroup contained large numbers of people with diabetes. The CCB was less effective than the thiazide in preventing heart failure but similar in other outcomes.

#### Harms:
The side effects and costs of treatment and overtreatment should be considered.

#### Benefits-Harms Assessment:
There is moderate-quality evidence from a single RCT that the benefit of treatment with these classes of drugs exceeds the benefit of ACEI.

### ICSI Hypertension Diagnosis and Treatment Work Group Supplement:

N/A
<table>
<thead>
<tr>
<th>JNC 8 Recommendation (8) is fully endorsed by the ICSI Hypertension Diagnosis and Treatment Work Group</th>
<th>Quality of Evidence and Strength of Recommendation as evaluated by JNC 8</th>
</tr>
</thead>
</table>
| “In the population aged ≥ 18 years with CKD, initial (or add-on) antihypertensive treatment should include an ACEI or ARB to improve kidney outcomes. This applies to all CKD patients with hypertension regardless of race or diabetes status.” | Quality of Evidence: GRADE B  
Strength of Recommendation: Moderate |

**Benefits:**  
There is moderate-quality evidence from RCTs that renal outcome, but not necessarily cardiovascular outcomes, are improved with ACEI or ARB therapy in patients with CKD. This includes black patients with CKD.  
**Harms:**  
The side effects and costs of treatment and overtreatment should be considered. Specific side effects of ACEI and ARB therapy (hyperkalemia and worsening renal function) are more common in patients with CKD.  
**Benefits-Harms Assessment:**  
There is moderate evidence from RCTs that the benefit of treatment exceeds the risks.  

**ICSI Hypertension Diagnosis and Treatment Work Group Supplement:**  
This recommendation applies to patients with CKD < 70 years with an estimated GFR or measured GFR less than 60 mL/min/1.73 m2 and in people of any age with albuminuria defined as a greater than 30 mg of albumin/g of creatinine at any level of GFR.  

<table>
<thead>
<tr>
<th>JNC 8 Recommendation (9) is fully endorsed by the ICSI Hypertension Diagnosis and Treatment Work Group</th>
<th>Quality of Evidence and Strength of Recommendation as evaluated by JNC 8</th>
</tr>
</thead>
</table>
| “The main objective of hypertension treatment is to attain and maintain goal BP. If goal BP is not reached within a month of treatment, increase the dose of the initial drug or add a second drug from one of the classes in recommendation 6 (thiazide-type diuretic, CCB, ACEI, or ARB). The clinician should continue to assess BP and adjust the treatment regimen until goal BP is reached. If goal BP cannot be reached with two drugs, add and titrate a third drug from the list provided. Do not use an ACEI and an ARB together in the same patient. If goal BP cannot be reached using only the drugs in recommendation 6 because of a contraindication or the need to use more than three drugs to reach goal BP, antihypertensive drugs from other classes can be used. Referral to a hypertension specialist may be indicated for patients in whom goal BP cannot be attained using the above strategy or for the management of complicated patients for whom additional clinical consultation is needed.” | Quality of Evidence: GRADE E  
Strength of Recommendation: Expert Opinion |

**Benefits:**  
More than one drug is frequently required to achieve BP goal. There is strong evidence from RCTs that combined ACEI and ARB therapy is harmful. The recommendation was implemented to provide guidance to clinicians for implementing recommendations 1-8.  
**Harms:**  
The side effects and costs of treatment and overtreatment should be considered.  
**Benefits-Harms Assessment:**  
There is high-quality evidence from RCTs that the benefit of treatment exceeds the risks.  

**ICSI Hypertension Diagnosis and Treatment Work Group Supplement:**  
N/A
### JNC 8 in support of ACC/AHA Healthy Lifestyle Recommendations for Adults with Elevated BP – advise adults who would benefit from BP lowering to:

<table>
<thead>
<tr>
<th>Topic</th>
<th>JNC 8 in support of ACC/AHA Healthy Lifestyle Recommendations Diet BP: Advise adults who would benefit from BP lowering (1) is fully endorsed by the ICSI Hypertension Diagnosis and Treatment Work Group</th>
<th>Quality of Evidence and Strength of Recommendation as evaluated by JNC 8</th>
</tr>
</thead>
<tbody>
<tr>
<td>“Consume a dietary pattern that emphasizes intake of vegetables, fruits, and whole grains; includes low-fat dairy products, poultry, fish, legumes, non-tropical vegetable oils, and nuts; and limits intake of sweets, sugar-sweetened beverages, and red meats.</td>
<td>Quality of Evidence: GRADE A</td>
<td>Strength of Recommendation: Strong</td>
</tr>
<tr>
<td>a. Adapt this dietary pattern to appropriate calorie requirements, personal and cultural food preferences, and nutrition therapy for other medical conditions (including diabetes).</td>
<td></td>
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<tr>
<td>b. Achieve this pattern by following plans such as the DASH dietary pattern, the USDA Food Pattern, or the AHA Diet.”</td>
<td></td>
<td></td>
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<tr>
<td>Benefits:</td>
<td>There is high-quality evidence from RCTs that the healthy lifestyle recommendations listed lower BP.</td>
<td></td>
</tr>
<tr>
<td>Harms:</td>
<td>There is little or no risk to these recommendations.</td>
<td></td>
</tr>
<tr>
<td>Benefits-Harms Assessment:</td>
<td>Benefit with little or no risk.</td>
<td></td>
</tr>
<tr>
<td>ICSI Hypertension Diagnosis and Treatment Work Group Supplement:</td>
<td>N/A</td>
<td></td>
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</table>

<table>
<thead>
<tr>
<th>JNC 8 in support of ACC/AHA Healthy Lifestyle Recommendations Diet BP: Advise adults who would benefit from BP lowering (2) is fully endorsed by the ICSI Hypertension Diagnosis and Treatment Work Group</th>
<th>Quality of Evidence and Strength of Recommendation as evaluated by JNC 8</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lower sodium intake. (1)</td>
<td>Quality of Evidence:</td>
</tr>
<tr>
<td>a. Consume no more than 2,400 mg of sodium/d (2)</td>
<td>1. GRADE A</td>
</tr>
<tr>
<td>b. Further reduction of sodium intake to 1500 mg/d can result in even greater reduction in BP (2)</td>
<td>2. GRADE B</td>
</tr>
<tr>
<td>c. Even without achieving these goals, reducing sodium intake by at least 1000 mg/d lowers BP (2)</td>
<td>Strength of Recommendation:</td>
</tr>
<tr>
<td></td>
<td>1. Strong</td>
</tr>
<tr>
<td></td>
<td>2. Moderate</td>
</tr>
<tr>
<td>Benefits:</td>
<td>There is high-quality evidence from RCTs that the moderate sodium restrictions lower BP.</td>
</tr>
<tr>
<td>Harms:</td>
<td>There is low-quality evidence that more extreme sodium restriction might have adverse effects.</td>
</tr>
<tr>
<td>Benefits-Harms Assessment:</td>
<td>There is high-quality evidence that the moderate sodium restrictions lower BP with little risk in hypertensive patients.</td>
</tr>
<tr>
<td>ICSI Hypertension Diagnosis and Treatment Work Group Supplement:</td>
<td>N/A</td>
</tr>
<tr>
<td><strong>JNC 8 in support of ACC/AHA Healthy Lifestyle Recommendations Diet BP (2 and 3 combined) is fully endorsed by the ICSI Hypertension Diagnosis and Treatment Work Group</strong></td>
<td><strong>Quality of Evidence and Strength of Recommendation as evaluated by JNC 8</strong></td>
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</tbody>
</table>
| “Combine the DASH dietary pattern with lower sodium intake.” | Quality of Evidence: GRADE A  
Strength of Recommendation: Strong |
| **Benefits:**  
There is strong evidence from RCTs that the DASH dietary pattern combined with moderate sodium restrictions lowers BP.  
**Harms:**  
There is little or no risk to these recommendations.  
**Benefits-Harms Assessment:**  
There is strong evidence from RCTs that the benefit of treatment exceeds the risks.  
**ICSI Hypertension Diagnosis and Treatment Work Group Supplement:**  
N/A |
| **JNC 8 in support of ACC/AHA Healthy Lifestyle Recommendation Physical Activity BP (1) is fully endorsed by the ICSI Hypertension Diagnosis and Treatment Work Group** | **Quality of Evidence and Strength of Recommendation as evaluated by JNC 8** |
| “In general, advise adults to engage in aerobic physical activity to lower BP: 3-4 sessions per week, lasting on average 40 minutes per session, and involving moderate to vigorous intensity physical activity.” | Quality of Evidence: GRADE B  
Strength of Recommendation: Moderate |
| **Benefits:**  
There is moderate-quality evidence that exercise lowers BP.  
**Harms:**  
In some patients with clinically undetected cardiac disease or other health problems initiating exercise could pose risks.  
**Benefits-Harms Assessment:**  
The benefit of aerobic exercise exceeds the risk with adequate screening or patients for pre-existing conditions.  
**ICSI Hypertension Diagnosis and Treatment Work Group Supplement:**  
N/A |