



INDIAN HEALTH SERVICE
National Pharmacy and Therapeutics Committee
Formulary Brief: Hypertension
-May 2022-



Background:

The National Pharmacy and Therapeutics Committee (NPTC) met in May 2022 to discuss cardiovascular conditions in which hypertension (HTN) guidelines were included. The NPTC also reviewed HTN guidelines in [2014](#) and [2018](#). It is estimated that $\leq 50\%$ of patients with HTN are at goal for their guideline-recommended blood pressure target.¹ The 10-year-risk of a major cardiovascular (CV) event associated with HTN is estimated to double for every 20/10 mm Hg rise in blood pressure (BP) over 115/75 mmHg.¹³ Reduction of major CV disease risk is estimated as 10% annual risk reduction for every 5 mmHg reduction in systolic BP (SBP) for those people diagnosed with HTN.⁹ AI/AN people experience an increased burden of HTN and CV risk compared to the total US population.¹⁴ Following this therapeutic analysis, **no modifications were made** to the National Core Formulary.

Discussion:

Proper measurement of BP is considered a critical step in the diagnosis and treatment of HTN. Improvement in HTN diagnosis and treatment necessitates proper BP measurement, whether clinic or home BP measurement. Non-pharmacologic management of hypertension is universal and includes recommendations for weight loss in a majority of patients, sodium restriction, regular physical activity and smoking cessation.

Tailoring BP targets and management for individual patient characteristics is shared across all HTN guidelines. Prior history of *ischemic heart disease (IHD)* and greater than 10% ten-year risk for IHD are utilized to tailor thresholds for initiation of pharmacotherapy and determining BP targets by the American Heart Association/American College of Cardiology (AHA/ACC) and International Society of Hypertension (ISH) guidelines. The ISH recommends a lower target for treatment (130/80) in people with IHD/10% ten-year risk. The AHA/ACC utilizes the same criteria to identify patients with a lower threshold for initiating pharmacotherapy.

Diabetes and its complications bring numerous considerations for HTN management.⁴ Medication selection typically includes angiotensin-converting enzyme inhibitors (ACE-i) or angiotensin receptor blockers (ARB) as first line in people with diabetes due to high prevalence of chronic kidney disease (CKD). The ADA also recommends tightened control targets for those with IHD or at risk.

KDIGO guidelines recommend ACE-i/ARB drugs as first line therapy and a lower threshold for initiation and target BP for treatment in people with CKD not on dialysis.

Older age is frequently identified as a special consideration for HTN treatment. The AHA/ACC guideline recommends a 130 mm Hg SBP target for people age 65 years and older. A diastolic BP (DBP) target is *not* identified to highlight that excessive lowering of DBP is a risk for acute MI- a risk more likely in elders given the age-associated reduction in vascular compliance. Additional considerations among elders include; avoiding orthostatic hypotension, polypharmacy, and increased risk for adverse drug reactions (ADRs).

Antihypertensive medications recommended as first-line treatments among different guidelines were all from the following four classes: ACE-i, ARB, dihydropyridine calcium channel blockers (CCB), and thiazide diuretics (THZ). Avoiding co-administration of ACE-i and ARB drugs is a universal recommendation. Guidelines generally consider B-blockers as second-line therapy and their initiation is recommended only when indicated for a comorbidity, resistant HTN, or use as indicated due to CHF or acute MI. People with well controlled BP and tolerating B-blockers should not be switched. ARB utilization with a drug such as spironolactone is also universally recommended as second-line among guidelines when addressing resistant hypertension.

Meta analyses comparing the four (4) first-line drug classes for mortality benefit were reviewed.⁶⁻⁸ THZ drugs show small but statistically significant mortality benefit compared to the other classes when administered in low doses.⁶ High-dose THZ drugs lose their mortality benefit at high doses, possibly due to impact of hypokalemia, hyponatremia and other ADR's associated with them.⁶ All first-line BP drug classes appear to have no clinically significant advantage comparatively and the mortality benefit of BP lowering in persons with HTN is independent of the drug classes used to achieve the treatment target.⁹

Most people with well-controlled HTN receive two or more antihypertensive agents. Two or more agents administered at submaximal doses are more effective and less likely to cause ADRs than a single drug at maximal dose.¹⁰ Most HTN guidelines recommend fixed dose combinations of antihypertensive drugs in an effort to reduce pill burden and improve

adherence. Utilization of fixed dose combinations is based on expert opinion and non-randomized studies.¹ Practical difficulties with dose titration, ADR management, and a lack of evidence of long-term BP control or mortality benefit with fixed dose combinations is noted.¹²

Many factors must be considered when treating HTN. Familiarity with HTN treatment guidelines is encouraged for all providers involved with HTN treatment. Guidelines are routinely cited as quality standards and while deviation from guidelines is often desirable or necessary, it should be well-reasoned and part of shared decision-making with patients.

Findings:

No formulary changes were made during this meeting. Committee discussion centered on utilization of fixed-dose combinations of first-line antihypertensive agents. After discussion about the benefits and potential drawbacks of fixed dose combination antihypertensive drugs, no changes were made to the National Core Formulary. The current formulary contains all the first-line drug classes necessary to provide effective and safe antihypertensive therapy.

Organization	Threshold for Pharmacotherapy	Agent	Target
AHA/ACC	≥130/80 if IHD or CV risk > 10% ≥140/ 90 if low risk	Dual Rx if BP >20/>10 over target β-blockers 2 nd line	<130/80 <140/90 if CVA <130 if over 65 yo
European Society of Cardiology	>130-139/85-89-Lifestyle ≥140/90 Lifestyle and Rx	Dual Rx if ≥140/90 1 Rx if elder β-blockers 2 nd line	<140/90 for all <130/80 if CVD Risk or < 65 yo
International Society of Hypertension	130-159/85-99 confirm BP is elevated ≥160/100-institute prompt Rx	Dual agent first β-blockers 2 nd line	< 65 yo- <130/80 ≥ 65 yo < 140/90
ADA	≥ 120/80- Lifestyle Rx ≥140/90- prompt Rx 1 drug and lifestyle ≥160/100-prompt Rx 2 drugs and lifestyle	ACE or ARB to Max dose with albuminuria 1st	<140/90 <130/80 if CVD risk ≥ 15% ten-year risk
KDIGO	> 129 SBP if BP properly measured	ACE or ARB to max in Albuminuria	<120/80 and BP properly measured

If you have any questions regarding this document, please contact the NPTC at IHSNPTC1@ihs.gov. For more information about the NPTC, please visit the [NPTC website](#).

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