STANFORD HOSPITAL AND CLINICS

ADULT HYPERTENSION PROTOCOL
STANFORD COORDINATED CARE

I. PURPOSE

To establish guidelines for the monitoring of antihypertensive therapy in adult patients and to define the roles and responsibilities of the collaborating clinical pharmacist and pharmacy resident.

SUPPORTIVE INFORMATION

Goal of Therapy

The ultimate goal of antihypertensive therapy is the reduction of cardiovascular and renal morbidity and mortality. Since most persons with hypertension, especially those age >50 years, will reach the DBP goal once SBP is at goal, the primary focus should be on achieving the SBP goal. Treating SBP and DBP to targets that are <140/90 mmHg is associated with a decrease in CVD complications. In patients with hypertension and renal disease, the BP goal is <130/80 mmHg.

Classification of blood pressure and treatment

Stage	Blood pressure	Treatments
Normal	<120/ <80	Encouraged
Pre-HTN	120-139/80-89	Lifestyle modifications. Consider drug tx if compelling indications* (DM, chronic kidney disease).
Stage 1 HTN	140-159/90-99	Lifestyle modifications and drug therapy.
Stage 2 HTN	≥160/≥100	Lifestyle modifications and drug therapy.
Urgency	>190/120	Consult physician.

Blood pressure goals

Diagnosis	Blood Pressure Goal
*Without compelling indications (see below)	<140 systolic
Diabetes	<140 systolic (< 130 systolic optional if no risk of falls)
ESRD/CHF	<130 systolic

*Compelling indications: heart failure, ischemic heart disease, post-MI, diabetes, chronic kidney dx, recurrent stroke prevention and high coronary vascular disease risk.

II. PROCEDURE

Clinic Visit

During the first visit, the following topics will be addressed to individualize therapy:

- Patient's goals
- PAM
- Medical history, surgical history, social history, and family history
- Current medications (prescription, nonprescription, herbal and/or recreational, including alcohol and tobacco use)
- Provide basic education of hypertension and possible complications related to HTN
- Goals of therapy
- Lifestyle modification

During follow-up visits, the following topics will be addressed

- Adherence with therapy (medication, diet, exercise, stress management)
- Efficacy of therapy and need for adjustment
- HTN education reinforcement

Follow-up visits will be scheduled at 2 weeks to 6 months depending on patients' responses to and adherence with treatment.

Physical Assessment

The following physical assessments on each visit should be performed

- Vital signs (BP and pulse rate) Note: large BP cuff should be used if patient is >200 pounds
- Visual inspection (i.e., peripheral edema)
- Weight

Medication Management

The clinical pharmacist or pharmacy resident is authorized to initiate, modify, or discontinue the following medications

- Diuretics
- Beta-blockers

- ACEIs
- ARBs
- Calcium channel blockers
- Alpha-blockers
- Vasodilators
- Centrally acting alpha-agonists

The clinical pharmacist or pharmacy resident will contact the primary physician on the initiation of the above medications or if a medication requires discontinuation.

The clinical pharmacist or pharmacy resident will provide drug education when a new drug is initiate and at follow-up visits.

The clinical pharmacist or pharmacy resident should always use the least expensive approach unless such an approach would endanger the patient.

Patient Education

Patient education materials can be supplied to the patient by accessing Lexicomp/Up-to-Date in the Lane Library on EPIC or the SHC intranet. The following topics can be printed for the patient:

- High Blood Pressure in Adults – The Basics
- Medicines for High Blood Pressure
- Controlling Your Blood Pressure Through Lifestyle
- Hypertension Diet – DASH diet

Action Plan

The patient's action plan will be determined at the end of visit and updated in EPIC in the problem list under Care Coordinator note.

Documentation

All patient encounters will be documented in the patient electronic medical record. Recommendations to change of therapy will be routed to the provider and care coordinated at close of visit.

Follow-up

Any necessary follow-up lab work will be completed one week after the initiation or dose increase of a HCTZ, ACEI or ARB.

III. PROTOCOL

Table 1: Initial Visit Protocol

Assessment	Plan
Not on drug treatment 140-159 systolic	Diuretic, reinforce lifestyle modification
Not on drug treatment ≥160 systolic	Begin with combination of diuretic and second-line/add-on drug, consider compelling reasons for choice of one or more drugs, reinforce lifestyle modification
Non adherence to regimen	Address reasons for non-adherence, adjust regimen, monitor adherence.
140-159 systolic on 1-2 medications	Increase dose or add another medication. Reinforce lifestyle modifications
≥160 systolic on 1 medication	Add combination of two drugs, reinforce lifestyle modification
≥180 systolic on 3 medications	Consult primary care physician regarding reasons for resistant hypertension, refer for work-up for secondary causes of hypertension as needed
At goal, no barriers to ongoing adherence	Continue present treatment, reinforce lifestyle modification

Table 2: Follow-up Visit Protocol

Assessment	Plan
At goal	Continue present treatment, reinforce lifestyle modification
BP < 10mmHg above goal	Increase dose or add another second- or third-line drug
BP ≥ 10mmHg above goal	Add another second- or third-line drug and increase doses of other agents. If other agent(s) at or above mid-dose, add a combination of 2 additional drugs.
Non-adherence to regimen	Address reasons for non-adherence, enlisting family members and other social support, use electronic medication monitor to provide feedback and reinforcement.
≥180 systolic on 3 BP meds	Consult patient's physician

Table 3: First Line Drug Choices

Diagnosis	Drug Class
Uncomplicated Hypertension	Thiazide diuretic (maximum dose 25 mg)
Diabetes mellitus with or without proteinuria	ACE inhibitor or ARB
Isolated systolic hypertension (elderly)	Diuretic CCB (long-acting dihydropyridine)
Heart failure: left ventricular dysfunction	ACE inhibitor Beta-blocker Diuretic ARB Aldosterone antagonist
High risk CHD	Diuretic ACE inhibitor/ARB Beta-blocker Long-acting CCB
Post MI	ACE inhibitor Beta-blocker Aldosterone antagonist
Stroke Prevention	Diuretic ACE inhibitor
Chronic kidney disease	Short-acting ACE inhibitor ARB

*See individual drug protocols for exclusion criteria and algorithm.

Table 4: Drugs the May Have Unfavorable Effects on Comorbid Conditions

Condition	Drug Therapy to Avoid
Angiodema	ACEI
Bronchospastic disease	Beta-blocker
Gout	Thiazide diuretic
Heart block (second or third degree)	Beta-blocker, CCB (non-DHP)
Hyponatremia	Thiazide diuretic
Potassium >5 mEq/L before treatment	Potassium sparing diuretic, aldosterone antagonist
Pregnancy or those likely to become pregnant	ACEI, ARB

Table 5: Lifestyle Modifications

Modification	**Recommendation**	**Average SBP reduction**
Weight reduction	Maintain BMI of 18.5-24.9	5-20 mmHg/10kg weight loss
Adopt a DASH (Dietary Approaches to Stop Hypertension) eating plan	Consume diet rich in fruits, vegetables and low dairy products with a reduced content of saturated and total fat	8-14 mmHg
Dietary sodium restriction	Reduce dietary sodium intake to not more than 2.4 g of Na	2-8 mmHg
Physical Activity	Engage in regular aerobic physical exercise for at least 30 minutes/day, most days of the week	4-9 mmHg
Moderation of alcohol consumption	Limit consumption to not more than 2 drinks (1 oz of ethanol)/day in most men and 1 drink per day in women and light weight persons	2-4 mmHg
Minerals	Maintain adequate intake of potassium 4700 mg/day, calcium 1240 mg/day and magnesium 500 mg/day	No data

IV. DOCUMENTATION

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