

Problem: Untreated or poorly controlled hypertension

(Systolic BP ≥ 160 and/or diastolic BP >90 mmHg)

Goal: *BP $<140/90$ mmHg, unless there are mitigating clinical circumstances. (i.e. patients with hypertension, coronary artery disease and/or diabetes BP goal $<120/80$ mmHg)*

Solution:

1. Collect clinical details

Assess the patient's pulse rate and blood pressure on two occasions

- ✓ Has the patient been prescribed an antihypertensive medication?
- ✓ If yes, is the patient compliant? If the patient is not compliant, why not? (e.g. side effects, cost, difficulty remembering, cognitive impairment - see ***Barriers to compliance***)
- ✓ Does the patient take a drug, which may interfere with BP control? (e.g. NSAID, corticosteroid, decongestants - see ***Guidelines for use***)
- ✓ Does the patient have symptoms related to hypertension (see ***Background facts***)?
- ✓ Does the patient's diet have a high salt content?
- ✓ Assess the patient's weight and lifestyle, including alcohol use.

2. Inform the physician

- ***If the patient is not on any antihypertensive:***
 - a. Ask if physician would like to see patient
 - b. Ask if physician would like to start an antihypertensive (reference #1 JNC 7 guidelines; tables 6-7)
- ***If the patient is on an antihypertensive, but not on any interfering drug:***
 - a. Inform physician of patient compliance (& if non-compliant, the reason)
 - b. Ask if physician would like to see patient
 - c. Ask if physician would like to change any medications
- ***If the patient is on an NSAID***
 - a. Inform physician of potential for interference
 - b. Go through suggestions for NSAIDs
- ***If the patient is on decongestant or sympathomimetic (eg. pseudoephedrine, Sudafed):***
 - a. Inform physician of medication and of potential for interference
 - b. Ask if physician would like the patient to stop taking interfering drug
- ***If patient is on a corticosteroid:***
 - a. Inform the physician, and ask what to do.

3. Ask for follow-up instructions

- When should blood pressure be taken?
- Patient reassessment by physician?

Per JNC 7 guidelines¹:

- a) Monthly follow-ups until Bp reaches goal
- b) Once BP is at goal, follow-ups every 3-6 months depending on patient's condition.
- c) Electrolytes, including serum Potassium and creatinine should be monitored at least 1- 2 times/year.

4. Discuss with patient/caregiver

- Consequences of uncontrolled blood pressure
- If NSAID, then pain materials (see below)
- Compliance issues (see below)

Background Information-based on JNC-7 Guidelines

Facts:

1. Hypertension is defined as systolic blood pressure of ≥ 140 mmHg and/or diastolic blood pressure of ≥ 90 mmHg measured on at least two occasions¹.
2. Individuals with a systolic blood pressure of 120–139 mmHg or a diastolic blood pressure of 80–89 mmHg should be considered as prehypertensive and require health-promoting lifestyle modifications to prevent cardiovascular disease (CVD)¹.
3. Hypertension is the main cause of stroke and is an important risk factor for myocardial infarction and other cardiovascular diseases such as congestive heart failure and aortic aneurysm.
4. Hypertension is usually symptom less until it has caused end-organ damage such as heart failure, angina, stroke and renal failure. Very high blood pressure may cause headaches.
5. Hypertension is increasingly common as people get older, but it should not be regarded as a benign occurrence. It is one of the reasons that elderly people are at increased risk of cardiovascular disease.
6. The benefits of treating both diastolic and systolic hypertension in older people are well established. Trials have shown that treatment reduces the risk of having a major cardiovascular event such as stroke or myocardial infarction by about one third².
7. The risk of having a major cardiovascular event is highest in elderly people. Therefore, the treatment of hypertension in older people will result in a bigger reduction in numbers of cardiovascular events than the treatment of high blood pressure in younger people.
8. Classification and management of blood pressure for adults¹.

BP Classification	SBP mmHg	DBP mmHg	Lifestyle Modification	Initial Drug Therapy	
				Without Compelling Indication	With Compelling Indications
Normal	<120	And <80	Encourage	No antihypertensive Drug indicated	Drug(s) for compelling indication
Prehypertension	120-139	Or 80-89	Yes		
Stage 1 Hypertension	140-159	Or 90-99	Yes	Thiazide-type diuretic for most. May consider ACEI, ARB, BB, CCB, or combination	Drug(s) for compelling indications. Other antihypertensive drugs (diuretic, ACEI, ARB, BB, CCB) as needed
Stage 2 Hypertension	≥160	Or ≥100	Yes	Two-drug combination for most (usually thiazide-type diuretic and ACEI or ARB or BB or CCB)	

(Refer to Reference 1, JNC 7 website, Table 8 for further guidelines)

Guidelines for Use:

- Blood pressure should be reduced slowly and cautiously in elderly people because of the risks
- of postural hypotension and adverse drug reactions.
- Lifestyle changes can be an alternative to drugs in mild hypertension and can reduce medication
- needs in more severe cases. They include:
 1. Diet modification and weight reduction
 2. Routine physical activity
 3. Moderation of alcohol consumption.

Life Style modifications to manage hypertension suggested by JNC 7 guidelines¹.

Modification		Recommendation	Approximate SBP Reduction (Range)
Diet Modification (consult nutritionist if available)	Weight Reduction	Maintain normal body weight (body mass index 18.5-24.9kg.m ²)	5-20mmHg/10kg weight loss
	Adopt DASH* eating plan	Consume a diet rich in fruits, vegetables, and low fat dairy products with reduced content of saturated and total fat	8-14mmHg
	Dietary Sodium Intake	Reduce dietary sodium intake to no more than 100mmol/day (2.4g sodium or 6g sodium chloride)	2-8mmHg
Physical activity		Engage in regular aerobic physical activity such as brisk walking (at least 30 min per day, most days of the week)	4-9mmHg
Moderation of alcohol consumption		Limit consumption to no more than 2 drinks (1oz or 30ml ethanol; e.g. 24oz beer, 10oz wine, or 3oz 80-proof whiskey) per day in most men and to no more than 1 drink per day in women and lighter weight persons.	2-4mmHg

*DASH (Dietary Approach to Stop Hypertension) eating plan

(More information on DASH can be found at:

<http://www.nhlbi.nih.gov/health/public/heart/hbp/dash/index.htm>)

- A number of drugs can increase blood pressure or interfere with anti-hypertensive treatment.
 1. **Corticosteroids** raise blood pressure by causing the kidneys to retain sodium and by acting on the renin-angiotensin system which plays an important role in blood pressure regulation.
 2. **Non-steroidal anti-inflammatory drugs (NSAIDs)** increase sodium retention and may raise blood pressure and interfere with the anti-hypertensive effects of diuretics, β -blockers and ACE inhibitors. All NSAIDs, including Vioxx, have this property.
 3. **Decongestants** which contain sympathomimetic agents such as pseudoephedrine (e.g. Actifed, Sinutab, Sudafed) and Note: phenylpropanolamine is no longer available in the US. Re-formulated products such as Poly-Histine, Profen, Triaminic may contain pseudoephedrine and can increase blood pressure.
- Compliance is a particular problem for anti-hypertensive medication because the

condition is usually symptom less, treatment is lifelong and the side-effects of treatment may seem to the patient to be worse than the disease. If non-compliance is suspected, try to determine the reason for it and an appropriate intervention.

Barriers to compliance and suggested interventions

- Difficulty reading drug label due to impaired vision
 - ✓ Ask pharmacist to use large type on labels.
 - ✓ Use color-coding system.
- Impaired dexterity due to arthritis, stroke, etc.
 - ✓ Use non-childproof containers.
- Difficulty remembering to take drugs
Note: cognitive impairment may interfere with adherence (both over & under) and the ability to report adverse effects.
 - ✓ Write out medication schedule.
 - ✓ Use compliance aids (medication boxes/calenders).
 - ✓ Involve care giver.
 - ✓ Explore longer acting formulations with pharmacist.
 - ✓ High cost of drugs
 - ✓ Discuss alternatives with physician and pharmacist.
 - ✓ Suggest generic drugs.
 - ✓ Obtain drugs through pharmaceutical company indigent program (i.e. www.togetherrx.com www.needymeds.com, www.medpin.org)
- Encourage lifestyle modifications where appropriate.
- Lack of knowledge about reasons for medication
 - ✓ Provide information the patient can understand.
 - ✓ Allow time for questions, concerns and repetition.
- Side effects
 - ✓ Determine what adverse symptoms the patient is experiencing.
 - ✓ Discuss alternatives with pharmacist and/or physician.

Note from Geriatric Advisory Panel: Ask MD to write diagnosis on the prescription directions so that it will be included on the prescription label. Often one medication is used for more than one condition.

References:

1. The Seventh Report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure. National Institute of Health Publication No. 03 - 5233, May 2003
<http://www.nhlbi.nih.gov/guidelines/hypertension>

2. National High Blood Pressure Education Program Working Group. Hypertension in the elderly.

Hypertension 1994; **23**: 275-285

3. Hashizume, Sato. Home Health Care. In: Chenitz WC, Stone JT, Salisbury SA (eds) *Clinical Gerontological Nursing*. Philadelphia: W.B. Saunders Company, 1991.

Problem: Untreated or poorly controlled hypertension

Solution Step 2 - Informing the Physician

Patients identified by the study screening procedures have a potential medication problem. However, we do not know everything about the patient and their medical history, and there may be good clinical reasons for the physician to have prescribed for the patient as s/he did. The physician may be aware of the potential problem, but have chosen that treatment as the best compromise for that particular patient.

He/she may be alarmed that the patient has been identified as having a problem, feel defensive because his treatment is being called into question and be worried about patient complaints and litigation. Tact and diplomacy are therefore extremely important.

Before calling the physician, discuss what you are going to say with the study pharmacist.

Suggested approach:

1. Introduce yourself, say you are from agency and tell the physician the name of the patient you are calling about.

2. Explain why you are calling.

I'm calling you about your patient X (patient's name). X has been identified by a hypertension screening procedure with a problem that may be related to medication. This does not mean that X necessarily has a medication problem, but simply that it would be worth re-evaluating him/her. I'd like to discuss the case with you to see if you think it is worth pursuing further.

3. Describe the identified potential problem.

The screening identified X as possibly having poorly controlled hypertension. This was because X's blood pressure was ≥ 160 systolic and/or >90 diastolic on two separate occasions.

4. Proceed with the remainder of the discussion according to the guideline and the category to which the patient belongs.

Problem: Orthostasis (≥ 20 mmHg drop in blood pressure) and dizziness on standing, with use of a diuretic or antihypertensive drug

Goal: No dizziness on standing and a smaller postural blood pressure drop

Solution:

1. **Collect clinical details**
 - What symptoms of orthostasis does the patient have?
 - What is the patient's blood pressure sitting (or lying) and standing?
 - What medications is the patient currently taking?

2. **Inform the physician**
 - ***If only on antihypertensive:***
 - a. Ask if doctor wants to consider any medication changes

 - ***If on antihypertensive and potentiating drug*** (see table of drugs):
 - a. Inform physician of potentiating drug(s)
 - b. Ask if physician wants to consider any medication changes

3. **Ask for follow-up instructions**

4. **Discuss with patient/caregiver:**
 - Patient countermeasures, e.g. rise slowly, etc. (see *Advice to Patient*).

5. **Repeat checks for orthostasis and related symptoms**

Background Information

Facts:

1. Orthostatic hypotension is defined as ≥ 20 mm Hg drop in systolic blood pressure on standing.
2. The prevalence of orthostatic hypotension increases with advancing age. It is a major cause of morbidity and mortality in elderly persons because it causes dizziness, fainting and falls. Patients may also develop a fear of falling and as a result, avoid activities.
3. It is more common in those with cardiovascular disease and hypertension.
4. Not everyone with orthostasis has symptoms, and many people who feel dizzy on standing do not have a large postural drop in blood pressure. However, symptoms usually occur with pathological orthostasis.
5. Orthostasis in elderly persons may be caused by a variety of factors, including diabetes and other chronic diseases which affect the autonomic nervous system. However, several commonly used groups of drugs produce postural blood pressure changes (see Table) and drugs are the most important avoidable cause of orthostasis.

Guidelines for Use:

- Drugs which may cause orthostasis should be started with low doses in elderly persons and increases in dose should be made in small increments. Postural blood pressure changes and symptoms should be monitored closely during dose changes.
- If possible, drugs should be taken at night while the patient is lying down.
- Be aware of other drugs the patient may be taking which can cause or increase hypotension or dizziness. In addition to the drugs listed in table 1 which cause orthostasis, sedatives, narcotic analgesics and alcohol may increase dizziness and unsteadiness.
- Any disease or condition which impairs mobility and results in periods of prolonged inactivity can produce orthostasis.
- A fall in blood pressure after a meal is common in elderly people. Symptomatic patients should be advised to avoid taking drugs which cause orthostasis before a meal. Small, frequent meals, a rest after eating and drinks containing caffeine (not recommended at night) may also help to reduce symptoms.

Groups of drugs which can cause orthostasis or make it worse		Examples	
		Generic name	Trade name
Antidepressants	cyclic antidepressants	amitriptyline doxepin imipramine nortriptyline	Elavil, Endep Sinequan Tofranil Aventyl, Pamelorl
	MAOIs	isocarboxazid	Marplan
Phenothiazines and other antipsychotics		haloperidol prochlorperazine thioridazine trifluoperazine	Haldol Compazine Mellaril Stelazine
Anti-Parkinson medications		levodopa/carbidopa	Atamet, Sinemet
Antihypertensives	alpha-adrenergic blockers	prazosin	Minipress
	beta-adrenergic blockers	atenolol metoprolol	Tenormin Lopressor
	centrally acting drugs	clonidine methyldopa	Catapres Aldomet
Vasodilators	calcium channel blockers	nifedipine diltiazem	Adalat, Procardia Cardizem, Dilacor
	nitrates	nitroglycerin products isosorbide di/mononitrate	Nitrostat, Nitrogard Isordil, Sorbitrate, Ismo
Diuretics		chlorothiazide hydrochlorothiazide metolazone bumetanide furosemide	Diuril Esidrix, Dyazide Zaroxolyn Bumex Lasix

References:

1. Lipsitz LA. Orthostatic hypotension in the elderly. *New Eng J Med* 1989; **321**: 952-957.
2. Abrams WB, Beers MH, Berkow R. *Merck Manual of Geriatrics*. 2nd ed. Whitehouse Station NJ: Merck Research Laboratories, 1995.
3. Shafler M. *The Nurse, Pharmacology, and Drug Therapy*. 2nd ed. California: Addison-Wesley Nursing, 1993.
4. Tideiksaar R. Preventing falls: Home hazard checklists to help older patients protect themselves. *Geriatrics* 1986; **41**: 26-28.

Problem: Slow pulse (<55/minute) with use of a drug which slows the heart or in a patient who requires thyroid replacement

Goal: Pulse ≥ 55 , unless there are mitigating clinical circumstances

Solution:

1. Collect clinical details

- What are the patient's radial and apical pulse rates?
- Is the patient's heart rhythm regular?
- What is the patient's blood pressure?
- Does the patient have any associated symptoms? (e.g. dizziness, syncope, chest pain, weakness, shortness of breath, orthopnea, paroxysmal nocturnal dyspnea, edema, nausea)
- Does patient have a pacemaker?

2. Inform the physician

- ***If symptomatic or if systolic BP <100 mmHg:***
Ask if patient should be sent in for exam or ECG
- ***If asymptomatic, on thyroid replacement:***
Ask if you should take blood for TSH and call with results?
- ***If asymptomatic, on β blocker, verapamil, diltiazem, or clonidine:***
Ask if medication should be decreased or discontinued
- ***If asymptomatic, on digoxin:***
Offer to schedule patient for ECG and get digoxin level.
- ***If asymptomatic, on another potentiating drug*** (discuss with pharmacist):
Inform doctor and ask for instructions

3. Ask for follow-up instructions.

- Offer to recheck pulse in two days.

Background Information

Facts:

1. Although a slow heart rate and low blood pressure are signs of physical fitness in a healthy person, that is not necessarily the case in someone with cardiovascular disease or hypothyroidism.
2. Conduction defects and damage to the conducting system of the heart from myocardial ischemia or infarction are increasingly common as people age. These may cause the heart rate to slow down. Hypothyroidism also slows the heart rate.
3. If the heart beats too slowly to maintain adequate cardiac output there may be symptoms of congestive cardiac failure, faintness or dizziness, weakness, breathlessness or angina.
4. A number of drugs slow the heart. These are mainly used for the treatment of cardiac arrhythmias or high blood pressure.

Drugs which slow the heart		Examples	
		Generic name	Trade name
antihypertensive or angina treatment	beta-adrenergic blockers	atenolol metoprolol propranolol	Tenormin Lopressor Inderal
	centrally acting	clonidine	Catapres
	calcium channel blockers	diltiazem verapamil	Cardizem, Dilacor Calan, Isoptin, Verelan
antiarrhythmics		amiodarone digoxin disopyramide mexiletine propafenone	Cordarone Lanoxin Norpace Mexitil Rhythmol

5. A slow heart rate may be a sign of inadequate thyroid replacement in someone with hypothyroidism.

Reference

Shafner M. *The Nurse, Pharmacology, and Drug Therapy*. 2nd ed. California: Addison-Wesley Nursing, 1993.

Problem: Low systolic blood pressure (<100mmHg) with use of a drug which lowers blood pressure

Goal: SBP >100 and <160mmHg, unless there are mitigating clinical circumstances

Solution Step 1:

1. Collect clinical details

- What is the patient's heart rate?
- Is the patient's heart rhythm regular?
- Might the patient be dehydrated? (e.g. diarrhoea, vomiting, inadequate fluid intake)
- Does the patient have any associated symptoms? (e.g. dizziness, syncope, chest pain, weakness, shortness of breath, orthopnea, paroxysmal nocturnal dyspnea, edema)

2. Inform the physician

- ***If symptomatic:***
Ask if physician would like to see the patient.
- ***If asymptomatic:***
Ask if any change should be made to dose of antihypertensive/diuretic.
- ***If asymptomatic, on potentiating drug*** (from discussion with pharmacist):
Inform physician and ask for instructions.

3. Ask for follow-up instructions.

- Offer to check BP in two days.

4. Discuss with patient/caregiver

- If poor oral intake or G.I. losses, provide education on volume replacement and maintenance.

Problem: Low systolic blood pressure

Solution Step 2 - Informing the Physician

Patients identified by the study screening procedures have a potential medication problem. However, we do not know everything about the patient and their medical history, and there may be good clinical reasons for the physician to have prescribed for the patient as s/he did. The physician may be aware of the potential problem, but have chosen that treatment as the best compromise for that particular patient. He/she may be alarmed that the patient has been identified as having a problem, feel defensive because his treatment is being called into question and be worried about patient complaints and litigation. Tact and diplomacy are therefore extremely important.

Before calling the physician, rehearse what you are going to say with the study pharmacist.

Suggested approach:

1. Introduce yourself, say you are from VNS-NY/VNA-LA and tell the physician the name of the patient you are calling about.
2. Explain why you are calling.

I'm calling you about your patient X (patient's name). The X (name of agency) is taking part in a study in which home-health patients are screened for problems that may be related to their medication. You may remember receiving a letter informing you that the study was going on.

X has been identified by the study screening procedure. This does not mean that X necessarily has a medication problem, but simply that it would be worth re-evaluating him/her. I'd like to discuss the case with you to see if you think it is worth pursuing further.

3. Describe the identified potential problem.

The study screening showed X had a systolic BP of ≤ 90 mmHG on two separate occasions (or SBP ≤ 100 with symptoms of dizziness on standing). X is also on (name of relevant drugs).

4. Proceed with the remainder of the discussion according to the guideline and the category to which the patient belongs.

Background Information

Facts:

1. In healthy people blood pressure is kept fairly constant. Baroreceptors detect changes in blood pressure and send signals to the heart and blood vessels. Changes in heart rate and blood vessel diameter then return pressure to normal. As people age baroreceptors become less sensitive and as a result, blood pressures vary more widely.
2. If blood pressure is too low, there may be confusion, dizziness and falls on standing.
3. The physiological response to inadequate blood pressure is an increase in heart rate and blood vessel tone. However, in elderly people, those with cardiovascular disease, or someone who is on a drug which slows the heart, such as a beta-blocker, may be unable to compensate.

Drugs which lower blood pressure		Examples	
		Generic name	Trade name
Antihypertensives	alpha-adrenergic blockers	prazosin	Minipress
	beta-adrenergic blockers	atenolol metoprolol	Tenormin Lopressor
	centrally acting drugs	clonidine methyldopa	Catapres Aldomet
	ACE inhibitors	captopril enalapril	Capoten Vasotec
Vasodilators	calcium channel blockers	nifedipine diltiazem	Adalat, Procardia Cardizem, Dilacor
	nitrates	nitroglycerin products isosorbide di/mononitrate	Nitrostat, Nitrogard Isordil, Sorbitrate, Ismo
Diuretics		chlorothiazide hydrochlorothiazide bumetanide furosemide	Diuril Esidrix, Dyazide Bumex Lasix

Reference

Shafner M. *The Nurse, Pharmacology, and Drug Therapy*. 2nd ed. California: Addison-Wesley Nursing, 1993.