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Management of Hypertension	**ACA Standards: 4-4359M, 4-4367**		
Joel McCurdy, MD, Chief Medical Officer Oklahoma Department of Corrections	**Signature on File**		

Management of Hypertension

Blood pressure should be measured and recorded at every health services clinic visit. If an elevated blood pressure is obtained, it should be confirmed on two separate follow-up visits on separate days. If blood pressure remains elevated on three separate occasions, a diagnosis of hypertension is made.

Elevated blood pressure is defined as systolic BP >140 or diastolic BP > 90 (JNC8).

I. Initial Evaluation

The initial evaluation should determine if the patient has target organ disease or other cardiovascular risk factors. A newly diagnosed patient should also be evaluated for identifiable causes of hypertension. Documentation of the chronic illness will be documented in accordance with OP-140137 entitled “Chronic Illness Management” and on the “Chronic Illness and/or Routine/Physical Examination” DOC 140137A.

A. History

1. Modifiable risk factors – obesity, physical inactivity, smoking, sodium intake, fat intake, diabetes mellitus and dyslipidemia
2. Medications, including over the counter and illicit drugs
3. Family history – hypertension, diabetes, coronary artery disease, stroke, hyperlipidemia.

B. Examination

1. Complete set of vital signs (weight, temperature, pulse, respiration, blood pressure in both arms) and calculation of body mass index (BMI)

Body Mass Index Table

	Normal						Overweight					Obese										Extreme Obesity																			
BMI	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54				
Height (Inches)	Body Weight (pounds)																																							
58	91	96	100	105	110	115						143	148	153	158	162	167	172	177	181	186																				
59	94	99	104	109	114	119	124	128	133	138	143	148	153	158	163	168	173	178	183	188	193	198	203	208	212	217	222	227	232	237	242	247	252	257	262	267				
60	97	102	107	112	118	123	128	133	138	143	148	153	158	163	168	174	179	184	189	194	199	204	209	215	220	225	230	235	240	245	250	255	261	266	271	276				
61	100	106	111	116	122	127	132	137	143	148	153	158	164	169	174	180	185	190	195	201	206	211	217	222	227	232	238	243	248	254	259	264	269	275	280	285				
62	104	109	115	120	126	131	136	142	147	153	158	164	169	175	180	186	191	196	202	207	213	218	224	229	235	240	246	251	256	262	267	273	278	284	289	295				
63	107	113	118	124	130	135	141	146	152	158	163	169	175	180	186	191	197	203	208	214	220	225	231	237	242	248	254	259	265	270	278	282	287	293	299	304				
64	110	116	122	128	134	140	145	151	157	163	169	174	180	186	192	197	204	209	215	221	227	232	238	244	250	256	262	267	273	279	285	291	296	302	308	314				
65	114	120	126	132	138	144	150	156	162	168	174	180	186	192	198	204	210	216	222	228	234	240	246	252	258	264	270	276	282	288	294	300	306	312	318	324				
66	118	124	130	136	142	148	155	161	167	173	179	186	192	198	204	210	216	223	229	235	241	247	253	260	266	272	278	284	291	297	303	309	315	322	328	334				
67	121	127	134	140	146	153	159	166	172	178	185	191	198	204	211	217	223	230	236	242	249	255	261	268	274	280	287	293	299	306	312	319	325	331	338	344				
68	125	131	138	144	151	158	164	171	177	184	190	197	203	210	216	223	230	236	243	249	256	262	269	276	282	289	295	302	308	315	322	328	335	341	348	354				
69	128	135	142	149	155	162	169	176	182	189	196	203	209	216	223	230	236	243	250	257	263	270	277	284	291	297	304	311	318	325	331	338	345	352	358	365				
70	132	139	146	153	160	167	174	181	188	195	202	209	216	222	229	236	243	250	257	264	271	278	285	292	299	306	313	320	327	334	341	348	355	362	369	376				
71	136	143	150	157	165	172	179	186	193	200	208	215	222	229	236	243	250	257	265	272	279	286	293	301	308	315	322	329	338	343	351	358	365	372	379	386				
72	140	147	154	162	169	177	184	191	199	206	213	221	228	235	242	250	258	265	272	279	287	294	302	309	316	324	331	338	346	353	361	368	375	383	390	397				
73	144	151	159	166	174	182	189	197	204	212	219	227	235	242	250	257	265	272	280	288	295	302	310	318	325	333	340	348	355	363	371	378	386	393	401	408				
74	148	155	163	171	179	186	194	202	210	218	225	233	241	249	256	264	272	280	287	295	303	311	319	326	334	342	350	358	365	373	381	389	396	404	412	420				
75	152	160	168	176	184	192	200	208	216	224	232	240	248	256	264	272	279	287	295	303	311	319	327	335	343	351	359	367	375	383	391	399	407	415	423	431				
76	156	164	172	180	189	197	205	213	221	230	238	246	254	263	271	279	287	295	304	312	320	328	336	344	353	361	369	377	385	394	402	410	418	426	435	443				

Source: Adapted from Clinical Guidelines on the Identification, Evaluation, and Treatment of Overweight and Obesity in Adults: The Evidence Report.

2. Funduscopic exam by health care provider
3. Neck – bruits, jugular venous distention, thyromegaly
4. Heart – rate, rhythm, size, point of maximum impulse, murmurs
5. Lungs – rales, wheezes
6. Abdomen – bruit, enlarged kidneys, masses, abnormal aortic pulsation
7. Extremities – pulses, bruits, edema
8. Neurologic signs

C. Lab and other Diagnostic Studies

1. Complete metabolic profile, TSH
2. Complete blood count
3. Urine analysis
4. EKG, baseline. After baseline, at discretion of Provider.
5. Chest X-ray if indicated
6. Lipid

D. Identifiable Causes of Hypertension

1. Sleep apnea
2. Drug induced/related
3. Chronic kidney disease
4. Primary aldosteronism
5. Renovascular disease
6. Cushing's syndrome or steroid therapy
7. Pheochromocytoma
8. Coarctation of aorta
9. Thyroid/parathryoid disease

II. Treatment (See Eighth Joint National Committee guidelines, JNC8)

A. Recommendations for Management of Hypertension

1. In the general population aged ≥60 years, initiate pharmacologic treatment to lower blood pressure (BP) at systolic blood pressure (SBP) ≥150 mm Hg or diastolic blood pressure (DBP) ≥90 mm Hg and treat to a goal SBP <150 mm Hg and goal DBP <90 mm Hg. (Strong Recommendation – Grade A)

   Corollary Recommendation

   In the general population aged ≥60 years, if pharmacologic treatment for high BP results in lower achieved SBP (eg, <140 mm Hg) and treatment is well tolerated and without adverse effects on health or quality of life, treatment does not need to be adjusted. (Expert Opinion – Grade E)

2. In the general population <60 years, initiate pharmacologic treatment to lower BP at DBP ≥90 mm Hg and treat to a goal DBP <90 mm Hg. (For ages 30-59 years, Strong Recommendation – Grade A; For ages 18-29 years, Expert Opinion – Grade E)

3. In the general population <60 years, initiate pharmacologic treatment to lower BP at SBP ≥140 mm Hg and treat to a goal SBP <140 mm Hg. (Expert Opinion – Grade E)

4. In the population aged ≥18 years with chronic kidney disease (CKD), initiate pharmacologic treatment to lower BP at SBP ≥140 mm Hg or DBP ≥90 mm Hg and treat to goal SBP <140 mm Hg and goal DBP <90 mm Hg. (Expert Opinion – Grade E)

5. In the population aged ≥18 years with diabetes, initiate pharmacologic treatment to lower BP at SBP ≥140 mm Hg or DBP ≥90 mm Hg and treat to a goal SBP <140 mm Hg and goal DBP <90 mm Hg. (Expert Opinion – Grade E)

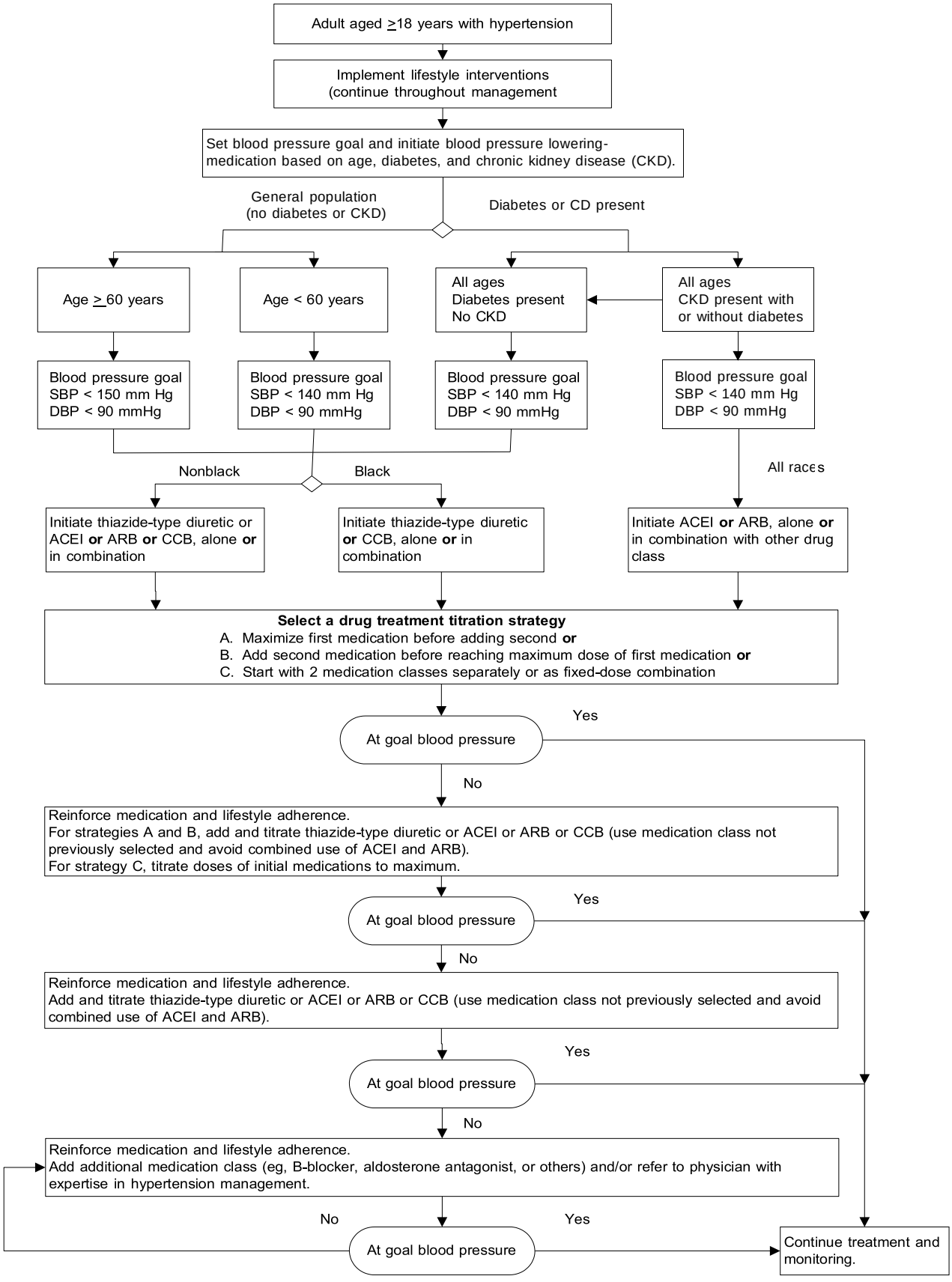
6. In the general nonblack population, including those with diabetes, initial antihypertensive treatment should include a thiazide-type diuretic, calcium channel blocker (CCB), angiotensin-converting enzyme inhibitor (ACEI), or angiotensin receptor blocker (ARB). (Moderate Recommendation – Grade B)

7. In the general black population, including those with diabetes, initial antihypertensive treatment should include a thiazide-type diuretic or CCB. (For general black population: Moderate Recommendation – Grade B; for black patients with diabetes: Weak Recommendation – Grade C)

8. 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. (Moderate Recommendation – Grade B)

9. 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 2 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 3 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. (Expert Opinion – Grade E)

B. Algorithm


Adult aged ≥18 years with hypertension
Implement lifestyle interventions (continue throughout management
Set blood pressure goal and initiate blood pressure lowering-medication based on age, diabetes, and chronic kidney disease (CKD).
General population (no diabetes or CKD)
Diabetes or CD present
Age ≥ 60 years
Age < 60 years
All ages Diabetes present No CKD
All ages CKD present with or without diabetes
Blood pressure goal SBP < 150 mm Hg DBP < 90 mmHg
Blood pressure goal SBP < 140 mm Hg DBP < 90 mmHg
Blood pressure goal SBP < 140 mm Hg DBP < 90 mmHg
Blood pressure goal SBP < 140 mm Hg DBP < 90 mmHg
Nonblack
Black
All races
Initiate thiazide-type diuretic or ACEI or ARB or CCB, alone or in combination
Initiate thiazide-type diuretic or CCB, alone or in combination
Initiate ACEI or ARB, alone or in combination with other drug class
Select a drug treatment titration strategy
A. Maximize first medication before adding second or
B. Add second medication before reaching maximum dose of first medication or
C. Start with 2 medication classes separately or as fixed-dose combination
At goal blood pressure
Yes
No
Reinforce medication and lifestyle adherence.
For strategies A and B, add and titrate thiazide-type diuretic or ACEI or ARB or CCB (use medication class not previously selected and avoid combined use of ACEI and ARB).
For strategy C, titrate doses of initial medications to maximum.
At goal blood pressure
Yes
No
Reinforce medication and lifestyle adherence.
Add and titrate thiazide-type diuretic or ACEI or ARB or CCB (use medication class not previously selected and avoid combined use of ACEI and ARB).
At goal blood pressure
Yes
No
Reinforce medication and lifestyle adherence.
Add additional medication class (eg, B-blocker, aldosterone antagonist, or others) and/or refer to physician with expertise in hypertension management.
No
At goal blood pressure
Yes
Continue treatment and monitoring.

III. Goals of Therapy

A. In uncomplicated hypertension the goal BP is systolic < 140 and diastolic < 90.

B. In patients with diabetes, or renal disease, the goal BP is systolic <140 and diastolic <90.

C. Many patients who are hypertensive will require 2 or more antihypertensive medications to achieve their BP goals.

D. If patient meets all goals of treatment without a need for hypertensive medication for 6 months a health care provider can discharge them from Chronic Clinic enrollment.

IV. Routine follow-up

Once antihypertensive therapy is initiated or changed, most patients should return for follow-up and medication adjustment at least monthly until BP goals are reached. Once goals of therapy have been reached and the patient is stable, Routine follow-up in chronic clinic should be arranged as follows:

A. Chronic Clinic Visit

1. Review medication regimen – adherence, side effects

2. Interval history – lifestyle modifications, new symptoms

3. Exam – Complete set of vital signs (blood pressure, temperature, pulse, respirations, weight, heart sounds, lung sounds, edema)

4. Patient education – lifestyle modifications, medication adherence, long-term complications of hypertension

5. Categorize in accordance with “Severity Classification of Common Chronic Illness” (OP-140137, Attachment A).

B. Annually

1. Interval history – as above

2. Complete physical exam

3. EKG baseline (then by provider discretion)

4. Oral exam by health care provider with referral to dental as needed.

5. Funduscopic exam by the health care provider. Refer to optometrist as indicated.

6. Laboratory

   a. CBC

   b. CMP

   c. FLP every 3 years

   d. Urinalysis (or dipstick)

7. Vaccines

   a. Influenza (annually)

   b. Pneumovax (revaccination is recommended only if the patient received a first dose prior to age 65. Give the second dose at or after age 65 only when 5 or more years have elapsed since the previous dose).

V. References

OP-140137 entitled "Chronic Illness Management"

Based on Joint National Committee on Prevention, Detection, Evaluation and Treatment of High Blood Pressure "The eighth report of the Joint National Committee on prevention, detection, evaluation, and treatment of high blood pressure [JNC 8]

VI. Action

The chief medical officer, Health Services will be responsible for compliance with this procedure.

The chief medical officer, Health Services will be responsible for the annual review and revisions.

Any exceptions to this procedure will require prior written approval from the director.

This procedure will be effective as indicated.

Replaced: Medical Services Resource Manual 140137-04 entitled "Management of Hypertension "dated November 7, 2017.

Distribution: Office of Medical Services Resource Manual

Referenced Forms	Title	Located In
DOC 140137A	Chronic Illness Note/Physical Examination”	OP-140137

Attachments

Attachment A	Severity Classification of Common Chronic Illness”	OP-140137