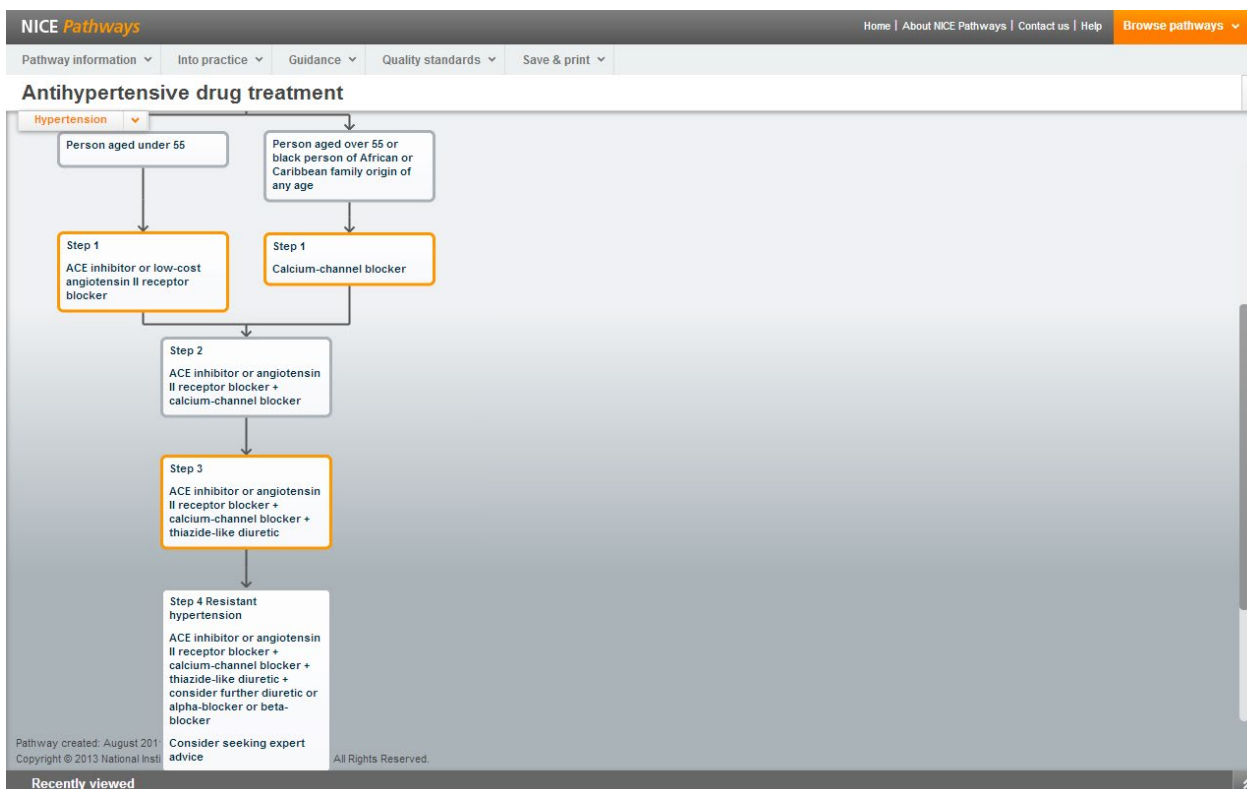
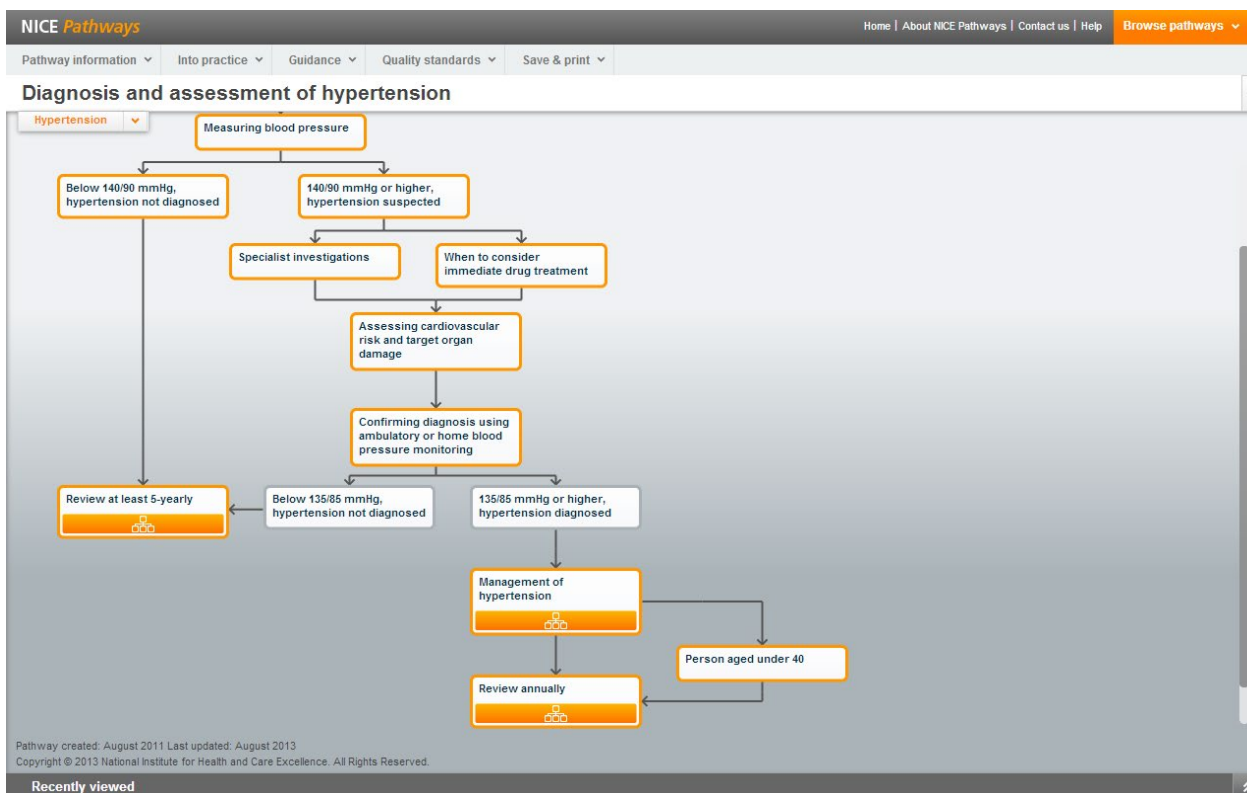


## APPENDIX 1. NICE pathways for the diagnosis and management of hypertension



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## APPENDIX 2. Thresholds and targets

### NICE recommendations, January 2014 (all figures are mmHg)

#### 1. Thresholds for offering hypertension treatment

*No target damage or diabetes*

- Clinic BP  $\geq 160/100$
- ABPM or HBPM  $\geq 150/95$

***If CVD risk is  $\geq 20\%$  ...***

- Clinic BP  $\geq 140/90$
- ABPM or HBPM  $\geq 135/85$

***Presence of diabetes or target organ damage***

- $\geq 140/90$

#### 2. Target BP

*No diabetes or Chronic Kidney Disease*

- $< 80$  years old - clinic BP  $< 140/90$
- $< 80$  years old - ABPM or HBPM  $< 135/85$
- $\geq 80$  years -  $< 150/90$

*Diabetes*

- Clinic BP  $< 140/80$

*Chronic Kidney Disease*

- Clinic BP  $< 140/90$
- (target range for systolic BP is 120–139)

*Diabetes **and** Chronic Kidney Disease*

- When ACR is  $\geq 70$  mg/mmol aim for  $<130/80$
- (target range for systolic BP is 120–129 )

*Diabetes **and** retinopathy and/or stroke*

- $<130 / 80$



### APPENDIX 3. Lifestyle Modifications—Recommendations and Benefits\*

Intervention	Recommendation: What Your Patients Can Do	Estimated range of BP reduction† (in mmHg)		Additional benefits/lifestyle modifications
		Systolic	Diastolic	
Weight reduction BMI: 18.5–24.9 Waist circumference: men < 102; women < 88 [Grade B]	Maintain normal body weight as indicated by a BMI of 18.5–24.9 kg/m <sup>2</sup>	5–20 for each 10 kg weight loss	6–13 for each 10 kg weight loss	Maintaining waist circumference (see left) will reduce potential hypertension and the development of metabolic syndrome.
DASH eating regimen (DASH: dietary approaches to stop hypertension) [Grade B]#	A diet rich in fruits, vegetables, low-fat dairy products Reduce intake of saturated and total fat Sodium 1600 mg or less	7–16	3–8	Effects are similar to a single antihypertensive drug in short term studies (six months) even without accompanying weight loss. Access the DASH diet eating plan at: <a href="http://www.nhlbi.nih.gov/health/public/heart/hbp/dash/index.htm">www.nhlbi.nih.gov/health/public/heart/hbp/dash/index.htm</a>
Increased physical activity 30–60 mins moderate intensity dynamic exercise (walking, jogging, cycling, swimming) 4–7 days per week [Grade D]	Regular aerobic activity – e.g., brisk walking, jogging, or biking for a <b>minimum</b> of 30 minutes per day on most days of the week (120–150 minutes per week)	3–9 (as well as positive effects on serum lipids)	2–6 (as well as positive effects on serum lipids)	Moderate physical activity produces reduction in blood pressure in ALL patients similar to that of standard antihypertensive medication
Reduced dietary sodium Age ≤ 50: 1500 mg 51–70: 1300 mg > 70: 1200 mg [Grade B]#	No more than 100 mmol per day (2.4 g sodium or 6 g sodium chloride). This means about one teaspoon of salt per day from all food sources (including prepared foods).	2–8	2–6	For patients who are salt-sensitive patients (i.e. African descent, individuals > 45 years, those with impaired renal function or diabetes) salt reduction has benefits in addition to weight reduction and a DASH diet.
Moderate alcohol consumption ≤2 drinks/day; no more than 14 drinks/week for men; 9/week for women [Grade B]	No more than two drinks per day for men No more than one drink per day for women and slight individuals (lower body weight)	2–5 for reduction from 3–6 drinks/ day to 1–2 drinks per day	1–3 for reduction from 3–6 drinks per day to 1–2 drinks per day	Nearly 10% of hypertension in males is associated with excess alcohol consumption. Reduction in consumption will help reduce BP in both normo- and hypertensive patients.

\* Also advise smoking cessation for overall cardiovascular risk reduction.

† Effects of implementing these modifications are dose and time dependent, and could be greater for some patients.

# To date salt restriction has not shown an impact on cardiovascular outcomes

**Note:** BP reductions with lifestyle modifications may be similar to antihypertensive monotherapy.

**Sources:** **1)** Chobanian AV, Bakris GL, Black HR, Cushman WC, Green LA, Izzo JL et al. The Seventh Report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure - The JNC 7 Report. JAMA 2003; 289(19):2560-2572.; **2)** The 2004 CHEP Recommendations: Listing of the New/Modified Recommendations. Canadian Hypertension Education Program, editor. 1-6.2004.; **3)** 2005 Canadian Hypertension Education Program Recommendations. Short executive summary. Canadian Hypertension Education Program, editor. 2005. Evidence-Based Recommendations Task Force of the Canadian Hypertension Education Program.; **4)** Touyz RM, Campbell N, Logan A, Gledhill N, Petrella R, Padwal R. The 2004 Canadian recommendations for the management of hypertension: Part III–Lifestyle modifications to prevent and control hypertension. Can J Cardiol 2004;20(1):55-59.; **5)** Obarzanek E, Proschan MA, Vollmer WM, Moore TJ, Sacks FM, Appel LJ et al. Individual blood pressure responses to changes in salt intake: results from the DASH-Sodium trial. Hypertension 2003; 42(4):459-467.; **6)** Padwal R, Campbell N, Touyz RM. Applying the 2005 Canadian Hypertension Education Program recommendations: 3. Lifestyle modifications to prevent and treat hypertension. CMAJ 2005;173(7). PMID: 16186578



#### APPENDIX 4. Individualising antihypertensive therapy

	Initial Therapy	Second Line Therapy	Notes/Cautions
<b>Hypertension without other compelling indications</b>			
Hypertension without other compelling indications	For < 55 years and not Afro-Caribbean origin ACE inhibitor or ARB For ≥ 55 years Thiazide diuretic, or long-acting CCB (consider aspirin and statins in those at high cardiovascular risk). Consider initiating therapy with combination of first-line drugs if the BP is >20 mm Hg systolic or >10 mm Hg diastolic above target	Combinations of first-line drugs	Not recommended for monotherapy: β-blocker, β-blocker in those > 60 years of age, ACE in Afro-Caribbean ethnic origin. Avoid ACE, ARB, and direct renin inhibitor if patient could get pregnant, consider beta blocker instead.  Combination of ACE with ARB not recommended.
<b>Diabetes &amp; cardiovascular disease</b>			
Diabetes with microalbuminuria*, renal disease, CVD or additional CV risk factors	ACE or ARB	Dihydropyridine (DHP)-CCB preferred over thiazide	Consider loop diuretic in hypertensive CKD patients with extracellular fluid volume overload.
Diabetes not included in the above category	ACE, ARB, DHP-CCB or thiazide diuretic	Combination of first-line drugs. If combination with ACE considered, DHP-CCB preferred over thiazide.	
<b>Cardiovascular disease</b>			
Coronary heart disease	ACE or ARB (except in low-risk pts); β-blocker for patients with stable angina	Long-acting CCB. When combination therapy used for high-risk patients, ACE or DHP-CCB preferred.	Avoid short-acting nifedipine. Combination of ACE with ARB not recommended.
Recent MI	β-blocker and ACE (ARB if ACE-intolerant)	Long-acting CCB if β-blocker contraindicated or ineffective	Do not use non-DHP-CCB with concomitant heart failure.
Heart failure	ACE (ARB if ACE intolerant) and β-blocker. Aldosterone antagonist for high-risk patients	Hydralazine/isosorbide dinitrate combination if ARB contraindicated or not tolerated. Can add thiazide or loop diuretic.	Titrate doses of ACE and ARB to those used in clinical trials. Carefully monitor potassium and renal function if combining ACE or ARB with aldosterone antagonist.
Left ventricular hypertrophy	ACE, ARB, long-acting CCB or thiazide diuretic	Combination of additional agents	Do not use hydralazine and minoxidil.
Past stroke or TIA	ACE/diuretic combinations	Combination of additional agents	
<b>Non-diabetic CKD</b>			
Non-diabetic CKD with proteinuria†	ACE (ARB if ACE intolerant) if there is proteinuria. Diuretic as additive therapy	Combination of additional agents	Carefully monitor renal function and potassium in pts taking ACE or ARB.
Renovascular disease	Does not affect initial treatment recommendations	Combination of additional agents	Avoid ACE or ARB if bilateral renal artery stenosis or solitary diseased kidney.

ACE: angiotensin converting enzyme inhibitor; ARB: angiotensin receptor blocker; CCB- calcium channel blocker; MI: myocardial infarction; CVD: cardiovascular disease; DHP CCB: Dihydropyridine calcium channel blocker

**Adapted from:** Daskalopoulou SS, Khan NA, Quinn RR, Ruzicka M, McKay DW, Hackam DG et al. The 2012 Canadian Hypertension Education Program recommendations for the management of hypertension: blood pressure measurement, diagnosis, assessment of risk, and therapy. Can J Cardiol 2012; 28(3):270-287.



## **Checking Your Blood Pressure at Home**

Checking your blood pressure regularly at home, and keeping a record, can be very useful. The record helps your GP practice know whether you actually have high blood pressure and, if so, how well your blood pressure is controlled. Home monitoring also helps you see the benefits of treatments and lifestyle changes, and reminds you to stick to your treatment plan.

### **Buying a Blood Pressure Device**

Blood pressure devices can be purchased in most pharmacies. Be sure to buy a device that has been checked for accuracy (the pharmacy or your GP practice staff may be able to advise you on this). It is very important to buy a device with the right size of cuff for your arm — measure the circumference (midpoint between shoulder and elbow) of your bare upper arm. Then match your measurement with measurements provided on the monitor's package or instruction manual. Ask for help if you need it.

Home blood pressure monitors cost approximately £20. Once you have purchased a home monitor, you can take it to your GP practice once or twice a year, to make sure it continues to give accurate readings. Also re-check the instructions for measuring blood pressure, to make sure you're still measuring your blood pressure properly.

### **Home Blood Pressure Monitoring: How To Do It Right**

- If necessary, empty your bladder or bowel beforehand.
- Rest quietly for five minutes before taking a measurement. Don't take your blood pressure if you are uncomfortable, cold, anxious, stressed or in pain.
- Sit with your feet flat on the floor (do not cross your legs) with your back supported and arm resting on a table or firm surface at heart level.
- Wrap the cuff snugly on your bare upper arm (two fingers should fit between the blood pressure cuff and your arm). The edge of the cuff must be 1 or 2 cm above your elbow.
- Measure your blood pressure in the morning and evening for seven days before your next appointment, or after a change in blood pressure medication. Take at least two readings each time. Keep a written record of your readings. Use the same arm each time you take a reading.
- DO NOT smoke or drink caffeine (coffee, tea, cola and some sports drinks) for 30 minutes beforehand.
- DO NOT talk or watch TV during monitoring.

Take your blood pressure as near to the same time each day following a similar routine. If you have BP medication to take, make a note of the time you take these on the days you measure your blood pressure. At <http://www.bloodpressureuk.org> you can find:

- A list of approved blood pressure devices (available under “device endorsements”)
- A video on how to measure blood pressure at home

### **Sources:**

- 1) Getting your blood pressure in check. Heart and Stroke Foundation. 2012. [http://www.heartandstroke.com/site/c.iklQLcMWJtE/b.3484023/k.2174/Heart\\_disease\\_\\_High\\_blood\\_pressure.htm](http://www.heartandstroke.com/site/c.iklQLcMWJtE/b.3484023/k.2174/Heart_disease__High_blood_pressure.htm)
- 2) Measuring BP at home. Hypertension Canada. 2012. [http://www.hypertension.ca/images/stories/dls/2011\\_Resources\\_En/2011\\_MeasureBPatHomeEN.pdf](http://www.hypertension.ca/images/stories/dls/2011_Resources_En/2011_MeasureBPatHomeEN.pdf)

Websites accessed January 2013



## **What you can do about High Blood Pressure**

Making changes to your lifestyle is an effective way to better control your blood pressure.

<b>If you:</b>	<b>You can reduce your BP by:</b>
Eat a healthy diet with less salt (< 1 teaspoon a day). See below.	- 5.1/-2.7
Lose weight	- 1.1/-0.9 per kg lost
Drink alcohol in moderation: one or two drinks a day, maximum of nine for women and 14 for men per week	-3.9/-2.4 (if < 3.6 drinks per day)
Be active: 30 to 60 minutes, 5 to 7 days a week. Try walking, biking, swimming, or any other physical activity that you enjoy. Even a little bit of physical activity is better than no activity.	-4.9/-3.7
Eat according to the DASH diet (high in calcium, potassium, magnesium and fibre, and low in saturated and trans fats). For more information, see online link in Resources.	-11.4/-5.5

### **To eat a healthy, low salt (sodium) diet:**

*Choose the following more often:*

- Fresh fruits and vegetables, low fat milk products, whole grains, lean meat, fish and poultry
- Use herbs and spices to flavour food – try not to use salt when cooking and remove the salt shaker from the table
- Read food labels – buy brands with 5% or less Daily Value (< 125 mg) of salt per serving

*Avoid the following:*

- Fast food, restaurant and packaged food
- Food high in sugar, or saturated or trans fat or with a 5% or more Daily Value (> 125 mg) of salt per serving
- Condiments such as ketchup, mustard, soy sauce, gravies and salad dressing high in salt
- Cured/smoked meats or fish

### **Other vital steps to take:**

- If you smoke, take steps to quit and avoid second-hand smoke. Stopping smoking lowers your chance of dying early.
- Reduce stress. Taking steps to reduce your stress can help improve your general health, including your blood pressure.

### **Resources**

<http://www.bloodpressureuk.org/Home>

<http://www.nhsinform.co.uk/>

[http://www.nhlbi.nih.gov/health/public/heart/hbp/dash/new\\_dash.pdf](http://www.nhlbi.nih.gov/health/public/heart/hbp/dash/new_dash.pdf) (provides detailed information on the DASH diet)

### **Sources:**

**1)** Hypertension Canada. Understanding and Managing Your Blood Pressure. 2012 <http://www.hypertension.ca/> Accessed August 2012.

**2)** Padwal R, Campbell N, Touyz RM, and For the Canadian Hypertension Education Program. CHEP Recommendations: Applying the 2005 Canadian Hypertension Education Program recommendations: 3. Lifestyle modifications to prevent and treat hypertension. CMAJ September 27, 2005 173:749-751