Appendix 1 (as supplied by the authors): 2014 C-CHANGE Guidelines* and updated References

Table 1. Body Habitus	
All	
Height, weight and waist circumference should be measured and body mass index calculated for all adults.	Obesity [1]
Maintenance of a healthy body weight (body mass index 18.5 to 24.9 kg/m2, and waist circumference less than 102 cm for men and less than 88 cm for women) is recommended for nonhypertensive individuals to prevent hypertension and for hypertensive patients to reduce blood pressure. All overweight hypertensive individuals should be advised to lose weight.	CHEP [2]
Overweight/obesity	
History and a general physical examination to exclude secondary (endocrine or syndrome-related) causes of overweight/obesity and overweight/obesity related health risks and complications.	Obesity [1]
Measuring body mass index (BMI = weight[kg]/height[m]2) in children aged two to seventeen years	Obesity* [3]

Table 2. Diet, sodium and alcohol intake	
All	
Two or fewer standard drinks per day; fewer than 14 drinks per week for men; fewer than 9 drinks per week for women.	CHEP [2]
To decrease blood pressure, consider reducing sodium intake towards 2,000 mg (5g of salt) per day.	CHEP* [2]
All individuals should be encouraged to adopt healthy eating habits to lower their CVD risk: (1) moderate energy (caloric) intake to achieve and maintain a healthy body weight; (2) emphasize a diet rich in vegetables, fruit, whole-grain cereals, and polyunsaturated and monounsaturated oils, including omega-3 fatty acids particularly from fish; (3) avoid trans fats, limit saturated and total fats to < 7% and <30% of daily total energy (caloric) intake, respectively; (4) increase daily fibre intake to >30 g; (5) limit cholesterol intake to 200 mg daily for individuals with dyslipidemia or at increased CVD risk. [4;5]	CCS* [6]
Diabetes	
People with diabetes should be offered timely diabetes education that is tailored to enhance self-care practices and behaviours.[7-9]	CDA* [10]
Overweight/Obesity	
An optimal dietary plan for achieving healthy body weight	Obesity [1]

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and dietary counseling for adults should be developed with a qualified and experienced health professional (preferably a registered dietitian) together with the individual and family to meet their needs.	
A comprehensive healthy lifestyle intervention is recommended for overweight and obese people.	Obesity [1]

Table 3. Risk Factor Screening	
All	
All individuals should be evaluated annually for type 2 diabetes risk on the basis of demographic and clinical criteria.	CDA7 [11]
Screening for diabetes using FPG and/or A1C should be performed every 3 years in individuals ≥ 40 years of age or at high risk using a risk calculator. More frequent and/or earlier testing with either FPG and/or A1C or 2hPG in a 75 g OGTT should be considered in those at very high risk using a risk calculator or in people with additional risk factors for diabetes. These risk factors include: o First-degree relative with type 2 diabetes; o Member of high-risk population (e.g. Aboriginal, African, Asian; Hispanic or South Asian descent; o History of prediabetes (IGT, IFG, or A1C 6.0%-6.4%); History of gestational diabetes mellitus; o History of delivery of a macrosomic infant; o Presence of vascular risk factors (low HDL <1.0 mmol/L in males, < 1.3 mmol/L in females, high triglycerides ≥ 1.7 mmol/L, hypertension, overweight/obesity); o Presence of associated diseases (polycystic ovary syndrome, acanthosis nigricans, obstructive sleep apnoea, psychiatric disorders, HIV infection); o Use of drugs associated with diabetes (glucocorticoids, atypical antipsychotics, HAART)	CDA* [11]
Testing with 2hPG in a 75 g OGTT should be undertaken in individuals with FPG 6.1 - 6.9 mmol/L and/or A1C 6.0% - 6.4% in order to identify individuals with IGT or diabetes	CDA* [11]
Testing with 2hPG in a 75 g OGTT may be undertaken in individuals with FPG 5.6 - 6.0 mmol/L and/or A1C 5.5% - 5.9% and ≥ 1 risk factor(s) in order to identify individuals with IGT or diabetes.	CDA [11]
Health care professionals who have been specifically trained to measure blood pressure (BP) accurately should assess BP in all adult patients at all appropriate visits to determine cardiovascular risk and monitor antihypertensive treatment.	CHEP [2]
Screening of plasma lipids is recommended in adult men ≥	CCS* [6]

40 and women ≥ 50 years of age or postmenopausal. Screen lipids at any age for: smoking, diabetes, hypertension, overweight, rheumatoid arthritis, systemic lupus erythematosis, psoriatic arthritis, ankylosing spondylitis, inflammatory bowel disease, chronic obstructive pulmonary disease, chronic HIV infection, CKD, abdominal aneurysm and erectile dysfunction. Consider screening individuals of First Nations or South Asian ancestry at an earlier age. [12-17]	
All patients/clients should be asked if they use tobacco and should have their tobacco use status documented on a regular basis. All physicians, nurses and other health care workers should strongly advise all patients who smoke to quit and provide brief advice.	CCAR [4]
Stroke	
Persons at risk of stroke and patients who have had a stroke should be assessed for vascular disease risk factors and lifestyle management issues (diet, sodium intake, exercise, weight, and alcohol intake, and use of oral contraceptives and hormone replacement therapy). They should receive information and counseling about possible strategies to modify their lifestyle and risk factors. Referrals to appropriate specialists should be made where required to provide more comprehensive assessments and structured programs to manage risk factors.	Stroke [18]
Diabetes	
In people with diabetes a baseline resting ECG should be performed in individuals with any of the following: o Age > 40 years, o Duration of diabetes > 15 years and older than 30 years o End organ damage (micro or macrovascular) o Other cardiac risk factors. Repeat resting ECG every 2 years.	CDA* [19]
Overweight/Obesity	
Screening for eating disorders, depression and psychiatric disorders, as appropriate.	Obesity [1]

Table 4. Diagnostic Strategies	
Diabetes	
o Diabetes should be diagnosed by any of the following criteria: o FPG≥7.0 mmol/L o A1C ≥6.5% (for use in adults in the absence of	CDA [20]

factors that affect the accuracy of A1C and not for use in those with suspected type 1 diabetes) o 2hPG in a 75 g OGTT ≥11.1 mmol/L o Random PG ≥11.1 mmol/L	
Hypertension	
Routine laboratory tests that should be performed for the investigation of all patients with hypertension include: urinalysis; blood chemistry (potassium, sodium and creatinine); fasting blood glucose and/or glycated hemoglobin (A1C); fasting serum total cholesterol and high density lipoprotein cholesterol, low density lipoprotein cholesterol and triglycerides; and standard 12-lead electrocardiography.	CHEP* [2]
Patients with hypertension and evidence of heart failure should have an objective assessment of left ventricular ejection fraction, either by echocardiogram or nuclear imaging.	CHEP [2]
The use of home blood pressure monitoring on a regular basis should be considered for patients with hypertension, particularly those with: diabetes mellitus; chronic kidney disease; suspected nonadherence; demonstrated white coat effect; and blood pressure controlled in the office but not at home (masked hypertension).	CHEP [2]
Overweight/Obesity	
Additional investigations, such as liver enzyme tests, urinalysis and sleep studies (when appropriate), to screen for and exclude other common overweight/obesity-related health problems.	Obesity [1]

Table 5. Risk Stratification	
All	
We recommend that a cardiovascular risk assessment, using the "10-Year Risk" provided by the Framingham model be completed every 3-5 years for men age 40-75, and women age 50-75 years. This should be modified (percent risk doubled) when family history of premature CVD is positive (i.e, first-degree relative < 55 years for men and < 65 years of age for women). A risk assessment might also be completed whenever a patient's expected risk status changes. Younger individuals with at least 1 risk factor for premature CVD might also benefit from a risk assessment to motivate them to improve their lifestyle. [21-28]	CCS* [6]
We recommend calculating and discussing a patient's "Cardiovascular Age" to improve the likelihood that patients will reach lipid targets and that poorly controlled	CCS* [6]

hypertension will be treated [25]	
Dyslipidemia	
We recommend that high risk be defined in subjects who have clinical atherosclerosis, abdominal aortic aneurysm, or an adjusted FRS of ≥ 20%. We have also included diabetes of > 15 years duration and age older than 30 years, diabetes with age older than 40 years, or the presence of microvascular disease, high risk kidney disease, or high risk hypertension. [29-35]	CCS* [6]
We recommend that the IR category include individuals with adjusted FRS ≥10% and < 20%. [33;36-47]	CCS* [6]

Table 6. Treatment targets	
All	
All those considering initiating a vigorous exercise program are encouraged to consult their physician or health care team professionals	Obesity [1]
Long-term, regular physical activity is suggested, which is associated with maintenance of body weight or a modest reduction in body weight for all overweight and obese people.	Obesity [1]
Physical activity and exercise should be sustainable and tailored to the individual. The total duration should be increased gradually to maximize the weight-loss benefits.	Obesity [1]
To achieve health benefits, adults aged 18–64 years should accumulate at least 150 min of moderate-to-vigorous-intensity aerobic physical activity per week, in bouts of 10 min or more.	CSEP [3]
It is also beneficial to add muscle- and bone-strengthening activities that use major muscle groups, at least two days per week.	CSEP [3]
More physical activity provides greater health benefits	CSEP [3]
Stroke	
Following the acute phase of a stroke, BP lowering treatment is recommended to a target of consistently <140/90 mmHg	CHEP [2]
Dyslipidemia	
We recommend a target LDL-C ≤ 2.0 mmol/L or ≥ 50% reduction of LDL-C for high risk individuals in whom treatment is initiated. We recommend that apo B ≤ 0.80 g/L or non-HDL-C ≤ 2.6 mmol/L be considered as alternative treatment targets for optimal risk reduction.	CCS* [6]
In Intermediate risk individuals with LDL-C ≥ 3.5 mmol/L, apo B ≥ 1.2 g/L, or non-HDL-C ≥ 4.3 mmol/L is suggested	CCS* [6]

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to identify patients who might benefit from pharmacotherapy. We recommend a target LDL-C ≤ 2.0 mmol/L or ≥ 50% reduction of LDL-C for intermediate risk individuals in whom treatment is initiated. Alternative target variables are apo B ≤ 0.8 g/L or non-HDL-C ≤ 2.6 mmol/L	
Diabetes	
All individuals with diabetes (type 1 or type 2) should follow a comprehensive, multifaceted approach to reduce cardiovascular risk in the majority of adult patients, including: Achievement and maintenance of healthy body weight; Healthy diet; Regular physical activity; Smoking cessation; Optimal glycemic control (usually A1C ≤ 7%); Optimal blood pressure control (<130/80 mm Hg); Additional vascular protective medications.	CDA [48]
Therapy in most individuals with type 1 or type 2 diabetes should be targeted to achieve an A1C ≤7.0% in order to reduce the risk of microvascular and, if implemented early in the course of disease, macrovascular complications. [49;50]	CDA [51]
An A1C≤ 6.5% may be targeted in some patients with type 2 diabetes to further lower the risk of nephropathy and retinopathy, but this must be balanced against the risk of hypoglycemia.[52;53]	CDA [51]
Less stringent A1C targets (7.1%-8.5% in most cases) may be appropriate in patients with type 1 or type 2 diabetes with any of the following: a. Limited life expectancy b. High level of functional dependency c. Extensive coronary artery disease at high risk of ischemic events d. Multiple comorbidities e. History of recurrent severe hypoglycemia f. Hypoglycemia unawareness g. Longstanding diabetes for whom it is difficult to achieve an A1C ≤ 7.0% despite effective doses of multiple antihyperglycemic agents, including intensified basal-bolus insulin therapy.	CDA* [51]
An intensive lifestyle intervention program combining dietary modification and increased physical activity may be used to achieve weight loss and improvements in glycemic control and cardiovascular risk factors.[54]	CDA* [55]
Hypertension	
Antihypertensive therapy should be strongly considered if systolic blood pressure readings average 140 mm Hg or higher in the presence of macrovascular target organ damage.	CHEP [2]
Persons with diabetes mellitus should be treated to attain	CHEP/CDA

systolic blood pressures of less than 130 mm Hg and diastolic blood pressures of less than 80 mm Hg. (These target blood pressure levels are the same as the blood pressure treatment thresholds.)	[2;56]
Antihypertensive therapy should be strongly considered if diastolic blood pressure readings average 90 mm Hg or higher in the presence of macrovascular target organ damage or other independent cardiovascular risk factors.	CHEP [2]
In the very elderly (age 80 years and older), who do not have diabetes or target organ damage, the SBP threshold for initiating drug therapy is ≥160 mm Hg and the SBP target is <150 mm Hg.[57]	CHEP* [2]
Overweight/Obesity	
The initial weight loss goal in obese individuals should be 5% to 10% of baseline body weight.	Obesity [1]

Table 7. Pharmacologic and or procedural therapy	
Stroke	
For patients with stroke treatment with an ACE inhibitor and thiazide/thiazide-like diuretic combination is preferred The combination of an ACE inhibitor and ARB is not recommended.	CHEP [2]
Strong consideration should be given to the initiation of antihypertensive therapy after the acute phase of a stroke or transient ischemic attack.	CHEP [2]
Antiplatelet therapy: all patients with ischemic stroke or transient ischemic attack should be prescribed antiplatelet therapy for secondary prevention of recurrent stroke unless there is an indication for anticoagulation.	Stroke [18]
ASA (81mg), combined ASA (25 mg) and extended-release dipyridamole (200 mg), or clopidogrel (75 mg) are all appropriate options and selection should depend on the clinical circumstances.	Stroke [18]
For the secondary prevention of stroke, patients with atrial fibrillation who have had a stroke/TIA should be treated with Oral Anticoagulation therapy.	Stroke [18]
Coronary Artery Disease/Ischaemic Heart Disease	
Patients with documented coronary artery disease, in the absence of specific contraindications or documented intolerance, should be treated with anti-platelet agents; for patients with a history of chronic stable angina, remote PCI, or CABG, ASA (75 mg PO to 162 mg) PO daily indefinitely	CACR [4]
Cardiac rehabilitation programs and services are	CACR [4]

recommended for most, and potentially all, patients with documented cardiovascular disease.	
Diabetes	
Beta blockers should be prescribed when indicated for systolic heart failure, as they provide similar benefits in people with diabetes compared with people without diabetes	CDA [58]
Statin therapy should be used to reduce cardiovascular risk in adults with type 1 or type 2 diabetes with any of the following features: a. Clinical macrovascular disease; b. Age ≥40 years; c. Age <40 years and 1 of the following: diabetes duration >15 years and age >30 years, microvascular complications	CDA* [48]
ACE inhibitor or ARB, at doses that have demonstrated vascular protection, should be used to reduce cardiovascular risk in adults with type 1 or type 2 diabetes with any of the following: a. Clinical macrovascular disease, b. Age ≥ 55 years, c. Age < 55 years and microvascular complications.[6;59-61]	CDA* [48]
For persons with diabetes and hypertension not included in the above recommendation, appropriate choices include (in alphabetical order): ACE inhibitors, angiotensin receptor blockers, dihydropyridine CCBs and thiazide/thiazide-like diuretics. If target blood pressures are not achieved with standard-dose monotherapy, additional antihypertensive therapy should be used. For people in whom combination therapy with an ACE inhibitor is being considered, a dihydropyridine CCB is preferable to hydrochlorothiazide.	CHEP/CDA [2;56]
Hypertension	
Initial therapy should consist of monotherapy with a thiazide diuretic; a β-blocker (in patients younger than 60 years); an ACE inhibitor (in nonblack patients); a long-acting CCB; or an ARB. If there are adverse effects, another drug from this group should be substituted. Hypokalemia should be avoided in patients treated with thiazide diuretic monotherapy.	CHEP [2]
Combination therapy using two first-line agents may also be considered as initial treatment of hypertension if systolic blood pressure is 20 mm Hg above target or if diastolic blood pressure is 10 mm Hg above target.	CHEP [2]
Additional antihypertensive drugs should be used if target blood pressure levels are not achieved with standard dose monotherapy. Add-on drugs should be chosen from first line	CHEP [2]

	choices. Useful choices include a thiazide diuretic or CCB with an ACE inhibitor, ARB or a β-blocker. Caution should be exercised in combining a nondihydropyridine CCB and a β-blocker. The combination of an ACE inhibitor and ARB is not recommended.	
	α-Blockers are not recommended as first-line agents for uncomplicated hypertension.	CHEP [2]
	Thiazide diuretics are recommended as additive antihypertensive therapy. For patients with chronic kidney disease and volume overload, loop diuretics are an alternative.	CHEP [2]
	For persons with cardiovascular or kidney disease, including microalbuminuria or with cardiovascular risk factors in addition to diabetes and hypertension, an ACE inhibitor or an ARB is recommended as initial therapy.	CHEP [2]
	In patients with systolic dysfunction, an ARB is recommended if ACE inhibitors are not tolerated.	CHEP [2]
	For hypertensive patients with heart failure whose blood pressure is not controlled, an ARB may be added to an ACE inhibitor and other antihypertensive drug treatment. Careful monitoring should be used if combining an ACE inhibitor and an ARB due to potential adverse effects such as hypotension, hyperkalemia and worsening renal function. Additional therapies may also include dihydropyridine CCBs.	CHEP [2]
	An ACE inhibitor or ARB is recommended for most patients with hypertension and coronary artery disease.	CHEP [2]
	In patients with coronary artery disease and deemed to be at high risk, when combination therapy is being used, choices should be individualized. The combination of an ACE inhibitor and a dihydropyridine CCB is preferable to an ACE inhibitor and a diuretic in selected patients.	CHEP [2]
	For patients with stable angina, β-blockers are preferred as initial therapy. CCBs may also be used.	CHEP [2]
	For patients with recent myocardial infarction, initial therapy should include both a β-blocker and an ACE inhibitor. An ARB can be used if the patient is intolerant of an ACE inhibitor	CHEP [2]
Overweight/Obesity		
	Adults with class III overweight/obesity (BMI ≥ 40.0 kg/m2) or class II overweight/obesity (BMI 35.0 to 39.9 kg/m2) with other comorbidities may be considered for bariatric surgery when other lifestyle interventions are inadequate in achieving weight goals.	Obesity [1]
	Primary care health professionals are encouraged to create	Obesity [1]

a nonjudgmental atmosphere when discussing weight management.	
Health care professionals are encouraged to consider the barriers people might have concerning overweight/obesity and its management.	Obesity [1]
*Each table is grouped into recommendations for all adults and for adults with particular comorbidities. The recommendations in the diagnostic strategies and pharmacological or procedural therapy tables are directed for adults with comorbidities, rather than for all adults.	

* New or updated recommendation for 2014

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