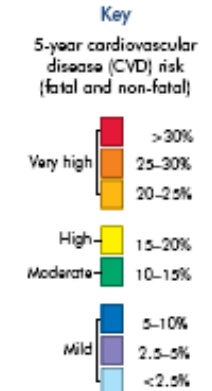
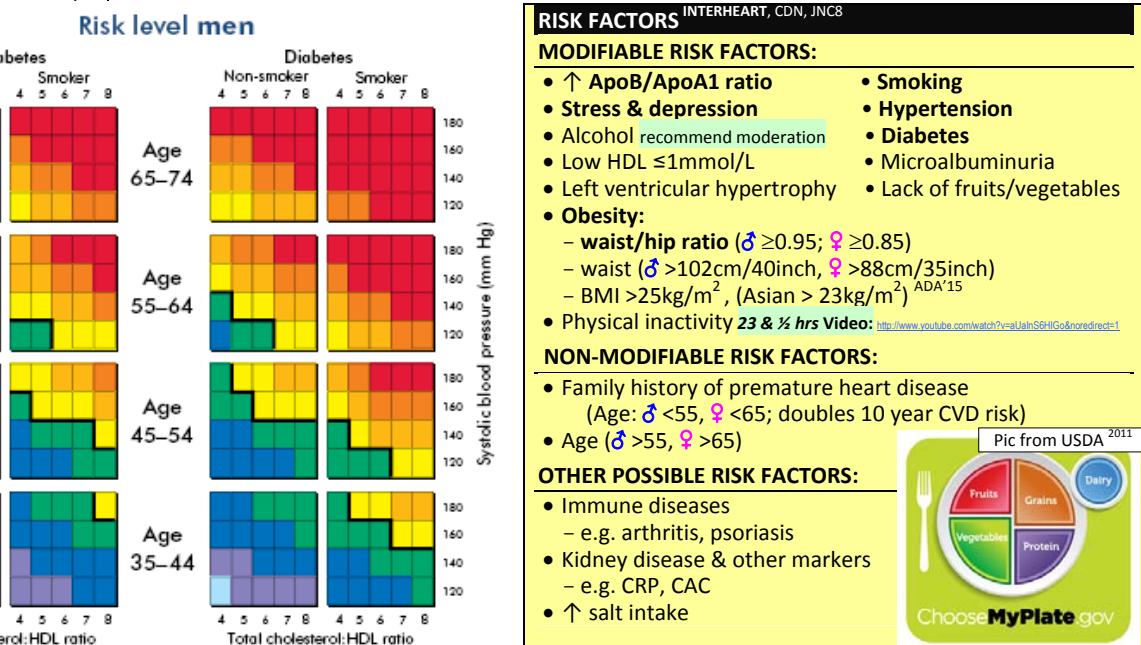
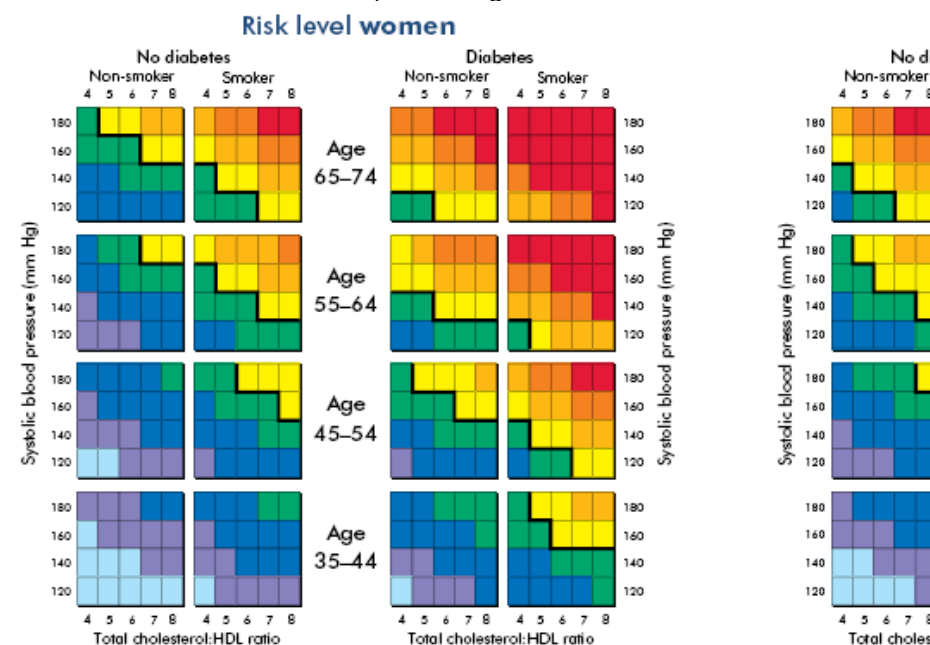


• Example: **New Zealand Guideline 2009 Group 5 Year CVD Risk Assessment Tables** (adapted with permission) [http://www.nzgg.org.nz/library\\_resources/45\\_cvd\\_handbook](http://www.nzgg.org.nz/library_resources/45_cvd_handbook)  
 - Quick & easy way to estimate heart & stroke risk. Based on Framingham (note: see [www.RxFiles.ca](http://www.RxFiles.ca) On-Line Extras for Canadian 10-year Framingham CVD Risk Tables & links to other risk calculators).

• Multiple cardiovascular disease risk assessment tools available, & there can be wide variability among the risk calculators. <sup>Allan et al</sup> Consider selecting one & using it consistently.  
 • Antihypertensive benefit greater in those at highest risk!



**Using the Charts**

- Identify the chart relating to the person's sex, diabetic status, smoking history and age.
- Within the chart choose the cell nearest to the person's age, systolic blood pressure (SBP) and total cholesterol (TC):HDL ratio. People who fall exactly on a threshold between cells are placed in the cell indicating higher risk.

**Note:** The risk charts now include values for SBP alone, as this is the most informative of conventionally measured blood pressure parameters for cardiovascular risk. Diastolic pressures may add some predictive power, especially at younger ages (eg, a diastolic pressure consistently >100 mm Hg in a patient with SBP values between 140 and 170 mm Hg).

Certain groups may have CVD risk underestimated using these charts. See Cardiovascular Guidelines Handbook (2009 Edition) for details.  
 Note: 15% on this 5 year CVD heart & stroke risk tool is approximately equal to 20% on the common 10 year Framingham CAD risk tool.

Risk level 5-year CV risk (fatal and non-fatal)	Benefits: NNT <sup>a</sup> for 5 years to prevent one event <sup>b</sup> (CVD events prevented per 100 people treated for 5 years)		
	1 intervention (25% risk reduction)	2 interventions (45% risk reduction)	3 interventions (55% risk reduction)
30%	13 (7.5 per 100)	7 (14 per 100)	6 (16 per 100)
20%	20 (5 per 100)	11 (9 per 100)	9 (11 per 100)
15%	27 (4 per 100)	15 (7 per 100)	12 (8 per 100)
10%	40 (2.5 per 100)	22 (4.5 per 100)	18 (5.5 per 100)
5%	80 (1.25 per 100)	44 (2.25 per 100)	36 (3 per 100)

a) NNT = Number needed to treat  
 Based on the conservative estimate that each intervention:  
**aspirin, BP treatment** (lowering SBP by 10 mm Hg) or **lipid modification** (↓ LDL by 20%) reduces cardiovascular risk by about 25% over 5 years.  
 b) Cardiovascular events are defined as MI, new angina, ischemic stroke, TIA, PVD, HF & CV death.

**Heart Healthy Diets:** <http://www.mayoclinic.com/health/mediterranean-diet/CL00011>,  
<http://www.cfp.ca/content/57/8/894.full#ref-20>, <http://www.choosemyplate.gov/>

**RISK FACTORS** INTERHEART, CDN, JNC8

**MODIFIABLE RISK FACTORS:**

- ↑ ApoB/ApoA1 ratio
- Stress & depression
- Alcohol recommend moderation
- Low HDL ≤1mmol/L
- Left ventricular hypertrophy
- Obesity:
  - waist/hip ratio (♂ ≥0.95; ♀ ≥0.85)
  - waist (♂ >102cm/40inch, ♀ >88cm/35inch)
  - BMI >25kg/m<sup>2</sup>, (Asian > 23kg/m<sup>2</sup>)<sup>ADA'15</sup>
  - Physical inactivity 23 & ¼ hrs Video: <http://www.youtube.com/watch?v=Ua1tSBHCoKp&feature=1>
- Smoking
- Hypertension
- Diabetes
- Low albuminuria
- Lack of fruits/vegetables

**NON-MODIFIABLE RISK FACTORS:**

- Family history of premature heart disease (Age: ♂ <55, ♀ <65; doubles 10 year CVD risk)
- Age (♂ >55, ♀ >65)

**OTHER POSSIBLE RISK FACTORS:**

- Immune diseases - e.g. arthritis, psoriasis
- Kidney disease & other markers - e.g. CRP, CAC
- ↑ salt intake

Pic from USDA 2011  
 Choose MyPlate.gov

TARGETS: Canadian (Adult)	BLOOD PRESSURE CHEP 2015 <sup>3</sup> Diagnosis based on out-of-office BP (24hr-ambulatory, home BP)		Consider Tx if:	Target BP
	Optimal: <120/80 Normal: <130/85 High Normal: <140/90 ~½ will develop HTN in 2 yrs ↓ salt intake. Accurate BP measurement important e.g. rest x 5 minutes (electronic device ideal)	<b>NO RISK Factors</b> ; no target organ damage (TOD)	≥160/100 JNC8 ≥140/90 if <60yrs	<140/90
	<b>ISOLATED SYSTOLIC HTN (ISH)</b> • Very Elderly (≥80yr & no TOD/DM) Orthostatic hypotension concern if DBP <60-65. <sup>AHA'11, HYVET, JATOS</sup>	SBP > 160 SBP ≥ 160 JNC8 ≥150/90 if ≥60yrs	<140 <150 if ≥80yr	<140/90
	<b>MODERATE-HIGH RISK Patient/CKD</b> • If HOME BP Measurement	≥140/90 ≥135/85	<140/90 <135/85	<140/90
	<b>TYPE 2 DIABETES</b> individualize treatment No benefit but ↑ harm if SBP<120 vs <140 <sup>ACCORD-BP</sup> 1°=NS; NNT ↓ stroke=92, NNH ↓ SAE=50; over ~4.7 yr	≥130/80	<130/80 JNC8 <140/90 ADA'15<140/90	<130/80
	<b>LIPIDS CCS 2012<sup>4</sup></b>	Treat if:	LDL mmol/L or %	ApoB
RISK (10yr CVD risk) CVD Framingham	<b>HIGH (≥20%)</b> ALL with CAD, CVD & PAD. Most DM (age >40 or >30 with 15yr hx DM) & CKD (CrCl <45mL/min)	≥3.5	≥1.2	≥4.3
	<b>MODERATE (10-19%)</b> <b>LOW (&lt;10%)</b> May try lifestyle changes for 3-6 months before drug therapy if targets not met. Caution: high-dose statins.	≥5	-	-
	<b>TARGET</b>	≤2 or ↓LDL ≥50%	≤0.8 or ↓LDL ≥50%	≤2.6 or ↓LDL ≥50%
	Target LDL <2 or ↓ ≥50%. [2012: CRP removed from main tx table. If LDL is <3.5, but ♂>50yr or ♀>60yr may check hsCRP twice 2 weeks apart (not during acute illness). If hsCRP > 2mg/L → statin (rosuvastatin 20mg as per JUPITER).]			
	• Low/Moderate Risk: guidelines suggest ↓LDL by ≥50% but also remember simvastatin 40mg, atorvastatin 10mg & pravastatin 40mg have strong outcome evidence (e.g. ↓ MI, stroke & death) from landmark trials but only ↓LDL by 18-35%. • AHA'13: <sup>7</sup> if ↑ risk of atherosclerotic CVD tx with statins. LDL for adherence, not a target. If high risk (10yr CV risk ≥7.5%): consider moderate dose statin (if ≥75yr or DM 40-75yr & LDL <4.9 & no CVD or DIs) or high intensity statin atorvastatin 40-80mg, rosuvastatin 20-40mg (if <75yr or if LDL≥4.9). Not recommend statins if HF/HD-CKD; or if by patient preference.			
	<b>BLOOD GLUCOSE CDA 2013<sup>5</sup></b>	Normal	Target (for most)	Frail Elderly (less stringent targets)
	A1C (%) q3-6months	≤6%	≤7% (≤6.5% for some)	≤8.5% (~ 8-9% VADT)
	FBG (mmol/L)	4-6	4-7	5-12 preprandial
	PPBG (mmol/L) 2hr post	5-8	5-10 (5-8 if A1C not met)	avoiding hypo takes precedent over targets
	"Individualize" Let the target serve the patient, not the patient the target! Consider age, <sup>8</sup> life expectancy, co-morbidity & risk of anti-hyperglycemic AE. Pursue targets if can be done safely without hypoglycemia. Calibrate meter every year.			

Chart Abbreviations:

A1C=glycosylated hemoglobin A<sub>1c</sub> Apo=apolipoprotein BP=blood pressure BMI=body mass index CAC=coronary artery calcification score CAD=coronary artery disease CKD=chronic kidney disease CrCl=creatinine clearance CRP=C-reactive protein CVD=cardiovascular disease DBP=diastolic blood pressure DM=diabetes mellitus Dx=disease FBG=fasting blood glucose HD-CKD=hemodialysis HDL=high density lipoprotein hsCRP=high sensitivity C-reactive protein HTN=hypertension HF=heart failure hx=history ISH=isolated systolic hypertension LDL=low density lipoprotein MI=myocardial infarction NNH=number needed to harm NNT=number needed to treat NS=non-significant PAD=peripheral arterial disease PVD=peripheral vascular disease PPBG=postprandial (2hr) blood glucose pt=patient SAE=serious adverse events SBP=systolic blood pressure TG=triglycerides TIA=transient ischemic attack TOD=target organ damage tx=treatment yr=year ♂=male ♀=female

**2009 Canadian -10yr risk of Cardiovascular (CVD) disease (based on Framingham Heart Study).**

RISK*	MEN										WOMEN															
AGE	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75+	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75+						
Age points	0	2	5	7	8	10	11	12 or 13	14	15	0	2	4	5	7	8	9	10	11	12						
TOTAL CHOL <4.1 mmol/l																										
4.1-5.2																										
5.2-6.2																										
6.2-7.2																										
≥ 7.2																										
HDL mmol/l	<0.9		0.9-1.2		1.2-1.3		1.3-1.6		≥1.6		<0.9		0.9-1.2		1.2-1.3		1.3-1.6		≥1.6							
	+2		+1		0		-1		-2		+2		+1		0		-1		-2							
SYSTOLIC BP mmHg	<b>Not Treated</b>					<b>Treated</b>					<b>Not Treated</b>					<b>Treated</b>										
	<120					<120					<120					<120										
	120-129					120-129					120-129					120-129										
	130-139					130-139					130-139					130-139										
	140-159					140-159					140-149					140-149										
	≥160					≥160					>160					>160										
SMOKER																										
No																										
Yes																										
Diabetic																										
No																										
Yes																										
TOTAL POINTS																										
POINTS	MEN: actual 10yr CVD risk %										WOMEN actual 10yr CVD risk %															
<3	-2-1	2-3	4-5	6	7	8	9	10	11	12	13-14	15-16	>17	<2	-1-2	3-5	6-7	8-9	10	11	12	13	14-15	16-17	18-20	≥21
<1% (10yr % Risk→)	1	2	3	4	5	6	7	9	11	13	15-18	21-25	>29	<1% (10yr % Risk→)	1	2	3	4-5	6	7	8	10	11-13	15-18	21-27	≥30

Guidelines use "13" but this appears to be an error; should be "12" based on reference.

Key: Low risk <10% Moderate risk 10-19% High risk ≥ 20%

\*Risk assessments based on Framingham data; other risk factors such as family history of CAD (2x CAD 10yr risk %=actual risk %), physical inactivity, obesity & left ventricular hypertrophy should also be considered.

Patients with High risk→ ALL pts with CAD,CVD,PAD; most with DIABETES age >40 or >30 with 15yr hx DM & chronic renal dx GFR <30ml/min regardless of risk score.

Cardiac Risk Tools: 1) [www.statcoder.com](http://www.statcoder.com) 2) [www.nhlbi.nih.gov/guidelines](http://www.nhlbi.nih.gov/guidelines) 3) <http://www.framinghamheartstudy.org/>

- 4) **Reynold Risk Score** (also incorporates family cardiac history & CRP results, but is based on non-diabetic individuals) <http://www.reynoldsriskscore.org/>
- 5) **Cardiovascular Life Expectancy Model Risk Score** (also incorporates family cardiac history) <http://www.chiprehab.com/>
- 6) **Cardiovascular Disease Risk Calculator:** <http://bestsciencemedicine.com/chd/calc2.html>
- 7) **AHA '13 CV Risk Calculator** [http://mv.americanheart.org/professional/StatementsGuidelines/PreventionGuidelines/Prevention-Guidelines\\_UCM\\_457698\\_SubHomePage.jsp](http://mv.americanheart.org/professional/StatementsGuidelines/PreventionGuidelines/Prevention-Guidelines_UCM_457698_SubHomePage.jsp)
- 8) **Risk Calculator: Joint British Societies' Consensus Recommendations for the Prevention of Cardiovascular Disease (JBS3).** <http://www.jbs3risk.com/>
- 9) **Systemic Cerebrovascular and Coronary Risk Evaluation (SCORE) risk calculator:** <http://www.score-canada.ca/>
- 10) **Patient friendly risk calculator:** <http://www.myhealthcheckup.com>

For suggested lipid targets, see bottom of page 26 on the RxFiles Lipid chart.

Comparative 10yr CAD % risks by AGE	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74yr	
Males	Low risk % →	2%	3	4	4	6	7	9	11	14
	Average risk % →	3%	5	7	11	14	16	21	25	30
Females	Low risk % →	<1%	<1	2	3	5	7	8	8	8
	Average risk % →	<1%	<1	2	5	8	12	12	13	14

Risk	TC /HDL
High	<4
Mod	>5
Low	>6

Previous TC/HDL ratio thresholds used in previous risk assessments.

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ACC/AHA American College of Cardiology Foundation / AHA American Heart Association 2011 – Hypertension in the Elderly: <http://circ.ahajournals.org/cgi/reprint/CIR.0b013e31821daaf6>  
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- <sup>5</sup> **Canadian 2008 Guidelines (Sept 2008)**: <http://www.diabetes.ca/files/cpg2008/cpg-2008.pdf>  
**Canadian 2003 Diabetes Guidelines** <http://www.diabetes.ca/cpg2003/download.aspx> (Meltzer S, Leiter L, Daneman D, et al 1998. Clinical practice guidelines for the management of diabetes in Canada. *CMAJ* 1998;159 (8 Suppl).)  
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Screening for coronary artery disease (CAD) in adults with type 2 diabetes and no indication of existing CAD does not improve outcomes more than standard care. This should come as no surprise – screening for asymptomatic CAD with electron beam tomography (*JAMA* 2003; 289:2215-23.) and carotid intima-thickness (*Stroke* 2001;32:1532-8) also did not improve outcomes. Knowing with additional certainty that a patient is "at risk" for CAD does not result in different medication use nor improved compliance. (LOE = 1b-)

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#### Additional Links:

AHA: Beneficial & Harmful Fats 1 pager – Jan 2009: <http://americanheart.mediaroom.com/file.php/290/Fats+---+beneficial+vs+harmful%282%29.pdf>