



Module 2

Global Cardiovascular Risk Assessment and Reduction in Women with Hypertension

This program meets the accreditation criteria of The College of Family Physicians of Canada and has been accredited for up to 1 Mainpro-M1 credits.

Canadian Hypertension Education Program



Global Cardiovascular Risk Assessment and Risk Reduction in Hypertensive Women

- Pamela
 - A 54-year-old, post-menopausal woman presents to your office for an annual examination



CHEP

 Hypertension
CANADA

Notes

Indicate to the group that this patient will be the focus of today's case discussion.

Case Development & Disclosures

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Notes

Read out the case authors and their disclosure information.

Conflict Disclosure Information

- Presenter 1:
 - Grants/Research Support: _____
 - Speakers Bureau/Honoraria: _____
 - Consulting Fees: _____
 - Other: _____



Instructions

Fill out prior to the meeting and disclose to the group any real or apparent conflict(s) of interest that may have a direct bearing on the subject matter of this CME program (based on the guidelines below).

Allow other participants to introduce themselves and give a brief outline of their practice and interests.

Guidelines for Disclosure:

To ensure balance, independence, objectivity and scientific rigor, please disclose to program participants any real or apparent conflict(s) of interest that may have a direct bearing on the subject matter of this CME program. This pertains to relationships with pharmaceutical companies, biomedical device manufacturers, or other corporations whose products or services are related to the subject matter of this program. The intent of this disclosure is not to prevent a facilitator with a potential conflict of interest from making a presentation. It is merely intended that any potential conflict would be identified openly so that the participants may form their own judgments about the program with the full disclosure of the facts. It remains for the audience to determine whether the facilitator's outside interests may reflect a possible bias in either the exposition or the conclusions presented.

Example

- Grants/Research Support: **PharmaCorp ABC**
- Speakers Bureau/Honoraria: **XYZ Biopharmaceuticals Ltd.**

Learning Objectives

CV risk assessment: art & science of CV risk reduction strategies

Upon completion of this activity, participants should be able to:

- Do a critical appraisal of CV risk assessment
- Evaluate indications and limitations of CV risk stratification
- Calculate vascular age; discuss how vascular age assessment can help in CV risk reduction
- Formulate a management plan using the Canadian Hypertension Education Program (CHEP) recommendations

CV; cardiovascular



Notes

Review the learning objectives for today's activity.

Statement of Need

Please write down your answer to the following:

“My greatest challenge as a health care provider in the management of female patients with hypertension is _____.”



Notes

Quickly go around the room and ask each participant to complete this statement.

Gender Gap in CV Risk Management

- Women with atherosclerosis less likely to be:
 - Diagnosed with CAD
 - Treated for CAD

CV: cardiovascular; CAD: coronary artery disease



Notes

Review the gender gaps in management of cardiovascular disease.

In-Hospital Mortality Rate: Acute MI

In-hospital mortality following a heart attack (per 100 patients) 1997-2000		
Age group	Women	Men
20-49 years	3.1	1.6
50-64 years	5.9	3.9
65-74 years	12.6	10.3
75+ years	24.4	22.2
Total (age 20+)	16.7	9.9

MI: myocardial infarction

Tu et al. *Can J Cardiol* 2003;19:893-901



Key Points

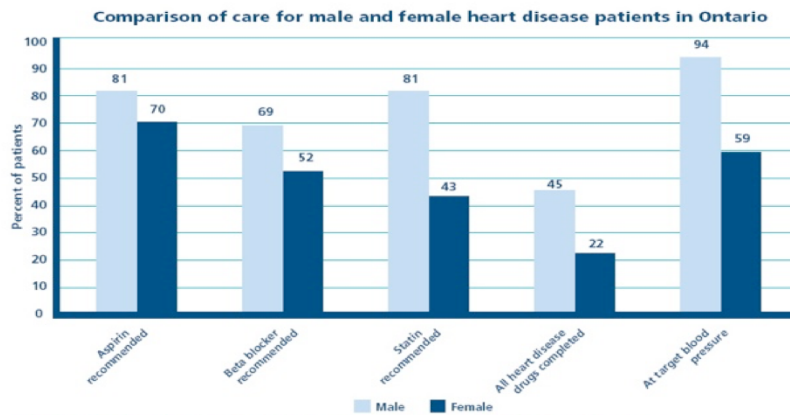
A study by the Canadian Cardiovascular Outcomes Research Team, showed that acute MI is associated with a substantial increase in mortality in Canada, especially in elderly and female patients. At any given age, the mortality in women exceeds mortality in men. Age- and sex-specific 30-day in-hospital mortality rates after an acute MI are shown above.

In total, 139,523 patients were included in the study, of whom 35.3% were women and 64.7% were men. The study examined all new cases of acute MI in Canadian patients ≥ 20 years old that occurred between fiscal years 1997/98 and 1999/2000.

Reference

1. Tu JV, et al. for the Canadian Cardiovascular Outcomes Research Team (CCORT). Outcomes of acute myocardial infarction in Canada. *Can J Cardiol* 2003;19:893-901.

Women Less Likely to Be Effectively Treated for CAD



Key Points

Hogg et al. compared primary care models in Ontario, looking specifically at the level of care provided to male and female heart disease patients. The percentage of male patients receiving pharmacotherapy was found to be much higher as compared to female patients. Furthermore, only 59% of women vs. 94% of men were noted to have achieved blood pressure targets.

Reference

1. Hogg WE, et al. Comparison of Models of Primary Health Care In Ontario. 18th World Organization of Family Doctors. (WONCA) Conference, Singapore. July 2007.

Pamela

Patient history

- Pamela, a 54-year-old teacher who is post-menopausal, presents for an annual exam
- She attends aerobic classes 2x/week
- She admits to smoking 3-4 cigarettes/day, and occasionally more, when stressed
- She has no health complaints and is not on any medications



Notes

Review the case study slide with the group.

Several questions are integrated in the case presentation – when these appear on screen, allow the group to discuss their possible answers and the rationale behind them before moving on to review feedback from the case authors.

Missing data are to be assumed NORMAL, to prevent prolonged discussions.

Pamela

Family history

- Mother, aged 74, diagnosed with intermittent claudication at 62 years of age
- Father, aged 79, no history of CV disease

Physical exam

- BMI: 26.8 kg/m²; waist circumference: 87 cm
- BP: 148/88 (avg. of repeated measures with validated oscillometric device [eg, Bp-TRU])
- HR: 72 bpm
- Nothing else of significance on physical exam
- You send Pamela for routine labs



CV: cardiovascular; BMI: body mass index; BP: blood pressure; HR: heart rate

Bp-TRU® (BPM-100) Vsm Medtech, Coquitlam, BC, Canada

CHEP



Notes

Review the patient's family history, and then the results of the physical exam.
Missing data are to be assumed NORMAL, to prevent prolonged discussions.

Pamela: Laboratory Investigations

Test	Results	Normal values
Fasting glucose	6.0 mmol/L	4.0-6.0 mmol/L
Urea	4.0 mmol/L	3.0-7.0 mmol/L
Creatinine	76 µmol/L; eGFR 116 ml/min	44-106 µmol/L
K	4.1 mmol/L	3.5-5.0 mmol/L
A1 _c	0.06	0.04-0.06
Hb	124 g/L	115-165 g/L
LDL	3.3 mmol/L	<3.3 mmol/L
TC	5.2 mmol/L	<5.2 mmol/L
TG	1.7 mmol/L	<2.2 mmol/L
HDL	0.9 mmol/L	>0.9 mmol/L
TC:HDL	5.78	<6.0

eGFR: estimated glomerular filtration rate; K: potassium; A1_c: glycated hemoglobin a 1; Hb: hemoglobin; LDL: low-density lipoprotein; TC: total cholesterol; TG: triglycerides; HDL: high-density lipoprotein; TC:HDL: total cholesterol high-density lipoprotein ratio



Notes

Review the results of lab investigations that were performed.

Discuss the implications of these findings.

Discussion Question 1

Based on the lab findings and history,
what is Pamela's CV risk?

Using Framingham table?

Using SCORE Canada?

Define CV risk?

CV: cardiovascular; SCORE: Systematic Cerebrovascular and Coronary Risk Evaluation



Notes

Discuss the question with the group.

Most physicians, family physicians, and specialists have very imprecise knowledge regarding Framingham tables (20+ tables, CAD or CVD) and SCORE Canada has been recently introduced. The “predicted CV risk” is usually confusing. Ask participants to be specific; highly variable answers are to be expected.

Reminder: Allow the group to discuss their possible answers and the rationale behind them before moving on to review feedback from the case authors.

Based on Lab Findings and History,
What is Pamela's CV Risk?

Please select all answers that you feel apply

- A. Using Framingham, 10 year CV risk: 10-20% (moderate risk)
- B. Using Framingham, 10 year CV risk: <10% (low risk)
- C. Using Framingham, 10 year CV risk: >20% (high risk)
- D. Using SCORE Canada, 10 year risk of CVD mortality: ≥5% (high risk)
- E. Using SCORE Canada, 10 year risk of CVD mortality: 2-4% (moderate risk)



Notes

Discuss the question with the group.

Most physicians, family physicians, and specialists have very imprecise knowledge regarding Framingham tables (20+ tables, CAD or CVD) and SCORE Canada has been recently introduced. The “predicted CV risk” is usually confusing. Ask participants to be specific; highly variable answers are to be expected.

Reminder: Allow the group to discuss their possible answers and the rationale behind them before moving on to review feedback from the case authors.

CV Risk Estimation: The Framingham Heart Study

Estimation of 10-year risk of total cardiovascular disease in women (Framingham Heart Study)

POINTS	Age	HDL-C mmol/L	Total Cholesterol	SBP Not Treated	SBP Treated	Smoker	Diabetic
-3				<120			
-2		>1.6					
-1		1.3-1.6		<120			
0	30-34	1.3-1.6	<4.1	120-129		NO	NO
1		0.9-1.2	4.1-5.2	130-139			
2	35-39	<0.9		140-149	120-129		
3			5.2-6.2		130-139	YES	
4	40-44		6.2-7.2	150-159			YES
5	45-49		>7.2	>160	140-149		
6					150-159		
7	50-54				160+		
8	55-59						
9	60-64						
10	65-69						
11	70-74						
12	75+						
Points Allotted							TOTAL POINTS 14-16

CV: cardiovascular

Genest et al. *Can J Cardiol* 2009;25:567-79; Adapted from D'Agostino et al. *Circulation* 2008;117:743-53



Notes

Review the CV risk calculation using the patient's data

Published in CMAJ, the above table allows for the risk prediction of total CV disease, over the next ten years. Please note that categories are not mutually exclusive, with secondary variation in risk estimation.

CV Risk Estimation: The Framingham Heart Study

Cardiovascular disease risk for women

Points	Risk, %	Points	Risk, %	Points	Risk, %
-2 or less	<1	6	3.3	14	11.7
-1	1.0	7	3.9	15	13.7
0	1.2	8	4.5	16	15.9
1	1.5	9	5.3	17	18.5
2	1.7	10	6.3	18	21.5
3	2.0	11	7.3	19	24.8
4	2.4	12	8.6	20	27.5
5	2.8	13	10.0	21+	>30

Genest et al. *Can J Cardiol* 2009;25:567-79; Adapted from D'Agostino et al. *Circulation* 2008;117:743-53



Notes

Review the CV risk calculation using the patient's data

From the calculated points, risk over the next ten years can be estimated, with the above variations.

Please ask participants to specify: low, moderate, or high risk (as per the Canadian Working Group on Dyslipidemia).

Description of “10-Year High Risk”

Canadian Working Group on Dyslipidemia

Year	%	Description
2003	30%	CHD (eg, death, MI, unstable angina and chest pain)
2006	20%	Hard CHD (eg, death or MI)
2009	20%	CVD: composite of CHD (coronary death, MI, coronary insufficiency, and angina), cerebrovascular events (including ischemic stroke, hemorrhagic stroke, and TIA), PAD (intermittent claudication), and heart failure

CHD: coronary heart disease; MI: myocardial infarction;
CVD: cardiovascular disease; TIA: transient ischemic attack; PAD: peripheral artery disease



Notes

This slide provides a summary of the discussion of the previous slide, showing the changes to the % defining high risk in the different Framingham tables proposed over the last 10 years. These changes in outcomes have created higher CV risk stratifications for the same risk factors.

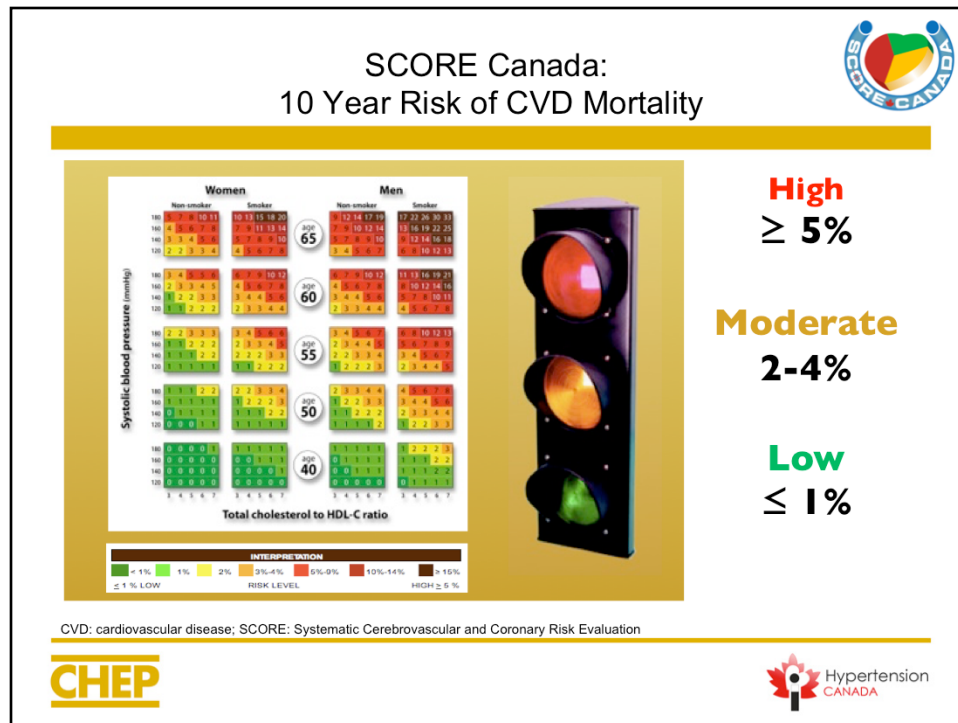
Also, over time, the clinical definition of morbidity events has changed greatly, currently having very little correlation to medicine today. If time allows, ask participants to compare the 1960 clinical definition of MI to today's definitions.

Key Points

In 2003, 2006, and 2009, the Canadian Working group on Dyslipidemia used different Framingham calculators. In 2003, a total coronary risk formula was recommended with a 30% level indicating high risk. In clinical trials, many of the adverse cardiac events were chest pain (50% in women).

In the 2006 recommendations, the CAD hard risk table introduced a change to 20% for the “high risk” category. In the most recent CV, BP, and lipid RCTs there were as many or more cerebrovascular events as cardiac events.

In 2009, the lipid panel chose a “general CV risk profile”, this was very general and based on past clinical definitions. However, even if extending the variety of outcomes, the same 20% limit was quoted as “high risk” instead of reverting to 30%, or choosing 35%, due to such a broad definition of CV events.



Key Points

SCORE Canada is the Canadian calibration of the SCORE system, a multi-European CV risk engine.

Using 14 different European cohorts, (n=205,178; >80,000 women, >8,000 CV deaths, ~3,000,000 pts/year exposure) it allows calculation of predicted CV death from cardiac and cerebrovascular events. The outcome data is clear, in high numbers, and allows comparison and calibration using selected national data. This is based on mortality data, as morbidity data are less reliable.

The cooperation of Dr. Michel Joffres, Simon Fraser University, and Professor Tony Fitzgerald, Cork University, Ireland allowed for a more precise Canadian risk engine by correcting for Canada CV risk factor prevalence and Canadian CV mortality. This approach has been validated in Germany, Belgium, Spain, and Switzerland where recent cohorts were available to correlate observed and predicted outcomes, with a satisfactory ratio.

“CVD Risk for the Next 10 Years”

Risk assessment method	Points	Risk estimate (%)	Interpretation	Description
Framingham	14-16	11.7-15.9	Moderate	Risk of multiple CVD incidents
SCORE Canada	-	2-3	Moderate	Risk of CV death

CVD: cardiovascular disease; SCORE: Systematic Cerebrovascular and Coronary Risk Evaluation



Key Points

For physicians wanting to determine morbidity (non-fatal MI and stroke) with SCORE Canada, the calculated mortality number must be multiplied by 3X.

Based on Lab Findings and History,
What is Pamela's CV Risk?

- ☒ A. Using Framingham, 10 year CV risk: >10% (moderate risk)
- ☐ B. Using Framingham, 10 year CV risk: <10% (low risk)
- ☐ C. Using Framingham, 10 year CV risk: >20% (high risk)
- ☐ D. Using SCORE Canada, 10 year risk of CVD mortality: $\geq 5\%$ (high risk)
- ☒ E. Using SCORE Canada, 10 year risk of CVD mortality: 2-4% (moderate risk)



Notes

Both answer choices A and E are correct.

Pamela: 3-Month Follow-Up

- Now 55 years old (was 54)
- TC: 5.2 mmol/L; HDL-C: 0.9 mmol/L; LDL-C: 3.3 mmol/L; TG: 1.7 mmol/L
- BP: 152/88 (148/88) mmHg with validated oscillometric device (BP-100)
- Non diabetic
- Smoker

TC: total cholesterol; HDL: high-density lipoprotein; LDL: low-density lipoprotein; TG: triglycerides; BP: blood pressure



Key Points

One reason why many physicians are confused and dissatisfied with the various risk stratification systems, is that small variations dramatically change the risk level when using the proposed Framingham point system, this is called the “boundary effect”.

CV Risk Estimation: The Framingham Heart Study

Estimation of 10-year risk of total cardiovascular disease in women (Framingham Heart Study)

POINTS	Age	HDL-C mmol/L	Total Cholesterol	SBP Not Treated	SBP Treated	Smoker	Diabetic
-3				<120			
-2		>1.6					
-1		1.3-1.6			<120		
0	30-34	1.2-1.3	<4.1	120-129		NO	NO
1		0.9-1.2	4.1-5.2	130-139			
2	35-39	<0.9		140-149	120-129		
3			5.2-6.2		130-139	YES	
4	40-44		6.2-7.2	150-159			YES
5	45-49		>7.2	>160	140-149		
6					150-159		
7	50-54				160+		
8	55-59						
9	60-64						
10	65-69						
11	70-74						
12	75+						
Points Allotted							TOTAL POINTS 17-19

CV: cardiovascular

Genest et al. *Can J Cardiol* 2009;25:567-79; Adapted from D'Agostino et al. *Circulation* 2008;117:743-53



Key Points

As shown here, when recalculating the patient's risk, using small changes in CV risk factors, non-exclusive categories are still included for estimation, and results in further overestimation of risk.

CV Risk Estimation: The Framingham Heart Study

Cardiovascular disease risk for women

Points	Risk, %	Points	Risk, %	Points	Risk, %
-2 or less	<1	6	3.3	14	11.7
-1	1.0	7	3.9	15	13.7
0	1.2	8	4.5	16	15.9
1	1.5	9	5.3	17	18.51
2	1.7	10	6.3	18	21.5
3	2.0	11	7.3	19	24.8
4	2.4	12	8.6	20	27.5
5	2.8	13	10.0	21+	>30

CV: cardiovascular

Genest et al. *Can J Cardiol* 2009;25:567-79; Adapted from D'Agostino et al. *Circulation* 2008;117:743-53



Key Points

At Pamela's 3 month follow-up, there is a 4 mmHg change in BP, but Pamela is now considered high risk? As previously stated, due to a problematic technical system, the "boundary effect" is pervasive and results an unreliable estimation of CV risk. Consequently, these method-induced errors often result in unrealistic estimates inhibiting the use global risk stratification.

“CVD Risk For the Next 10 Years”				
				
Risk assessment method	Points	Risk estimate (%)	Interpretation	Description
FRAMINGHAM				
T - 0	14-16	11.7-15.9	Moderate	Risk of multiple CVD incidents
T + 3 months SBP + 4 mmHg	17-19	18.5-25.8	Moderate - High	Risk of multiple CVD incidents
SCORE Canada				
T - 0	-	2-3	Moderate	Risk of CV death
T + 3 months SBP + 4 mm Hg	-	2-3	Moderate	Risk of CV death
CVD: cardiovascular disease; SCORE: Systematic Cerebrovascular and Coronary Risk Evaluation; SBP: systolic blood pressure				
				

Notes

The following slides will consider risk estimation using the SCORE system.

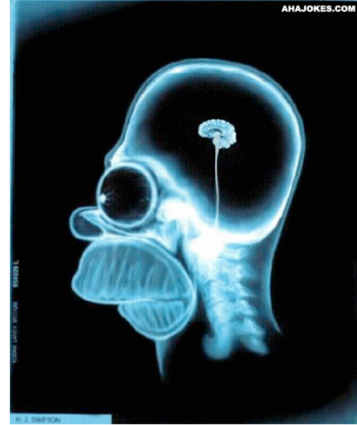
SCORE Canada is the Canadian calibration of the SCORE system, a multi-European CV risk engine.

Key Points

The large variation in estimated CV risk that results from minor changes in age and systolic BP is not in line with clinical experience. This slide provides a good example of why a “point system” may not be useful to estimate CV risk.

CV Risk Assessment

- Science or art...
- Science and art...



CV: cardiovascular

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Notes

Ask the opinion of participants, and try to convey the message below.

Key Points

Assessing CV risk factors is a science (epidemiology) with rules (use of scientific tools to avoid technical errors, such as those introduced by the points system and the boundary effect).

In Canada, assessment should be done using risk engines calibrated for current-day Canada, which consider Canadian prevalence of CV risk factors and their impact among the Canadian population (i.e., mortality and morbidity experienced in Canada).

Clinicians should also use added information from their clinical practice as modulating factors to apply the art of medicine in their assessments (i.e., family history, imaging results).

Factors to Consider When Using SCORE Risk Prediction Method



- Person approaching next age category
- Pre-clinical evidence of atherosclerosis (imaging test)
- Strong family history of premature CVD
 - Multiply risk by 1.7 (men) or 2.0 (women)
- Obesity
 - BMI: $>30 \text{ kg/m}^2$
 - Waist circumference: $>102 \text{ cm}$ (men), $>88 \text{ cm}$ (women)
- Sedentary lifestyle
- Diabetes
 - Multiply risk by 3 (men) or 5 (women)
- Raised serum TG level
- Raised level of CRP, fibrinogen, homocysteine, apoB, or Lp(a)

SCORE: Systematic Cerebrovascular and Coronary Risk Evaluation;
CVD: cardiovascular disease; BMI: body mass index; TG: triglycerides; CRP: c-reactive protein; apoB: apolipoprotein B; Lp(a): lipoprotein(a)



Key Points

Total fatal CVD risk may be lower/higher than indicated in the standard chart for many patients.

Use the qualifiers shown in the slide to modulate total fatal CVD risk.

The charts should also be used in light of the clinician's knowledge and judgement, especially with regard to local conditions.

Rx Implications of SCORE Spain vs. Framingham (D'Agostino Revision) in Hypertensive Patients

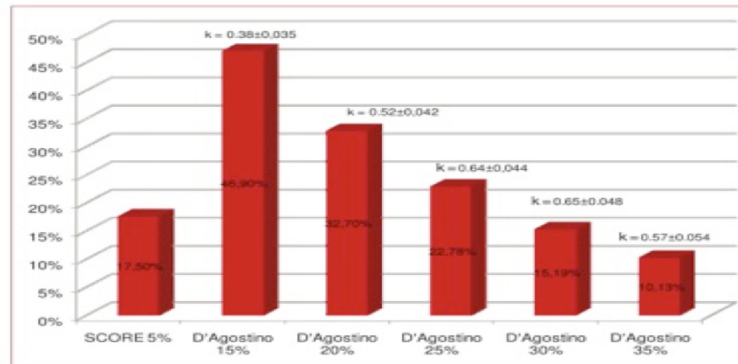


Figure 2
Proportions of subjects classified as high risk with SCORE (5%) and D'AGOSTINO at different cut-off points and agreement with SCORE. κ : Kappa index.

SCORE: Systematic Cerebrovascular and Coronary Risk Evaluation

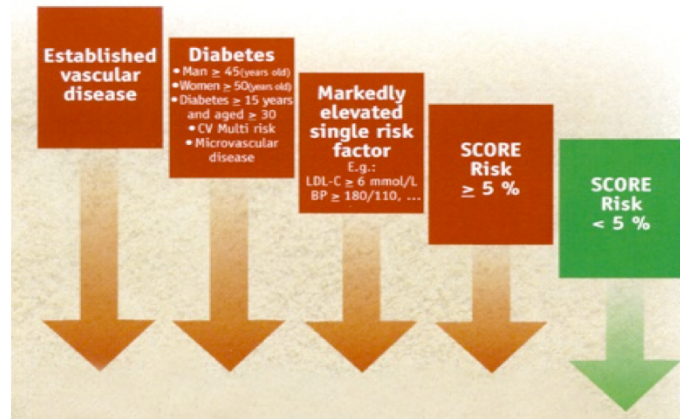
Gómez-Marcos et al. *BMC Cardiovascular Disorders* 2009;9:17



Key Points

This example from a hypertensive outpatient clinic in Spain compares the percentage of patients with hypertension at risk. SCORE Spain classified 15% of patients as high risk. In contrast, the commonly used Framingham 20% (as revised by D'Agostino) classified 30% of pts as high risk, a 200% over-classification. The SCORE Spain was calculated similar to SCORE Canada (basic SCORE risk engine, calibrated with recent Spanish CV risk factors and mortality). Additionally, SCORE Spain had the opportunity, using recent cohort data, to correlate the predicted/observed ratio and to proceed to an external validation.

Practical Recommendations for CV Risk Assessment



SCORE: Systematic Cerebrovascular and Coronary Risk Evaluation;
CV: cardiovascular; LDL-C: low density lipoprotein-cholesterol; BP: blood pressure



Key Points

Who should be risk stratified?

In general practice:

- 8-10% of patients are known vascular patients and are “de facto high-risk”
- 5-10% of patients have diabetes and CAD high CV risk indicators (men >45 years old, women >50 years old, diabetes for >15 years + age >30 , diabetes + multiple CV risk factors, etc.)
- The presence of an extreme level of CV risk must be treated (e.g., BP >180 mmHg, LDL-C >6 mmol)
- 75-85% of patients must be offered a global CV risk evaluation, and therapy adjusted to global CV risk estimation. It is recommended that patients be re-evaluated for CV risk stratification on a 2-3 year schedule, if patient is not at high risk initially

How to Use SCORE Canada



What if the patient was <40 years of age?

Relative risk table for patients <40 years of age

		Non-smoker					Smoker				
Systolic BP	180	3	3	4	5	6	6	7	8	10	12
	160	2	3	3	4	4	4	5	6	7	8
	140	1	2	2	2	3	3	3	4	5	6
	120	1	1	1	2	2	2	2	3	3	4
		4	5	6	7	8	4	5	6	7	8
		Total cholesterol to HDL-C ratio									

SCORE: Systematic Cerebrovascular and Coronary Risk Evaluation;
HDL-C: high density lipoprotein-cholesterol; BP: blood pressure



Key Points

The “ten-year risk” estimate should not be applied to patients ≤ 40 years of age, since the CV risk (an absolute low over the next 10 years) will be greater 15-20 years later if it is not prevented. A “relative risk” to age must be estimated, comparing the relative CV risk induced by the different risk factors, as opposed to just considering a patient with optimal status as being at low risk (e.g., non-smoker, systolic BP = 120 mmHg, TC/HDL-C = 4).

Assessment of Overall CV Risk

Treat hypertension in the context of overall CV risk

1. Overall cardiovascular risk should be assessed. In hypertensive patients consider using calculations that include cerebrovascular events
2. In the absence of Canadian data to determine the accuracy of risk calculations, avoid using absolute levels of risk to support treatment decisions at specific risk thresholds

Simply counting risk factors may underestimate risk

CV: cardiovascular



Key Points

According to CHEP, global cardiovascular risk should be assessed. In the absence of Canadian data to determine the accuracy of risk calculations, avoid using absolute levels of risk to support treatment decisions.

Canadian data will not become available in the next 20 years, since there is no Canadian cohort available to do external validation. In selected European countries (France, Belgium, Switzerland, etc.) the process of comparing observed/expected results was repeatedly found to be highly successful.

As clinicians, we can be confident of the precision of risk estimation using SCORE Canada for our Canadian patients.

Reference

2011 Canadian Hypertension Education Program Recommendations.

Pamela: Discussing CV Risk

- Review of Pamela's risk factors
 - 54-yo, smoker, and approaching next age category
 - Family history of intermittent claudication (mother)
 - Systolic BP: 148 mmHg
 - TC/HDL-C ratio: 5.78
 - Framingham: moderate-high; SCORE: moderate
- Discussing CVD risk
 - Pamela listens and repeats what you said about her risk
 - She says that she has tried to quit smoking before but has always restarted
 - She dislikes the idea of taking pills, asking: "Does that mean I would have to take a pill for the rest of my life?"
 - She also asks: "How will this affect me over time?"

SCORE: Systematic Cerebrovascular and Coronary Risk Evaluation;
CVD: cardiovascular disease; BP: blood pressure; TC/HDL-C: total cholesterol high-density lipoprotein ratio



Notes

Review the patient's risk factors with the SCORE assessment tool in mind.

Discussion Question 2

How would you explain to Pamela what her
CV risk score means?



Notes

Reminder: Allow the group to discuss their possible answers and the rationale behind them before moving on to review feedback from the case authors.

How would you explain to Pamela what her CV risk score means?

- A. Use fear to shake Pamela into changing her behaviour
- B. Discuss important risk assessment points (e.g., risk, benefit, communication) with Pamela
- C. Inform Pamela of her global risk
- D. Talk to Pamela about her cardiovascular risk age
- E. Show Pamela how the SCORE Canada risk calculator can estimate her vascular age

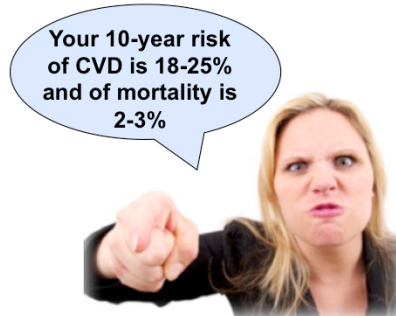


Notes

Discuss the question with the group.

Allow the group to discuss possible answers and the rationale behind them before moving on to review feedback from the case authors.

A) Use Fear to Shake Pamela Into Changing Her Behaviour



CVD: cardiovascular disease

CHEP

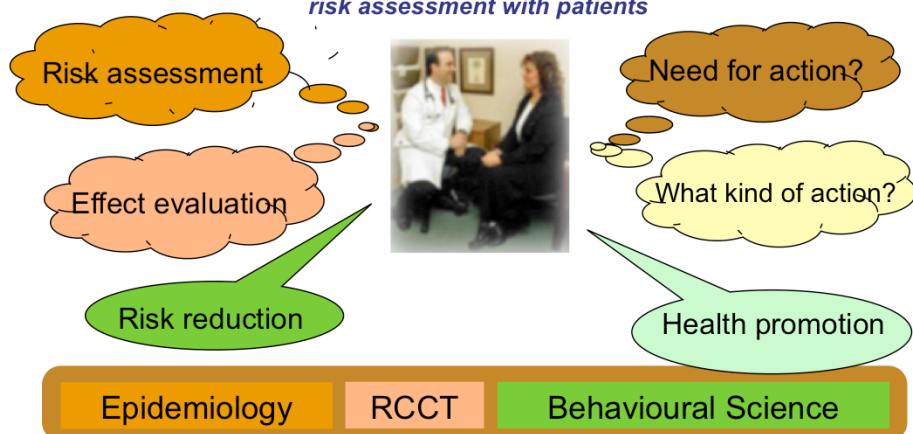
 Hypertension
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Notes

Although it may have little impact on some patients, hearing a 10-year risk CV assessment can be frightening for many others.

B) Discuss Important Risk Assessment Points with Pamela

Risk, benefit, communication – important points when discussing risk assessment with patients



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Notes

Discuss some of the points that are important when communicating risk assessment to patients.

2015 CHEP Recommendations
Assessing CV Risk to Improve Adherence

- C) Inform Pamela of her global risk
- Consider informing patients of their global risk to improve the effectiveness of risk factor modification (Grade B)
- D) Talk to Pamela about her cardiovascular risk age
- Consider also using analogies that describe comparative risk such as “Cardiovascular Age”, “Vascular Age” or “Heart Age” to inform patients of their risk status (Grade B)

CV: cardiovascular

2015 Canadian Hypertension Education Program Recommendations



Key Points

Recent CHEP recommendations suggest the clinician consider informing patients of their global CV risk to improve the effectiveness of risk factor modification. Using analogies that describe comparative risk such as “cardiovascular age”, “vascular age”, or “heart age” can help inform patients of their risk status.

E) Pamela: Estimating Vascular Age with SCORE Canada

- Female, age 55
 - Smoker
 - SBP 152/88 mmHg
 - TC/HDL-C ratio 5.9
 - Non diabetic
 - **10-year CVD risk of death is 2-3%**
- Female, age 55
 - Non smoker
 - SBP 130mmHg
 - TC/HDL-C ratio 3
- **Vascular age: 65**



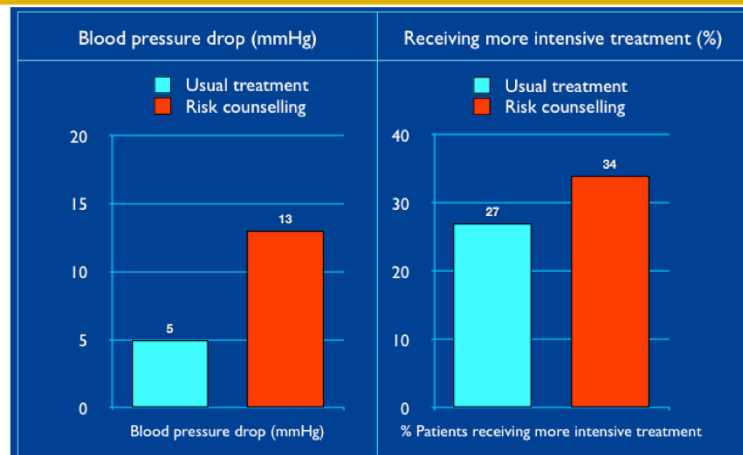
SCORE: Systematic Cerebrovascular and Coronary Risk Evaluation; BP: blood pressure; TC/HDL-C: total cholesterol high-density lipoprotein ratio



Key Points

Pamela's calculated risk of CVD death over next ten years is 2-3%. This is the same 2% risk that would be predicted in a 65-y-old female, non-smoker, with a systolic BP of 130 mmHg, and a TC/HDL-C ratio of 3.

Impact of Discussing Coronary Risk with Patients Receiving BP Treatment



BP: blood pressure

Grover et al. *J Gen Intern Med* 2009;24:33-9

CHEP

**Hypertension
CANADA**

Key Points

The CHECK-UP study, included 3,053 patients with dyslipidemia; 2,631 completed the full 12-month follow-up, including 1,352 (51%) who did not have previously diagnosed hypertension, and 1,279 (49%) who had diagnosed hypertension and were on medication at entry into the study.

The use of a risk profile was associated with an increased likelihood of starting therapy (OR = 1.78, 95% CI 1.06-3.00) or modifying therapy (OR = 1.40, 95% CI 1.03-1.91). Patients who received risk counselling experienced a greater drop in blood pressure vs. those who received treatment as usual. Ongoing coronary risk assessment was associated with more appropriate blood pressure management.

Reference

1. Grover et al. Discussing Coronary Risk with Patients to Improve Blood Pressure Treatment Secondary Results from the CHECK-UP: Study A Randomized Controlled Trial. *J Gen Intern Med* 2009;24:33-9.

Patient Education Components

- Patients need to understand and be involved in decision making
- Patients need to know:
 - What the purpose is of the treatment
 - Why lifestyle modification and medication are needed
 - How long the treatment regimen is
 - How to take the medication
 - What to do if they have side effects
 - What to do if they forget to take their medication
 - That they have to refill their medication until asked otherwise
- Patients need to be motivated
- Patients need to feel empowered & that they can do something

Drouin, Milot. Therapeutic Guide Hypertension, 3rd ed



Key Points

Recommended components of patient education are shown in the slide. It is critical that patients understand and are involved in decision making regarding management of cardiovascular risk. Patients should be made aware of the purpose of the treatment, lifestyle modifications, treatment duration, possible side effects, actions to take in the event of a missed dose, and the importance of refilling their medication.

It is also important that patients are adequately motivated and empowered to participate in their treatment.

Discussion Question 3

What are the possible next steps in managing her CV risk?



Notes

Reminder: Allow the group to discuss their possible answers and the rationale behind them before moving on to review feedback from the case authors.

What are the possible next steps in managing her CV risk?

- A. Consider smoking cessation strategies
- B. Address dyslipidemia
- C. Manage hypertension with lifestyle changes
- D. Manage hypertension with drug therapy

CV: cardiovascular; CVD: cardiovascular disease



Notes

Discuss the question with the group.

Allow the group to discuss possible answers and the rationale behind them before moving on to review feedback from the case authors.

Impact of Risk Factors on Relative Risks for CVD Mortality

	Hazard ratio (95%CI)
Systolic BP (10 mmHg)	1.21 (1.19, 1.24)
TC or TC/HDL (1 mmol/L or one unit)	1.20 (1.19, 1.20)
Smoking	2.00 (1.90, 1.21)

CVD: cardiovascular disease; BP: blood pressure; TC: total cholesterol; TC/HDL-C: total cholesterol high-density lipoprotein ratio

Conroy et al. *Eur Heart J* 2003;24:987-1003



Key Points

Based on an analysis of the entire SCORE database, it was found that CV risk factor are associated with the same relative risk in countries with both low CVD prevalence (e.g., Spain, Belgium, etc.) and countries with high CVD prevalence (e.g., Finland, Russia, etc.). The CV impact of smoking, elevated BP, or dyslipidemia was found to be relatively constant in all populations. Therefore, the net CV impact can be determined by the total prevalence of the different CV risk factors. From these constant effects, a basic formula for estimation of 10-year risk of fatal CVD could be established.

For each country, a national SCORE should be determined using national CVD mortality and prevalence of the basic CV risk factors. This slide shows the calculations of SCORE CANADA.

A) Consider Smoking Cessation Strategies

- CV risk would decrease by 50% in 1 year & 90% in 2 years, also cancer risk...
 - Smoking cessation therapies
 - Nicotine replacement therapy
 - Bupropion
 - Varenicline
 - In conjunction with structured smoking cessation counseling

CV: cardiovascular



Key Points

Smoking cessation would have considerable impact on CV risk, being associated with a decrease of up to 50% after one year, as much as a 90% after 2 years. Smoking cessation has the added benefit of reducing cancer risk as well.

B) Address Dyslipidemia

- Dyslipidemia treatment
 - Risk would decrease 20% per 1 mmol of TC or 1 unit of TC/HDL, over next 4-5 years
 - Lifestyle intervention
 - Monotherapy
 - Combination therapy may be needed for some patients

LDL: low-density lipoprotein; TC: total cholesterol; TC/HDL-C: total cholesterol high-density lipoprotein ratio



Key Points

A 1 mmol/L decrease in total cholesterol has been associated with a 20% decrease in CV risk.

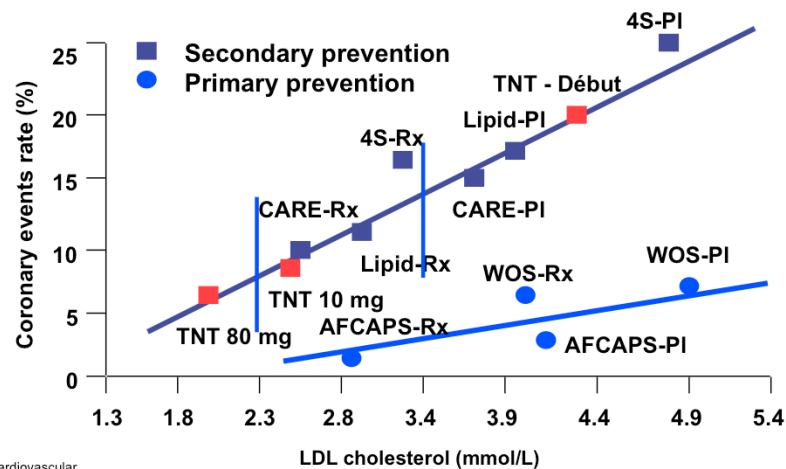
According to the 2009 Canadian Cardiovascular Society guidelines for the management of dyslipidemia, pharmacotherapy should be started immediately in high-risk individuals, concomitant with health behaviour interventions. The primary target of therapy is to achieve an LDL-C of <2.0 mmol/L, an apoB of <0.8 g/L or a 50% reduction in LDL-C from baseline values. The majority of patients will be able to achieve target LDL-C levels on statin monotherapy; however, a significant minority of patients may require combination therapy with an agent that inhibits cholesterol absorption (ezetimibe) or bile acid reabsorption (cholestyramine, colestipol), or the concomitant use of niacin. Some interventions may be lifelong, particularly lifestyle modifications, underscoring the importance of precision in stratifying risk.

Also of potential interest are the clinical difference between CCS and European recommendations as they are based on the same data.

References

1. Genest J, et al. 2009 Canadian Cardiovascular Society/Canadian guidelines for the diagnosis and treatment of dyslipidemia and prevention of cardiovascular disease in the adult – 2009 recommendations. *Can J Cardiol* 2009;25:567-579.

Impact of Statin Therapy on CV Risk



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Key Points

Shown in the figure above are various statin trials that have contributed to the evidence-base for statin treatment. The absolute effect of cholesterol lowering in symptomatic and asymptomatic patients is striking. The NNTs for primary and secondary prevention are very different.

Please note that most of these trials had no target for LDL reduction, but rather a fixed dose regimen. Most LDL recommendations are based on better CV outcomes at obtained LDL levels.

C) Manage Hypertension with Lifestyle Changes

Lifestyle therapies in adults with hypertension

Intervention	Target
Reduce foods with added sodium	<2000 mg/day
Weight loss	BMI <25 kg/m ²
Alcohol restriction	≤2 drinks/day
Physical activity	30-60 minutes 4-7 days/week
Dietary patterns	DASH diet
Smoking cessation	Smoke free environment
Waist circumference	Men <102 cm Women <88 cm



BMI: body-mass index; DASH: Dietary Approaches to Stop Hypertension



Key Points

Lifestyle interventions can have a substantial impact on blood pressure. This slide shows recommendations and targets for specific interventions.

D) Manage Hypertension with Drug Therapy

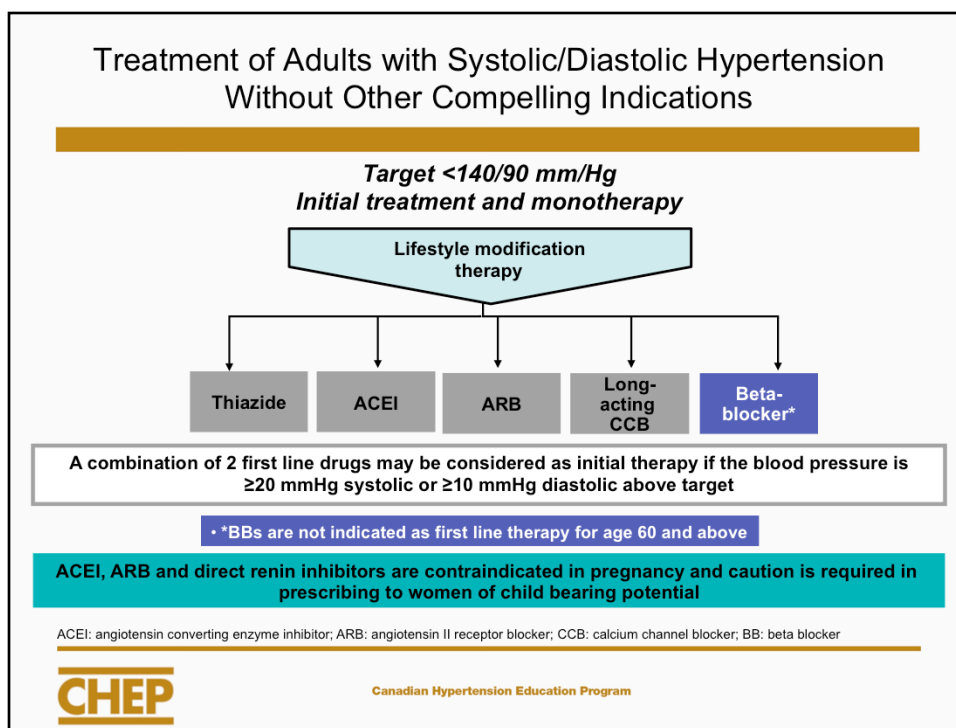
- Hypertensive treatment of systolic BP <140/90 mmHg
 - Stroke risk would decrease 35% and CHD risk by 25%, for each reduction of 10 mmHg systolic
 - Monotherapy with lifestyle intervention (combination of 2 first line drugs may be considered as initial therapy if BP is >20 mmHg systolic or >10 mmHg diastolic above target)

BP: blood pressure; CHD: coronary heart disease



Key Points

In hypertension without other compelling indications, CHEP recommends a target of <140/90 mmHg. Recommendations for lifestyle interventions and pharmacotherapy are outlined in the slides that follow.



Key Points

This algorithm shows the CHEP 2012 recommendations for individuals with systolic/diastolic hypertension without other compelling indications.

First line therapy choices include thiazide diuretics, beta-blockers, ACE-inhibitors, ARBs, or long-acting calcium channel blockers (ASA and statins can be considered in select patients). First-line combination therapy may be considered if SBP is >20 mmHg or DBP is >10 mmHg above target.

Beta-blockers are not recommended as initial therapy in those >60 years of age. Hypokalemia should be avoided by using potassium-sparing agents in those who are prescribed diuretics as monotherapy. ACE-inhibitors are not recommended in black patients as monotherapy. ACE-inhibitors, ARBs, and direct renin inhibitors are potential teratogens, and caution is therefore required if prescribing to women of child bearing potential. The combination of an ACE-inhibitor with an ARB is not recommended.

Pamela: Case Progression

- After a number of visits in your clinic, one of the nurses on your team initiates patient education and motivational interviewing with Pamela
- Pamela has agreed to start anti-hypertensives, attend a smoking cessation program and is starting a lifestyle intervention to help improve her dyslipidemia
- “Out of the office” BP measurement could help the patient to self monitor BP

BP: blood pressure



Notes

Review the progress of Pamela's case with the group.

Discussion Question 4

What is your follow-up plan for this patient?



Notes

Reminder: Allow the group to discuss their possible answers and the rationale behind them before moving on to review feedback from the case authors.

What is your follow-up plan for this patient?

- A. Review Pamela's BP in clinic 3-4 times/year
- B. Monitor global CV risk factors
- C. Continue lifestyle modifications & consider self-monitoring of BP

BP: blood pressure; CV: cardiovascular



Notes

Discuss the question with the group.

Allow the group to discuss possible answers and the rationale behind them before moving on to review feedback from the case authors.

There is not necessarily one right answer; the goal of the exercise is to have an open discussion.

When you have discussed each possible answer, proceed to the following slides to see the feedback provided by the case authors.

A) Review Pamela's BP in Clinic 3-4 Times/Year

- Patients with BP above target are recommended to be followed at least every 2nd month
- Follow-up visits are used to increase the intensity of lifestyle and drug therapy, monitor the response to therapy and assess adherence

BP: blood pressure



Notes

Review the discussion points on the slide, and the need for regular follow-up in patients with BP levels above target. Discuss the role of the multidisciplinary team in improving adherence.

B) Monitor Global CV Risk Factors

- Ensure her BP remains controlled
 - Target: <140/90 mmHg/office, <135/85 home
- Smoking cessation
- Consider lipid Rx as per response to lifestyle and global CV risk

**Risk engines cannot be taken at face value for CV reduction,
but they can be effective in motivating patients**

CV: cardiovascular; BP: blood pressure



Notes

Review the discussion points on the slide. Stress the importance of regular monitoring of CV risk factors. It is important to make sure that BP control is not only achieved but also maintained. Smoking cessation and lipid control are also important. Note that risk assessment tools should not be used to monitor CV risk reduction, but they can be an important motivating factor.

C) Continue Lifestyle Modifications & Consider Self-monitoring of BP

- Frequent brief interventions double the rate of lifestyle changes
- All hypertensives require ongoing support to initiate and maintain lifestyle changes
- Self monitoring of BP can enhance adherence

BP: blood pressure



Notes

Review the discussion points regarding the importance of lifestyle modifications in improving outcomes.

Key Learnings

- ✓ Significant gender gap in management of atherosclerotic disease and atherosclerotic risk factors
- ✓ Women with CAD and atherosclerotic risk factors undertreated
- ✓ Key to management: initial global CV risk assessment translated to CV age
- ✓ CV risk assessment a science, to be modulated with art of medicine
- ✓ Global CV risk reduction implies reduction in multiple CV risk factors

CAD: coronary artery disease; CV: cardiovascular



Notes

Review the key points discussed throughout the meeting.

New Patient Resources for Hypertension Online

- www.hypertension.ca - Download current resources for the prevention and control of hypertension
- www.c-changeprogram.ca -To learn more about the harmonized recommendations for CVD prevention and treatment
- www.heartandstroke.ca/BP -To monitor home blood pressure and encourage self management of lifestyle
- www.canadianstrokenetwork.ca – Download current resources to support best practice recommendations for stroke care
- <http://www.hypertension.qc.ca/> - Société Québécoise d' hypertension artérielle

Full slide set of 2015 CHEP Recommendations available at:
www.hypertension.ca



Canadian Hypertension Education Program

Notes

This slide shows some websites that clinicians may find useful for their patients with hypertension.

Refer the group to the website for the full CHEP Recommendations and more information.

Event wrap-up & acknowledgments

- Thank the participants for sharing their expertise and opinions, and acknowledge CHEP for developing the program content