



# Clinical Issues in Hypertension

Canadian Coalition for High Blood Pressure Prevention and Control  
Coalition Canadienne pour la Prévention et le Contrôle de l'Hypertension Artérielle

## Lessons from The Healthy Heart Kit

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### Why focus on Cardiovascular Disease Prevention in Primary Care?

Cardiovascular (including cerebrovascular) health is not a focus, nor is it confined to target populations. The risks of cardiovascular and cerebrovascular morbidity and mortality are epidemic and endemic. This is true in both industrial and developing countries.<sup>1-4</sup> Examine the case of just one of the risk factors taken into account by the Healthy Heart Kit (HHK): diabetes. Type 2 diabetes is better understood than ever as a key risk factor. The likelihood of hyperglycemia and its inherent risk is rising astronomically in Canada and elsewhere. Interrelationships with obesity, hypertension, sedentary living and hypercholesterolemia raise risk exponentially.<sup>5</sup> To a significant degree, quantifiable risk is modifiable by lifestyle change. For many patients, a doc-

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# The Healthy Heart Kit

Table 1

## Ten Benefits of The Healthy Heart Kit

- The Healthy Heart Kit (HHK) provides six clinical practice guidelines carefully integrated with each other, to save time.
- These guidelines have patient education tools which are integrated with each other, and that correspond to the physician's guidelines, to minimize patient confusion.
- Risk factor prediction charts optimize patient-professional shared decision-making.
- Evidence, problem solvers, and decision support are embedded in each therapeutic module.
- Available and periodically updated on the Web, the HHK serves as a reference tool for physicians, patients, health information consumers, and the public at large.
- Each therapeutic module allows individual risk estimation and therapeutic direction found to decrease anxiety for patients using electronic health information.
- The HHK has been evaluated by the College of Family Physicians and enhances patient satisfaction.
- The HHK provides tips to family doctors and patients on how to prioritize behavioral change, to optimize chance of success!
- The HHK provides a basis for motivational interviewing to enhance practice, and to help patients develop healthy cardiovascular lifestyles.
- The HHK serves as an educational tool for health professionals, patients, consumers, and the public in prevention and/or management of: smoking, cessation, hypertension, hypercholesterolemia, obesity, sedentary lifestyle, hyperglycemia and diabetes. Consider family risk profile and patient history of a cardiovascular event, and almost 100% of patients could benefit!

### TRY IT! YOU'LL LIKE IT!

- NO OTHER GUIDELINE INTEGRATES SIX GUIDELINES.
- NO OTHER GUIDELINE INTEGRATES SPECIFIC PATIENT EDUCATION MATERIAL SPECIFIC TO EACH ALGORITHM AND HARMONIZED WITH THE SPECIFIC PHYSICIAN PROTOCOL.
- NO OTHER GUIDELINE SUPPORTS DECISIONS IN THE FACE OF MULTIPLE RISK FACTORS.
- NO OTHER GUIDELINE PROVIDES SUCH WELL-FORMATTED TOOLS, KNOWN TO ENHANCE PRACTICE.
- NO OTHER GUIDELINE EXISTS FOR HEALTH PROMOTION IN PRACTICE.
- NO OTHER GUIDELINE HAS BEEN SO EXTENSIVELY EVALUATED BY THE COLLEGE OF FAMILY PHYSICIANS AND FOUND TO BE EFFECTIVE.

tor's recommendation is the most powerful incentive to stop smoking, improve eating habits, lose weight, and become more physically active.<sup>6-17</sup>

Two out of three Canadians have one or more of the classical major risk factors for cardiovascular disease (CVD), such as smoking, high blood pressure, and elevated blood cholesterol. Well over a third of Canadian adults lead

a sedentary lifestyle, and just under half of all Canadians are overweight.

CVD is largely preventable. Furthermore, the benefits of CVD prevention extend to other areas of chronic disease. Many of the lifestyle practices that endanger Canadians' cardiovascular health also contribute to cancer and lung disease. Primary-care physicians are in a unique position to help patients make lifestyle

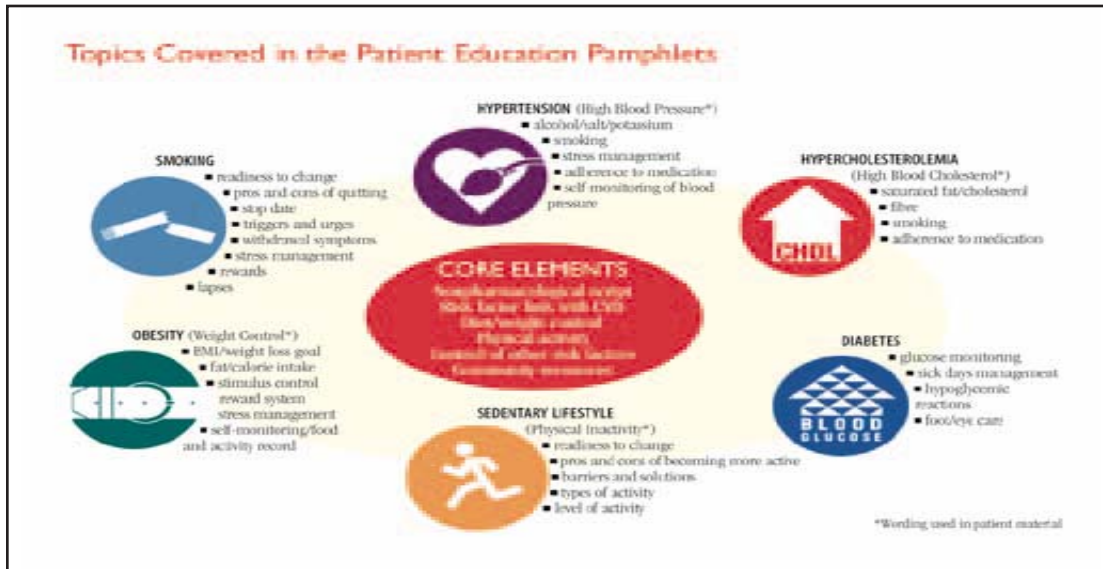


Figure 1: The HHK addresses Six Modifiable Lifestyles.

changes that will reduce their CVD risk.

The HHK addresses the principle modifiable risk factors that threaten cardiovascular health (Table 1).<sup>18-28</sup>

## What is the Healthy Heart Kit?

The HHK is a risk management and patient education tool for the prevention of cardiovascular disease and the promotion of cardiovascular health. Its approach is primarily non-pharmacologic. It has been designed for use by primary-care physicians with adult patients who have one or more of the principle modifiable lifestyle CVD risk factors: smoking, hypertension, hypercholesterolemia, obesity/overweight, sedentary lifestyle, diabetes/hyperglycemia. (Figure 1)

The HHK is also a practice organization tool to facilitate the integration of CVD prevention activities into medical practice. It includes instruments for systematic CVD risk assess-

ment/management and a chart labeling system. The HHK can be used even during brief patient encounters and will not significantly increase the amount of time spent with patients. Practice organization for CVD prevention is most successful when undertaken collaboratively by physicians, office staff, community pharmacists and nurses, and patients!

## What's in the Kit?

- **CVD Risk Assessment Grid** consists of a Coronary Heart Disease Risk Factor Prediction Chart and a Stroke Risk Factor Prediction Chart, based on American Heart Association data. (Figures 2 and 3)
- **BMI Chart** determines body mass index (BMI) and helps assess the amount of weight to lose. (See Web site)
- **Algorithms** suggest clinical approaches for managing patients with the following CVD risk factors. Each algorithm contains explanatory footnotes. (Figure 4)



# The Healthy Heart Kit

## Coronary Heart Disease Risk Factor Prediction Chart<sup>1, 2, 3</sup>

### 1. FIND POINTS FOR EACH RISK FACTOR

Age (If Female)		Age (If Male)		HDL-Cholesterol		Total-Cholesterol		Systolic Blood Pressure		Other	
Age	Pts.	Age	Pts.	HDL-C	Pts.	Total-C	Pts.	SBP	Pts.		Pts.
30	-12	30	-2	0.64-0.68	7	3.60-3.52	-3	98-104	-2	Cigarettes	4
31	-11	31	-1	0.69-0.75	6	3.93-4.31	-2	105-112	-1	Diabetic-male	3
32	-9	32-33	0	0.76-0.83	5	4.32-4.73	-1	113-120	0	Diabetic-female	6
33	-8	34	1	0.84-0.91	4	4.74-5.17	0	121-129	1	ECG-LVH	9
34	-6	35-36	2	0.92-0.99	3	5.18-5.68	1	130-139	2	For each NO	0
35	-5	37-38	3	1.00-1.09	2	5.69-6.21	2	140-149	3		
36	-4	39	4	1.10-1.20	1	6.22-6.80	3	150-160	4		
37	-3	40-41	5	1.21-1.30	0	6.81-7.48	4	161-172	5		
38	-2	42-43	6	1.31-1.43	-1	7.49-8.18	5	173-185	6		
39	-1	44-45	7	1.44-1.56	-2	8.19-8.58	6				
40	0	46-47	8	1.57-1.72	-3						
41	1	48-49	9	1.73-1.90	-4						
42-43	2	50-51	10	1.91-2.08	-5						
44	3	52-54	11	2.09-2.26	-6						
45-46	4	55-55	12	2.27-2.50	-7						
47-48	5	57-59	13								
49-50	6	60-61	14								
51-52	7	62-64	15								
53-55	8	65-67	16								
56-60	9	68-70	17								
61-67	10	71-73	18								
68-74	11	74	19								

### 2. SUM POINTS FOR ALL RISK FACTORS

(Note: Minus Points Subtract From Total)

$$\text{Age} + \text{HDL-C} + \text{Total-C} + \text{SBP} + \text{Smoker} + \text{Diabetes} + \text{ECG-LVH} = \text{Point Total}$$

### 3. LOOK UP RISK CORRESPONDING TO POINT TOTAL

Pts.	Probability			Pts.	Probability			Pts.	Probability		
	5 Yr.	10 Yr.			5 Yr.	10 Yr.			5 Yr.	10 Yr.	
1	< 1%	< 2%		13	3%	8%		25	14%	27%	
2	1%	2%		14	4%	9%		26	16%	29%	
3	1%	2%		15	5%	10%		27	17%	31%	
4	1%	2%		16	5%	12%		28	19%	33%	
5	1%	3%		17	6%	13%		29	20%	36%	
6	1%	3%		18	7%	14%		30	22%	38%	
7	1%	4%		19	8%	15%		31	24%	40%	
8	2%	4%		20	8%	16%		32	25%	42%	
9	2%	5%		21	9%	17%					
10	2%	6%		22	11%	21%					
11	3%	6%		23	12%	23%					
12	3%	7%		24	13%	25%					

### 4. COMPARE TO AVERAGE 10-YEAR RISK

Age	Probability		Men
	Women		
30-34	< 1%		3%
35-39	< 1%		5%
40-44	2%		6%
45-49	5%		10%
50-54	8%		14%
55-59	12%		16%
60-64	13%		21%
65-69	9%		30%
70-74	12%		24%

1) This chart applies essentially to primary prevention.

2) Risk scores presented in the chart are not accurate when risk factors are present in severe form; thus, heavy smoking, marked hypertension, and extremely elevated serum cholesterol confer much greater risk than that suggested by the chart.

3) While obesity and sedentary lifestyle are important factors as well, adding them into the equation will overestimate risk. They should be included in one's clinical judgement in assessing a patient.

Framingham Heart Study - National Heart, Lung, and Blood Institute. © Reproduced with permission. Risk Factor Prediction Kit, 1990. Copyright American Heart Association.

The American Heart Association has recently published new risk scores for coronary heart disease. These scores are based on reclassified risk factors to be more consistent with current official American recommendations for blood pressure and cholesterol control. Please note that the predictive capability of these scores is similar to the model presented here. The 1998 score sheets are available on the internet at [www.nhlbi.nih.gov/nhlbi/fran/](http://www.nhlbi.nih.gov/nhlbi/fran/)

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Figure 2: The HHK Quantifies Individual Risk of Coronary Event.



## Stroke Risk Factor Prediction Chart

**1. FIND POINTS FOR EACH RISK FACTOR**

Men							
Age	SBP	HYP RX	Diabetes	Cigs	CVD	AF	LVH
54-56 = 0	95-105 = 0	No = 0	No = 0	No = 0	No = 0	No = 0	No = 0
57-59 = 1	106-116 = 1	Yes = 2	Yes = 1	Yes = 3	Yes = 3	Yes = 4	Yes = 6
60-62 = 2	117-126 = 2						
63-65 = 3	127-137 = 3						
66-68 = 4	138-148 = 4						
69-71 = 5	149-159 = 5						
72-74 = 6	160-170 = 6						
75-77 = 7	171-181 = 7						
78-80 = 8	182-191 = 8						
81-83 = 9	192-202 = 9						
84-86 = 10	203-213 = 10						

Women							
Age	SBP	HYP RX	Diabetes	Cigs	CVD	AF	LVH
54-56 = 0	95-104 = 0	No = 0	No = 0	No = 0	No = 0	No = 0	No = 0
57-59 = 1	105-114 = 1	If yes see below	Yes = 1	Yes = 3	Yes = 2	Yes = 6	Yes = 4
60-62 = 2	115-124 = 2						
63-65 = 3	125-134 = 3						
66-68 = 4	135-144 = 4						
69-71 = 5	145-154 = 5						
72-74 = 6	155-164 = 6						
75-77 = 7	165-174 = 7						
78-80 = 8	175-184 = 8						
81-83 = 9	185-194 = 9						
84-86 = 10	195-204 = 10						

If Currently Under Anti-Hypertensive Therapy Add The Following Points Depending On SBP Level

SBP	95-104	105-114	115-124	125-134	135-144	145-154
Points	6	5	5	4	3	3
SBP	155-164	165-174	175-184	185-194	195-204	
Points	2	1	1	0	0	

**2. SUM POINTS FOR ALL RISK FACTORS**

Age + SBP + HYP RX + Diabetes + CIGS + CVD + AF + LVH = Point Total

**3. LOOK UP RISK CORRESPONDING TO POINT TOTAL**

Men 10 Yr.						Women 10 Yr.					
Pts.	Prob.	Pts.	Prob.	Pts.	Prob.	Pts.	Prob.	Pts.	Prob.	Pts.	Prob.
1	2.6%	11	11.2%	21	41.7%	1	1.1%	11	7.6%	21	43.4%
2	3.0%	12	12.9%	22	46.6%	2	1.3%	12	9.2%	22	50.0%
3	3.5%	13	14.8%	23	51.8%	3	1.6%	13	11.1%	23	57.0%
4	4.0%	14	17.0%	24	57.3%	4	2.0%	14	13.3%	24	64.2%
5	4.7%	15	19.5%	25	62.8%	5	2.4%	15	16.0%	25	71.4%
6	5.4%	16	22.4%	26	68.4%	6	2.9%	16	19.1%	26	78.2%
7	6.3%	17	25.5%	27	73.8%	7	3.5%	17	22.8%	27	84.4%
8	7.3%	18	29.0%	28	79.0%	8	4.3%	18	27.0%		
9	8.4%	19	32.9%	29	83.7%	9	5.2%	19	31.9%		
10	9.7%	20	37.1%	30	87.9%	10	6.3%	20	37.3%		

**4. COMPARE TO AVERAGE 10-YEAR RISK**

Avg. 10 Yr. Prob. By Age		
Age	Men	Women
55-59	5.9%	3.0%
60-64	7.8%	4.7%
65-69	11.0%	7.2%
70-74	13.7%	10.9%
75-79	18.0%	15.5%
80-84	22.3%	23.9%

**KEY FOR SYMBOLS**

- SBP** - Systolic blood pressure
- HYP RX** - Under anti-hypertensive therapy?
- DIABETES** - History of diabetes?
- CIGS** - Smokes cigarettes?
- CVD** - History of myocardial infarction, angina pectoris, coronary insufficiency, intermittent claudication or congestive heart failure?
- AF** - History of atrial fibrillation?
- LVH** - Left ventricular hypertrophy on ECG?

Framingham Heart Study - National Heart, Lung, and Blood Institute  
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Figure 3: The HHK Quantifies Individual Risk of Cerebrovascular Accident.



# The Healthy Heart Kit

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- Smoking
- Hypertension
- Hypercholesterolemia
- Obesity/overweight
- Sedentary lifestyle
- Diabetes mellitus
- **Problem Solvers** outline potential problems and solutions related to the clinical management of CVD risk factors.
- **Footnotes** for each algorithm highlight the evidence on which risk estimate and algorithm are based.
- **Patient Education Guides** Each guide includes a nonpharmacologic script to help establish an action plan and assist with followup. (Figure 5)

## How to get the Best Results? The Triple A Approach

### *ASK and ASSESS* *ADVISE* *ASSIST*

Use the Coronary Heart Disease and Stroke Risk Prediction charts and the BMI chart to estimate risk for your patient. Prescribe behaviors to change. Affirm the patient's decision based not only on risk, but also on motivation, and select an algorithm and the corresponding patient education material.

**ASSESSMENT** will help you to appreciate the magnitude of your patient's risk factors, such as smoking. This assessment will help you to determine your patient's readiness to change specific behaviors, and to detect factors that might influence therapeutic choices.

The **ADVISE** approach is based on the fact that counselling can be brief when supported by resource materials such as the patient education tools provided in the kit. Counseling is

more than the delivery of information. It is a process of influencing patient behavior to bring about change in his or her knowledge, attitudes and skills needed to improve health. Consideration of your patient's social and cultural environment, readiness to change, and personal preferences is needed if maximum change is to occur. Motivational interviewing linked with shared decision-making, typify effective counselling.

**ASSIST** is the nonpharmacologic script at the beginning of each patient education tool. This format has been designed to help you tailor your counseling according to your patient's personal preferences and readiness to change.

- For hypertension, hypercholesterolemia, obesity/overweight and diabetes, the nonpharmacologic script includes behavioral measures whose effectiveness in reducing these risk factors has been demonstrated. To avoid overwhelming your patient with too many recommendations at one time, it is suggested that you highlight the most important change(s) and negotiate with your patient to decide which behavioral change(s) to try first, and emphasize the sections of the educational tool you want your patient to read. It is recommended you mention to your patient that the content will be discussed at the next appointment.
- For smoking and sedentary lifestyle, the nonpharmacologic script uses a stage-based approach, the same approach taken in the smoking and sedentary lifestyle algorithms. It is suggested that you select the most appropriate recommendation(s) on the scripts, according to your patient's readiness to change. Encourage your patient to read the corresponding section. When your patient has progressed to the

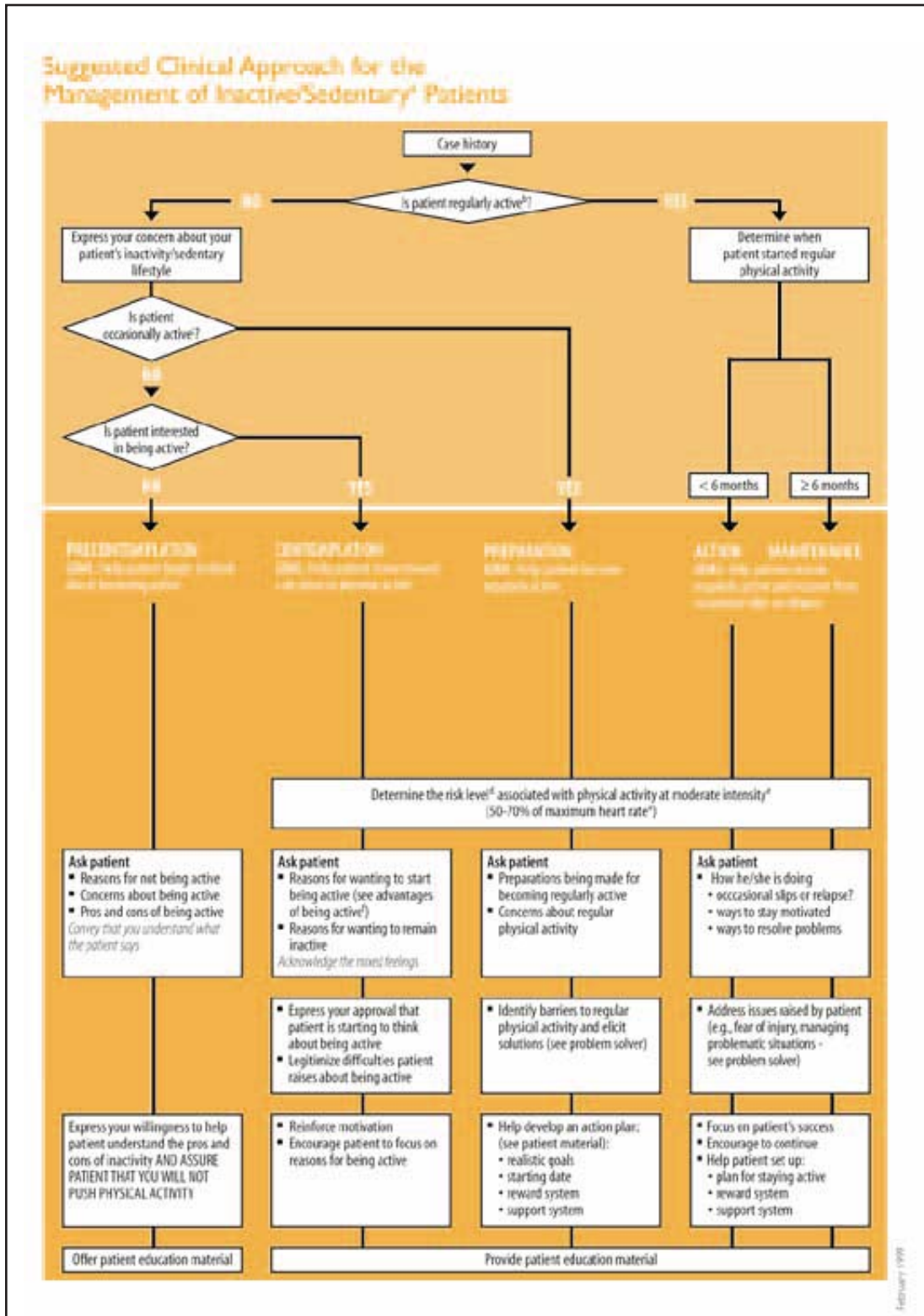


Figure 4: The HHK Provides Algorithms to Stage Patients' Readiness-to-Change and to Support Clinical Decision Making.



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Figure 5: The HHK Provides Patient Education Guidance to Reinforce Physician's Guidance.

next stage, you can encourage additional recommendations to combat addiction and weight gain.

The nonpharmacologic script can also be used as a followup tool for future visits. You are encouraged to assess the magnitude of the targeted behavioral change and when it is appropriate to add another behavioral change. Good chart documentation of the nonpharmacologic measures is also indicated to assure optimal followup.

## Be Creative

**Monitor** your patient's progress over time. Encourage your patients to access the HHK on the Web. Send him/her to internet cafés, or out to the barn, if that's where the only household computer is! Lend your HHK CD-Roms to patients.

**e-mail** Health Canada to request CD-Roms for all your patients!

**Suggest** that patients discuss their goals with other health professionals and educators: community-based pharmacists, nurses, nutritionists, physical activity trainers, school health educators. "Patients have a better chance of focusing on their goals and achieving success when we are all singing from the same hymn-book!" (A quote from Dr. Andrew Pipe of the University of Ottawa Heart Institute and CCFP representative to the national intersectoral partnership Achieving Cardiovascular Health In Canada (ACHIC).

## What makes you so sure the HHK works and is worthy of my patients?

The Canadian Coalition for High Blood Pressure Prevention and Control has provided many HHK educational workshops at national, provincial and local Continuing Medical Education (CME) venues. Followup of over 900 participants revealed that most doctors and other professionals were able to implement the HHK guidelines and to sustain them proactively for over nine months. Previous guidelines (other than the HHK), have had a lower rate of implementation in practice, due to the lack of applicability, the generalizability of guidelines and to practice barriers. Most of these other guidelines, if implemented, were sustainable for three to six months, until the physician encountered new reports and new





evidence in the literature countering the integration of the previous guidelines.<sup>29-35</sup>

Other initiatives have helped family physicians and others to implement and sustain health promotion, cardiovascular disease prevention, and risk factor management in practice.<sup>36,37</sup>

Educational research reveals that guidelines can be implemented through CME and continuing professional development.

In a study of 71 family physicians, the HHK was found to enhance implementation of cardiovascular health guidelines, even where initial physician readiness-to-change scores were low ( $P=0.0009$ ).<sup>38</sup>

In a study of 130 family physicians, knowledge skills and attitudes towards cardiovascular health promotion and lifestyle education in practice were significantly enhanced by receiving an electronic form of the HHK guideline, by having at least one educational workshop, by practice support, and by practice tools. Physicians also reported that patients were satisfied, but data analysis on 12-month patient outcome is not yet completed.<sup>39</sup>

According to a study of CME strategies, the implementation of clinical guidelines is most effective when educational design is embedded in practice tools. Ineffective guidelines lack educational design and/or practice tools. Marketing of guidelines was also thought to be important to implementation.<sup>40</sup>

In a study on the role of CME in national strategies for guideline implementation for health promotion in practice, cardiovascular health guidelines were compared for the U.K., U.S., and Canada. The HHK was recommended as a good model for the following reasons: multiple guidelines are crafted to fit together logically; the electronic versions are suitable for professionals and patients; tools are adapt-

able across health professions, and the logic cadence and format incorporate principles of educational design.<sup>41</sup>

To optimize the impact on patient health and minimize the demand on physician time, practice support tools must be: quickly accessible; provide guidance for individualizing and quantifying patient risk; and be Internet-accessible for physicians, other health professionals, patients and the public. The HHK incorporates these tools and more. The future of clinical guidelines will be Web interactivity for physicians. The HHK will be among the few guidelines to have potential to permit patient education interactivity and self-assessment by the public.<sup>42-46</sup>

The College of Family Physicians of Canada has promoted and supported the development of a learning module based in the HHK. This work has been carried out for use by the national CME network of Problem-Based Small Group Learning Program based at the Foundation for Medical Practice Education (see their Web address below). In addition, the College of Family Physicians studied professional satisfaction, efficiency, patient satisfaction and perceived change in practice.

The HHK is sponsored by Health Canada in partnership with the College of Family Physicians of Canada, the Heart and Stroke Foundation of Canada and Quebec, and by La Direction de la Santé Publique of the Régie Régionale de la Santé et des Services Sociaux de Montréal-Centre.

The HHK has been endorsed by the College of Family Physicians of Canada, the Canadian Cardiovascular Society, the Canadian Medical Association, the Canadian Coalition for High Blood Pressure Prevention and Control, the Heart and Stroke Foundation of Canada and



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Quebec. The HHK was launched by the Minister of Health, Allan Rock in the Parliament Buildings in February 1999, and was supported by many professional agencies, including the national intersectoral partnerships ACHIC.<sup>1,2</sup>

The Canadian Coalition for High Blood Pressure Prevention and Control (CCHBPPC) has undertaken major national intersectoral strategies to assist family doctors, specialists, community nurses and community pharmacists to implement the kit. Over the next two years, ten regional initiatives to support health professionals in health promotion and in practice are being undertaken across Canada in partnership with Health Canada, The College of Family Physicians, The Canadian Medical Association, and the Coalition's intersectoral partners. Similar initiatives based on HHK principles are being undertaken in Taiwan and the U.K..

## Conclusion

Most Canadians are at risk for cardiovascular and cerebrovascular disease. Hyperglycemia and Type 2 diabetes are serious contributors to morbidity and mortality related to CVD. The Canadian epidemic of obesity and inactivity puts virtually all Canadians at risk for Type 2 diabetes, for heart attack and stroke, and for chronic disease. Advice from family doctors, specialists and other health professionals can help patients change their risky lifestyles.<sup>47</sup>

The perception of inactivity and obesity as a kind of cultural norm lulls patients, doctors and the public into thinking that only a portion of the population is at risk, that only some people need to be targeted. This notion is false.

The good news is that lifestyle can significantly reduce risk, that health professionals can motivate and assist people to improve, and that

the HHK is a treasured resource for professionals, patients, health information consumers, and the public at large.

For more information:

### Web sites:

[www.healthyheartkit.com](http://www.healthyheartkit.com)

[www.canadianbpcoalition.org](http://www.canadianbpcoalition.org)

[www.fmpe.org](http://www.fmpe.org)

### To obtain CD-ROMs:

send an e-mail to Leslie Lawson Flynn at Health Canada: [leslie\\_flynn@hc-sc.gc.ca](mailto:leslie_flynn@hc-sc.gc.ca)

You can request the HHK Small Group Teaching Module through your animator, or contact Dr. Jacqueline Wakefield at The Canadian Foundation for Problem-Based Small Group Learning.

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