

# Cardiac Rehabilitation for Hypertension Assessment and Control: Report From the International Council of Cardiovascular Prevention and Rehabilitation

Abraham Samuel Babu, MPT;<sup>1</sup> Sherry L. Grace, PhD<sup>2,3</sup>

From the Department of Physiotherapy, School of Allied Health Sciences, Manipal University, Manipal, Karnataka, India;<sup>1</sup> Faculty of Health, York University;<sup>2</sup> and Toronto Rehabilitation Institute, University Health Network, Toronto, ON, Canada<sup>3</sup>

The burden of cardiovascular diseases (CVDs) has been steadily rising over the past decades, with an over 40% increase globally.<sup>1</sup> Efforts in primary and secondary prevention of CVD and its associated risk factors are required to mitigate this epidemic. One of the chief risk factors contributing to the CVD burden is hypertension, as it is a significant contributor to CVD-related morbidity and mortality. Specifically, hypertension is estimated to cause 7.5 million deaths, which is approximately 12.8% of total mortality, making it one of the top 10 leading causes for death across the world.<sup>2,3</sup> Moreover, hypertension accounts for nearly 57 million disability-adjusted life years or 3.7% of total disability-adjusted life years.<sup>2</sup>

Given this high rate of morbidity, secondary prevention to control hypertension is tantamount. Cardiac rehabilitation (CR) is a comprehensive model of care for the secondary prevention and control of CVD, including blood pressure (BP) assessment and delivery of interventions for hypertension management. The International Council of Cardiovascular Prevention and Rehabilitation (ICCPR) is concerned with promoting greater delivery of CR, which, in turn, will promote greater assessment and control of BP.

The ICCPR has recently partnered formally with the World Hypertension League (WHL). Consequently, the WHL has official representation on the ICCPR council and actively contributes to our primary initiatives. ICCPR is collaborating on WHL's recent dietary salt initiative and has official representation on the expert committee to develop a call to action.<sup>4</sup> Outlined herein are the aims of the ICCPR, a description of CR in a global context, and ICCPR's current efforts, with a particular focus on hypertension management.

## INTERNATIONAL COUNCIL OF CARDIOVASCULAR PREVENTION AND REHABILITATION

The ICCPR (<http://globalcardiacrehab.com>) was formed in 2011 by a group of CR experts from leading CR associations internationally to fill the gap in

communication between such associations and unite in efforts to “promote cardiovascular disease prevention and cardiac rehabilitation for all.” The ICCPR is composed of elected representatives from the board of directors of CR-associated organizations from across the world. The associations of the 24 current members are shown in the Figure. The ICCPR is an official member of the World Heart Federation.

As outlined in our inaugural Charter,<sup>5</sup> among our main goals are to: (1) promote CR as an essential, not optional, service; and (2) support countries to establish and augment programs of CR, adapted to local needs and conditions. The ICCPR council meets quarterly via web conference to work towards these aims. The ICCPR is led by an Executive Board, on which the senior author serves.

## CARDIAC REHABILITATION

CR is defined by the World Health Organization (WHO) as “the sum of activities required to influence favourably the underlying cause of the disease, as well as the best possible physical, mental and social conditions, so that they may, by their own efforts preserve or resume when lost, as normal a place as possible in the community.”<sup>6</sup> The “core components” of CR are commonly agreed upon by the member associations of ICCPR and include individualized programs of cardioprotective pharmacologic therapies in conjunction with health behavior and education interventions of physical activity and exercise, nutrition, psychological health, and smoking cessation.<sup>5</sup> These components are generally delivered by an interprofessional team over a series of months, which is of particular benefit for monitoring BP. Again, one of the main elements is BP assessment and monitoring, as well multifactorial, evidence-based intervention to achieve control.

Among patients with CVD, participation in CR is associated with reduced rates of all-cause mortality and cardiac mortality by 13% to 26% and 20% to 36%, respectively.<sup>7</sup> An observational study of 601,099 US Medicare beneficiaries enrolled in CR found a reduction in 5-year all-cause mortality rates by 21% to 34%.<sup>8</sup> A recent Cochrane overview of six CR Cochrane reviews concluded that compared with usual care alone, the addition of CR participation was related to significantly reduced hospital re-admissions, even in low-risk patients following myocardial infarction or percutaneous intervention or among those with heart failure.<sup>9</sup>

This manuscript was invited by the World Hypertension League.

**Address for correspondence:** Sherry L. Grace, PhD, York University, Bethune 368, 4700 Keele Street, Toronto, ON M3J 1P3, Canada  
**E-mail:** [sgrace@yorku.ca](mailto:sgrace@yorku.ca)

DOI: 10.1111/jch.12663



**FIGURE.** Member organizations of International Council of Cardiovascular Prevention and Rehabilitation.

Meta-analyses have also demonstrated that CR participation is associated with reductions in BP. With comprehensive CR, systolic BP was significantly reduced by 3 mm Hg to 7 mm Hg,<sup>10,11</sup> while diastolic BP was significantly reduced by 2 mm Hg.<sup>11</sup> While much of this evidence comes from high-income countries, the benefits of CR in low- and middle-income countries has also been established.<sup>7</sup>

**THE ROLE OF CR IN IDENTIFYING, MONITORING, AND CONTROLLING HYPERTENSION**

As outlined above, a core element of CR focuses on evaluation, intervention, and monitoring of BP. Table I displays hypertension-specific excerpts from guidelines/position statements/quality indicators from the leading CR associations globally.<sup>12-17</sup> As shown, achieving BP targets by program discharge is a key outcome of CR among the majority of Society publications.

A cornerstone of hypertension management is lifestyle changes, namely diet, exercise, and smoking cessation, which are promoted in CR. Indeed, this has been reiterated in recent hypertension guidelines.<sup>18</sup> In particular, exercise training has been a key intervention to mitigate the burden of hypertension and its

comorbidities.<sup>19</sup> Exercise prescription recommendations from leading associations with corresponding BP reductions are summarized in Table II.

A core component of CR also relates to medical management. As such, pharmacotherapy is reviewed at the initial assessment to ensure that patients are taking the guideline-recommended therapies for hypertension control, and that they are titrated and tolerated such that targets are achieved. CR education and counseling focuses on medication actions, side effects, and the importance of adherence.

**UTILIZATION OF CR GLOBALLY**

Despite the high quality and quantity of evidence supporting guideline recommendations for CR referral from leading professional organizations (eg, American Heart Association and the American College of Cardiology Foundation),<sup>20</sup> CR utilization rates are incredibly low globally.<sup>21</sup> CR is available in only 38.8% countries worldwide: 68.0% of high-income, 28.2% of middle-income, and 8.3% of low-income countries. The number of CR programs per inhabitant (referred to as CR density) is a crude estimate of the number of patients who might have access to CR in each country.<sup>22</sup> Based on national and regional surveys in high-income

**TABLE I.** Hypertension as a Core Component of CR

Association (Year)	Component	Description/Recommendation
AHA/AACVPR (2007) <sup>12</sup>	Assessment	Measure BP in sitting position ≥2 days on both arms and in various positions
	Intervention	Assess current treatment compliance and nonprescription drugs that may affect BP Lifestyle modifications if BP is between 120–139/80–89 mm Hg Drug therapy if BP is >130/80 mm Hg after lifestyle modifications in patients with CKD, HF, and DM and >140/90 mm Hg for others
	Expected outcome	Normalize BP in prehypertensive patients and achieve specified targets for those who are healthy (<140/90 mm Hg) and those with CKD, HF, and DM (<130/80 mm Hg)
AACVPR performance measures (2007) <sup>13</sup>	Performance Measure B-3B: Individualized assessment of BP control	1. Assessment of BP control, with target goals defined by AHA/ACC secondary prevention guidelines. 2. For patients with a diagnosis of hypertension, an intervention plan is developed. This should include education about target BP goals, medication compliance, lifestyle modification for optimal dietary and physical activity habits, and weight control. 3. During the CR program, BP control is reassessed and communicated to the patient as well as to the primary care provider and/or cardiologist
BACPR (2012) <sup>14</sup>	Medical risk factor modification including assessment, monitoring, and treatment	
EACPR (2014) <sup>15</sup>	Assessment	BP frequently at rest. During exercise, BP should be monitored when hypertension on effort is suspected
	Education	If resting systolic BP is 130–139 mm Hg or diastolic BP is 85–89 mm Hg, recommend lifestyle modifications. If resting systolic BP is >140 mm Hg or diastolic BP is >90 mm Hg despite lifestyle changes, initiate drug therapy
ACRA (2014) <sup>16</sup>	Expected outcome	BP <140/90 mm Hg
	Assessment	According to best practice guidelines Sitting and standing BP evaluation
	Key performance indicators	Percentage of patients who received BP education session Percentage of patients referred for medication titration Percentage of patients who achieve and maintain a BP of <130/80 mm Hg at 3, 6, and 12 months Percentage of patients referred to general practitioner
CACPR quality indicators (2014) <sup>17</sup>	Process indicator CR-13: assessment of BP control	Assessment of BP should be made at program entry and exit in order to determine cardiovascular risk, identify patients who are not at target, and monitor antihypertensive treatment. Canadian Hypertension Education Program recommendations regarding patient preparation, posture and position, equipment, and technique should be followed to ensure accurate assessment. Subsequently, risk factor management should be undertaken in the appropriate manner during the CR program in order to reach goal by program completion. BP control is defined as systolic and diastolic values, which are less than or equal to the guideline-recommended threshold. Programs should aim to achieve BP control in at least 90% of patients (benchmark)
Abbreviations: AACVPR, American Association of Cardiovascular and Pulmonary Rehabilitation; ACC, American College of Cardiology; ACRA, Australian Cardiovascular Health and Rehabilitation Association; AHA, American Heart Association; BACPR, British Association of Cardiovascular Prevention and Rehabilitation; BP, blood pressure; CACPR, Canadian Association of Cardiovascular Prevention and Rehabilitation; CKD, chronic kidney disease; CR, cardiac rehabilitation; DM, diabetes mellitus; EACPR, European Association of Cardiovascular Prevention and Rehabilitation; HF, heart failure.		

countries, CR density ranges from one program per 100,000 to one program per 300,000 inhabitants.<sup>23–25</sup> In middle-income countries, CR density ranges from 0.9 to 6.4 million inhabitants per program.<sup>23</sup>

Given data demonstrating the cost-effectiveness of CR,<sup>26</sup> clearly there is a need to augment delivery of CR to ensure greater patient access and, subsequently, greater hypertension management. Given the low cost to deliver CR, this model of care will be useful in

low-resource settings to increase the reach of hypertension interventions.

### ICCPR'S CURRENT EFFORTS TOWARD CVD CONTROL AND CR ADVOCACY

ICCPR is currently focused on two initiatives to increase the provision of CR globally. The first is a consensus statement on a CR delivery model for low-resource settings. Leaders with WHL served as key members of

**TABLE II.** Exercise Prescription Guidelines, Scientific Statements, and Recommendations for the Prevention, Treatment, and Control of Hypertension Made by Leading Professional Committees and Organizations<sup>a</sup>

Professional Committee/Organization						
The FITT of the Ex Rx	JNC 8 <sup>28</sup> and AHA/ACC Lifestyle Work Group <sup>29</sup>	JNC 7 <sup>30</sup>	AHA <sup>31</sup>	ACSM <sup>32</sup>	ESH/ESC <sup>33</sup>	CHEP <sup>34</sup>
Frequency (how often?)	3–4 sessions per wk ≥12 wk	Most days of the week	Most days of the week	Most, preferably all, days of the week	5–7 d/wk	4–7 d/wk in addition to habitual daily activity
Intensity (how hard?)	Moderate to vigorous <sup>b</sup>	None specified	Moderate to high, >40%–60% of maximum	Moderate 40% to <60% of VO <sub>2reserve</sub>	Moderate <sup>b</sup>	Moderate <sup>b</sup>
Time (how long?)	40 min per session	≥30 min/d	150 min/wk	30–60 min continuous or accumulated in bouts ≥10 min each	≥30 min/d	Accumulation of 30–60 min/d
Type (what kind?) Primary	Aerobic	Aerobic	Aerobic	Aerobic	Aerobic	Dynamic exercise (aerobic)
Evidence rating	"High" <sup>c,d</sup> Grade B <sup>c,d</sup> Class IIa level of evidence A <sup>e</sup>		Class I level of evidence A <sup>e</sup>	Evidence category A, <sup>f,g</sup> evidence category B <sup>f,g</sup>	Class I level of evidence A–B <sup>h</sup>	Grade D <sup>h</sup>
Adjuvant						Dynamic, isometric, or handgrip RT
Evidence rating			Dynamic RT Class IIa level of evidence B <sup>e</sup>	Dynamic RT 2–3 d/wk Moderate 60%–80% 1-RM, 8–12 repetitions Evidence category B <sup>f,k</sup>	Dynamic RT 2–3 d/wk	Grade D <sup>i</sup>
BP reduction, mm Hg	1–5	4–9		5–7 among patients with hypertension	2–3 overall; 5–7 among patients with hypertension	
Review methodology	Meta-analyses and systematic reviews of RCTs or controlled clinical trials from 2001 to 2011	Nonsystematic literature review including a range of study types. Recommendations made by consensus	An initial search that identified a meta-analysis or review within the past 6 y; a second systematic review from 2006 to 2011 followed	Systematic literature review including a range of study types. Recommendations made by consensus	Systematic literature review of RCTs and meta-analyses of RCTs as highest priority; other data were considered if appropriate scientific caliber	Systematic literature review using PubMed/MEDLINE of RCTs and systematic reviews of RCTs up to 2013; aided by the Cochrane Collaboration. Recommendations made by consensus

Abbreviations: ACC, American College of Cardiology; ACSM, American College of Sports Medicine; CHEP, Canadian Hypertension Education Program; ESH, European Society of Hypertension; JNC 8, Eighth Joint National Committee; JNC 7, Seventh Report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure; RCTs, randomized controlled trials; 1-RM, one repetition maximum; RT, resistance training.

<sup>a</sup>Organizations listed above. <sup>b</sup>Moderate intensity is defined as 40% to <60% oxygen uptake reserve (VO<sub>2reserve</sub>) or an intensity that causes noticeable increases in heart rate and breathing; vigorous or high intensity is defined as ≥60% VO<sub>2reserve</sub> or an intensity that causes substantial increases in heart rate and breathing.

<sup>c</sup>The National Heart, Lung, and Blood Institute (NHLBI)<sup>5</sup> rating system grades the strength of the evidence (Evidence Statement) and the strength of the recommendation(s) (Evidence Recommendation); adapted from the US Preventive Services Task Force.<sup>35</sup>

<sup>d</sup>The Lifestyle Work Group rated the Evidence Statement for aerobic exercise to lower blood pressure (BP) as "high"; the Evidence Recommendation for the exercise prescription (Ex Rx) or Frequency, Intensity, Time, and Type of the exercise prescription (FITT) to lower BP was rated grade B<sup>c</sup> or "moderate"; corresponding to class IIa level of evidence A.<sup>e</sup>

<sup>e</sup>Classification of recommendations and level of evidence per American Heart Association (AHA) guideline criteria.<sup>31,36,37</sup>

<sup>f</sup>NHLBI grading of evidence.<sup>38</sup>

<sup>g</sup>The strength of evidence was rated: evidence category B<sup>f</sup> for the immediate effects of aerobic exercise or postexercise hypotension; evidence category A<sup>f</sup> for aerobic exercise to lower BP; evidence category B<sup>f</sup> for the recommended aerobic Ex Rx (or FITT) to lower BP.

<sup>h</sup>European Society of Cardiology (ESC) recommendations.<sup>39</sup>

<sup>i</sup>Canadian Hypertension Education Program (CHEP) graded recommendations by the underlying evidence<sup>14</sup> using grade A (strongest evidence, based on high-quality studies) to grade D (weakest evidence, based on low-power imprecise studies or expert opinion alone).

<sup>j</sup>CHEP assigned grade D<sup>i</sup> to "higher intensity exercise is not more effective."

<sup>k</sup>The strength of evidence was rated evidence category C<sup>h</sup> for the immediate effects of dynamic resistance exercise or postexercise hypotension.

Reproduced with permission from Pescatello et al.<sup>19</sup>

the primary writing panel for this initiative. Following a literature review, low-cost approaches to delivering the core components of CR were proposed. Recommendations for each component were developed using a modified Grading of Recommendations Assessment, Development and Evaluation (GRADE approach),<sup>27</sup> or consensus where evidence was not available. An algorithm to tailor the program based on the type of healthcare provider available for delivery (ie, community healthcare worker, allied health professional, or physician/equivalent) was also developed to facilitate implementation. We are currently working toward academic dissemination of this work, and then, as offered by WHL leadership, we hope to distill the recommendations for clinical and policy application through the website <http://www.worldhypertension-league.org/>, among other venues.

The second initiative is a practical guide to support CR reimbursement advocacy. The economic impact of CVD and the corresponding benefits of CR and its cost-effectiveness are summarized. This provides the case for CR reimbursement. Second, the results of the ICCPR survey on CR reimbursement policies by government and insurance companies are summarized, which show that government reimbursement is low and many patients pay out-of-pocket. Finally, a multifaceted approach to CR advocacy is forwarded. Indeed, the WHL has demonstrated leadership in its advocacy work and has been highly supportive of our efforts in this regard.

In conclusion, the ICCPR is delighted to partner with WHL in our efforts to increase hypertension management in CVD patients globally. We hope to continue with our fruitful partnership, as CR is an important model of care for hypertension management.

*Acknowledgment:* None.

*Disclosures:* None.

*Conflicts of interest:* None.

## References

1. GBD 2013 Mortality and Causes of Death Collaborators. Global, regional, and national age-sex specific all-cause and cause-specific mortality for 240 causes of death, 1990–2013: a systematic analysis for the Global Burden of Disease Study 2013. *Lancet*. 2015;385:117–171.
2. WHO. Global Health Observatory (GHO) data: Raised blood pressure; Situation and trends. [http://www.who.int/gho/ncd/risk\\_factors/blood\\_pressure\\_prevalence\\_text/en/](http://www.who.int/gho/ncd/risk_factors/blood_pressure_prevalence_text/en/). Accessed June 12, 2015.
3. WHO. The top 10 causes for death. Fact Sheet no.310. <http://www.who.int/mediacentre/factsheets/fs310/en/>. Accessed June 12, 2015.
4. Campbell NC, Lackland DT, Lisheng L, et al. The world hypertension league: a look back and a vision forward. *J Clin Hypertens (Greenwich)*. 2015;17:5–6.
5. Grace SL, Warburton DR, Stone JA, et al. International charter on cardiovascular prevention and rehabilitation: a call for action. *J Cardiopulm Rehabil Prev*. 2013;33:128–131.
6. WHO. *Rehabilitation after Cardiovascular Disease with Special Emphasis on Developing Countries*. Geneva: WHO; 1993. WHO Technical Report Series No 831.
7. Turk-Adawi KI, Grace SL. Narrative review comparing the benefits of and participation in cardiac rehabilitation in high-, middle- and low-income countries. *Heart Lung Circ*. 2015;24:510–520.
8. Suaya JA, Stason WB, Ades PA, et al. Cardiac rehabilitation and survival in older coronary patients. *J Am Coll Cardiol*. 2009;54:25–33.
9. Anderson L, Taylor RS. Cardiac rehabilitation for people with heart disease: an overview of Cochrane systematic reviews. *Cochrane Database Syst Rev*. 2014;CD011273.
10. Jolliffe JA, Rees K, Taylor RS, et al. Exercise-based rehabilitation for coronary heart disease. *Cochrane Database Syst Rev*. 2001;1: CD001800.
11. Brown A, Noorani H, Taylor R, et al. *A Clinical and Economic Review of Exercise-Based Cardiac Rehabilitation Programs for Coronary Artery Disease*. Ottawa: Canadian Coordinating Office for Health Technology Assessment; 2003. Technology overview no 11 Available from [https://www.cadth.ca/sites/default/files/pdf/262\\_cardiac\\_rehab\\_ov\\_e.pdf](https://www.cadth.ca/sites/default/files/pdf/262_cardiac_rehab_ov_e.pdf). Accessed June 23, 2015.
12. Balady GJ, Williams MA, Ades PA, et al. Core components of cardiac rehabilitation/secondary prevention programs: 2007 update: a scientific statement from the American Heart Association Exercise, Cardiac Rehabilitation, and Prevention Committee, the Council on Clinical Cardiology; the Councils on Cardiovascular Nursing, Epidemiology and Prevention, and Nutrition, Physical Activity, and Metabolism; and the American Association of Cardiovascular and Pulmonary Rehabilitation. *J Cardiopulm Rehabil Prev*. 2007;27:121–129.
13. Thomas RJ, King M, Lui K, et al. AACVPR/ACC/AHA 2007 performance measures on cardiac rehabilitation for referral to and delivery of cardiac rehabilitation/secondary prevention services. *J Cardiopulm Rehabil Prev*. 2007;27:260–290.
14. The BACPR Standards and Core Components for Cardiovascular Disease Prevention and Rehabilitation 2012 (2nd ed). [http://www.bacpr.com/resources/46C\\_BACPR\\_Standards\\_and\\_Core\\_Components\\_2012.pdf](http://www.bacpr.com/resources/46C_BACPR_Standards_and_Core_Components_2012.pdf). Accessed June 23, 2015.
15. Piepoli MF, Corrà U, Adamopoulos S, et al. Secondary prevention in the clinical management of patients with cardiovascular diseases. Core components, standards and outcome measures for referral and delivery: a policy statement from the cardiac rehabilitation section of the European Association for Cardiovascular Prevention & Rehabilitation. Endorsed by the Committee for Practice Guidelines of the European Society of Cardiology. *Eur J Prev Cardiol*. 2014;21:664–681.
16. Woodruffe S, Neubeck L, Clark RA, et al. Australian Cardiovascular Health and Rehabilitation Association (ACRA) core components of cardiovascular disease secondary prevention and cardiac rehabilitation 2014. *Heart Lung Circ*. 2015;24:430–441.
17. Grace SL, Poirier P, Norris CM, et al. Pan-Canadian development of cardiac rehabilitation and secondary prevention quality indicators. *Can J Cardiol*. 2014;30:945–948.
18. James PA, Oparil S, Carter BL, et al. 2014 evidence-based guideline for the management of high blood pressure in adults: report from the panel members appointed to the Eighth Joint National Committee (JNC 8). *JAMA*. 2014;311:507–520.
19. Pescatello LS, MacDonald HV, Ash GI, et al. Assessing the existing professional exercise recommendations for hypertension: a review and recommendations for future research priorities. *Mayo Clin Proc*. 2015;90:801–812.
20. Smith SC Jr, Benjamin EJ, Bonow RO, et al. AHA/ACC secondary prevention and risk reduction therapy for patients with coronary and other atherosclerotic vascular disease: 2011 update: a guideline from the American Heart Association and American College of Cardiology Foundation. *Circulation*. 2011;124:2458–2473.
21. Turk-Adawi K, Sarrafzadegan N, Grace SL. Global availability of cardiac rehabilitation. *Nat Rev Cardiol*. 2014;11:586–596.
22. Anchique Santos CV, Lopez-Jimenez F, Benaim B, et al. Cardiac rehabilitation in Latin America. *Prog Cardiovasc Dis*. 2014;57:268–275.
23. Cortes-Bergoderi M, Lopez-Jimenez F, Herdy AH, et al. Availability and characteristics of cardiovascular rehabilitation programs in South America. *J Cardiopulm Rehabil Prev*. 2013;33:33–41.
24. Tramarin R, Ambrosetti M, De Feo S, et al. The Italian Survey on Cardiac Rehabilitation-2008 (ISYDE-2008). Part 3. National availability and organization of cardiac rehabilitation facilities. Official report of the Italian Association for Cardiovascular Prevention, Rehabilitation and Epidemiology (IACPR-GICR). *Monaldi Arch Chest Dis*. 2008;70:175–205.
25. Curnier DY, Savage PD, Ades PA. Geographic distribution of cardiac rehabilitation programs in the United States. *J Cardiopulm Rehabil*. 2005;25:80–84.
26. Wong WP, Feng J, Pwee KH, Lim J. A systematic review of economic evaluations of cardiac rehabilitation. *BMC Health Serv Res*. 2012;12:243.
27. Guyatt GH, Oxman AD, Vist G, et al. Rating quality of evidence and strength of recommendations GRADE: an emerging consensus on rating quality of evidence and strength of recommendations. *BMJ*. 2008;336:924–926.

28. James PA, Oparil S, Carter BL, et al. 2014 Evidence-based guideline for the management of high blood pressure in adults: report from the panel members appointed to the Eighth Joint National Committee (JNC 8) [published correction appears in JAMA. 2014;311:1809]. *JAMA* 2014;311:507–520.
29. Eckel RH, Jakicic JM, Ard JD, et al. 2013 AHA/ACC guideline on lifestyle management to reduce cardiovascular risk: a report of the American College of Cardiology/American Heart Association Task Force on Practice Guidelines [published correction appears in J Am Coll Cardiol. 2014;63(25, pt B):3027-3028]. *J Am Coll Cardiol* 2014;63(pt B):2960–2984.
30. Chobanian AV, Bakris GL, Black HR, et al. National High Blood Pressure Education Program Coordinating Committee. The Seventh Report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure: the JNC 7 report [published correction appears in JAMA. 2003;290:197]. *JAMA* 2003;289:2560–2572.
31. Brook RD, Appel LJ, Rubenfire M, et al. American Heart Association Professional Education Committee of the Council for High Blood Pressure Research, Council on Cardiovascular and Stroke Nursing, Council on Epidemiology and Prevention, and Council on Nutrition, Physical Activity. Beyond medications and diet: alternative approaches to lowering blood pressure; a scientific statement from the American Heart Association. *Hypertension* 2013;61:1360–1383.
32. Pescatello LS, Franklin BA, Fagard R, Farquhar WB, Kelley GA, Ray CA. American College of Sports Medicine position stand: exercise and hypertension. *Med Sci Sports Exerc.* 2004;36:533–553.
33. Mancia G, Fagard R, Narkiewicz K, et al; Task Force for the Management of Arterial Hypertension of the European Society of Hypertension and the European Society of Cardiology. 2013 ESH/ESC Practice Guidelines for the Management of Arterial Hypertension. *Blood Press* 2014;23:3–16.
34. Dasgupta K, Quinn RR, Zarnke KB, et al. The 2014 Canadian Hypertension Education Program recommendations for blood pressure measurement, diagnosis, assessment of risk, prevention, and treatment of hypertension. *Can J Cardiol* 2014;30:485–501.
35. U.S. Preventive Services Task Force Procedure Manual. US Preventive Services Task Force website. <http://www.uspreventiveservicestaskforce.org/Page/Name/procedure-manual>. Published July 2008. Accessed September 11, 2014. AHRQ Publication 08-05118-EF.
36. American Heart Association. Methodology Manual and Policies From the ACCF/AHA Task Force on Practice Guidelines. American Heart Association website. [http://my.americanheart.org/idc/groups/ahamah-public/@wcm/@sop/documents/downloadable/ucm\\_319826.pdf](http://my.americanheart.org/idc/groups/ahamah-public/@wcm/@sop/documents/downloadable/ucm_319826.pdf). Published June 2010. Accessed September 11, 2014.
37. Gibbons RJ, Smith S, Antman E. American College of Cardiology/American Heart Association clinical practice guidelines, Part I: where do they come from? *Circulation.* 2003;107:2979–2986.
38. Clinical guidelines on the identification, evaluation, and treatment of overweight and obesity in adults—the evidence report: National Institutes of Health [published correction appears in *Obes Res.* 1998;6:464]. *Obes Res* 1998;6(suppl 2):51S–209S.
39. Writing ESC guidelines. European Society of Cardiology website. <http://www.escardio.org/guidelines-surveys/esc-guidelines/about/Pages/rules-writing.aspx>. Accessed September 11, 2014.
40. McAlister FA. The Canadian Hypertension Education Program: a unique Canadian initiative. *Can J Cardiol* 2006;22:559–564.