## Appendix 2

<table>
<thead>
<tr>
<th>Frequency of risk factors monitoring as reported in guidelines*</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Primary Prevention</strong></td>
</tr>
<tr>
<td>Lipids</td>
</tr>
<tr>
<td>AHA/ADA 2007 [20]</td>
</tr>
<tr>
<td>AHA/stroke 2006 [21]</td>
</tr>
<tr>
<td>BCMA 2008 [19]</td>
</tr>
<tr>
<td>NVDPA 2004 [17]</td>
</tr>
<tr>
<td>ACC-AHA STEMI 2009 [11]</td>
</tr>
<tr>
<td><strong>Secondary Prevention</strong></td>
</tr>
<tr>
<td>Lipids</td>
</tr>
<tr>
<td>AHA/AACVP 2007 [17]</td>
</tr>
<tr>
<td>ESC HF 2008 [19]</td>
</tr>
<tr>
<td>MQIC 2009 [22]</td>
</tr>
<tr>
<td>SVS 2008 [25]</td>
</tr>
<tr>
<td>ICSI 2009 [27]</td>
</tr>
<tr>
<td><strong>Primary Prevention and Secondary Prevention</strong></td>
</tr>
<tr>
<td>Lipids</td>
</tr>
<tr>
<td>CSN 2006 [10]</td>
</tr>
<tr>
<td>ESO 2008 [9]</td>
</tr>
<tr>
<td>JBS 2005 [16]</td>
</tr>
<tr>
<td>ESC JTF4 2007 [13]</td>
</tr>
<tr>
<td>Reference</td>
</tr>
<tr>
<td>-----------</td>
</tr>
<tr>
<td>PITP 2004</td>
</tr>
<tr>
<td>ES 2008</td>
</tr>
<tr>
<td>SIGN 2007</td>
</tr>
<tr>
<td>NZGG 2007</td>
</tr>
<tr>
<td>ACC-AHA STEMI 2009</td>
</tr>
</tbody>
</table>

* Selection of guidelines that reported CVD or stroke as the main topic in the title and addressing at least one risk factors monitoring.

§ Type of prevention addressed by guideline. We examined the full document looking at whether it addressed primary or secondary prevention or both.

NR: Not reported

**Additional references for specific statement and level or presence of evidence underpinning recommendations in guidelines that report specific time intervals for monitoring**


<table>
<thead>
<tr>
<th>Appendix 4</th>
<th>Data collection</th>
<th>General Domains (guidelines characteristics)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Main disease or condition addressed in the guideline</strong></td>
<td></td>
<td>We first considered the title of the document. If more than one condition was mentioned, we assigned both of them using the links “in”, “and” as considered appropriate.</td>
</tr>
<tr>
<td><strong>Primary or secondary prevention of CVD</strong></td>
<td></td>
<td>We examined the full document looking at whether it addressed issues of screening or prevention before the initial diagnosis (primary), or whether it addressed issues of preventing recurrence or complications after the initial diagnosis (secondary), or both.</td>
</tr>
<tr>
<td><strong>Chapter or section on a specific risk factor (dyslipidemia, hypertension or tobacco use)</strong></td>
<td></td>
<td>We considered a grade of 1 if we found a chapter or section, regardless of extension, specifically addressing one or more of the risk factor in question. If the risk factor was mentioned or described as part of another subtitle or subheading, or if it was only mentioned as part of another paragraph, we considered a grade of 0.</td>
</tr>
<tr>
<td><strong>Addressing risk factors monitoring</strong></td>
<td></td>
<td><em>Grade of 2</em> was assigned if we found a section or at least a separate paragraph, a separate cell within a table or a separate bullet within a paragraph addressing any form of ongoing monitoring or follow-up for the specific risk factor. <em>Grade of 1</em> was assigned if we found any other mention of monitoring or follow-up within another section or non-bulleted paragraph. We considered a grade 0 only if we did not find any mention at all of monitoring or follow-up.</td>
</tr>
</tbody>
</table>

### Specific Domains on Monitoring Risk Factors

<p>| <strong>Specific target or parameter to monitor for a given risk factor (what to monitor)</strong> | | <em>Grade of 2</em> was assigned if the guideline specifically addressed different parameters to monitor (LDL, HDL or total cholesterol, etc) or different targets by risk categories (specific blood pressure goals for specific population) |
| <strong>Grade of 1</strong> was assigned if a parameter in a general recommendation regarding what target or parameter to follow was made was specified without distinguishing between risk categories (measure lipids level or measure blood pressure). |
| <strong>Grade of 0</strong> was assigned only if there was no mention about target or parameter for monitoring risk factors. |
| In the case of smoking specifically, we considered 1 as the highest score since there should not be any target differences between risk categories. |</p>
<table>
<thead>
<tr>
<th><strong>Frequency with which a risk factor should be monitored</strong></th>
<th><strong>(when to monitor)</strong></th>
</tr>
</thead>
</table>
| *Grade of 2* was assigned if a specific time interval was recommended,*

*Grade of 1* was assigned if a non-specific time interval was recommended. Specifically in the case of the guidelines addressing the diabetes population, we considered a grade of 2 even for a non-specific recommendation such as ‘blood pressure should measure every visit’. In the specific case of smoking as a risk factor, we considered a grade of 2 for a non-specific recommendation such as ‘every visit’, since we consider it controversial whether or not a more specific recommendation in this case would be of any help.

<table>
<thead>
<tr>
<th><strong>Specific recommendations regarding what interventions to consider during a follow-up if the targets are not met</strong></th>
<th><strong>(what to do if target is out of range)</strong></th>
</tr>
</thead>
</table>
| *Grade of 2* was assigned if clear, detailed interventions were described,*

*Grade of 1* was assigned if unclear, non-specific or vague recommendations were made.

We considered the information (if mentioned and detailed) for the initial treatment titration sufficient and applicable to the follow-up period.

---

* Specific recommendation  § general recommendation  ¥ absence of recommendation
## Appendix 3  
Frequency of monitoring of the three major CVD risk factors in the 117 guidelines

<table>
<thead>
<tr>
<th>Total GL</th>
<th>117</th>
<th>84 (72%)</th>
<th>53 (63%)</th>
<th>79 (68%)</th>
<th>40 (51%)</th>
<th>65 (56%)</th>
<th>37 (57%)</th>
</tr>
</thead>
</table>

### Year of publication

<table>
<thead>
<tr>
<th>Year</th>
<th>GL</th>
<th>LM</th>
<th>HTN</th>
<th>SMK</th>
</tr>
</thead>
<tbody>
<tr>
<td>2002</td>
<td>4</td>
<td>3  (75)</td>
<td>1  (33)</td>
<td>3  (75)</td>
</tr>
<tr>
<td>2003</td>
<td>18</td>
<td>14 (77)</td>
<td>7  (50)</td>
<td>9  (50)</td>
</tr>
<tr>
<td>2004</td>
<td>12</td>
<td>8  (66)</td>
<td>4  (50)</td>
<td>9  (75)</td>
</tr>
<tr>
<td>2005</td>
<td>6</td>
<td>5  (83)</td>
<td>3  (60)</td>
<td>3  (50)</td>
</tr>
<tr>
<td>2006</td>
<td>11</td>
<td>8  (72)</td>
<td>6  (75)</td>
<td>10 (91)</td>
</tr>
<tr>
<td>2007</td>
<td>18</td>
<td>14 (77)</td>
<td>9  (64)</td>
<td>14 (77)</td>
</tr>
<tr>
<td>2008</td>
<td>34</td>
<td>23 (67)</td>
<td>17 (74)</td>
<td>23 (68)</td>
</tr>
<tr>
<td>2009</td>
<td>14</td>
<td>9  (64)</td>
<td>6  (67)</td>
<td>8  (57)</td>
</tr>
</tbody>
</table>

### Country or region

<table>
<thead>
<tr>
<th>Region</th>
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<th>LM</th>
<th>HTN</th>
<th>SMK</th>
</tr>
</thead>
<tbody>
<tr>
<td>ANZ</td>
<td>13</td>
<td>9  (69)</td>
<td>6  (67)</td>
<td>9  (69)</td>
</tr>
<tr>
<td>CA</td>
<td>10</td>
<td>8  (80)</td>
<td>7  (88)</td>
<td>5  (50)</td>
</tr>
<tr>
<td>EU</td>
<td>8</td>
<td>4  (50)</td>
<td>3  (75)</td>
<td>7  (88)</td>
</tr>
<tr>
<td>O</td>
<td>12</td>
<td>7  (58)</td>
<td>5  (71)</td>
<td>7  (58)</td>
</tr>
<tr>
<td>SL</td>
<td>3</td>
<td>3  (100)</td>
<td>2  (67)</td>
<td>3  (100)</td>
</tr>
<tr>
<td>SP</td>
<td>3</td>
<td>3  (100)</td>
<td>2  (67)</td>
<td>3  (100)</td>
</tr>
<tr>
<td>UK</td>
<td>12</td>
<td>9  (75)</td>
<td>6  (67)</td>
<td>8  (67)</td>
</tr>
<tr>
<td>US</td>
<td>56</td>
<td>41 (73)</td>
<td>22 (54)</td>
<td>37 (66)</td>
</tr>
</tbody>
</table>

### Principal disease addressed

<table>
<thead>
<tr>
<th>Disease</th>
<th>GL</th>
<th>LM</th>
<th>HTN</th>
<th>SMK</th>
</tr>
</thead>
<tbody>
<tr>
<td>CKD</td>
<td>7</td>
<td>5  (71)</td>
<td>4  (80)</td>
<td>6  (86)</td>
</tr>
<tr>
<td>CVD</td>
<td>45</td>
<td>37 (82)</td>
<td>19 (51)</td>
<td>40 (88)</td>
</tr>
<tr>
<td>DM</td>
<td>9</td>
<td>9  (100)</td>
<td>8  (89)</td>
<td>9  (100)</td>
</tr>
<tr>
<td>GP</td>
<td>5</td>
<td>3  (60)</td>
<td>2  (67)</td>
<td>3  (60)</td>
</tr>
</tbody>
</table>
Appendix 4

Full Search Strategy

Our initial strategy was designed with the aid of an information specialist and searched NIH NCBM National Library of Medicine, using the following strategy: ("Cardiovascular Diseases/prevention and control" OR "Cardiovascular Diseases/therapy") AND ("Hypertension" OR "Dyslipidemias" OR "Tobacco Use Cessation") limiting to Practice Guideline [publication type] human subjects and English language articles published between January 2002 and February 2010 inclusive. This search provided 333 initial results.

We also searched the TRIP (www.tripdatabase.com) and the National Guideline Clearinghouse (NGC) databases (http://www.guideline.gov/) using the same search terms described above. We obtained an additional 346 results from the TRIP database and 197 results from the NGC database: total of 876 total results from our three separate databases.

We did a preliminary review of the 876 results and excluded all repeated and non-english guidelines, as well as guidelines focusing on pediatric or pregnant populations and any guidelines not focusing on cardiovascular disease treatment or prevention. After this preliminary review we ended up with 122 guidelines, five of which we were unable to find the full-text document.

We then proceeded to review the 117 guidelines of which our final database consisted (Appendix xx ).

Appendix included reference lists


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14. Samuel Klein, MD; Lora E. Burke, RN, MPH, PhD; George A. Bray, MD; Steven Blair, PED; David B. Allison, PhD; Xavier Pi-Sunyer, MD; Yuling Hong, MD, PhD; Robert H. Eckel, MD Clinical Implications of Obesity With Specific Focus on Cardiovascular Disease. A Statement for Professionals From the American Heart Association Council on Nutrition, Physical Activity, and Metabolism: Endorsed by the American College of Cardiology Foundation. Circulation. 2004;110:2952-2967.


19. Clive Rosendorff, MD, PhD, FAHA, Chair; Henry R. Black, MD; Christopher P. Cannon, MD, FAHA; Bernard J. Gersh, MB ChB, DPhil, FAHA; Joel Gore, MD, FAHA; Joseph L. Izzo, Jr, MD; Norman M. Kaplan, MD; Christopher M. O’Connor, MD, FAHA; Patrick T. O’Gara, MD, FAHA; Suzanne Oparil, MD, FAHA. Treatment of Hypertension in the Prevention and Management of Ischemic Heart Disease. A Scientific Statement From the American Heart Association Council for High Blood Pressure Research and the Councils on Clinical Cardiology and Epidemiology and Prevention. Circulation 2007;115:2761-2788.


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51. Heart Failure in Adults (Guideline) Institute for Clinical Systems Improvement (ICSI); 2009 Available from: (http://www.icsi.org/guidelines_and_more/gl_os_prot/cardiovascular/heart_failure_2/heart_failure_in_adults__guideline_.html) Accessed on 1 Dec 2010


53. Hypertension Diagnosis and Treatment (Guideline) Institute for Clinical Systems Improvement (ICSI); 2009 Available from: (http://www.icsi.org/guidelines_and_more/gl_os_prot/cardiovascular/hypertension_4/hypertension_diagnosis_and_treatment__11.html) Accessed on 1 Dec 2010

54. Preventive Services for Adults (Guideline) Institute for Clinical Systems Improvement (ICSI); 2009. Available from: (http://www.icsi.org/guidelines_and_more/gl_os_prot/preventive_health_maintenance/preventive


Fedder DO, Koro CE, L'Italien GJ. New National Cholesterol Education Program III guidelines for primary prevention lipid-lowering drug therapy: projected impact on the size, sex, and age


117. Canadian Best Practice Recommendations for Stroke Care: Canadian Stroke Network and the Heart and Stroke Foundation of Canada. 2006 Available from (http://www.canadianstrokenetwork.ca/) Accessed on 1 Dec 2010

BMJ Pico

Inadequate reporting of monitoring regimes of CVD risk factors in clinical guidelines: a systematic review.

Ivan Moschetti, 1 Daniel Brandt, 2 Rafael Perera, 1 Mike Clarke, 3 Carl Heneghan 1

1. Dept of Primary Health Care, University of Oxford
2. Dept of Medicine, University of Toronto
3. UK Cochrane Centre, National Institute for Health Research

Corresponding author: Dr Carl Heneghan carl.heneghan@dphpc.ox.ac.uk

Study question: How well do clinical practice guidelines aimed at cardiovascular disease management report recommendations for monitoring cardiovascular disease (CVD) risk factors?
Summary answer: More than half of the guidelines in our sample did not address the monitoring of one or more of the main CVD risk factors and less than one third addressed all three (dyslipidemia, hypertension and smoking cessation).

What is known and what this paper adds:
What is already known: Management and monitoring of CVD and its risk factors is one of the most common consultations in healthcare. Clinical guidelines are often referred to by providers looking for recommendations regarding treatment and monitoring of these conditions.
What this study adds: Only a small proportion (20%) of the guidelines we identified and appraised in a systematic review address monitoring for all three main CVD risk factors, and the recommendations were often vague, confusing and contradictory, making them difficult to implement in clinical practice.

Selection criteria for studies: All guidelines published in the English language between January 2002 and February 2010 addressing CVD prevention or treatment, found on the NIH NCBM NLM, TRIP database and National Guideline Clearinghouse.

Primary outcome(s): Whether, and to what extent, was monitoring for any of the CVD risk factors addressed in each guideline.

Main results and role of chance:
- We identified 117 guidelines, 84 of which contained a section on lipids. Half of these (53%) did not provide specific recommendations for what to monitor, 51% for when to monitor, and 64% for what action to take if the target is out of range.
- The guidelines mentioning hypertension (79) and smoking (65) were little better, with 63% and 54% respectively not providing a recommendation for what to monitor. For both these risk factors, approximately two-thirds recommend when to monitor, and what action to take.
- The number of guidelines that explicitly referenced the level of evidence for monitoring was low, with most of the recommendations based on very weak level of evidence.
Bias, confounding and other reasons for caution:
We restricted our systematic review to guidelines published in English, but our findings are likely to be relevant to many parts of the world. We looked only at dyslipidemia, hypertension and tobacco use as CVD risk factors. Although there are many other risk factors, we choose these three as the most important for consideration in consultations about health care.

Study funding/Potential competing interests:
The study did not require any funding other than the regular income and the time used by the authors. There are no known competing interests.