AHA/ACC/HHS Strategies to Enhance Application of Clinical Practice Guidelines in Patients With Cardiovascular Disease and Comorbid Conditions: From the American Heart Association, American College of Cardiology, and US Department of Health and Human Services

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AHA/ACC/HHS Strategies to Enhance Application of Clinical Practice Guidelines in Patients With Cardiovascular Disease and Comorbid Conditions

From the American Heart Association, American College of Cardiology, and US Department of Health and Human Services

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Background

Cardiovascular disease, the leading cause of death in the United States and worldwide, accounts for substantial suffering and healthcare-related expenditures.[1–3] For more than 30 years, the American Heart Association (AHA) and the American College of Cardiology (ACC) have partnered with other organizations to translate the best available scientific evidence into clinical practice guidelines (CPGs) for cardiovascular conditions. These efforts reflect a shared vision and responsibility for using scientific evidence and the expert clinical opinion of leaders in the field to develop recommendations for healthcare providers. These CPGs, based on systematic methods to evaluate and classify evidence, have provided the cornerstones for delivering quality cardiovascular care.

CPGs are essential tools for optimizing care for patients with cardiovascular conditions. Enhancing the utility of CPGs requires that the development process reflect the evolution of relevant foundational domains, such as biomedical discoveries, public policy, clinical care systems, and epidemiological knowledge. Dynamic changes in these domains pose substantial implications for organizations that develop CPGs. Among these changes is the increasing prevalence of ≥2 chronic conditions among individual Americans, estimated to be present in more than one quarter of adults.[4] In the large population of Medicare beneficiaries, the prevalence of persons with multiple chronic conditions is considerably greater: more than two thirds (68%) have ≥2 chronic conditions, and 14% have ≥6 chronic conditions.[5,6]

Comorbidities and CPGs for Cardiovascular Conditions

CPGs jointly developed by the AHA/ACC are cardiovascular disease-specific documents focused on the prevention, diagnosis, and management of conditions such as ischemic heart disease, heart failure, and atrial fibrillation. These CPGs often contain considerations for special factors (eg, older adults) and common problems affecting pharmacokinetics (eg, renal impairment). For example, the 2014 CPG on atrial fibrillation[7] highlights special considerations for acute myocardial infarction, pregnancy, hyperthyroidism, and other conditions. With the exception of the CPGs on atrial fibrillation and heart failure,[7,8] CPGs have not systematically incorporated recommendations on how common comorbidities that accompany a specific cardiovascular condition might affect the care and management of patients with comorbidities.

With progressive growth in the size of the older adult population and the increased prevalence of comorbidities in patients with cardiovascular conditions, CPGs need to address the complex implications of comorbidity for the care of cardiovascular patients. This issue is particularly important for some older adults, because clinicians must select from among treatments on the basis of evidence for risk and benefit.[9]

*The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the US Centers for Disease Control and Prevention

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Table 1. The 10 Most Common Comorbidities for 4 Index Cardiovascular Conditions: 2012 Data for Medicare Beneficiaries ≥65 Years of Age[13]

Comorbidity	Ischemic Heart Disease* (N=8 678 060)	HF* (N=4 366 489)	AF* (N=2 556 839)	Stroke* (N=1 145 719)
Hypertension	1 (81.3)	1 (85.6)	1 (84.5)	1 (89.0)
Hyperlipidemia	2 (69.1)	3 (62.6)	2 (64.4)	2 (69.9)
Diabetes mellitus	3 (41.7)	5 (47.1)	7 (37.1)	6 (41.5)
Arthritis	4 (40.6)	6 (45.6)	6 (41.7)	5 (44.2)
Anemia	5 (38.7)	4 (51.2)	5 (43.0)	4 (46.8)
HF	6 (36.3)	Index	4 (50.9)	7 (37.2)
Ischemic heart disease	Index	2 (72.1)	3 (63.5)	3 (58.1)
Chronic kidney disease	7 (30.2)	7 (44.8)	8 (34.4)	8 (35.2)
Cataract	8 (21.6)	†	10 (22.6)	†
COPD	9 (21.0)	8 (30.9)	9 (23.8)	†
AF	10 (18.7)	9 (28.8)	Index	†
Alzheimer's disease/dementia	†	10 (26.3)	†	9 (33.8)
Depression	†	†	†	10 (29.7)
Stroke	†	†	†	Index

*Data shown as rank and percentage of persons with index condition who also had a comorbidity. The percentage is included parenthetically when applicable.

†Comorbidity was not in the top 10 for this index condition.[13]

AF indicates atrial fibrillation; COPD, chronic obstructive pulmonary disease; and HF, heart failure.

Recognizing this imperative, the AHA/ACC have taken steps to address comorbidities more consistently in CPGs, including actions resulting from the US Department of Health and Human Services initiative on multiple chronic conditions.[10] The centerpiece of this initiative—a strategic framework on multiple chronic conditions—explicitly focuses on the need for developers of CPGs to address chronic conditions.[11] Accordingly, the Department of Health and Human Services and the Institute of Medicine convened a stakeholder meeting that included the AHA/ACC to identify core principles for CPGs in the effective management of people with multiple chronic conditions and related actions that might be taken by developers of CPGs.[12] At the request of the AHA/ACC, the Centers for Medicare & Medicaid Services (CMS) provided the data for analysis of the most common comorbidities in Medicare beneficiaries with selected cardiovascular conditions for potential use in development of CPGs.

Prevalence of Comorbidities Among Patients Presenting With Index Cardiovascular Conditions

To assess the frequency of comorbidities, the 10 most common comorbid conditions among Medicare beneficiaries were identified using CMS administrative enrollment and claims data[13] for 4 index cardiovascular conditions: ischemic heart disease, heart failure, atrial fibrillation, and stroke. The Medicare population was limited to beneficiaries ≥65 years of age who were continuously enrolled in Medicare fee-for-service (both Parts A and B) during 2012. Beneficiaries enrolled in Medicare Advantage during 2012 were excluded because claims data were unavailable for these beneficiaries. Beneficiaries who died during the year were included up to the date of death.

For each of the 4 index cardiovascular conditions, comorbidity was determined with the following conditions: acquired hypothyroidism, acute myocardial infarction, Alzheimer's disease or dementia, anemia, arthritis (osteoarthritis and rheumatoid arthritis), asthma, atrial fibrillation, autism spectrum disorder, benign prostatic hyperplasia, breast cancer (female and male), cataract, chronic kidney disease, colon cancer, chronic obstructive pulmonary disease, depression, diabetes mellitus, endometrial cancer, glaucoma, heart failure, hip or pelvic fracture, hyperlipidemia, hypertension, ischemic heart disease, lung cancer, osteoporosis, prostate cancer, schizophrenia and other psychotic disorders, or stroke. A Medicare beneficiary was considered to have a chronic condition if the CMS administrative data included a claim indicating that the beneficiary received service or treatment for the specific condition. Detailed information on the identification of chronic conditions is available from the CMS Chronic Conditions Data Warehouse.[13]

Table 1 shows the 10 most common comorbidities for each index cardiovascular condition for beneficiaries ≥65 years of age in 2012.[13] The numbers of Medicare beneficiaries with the 4 index cardiovascular conditions were 8 678 060 with ischemic heart disease, 4 366 489 with heart failure, 2 556 839 with atrial fibrillation, and 1 145 719 with stroke. Two conditions that are major cardiovascular risk factors—hypertension and hyperlipidemia—constitute the most frequent dyad. Hypertension, hyperlipidemia, and ischemic heart disease were the 3 most prevalent comorbidities for patients with heart failure, atrial fibrillation, and stroke,

Table 2. The 5 Most Prevalent Comorbidities for 2012 Medicare Beneficiaries ≥65 Years of Age With at Least 2 (Dyads) or 3 (Triads) Chronic Conditions[14]

Comorbidities	Prevalence (%)
Dyads (beneficiaries with ≥2 comorbidities; N=19 139 696)	
High cholesterol and high BP	57.2
High BP and ischemic heart disease	36.8
High BP and arthritis	33.3
High BP and diabetes mellitus	32.7
High cholesterol and ischemic heart disease	31.3
Triads (beneficiaries with ≥3 comorbidities; N=14 908 988)	
High cholesterol, high BP, and ischemic heart disease	35.8
High cholesterol, high BP, and diabetes mellitus	31.7
High cholesterol, high BP, and arthritis	28.8
High BP, diabetes mellitus, and ischemic heart disease	21.5
High BP, arthritis, and ischemic heart disease	20.6

BP indicates blood pressure.

Reproduced with permission from the Centers for Medicare & Medicaid Services.[14]

whereas hypertension, hyperlipidemia, and diabetes mellitus were the most prevalent comorbidities in those with ischemic heart disease; however, arthritis, anemia, chronic obstructive pulmonary disease, and Alzheimer's disease also appeared.

Table 2 lists the top 5 most prevalent dyad and triad comorbidities for beneficiaries ≥65 years of age with at least 2 (for dyads) or 3 (for triads) chronic conditions. Combinations of high cholesterol, high blood pressure, and ischemic heart disease were most frequently represented in the dyads and triads, with diabetes mellitus and arthritis completing the remaining prevalent combinations.[14]

Implications and Future Directions In the Development of CPGs

Two general, but important, points emerge from the CMS data. First, a beneficiary with cardiovascular disease but without at least 1 comorbid chronic condition is the exception rather than the rule. Second, whereas common risk factors such as hypertension and hyperlipidemia are associated with the index cardiovascular conditions, the index conditions are associated with a constellation of comorbidities, the pathophysiology of which may be distinct from the index condition and for which prevalence increases with age or other factors.

Organizations that develop CPGs must now consider comorbidities during the development process for disease-specific CPGs. For high-prevalence index conditions, few CPGs address comorbidities,[15] and even fewer provide guidance for patients with specific combinations of diseases. Managing patients with multiple conditions is more complex than managing patients with a single disease, and the presence of multiple conditions increases challenges for healthcare providers and patients. Comorbidities may constitute barriers to adherence to CPGs, and caring for patients with multiple comorbidities can affect patient safety if recommendations for diagnosis and treatment in one CPG conflict with those for another condition.[16] The complexity of various regimens for multiple comorbidities adds to the difficulty in patient management and assessment of clinical outcomes.[17] Furthermore, limited attention has been given to the physical, cognitive, social, psychological, and financial implications of managing comorbidities. Involving patients in the CPG development process, which the AHA/ACC recently initiated, is critically important to fully appreciate patient perspectives.[18,19]

Currently, there are important challenges in addressing common comorbidities in the development and implementation of CPGs. Patients with comorbidities are often excluded from clinical trials, limiting the evidence with which to make generalizable recommendations.[20–22] This concern is explicitly addressed in the Department of Health and Human Services strategic framework, which emphasizes the need for external validation of clinical and drug approval trials by ensuring that persons with multiple comorbid conditions are not excluded unnecessarily.[11] In support of this objective, the US Food and Drug Administration now instructs that a regular part of its assessment of clinical trials incorporate a closer examination of the populations to be included in such trials and presumes that drug developers include patients with multiple comorbid conditions.[23] The increasing use of electronic health records and clinical registries would also allow a longitudinal evaluation of the management strategies and clinical outcomes of patients with cardiovascular disease and comorbidities, which often is not afforded by randomized clinical trials. Other challenges to addressing comorbidities in CPGs are the number of comorbidities to be considered and those that may be underreported, such as obesity, depression, significant cognitive impairment, and frailty, several of which become increasingly common with age and affect patient management and outcome. Thus, given the current lack of trial evidence and the complexity of treating patients with common cardiovascular comorbidities, CPGs may, in certain instances, need to be more nuanced to account for clinical judgement and acknowledge the role of individualized, patient-centered decision making in implementation.

In the future, the AHA/ACC CPGs will explicitly discuss the applicability and quality of recommendations for the most frequent combinations of comorbidities that accompany cardiovascular conditions. An important step in this direction is the collaboration between the AHA/ACC and the Department of Health and Human Services that includes development of comorbidity data for selected cardiovascular conditions that, in turn, can be included and addressed in CPGs such as the most recent guidelines on atrial fibrillation and heart failure.[7,8] The AHA/ACC aim to partner with various organizations to determine how best to highlight and address the complex issues arising from comorbidities in clinical medicine.

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ACC indicates American College of Cardiology; AHA, American Heart Association; and HHS, US Department of Health and Human Services.

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