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CLINICAL PRACTICE GUIDELINE

2025 ACC/AHA Clinical Practice Guidelines Core Principles and Development Process



A Report of the American College of Cardiology/American Heart Association
Joint Committee on Clinical Practice Guidelines

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INTRODUCTION

This document summarizes principles common to all American College of Cardiology (ACC) and American Heart Association (AHA) clinical practice guidelines. Each specific guideline will refer to these basic principles to provide the reader with best practices in a concise format. Additionally, this document addresses common elements of the development process for ACC/AHA clinical practice guidelines.

1. ACC/AHA GUIDELINE AUDIENCE

ACC/AHA clinical practice guidelines are primarily intended to provide evidence-based practical recommendations for clinicians caring for patients at risk for or with cardiovascular disease (CVD). ACC/AHA guidelines also may be of interest to others, including nursing professionals, pharmacists, medical researchers, hospital administrators, health care systems, economists, policy makers, and patients.

2. GUIDELINE DEVELOPMENT PROCESS

The ACC/AHA guideline development process entails a rigorous approach that includes: 1) identifying and defining the scope of clinical topics; 2) reviewing and conducting ongoing surveillance of the evidence base; 3) selecting multidisciplinary writing committees (WCs); 4) developing PICOT recommendations classified by strength of the recommendation and level of evidence; 5) applying a standardized publication style using a modular format; 6) implementing an iterative review process; 7) obtaining formal approval from the ACC and AHA; and 8) collaborating with other societies to ensure stakeholder representation and facilitate guideline implementation.

2.1. Guideline Recommendations

The cornerstone of ACC/AHA guidelines is a robust methodology to write and classify recommendations. Patient-centered recommendations are developed using a PICOTS (Population, Intervention, Comparator, Outcome, Timing, and Setting) format. Each recommendation is assigned a Class of Recommendation (COR) with the strength of the recommendation reflecting the risk to benefit balance, including the severity of the outcome, magnitude of effect, alternate treatments, and other considerations. The Level of Evidence (LOE) is classified separately using a structured approach to assess the quality of the evidence supporting the recommendation (Table 1).

The ACC/AHA Joint Committee on Clinical Practice Guidelines continuously reviews, updates, and modifies guideline methodology on the basis of published

standards from organizations including the National Academies of Sciences, Engineering, and Medicine.^{1,2} Similarly, the guideline format is reevaluated and modified in response to evolving technologies and other factors to optimally disseminate information to health care professionals at the point of care.

Numerous modifications to the guidelines have been implemented to shorten their length and make them more user friendly. Guidelines are written in a modular format, with each module containing a brief synopsis, a set of related recommendations (ie, COR and LOE), links to the key references for each recommendation, recommendation-specific supportive text, and when appropriate, clinical decision flowcharts that summarize the recommendations. Additional figures or tables may be included to accompany the information. Standardized color coding is used to indicate the COR in tables and flowcharts. This modular format will facilitate the transition to a digital guideline system and allow for updates to individual modules, rather than the entire topic's guideline, as new practice-changing evidence is published. This standardized publication format also ensures consistency in the guideline's structure and terminology across guideline topics.

Guidelines also include cost-value statements when data addressing the cost-value for a drug, device, or intervention are available.³

2.2. Selection of the Writing Committee and Peer Review Committee

ACC/AHA guideline development is led by a WC. A separate peer review committee provides iterative review at specified points in the development process and serves as a sounding board for any controversial issues that arise during WC discussions. Both the WC and peer review committee are selected from nominated individuals to provide multidisciplinary panels of cardiovascular clinicians (including cardiologists, primary care physicians, nurses, pharmacists, health economists, and other health care professionals), methodology experts, and lay representatives.

One of the foundations of the development process is transparency, achieved through comprehensive disclosures of any relationships with industry for the WC chair, members, and peer reviewers, which maintains the trustworthiness of the process. The WC must have >50% of members with no relevant relationships with industry.

In addition, the ACC and AHA strive to ensure that the broader cardiovascular community is reflected by the guideline WCs, with experts chosen from a spectrum of backgrounds to represent different geographic regions, sexes, races, ethnicities, intellectual perspectives and biases, and clinical practice settings. The ACC and AHA also collaborate with other societies to ensure

TABLE 1 Applying the American College of Cardiology/American Heart Association Class of Recommendation and Level of Evidence to Clinical Strategies, Interventions, Treatments, or Diagnostic Testing in Patient Care* (Updated December 2024)

CLASS (STRENGTH) OF RECOMMENDATION	LEVEL (QUALITY) OF EVIDENCE [‡]
Class 1 (STRONG) Benefit >>> Risk Suggested phrases for writing recommendations: - Is recommended - Is indicated/useful/effective/beneficial - Should be performed/administered/other - Comparative-Effectiveness Phrases[†]: - Treatment/strategy A is recommended/indicated in preference to treatment B - Treatment A should be chosen over treatment B	Level A - High-quality evidence[‡] from more than 1 RCT - Meta-analyses of high-quality RCTs - One or more RCTs corroborated by high-quality registry studies
Class 2a (MODERATE) Benefit >> Risk Suggested phrases for writing recommendations: - Is reasonable - Can be useful/effective/beneficial - Comparative-Effectiveness Phrases[†]: - Treatment/strategy A is probably recommended/indicated in preference to treatment B - It is reasonable to choose treatment A over treatment B	Level B-R (Randomized) - Moderate-quality evidence[‡] from 1 or more RCTs - Meta-analyses of moderate-quality RCTs
Class 2b (WEAK) Benefit ≥ Risk Suggested phrases for writing recommendations: - May/might be reasonable - May/might be considered - Usefulness/effectiveness is unknown/unclear/uncertain or not well-established	Level B-NR (Nonrandomized) - Moderate-quality evidence[‡] from 1 or more well-designed, well-executed nonrandomized studies, observational studies, or registry studies - Meta-analyses of such studies
Class 3: No Benefit (MODERATE) Benefit = Risk (Generally, LOE A or B use only) Suggested phrases for writing recommendations: - Is not recommended - Is not indicated/useful/effective/beneficial - Should not be performed/administered/other	Level C-LD (Limited Data) - Randomized or nonrandomized observational or registry studies with limitations of design or execution - Meta-analyses of such studies - Physiological or mechanistic studies in human subjects
Class 3: HARM (STRONG) Risk > Benefit Suggested phrases for writing recommendations: - Potentially harmful - Causes harm - Associated with excess morbidity/mortality - Should not be performed/administered/other	Level C-EO (Expert Opinion) Consensus of expert opinion based on clinical experience

COR and LOE are determined independently (any COR may be paired with any LOE).

A recommendation with LOE C does not imply that the recommendation is weak. Many important clinical questions addressed in guidelines do not lend themselves to clinical trials. Although RCTs are unavailable, there may be a very clear clinical consensus that a particular test or therapy is useful or effective.

* The outcome or result of the intervention should be specified (an improved clinical outcome or increased diagnostic accuracy or incremental prognostic information).

† For comparative-effectiveness recommendations (COR 1 and 2a; LOE A and B only), studies that support the use of comparator verbs should involve direct comparisons of the treatments or strategies being evaluated.

‡ The method of assessing quality is evolving, including the application of standardized, widely-used, and preferably validated evidence grading tools; and for systematic reviews, the incorporation of an Evidence Review Committee.

COR indicates Class of Recommendation; EO, expert opinion; LD, limited data; LOE, Level of Evidence; NR, nonrandomized; R, randomized; and RCT, randomized controlled trial.

stakeholder representation and facilitate guideline implementation.

2.3. Surveillance Committee and Evidence Review

When developing recommendations, the WC uses evidence-based methodologies that are based on all available data.^{4,5} Literature searches focus on randomized controlled trials but may also include registries, nonrandomized comparative and descriptive studies, case series, cohort studies, systematic reviews, and expert opinions. Only key references are cited. Relevant and cited studies are compiled and added to evidence tables when appropriate. The finalized evidence tables summarize the evidence used by the WC to formulate recommendations and are published online concurrently with each guideline. References selected and published in the guidelines are representative of the evidence on a topic but are not all-inclusive.

To ensure that guideline recommendations remain current, new data are reviewed on an ongoing basis by staff and an independent surveillance committee. Formal review and maintenance of the guidelines will be prompted by the identification of potentially practice-changing new data that would change the COR or LOE of a specific recommendation or lead to a new recommendation. For additional information and policies on guideline development, readers may consult the ACC/AHA guidelines methodology manual and other methodology articles.⁴⁻⁷

3. STANDARD MEDICAL CARE FOR ALL PATIENTS WITH CARDIOVASCULAR DISEASE

3.1. Clinical History and Physical Examination

Clinical practice guidelines begin with the premise that clinicians are providing standard medical care, including a comprehensive clinical history and appropriate physical examination (Table 2). The cardiovascular clinical history provides the basis for understanding a patient's health experience and changes in their physical function and symptoms over time. A patient's medical and family history may identify underlying risk factors relevant to the implementation of guideline recommendations. An assessment of risk for primary and secondary prevention of CVD is based on the clinical history and is supplemented by appropriate laboratory and noninvasive testing. Additionally, the clinical history offers an opportunity for shared decision-making (SDM) to understand a patient's goals and values regarding their cardiovascular care.⁸

3.2. Standard Diagnostic Methods

ACC/AHA guidelines assume that, in addition to a thorough clinical history, review of medical records, and physical examination, appropriate standard clinical and cardiovascular tests have been performed as part of the initial cardiovascular assessment. An understanding of appropriate use criteria, pretest and post-test probabilities, and clinical scenarios in which testing would assist in management is fundamental to provide suitable recommendations for cardiac testing for patients. The ACC/AHA clinical guidelines often provide guidance on when cardiac noninvasive and invasive testing is appropriate and the frequency with which to repeat testing if indicated.

In addition, standard tests that are appropriate in the initial evaluation of patients include:

- **Laboratory:** Blood tests for blood counts, thyroid function, electrolytes, renal function, lipid levels, inflammatory markers, and serum B-type natriuretic peptide levels are routine.
- **Electrocardiogram (ECG):** A 12-lead ECG allows diagnosis of arrhythmias or conduction abnormalities and provides information about cardiac structure and function. Ambulatory ECG monitoring may be used for the diagnosis of intermittent arrhythmias or to quantify the temporal frequency of a known arrhythmia. The role of consumer smart devices for the detection and management of cardiac disease is evolving.
- **Imaging:** Transthoracic echocardiography allows for detailed assessment of resting cardiac anatomy, atrial and ventricular sizes, systolic and diastolic function, valvular evaluations, volume status, congenital abnormalities, pericardial disease, and/or extracardiac disease. Coronary computed tomography (CT) allows quantitation of coronary or valve calcium. CT angiography allows direct visualization of coronary anatomy. Cardiac CT and magnetic resonance imaging are routinely utilized for the assessment of complex structural or vascular disease.
- **Stress testing:** Exercise treadmill testing using ECG evaluation without imaging remains a useful tool for assessing exercise capacity, elicitation of symptoms, and for risk stratification in low-risk patients who may have undiagnosed atherosclerotic coronary artery disease. Stress testing may also be accompanied by echocardiography, nuclear imaging (ie, single-photon emission CT, positron emission tomography), or cardiac magnetic resonance imaging, especially for intermediate- or higher-risk patients.

TABLE 2 Elements of a Clinical History and Physical Examination

Clinical History	
Reason for Seeking Health Care	- Chief complaint - Priorities for seeking cardiovascular care
Presentation of Current Concerns or Ailment	- Time course - Alleviating or exacerbating factors - Characterization
Physical Functioning	- Baseline functional status - Ability to perform ADLs - Occupational and leisure physical activity - Time course for changes in physical functioning
Current and Past Medical History That Increases Cardiovascular Risk	- Relevant history and conditions related to: - Cardiometabolic health - Autoimmune disease - Chronic infections - Mental health - SDOH
Family History	- Hypertension - Inherited cardiovascular condition - Diabetes - Dyslipidemia - Pregnancy-related hypertensive disorders - Early CVD events - Cardiac dysfunction - Congenital heart disease - Sudden cardiac death
Review of Medical Records	- Referral request and primary care information - Previous cardiovascular events - Cardiovascular imaging and other testing
Physical Examination	
Vital Signs	- Appropriately obtained resting BP, heart rate, respiratory rate, oxygen saturation if indicated - Height and body weight to estimate BMI or abdominal circumference
General	- Is the patient well-nourished? - Mental status? - Exhibiting distress or tachypnea? - Diaphoretic?
Skin + Nails + Eyes	- Xanthomas related to dyslipidemia - Retinal examinations to identify dyslipidemia and hypertensive disease - Temperature for concerns of shock or arterial insufficiency - Petechia or signs of bruising - Osler nodes, Janeway lesions, or splinter hemorrhages for endocarditis or vasculitis concerns
Volume Status	- Baseline and trends in: - Body weight - Peripheral edema - Jugular venous pressure and pulsation
Palpation	- Upper and lower extremity peripheral pulses - Carotid upstroke (amplitude, timing) - Palpation of precordial thrills, heaves, or lifts - Abdominal examinations to evaluate ascites, hepatomegaly, or splenomegaly
Auscultation	- Lung fields for pulmonary pathologies, edema, and effusions - Heart sounds for valvular function, cardiac shunts, and pericardial disease - Carotid and femoral artery for vascular disease
Point-of-Care Ultrasound	- Cardiac chamber size - Ventricular function - Pericardial effusion - Volume status assessed with inferior vena cava evaluation - Lung fields evaluation for pulmonary edema - May provide supplementation to comprehensive imaging studies

ADLs indicates activities of daily living; BMI, body mass index; BP, blood pressure; CVD, cardiovascular disease; and SDOH, social determinants of health.

4. EVALUATION AND MANAGEMENT OF CARDIOVASCULAR RISK FACTORS

4.1. Primary Prevention—AHA's Life's Essential 8 and Cardiovascular-Kidney-Metabolic Health

Embedded in all ACC/AHA clinical practice guidelines is the concept that cardiovascular risk factors have been

appropriately assessed and treated, regardless of the specific type of CVD affecting the patient.

CVD is the most common noncommunicable disease worldwide, accounting for approximately one-third of all global deaths.⁹ Several modifiable risk factors, including increased body mass index (BMI), systolic blood pressure, low-density lipoprotein cholesterol level, tobacco

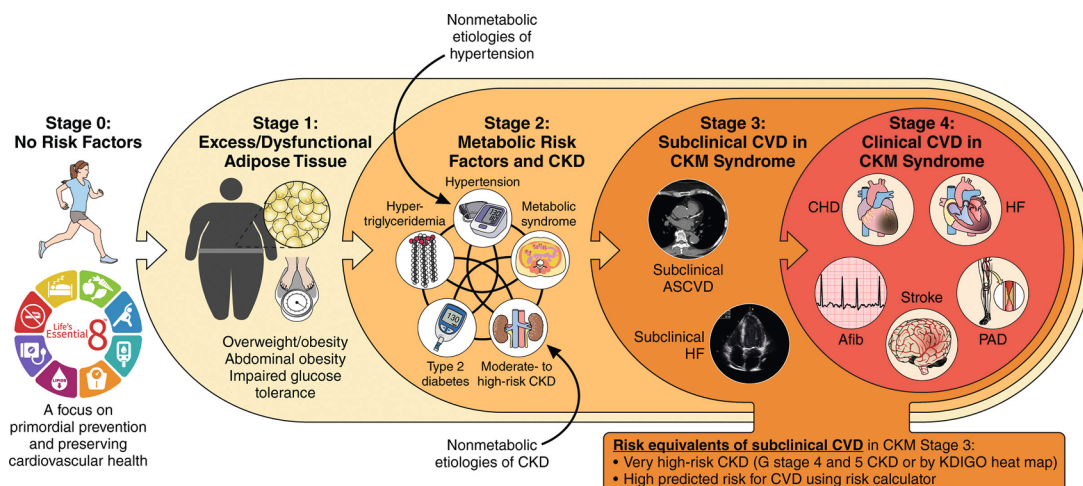
FIGURE 1 Life's Essential 8

Life's Essential 8 includes the 8 components of cardiovascular health: healthy diet, participation in physical activity, avoidance of nicotine, healthy sleep, healthy weight, and healthy levels of blood lipids, blood glucose, and blood pressure. Reprinted with permission from Lloyd-Jones et al.¹⁵

smoking, and diabetes, account for most of the attributable risk for CVD prevalence and incidence.^{10,11} Approximately a decade ago, the AHA expanded its focus from addressing existing CVD and risk factors to adding

strategies that would also directly promote the health of the population and individuals.¹² Central to this new approach was the creation of a novel and operational definition for the construct of cardiovascular health (CVH).¹² The initial definition of CVH was based on 7 health behaviors and health factors that, when optimal, were associated with greater CVD-free survival, total longevity, and higher quality of life.¹² The 7 components of CVH, subsequently called Life's Simple 7, included indicators of dietary quality, participation in physical activity, exposure to cigarette smoking, and measures of BMI, fasting blood glucose, total cholesterol, and blood pressure.¹² Each metric was classified as poor, intermediate, or ideal based on accepted clinical thresholds.

Numerous studies have now shown robust, stepwise, inverse associations between the number of ideal CVH metrics, or overall CVH score, and total CVD and CVD mortality, all-cause mortality, and a wide variety of non-CVD outcomes, including a large meta-analysis of 9 prospective cohort studies involving a total of 12,878 participants.¹³ Since the original metrics were developed in 2010, key findings have illustrated the essential, foundational context of psychological health and well-being and social determinants of health (SDOH) for maintaining or improving CVH.^{12,14} The AHA proposed updated definitions and rescoring of the original 7 CVH metrics on a more continuous scale to better account for interindividual difference and intraindividual change. In 2022, with the addition of a new sleep metric, Life's Essential 8 was created.¹⁵ Designed to measure, monitor, and improve

FIGURE 2 Stages of CKM Syndrome

The CKM staging construct reflects the progressive pathophysiology and increasing absolute CVD risk along the spectrum of CKM syndrome. Afib indicates atrial fibrillation; ASCVD, atherosclerotic cardiovascular disease; CHD, coronary heart disease; CKD, chronic kidney disease; CKM, cardiovascular-kidney-metabolic; HF, heart failure; KDIGO, Kidney Disease Improving Global Outcomes; and PAD, peripheral artery disease. Reprinted with permission from Ndumele et al.¹⁶

CVH, Life's Essential 8 includes 8 components: diet, physical activity, nicotine exposure, sleep health, BMI, blood lipids, blood glucose, and blood pressure (Figure 1). Clinicians and patients are accustomed to health status being framed as a risk (implying negative or bad) for a given disease or condition. When Life's Essential 8 is implemented in diverse settings, it should ideally be presented in a positive manner in a lay-friendly format to ensure accurate interpretation, to emphasize its strong associations with favorable health outcomes, and to provide motivation to change one's behavior as needed.

Another important determinant of cardiovascular health is cardiovascular-kidney-metabolic (CKM) health, a relatively new term describing the interplay among metabolic risk factors, chronic kidney disease (CKD), and the cardiovascular system, and its profound impact on morbidity and mortality. There are multisystem consequences of poor CKM health, the most significant of which is the high incidence of associated CVD events and cardiovascular mortality.¹⁶ Recently, a CKM staging construct has been proposed that reflects the pathophysiology, spectrum of risk, and opportunities to optimize prevention and care within CKM syndrome: stage 0, no CKM risk factors; stage 1, excess or dysfunctional adiposity; stage 2, metabolic risk factors (hypertriglyceridemia, hypertension, type 2 diabetes, metabolic syndrome) or moderate- to high-risk CKD; stage 3, subclinical CVD in CKM syndrome or risk equivalents (high predicted CVD risk or very high-risk CKD); and stage 4, clinical CVD in CKM syndrome (Figure 2).

4.2. Social Determinants of Health

All clinical practice guideline recommendations should consider SDOH, the structural determinants and conditions in which people are born, grow, live, work, and age that affect health, functioning, and quality of life.^{17,18} Five key domains comprise SDOH, including economic stability, neighborhood and built environment, education, social and community context, and health and health care, all of which have major impacts on people's health, well-being, and quality of life.¹⁹ The "2024 ACC/AHA Key Data Elements and Definitions for Social Determinants of Health in Cardiology" provides standard definitions for SDOH relevant to CVD.²⁰ Strategies to integrate SDOH in electronic health records and data repositories are necessary to ensure that these standards can be deployed to achieve more equitable and optimal health outcomes. There is also a need for better understanding of the interrelationship among SDOH and the mediating effects of 1 domain upon another (eg, structural racism underlies socioeconomic deprivation, which in turn results in dietary patterns, substance use rates, environmental risks, and barriers to health care access).²⁰

SDOH affect a wide range of health risks, outcomes, and quality-of-life indicators and contribute to health disparities; therefore, it is critical to incorporate SDOH into clinical practice, addressing them with each and every patient. Mechanisms are also needed to enhance the inclusion of consistently defined data elements that best reflect individuals and their lived environment in electronic health records, clinical research, and health data systems.¹⁷

5. MULTIDISCIPLINARY TEAMS AND CENTERS OF EXCELLENCE

ACC/AHA guidelines expect that multidisciplinary teams (MDTs) will be utilized for the management of patients with complex CVD, conditions that affect additional organ systems, and high-risk patients.^{21,22} MDTs help facilitate diagnostic and treatment management decisions, considering individual patient characteristics and relevant social determinants bearing in mind local expertise and incorporating patient preferences in an SDM framework. Logistical considerations for the institution include the frequency of type of MDTs, the frequency of meetings, whether the meetings are in person vs virtual, and a mechanism to convene ad hoc and emergent meetings when required. There is the expectation that decision-making is based on the clinical indication, regardless of the patient's sex, gender, race, or ethnicity.²³

The composition of the MDT, commonly known as the heart team, is tailored to the specific clinical condition and includes physicians, nursing professionals, pharmacists, and patient care coordinators, often spanning multiple clinical specialties. High-quality cardiovascular care is often predicated on high hospital and operator volumes with comprehensive care provided by a collaborative MDT within a Center of Excellence.^{24–26} For example, a standard MDT for patients being considered for coronary revascularization might include a cardiac surgeon, interventional cardiologist, and noninterventional cardiologist.^{23,27,28} In contrast, the MDT at a comprehensive heart valve center typically includes specialists in cardiac surgery, interventional cardiology, vascular surgery, anesthesia, critical care, imaging, other medical disciplines, nursing, and other allied health professionals.²⁹ Expertise in genetics and genetics counseling is important for MDTs for thoracic aortic disease and hypertrophic cardiomyopathy.^{30,31}

6. PATIENT CONSIDERATIONS

6.1. Patient Education

ACC/AHA clinical practice guidelines are intended for cardiovascular clinicians. However, patient education,

both in person and by directing patients to digital resources, such as those provided by the ACC and AHA, is a foundational principle for all guideline recommendations.^{32,33}

Patient education is the delivery of information from clinicians to patients to improve health behavior and outcomes. Clinicians are ideally positioned to engage in meaningful dialogue with individuals who are at risk for or have cardiovascular conditions. Education about self-care skills to prevent and manage risk factors and conditions is essential.³⁴ The clinical encounter, especially during recovery, provides a teachable moment to deliver structured education, including priming the patient to engage in lifestyle modification and adhere to the treatment regimen.

Systematic reviews of educational interventions targeting secondary prevention in patients with coronary heart disease have demonstrated effectiveness in improving disease-related knowledge, healthy behaviors, and medication adherence.³⁵⁻³⁷ The majority of the programs used multiple delivery modes, with nearly all the programs using multiple sessions (median duration, 2 months).³⁵ The programs' duration had a significant influence on outcomes, with those lasting >3 months having more benefit.³⁵ A shortcoming of published studies of educational interventions to date is that they are markedly heterogeneous, varying in level of intensity, duration, delivery mode, and resources needed, with differing outcome assessments, including length of follow-up.³⁴⁻⁴² Although there are insufficient comparative data to provide clinicians guidance about which specific educational interventions are best, evidence supports the use of individualized goal setting that demonstrates respect for the patient and their circumstances, with structured content that is culturally appropriate and outcomes clearly defined.³⁸

Best practices for patient education include: 1) structured discharge education for hospitalized patients; 2) use of educational materials appropriate for the patient's degree of literacy; 3) engagement with self-care interventions when possible; and 4) use of digital and phone-based prompts to improve medication adherence.

6.2. Decision Aids

Decision aids can accelerate patient learning and enhance SDM processes for the implementation of clinical practice guideline recommendations. Patient decision aids (PDAs) are used to guide, not replace, preference-sensitive treatment discussions when patients and clinicians face equipoise in deciding among treatment options.⁴³ They are designed to present balanced, unbiased, literacy-sensitive, culturally congruent information about the risks and benefits of treatment options based on the latest evidence.⁴⁴ PDAs should be utilized in advance of the

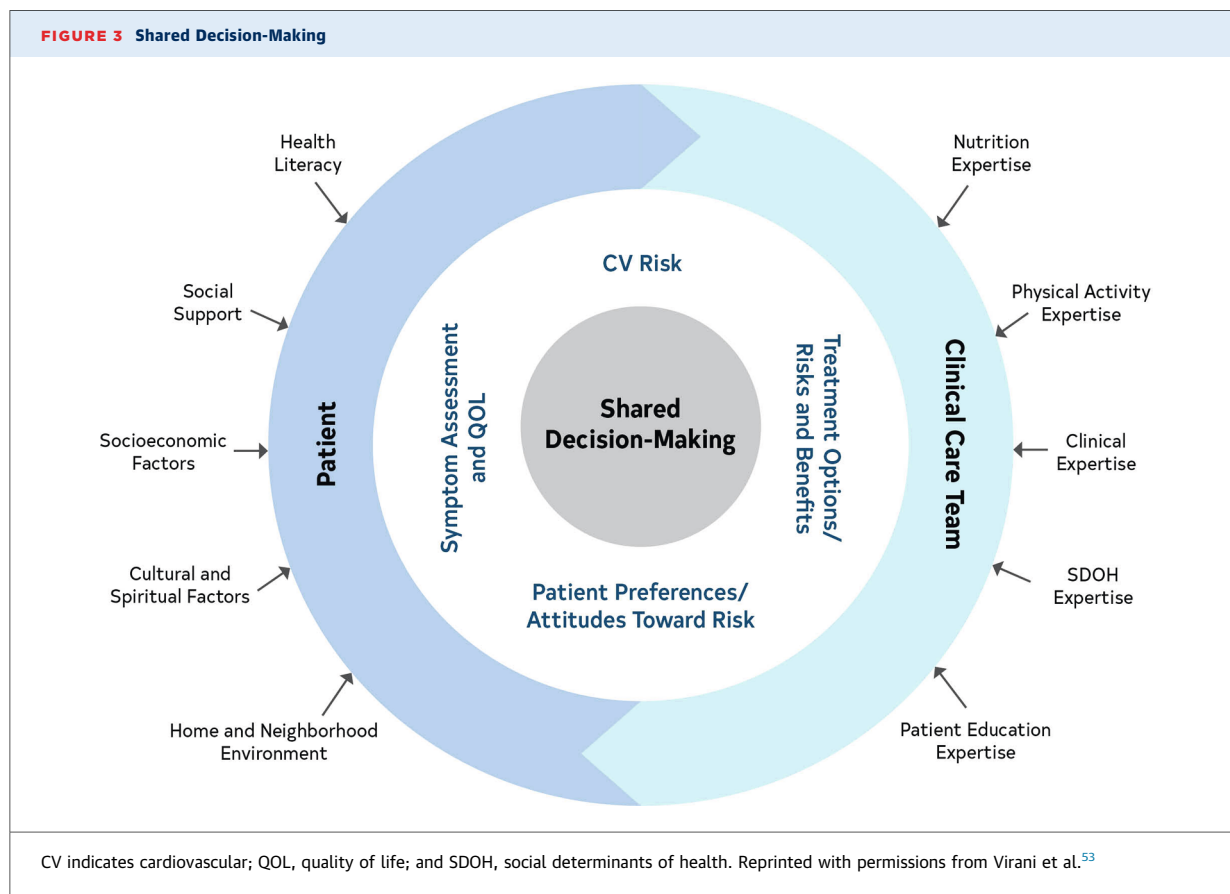
treatment decision to allow time for patients and care partners to emotionally and cognitively process the information presented, so they can prioritize and communicate their individualized goals to drive decisions.

Individuals who are at risk for or have cardiovascular conditions have been shown to benefit from PDAs, which improve knowledge levels of treatment options, reduce decisional conflict, enhance patient-clinician communication, and improve patient and clinician satisfaction with treatment choices without having a significant effect on the encounter duration.^{43,45-48} When deciding between treatment options, patients prefer using PDAs collaboratively with a clinician as opposed to a stand-alone tool.⁴⁹ Moreover, PDAs are coupled with a decision coach, resulting in more active participation in the decision-making process and the highest improvement in knowledge.⁴⁵

An inclusive design approach should be used when developing PDAs, including considering their use in persons who are socially disadvantaged and have low health literacy and health numeracy. PDAs should adhere to the International Patient Decision Aid Standards, be personalized, written in plain language, and tailored to patient-specific information (eg, demographic, clinical, genetic) and treatment options available for the condition.^{50,51} Paper-based PDAs are the most common form of delivery compared with web-based, video, or CD delivery modes.⁵² Digital PDAs offer advantages for displaying tailored choice options for those who prefer to engage in digital technologies; yet, households with limited device accessibility or connectivity may be at a disadvantage, necessitating the use of digital PDAs in clinical settings.

6.3. Shared Decision-Making

SDM is an essential component of clinical management for all guideline-based clinical care. Management, in accordance with guideline recommendations, is effective only when followed by both practitioners and patients. Adherence to recommendations can be enhanced by SDM, with patient engagement in selecting interventions on the basis of individual values, preferences, and associated conditions and comorbidities (Figure 3).⁵³ This may include using decision support (eg, decision aids, decision coach) to ensure that the patient can make the best decision without having decisional regret or conflict.⁵⁴⁻⁵⁶ SDM is relevant across the spectrum of cardiovascular care where equipoise exists, including prevention efforts requiring behavior change and adherence, chronic disease management, and therapies for acute or advanced conditions. Strategies for the successful implementation of SDM include identifying reimbursement and workflow solutions, obtaining leadership support, providing focused team-based SDM training for clinicians, and gaining access to high-quality decision aids.^{54,55}

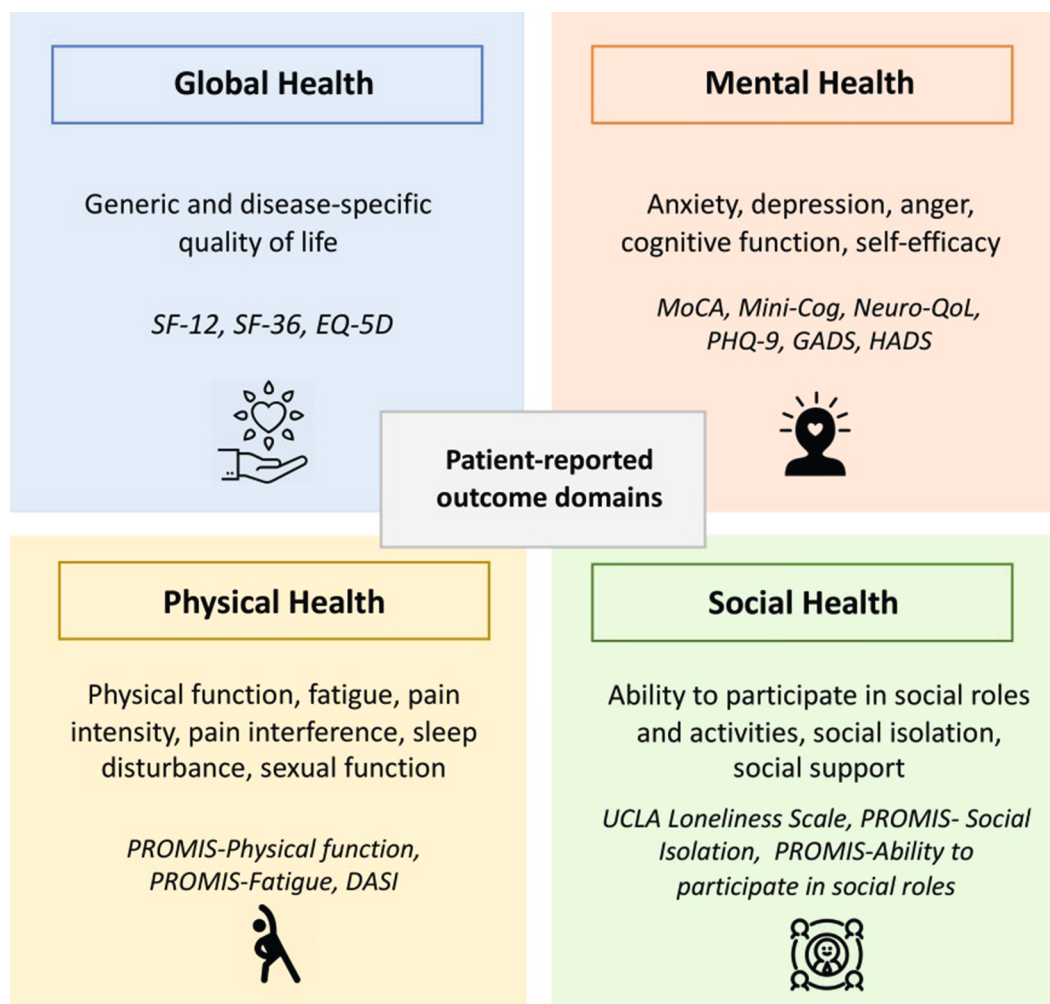


6.4. Patient-Reported Outcomes

ACC/AHA clinical practice guidelines incorporate patient-reported outcomes (PROs) in recommendations when possible. However, to date, only a minority of cardiovascular PROs have been recognized by the U.S. Food and Drug Administration as suitable outcomes from a regulatory approval perspective. Thus, at present, the regulatory perspective on acceptable PRO measures is likely too narrow to use in deciding whether specific PROs from clinical trials should be included in guideline recommendations.^{57–59} PROs are reports of a person’s health status that are directly measured by a patient without interpretation by a health care professional (Figure 4).^{60,61} The nature of CVD and its impact on patients’ lives have been well documented, including high symptomology and influence on physical and social function, emotional well-being, and health-related quality of life.⁶⁰ PROs provide a holistic perspective across multiple domains of health (global, mental, physical, and social health).^{60–62} The *Consensus-based Standards for the selection of*

health Measurement Instruments (COSMIN) checklist recommends using a multidomain approach for the measurement of PROs.⁶³

At the individual level, patients are beginning to use PROs, independent of clinician involvement, for tracking health status, including symptom monitoring.⁶⁴ The systematic collection of PRO data longitudinally for chronic disease management or before and after a cardiac intervention can be helpful in detecting pattern changes in patients’ disease trajectory beyond physiological monitoring alone. As recommended by the Patient-Centered Outcomes Research Institute, the collection of these data aligns with patient priorities when making decisions about care.^{49,65} At the population level, PROs are used in clinical trials as patient-centered endpoints to complement traditional “hard outcomes” (eg, survival). However, PROs have yet to reach their full potential of being integrated into routine clinical care, providing information about which patients would potentially benefit from specialty care or a particular treatment.⁶⁶ Systematically collecting PROs also helps to evaluate health care

FIGURE 4 Four Patient-Reported Outcome Domains With Select Examples of Instruments

DASI indicates Duke Activity Status Index; EQ-5D, EuroQoL; GAD, general anxiety disorder; HADS, Hospital Anxiety and Depression Scale; KCCQ, Kansas City Cardiomyopathy Questionnaire; MoCA, Montreal Cognitive Assessment; Neuro-QoL, Quality of Life in Neurological Disorders; PHQ-9, Patient Health Questionnaire-9; PROMIS, Patient-Reported Outcomes Measurement Information System; SAQ, Seattle Angina Questionnaire; SF-12, Short-Form Health Survey 12 items; SF-36, Short-Form Health Survey 36 items; and SPPB, Short Physical Performance Battery. Reprinted with permission from Masterson et al.⁶¹

quality in a value-based medical system. There is a need to tailor PROs for language, culture, literacy, and numeracy levels to optimize their use in diverse populations.^{60-62,66}

SUMMARY

The process for developing ACC/AHA clinical practice guidelines summarized here applies to all guidelines going forward. Similarly, the core principles for diagnosis and management are implicit and will only be

addressed in individual guidelines if there are unique aspects relevant to a specific patient population. An appropriate clinical history, physical examination, and standard diagnostic methods are essential in the initial evaluation of all patients. The management of patients with CVD always includes primary prevention and consideration of SDOH, with care provided by MDTs in the context of centers of excellence for complex conditions. Patient education, decision aids, and SDM are integral to the management of all types of CVD.

REFERENCES

- Committee on Standards for Developing Trustworthy Clinical Practice Guidelines, U.S. Institute of Medicine. *Clinical Practice Guidelines We Can Trust*. National Academies Press; 2011.
- Committee on Standards for Systematic Reviews of Comparative Effectiveness Research, U.S. Institute of Medicine. *Finding What Works in Healthcare: Standards for Systematic Reviews*. National Academies Press; 2011.
- Kazi DS, Abdullah AR, Arnold SV, et al. 2025 AHA/ACC statement on cost/value methodology in clinical practice guidelines and performance measures (update from 2014 statement): a report of the American College of Cardiology/American Heart Association Joint Committee on Clinical Practice Guidelines and Joint Committee on Performance Measures. *J Am Coll Cardiol*. 2026;87:1177–1206.
- ACCF/AHA Task Force on Practice Guidelines. Methodology manual and policies from the ACCF/AHA Task Force on Practice Guidelines. *American College of Cardiology and American Heart Association*. 2010. Accessed September 15, 2024. <https://www.acc.org/Guidelines/About-Guidelines-and-Clinical-Documents/Methodology>
- Halperin JL, Levine GN, Al-Khatib SM, et al. Further evolution of the ACC/AHA clinical practice guideline recommendation classification system: a report of the American College of Cardiology/American Heart Association Task Force on Clinical Practice Guidelines. *J Am Coll Cardiol*. 2016;67:1572–1574.
- Arnett DK, Goodman RA, Halperin JL, et al. 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 U.S. Department of Health and Human Services. *J Am Coll Cardiol*. 2014;64:1851–1856.
- Levine GN, O'Gara PT, Beckman JA, et al. Recent innovations, modifications, and evolution of ACC/AHA Clinical Practice Guidelines: an update for our constituencies: a report of the American College of Cardiology/American Heart Association Task Force on Clinical Practice Guidelines. *J Am Coll Cardiol*. 2019;73:1990–1998.
- Montori VM, Ruissen MM, Hargraves IG, et al. Shared decision-making as a method of care. *BMJ Evid Based Med*. 2023;28:213–217.
- Joseph P, Leong D, McKee M, et al. Reducing the global burden of cardiovascular disease, part 1: the epidemiology and risk factors. *Circ Res*. 2017;121:677–694.
- Yusuf S, Joseph P, Rangarajan S, et al. Modifiable risk factors, cardiovascular disease, and mortality in 155 722 individuals from 21 high-income, middle-income, and low-income countries (PURE): a prospective cohort study. *Lancet*. 2020;395:795–808.
- Magnussen C, Ojeda FM, Leong DP, et al. Global effect of modifiable risk factors on cardiovascular disease and mortality. *N Engl J Med*. 2023;389:1273–1285.
- Lloyd-Jones DM, Hong Y, Labarthe D, et al. Defining and setting national goals for cardiovascular health promotion and disease reduction: the American Heart Association's strategic impact goal through 2020 and beyond. *Circulation*. 2010;121:586–613.
- Fang N, Jiang M, Fan Y. Ideal cardiovascular health metrics and risk of cardiovascular disease or mortality: a meta-analysis. *Int J Cardiol*. 2016;214:279–283.
- Kim JH, Islam SJ, Topel ML, et al. Individual psychosocial resilience, neighborhood context, and cardiovascular health in black adults: a multilevel investigation from the Morehouse-Emory Cardiovascular Center for Health Equity Study. *Circ Cardiovasc Qual Outcomes*. 2020;13:e006638.
- Lloyd-Jones DM, Allen NB, Anderson CAM, et al. Life's essential 8: updating and enhancing the American Heart Association's construct of cardiovascular health: a presidential advisory from the American Heart Association. *Circulation*. 2022;146:e18–e43.
- Ndumele CE, Rangaswami J, Chow SL, et al. Cardiovascular-kidney-metabolic health: a presidential advisory from the American Heart Association. *Circulation*. 2023;148:1606–1635.
- Di Thiene D, Marceca M. Closing the gap in a generation: health equity through action on the social determinants of health. A challenge for the international community. *Ann Ig*. 2008;20:595–601.
- U.S. Department of Health and Human Services. Social determinants of health - Healthy People 2030. Accessed November 14, 2024. <https://odphp.health.gov/healthypeople/priority-areas/social-determinants-health>
- Havranek EP, Mujahid MS, Barr DA, et al. Social determinants of risk and outcomes for cardiovascular disease: a scientific statement from the American Heart Association. *Circulation*. 2015;132:873–898.
- Morris AA, Masoudi FA, Abdullah AR, et al. 2024 ACC/AHA key data elements and definitions for social determinants of health in cardiology. *J Am Coll Cardiol*. 2024;84:e109–e226.
- Heidenreich PA, Bozkurt B, Aguilar D, et al. 2022 AHA/ACC/HFSA guideline for the management of heart failure: a report of the American College of Cardiology/American Heart Association Joint Committee on Clinical Practice Guidelines. *J Am Coll Cardiol*. 2022;79:e263–e421.
- Stout KK, Daniels CJ, Aboulhosn JA, et al. 2018 AHA/ACC guideline for the management of adults with congenital heart disease: a report of the American College of Cardiology/American Heart Association Task Force on Clinical Practice Guidelines. *J Am Coll Cardiol*. 2019;73:e81–e192.
- Lawton JS, Tamis-Holland JE, Bangalore S, et al. 2021 ACC/AHA/SCAI guideline for coronary artery revascularization: a report of the American College of Cardiology/American Heart Association Joint Committee on Clinical Practice Guidelines. *J Am Coll Cardiol*. 2022;79:e21–e129.
- Andersen ND, Ganapathi AM, Hanna JM, et al. Outcomes of acute type A dissection repair before and after implementation of a multidisciplinary thoracic aortic surgery program. *J Am Coll Cardiol*. 2014;63:1796–1803.
- Benedetto U, Dimagli A, Kaura A, et al. Determinants of outcomes following surgery for type A acute aortic dissection: the UK National Adult Cardiac Surgical Audit. *Eur Heart J*. 2021;43:44–52.
- Kawczynski MJ, van Kuijk SMJ, Olsthoorn JR, et al. Type A aortic dissection: optimal annual case volume for surgery. *Eur Heart J*. 2023;44:4357–4372.
- Scott-Herridge JA, McIntyre WF, Hiebert BM, et al. Does a heart team improve clinical outcomes? *Am J Cardiol*. 2022;169:120–126.
- Tsang MB, Schwalm JD, Gandhi S, et al. Comparison of heart team vs interventional cardiologist recommendations for the treatment of patients with multivessel coronary artery disease. *JAMA Netw Open*. 2020;3:e2012749.
- Otto CM, Nishimura RA, Bonow RO, et al. 2020 ACC/AHA guideline for the management of patients with valvular heart disease: a report of the American College of Cardiology/American Heart Association Joint Committee on Clinical Practice Guidelines. *J Am Coll Cardiol*. 2021;77:e25–e197.
- Isselbacher EM, Preventza O, Hamilton Black IIIJ, et al. 2022 ACC/AHA guideline for the diagnosis and management of aortic disease: a report of the American Heart Association/American College of Cardiology Joint Committee on Clinical Practice Guidelines. *J Am Coll Cardiol*. 2022;80:e223–e393.
- Ommen SR, Mital S, Burke MA, et al. 2020 AHA/ACC guideline for the diagnosis and treatment of patients with hypertrophic cardiomyopathy: a report of the American College of Cardiology/American Heart Association Joint Committee on Clinical Practice Guidelines. *J Am Coll Cardiol*. 2020;76:e159–e240.
- American College of Cardiology. CardioSmart. Accessed November 14, 2024. <https://www.cardiosmart.org/>
- American Heart Association. Get With The Guidelines: patient education materials. Accessed November 14, 2024. <https://www.heart.org/en/professional/quality-improvement/get-with-the-guidelines-patient-education-materials>
- Riegel B, Moser DK, Buck HG, et al. Self-care for the prevention and management of cardiovascular disease and stroke: a scientific statement for health-care professionals from the American Heart Association. *J Am Heart Assoc*. 2017;6:e006997.
- Shi W, Ghisi GLM, Zhang L, et al. Systematic review, meta-analysis and meta-regression to determine the effects of patient education on health behaviour change in adults diagnosed with coronary heart disease. *J Clin Nurs*. 2023;32:5300–5327.
- Feng YY, Chaves GSS, Shi W, et al. Education interventions in Chinese cardiac patients on health behaviours, disease-related knowledge, and health outcomes: a systematic review and meta-analysis. *Patient Educ Couns*. 2021;104:1018–1029.
- Kourbelis CM, Marin TS, Foote J, et al. Effectiveness of discharge education strategies versus usual care on clinical outcomes in acute coronary syndrome patients: a systematic review. *JBI Evid Synth*. 2020;18:309–331.
- Zhu X, Yang Y, Cao M. Effect of a mutual goal-based continuous care program on self-management behaviour and health outcomes in patients after

percutaneous coronary intervention: a randomized controlled trial. *Nurs Open*. 2023;10:3707-3718.

39. Wasir AS, Volgman AS, Jolly M. Assessing readability and comprehension of web-based patient education materials by American Heart Association (AHA) and CardioSmart online platform by American College of Cardiology (ACC): how useful are these websites for patient understanding? *Am Heart J Plus*. 2023;32:100308.

40. Cao W, Milks MW, Liu X, et al. mHealth interventions for self-management of hypertension: framework and systematic review on engagement, interactivity, and tailoring. *JMIR Mhealth Uhealth*. 2022;10:e29415.

41. Cross AJ, Elliott RA, Petrie K, et al. Interventions for improving medication-taking ability and adherence in older adults prescribed multiple medications. *Cochrane Database Syst Rev*. 2020;5:CD012419.

42. Palm P, Qvist I, Rasmussen TB, et al. Educational interventions to improve outcomes in patients with atrial fibrillation—a systematic review. *Int J Clin Pract*. 2020;74:e13629.

43. Masterson Creber R, Benda N, Dimagli A, et al. Using patient decision aids for cardiology care in diverse populations. *Curr Cardiol Rep*. 2023;25:1543-1553.

44. Chenel V, Mortenson WB, Guay M, et al. Cultural adaptation and validation of patient decision aids: a scoping review. *Patient Prefer Adherence*. 2018;12:321-332.

45. Doll JA, Jones WS, Lokhnygina Y, et al. PREPARED study: a study of shared decision-making for coronary artery disease. *Circ Cardiovasc Qual Outcomes*. 2019;12:e005244.

46. Anaya J, Moonsamy P, Sepucha KR, et al. Pilot study of a patient decision aid for valve choices in surgical aortic valve replacement. *Ann Thorac Surg*. 2019;108:730-736.

47. Korteland NM, Ahmed Y, Koolbergen DR, et al. Does the use of a decision aid improve decision making in prosthetic heart valve selection? a multicenter randomized trial. *Circ Cardiovasc Qual Outcomes*. 2017;10:e003178.

48. Kunneman M, Branda ME, Hargraves IG, et al. Assessment of shared decision-making for stroke

prevention in patients with atrial fibrillation: a randomized clinical trial. *JAMA Intern Med*. 2020;180:1215-1224.

49. Nguyen DD, Decker C, Pacheco CM, et al. Developing an individualized patient decision aid for chronic coronary disease based on the ISCHEMIA trial: a mixed-methods study. *Circ Cardiovasc Qual Outcomes*. 2024;17:e010923.

50. Wittman HO, Maki KG, Vaissan G, et al. Systematic development of patient decision aids: an update from the IPDAS Collaboration. *Med Decis Making*. 2021;41:736-754.

51. Holmes-Rovner M, Moumjid N, Llewellyn-Thomas H, et al. IPDAS 2005: Criteria for Judging the Quality of Patient Decision Aids. Accessed September 15, 2024. https://decisionaid.ohri.ca/IPDAS/ipdas_checklist.pdf

52. Zhang D, Zhou Y, Liu J, et al. Application of patient decision aids in treatment selection of cardiac surgery patients: a scoping review. *Heart Lung*. 2022;56:76-85.

53. Virani SS, Newby LK, Arnold SV, et al. 2023 AHA/ACC/ASPC/NLA/PCNA guideline for the management of patients with chronic coronary disease: a report of the American Heart Association/American College of Cardiology Joint Committee on Clinical Practice Guidelines. *J Am Coll Cardiol*. 2023;82:833-955.

54. Dennison Himmelfarb CR, Beckie TM, Allen LA, et al. Shared decision-making and cardiovascular health: a scientific statement from the American Heart Association. *Circulation*. 2023;148:912-931.

55. Perpetua EM, Palmer R, Le VT, et al. JACC: Advances expert panel perspective: shared decision-making in multidisciplinary team-based cardiovascular care. *JACC Adv*. 2024;3:100981.

56. Backman WD, Levine SA, Wenger NK, et al. Shared decision-making for older adults with cardiovascular disease. *Clin Cardiol*. 2020;43:196-204.

57. Rahimi K, Malhotra A, Banning AP, et al. Outcome selection and role of patient reported outcomes in contemporary cardiovascular trials: systematic review. *BMJ*. 2010;341:c5707.

58. U.S. Department of Health and Human Services, FDA. Guidance for industry: patient-reported outcome measures: use in medical product development to

support labeling claims. Accessed September 15, 2024. <https://www.fda.gov/regulatory-information/search-fda-guidance-documents/patient-reported-outcome-measures-use-medical-product-development-support-labeling-claims>

59. Mark DB. Assessing quality-of-life outcomes in cardiovascular clinical research. *Nat Rev Cardiol*. 2016;13:286-308.

60. Goldfarb MJ, Saylor MA, Bozkurt B, et al. Patient-centered adult cardiovascular care: a scientific statement from the American Heart Association. *Circulation*. 2024;149:e1176-e1188.

61. Masterson Creber R, Spadaccio C, Dimagli A, et al. Patient-reported outcomes in cardiovascular trials. *Can J Cardiol*. 2021;37:1340-1352.

62. Kornowski R. Patient-reported outcome measures in cardiovascular disease. *Eur Heart J Qual Care Clin Outcomes*. 2023;9:119-127.

63. Mokkink LB, Elsman EBM, Terwee CB. COSMIN guideline for systematic reviews of patient-reported outcome measures version 2.0. *Qual Life Res*. 2024;33:2929-2939.

64. Reading Turchioe M, Grossman LV, Myers AC, et al. Visual analogies, not graphs, increase patients' comprehension of changes in their health status. *J Am Med Inform Assoc*. 2020;27:677-689.

65. Patient-Centered Outcomes Research Institute. PCORI Methodology Standards. 2015. Accessed November 14, 2024. <https://www.pcori.org/research-related-projects/about-our-research/research-methodology/pcori-methodology-standards>

66. Spertus JA, Singh AT, Arnold SV. Future of patient-reported outcomes: bringing patients' voices into health care. *Circ Cardiovasc Qual Outcomes*. 2024;17:e010008.

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