

Current Controversies and Disparities in Cardiology

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The field of Cardiology, despite decades of research and refinement, remains riddled with controversies and disparities in standardization. These discrepancies not only complicate clinical decision-making but also have direct consequences for patient outcomes and the interpretation of diagnostic criteria. This article explores several major points of contention in contemporary cardiology, including the definition of normal QT interval length on electrocardiograms (ECGs), the clinical interpretation of peaked T waves, and, perhaps most critically, the continually shifting thresholds for what constitutes normal blood pressure according to leading guidelines.

QT Interval: Undefined Boundaries

The QT interval measured on an ECG, representing ventricular depolarization and repolarization time, is a foundational metric in cardiac electrophysiology. However, what constitutes a 'normal' QT interval is far from universally agreed upon. Decades ago, broadly accepted values defined normality, often cited as less than 440 ms in men and 460 ms in women. Yet, over time these standards have mutated, with institutions adopting varying upper thresholds and correction formulas (e.g., Bazett's, Fridericia's), each with their own limitations. Such inconsistencies can result in misdiagnosis of long QT syndrome or overlook risks of arrhythmias, given that

prolongation can be influenced by age, gender, heart rate, and even ethnic background.

Clinical practice further complicates this issue: some guidelines stress that a QTc above 500 ms is dangerous, yet sudden cardiac death has occurred at lower values, and certain populations normally exhibit longer durations. For drug trial safety, the FDA considers >500 ms or >60 ms increase from baseline as reason for concern, but many clinicians still rely on older cut-off values. This lack of universal consensus not only muddles clinical interpretation but may lead to unnecessary interventions or, conversely, underestimation of genuine risk.

Peaked T Waves: Between Myth and Modernity

Another enduring controversy surrounds the interpretation of peaked and narrow T waves observed on ECGs. Traditionally, such findings have been classically associated with hyperkalemia—an urgent electrolyte imbalance. Yet, accumulating evidence and clinical experience suggest these morphological changes are not exclusive to hyperkalemia and, in fact, can frequently signal acute myocardial infarction (AMI) in the absence of elevated potassium.

Classic teaching posits that tall, symmetrical, and sharply peaked

T waves (>10 mm in limb leads) are a “red flag” for hyperkalemia, prompting rapid laboratory assessment and management. However, studies have demonstrated that the ischemic myocardium during hyper acute phases of AMI can manifest similarly peaked T waves due to localized K⁺ displacement and altered repolarization. The result is frequent clinical confusion, potentially delaying targeted AMI treatment in favor of misstated electrolyte correction, or vice versa. The persistent dogma linking T wave morphology solely to electrolyte status exemplifies the need for more nuanced criteria and improved education regarding ECG interpretation.

Blood Pressure Thresholds: Shifting Goalposts

The definition of optimal blood pressure—a core parameter in cardiovascular risk management—has undergone substantial revision in recent years, fueling intense debate among both practitioners and researchers. In the not-too-distant past, reputable bodies such as the American College of Cardiology (ACC) and American Heart Association (AHA) considered a blood pressure of 140/90 mm Hg to be the upper limit of normal for adults, including those aged over 60. Even European societies recognized a degree of flexibility based on age, comorbidities, and functional status.

However, since the publication of the landmark SPRINT trial and subsequent reappraisal of risk associations, modern guidelines have become dramatically more stringent. The 2017 ACC/AHA guidelines now define normal as less than 120/80 mm Hg, with hypertension beginning at 130/80 mm Hg and above. Such a shift effectively classifies a significantly greater proportion of the population as hypertensive, particularly among the elderly, where prior targets were 140–150 mm Hg. These changes were not driven purely by consensus but by meta-analyses linking lower thresholds to reduced cardiovascular events. Nevertheless, critics argue that the methodology of such studies, potential overdiagnosis, and increased polypharmacy risk have not been fully accounted for.

European guidelines (ESC/ESH) have resisted the shift to lower values for older adults, acknowledging that excessively tight control may lead to orthostatic hypotension, falls, and diminished quality of life in the aging population. The enduring discord between American and European recommendations creates confusion for multinational practitioners and patients, demonstrating a crucial need for harmonized standards based on both evidence and individualized care.

Additional Disparities Across Specialty Lines

Beyond the above controversies, cardiology grapples with ongoing disagreements in other domains:

- **Heart Failure Diagnostics:** The preferred biomarker—BNP versus NT-proBNP—and diagnostic algorithms for heart failure vary widely. Some guidelines accept either marker, while others specify thresholds based on patient profile, kidney function, or comorbidities.
- **Coronary Artery Disease Evaluation:** The interpretation of fractional flow reserve (FFR), stress testing results, and the appropriateness of interventions are nonuniform. Competing societies endorse differing procedural or imaging modalities,

often influenced by local expertise or resource constraints.

- **Anticoagulation Regimens:** Recommendations for atrial fibrillation stroke prevention continually shift, with CHA₂DS₂-VASc and HAS-BLED scores deployed, sometimes contradictorily, leading to disparity in implementation between regions and populations.

Implications for Clinical Practice

The existence of divergent standards and interpretations has profound consequences:

- **Diagnostic Ambiguity:** Variable definition of normal ranges increases the likelihood of misdiagnosis, over-investigation, or missed pathology, impacting patient management and legal liability.
- **Training Variability:** Early-career cardiologists receive different guidance depending on region and institution, complicating standardized education and inter-center collaboration.
- **Therapeutic Uncertainty:** Shifting guidelines result in abrupt changes to pharmacologic, interventional, or lifestyle recommendations, affecting chronic disease management and adherence.

The Role of Emerging Evidence

Efforts to resolve controversy often rely on high-impact clinical trials and large-scale registry analyses. Yet even these are subject to selection bias, regional heterogeneity, and statistical limitations. The field increasingly recognizes the importance of individualized medicine, taking into account genetic predispositions, comorbidity profiles, and patient priorities. Artificial Intelligence (AI) applications may aid in reconciling varied datasets and providing real-time guidance based on a broader pool of inputs, but this solution is not without its own challenges related to interpretability and transparency.

Continued dialogue among international societies (such as AHA/ACC, ESC/ESH, and others), publication of joint position statements, and standardization of research protocols promise gradual convergence of consensus, but the process is inherently slow. Professional humility, interdisciplinary openness, and the prioritization of patient-centered outcomes are essential to ensure that cardiology evolves towards greater clarity and fewer disparities.

Conclusion

Controversies and disparities in cardiology—from ECG interpretation to blood pressure targets—represent a complex interplay of tradition, evolving evidence, and varied guidelines. The lack of universal standards complicates not only the daily work of clinicians but also impacts patient safety and resource allocation. Resolving these debates will require collaborative international efforts, transparent research practices, and an unwavering focus on individualized patient care. Until then, cardiologists must navigate this evolving landscape with critical thinking, ongoing education, and an appreciation for the uncertainties that define the specialty.