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Closing Gaps in Essential Chest Pain Care Through Accreditation

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Multiple investigations have shown that a well-designed strategy for managing acute chest pain in patients can result in shorter length of stay and improved resource utilization (1,2). Care in specialized chest pain units has been shown to achieve a better quality of life at lower cost, a rare occurrence in health care (2).

Unfortunately, clinicians face many potential barriers to the adoption of best practices, including self-efficacy, inertia of previous practice, and external barriers (3). Similarly, many organizations struggle with how best to organize clinical leadership, administrative support, diagnostic evaluation protocols, and system-based care. Despite large-scale

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efforts toward improving care, there are limited data quantifying the gaps between best and real-world practices in the United States and institutional variation in the adoption of optimal care strategies.

Chest Pain Center (CPC) accreditation, as offered by the American College of Cardiology (ACC), is designed to help facilities identify and then resolve real and perceived barriers for the care for patients with suspected ACS. Since 1998, more than 1,000 facilities have achieved CPC accreditation by embracing a team-based approach to patient care that involves relevant stakeholders and a focus on process improvement (4). Before accreditation, a facility conducts a comprehensive self-evaluation of care delivery for patients with suspected ACS. This gap analysis is a meticulous report of compliance with the essential components (ECs) mandatory for accreditation. The goal is to achieve 100% adoption of the processes outlined by the ECs. The purpose of this report is to describe the current state of care delivery at facilities before accreditation and demonstrate the potential magnitude of improvement resulting from the process of accreditation.

We used data from facilities achieving designation as a CPC from ACC Accreditation Services (previously the Society for Cardiovascular Patient Care) between 2014 and 2019. At the initiation of the accreditation process, all facilities conduct an audit of their baseline compliance with the ECs. Because achievement of all 244 ECs is mandatory for accreditation, the proportion of facilities with processes in place that meet the ECs is 100% at the end of the accreditation process. The authors, in consultation with the ACC Accreditation Management Board, selected 66 ECs for this analysis based on their alignment with the quadruple aim of high-quality health care: improved outcomes, improved patient experience, improved clinical experience, and lower cost (5).

To enable subgroup comparisons, facilities were categorized into the following groupings: 1) rural, suburban, or urban; 2) teaching/academic versus nonteaching/nonacademic; and 3) hospital size based on quartiles of reported total bed capacity. Data for each grouping were validated using information from the American Hospital Association and the ACC NCDR (National Cardiovascular Data Registry); teaching/academic status was determined by membership in the Council of Teaching Hospitals and/or affiliation with an accredited medical school. Some metrics apply only to facilities with 24-h percutaneous coronary intervention (PCI) capability because CPC accreditation is available with or without this service. Facilities were excluded if data on these characteristics were not available. Using the Bonferroni correction, alpha was defined as ≤0.00025 (0.05 of 198) to be statistically significant. This investigation does not constitute human subjects research; institutional review board approval was not necessary.

A total of 718 facilities achieved CPC accreditation during the sampling period; 657 (91.5%) had complete data and were included in the analysis. Compliance with ECs ranged from a low of 14.3% for a process to perform a follow-up stress test within 72 h to a high of 78.7% for external signage that communicates directional access to the emergency department (ED) (**Table 1**). Roughly equal proportions of the sample were academic (48.8%) and nonacademic (51.1%) facilities. Urban facilities comprised 69.5% of the sample. Among the 66 ECs evaluated, no significant differences were observed based on facility size, although performance on several ECs differed based on community and academic affiliation.

Urban facilities were more likely to collaborate with emergency medical services (EMS) on the accuracy of field ST-segment elevation myocardial infarction (STEMI) activations (rural: n = 19 [31.7%]; suburban:

ABBREVIATIONS AND ACRONYMS

ACC = American College of Cardiology

ACS = acute coronary syndrome

CPC = Chest Pain Center

EC = essential component

ECG = electrocardiogram

ED = emergency department

EMS = emergency medical services

PCI = percutaneous intervention

STEMI = ST-segment elevation myocardial infarction

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TABLE 1 Essential Component of Chest Pain Care and the Quadruple Aim (N = 659)

Essential Component	Concept	
Improved outcomes		
All new employees receive Early Heart Attack Care (EHAC) training	Early initiation of care	377 (57.3)
ED physicians have authority to activate the STEMI system	Early initiation of care	402 (61.1)
ED physicians have authority to initiate the reperfusion strategy	Early initiation of care	157 (23.9)
First ECG is performed, read, and documented within a goal time of 10 min	Early initiation of care	429 (65.2)
Collaboration with EMS to improve the accuracy of STEMI field activations	Systematic approach to ACS	340 (51.7)
Collaboration with EMS on 12-lead ECG field transmission	Systematic approach to ACS	402 (61.1)
Facility-specific STEMI plan reflecting ACC/AHA guidelines (24/7 PCI capable)	Systematic approach to ACS	263 (40.0)
Facility-specific STEMI plan reflecting ACC/AHA guidelines (non-24/7 PCI)	Systematic approach to ACS	90 (13.7)
Defined roles and responsibilities of team members involved in the STEMI process	Systematic approach to ACS	343 (52.1)
The catheterization laboratory team is activated using a single point of contact	Systematic approach to ACS	400 (60.8)
A process for early angiography for recurrent symptoms/ischemia	Systematic approach to ACS	245 (37.2)
Referral for cardiac rehabilitation or secondary prevention program	Comprehensive care	342 (52.0)
Discharge instructions outline dose and duration for:		
Aspirin	Comprehensive care	318 (48.3)
Antiplatelet treatment	Comprehensive care	285 (43.3)
Beta-blocker	Comprehensive care	336 (51.1)
Angiotensin blockade	Comprehensive care	332 (50.5)
Nitroglycerin	Comprehensive care	316 (48.0)
Statin	Comprehensive care	332 (50.5)
Improved patient experience		
Sex- and age-related differences in the symptoms of ACS	Reducing disparities	365 (55.5)
Internal signage communicates directional access to the ED	Facility navigation	475 (72.2)
External signage communicates directional access to the ED	Facility navigation	518 (78.7)
External signage is unobstructed and observable in low light	Facility navigation	511 (77.7)
Annual visual inspections of external and internal signage	Facility navigation	338 (51.4)
An external community health assessment	Community engagement	277 (42.1)
An internal community health assessment	Community engagement	259 (39.4)
Improved clinician experience		
Emergency physician champion	Physician engagement	362 (55.0)
Cardiology physician champion	Physician engagement	382 (58.1)
A documented relationship between the facility's staff and EMS medical director	Physician engagement	333 (50.6)
Input from internal and external front-line personnel	Multidisciplinary collaboration	279 (42.4)
Input from laboratory staff	Multidisciplinary collaboration	356 (54.1)
Designated onsite individual to act as liaison to EMS	Multidisciplinary collaboration	427 (64.9)
A process to provide comprehensive STEMI case-specific feedback to EMS	Multidisciplinary collaboration	399 (60.6)
Lower cost		
A definition of low-risk patients eligible for discharge without stress testing	Plans to minimize ED length of stay	220 (33.4)
A definition of low-risk patients eligible for outpatient stress testing	Plans to minimize ED length of stay	201 (30.5)
A definition of low-risk patients eligible for observation services	Plans to minimize ED length of stay	262 (39.8)
Process to schedule follow-up stress testing to be performed within 72 h	Process for outpatient stress testing	94 (14.3)
A clear statement of who is responsible for results of outpatient stress testing	Process for outpatient stress testing	201 (30.5)
Identify who can perform stress testing/cardiac imaging	Process for outpatient stress testing	419 (63.7)
Identify who can interpret stress tests/cardiac imaging results	Process for outpatient stress testing	418 (63.5)

Values are n (%).

ACC = American College of Cardiology; ACS = acute coronary syndrome; AHA = American Heart Association; ECG = electrocardiogram, ED = emergency department, EMS = emergency medical services, PCI = percutaneous coronary intervention, STEMI = ST-elevation myocardial infarction.

n = 48 [47.1%]; urban: n = 264 [57.5%]; p < 0.0001), to have a 10-min goal for presentation-to-ECG time (rural: n = 33 [55.0%]; suburban: n = 58 [56.9%]; urban: n = 317 [69.1%]; p = 0.012), and to have a single catheterization lab contact point (rural: n = 23 [38.3%]; suburban: n = 48 [47.1%]; urban: n = 324 [70.6%]; p < 0.0001) compared with suburban and rural facilities. Urban facilities were more likely to give ED clinicians STEMI activation authority (rural: n = 20 [33.3%]; suburban: n = 48 [47.1%]; urban: n = 307 [66.9%]; p < 0.0001) and less likely to give them reperfusion authority (rural: n = 20 [33.3%]; suburban: n = 29 [28.4%]; urban: n = 89 [19.4%]; p = 0.013). Academically affiliated

facilities were more likely to offer external (n = 159 [49.8%] vs. n = 117 [34.9%] for nonacademic; $p < 0.0001$) and internal (n = 154 [48.3%] vs. n = 104 [31.0%] for nonacademic; $p < 0.0001$) health assessments. Rural hospitals were substantially less likely to offer internal health screenings (n = 9 [15.0%] vs. n = 42 [41.2%] for suburban and n = 196 [42.7%] for urban; $p < 0.0001$). Rural facilities were less likely to have identified physician champions (n = 21 [35.0%] vs. n = 44 [43.1%] for suburban and n = 281 [61.2%] for urban for emergency medicine; $p < 0.0001$; n = 22 [36.7%] vs. n = 51 [50.0%] for suburban and n = 296 [64.5%] urban for cardiology; $p < 0.0001$).

Participation in an accreditation program mandates compliance with best practices to improve care processes and close gaps in ACS care that might otherwise leave patients and clinicians prone to worse outcomes at higher cost. By emphasizing how these improvements specifically align with the quadruple aim of improved outcomes, improved patient and clinician experiences, and lower cost, we show several examples of how the ACC's accreditation process helps facilities implement best practices that matter to stakeholders.

One example of a clinically important, but underachieved process, is prompt door-to-ECG time. Reducing delays in restoring coronary flow improves patient outcomes and expediting this initial step is critical (6). Accreditation as a CPC requires adoption of a prompt door-to-ECG process as a strategy to improve outcomes for patients. Another simple process often overlooked is adequate signage, which may seem trivial but is linked to patient dissatisfaction (7). At most institutions, signage is commonly the sole responsibility of nonclinician engineers who have other mission-critical obligations. We found that one-quarter of facilities seeking CPC accreditation had inadequate or poorly visible signage. The majority of ED patients present via their own private transport, and because delayed acute myocardial infarction care is directly associated with increased mortality, it is critical that an acutely ill patient can find his or her way to the ED (8).

Using a multidisciplinary approach to care is a growing standard for many service lines. The ACC encourages a "heart team" approach for cardiovascular care that has been shown to improve outcomes (9). Similar encouragement has been made for cooperation in the care of patients with cardiovascular issues in the ED setting. We found that the majority of facilities seeking CPC accreditation did not have active, regular collaboration with ancillary staff, first responders, or laboratory staff and did not identify an emergency medicine or cardiology physician champion for the care of patients with ACS.

Facilities could accomplish all the CPC accreditation ECs, such as reduced door-to-ECG times, improved signage, and a multidisciplinary approach to care on their own, but 2 important caveats should be noted. First, as our baseline data show, many facilities are far from achieving high compliance with the care processes associated with high-performance chest pain centers. Second, achieving all of the ECs is challenging and may not be feasible for a facility to accomplish on its own. Accreditation requires evidence of multidisciplinary engagement and encourages site surveyors to provide constructive feedback on evidence-based strategies to improve care during their facility inspection and review. Documentation of agreements, scheduled meetings and events, organizational structure and leadership charts, clinical protocols, care pathways, order sets, and other ECs are required for successful accreditation. Accreditation requires the implementation of processes to ensure that improvements are maintained and that process improvements continue past the date of accreditation. To accomplish this, many facilities appoint a full-time employee as the chest pain coordinator. Staff commitment is an indirect cost in addition to the cost of accreditation, typically approximately $20,000 for a 3-year cycle.

Several metrics were different based on the community of care with urban and suburban facilities outperforming rural facilities at baseline. Reasons for this are unclear and warrant further investigation. Rural facilities may be challenged by having fewer resources than larger urban facilities. This limitation may also bias against rural participation in CPC accreditation, which is a possibility in our sample, given the apparent over-representation by urban facilities. Several metrics were also better at baseline for academic compared to nonacademic facilities. As such, accreditation may serve as a mechanism to reduce gaps that might exist between academic and nonacademic or rural and nonrural facilities. Despite statistical distinctions among subgroups, it is important to note that significant gaps existed for nearly all ECs across the range of facilities, suggesting room for quality improvement initiatives throughout the spectrum of hospitals.

Our investigation is limited by lack of data to show that accreditation directly improves clinical outcomes. Accreditation ECs require best practice processes to be in place, but adherence by individuals

may not be 100%. Although having 244 ECs may seem onerous, the list is periodically reviewed to add and retire ECs based on advances in medical knowledge. Although prior studies have shown that accredited centers have superior compliance with guideline recommendations for the management of ACS compared to centers without CPC accreditation, we cannot determine if this difference is a result of the hospitals that self-select to participate or if the improvement is a direct effect of accreditation (10).

We found that before accreditation, many hospitals had gaps in care processes for patients with suspected ACS that aligned with the quadruple aim of high-quality health care. To achieve ACC CPC accreditation, such gaps and care process deficiencies must be addressed with 100% compliance. As such, ACC CPC accreditation may be an effective mechanism for improving processes of care for patients with suspected ACS.

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