

## VIEWPOINT

# The NCDR's Chest Pain Myocardial Infarction Registry



## 15 Years of Myocardial Infarction Quality Improvement

Michael C. Kontos, MD,<sup>a</sup> Sanjay Gandhi, MD,<sup>b</sup> Kirk N. Garrett, MD,<sup>c</sup> Leslie L. Davis, PhD,<sup>d</sup> Cornelia Anderson, MSN, CPHQ,<sup>e</sup> Tracy Y. Wang, MD, MHS, MSc,<sup>f,g</sup> Deepak L. Bhatt, MD, MPH<sup>h</sup>

**THE PAST.** The Acute Coronary Intervention and Outcomes Network (ACTION) Registry originated in 2007 from the merger of the National Registry of Myocardial Infarction registry and the Can Rapid Risk Stratification of Unstable Angina Patients Suppress Adverse Outcomes with Early Implementation of ACC/AHA Guidelines registry.<sup>1</sup> In 2016, the American College of Cardiology (ACC) merged with the Society of Cardiovascular Patient Care, an organization focused on accreditation of high-performing cardiovascular centers; that same year the Chest Pain Myocardial Infarction (CPMI) registry expanded internationally, now including nine hospitals in Canada, United Arab Emirates, Thailand, and Pakistan. In 2017, to reflect the inclusion of unstable angina and lower risk chest pain patients, the ACTION registry was renamed the (CPMI) registry.

**THE PRESENT.** The CPMI registry aligns with the ACC's mission to transform cardiovascular care and improve heart health and the ACC's goal to generate and deliver actionable knowledge to advance quality, equity, and value of cardiovascular care (Figure 1). The registry strives to achieve these by providing

timely data to participants to promote quality initiatives and adherence to guideline-based therapies. Provider-level dashboards offer clinicians ongoing feedback and support for quality improvement, volume tracking, and sustained credentialing (eg, Maintenance of Certification with the American Board of Internal Medicine). As of December 2021, 735 U.S. hospitals participate in the CPMI registry, with 2,298,817 patient records contributed by member hospitals since the registry's initiation.

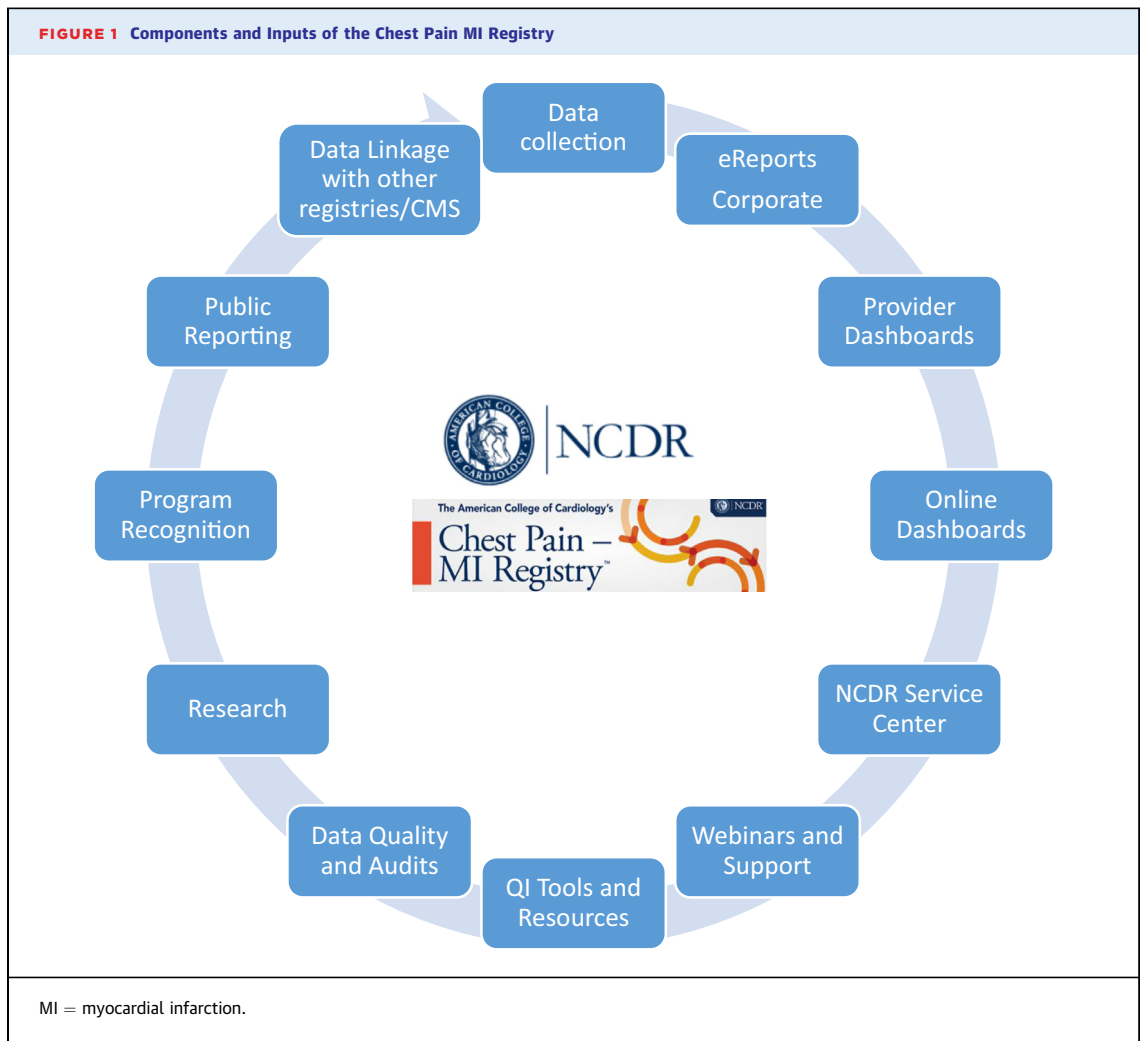
**RETURN ON INVESTMENT FOR REGISTRY PARTICIPATION.** The registry provides access to interactive dashboards for hospitals and clinicians that benchmark their performance against the 2017 ACC/AHA Clinical Performance and Quality Measures for acute myocardial infarction (AMI)<sup>2</sup> with the goal of improving quality of care and clinical outcomes. In addition, statewide dashboards available through the ACC state chapters can be used to augment statewide quality of care initiatives.

National Cardiovascular Data Registry (NCDR) supports participating hospitals by hosting an online learning center with resources including webinars, evidence-based tools, and monthly phone calls as well as sponsoring an annual quality summit for sharing best practices for performance and quality improvement. Participating hospitals and clinicians can take advantage of unique tools/offers that meet Quality Payment Program requirements to earn improvement activity credit within the Merit-Based Incentive Payment System operated by Centers for Medicare & Medicaid Services (CMS). Finally, the CPMI can be used as a data source to fulfill Chest Pain Center accreditation.<sup>3</sup>

**QUALITY METRICS.** Hospital performance and quality are quantified as individual performance metrics and composite measures, derived by calculating the

From the <sup>a</sup>Division of Cardiology, Virginia Commonwealth University, Richmond, Virginia, USA; <sup>b</sup>Division of Cardiology, Case Western Reserve University- MetroHealth Hospital, Cleveland, Ohio, USA; <sup>c</sup>Division of Cardiology, ChristianaCare, Newark, Delaware, USA; <sup>d</sup>School of Nursing, University of North Carolina at Chapel Hill, Chapel Hill, North Carolina, USA; <sup>e</sup>NCDR, Washington, District of Columbia, USA; <sup>f</sup>Duke Clinical Research Institute, Duke University School of Medicine, Durham, North Carolina, USA; <sup>g</sup>Division of Cardiology, Duke University Medical Center, Durham, North Carolina, USA; and the <sup>h</sup>Division of Cardiology, Mount Sinai Heart, Icahn School of Medicine at Mount Sinai, New York, New York, USA.

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proportion of eligible treatments a patient received after exclusion of patients with treatment contraindications. The defect-free care composite measure provides a single summary score of the proportion of patients who received all eligible process measures and is endorsed by the National Quality Foundation. Additionally, CPMI registry provides the hospital's 30-day risk standardized AMI mortality linked to the National Death Index. Quality metrics are updated periodically and reviewed yearly for appropriateness and changed based on current recommended performance measures.

High achieving hospitals receive performance awards based on the number of quarters of sustained performance and guideline adherence using composite and defect-free care measures. Such recognition is prized by hospital organizations as it highlights their commitment to quality care. In 2021, 404 hospitals received performance achievement awards. Hospitals demonstrating superior

performance in multiple NCDR registries are eligible for the *HeartCARE Center National Distinction of Excellence* award that has been earned by 40 hospitals.

**QUALITY METRICS AND PAYERS.** There has been a convergence of registry performance measures and metrics required by payers, government agencies, and professional organizations due to an increased focus on improved quality and reduced costs. Hospitals participating in the CPMI registry have demonstrated consistent improvements in performance metrics including important reductions in STEMI reperfusion times and the proportion of eligible ST elevation myocardial infarction patients who received reperfusion therapy.<sup>4</sup> Although reasons for improvement are likely multifactorial, regular CPMI feedback on performance, benchmarked to the performance of other systems, likely contributed to the improvements.

In alignment with ACC's mission of advancing equitable cardiovascular care, hospitals participating in CPMI have reduced care variation in multiple sociodemographic subgroups and minority populations; in hospitals with safety net status, those living in historically underserved areas, and those with Medicaid insurance coverage.<sup>5</sup> Participation in the CPMI registry has also been associated with lower readmission rates compared with nonregistry participating sites.<sup>6</sup>

#### **PUBLIC REPORTING OF HOSPITAL PERFORMANCE.**

In 2002, CMS implemented the *Hospital Compare* website, which provided the public with hospital-level outcome data for common conditions, including AMI and heart failure. Subsequently, the ACC initiated a program for voluntary, hospital-level public reporting for both the CathPCI and CPMI registries.<sup>7</sup> Eligible hospitals voluntarily agree to publicly report data of specific quality measures via the *Find Your Heart a Home* website, giving the public access to hospital performance data. Public reporting is recognized as a quality measure by many public hospital grading agencies (eg, U.S. News and World Report, Leapfrog, Healthgrades).

#### **QUALITY CAMPAIGNS/TOOLKITS ASSOCIATED WITH CPMI REGISTRY.**

Using the CPMI registry as the data source, ACC has initiated numerous quality initiatives that span the entirety of the acute care experience that have been used to generate and deliver actionable knowledge that successfully improved care. Examples include *D2B: Sustain the Gain*, a program associated with reducing D2B time for patients with STEMI; *MISSION:Lifeline*, in which data on process measures and outcomes from the ACTION registry were used to generate STEMI reports for driving system process and quality improvements at the local, regional, and statewide levels; and *Patient Navigator-Focus MI*, providing guidance and support for the implementation of transition of care strategies aimed at improving in-hospital and post-discharge outcomes for patients with AMI and heart failure.

**RESEARCH AND PUBLICATIONS.** CPMI databank represents a rich source of information available to clinical investigators to query various aspects of "real world" cardiovascular care. Studies of presenting characteristics, treatments, trends, and outcomes in the AMI population have resulted in >100 abstracts and >140 peer-reviewed manuscripts in high-impact journals (available at NCDR.com). While STEMI and ACS guidelines are based largely on the results of randomized controlled trials, not all clinical questions are well-suited to a randomized trial;

high-quality observational data provide complementary information and provide evidence to guide practice. Seminal ACTION/CPMI publications have led to or supported guidelines including demonstrating the benefit of prehospital electrocardiography in reducing D2B times<sup>8</sup> and demonstrating the relationship between door in/door out times and survival among patients transferred out of a non-PCI capable hospital<sup>9</sup> among others. In addition, data collected from CPMI were used for the collaborative ACC/AHA Mission:Lifeline program to answer questions related to STEMI and cardiac resuscitation systems of care, including prehospital data review, interfacility transfer, activation and hospital bypass protocols, and emergency department and cardiac catheterization laboratory activities. Almost 50 publications resulted from this initiative, which also supported the STEMI Systems Accelerator Projects.

## **THE FUTURE**

#### **CHALLENGES AND OPPORTUNITIES FOR THE CPMI REGISTRY.**

For NCDR and the CPMI registry to remain relevant in a value-based environment, the registry needs to be interactive, anticipatory, efficient, and should support population health management. This requires data to be meaningful and timely with information to impact quality outcomes. To do so, reports are generated quarterly, while site-specific data are updated weekly.

The CPMI registry is not a static instrument. Through optimization efforts, the registry has evolved due to changes in science, treatments, stakeholder needs, technology, and participant feedback. To balance administrative burden associated with data abstraction, the addition of metrics is balanced by removal of those that are no longer pertinent. This has led 3 major revisions of the case report form that reflect changes in performance measures and guidelines. In addition, in 2020, data collection was augmented to include COVID-19 specific information including biomarkers, treatment, and outcomes.

Further efforts to reduce costs associated with abstracting and submitting data include automating data abstraction from electronic health records (EHRs) into NCDR registries including artificial-intelligence-facilitated data abstraction.

EHRs are optimized for clinical care, billing, and insurance rather than clinical outcomes, and frequently lack data standardization, data validity, and quality control for systematic analyses registries remain critical. In contrast, registries provide more accurate and granular data. Importantly, the CPMI registry has a comprehensive mechanism for

ongoing training of abstractors and performs extensive audits conducted randomly at approximately 10% of sites annually. Accuracy is very high, typically exceeding 96%.

The breadth and robustness of analyses have increased by linking with other registries (eg, CathPCI registry) and/or with administrative data. Linkage to CMS provides complementary clinical information to administrative data sets around an acute care event thereby providing additional longitudinal outcomes, and costs beyond hospital discharge.

The Global STEMI Quality Improvement Initiative seeks to apply successful STEMI strategies to ACC chapters in other countries. This program leverages the CPMI registry for data collection to provide feedback for ongoing continuous quality improvements.<sup>10</sup> Finally, use of data from clinical registries to compare real-world populations with those from clinical trials can better inform applicability of newer treatments, or supplement postmarketing surveillance of new drugs or devices.

## CONCLUSIONS

The CPMI registry has evolved significantly over the last 15 years to reflect changes in clinical practice guidelines and updates in performance metrics. CPMI continues to provide data-driven tools to hospitals to improve care of patients with ACS and generate clinical knowledge and research that assist in improving care and outcomes. Further integration of CPMI with EHR and administrative data will provide opportunities for facilitating, measuring, and improving outcomes in patients with ACS.

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**ADDRESS FOR CORRESPONDENCE:** Dr Michael C. Kontos, Pauley Heart Center, Virginia Commonwealth University, PO Box 980051, Richmond, 23298-0051 Virginia, USA. E-mail: [michael.kontos@vcuhealth.org](mailto:michael.kontos@vcuhealth.org).

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