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## **Why report outcomes when process measures will suffice?**

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Evidence for between and within country variation in mortality from cardiovascular disease has made the measurement and reporting of quality of cardiac care and its outcomes increasingly relevant to clinical practice. The European Society of Cardiology has recognised the importance of this through a number of ventures including the EurObservational Research Programme and the European Atlas of Cardiology, each collecting information from member countries about processes and outcomes relating to cardiovascular disease and its treatment. In 1910, Dr Ernest Codman suggested that surgeons track and publish their patient's outcomes.<sup>1</sup> Nowadays, outcomes reporting has become central to the evaluation of clinical care across a number of healthcare systems. For example, the National Health Service of England and Wales transparently reports operator-level standardised mortality rates for percutaneous coronary intervention which includes all publically funded procedures performed by all operators. Yet, many argue that we should concentrate on the measurement of adherence to guideline-indicated care, 'the process' rather than mortality, 'the outcome'.<sup>2</sup>

There are several methods by which processes of care may be ascertained. Single measures of process focus on one specific aspect of care.<sup>3</sup> Composite measures combine several measures to create a single score. As such, they can pool indices representing structure (centre volume, hospital characteristics), processes (discharge medications prescribed at hospital discharge, attainment of reperfusion rates for STEMI) and outcomes (unadjusted survival rates, case-mix standardised mortality rates).<sup>4</sup> These parameters can be combined using a predetermined method, such as weighted opportunity-based scores, all or none

measures, budget allocation, benefit of the doubt or unobserved component models to create the final composite score.<sup>5-7</sup>

Composite scores are useful because they allow the collective evaluation of a range of performance indices.<sup>8</sup> This enables the immediate representation of overall quality rather than that of a finite clinical parameter. However, since data are summated, there is the potential for loss of information that would inform a quality improvement initiative.<sup>9</sup> Furthermore, when interpreting composite performance indicators, it is necessary to appreciate the methods used to calculate the score. An all or none approach, which, requires all components of an indicator to be fulfilled for the provider to score a point, identifies excellent practice. However, it is a harsh judging tool, since failing to meet any one of the measures results in zero points and therefore no attainment of the pre-specified standard. By reflecting the proportion of interventions that were received out of the number of opportunities there were to receive the interventions, opportunity-based methods allow greater flexibility in performance attainment across the set of indices.

In this issue of EHJ QCCO, Aliprandi-Costa and colleagues present the results of a retrospective study of 7,444 patients hospitalised with acute coronary syndrome enrolled in the CONCORDANCE registry between 2009 and 2015.<sup>10</sup> The authors developed a composite score derived from 14 guideline-indicated Clinical Process Indicators, aggregated using an equal weighting method, to evaluate the association between process measures and clinical outcomes. The recommendations given to these clinical indicators, by the European, American and Australian cardiology societies are shown in Table 1. The authors found that

hospitals in the best performing tertile of adherence for the clinical process indicators had the best outcomes, supporting the notion that adherence to guidelines leads to improved survival.<sup>11-14</sup>

In an attempt to unpick potential mediators for the significant inverse relationship between better care and reduced mortality, the authors studied how hospital facilities impacted on the quality of care provided. Those hospitals with the highest adherence to guideline-indicated care were statistically significantly more likely to be capable of percutaneous coronary intervention. Moreover, those hospitals with the poorest adherence more often recorded acute coronary syndrome ischaemic risk on admission and employed quality improvement co-ordinators, which is surprising as one would expect better adherence performance with these interventions. The authors conclude that it is possible that the noted differences in performance related, in part, to the structural differences between hospitals. Data from the United Kingdom heart attack register, the Myocardial Ischaemia National Audit Project (MINAP) also support this notion.<sup>15</sup> A study of 357,228 cases of non-ST-segment elevation myocardial infarction found wide between hospital variation in guideline-indicated care that remained after adjustment for case mix.<sup>15</sup> Another study found that half of the variation in the diffusion of primary percutaneous coronary intervention across England was due to hospital-level characteristics over and above that of case mix, hospital operator numbers and hospital mode of delivery of the service.<sup>16</sup> Even so, the study by Aliprandi-Costa and colleagues, found that structural differences did not fully explain all of the variation between hospitals. Those with higher adherence scores demonstrated higher rates of discharge medication prescription than those with lower

scores – suggesting that healthcare professionals’ behaviour is a key step in delivering optimal clinical outcomes.

Quality of care will only be improved by measuring and reporting performance. This permits the identification of variation, thus facilitating targeted strategies to improve care. It is here that composite measures have an important role to play. As the authors demonstrated; better clinical outcomes are associated with higher levels of adherence to a composite score of process measures for acute myocardial infarction care. Recently the European Society of Cardiology Acute Cardiovascular Care Association published a position paper defining a set of quality indicators for AMI care within Europe.<sup>7</sup> Included within this recommendation is an opportunity based composite score – clearly recognising the importance of such methods in reducing unwarranted variation in cardiovascular care.

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