Circulation: Cardiovascular Quality and Outcomes
Editors’ Picks
Most Important Articles Published in 2011

The Editors

The following articles are being highlighted as part of Circulation’s Topic Review series. This series summarizes the most important manuscripts, as selected by the editors, published in Circulation and the Circulation subspecialty journals. The studies included in this article represent the Editors’ Picks for each Circulation: Cardiovascular Quality and Outcomes’ issue published in 2011. (Circulation. 2012;126:e40-e44.)

Moving the Tipping Point: The Decision to Anticoagulate Patients With Atrial Fibrillation

Summary: The rate of stroke in patients with atrial fibrillation has declined over the past 2 decades. New and potentially safer anticoagulant medications are on the horizon. Thus, the balance between risk factors for stroke and benefit of anticoagulation may be shifting. Tools in use to predict stroke risk may overestimate this risk, and thus result in recommendations for blood thinning therapy for some patients who may not require such treatment. The CHADS2 score is one such tool. Using more recent estimates of stroke risk shifts the “tipping point,” such that anticoagulation is preferred at a higher CHADS2 score (ie, higher stroke risk), reducing the number of patients for whom anticoagulation is recommended. The introduction of “new, safer” agents, however, would shift the tipping point in the opposite direction.

Conclusions: Use of a more contemporary estimate of stroke risk shifts the “tipping point,” such that anticoagulation is preferred at a higher CHADS2 score, reducing the number of patients for whom anticoagulation is recommended. The introduction of “new, safer” agents, however, would shift the tipping point in the opposite direction.

Risk-Adjusted Percent Time in Therapeutic Range as a Quality Indicator for Outpatient Oral Anticoagulation: Results of the Veterans Affairs Study To Improve Anticoagulation (VARIA)

Summary: The safety and effectiveness of oral anticoagulation can be improved by better control, (ie, more time in therapeutic range [TTR]). Although oral anticoagulation is prescribed for millions of patients each year, there has been no organized approach to measuring or improving the quality of oral anticoagulation. We used clinic-level risk-adjusted TTR to profile the performance of 100 anticoagulation clinics in an integrated system of care (the Veterans Health Administration). We propose the use of risk-adjusted TTR as a quality indicator to measure and track the quality of oral anticoagulation in the Veterans Health Administration and other integrated health systems. Quality measurement in oral anticoagulation is a necessary prerequisite to quality improvement, which holds the promise of preventing adverse events due to inadequate or excessive anticoagulation.

Conclusion: Risk-adjusted TTR can be used to profile the quality of outpatient oral anticoagulation in a large, integrated health system. This measure can serve as the basis for quality measurement and quality improvement efforts.

Willingness To Pay To Eliminate the Risk of Restenosis Following Percutaneous Coronary Intervention: A Contingent Valuation

Summary: Restenosis occurs in ~15% of patients undergoing percutaneous coronary intervention (PCI) with bare-metal stents. In a previous contingent valuation study in the United States, patients presented with a 30% risk of restenosis following PCI were willing to pay median amounts of $273, $366, and $1162 for a 10%, 20%, and 30% reduction in the risk of restenosis, respectively. Our study shows that patients in a public healthcare system would be willing to pay a median amount of $2802 for a procedure that would eliminate the risk of restenosis following PCI. Our study also identified that before undergoing cardiac catheterization followed by ad hoc PCI, 90.7% of patients believed that PCI could prolong their life span, and 92.2% of patients believed that it could improve their quality of life.

Conclusion: The potential to eliminate the risk of restenosis, a benign complication, would have substantial value for patients undergoing PCI.

Extent of and Reasons for Nonuse of Implantable Cardioverter Defibrillator Devices in Clinical Practice Among Eligible Patients With Left Ventricular Systolic Dysfunction

Summary: The implantable cardioverter defibrillator (ICD) has been shown to be effective for both primary and secondary prevention of sudden cardiac death. Analyses of claims and registry data have found underuse and disparate use of ICDs in clinical practice. Through detailed medical record abstraction, we found that a majority of heart failure patients who were seemingly eligible for an ICD had a contradiction to the ICD or had refused the ICD. After accounting for true ICD eligibility, the rate of underuse was only 13%. Unlike previous analyses of claims or registry data, we found that after accounting for true ICD eligibility, there was no association between female sex or advanced age and lack of ICD use.
Anticoagulation Care

INR Values: A Quality Indicator for

Aspirin Therapy: A Proposal for Personalizing National Guidelines

Summary: Aspirin use reduces first heart attack and ischemic stroke by about 18% and 14%, respectively, but it also increases rates of intracerebral hemorrhage and gastrointestinal bleeding. Only ≈28% of American adults are in the high cardiovascular risk group for whom aspirin for primary prevention is likely to be highly beneficial. For most adult Americans, the potential benefit of aspirin is small, and treatment decisions should depend almost completely on personal preferences.

Conclusions: The benefits of aspirin therapy depend substantially on an individual’s risk of cardiovascular disease and adverse treatment effects. Understanding who benefits from aspirin use and how much can help clinicians and patients to develop a more patient-centered approach to preventive therapy.

Prompt Repeat Testing After Out-of-Range INR Values: A Quality Indicator for Anticoagulation Care

Summary: Episodes of excessive or insufficient anticoagulation increase the risks of bleeding and thromboembolism, respectively. There have been no previous studies regarding the ideal follow-up interval after a high (≥4) or low (≤1.5) International Normalized Ratio (INR) value. In the absence of empirical evidence, clinical guidelines make no specific recommendations regarding follow-up after an out-of-range INR value. In our study, the mean interval until the next INR test after a high or low INR varied widely among 100 sites of care in an integrated health care system (from 6–18 days after a high INR and from 10–24 days after a low INR). Sites with shorter mean follow-up intervals had better anticoagulation control. Risk-adjusted site mean percent time in range was approximately 1% lower for each additional day of the follow-up interval after either a high or low INR. Follow-up within 1 week after a high or low INR appears to be ideal, based on our results; this has the potential to serve both as a performance measure and as a putative standard of care.

Conclusions: Prompt repeat testing after out-of-range INR values is associated with better anticoagulation control at the site level and could be an important part of a quality improvement effort for oral anticoagulation.

Real-World Lessons From the Implementation of a Depression Screening Protocol in Acute Myocardial Infarction Patients: Implications for the American Heart Association Depression Screening Advisory

Summary: The American Heart Association published a scientific statement in 2008 to increase the awareness on depression in coronary heart disease, suggesting the use of a 2-step depression screening protocol using the 2-item Patient Health Questionnaire (PHQ), followed by the 9-item PHQ when screened positive, to facilitate the recognition of depression in routine clinical practice. Having adopted a similar routine screening protocol in an acute myocardial infarction setting and using parallel PHQ registry data in the same patients, this study demonstrates that 1 in 4 patients did not get screened; patients with the highest risk of depression—women and those with prior cardiac disease—were particularly missed. Relying on the full PHQ-9 instrument instead of the 2-step protocol may be more practical and render more reproducible and accurate screening results, as the agreement on a positive screen for depression was low for the PHQ-2, but better when relying on the full PHQ-9 instrument when comparing routine screening data and parallel registry data in the same acute myocardial infarction patients as a control. Depression remains widely recognized in acute myocardial infarction centers across the United States; although the institution that adopted the routine screening protocol had comparable overall depression recognition rates as compared with 23 centers that did not have a protocol in place, depression recognition rates in those who underwent the routine depression screening protocol were >90%. Feedback from nursing and clinical staff working with the 2-step depression screening protocol in routine clinical care conveyed a need for better support, continued education and feedback, and a simplified process supported by psychiatric or psychological staff.

Conclusions: In this early effort to implement a depression screening protocol, a large proportion of patients did not get screened, and only a modest impact on depression recognition rates was realized. Simplifying the protocol by using the PHQ-9 alone and providing more support and feedback may improve the rates of depression detection and treatment.
remains a top priority to improve ST-segment elevation–myocardial infarction (STEMI) care and patient outcomes. There are few data identifying factors that contribute to shorter door-in–door-out times among STEMI patients evaluated at non-PCI hospitals. Prehospital, emergency department, and hospital processes of care adopted as part of a statewide STEMI regionalization program were each independently associated with shorter door-in–door-out times for STEMI patients requiring transfer. Adoption of several emergency medical services care processes was associated with the largest absolute reduction in treatment times. Integrated, system-based approaches are promising strategies with which to improve region-alized STEMI care.

**Conclusions:** Prehospital, ED, and hospital processes of care were independently associated with shorter door-in–door-out times for STEMI patients requiring transfer. Adoption of several EMS processes was associated with the largest reduction in treatment times. These findings highlight the need for an integrated, system-based approach to improving STEMI care.10

**Identifying Patients Hospitalized With Heart Failure at Risk for Unfavorable Future Quality of Life**

**Summary:** Communicating expectations for the future to enable shared decision-making is desired by patients with heart failure and is endorsed by heart failure practice guidelines. Whereas multiple risk models exist for survival after heart failure hospitalization, no similar models exist that also estimate future quality of life, despite its importance to patients with symptomatic heart failure. Clinical characteristics available at the time of hospital discharge can help identify patients at high risk for persistently unfavorable health status or death over the next 6 months. Traditional predictors of death and hospital readmission (particularly natriuretic peptide levels) are less strongly associated with future health status; baseline health status is the strongest predictor of future health status. The model covariates identified here, identifying a risk of either low quality or short quantity of life, can target patients for whom aggressive treatment options (eg, devices or transplantation) and/or end-of-life discussions should be strongly considered before hospital discharge.

**Conclusions:** At the time of hospital discharge, readily available clinical characteristics are associated with heart failure patients at high risk for persistently unfavorable quality of life or death over the next 6 months. Such information can target patients for whom aggressive treatment options (eg, devices or transplantation) and/or end-of-life discussions should be strongly considered before hospital discharge.11

**Prevalence of Inadequate Blood Pressure Control Among Veterans After Acute Ischemic Stroke Hospitalization: A Retrospective Cohort**

**Summary:** Deficiencies in delivery of secondary preventative care have been noted after stroke; and reducing patients’ blood pressure after stroke has been demonstrated to improve risk for recurrent stroke. Treatment of hypertension should be instituted after the acute stroke period in patients who have consistently elevated blood pressure. Forty-three percent of patients with acute ischemic stroke had their last documented in-hospital blood pressure value as ≥140/90 mm Hg, and 33% remained uncontrolled by 6 months after hospitalization; the probability of being controlled remained significantly lower for patients with history of diabetes and/or hypertension. Only 15% of patients received the recommended antihyperten-sive combination of angiotensin-converting enzyme inhibitors/angiotensin receptor blockers and thiazide diuretics at the time of discharge. We propose that the quality of care for patients with cerebrovascular events could be beneficially affected through the systematic in-hospital initiation of secondary prevention strategies, thus enhancing guideline adherence and improving care among those at highest risk for a vascular event.

**Conclusions:** Blood pressure values in excess of national guidelines are common after stroke. Forty-three percent of patients were discharged with an elevated BP, and 33% remained uncontrolled by 6 months.12

**Influence of Frailty and Health Status on Outcomes in Patients With Coronary Disease Undergoing Percutaneous Revascularization**

**Summary:** Frailty, comorbidity, and quality of life are important variables that predict long-term outcomes in older adults. Current risk-prediction models do not routinely incorporate these measures in the risk assessment of the patients undergoing percutaneous coronary interventions. Adding frailty, comorbidity, and quality of life to the traditional cardiovascular risk factors significantly improves risk prediction of older patients undergoing percutaneous coronary interventions. About 40% patients were moved to the higher risk category with the addition of these variables.

**Conclusions:** After percutaneous coronary intervention, frailty, comorbidity and poor quality of life are prevalent and are associated with adverse long-term outcomes. Their inclusion improves the discriminatory ability of the Mayo Clinic risk score derived from the routine cardiovascular risk factors.13

**Are Quality Improvements in the Get With The Guidelines-Stroke Program Related to Better Care or Better Data Documentation?**

**Summary:** Quality improvement registry programs like GWTG often show increases in performance measure compliance over time, which is assumed to be an indicator of better patient care. Increases in compliance could be a result of changes in data documentation, leading to reductions in the amount of missing data and better documentation of eligibility criteria and treatment contraindications. Hospitals could improve performance by reducing the number of reported eligible subjects (ie, decreasing the measure denominator) rather than by improving care (ie, increasing the measure numerator). This analysis found that increases in stroke performance measures in the GWTG-Stroke program were associated with an increase in the proportion of eligible subjects treated (ie, increases in the measure numerator) and not changes in the documentation of missing data or contraindications. These findings suggest that the majority of the quality gains in the GWTG-Stroke program reflect an increase in the number of eligible patients with ischemic stroke being treated rather than changes to the underlying target population or in the documenta-tion of contraindications or missing data.

**Conclusions:** These findings suggest that the majority of performance improvement in the Get With The Guidelines-Stroke program represent an increase in the number of patients with stroke treated and not changes to the underlying target populations or documenta-tion of contraindications or missing data.14

**Accuracy and Prognostic Value of American Heart Association–Recommended Depression Screening in Patients With Coronary Heart Disease: Data From the Heart and Soul Study**

**Summary:** Major depressive disorder is present in approximately 20% of patients with coronary heart disease, and depressive symp-toms are associated with adverse cardiovascular outcomes, indepen-dent of traditional risk factors and disease severity. The American Heart Association has recommended a 2-step screening method for detecting depression in patients with coronary heart disease. This article found that the American Heart Association–recommended screening method has high specificity (91%) but poor sensitivity (54%) as compared with a gold standard interview for depression. This article also demonstrated that a positive American Heart
Association depression screen predicts adverse cardiovascular outcomes, regardless of the presence or absence of major depressive disorder.

Conclusions: Among outpatients with stable coronary heart disease, the AHA-recommended depression screening protocol is highly specific for depression and identifies patients at risk for adverse cardiovascular outcomes.15

Survival Benefit With Drug-Eluting Stents in Observational Studies: Fact or Artifact?

Summary: Both randomized trials and observational studies comparing drug-eluting stents (DESs) with bare metal stents (BMSs) have demonstrated substantial reductions in target lesion revascularization (TLR) with DES use. Data on mortality, however, are strikingly disparate, with only observational studies supporting a benefit with DESs. Standard risk-adjustment techniques, such as multivariable regression and propensity matching, account for measured confounders in observational data. Instrumental variable (IV) analysis is a quasi-experimental approach for observational studies that has the theoretical advantage of adjusting for both observed and unobserved confounders. Among unselected PCI patients in contemporary practice, DES use is associated with a consistent reduction in TLR regardless of risk-adjustment method. The degree of concordance in treatment effects for 1-year mortality, however, varied across alternative analytic techniques, with no significant association seen with IV analysis. Differences in risk estimates may be predominantly related to residual selection biases in nonrandomized studies.

Conclusions: Among unselected PCI patients in contemporary practice, DES use tended to be associated with a consistent reduction in TLR regardless of risk-adjustment method but showed discordant effects on mortality with conventional risk adjustment compared with instrumentable variable analysis. These findings underscore the limitations of standard risk-adjustment methods to adequately address treatment selection bias in nonrandomized studies and have important implications for comparative effectiveness research using observational data.16

Community Outreach and Cardiovascular Health (COACH) Trial: A Randomized, Controlled Trial of Nurse Practitioner/Community Health Worker Cardiovascular Disease Risk Reduction in Urban Community Health Centers

Summary: Despite well-publicized guidelines on the appropriate management of cardiovascular disease and type 2 diabetes, the implementation of risk-reducing practices remains poor, especially in high-risk vulnerable populations. Case management by a specially trained nurse-led team is one of the most efficacious strategies to improve cardiovascular disease risk factor management. An intervention delivered by a nurse practitioner/community health worker team using individualized treatment regimens based on treat-to-target algorithms improved cardiovascular disease risk factor status and perceptions of chronic illness care. The results of this trial support nurse-led patient-centered medical homes to improve the quality of cardiovascular disease care in high-risk underserved populations.

Conclusions: An intervention delivered by a Nurse/Practitioner/Community Health Worker team using individualized treatment regimens based on treat-to-target algorithms can be an effective approach to improve risk factor status and perceptions of chronic illness care in high-risk patients.17

Comparison of Composite Measure Methodologies for Rewarding Quality of Care: An Analysis From the American Heart Association’s Get With The Guidelines Program

Summary: Composite performance measures are used to aggregate multiple discrete metrics into a comprehensive assessment of quality of care. Although there are multiple approaches to aggregating measures of quality, little is known about the influence of different composite scoring methods on hospital rankings for the care of patients with acute myocardial infarction. The two principal methods—the opportunity-based score and the all-or-none approach—generate highly correlated scores for hospitals caring for patients with acute myocardial infarction. Although the all-or-none approach yields a greater dispersion in scores, it is similar to the opportunity-based method in ranking hospitals. Neither composite scoring method has a strong correlation with the outcomes of 30-day risk-standardized mortality or readmission.

Conclusions: The opportunity-based and all-or-none coronary artery disease composite indices are highly correlated and yield similar ranking of the top and bottom quintiles of hospitals. The two methods provide similarly modest correlations with 30-day mortality, but not readmission.18

References


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