

*The quality improvement initiative entailed a partnership between a national professional society and its guideline, the local Peer Review Organization, and a coalition of local employers, insurers, and health systems.*

EVIDENCE-BASED MEDICINE

# Taking the National Guideline for Care of Acute Myocardial Infarction to the Bedside: Developing the Guideline Applied in Practice (GAP) Initiative in Southeast Michigan

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**I**n 1981 the American College of Cardiology (ACC), in partnership with the American Heart Association (AHA), began developing clinical practice guidelines to assist in the diagnosis and management of patients with various cardiovascular

diseases. Today, 17 ACC/AHA practice guidelines are available to support optimal cardiovascular care. The Acute Myocardial Infarction (AMI) guideline was first published in 1996<sup>1</sup> and was updated in 1999.<sup>2</sup> Although a number of reports have found

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## Article-at-a-Glance

**Background:** The Guideline Applied in Practice (GAP) program was developed in 2000 to improve the quality of care by improving adherence to clinical practice guidelines. For the first GAP project, the American College of Cardiology (ACC) partnered with the Southeast Michigan Quality Forum Cardiovascular Subgroup and the Michigan Peer Review Organization (MPRO) to develop interventions that might facilitate the use of the ACC/AHA Acute Myocardial Infarction (AMI) guideline in the practice setting. Ten Michigan hospitals participated in implementing the project, which began in March 2000.

**Designing the project:** The project developed a multifaceted intervention aimed at key players in the care delivery triangle: the physician, nurse, and patient. Intervention components included a project kick-off presentation and dinner, creation and implementation of a customized tool kit, identification and assignment

of local nurse and physician opinion leaders, grand rounds site visits, and measurement before and after the intervention.

**Implementing the project:** The GAP project experience suggests that hospitals are enthusiastic about partnering with ACC to improve quality of care; partners can work together to develop a program for guideline implementation; rapid-cycle implementation is possible with the GAP model; guidelines and quality indicators for AMI are well accepted; and hospitals can adapt the national guideline for care into usable tools focused on physicians, nurses, and patients.

**Discussion:** Important structure and process changes—both of which are required for successful QI efforts—have been demonstrated in this project. Ultimately, the failure or success of this initiative will depend on an indication that the demonstrated improvement in the quality indicators is sustained over time.

that implementing practice guidelines leads to improvements in the quality of care delivered,<sup>3</sup> others have found a discouraging lack of guideline implementation and/or impact.<sup>4</sup> Despite considerable investment in the development and dissemination of guidelines, many studies suggest that a large proportion of eligible patients do not receive the cardiovascular care recommended. For instance, a pilot study from the Centers for Medicare & Medicaid Services (CMS; formerly known as the Health Care Financing Administration) Cooperative Cardiovas-

cular Project (CCP), which evaluated AMI care, reported that only 45% of ideal Medicare candidates received beta blockers at discharge, only 77% received aspirin at discharge, and smoking cessation counseling was documented only 27% of the time.<sup>5</sup> An investigation of physicians' prescribing practices reported that only 72% of patients eligible to receive thrombolytic therapy according to AMI guideline recommendations actually received it.<sup>6</sup> More recently, CMS reported continuing gaps between ideal goals of evidence-based therapy and practice in

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the treatment of elderly patients in several cardiovascular disease states.<sup>7</sup>

Thus, in 1999 the ACC, seeking to learn whether providing assistance with guideline implementation could reduce the gap between the care recommended in guidelines and that delivered in practice, launched the Guidelines Applied to Practice (GAP) project. The purpose of this initial GAP project was to investigate whether the quality of cardiovascular care delivered could be improved through partnerships with care providers and the creation and implementation of guideline tools and processes that facilitate evidence-based cardiovascular care.

The quality indicators used to measure the project's success were those used for CMS's current national AMI quality improvement (QI) project and for the Michigan Peer Review Organization's (MPRO's) measurement for each Michigan acute care hospital. Baseline and remeasurement chart abstraction were completed by a CMS-contracted clinical data abstraction center. The project quality indicators measure rates for key processes of care early in the treatment and also later in treatment, at discharge for ideal patients. Patients were determined to be ideal candidates for the specific therapy after criteria were applied to determine AMI confirmation and after cases that met any of the exclusion or contraindication criteria were excluded. The treatment and test indicators are shown in Table 1 (right).

In this article, we describe the QI effort conducted to implement a GAP project in terms of care provided to patients with AMI in ten hospitals in southeastern Michigan.

Table 1. Quality Indicators Measured in the Guideline Applied in Practice Initiative\*

Early Therapy in Acute MI
■ Aspirin within 24 hours
■ Beta blocker within 24 hours
■ ACE inhibitor within 24 hours <sup>†</sup>
■ LDL cholesterol measured within 24 hours <sup>†</sup>
■ Time to reperfusion in ST elevation MI
■ Median time to thrombolysis
■ Median time to PTCA
Discharge Therapy
■ Aspirin at discharge
■ Beta blocker at discharge
■ ACE inhibitor at discharge
■ Smoking cessation counseling
■ Cholesterol-lowering therapy at discharge <sup>†</sup>
■ Dietary counseling <sup>†</sup>

\* MI, myocardial infarction; ACE, angiotensin-converting enzyme; LDL, low-density lipid; PTCA, percutaneous transluminal coronary angioplasty. Only "ideal" patients were considered for each of the measures.

<sup>†</sup> Draft indicators (under development and review in the Centers for Medicare & Medicaid Services' Sixth Scope of Work).

## Designing the Project Creating the Infrastructure

A GAP steering committee composed of seven ACC members convened in October 1999 to determine the project's purpose, time line, clinical scope, site partner, interventions, and project design. The Southeast Michigan Heart Consortium was selected to be the initial site partner on the basis of its commitment to QI and excellence in practice. The consortium consisted of 32

*Health Care Quality Improvement Program, initiated by the Centers for Medicare & Medicaid Services, which has encouraged identification of quality improvement projects derived from analysis of patterns of care, and therefore it required no special funding on the part of this contractor. Ideas and contributions to the author concerning experience in engaging with issues presented are welcomed.*

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hospitals with a diverse patient population from which a representative sample could be drawn, and both QI efforts and data collection were ongoing via MPRO. As part of the GAP project, the ACC collaborated with MPRO and the Southeast Michigan Quality Forum for Cardiovascular Care (operating under the auspices of the Greater Detroit Area Health Council [GDAHCC]). Each partner brought a unique set of qualities to the partnership. ACC provided professional credibility and clinical expertise through its network of more than 27,000 cardiologists who are registered members. It also provided resources in the form of funding for all aspects of the project except data collection and employed one full-time employee [M.G.] and one part-time employee [M.J.O.], who were responsible for project management and oversight. MPRO brought QI expertise in the form of project managers [P.L.B., C.K.M.] and a data analyst [A.B.] who previously worked on AMI QI projects in all Michigan hospitals; an established network of QI projects; and experience in data collection, data analysis, and feedback. GDAHCC supplied industry and insurance company support and helped identify local physician and nurse leadership to develop templates for tool kit components and to work directly with hospitals and providers. CMS, through MPRO, provided data collection and analysis for the Medicare cases. Funding for non-Medicare data collection and analysis was obtained through an unrestricted grant from Pfizer, Inc (New York).

A project oversight team, which was responsible for the design, coordination, and implementation of the GAP project, was composed of persons representing each of the three partners—ACC, MPRO, and GDAHCC.

A core team, consisting of physician leaders from each of the six hospital systems participating in the Southeast Michigan Quality Forum and leaders from the forum and MPRO, was established to assist the project oversight team plan and implement the project in the region. The team had several responsibilities, including identifying other physician and nurse opinion leaders in southeastern Michigan, selecting hospitals to participate, creating templates for GAP tool kit components, and establishing clinically meaningful performance targets.

### Site Selection

In January 2000 ACC invited 32 hospitals involved in MPRO's Acute Myocardial Infarction Cooperative

Improvement Project to apply to participate in the GAP project. Invitation letters were sent to each hospital's chief executive officer (CEO), chief of cardiology, and the hospital contact for prior AMI quality initiatives with MPRO. The invitation was the first notice hospitals received about the project. The invitation explained the purpose of the project, presented the time line, and listed expectations of participating hospitals. A response form to be completed by hospitals wishing to participate was also included, and hospitals were asked to return the forms to the GAP project manager with four signatures (from the hospital CEO, chief of cardiology, physician leader, and nurse leader) within 10 working days.

The project oversight team and the core team participated in site selection in early February 2000; this entailed choosing a limited number of intervention sites from the list of respondents. The team had decided that individual hospitals would be selected (rather than four from one system, for example), that at least one hospital from each system represented in the Southeast Michigan Quality Forum would be chosen, and that the hospitals selected would represent a diverse hospital characteristic profile. To ensure a diverse group, the following characteristics were considered:

- hospital size (large, medium, or small, based on the number of patients with AMI who were cared for);
- hospital location (county in which hospital is located);
- teaching or nonteaching hospital type;
- diversity (percentage of total discharges identified as Caucasian);
- Disproportionate Share Hospital allotment dollars allocated to the hospital; and
- Ability for hospital to provide complete cardiac care, short of surgery.

Performance on baseline indicators was also considered, to ensure that the baseline results were not skewed to the low or high end of performance. The rates of baseline performance on the quality indicators were reviewed, and hospitals were categorized with a high, average, or low "collective" performance at baseline. The final ten hospitals selected consisted of four high, three average, and three low performers. Even those with a high performance at baseline had opportunity for improvement because none were at 100% before implementation. The hospital's current QI initiatives were not considered during selection.

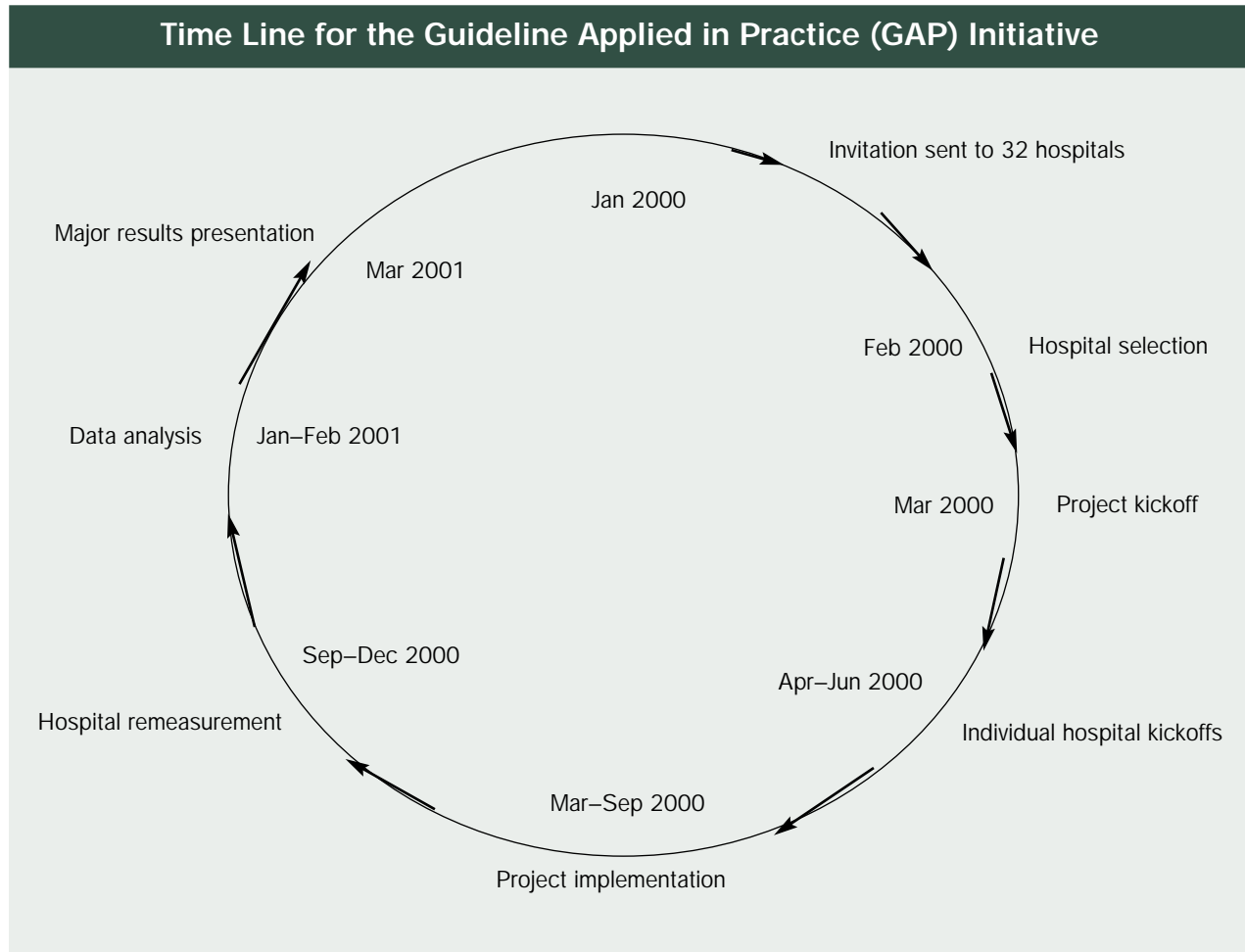


Figure 1. The GAP project adopted a rapid-cycle approach to quality improvement. The project was implemented in a single calendar year. Initial measurement occurred before the project, as part of the Centers for Medicare & Medicaid Services's Quality Improvement Program and again after the project, as part of its Sixth Scope of Work.

**The Intervention**

The GAP project was a multifaceted intervention that consisted of a project kick-off presentation, creation and implementation of a customized tool kit, identification and assignment of local physician and nurse opinion leaders, grand rounds site visits, and measurement before and after the intervention measurement. The project was also characterized by a rapid time line (Figure 1, above).

The Model for the Innovation-Decision Process, as described by Everett M. Rogers,<sup>8</sup> served as a conceptual model for the development of the GAP project interventions. This five-stage model of knowledge, persuasion, decision, implementation, and confirmation describes the stages, collaborators follow in adopting a desired practice change. Compo-

nents of Rogers's model are most obvious with a closer examination of the second phase of the innovation--decision process and persuasion. Rogers describes five perceived characteristics of an innovation that can affect the rate of diffusion and adoption of an innovation during the persuasion stage: the perceived relative advantage, compatibility, complexity, trialability, and observability of the innovation.

Relative advantage is the degree to which a change, such as the GAP initiative, is perceived as being better than current practice. The comprehensive nature of the GAP tool kit in addressing guideline application and measuring the indicators was perceived as an advantage over current practice. Furthermore, endorsement of the project and tool kit by the ACC and local and national opinion leaders, as well as

the opportunity to partner with local and national organizations, provided a certain social prestige.

According to Rogers, the perceived compatibility with values and beliefs affects the rate of adoption of an innovation. The GAP project goal was compatible with the values and beliefs of the care providers—to improve the application of the AHA/ACC guidelines. Physicians respect their professional organization and value the guidelines. In addition, the tool kit met health care provider needs by serving as a trigger of care and providing a system to support the care they value, which is especially helpful during busy medical care. Both aspects have a positive impact on the perceived compatibility of the GAP project.

Rogers explains complexity as the perception of ease or difficulty to understand and use an innovation. The project's tools fit very neatly into existing health care systems. Some providers were already using variations of these tools. However, the GAP tools were more comprehensive, consistent with professional guidelines, and designed to be user friendly for providers and patients.

Providing a tool kit that required only review and modification, not hours of design and redesign, met the third component of persuasion: trialability. Likewise, providing data abstraction and reports eased the burden on the hospital staff. This allowed for easy trialability of this project, further fostering ease of adoption.

Aspects of the GAP project were very visible to care providers, meeting Rogers's final persuasion component: observability. All project leads reported the enthusiasm and participation of physician champions, and cardiologists had a significant positive impact on project implementation. In addition, hospitals that used concurrent monitoring observed immediate positive results when the tools were used. The high-profile nature of this project—which entailed support from local and national opinion leaders for kickoffs, grand rounds, results presentations, and publications—made this project very visible. Rogers observed that the greatest response to change occurs when opinion leaders adopt the innovation, a mechanism utilized in the GAP project.

### Project Kickoff

The project kickoff, hosted by General Motors, was held in March 2000 in Detroit. The meeting was attended by 30 representatives from eight intervention

hospitals, Southeast Michigan Quality Forum physician and nurse opinion leaders, General Motors representatives, and the project oversight team. Several topics were discussed at the kick-off, including the project's purpose, the proposed tool kit, data collection procedures, hospital-specific project development, the role of physician and nurse opinion leaders, and hospital responsibilities.

### The Tool Kit

The GAP tool kit consists of seven critical pieces (Table 2, below). Tool kit templates created by core team members were based on the national AMI guideline and tools that had already been utilized successfully at several Southeastern Michigan hospitals.<sup>3</sup> The pocket guide (which includes a pocket card that is removable from the inside cover) was created by the ACC/AHA Task Force for the AMI guideline. Chart stickers were created by ACC project staff. The standard orders, pathway, pocket guide and card, and discharge form all serve as triggers to remind staff of the accepted treatments embedded in the guidelines. The orders and discharge form also allow for easier documentation that the therapy was considered and given or that the therapy was considered but contraindications exist for the patient.

Hospitals were given great flexibility in deciding which tool kit templates they would use and how they would be produced. Several options were made available, to promote the greatest acceptance of the tool kit by each hospital community:

- ACC templates could be used as is or could be customized to accommodate unique conditions at the institution;
- The ACC GAP project logo, created specifically for the project, could be used on ACC templates that were not substantially modified;

Table 2. Tool Kit Components and Their Target Audiences\*

Component	Target Audience
AMI standard orders	Physicians
Clinical pathway	Nurses
Pocket guide/pocket card	Physicians
Patient information form	Patients
Patient discharge form	Patients
Chart stickers	All clinical staff
Hospital performance charts	All clinical staff

\* AMI, acute myocardial infarction.

- Institution logos could be used on any tools;
- Hospitals could choose any color scheme for the tools; and
- Templates could be printed by the ACC.

Hospitals wishing to have electronic or carbon versions of the tools were encouraged to work within their systems to facilitate this process.

### Opinion Leaders

A number of physician and nurse opinion leaders from the Southeast Michigan Quality Forum were asked to serve as members of the GAP project intervention team. Each of the six hospital systems participating in the forum was encouraged to identify one or more physician and nurse leaders to provide assistance to other hospitals on QI principles, tool kit development and customization, and project implementation. Each opinion leader received an AMI resource guide developed by Qualidigm (Middletown, Conn), the Connecticut Quality Improvement Organization CMS. Each GAP hospital was assigned one physician and one nurse lead from outside its hospital system. Assignments were based on geographic proximity and personal preferences. Opinion leaders were not assigned to their own hospitals. Assignments were announced at the kick-off dinner, and physician–nurse teams were encouraged to introduce themselves to representatives from their assigned hospitals. The project grant provided financial compensation for time opinion leaders spent working in assigned hospitals.

### Hospital Kickoff

Grand rounds at each participating hospital were targeted for April and May 2000. All staff involved in the care of heart attack patients were encouraged to attend. During the grand rounds, which lasted 1 to 2 hours, the project co-investigators presented the project protocol along with the hospital's baseline performance on the quality indicators. In addition to their own data, hospitals were shown the state average and the GAP hospital aggregate score on the quality indicators. Hospital staff were given the option to participate in the presentation as much as they desired. The entire intervention tool kit to be used at the site was disseminated at the grand rounds, and ways to develop processes to incorporate it into practice were discussed. Hospitals were encouraged to review current processes of care, identify barriers to implement-

ing the tool kit, include interdisciplinary teams in the planning process, and, if appropriate, develop new processes of care. External opinion leaders were introduced and encouraged to meet with hospital project leads to plan subsequent meetings and dialogue.

Each hospital was given three posters that announced its participation in the GAP project and was encouraged to hang them in highly visible locations.

### Data Collection

To evaluate the QI of cardiovascular care delivered by using the GAP guideline tools, medical records data were abstracted from participating hospitals. MedQuest, public-domain software developed by Fu Associates (Arlington, Va) for CMS and CDC, was used to design a cooperative cardiovascular (CC3) module to collect health care process data for AMI patients who were discharged. To ensure that the chart review methodology was consistent across the hospitals, CMS contracted with a clinical data abstraction company (DynKePro; York, Penn) to perform training as well as accuracy and reliability assessments. The company conducted medical record abstraction, using the CC3 module to gather demographic, comorbidity, and QI data for this project (and for CMS's Health Care QI Program [HCQIP] among inpatient fee-for-service Medicare beneficiaries). The CC3 module was renamed *CCM* and modified to determine whether the tools for implementing the GAP project, including the standardized order set and the standardized discharge tool, were used in the care of a given patient.

### The Population

Data were collected for baseline and postintervention evaluation of the quality indicators. For the baseline data collection, patients with a principal discharge of an AMI (ICD-9-CM [*International Classification of Diseases, 9th Revision*] code 410.xx) between July 1, 1998, and June 30, 1999, were eligible for study inclusion. Patients admitted for further observation, evaluation, or treatment of an AMI who had received initial treatment but for whom the infarction was still less than 8 weeks old (ICD-9-CM code 410.x2) were excluded. Data were abstracted from two groups: patients with Medicare as their primary insurance (Medicare group) and patients not holding Medicare as their primary insurance (non-Medicare group). All AMI discharges from the 10 selected Michigan

hospitals were eligible for the Medicare group, regardless of beneficiary state of residence, beneficiary age, or type of beneficiary. Seven of the ten hospitals participated in the non-Medicare portion of the study, providing AMI cases unrestricted by non-Medicare insurance type or age. Cases discharged between September 1, 2000, and December 15, 2000, with the same inclusion criteria were eligible for remeasurement.

Table 3. Targeted Improvement Levels for Quality Indicators\*

Quality Indicator	Targeted Improvement Level
Aspirin within 24 hours	95%
Beta blocker within 24 hours	78%
Median time to thrombolysis	30 minutes
Median time to PTCA	60–120 minutes
Aspirin at discharge	95%
Beta blocker at discharge	87%
ACE inhibitor at discharge	78%
Smoking cessation counseling	75%

\* PTCA, percutaneous transluminal coronary angioplasty; ACE, angiotensin-converting enzyme.

### Sampling

The sample size was developed following determination of a target level of improvement by the project's physician leads for each quality indicator, as illustrated in Table 3 (above). GAP physician leads were asked to subjectively indicate what rate would show a meaningful improvement and at the same time be achievable. A sample of 1,000 cases was projected to provide 80% power to detect a 10% difference in a typical quality indicator.\*

Medicare baseline cases were identified from filed CMS beneficiary claims data, and remeasurement Medicare and non-Medicare patients were identified from individual hospitals.

The Medicare sample was drawn from a 20% random sample with a 5% oversample and a minimum of 40 cases per hospital; the non-Medicare sample was drawn from a 10% random sample with a 15% oversample and a minimum of 25 cases per hospital. From a universe of 2,588 Medicare and 1,872 non-Medicare cases, 550 Medicare and 264 non-Medicare medical records were requested, and 537 and 254 records were abstracted at baseline, respectively. All Medicare cases discharged from the hospital with a valid beneficiary claim during the remeasurement period were sampled. Fifty percent of non-Medicare cases were selected, using a 15% oversample and a minimum of 25 cases per hospital. During remeasurement, 780 Medicare and 316 non-Medicare charts were requested, and 771 and 313 charts were abstracted, respectively.

\* The actual sample of 814 patients at baseline fell somewhat short; a sample of 1,000 patients was obtained for remeasurement.

### Data Analysis

Data analysis was performed in a manner similar to the data analysis to CMS's current national AMI quality indicators. Abstracted data were analyzed to confirm the presence of an AMI based on elevated cardiac biomarkers and/or electrocardiogram analyses, and/or presence of chest pain within 48 hours of arrival; unconfirmed cases were excluded from quality indicator calculations. Specific exclusion criteria were applied to each quality indicator and included the admission or discharge disposition and contraindications to the intervention.

Each quality indicator baseline rate was compared with the remeasurement rate at the aggregate and individual hospital levels. A target level of improvement was determined by core team physician leaders for each quality indicator, as illustrated in Table 3. The aggregate statistical tests of significance were done by using a two-tailed binomial *z* test (*p* = 0.05) for proportions. Data analysis was performed by using the SAS version 8.0 statistical software package (SAS; Chicago).

### Project Implementation

Twenty-two hospitals responded positively to the invitation to apply to participate in GAP. Nine hospitals did not reply and one hospital closed. Ten hospitals were selected from the 22 applicants (Figure 2, p 13). Selected hospitals represent the range of hospitals in the region:

- Three are large volume (> 400 AMI Medicare discharges per year);
- Eight are teaching hospitals;
- Two are predominantly osteopathic; and
- Five serve a minority population greater than 10%.

Selected hospitals' previous performance on quality indicators ranged from low to high. Selected

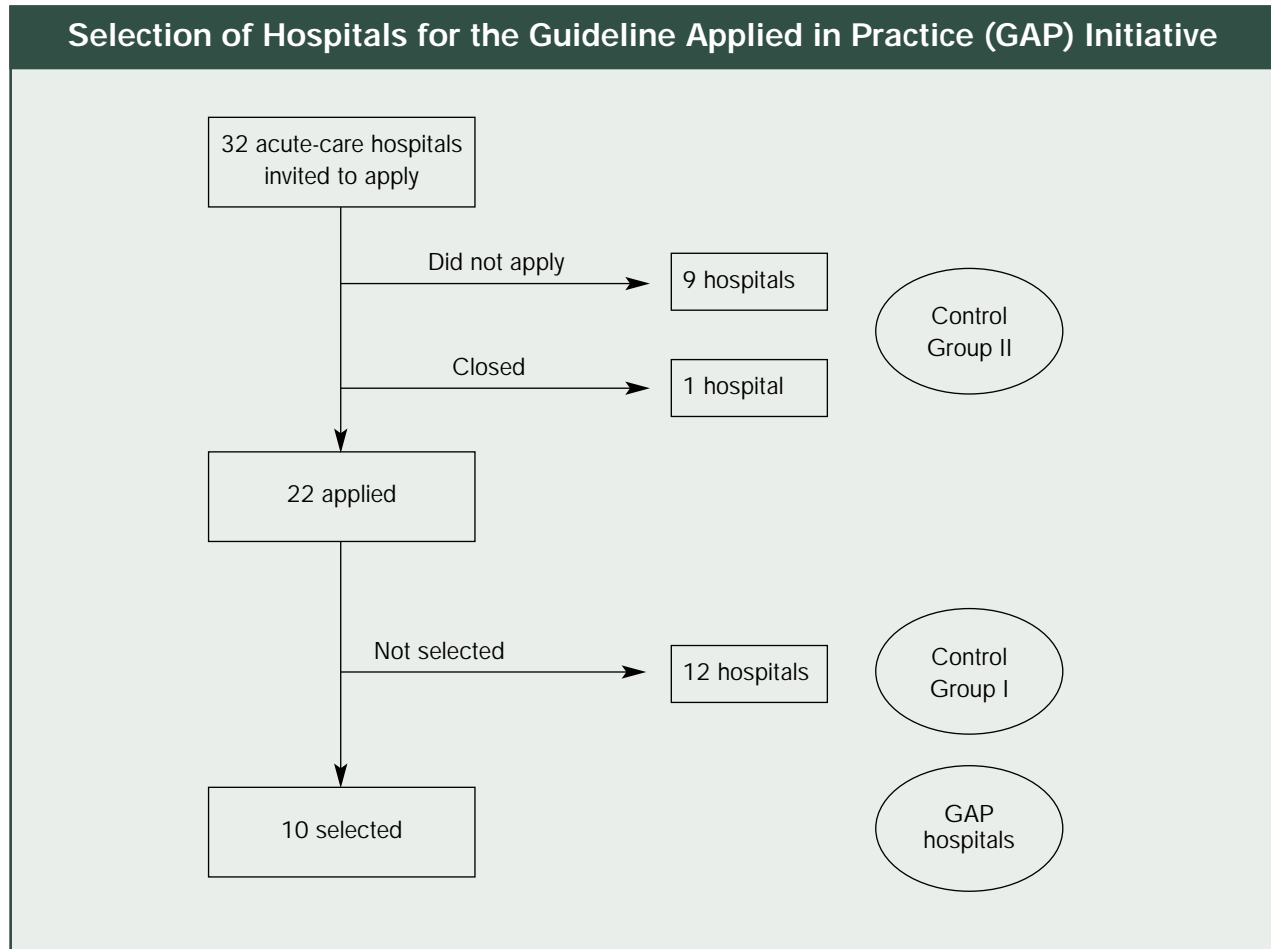


Figure 2. Of 32 hospitals invited to participate in GAP, 22 indicated interest and 10 were selected. Quality indicator adherence in acute myocardial infarction is being measured before and after the GAP initiative in 10 hospitals and, for Medicare patients, will be compared with before and after tests in two control groups of hospitals.

hospitals were expected to identify physician and nurse leads, as well as QI staff (“project leads”) to coordinate the project at their hospital. Of the hospitals not selected for participation, the majority were medium sized and teaching hospitals. Their performance at baseline measurement ranged from low (3 hospitals) to high (5 hospitals). Figure 2 demonstrates the selection of intervention sites and controls in place for measuring the project’s success following its completion.

#### Tool Kit Use

Although a majority of hospitals used almost the entire tool kit, there was wide variation in how the hospitals chose to customize the tools. The customization decisions made by hospitals fell into five categories:

- Use the GAP template;
- Use a hybrid of the GAP template and the hospital’s own;
- Modify an existing tool to reflect the ACC guideline;
- Use an existing tool in place prior to GAP; and
- Do not use the tool at all.

In every case but one, hospitals chose different options for each tool. Table 4 (p 14) lists how various hospitals adopted several of the tools. Tool kit use was assessed through a combination of self-reports from participating hospitals and reports from intervention team members. Hospital project leads were asked to share copies of the final versions of the tools being used at their hospital as part of the project.

ACC has approved a template for each of the tools used in the GAP project, which are available on

Table 4. Reported Adoption of Tool Kit Components\*

Tool Kit Component	How Tool Was Adopted
Standard orders	4 hospitals used orders already in place; 3 modified their own to reflect the GAP template; 1 used a hybrid of GAP and its own.
Clinical pathway	6 hospitals used clinical pathways already in place; 1 distributed the GAP template at the grand rounds but was not used as a documented tool; 1 hospital did not use a pathway.
Pocket guide and card	9 hospitals disseminated the pocket guides and cards; one hospital did not because of internal regulations regarding the use of the word <i>guideline</i> .
Patient information form	5 hospitals used a hybrid of the template and their own; 3 hospitals used their own patient education materials.
Patient discharge form	4 hospitals used discharge forms already in place; 2 modified their own forms to reflect the ACC template; 2 used a hybrid of the template and their own; 1 used the GAP template.
Chart stickers	Disseminated to project lead at 10 hospitals; were not used at any hospital.

\* GAP, Guideline Applied in Practice; ACC, American College of Cardiology. Not all hospitals submitted information about how the tools were adopted at their institutions.

the ACC web site, at [www.acc.org/home\\_links/ami\\_gap.htm](http://www.acc.org/home_links/ami_gap.htm). The templates are as follows:

- AMI standard orders;
- A clinical pathway;
- The ACC pocket guide and pocket card;
- A patient information form;
- A patient discharge document;
- The chart stickers; and
- Two hospital performance charts that were presented at grand rounds.

Several hospitals elected to implement the GAP project as a pilot to gain experience with GAP tools. This avoided a lengthy “forms committee” approval process and facilitated keeping up with the rapid timeline (see Figure 1). Six hospitals chose to use the GAP project logo on the patient information form and/or the patient discharge form. These tools were printed by the ACC and included the institution’s logo. Four hospitals asked the ACC to print the tools in specific colors. Pocket guides and cards were distributed at nine hospitals. One hospital did not allow for the dissemination of the pocket guide and card because of internal regulations regarding use of the word *guideline*. Chart stickers were disseminated to all ten hospitals. Decisions about what tools would be used and how they would be customized were typically made by interdisciplinary teams established within each hospital. Five hospitals used interdisciplinary teams. Hospitals that used interdisciplinary teams reported meeting

with their teams at least once before project implementation and at least once after implementation began. Three hospitals reported several formal meetings of their interdisciplinary teams. Implementation of the tool kit occurred between May and September 2000.

**Opinion Leader Activities**

Seven physicians and eight nurse opinion leaders, representing six hospital systems participating in the quality forum, volunteered to serve as members of the GAP project intervention team. Opinion leaders attended the kick-off dinner and grand rounds at their assigned hospitals, and, when possible, they participated in project meetings with their assigned hospitals, either by conference call or on-site visits. They were also able to provide consultation via e-mail. Opinion leaders had contact with their assigned hospitals during the planning, implementation, and follow-up phases of the project. As expected, most contact occurred during the planning phase, as hospitals examined their tool kits and current processes of care and developed new strategies for improvement. Opinion leaders reported an average of two contacts with their assigned hospitals.

ACC kept abreast of the project’s status at each hospital through observation forms provided to the opinion leaders and through e-mail queries to hospital project leads. Opinion leaders were asked to complete

the forms and return them to the ACC project manager after each hospital contact. The forms queried the type of assistance provided during the contact, the contact initiator, and what tools were in use. The GAP project manager sent e-mail queries to hospital project leads about the project planning and implementation status. Hospital project leads were particularly responsive to these electronic queries.

A brief questionnaire was distributed to opinion leaders during the implementation phase of the project to gather information about physician make-up within each GAP hospital, tool kit dissemination, project coordination, and data collection activity. Opinion leaders were requested to use the questionnaires during contacts with their assigned hospitals. The questionnaires were not intended to serve as a thorough evaluation tool to assess hospital activity but as a mechanism to collect additional information about project progress and as a means of facilitating communication between opinion leaders and their assigned hospitals.

### Hospital Kickoff Presentations

Eight grand rounds were held in April and May 2000. Because of scheduling conflicts, two grand rounds were held in early June. Grand rounds were held onsite at each hospital, and either breakfast or dinner was provided. Attendance varied considerably, with 12 being the lowest turnout and more than 70 the highest. The average turnout was approximately 30 people. Hospital-specific performance charts containing data from calendar year 1998 were presented at the grand rounds. Updated data (July 1, 1998–June 30, 1999) were made available to the hospitals at the beginning of September 2000. At six sites, hospital staff chose to participate in the presentation. Hospital project leads presented their hospital-specific customized tools and described how they were created. Some sites used the grand rounds as an opportunity to distribute to staff not only the GAP tool kit but additional educational materials, including diagnosis of AMI care stickers, key messages about AMI clinical guidelines, and educational packets.

### Outcomes Tracking By Hospitals

Each of the ten hospitals that participated in the GAP project monitored its own progress. Eight hospi-

tals conducted retrospective review of the key quality indicators. Two hospitals monitored the use of the GAP tool kit components. Initial results suggest that the project tools and strategies have been successful. The data demonstrate that there is improvement in all the indicators, some with statistical significance. The clinical findings have been reported at national conferences and are available at [www.acc.org](http://www.acc.org).

### Summary of Project Interventions

Table 5 (p 16) lists the activities in the ten hospitals and the resulting structural and process changes. Widespread tool adoption was seen, but with remarkable variability, as described. Several hospitals experienced important process changes. In particular, creation of active dialogue between specialists and generalists led to much wider adaptation of GAP goals and tools than had occurred before this process. At several institutions, a large percentage of AMI patients were cared for by generalists, but key quality initiatives were being directed exclusively by specialists. Breaking down this barrier was an important outgrowth of GAP. Another important change was the development of interdisciplinary teams consisting of cardiologists, cardiac care nurses, emergency department physicians and nurses, family practice physicians, pharmacists, and QI staff. In several hospitals, these teams were initially created to review the GAP tool kit and to review the processes by which the tool kit could be incorporated. Once the tools were implemented, some interdisciplinary teams continued to meet to discuss how to increase project awareness and maintain compliance in utilizing the tools. Other notable changes resulting from participation in the GAP project included broad dissemination of information within hospitals, identification of expectations for physicians and nurses, and identification of team leaders within each hospital.

### Barriers Faced During GAP Implementation

Participating hospitals reported several obstacles to project implementation, which entailed difficulties within the implementation team, obstacles during project implementation, and monitoring of the progress of the QI effort (“self-monitoring”).

*Difficulties within the implementation team.* As described earlier, each participating hospital was asked to establish a hospital implementation team consisting

**Table 5. Hospital Structural and Process Changes Resulting from Participation in the Guideline Applied in Practice (GAP) Initiative\***

<b>Hospital Activities</b>	<b>Results</b>
<p><b>Quality Improvement Activities</b></p> <ul style="list-style-type: none"> <li>■ More aggressive/extensive efforts to raise awareness of tools</li> <li>■ Broad dissemination of tool kit—all hospitals distributed tools to a wide audience: internal medicine, emergency department physicians and nurses, family physicians, pharmacy staff, and other hospital staff</li> <li>■ Development of additional tools to complement the GAP tool kit</li> <li>■ Review of processes, evidenced-based decision making, tool review to assess whether current processes are consistent with guideline</li> <li>■ Identification of gaps in care</li> <li>■ Expectations of physicians and nurses defined (eg, for ensuring that documents are in chart, reviewing patient information form with patient, completing discharge form)</li> <li>■ Identification of team leaders</li> <li>■ Alignment of clinical support</li> </ul>	<p><b>Structural Changes</b></p> <ul style="list-style-type: none"> <li>■ <i>Standard orders</i>: 4 hospitals used orders already in place; 3 modified their own to reflect GAP template; 1 used a hybrid of GAP and its own</li> <li>■ <i>Clinical pathway</i>: 6 hospitals used clinical pathways already in place; 1 distributed the GAP template at the grand rounds but did not use it as a documented tool; 1 hospital did not use a pathway</li> <li>■ <i>Patient information form</i>: 5 hospitals used a hybrid of the template and their own; 3 hospitals used their own patient education materials</li> <li>■ <i>Patient discharge form</i>: 4 hospitals used discharge forms already in place; 2 modified their own to reflect the GAP template; 2 used a hybrid of the template and their own; 1 used the GAP templates</li> <li>■ Online system “Dr GAP” created for automatic notification/designation of AMIs</li> <li>■ Interdisciplinary teams created to address issues that arise regarding the GAP project</li> <li>■ Full-time GAP coordinators established to monitor compliance.</li> <li>■ Continuous review to identify noncompliant physicians</li> </ul> <p><b>Process Changes</b></p> <ul style="list-style-type: none"> <li>■ Increase in rate of aspirin prescribed within 24 hours of arrival to hospital</li> <li>■ Increase in rate of beta blockers prescribed within 24 hours of arrival to hospital</li> <li>■ Increase in rate of aspirin prescribed at discharge</li> <li>■ Increase in rate of beta blockers prescribed at discharge</li> <li>■ Increase in rate of ACE inhibitors prescribed at discharge</li> <li>■ Increase in rate of smoking cessation counseling</li> <li>■ Decrease in rate of median time to thrombolysis</li> <li>■ Decrease in rate of median time to PTCA</li> </ul>
<p><small>* AMI, acute myocardial infarction; ACE, angiotensin-converting enzyme; PTCA, percutaneous transluminal coronary angioplasty.</small></p>	

of a physician champion, a project lead, and the current MPRO project contact lead. The implementation teams at most hospitals were supplemented by interdisciplinary groups of colleagues. Two hospitals reported setbacks in implementation because of the loss of key team members at the start of implementation. One hospital also reported territorial issues (for example, misunderstandings between specialists and

generalists) as a barrier to implementation. The hospitals dealt with these challenges by leaning on other team members to fulfill the roles that were lost.

A second barrier to implementation was resistance to consultation from external opinion leaders. Some project leads delayed returning phone calls, refused to schedule meetings with the opinion leaders assigned to their hospital, and were slow to respond to

questionnaires from their GAP project manager. This barrier was overcome through persistent efforts at communication by the GAP project managers.

**Obstacles during implementation.** Competing priorities made project implementation a challenge for all hospitals. Because the GAP project was not the most pressing priority at all hospitals, some hospitals delayed implementing the GAP project and/or did not monitor its implementation to ensure success. In addition, resources for monitoring implementation were lost to competing priorities in two hospitals.

Hospitals reported using two tactics to manage their competing priorities: First, the various cardiovascular priorities were integrated into the GAP project time line, and second, the standing orders and discharge documents for heart failure were rolled out at the same time as the GAP initiative. Coordinating the time lines and disseminating the tools increased efficiency and captured staffs' attention.

Some hospitals reported staff resistance to using components of the tool kit. Resistance came from all disciplines—internists, emergency department physicians, family practice physicians, and cardiologists. Nursing staff were resistant to using the discharge document at two hospitals. Identifying the source of resistance proved to be important to designing strategies to overcome this barrier.

**Barriers to self-monitoring.** A great deal was learned about the differences between the self-monitoring data and the abstracted data. Most often, the abstracted data showed lower rates of compliance with the recommended tools, except for the ideal patients, when rates were often higher.

Given that each source of data has its own “data and variable definitions and rules,” both sources can be considered accurate. The abstracted data have the advantage of providing enough information to objectively identify the ideal patients and provide very consistent measurements between hospitals. The self-monitoring data have the advantages of “local knowledge” of charts, documentation “rules,” and on-site and timely clarifications. They also offer an accurate picture of care as it occurs within the hospital.

## Discussion

Several important conclusions can be made based on our experience with the GAP project to date. First, the

enthusiasm of hospitals to partner with ACC (and its national guideline effort), the Southeast Michigan Quality Forum, and MPRO, was remarkable. Fully 22 (two-thirds) of the 32 hospitals contacted were ready to commit the energy and resources necessary to carry out this project, which likely reflects the respect of the invited hospitals for the ACC, the previously effective partnerships for quality enjoyed with MPRO, and the interest and investment of major southeastern Michigan employers and payers in QI.

Second, the project leadership team and participating hospitals were able to adapt the national guideline for care into usable tools focused on patients, physicians, and nurses. This success is related to several factors. Many of the hospitals already had used or considered using specific pieces of the tool kit, such as clinical pathways and standardized orders. Review of hospitals' previous improvement projects indicated that they did not always result in an improvement in quality indicator data, which suggested that GAP's contributed added value in that it was comprehensive.

The GAP project involved ensuring that the existing tools matched the guideline recommendations and adoption of additional tools such as those directed at patients. Importantly, the flexibility to create tools that matched the hospitals' style or to use either the ACC GAP logo and/or the hospital logo were helpful in gaining buy-in and endorsement in each location. Also, the previous successful application of several of the tools and processes locally gave added confidence that the effort would succeed.<sup>9</sup>

Important changes in structure and process—both of which are required for successful QI efforts—have been demonstrated in this project. Eight of the ten hospitals created their own mechanisms to track compliance with the key indicators, and two of the hospitals also were tracking patients' use of the tools. Perhaps the most notable changes involved creation of connections between specialists and generalists, creation of interdisciplinary and interdepartmental teams, and clear delineation of treatment goals and internal physician/nurse leadership.

One hospital reported difficulty in improving its performance through a previous effort, which focused on improving rates for administration of beta blockers at discharge through the use of a discharge form. Staff reported that the effort failed because of staff resistance to use of a new discharge form. However, the

resistance was not apparent with the implementation of the GAP discharge document, which may reflect discussions with the opinion leaders, the ACC endorsement of the tool, and the fact the GAP was a high-profile project in the region.

Another hospital used an interdisciplinary GAP process committee to oversee project implementation, which proved invaluable when its physician champion had to withdraw from the project because of illness. The team continued to move the project forward, meeting with emergency department staff, general unit nursing managers, and new resident physicians, and creating and distributing newsletters to the cardiology, internal medicine, family practice, and emergency practice physicians; critical care unit and emergency department nurses; and cardiology advance practice nurses. Distribution of the pocket guide and card and use of the posters and stickers proved to be a good tool with which to teach and remind the staff about the project.

Ultimately, this initiative's failure or success will depend on an indication that any demonstrated

improvement in the quality indicators is sustained over time. Because it has partnered with MPRO and CMS's Sixth Scope of Work, the project will have the capability to compare improvements in GAP hospitals with those that expressed interest in GAP (see Figure 2) and those that did not. These comparisons will be available and useful for Medicare beneficiaries. If the final results show favorable effects, remeasurement at a later time will be important in assessing effects on long-term QI.

In conclusion, the creation of a partnership between a national professional society and its guideline, the local PRO, and a coalition of local employers, insurers, and health systems has yielded favorable structure, process, and outcomes tracking effects in AMI care in southeastern Michigan. The targeting of the national guideline at patients, physicians, and nurses by using local opinion leaders and allowing a local flexibility in tool development has also been effective. This "three triangles" approach (Figure 3, below) offers the possibility of success for quality initiatives focused on other problems in other settings. **J**

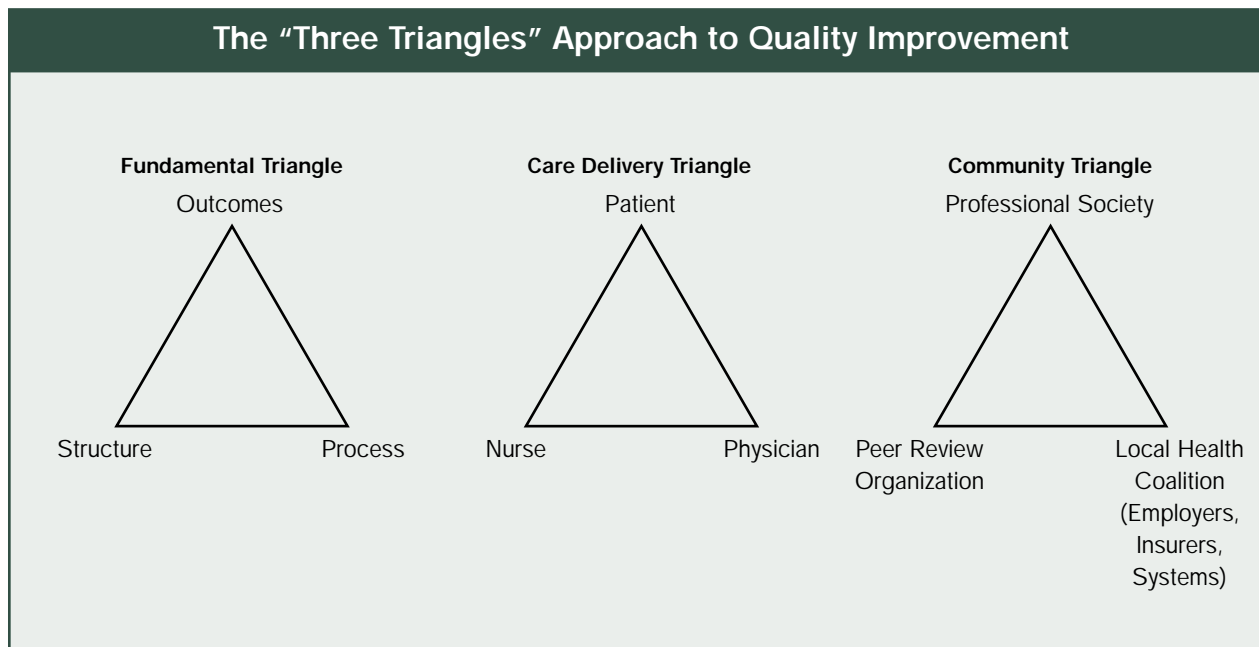


Figure 3. The successful development of the Guideline Applied in Practice (GAP) Initiative in Southeastern Michigan builds on the foundations of traditional quality improvement (Fundamental triangle, based on Donabedian's classic quality improvement paradigm, as adapted from Donabedian A: The Definition of Quality and Approaches to Its Assessment Vol 1. Ann Arbor, MI: Health Administration Press, 1980); community partnerships of the American College of Cardiology; the Michigan Peer Review Organization, and the local health coalition; and a care delivery partnership whereby the patient, nurse, and physician share common knowledge and goals for acute myocardial infarction care.

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