

An Organizational Framework for the AMI ACC-GAP™ Project

Cecelia K. Montoye, RN, MSN, CPHQ,* Kim A. Eagle, MD, FACC,†
on behalf of the Michigan ACC-GAP™ Investigators,
ACC-GAP™ Steering Committee, and the American College of Cardiology

Ann Arbor, Michigan

1.0. INTRODUCTION

Much has been learned about the best practices relative to guidelines applied consistently at the bedside in the three American College of Cardiology Acute Myocardial Infarction Guidelines Applied in Practice (ACC AMI-GAP) demonstration projects. The results and knowledge gleaned from these projects have been widely shared at national conferences (1–6) and in peer-reviewed journals (7–10), and have diffused into local practices. In differentiating between the spread of good practice through diffusion or dissemination, Sarah W. Fraser defines diffusion as a passive activity whereas dissemination is a more planned and controlled active process (11). Many local hospitals may have implemented the ACC AMI-GAP tool kit either through diffusion or dissemination, with success dependent on the resistance met and the ability to recognize and overcome barriers to success. Presented here is an organizational framework for spreading the successful practices learned from the AMI-GAP quality improvement (QI) demonstration project through dissemination, or a planned controlled activity that will support successful project implementation. These recommendations are based on the three ACC AMI-GAP projects and what was learned about the impact of using standardized tools and how to successfully implement an inpatient QI project, and the impact of creating a standardized care system for AMI.

Suggested reading:

1. Eagle KA, Gallogly M, Mehta RH, et al. Taking the national guideline for care of acute myocardial infarction to the bedside: developing the Guidelines Applied in Practice (GAP) initiative in southeast Michigan. *Jt Comm J Qual Improv* 2002;28:5–19.
2. Mehta RH, Montoye CK, Gallogly M, et al. Improving the quality of care for acute myocardial infarction: the Guidelines Applied in Practice (GAP) initiative. *JAMA* 2002;287:1269–76.
3. Mehta RH, Montoye CK, Faul J, et al. Enhancing quality of care for acute myocardial infarction: shifting the focus of improvement from key indicators to process of care and tool use: American College of Cardiology AMI GAP project in Michigan: Flint and Saginaw expansion. *J Am Coll Cardiol* 2004;43:2166–73.

4. Montoye CK, Mehta RH, Baker PL, et al. A rapid-cycle collaborative model to promote guidelines for acute myocardial infarction. *Jt Comm J Qual Saf* 2003;29:468–78.
5. Fraser SW. *Accelerating the Spread of Good Practice: A Toolkit for Health Care*. United Kingdom: Kingsham Press, 2002:3–13.

2.0. ACC AMI-GAP QI MODEL

The QI model for the ACC AMI-GAP projects has evolved from all three projects. The first project (pilot) recruited volunteer hospitals and required physician champions and project leaders at each hospital to lead the projects. Hospitals were provided data feedback to stimulate QI activities and the ACC AMI tool kit, which was to be modified and implemented in their processes of care. The pilot project also made available external physician/nurse teams to provide one-on-one QI support and guidance. The external team members were clinicians from the southeast Michigan community. The second project (Flint-Saginaw expansion) provided one-on-one QI support via a consistent external team with physician/nurse members from the project leadership group. Project leaders were also brought together for several learning and sharing meetings at critical phases in the project—monitoring tool use, remeasurement, and results phases.

Incorporating successes and lessons learned from the GAP pilot project (8,9) and the Flint-Saginaw Expansion GAP project (10), the third project, entitled the Southeast Michigan Expansion GAP project, was launched in the Fall of 2002. Like the first two GAP projects, this project aimed to improve the care of patients with AMI through implementation of the ACC AMI tool kit and a concentrated QI intervention led by local cardiology physician champions and hospital project leaders. The level of support provided to hospital teams was intensified through implementation of the ACC AMI-GAP collaborative model, which was based on the lessons learned from the previous GAP projects (10). The GAP collaborative model was modeled after that of the Institute for Healthcare Improvement (IHI) breakthrough series model (BTS) (12) with several important distinctions. In both models, teams from multiple organizations come together to work on a common problem. In the IHI model, the teams work at their own pace, sharing successes and lessons learned at learning sessions held periodically throughout the time span of the collaborative. The ACC

From the *St Joseph's Mercy Hospital, Ann Arbor, Michigan; and the †University of Michigan Cardiovascular Center, Ann Arbor, Michigan.

Abbreviations and Acronyms

ACC AMI-GAP	= American College of Cardiology Acute Myocardial Infarction Guidelines Applied in Practice
ACS	= acute coronary syndrome
AHA	= American Heart Association
AMI	= acute myocardial infarction
BTS	= breakthrough series model
CQI	= collaborative quality improvement
IHI	= Institute for Healthcare Improvement
JCAHO	= Joint Commission on Accreditation of Healthcare Organizations
PCI	= percutaneous coronary intervention
PDSA	= plan-do-study-act
QI	= quality improvement

AMI-GAP collaborative model is a research model imbedded in a QI model, in that all hospital teams are working within the same time frame for baseline measurement, intervention implementation, and remeasurement. Furthermore, the ACC AMI-GAP collaborative model is a collaborative rapid-cycle model that focuses on successful project implementation through five distinct QI phases: planning, tool implementation, monitoring tool use, remeasurement, and results (Fig. 1).

These phases were designed to support successful project implementation and to focus hospital QI activities on the use of the evidence-based AMI care tools. Successful tool use is critical because, as demonstrated in previous projects, when the AMI specific tools are used (Fig. 2), rates for quality of care measures are high (8,9), and there is a corresponding improvement in 30-day and 1-year outcomes (Tables 1, 2, and 3) (13). Physician champions and project leaders subsequently coordinated multidisciplinary teams to plan their respective hospital's activities. The multidisciplinary teams developed a systematic process for implementation of their project, including an introductory kickoff of grand rounds at each hospital. Five project leader learning sessions that corresponded with the phases of project implementation were conducted to:

- Review goals of the current phase
- Identify barriers
- Share successes and lessons learned and
- Collectively develop strategies to overcome barriers and to support progress

Monitoring the successful implementation of each project phase and, more importantly, monitoring and increasing the rate of tool use, was a critical component of the collaborative model and a major focus of each learning session. Described here are components of each phase, discussion of how to implement each phase, and measures of successful implementation of each phase. This document reviews the five phases of project implementation that were the focus of the third GAP project (Appendix A). Although these recommendations can be applied to any clinical topic, for both inpatient and outpatient setting QI projects, the examples given here are based on our experiences with the AMI-GAP projects.

Suggested reading:

1. Montoye CK, Mehta RH, Baker PL, et al. A rapid-cycle collaborative model to promote guidelines for acute myocardial infarction. *Jt Comm J Qual Saf* 2003; 29:468-78.
2. Eagle KA, Montoye CK, Riba AL, et al. Guideline-based standardized care is associated with substantially lower mortality in Medicare patients with acute myocardial infarction. *J Am Coll Cardiol* 2005;46:1242-8.

3.0. PLANNING PHASE

The planning phase of the project is perhaps the most intense both for the team and for the project leaders. Planning for every aspect of the project needs to be completed and incorporated into a written action plan. After establishing a team, the GAP tools need to be modified to meet the needs of the local culture; goals and aim statements need to be written; monitoring and measurement tools need to be designed; and the educational and implementation plans need to be developed. And all of this

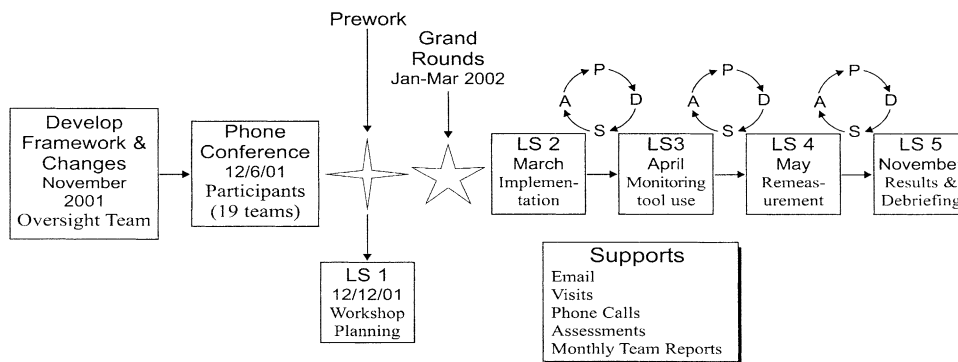


Figure 1. The American College of Cardiology Acute Myocardial Infarction Guidelines Applied in Practice (ACC AMI-GAP) project merges a research model with a collaborative model for improvement with all participants implementing the same intervention (ACC AMI-GAP tool kit) and aggregate pre- and post-measurement occurring within the same time frame. Learning sessions focus on increasing the use of the GAP tools and successful implementation of project phases of planning, tool implementation, monitoring tool use, remeasurement, and results. The Breakthrough Series Collaborative Model © 2001 Institute (12).

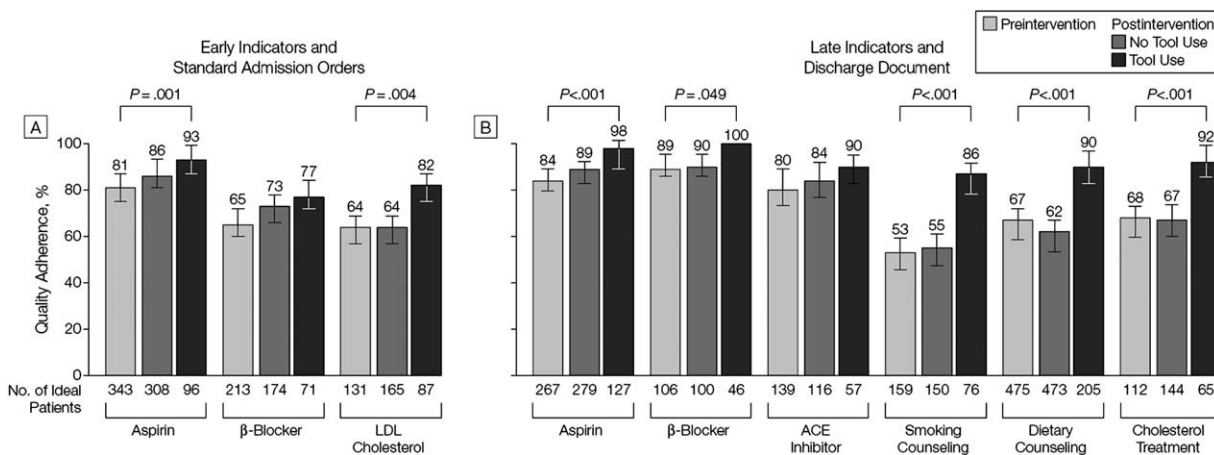


Figure 2. Adherence to early indicators in patients with and without evidence of the use of standardized admission orders, and adherence to late indicators in patients with and without the evidence of use of the standardized discharge form.

needs to be documented in a written action plan and timeline. Examples of a written action plan and a planning checklist are included in Appendix B. The written action plan corresponds with the phases and steps of the AMI-GAP collaborative model, and the information included in section 3.4 in the following text of this manual. The planning checklist is used to double-check the team’s work before proceeding beyond the planning phase. While the focus on project phases is unique to the ACC AMI-GAP collaborative model, the basic QI principles and techniques are not. These principles are the subject of numerous textbooks and articles, and have been the focus of numerous conferences. Several references are listed here as suggested supplemental references to this manual. The following section contains details about the planning phase and recommendations based on the experiences of the three GAP projects.

Suggested readings:

- Langley GJ, Nolan KM, Nolan TW, Norman CL, Provost LP. *The Improvement Guide*. San Francisco, CA: Jossey-Bass Publishers, 1996.

- Institute for Healthcare Improvement. Available at: www.IHI.org.
- Michigan Peer Review Organization Continuing Education, Quality Improvement Education Program. Available at: www.MPRO.org.
- Scholtes PR, Joiner BL, Streibel BJ. *The Team Handbook*. Madison, WI: Oriol Inc. Publishers, 2000.

3.1. Identify a Focus

Which comes first, the team or the problem? Does a team identify a problem to solve or does a problem exist and a team forms to address it? Local situations will determine the order of events, but for the purposes of this manual, it is assumed that the readers have decided or are in the process of deciding to implement an AMI-GAP project. This decision may be sparked by regulatory agencies, identification of a high cost or high volume patient population, a known opportunity for improvement in quality of care indicators, and/or interest by local cardiologists or other clinicians from reading the articles that have reported the successes of the ACC AMI-GAP projects. The care of patients with AMI is very broad. As such, the ACC AMI-GAP projects and this manual have narrowed the focus to a QI initiative that supports health care providers in caring for patients hospitalized with AMI, through the use of standardized care tools that guide clinicians through decisions that are consistent with the ACC/American Heart Association (AHA) guidelines.

3.2. Project Support and Approval

Before proceeding with the AMI-GAP project, it is suggested that hospital administration and leadership from cardiology, nursing, emergency care, and QI declare the project a priority and provide support and resources. In all three previous GAP projects, teams that had this approval and support appeared to be more successful because personnel resources and support for all phases of the project were made available. This supportive group is labeled differently

Table 1. Complications and Outcomes

Complications/Outcomes	Baseline (%) n = 1,368	Post GAP (%) n = 1,489	p Value
In-hospital			
Hypotension	419 (30.6)	492 (33.0)	0.17
Shock	16 (1.2)	18 (1.2)	0.92
Heart failure/pulmonary edema	652 (47.7)	660 (44.3)	0.07
Stroke	68 (4.9)	78 (5.2)	0.74
Renal failure	340 (25.0)	357 (24.2)	0.61
Hemorrhage/bleeding	338 (24.7)	381 (25.6)	0.59
Transfusion	278 (20.3)	364 (24.4)	0.008
Discharge to acute care hospital	174 (12.7)	162 (10.9)	0.13
In-hospital mortality	186 (13.6)	159 (10.4)	0.017
Later outcomes			
30-day mortality	295 (21.6)	249 (16.7)	0.001
1-year mortality	524 (38.3)	494 (33.2)	0.004

Reprinted with permission from Eagle KA, et al. (13).

Table 2. Independent Predictors of Mortality—Influence of GAP

In-Hospital Mortality				30-Day Mortality				1-Year Mortality			
Variable	Odds Ratio	95% CI	p Value	Variable	Odds Ratio	95% CI	p Value	Variable	Odds Ratio	95% CI	p Value
Age*	1.04	1.02–1.06	<0.0001	Age*	1.044	1.03–1.06	<0.0001	Age	1.05	1.04–1.07	<0.0001
No prior MI	0.69	0.51–0.94	0.019	Prior PCI	0.60	0.41–0.88	0.01	Prior HF	1.54	1.24–1.91	0.001
Chest pain	0.41	0.31–0.55	<0.0001	Chest pain	0.41	0.32–0.52	<0.0001	Prior COPD	1.38	1.11–1.71	0.004
Heart rate*	1.006	1.001–1.012	0.03	Heart rate*	1.005	1.001–1.01	0.03	Chest pain	0.43	0.35–0.53	<0.0001
Ant. MI	1.55	1.16–2.01	0.003	Ant MI	1.499	1.17–1.91	0.001	Inf. MI	1.30	1.05–1.62	0.015
Inf. MI	1.84	1.37–2.48	<0.0001	Inf. MI	1.31	1.02–1.68	0.04	Atrial fib	1.29	1.02–1.62	0.03
Atrial fib	1.48	1.09–2.01	0.01	Atrial fib	1.38	1.07–1.79	0.015	Hct <30	1.75	1.32–2.31	<0.0001
PCI	0.41	0.25–0.67	0.0003	Hct <30	1.41	1.03–1.92	0.03	LVEF	1.49	1.21–1.83	0.0002
CABG	0.53	0.28–0.99	0.05	LVEF	1.40	1.10–1.79	0.006	PCI	0.34	0.24–0.47	<0.0001
Troponin ↑*	1.001	1.001–1.002	0.0002	PCI	0.34	0.22–0.52	<0.0001	CABG	0.30	0.18–0.48	<0.0001
GAP	0.79	0.59–1.04	0.09	CABG	0.37	0.21–0.66	0.0008	Troponin ↑*	1.001	1.000–1.002	0.002
				Troponin ↑*	1.001	1.001–1.002	<0.0001	GAP	0.78	0.64–0.95	0.013
				GAP	0.74	0.59–0.94	0.012				
C-statistic = 0.766				C-statistic = 0.757				C-statistic = 0.767			

*Continuous variable. Reprinted with permission from Eagle KA, et al. (13).

Ant = anterior; CABG = coronary artery bypass graft surgery; COPD = chronic obstructive pulmonary disease; fib = fibrillation; GAP = Guidelines Applied in Practice; Hct = hematocrit; HF = heart failure; Inf = inferior; LVEF = left ventricular ejection fraction; MI = myocardial infarction; PCI = percutaneous coronary intervention.

by various sources as the “guidance team” or “team sponsor” (14), “system leaders” (15), “leadership team,” or simply “leaders” (16,17). They are commonly defined as those who are in a leadership or management position, who have a stake in the process or problem (stakeholder), and have decision-making authority, clout, and, most importantly, financial and manpower resources to support the QI activity.

The list may be expanded beyond the list provided in the previous text; it is important that each team identify from whom they need support and be able to articulate the involvement that is needed. The support and involvement was obvious and visible in the teams that were most successful in the three GAP projects. For example, the kickoff grand round events were high-profile events with participation by executive leadership and presentations by

physician champions from cardiology as well as the emergency department. At some sites, the chief executive officer sent letters to physicians announcing the project and the expectation that the standing orders would be used! Successful projects had resources for monitoring tool use rates, and team members were able to attend all of the learning sessions. The support and involvement of leaders was obvious in successful teams and less so in those teams that seemed to struggle at various phases of their project implementation.

3.3. Creating a Team

Most often a team comes together for the life span of the project and to report the results to an oversight leadership team. Team size, structure, and membership may vary, according to the organizational culture, but it is critical to

Table 3. Independent Predictors of Mortality—Influence of Standard Care Tools and GAP

In-Hospital Mortality				30-Day Mortality				1-Year Mortality			
Variable	Odds Ratio	95% CI	p Value	Variable	Odds Ratio	95% CI	p Value	Variable	Odds Ratio	95% CI	p Value
Age*	1.04	1.02–1.06	<0.0001	Age*	1.04	1.02–1.06	0.0004	Age	1.05	1.03–1.06	<0.0001
No prior MI	0.69	0.51–0.94	0.019	History of stroke	1.75	1.23–2.50	0.002	Prior HF	1.61	1.26–2.05	0.0001
Chest pain	0.41	0.31–0.56	<0.0001	History of PCI	0.41	0.32–0.52	<0.0001	Prior COPD	1.55	1.22–1.98	0.0004
Heart Rate*	1.006	1.001–1.012	0.03	Chest pain	0.47	0.33–0.66	<0.0001	Chest pain	0.51	0.40–0.65	<0.0001
Ant. MI	1.55	1.16–2.07	0.003	LVEF	1.40	1.10–1.79	0.006	Anemia	1.74	1.27–2.37	0.0005
Inf. MI	1.84	1.37–2.48	<0.0001	PCI	0.22	0.09–0.54	0.001	LVEF	1.46	1.16–1.85	0.0014
PCI	0.41	0.25–0.67	0.0004	CABG	0.15	0.03–0.62	0.009	PCI	0.34	0.23–0.51	<0.0001
CABG	0.53	0.28–0.99	0.05	Heart failure	0.59	0.39–0.91	0.017	CABG	0.22	0.12–0.42	<0.0001
Troponin ↑*	1.001	1.001–1.002	0.0002	GAP	0.84	0.59–1.20	0.339	GAP	0.95	0.75–1.21	0.687
GAP	0.81	0.59–1.13	0.21	Discharge tool	0.52	0.27–0.98	0.042	Discharge tool	0.53	0.36–0.76	0.0006
Standard Orders	0.92	0.63–1.35	0.68								
C-statistic = 0.767				C-statistic = 0.800				C-statistic = 0.774			

*Continuous variable. Reprinted with permission from Eagle KA, et al. (13).

Abbreviations as in Table 2.

success that the team is comprised of members that meet the needs of the project. Those teams most successful in the ACC AMI-GAP projects were led by very active and dedicated physician champions and project leaders. The culture of the facility will determine how the project leaders are selected; they may volunteer, it may be assumed that a cardiology nurse specialist and chief of cardiology assume the role, or it may be a QI specialist and cardiologist who are interested in QI. Successful teams also had team members that were representative of the entire process of caring for patients with AMI, such as representatives from the emergency department, critical care, cardiac catheterization laboratory, and post-critical care nursing units. Additionally, members representing the work that needed to be done to implement and measure the QI effort should be included on the team, such as QI specialist, data collectors, medical records, and clerical staff. A sample team member list is provided in Appendix B.

The ACC AMI-GAP collaborative model provides a roadmap for the team leadership to follow as they guide the team and caregivers through a successful project implementation, but it is important that all team members accept responsibility and accountability for the work necessary for a successful journey.

3.3a. Physician Champion Role. There is often confusion regarding the physician champion role with some interpreting the role as comparable to the role of an opinion leader. An opinion leader is one who is often the first to know about and adopt innovations, one whom their peers look to for guidance or opinion, and one who can informally influence others' attitudes or behavior (18).

The physician champion may very well be an opinion leader, but rather than simply exerting an informal influence, they need to be an operational leader in designing, implementing, and measuring improvement. The physician champion role was critical to the success of the GAP projects. Having the GAP standardized tools available was not enough to create change. Sites that had effective clinical leadership provided by physicians and nurse leaders are generally more successful in achieving behavioral change or tool use (19). The physician champion ideally is someone who is respected for leadership skills, clinical role-modeling, and practice outcomes, and is enthusiastic about achieving high-quality performance indicators and process improvement. In the three GAP projects, they were most often a cardiologist, but if the majority of patients with AMI are treated by a different specialist group, such as family practice or internal medicine for example, then the physician champion may be from that physician group. Another model is to have the project led by both a cardiologist and a non-specialist, complementing each other. In the third GAP project, the group of hospitals that was the highest achievers of tool use and QI rates was led by physician champions from both the cardiology and the emergency department.

Overall responsibilities for the physician champions are noted in the following list. The level of involvement

(oversight or day-to-day management) and the time spent on these responsibilities depend both on needs of the project and of course availability. In general, the physician champion(s) should either lead efforts to or:

- Provide clinical direction and support, oversight, and coordination
- Ensure academic detailing of evidenced-based therapy (in care tools, presentations, and discussions)
- Actively participate in project meetings
- Be a clinical consultant and liaison, troubleshooter, and resource for problem solving
- Provide credibility with the medical staff: advocate purposes, goals, and commitment to the project
- Partner with project leader(s) to:
 - Develop, customize, adapt, and implement the tools
 - Develop action plans for implementing systematic processes of care
 - Help troubleshoot barriers to implementation, by first identifying barriers and then facilitating strategies to overcome barriers
 - Monitor tool use and barriers to use in order to optimize care
 - Monitor progress of project
 - Report project progress

The physician champion(s) is crucial to the success of the project. It was evident in all three GAP projects that when the physician champion was not actively leading the project, grand rounds were poorly attended, there was little, if any, feedback to physicians who did not use the forms, project leaders were frustrated with the lack of a partnership implementation, and tool use rates were less than the aggregate mean. Those sites with high rates of tool use had very active and enthusiastic physician leadership, which was committed to implementation and active, iterative change required to overcome barriers.

3.3b. Project Leader Role. A variety of skills are required to be an effective project leader. The project leader is the day-to-day project manager who ensures that the project is planned, actions are completed, reports are generated and reviewed, and modifications to the plan are made. The project leader should be someone who has a good understanding of QI principles and techniques and a basic knowledge of the process of caring for patients with AMI. The project leaders in the three GAP projects were nurses, with the exception of two teams that were led very successfully by physician QI directors. The main responsibilities for the project leader are to ensure that a complete and detailed plan is developed, written, and successfully implemented, that project progress is monitored, and that barriers to success are identified and strategies developed to overcome them. An effective project leader is organized, detail-oriented, able to lead meetings, and willing to delegate while providing expectations and guidance. The project leader generally is the individual who communicates to the rest of the organization, such as reporting to administration or presenting at department or staff meetings. It is imperative that the project

leader develop a close working relationship with the physician champion and also have access to the physician champion when the need arises.

The project leader role is summarized as follows:

- Day-to-day leader of team and project
- Partner with physician champion to lead project
- Convene team members and regularly scheduled meetings
 - Prepare and provide agendas that include topics of discussion, a time limit, and lead person for each topic
 - Maintain a written record of each meeting
 - Ensure meeting roles of leader, facilitator, timekeeper, note keeper, and team member are maintained
 - Provide team members with project explanation, expectations, and guidance for successful team meetings and project implementation
 - Utilize collaborative quality improvement (CQI) tools when their use will facilitate effective discussion and decision making
- Lead team efforts to:
 - Develop and implement action plans
 - Monitor project implementation and use of tools
 - Identify barriers to successful project implementation and develop strategies to overcome them
 - Report project progress

There can be no project without the project leader! The list looks short, but each item can be very complicated. Effective project leaders have a unique combination of basic clinical and QI knowledge. The project leader does not have to do everything in isolation, but needs to ensure that everything has been done. In fact, in our three GAP projects, those leaders with detailed and comprehensive written action plans and team members that were able to share the work load were more successful with project implementation. The project leader responsibilities may require 8 to 20 h per week depending on the team structure, sharing of responsibilities, and other positions already in place at the hospital, such as QI specialist, marketers, and data collectors.

3.3c. Team Members and Structure. It may be obvious but needs to be acknowledged that those who have made the decision to implement an AMI GAP project cannot conduct the project in isolation or without the knowledge and support of others who represent care for AMI patients! It is important to create a team structure that supports project implementation and team membership representing all units and staff that care for patients with AMI. It is challenging to spontaneously generate a list of stakeholders, so creating a “high-level” process flow chart of AMI care will be useful. A “high-level” flow chart is generally 6 to 12 steps that show the major components of a process and, therefore, may be helpful in understanding the process flow, identifying stakeholders, collecting data, and identifying resources (20). When flow charting the care of the AMI patient, it is important to start pre-hospital, through the emergency department, catheterization laboratory, and

through critical care, general nursing units, and through to discharge. The flow chart should list all of the departments that care for the patient or influence the care of the patient or project, laboratory services, radiology, pharmacy, pastoral care, clerical staff, admitting staff, discharge planners, clinical nurse specialist (CNS) or advanced nurse practitioner (ANP), information technology, medical records, QI department, cardiology services, executive or administration, internist, family practice, resource pools, and hospitalists. Creation of a stakeholders’ list following the flow chart is helpful. The stakeholders’ list is not the same as the team members’ list. But the team members’ list can be generated from the stakeholders’ list. Creating the team members’ list is described in the following text.

Some of the stakeholders may serve in an ad-hoc capacity, or information-sharing capacity, but it is important to start with a full and complete list so that one can use all of the resources and influences necessary for a successful project implementation.

Some teams may choose to conduct all of the business in a large group. Others may have smaller working group meetings, with one member of the working group meeting reporting to the larger group. It really is a matter of preference and culture.

Being creative with team membership is easier when one develops a flow chart incorporating aspects of the project and measurement. Creative team structures observed in previous GAP projects have included subgroups to work on tool development and approval processing, data collection and reporting, educational planning and implementation, emergency department implementation, processes and timeliness of reperfusion, and oversight leadership groups. For example, several teams recruited a marketer to help develop an educational and publicity plan. The marketer was an ad-hoc member attending smaller planning meetings, and reporting to the larger group. Others enlisted a representative from medical records to help plan sampling for monitoring tool use and remeasurement. This was a key person to have input from when developing strategies to overcome incomplete records at time of remeasurement. Many teams recruited clinical care unit champions who had separate meetings to report the successes and barriers of their respective units. Some may not realize the importance of having an emergency medical services representative as an ad-hoc member. But the measurement of the early administration of aspirin quality indicator can be greatly influenced by the documentation on the “run sheet,” which documents care provided at home or during transport, which is often the time the aspirin is administered.

Different teams will need to meet at different intervals and at different times in the project depending on local circumstances. If the group decides to use the subteam concept, then each subteam should report to the larger oversight or leadership team. Team members need to be responsible for guaranteeing their attendance at meetings,

contributing in planning, and participation in the activities of project implementation.

3.4. Project Goals

After collecting baseline data and information, it is important to develop a clear and concise statement of the intended improvement for both the AMI quality indicators and for care tool use. Further discussion about clinical tool use and indicator measurement is provided in sections 3.8 and 3.9 in the following text. Comparing the baseline with the targeted rates helps illustrate the rationale and importance of the project.

Developing a specific aim statement for an AMI-GAP project should include specific targets for each of the quality indicators. It is useful to keep in mind that quality indicators are NOT the guidelines; rather they help determine how successfully we are applying the guidelines. The quality indicators that have been measured in the AMI-GAP projects are consistent with those that are measured by Centers for Medicare and Medicaid Services (CMS) and Joint Commission on Accreditation of Healthcare Organizations (JCAHO) core measures. These include:

- Early treatment indicators
 - Aspirin 24 h before or within arrival
 - Beta-blocker within 24 h of arrival
 - Timely reperfusion; ≤ 30 min for thrombolytics or ≤ 90 min for percutaneous coronary intervention (PCI)
- Later treatment indicators
 - Aspirin prescribed at discharge
 - Beta-blocker prescribed at discharge
 - Angiotensin-converting enzyme inhibitors prescribed for those with ejection fraction < 40
 - Smoking counseling
- Test measures
 - Measuring low-density lipoprotein cholesterol
 - Prescription of low-density lipoprotein cholesterol-lowering medication for those with elevated low-density lipoprotein cholesterol
 - Dietary counseling
 - A hospital team may want to add additional indicators such as referral to cardiac rehabilitation, use of emergency department protocol, or documented education regarding when and how to use nitroglycerin, or when to prescribe additional pharmacologic agents such as clopidogrel
- Treatment indications should be reviewed and updated whenever the guidelines and their corresponding performance measures are updated

It is equally important for teams to identify an aim statement and target rate for tool use for all of the tools that will impact the quality indicator rates and that will be part of the permanent record such as standing orders, discharge document, and clinical pathway. Each of the three previous AMI-GAP projects showed that when the standardized

guideline-based care tools are used, the indicator rates are higher and the documentation is more complete. The rate at which the tools are used is a good marker of how successfully the new process of care (using standardized forms) is implemented.

If hospitals have already been using standing orders, it is useful to identify the baseline tool use rates and look for trends of use. Identifying patterns of use allows the team to write an aim statement specific to the current status. For example, one team in the third GAP project found that the standing orders were not being used by the hospitalists. This led to development of a special focus in their plan with a specific aim statement related to use by hospitalists. Another group of hospitals assumed that their standing orders were being used and did not develop plans to increase their use. The early treatment indicators did not improve because the standing order tool use had not changed.

Aim statements should be specific, measurable, and should include a target goal and a time frame. Teams may develop an overall aim statement for all of the quality indicators or a separate aim statement for each of the quality indicators. If they have high rates on some of the quality indicators, and an individual aim statement may not be needed for all indicators. Tool use aim statements may incorporate all of the care tools, or the team may select to have a separate aim statement for each care tool use. There is an advantage to having separate aim statements for all of the indicators and care tools. Different groups of caregivers may impact the rates or tool use, such as physicians impacting standard tool use rates and early indicators documentation and nurses impacting the discharge tool use. Measuring these separately provides more information and data for feedback than if they were lumped together.

A word of caution is needed regarding aim statements. Some teams have a tendency to be very cautious and will write aim statements reflecting only small incremental improvement. For example, a team wrote that the tool use will increase by 10% every month. It would take nine months to get to 90% if you are starting out at 0%! It would be better to expect larger increments such as an increase of 25% each month or shorten the time frame to 10% every week or two weeks. Expecting a more substantial gain can facilitate a departure from a practice-as-usual mindset to a systems-based concept.

Examples of clear, concise aim statements for an AMI-GAP project may be:

- Increase rate at which beta-blocker is given to ideal patients to 90% within six months
- Smoking cessation counseling will be documented at the rate of 90% within six months
- AMI-specific discharge tools will be used consistently for all patients discharged with diagnosis of AMI at a rate of 95% within six months

3.5. Project Action Plan

The purpose of the action plan is to document a detailed plan for implementing the AMI-GAP project. It is a written, detailed plan including assessment of the current status or resources related to AMI care, actions or strategies that will be implemented, persons responsible for activities, time frames, and measure of successful completion of the various phases of project implementation.

The action plan is best developed through a team effort. A sample action plan form is included in Appendix B, and it provides a basic listing of issues to be planned for. Project plans need to be individualized. The project leader and physician champion may want to provide a draft template for the first project team meeting. This will help give guidance to the team and provide structure for their discussions.

Topics to be planned for include:

- Team leadership members, structure, and meetings
- Goals and aims statements
- ACC AMI-GAP tool kit modification and printing schedule
- New (or revised) tool implementation or new systematic process of care plan
- Educational plan
- Monitoring tool use
- Remeasurement
- Results
- Reporting
 - Project status
 - Progress and results
- Project implementation successes and barriers, and results

3.6. ACC AMI-GAP Tool Kit

The decision to implement the GAP project implies that the ACC AMI-GAP tool kit will be used and that during project planning, hospital-specific tools will need to be created or existing tools modified to be consistent with the ACC AMI-GAP tool kit (21). At the very least, in order to achieve the high rates reported for the quality indicators in previous GAP projects, a standing order set and AMI-specific discharge document is needed. The ACC AMI-GAP template documents are included in Appendix C.

The hypothesis of the ACC AMI-GAP projects is that the quality of AMI care can be enhanced through a performance improvement initiative that includes providing institutions, caregivers, and patients with tools and strategies, that targets treatment goals, focuses on improving key processes of care, and optimizes adherence to guidelines. During the first GAP pilot project, core team members consisting of local cardiologists and nurses created templates for the standardized forms that were to be used by each hospital team. The templates were based upon the national ACC/AHA guidelines for AMI and tools that had already been utilized successfully at several southeast Michigan

hospitals (8). The templates were reviewed by the ACC's task force on practice guidelines and GAP steering committee to confirm that they conformed to the national AMI guidelines and after approval became the ACC AMI-GAP tool kit. The GAP tool kit consists of seven critical pieces:

- 1) AMI standard orders: for physicians to use to order evidenced-based therapy or document contraindications to their use;
- 2) Clinical pathway: for nurses to use to follow the patient through the expected course of treatment;
- 3) Pocket guide/pocket card: an easy-to-use condensed version of the guidelines for clinicians to carry in their pockets;
- 4) Patient information form: intended to be read by the patient and family members that will help explain the normal course of care and what they can expect during their admission;
- 5) Patient discharge form: to be used by the discharging caregiver, usually a nurse, and the patient. This document includes instructions about or contraindications to the evidenced-based therapy, smoking, and dietary counseling, follow-up appointments, and so on;
- 6) Chart stickers: to remind the staff that the AMI-GAP protocol should be followed; and
- 7) Hospital performance charts: providing comparisons at baseline and remeasurement for the quality indicators and tool use rates.

The pocket guide/pocket card was created by the ACC/AHA Task Force for Practice Guidelines from the AMI guidelines. Chart stickers were created by ACC project staff to serve as a reminder to caregivers to provide appropriate and timely AMI-specific care to the patients.

The physician and nurse leaders and the multidisciplinary team at each hospital were expected to customize and implement the ACC AMI tool kit. Each of the three GAP projects provided different experiences with the tool kit. In the pilot project, all sites utilized a standardized order set and discharge document, modifying their own to be consistent with the template or creating a new order set based on the template. All order sets in the pilot project were "AMI order sets." Most but not all hospitals used a critical pathway and the pocket guide and card. All had patient educational materials. None of the 10 selected to use the chart stickers.

The experience with the five hospitals in the second project (Flint-Saginaw expansion) was different. All five used all pieces of the tool kit, again modifying their own forms or creating new forms based on the templates. Several of the hospitals chose to implement "acute coronary syndrome (ACS) order sets" rather than AMI-specific orders. Some teams felt that an ACS order set was more inclusive, and help to ensure guideline-based care in patients with ACS in which the distinction between instable angina and non-ST-segment elevation myocardial infarction was not clear at admission. Hospital teams in the third GAP project

used all of the tools, again with some creating ACS order sets to capture more patients up front. Some sites reported that quality indicator rates were lower than expected because the patients that presented without an obvious AMI were not started on the standing orders for AMI. Creating a standard order set that reaches all ACS patients allowed these institutions to capture those patients who eventually “ruled-in” with AMI.

Several hospitals were very creative with the patient information form, incorporating the material into a professionally designed tri-fold brochure. Others incorporated explanations of commonly administered tests and procedures such as electrocardiograms, telemetry monitoring, echocardiography testing, and stress testing. Some sites determined that if the family was present in the emergency department, the materials should be distributed to them at the time of admission. Again, a given hospital’s culture and pre-existing care and education tools will dictate the final design for each project.

It is important to recall that new care forms may require approval of the “forms committee” thought by some to be the most powerful committee in the hospital system! The review and approval process can sometimes be lengthy. The team should be aware of the process in advance including the committee’s meeting schedule and a likely date when the project’s forms will be reviewed in order to create a realistic time frame for the action plan. Some hospitals may require approval from other pertinent committees such as cardiology and nursing practice in advance of the forms committee. Getting their feedback during the form development will help gain their approval for the finalized forms. Sometimes the physician champion can favorably influence the time required by the forms committee. Teams need also to be sensitive about the time required to typeset and print the new forms. This too can be a lengthy and time-consuming task. It would be detrimental to a project’s success to have to delay an announced start date because the care forms had not been approved and were therefore not available.

3.7. *Planning for Implementation Phase*

The implementation phase includes the educational plan and marketing plan execution and the implementation of new or modified GAP tools. The team must also plan a method to evaluate the implementation phase and, very importantly, modify or create new plans and activities if necessary to achieve a successful implementation phase.

3.7a. Educational Plan. One of the barriers to tool use identified during the first two GAP projects was that some staff reported “I did not know anything about the GAP project.” The cause of this lack of knowledge could have been that the project team didn’t plan educational presentations to reach all of the staff, or that all of the staff did not attend the planned presentations. The important lesson learned from the three GAP projects is that it is important to develop an educational plan detailing the content for staff education and scheduling educational events to reach all of

the staff. The measures of success for this aspect of the project are that the presentations are planned to be inclusive of all staff that will be working with the care tools and that an attendance record has been kept and evaluated for completeness. Additional presentations can be planned to ensure that all staff members are reached.

The following list is the recommended content for the GAP presentations:

- Introduction of the team leadership and membership
- Current status of AMI care and baseline quality indicator rates
- Introduction of the goals
- Overview and results of the ACC AMI-GAP projects
- Description of the hospital project, tools, process, evaluation, timeline
- Expectations for staff participation

Consider planning the required number of educational events that will reach close to 100% of the following care providers and staff:

- Physicians—cardiologist, internists, family practice, hospitals, emergency
- Nursing staff—emergency, critical care, general cardiac units, discharge coordinators, advance practice nurses
- Cardiopulmonary services
- Clerical staff
- Medical records department staff
- Pharmacy department staff
- Clinical laboratory staff

Review the process flow chart to determine that all pertinent staff members that need to be reached with the educational plan are involved

3.7b. Project Kickoff Educational Event. The methodology of all three GAP projects included a project kickoff event held at each hospital. This educational event was a presentation by the project and hospital leadership and included an overview of the GAP project and previous findings and specifics regarding the hospital’s project forms, timeline, and expectations. The main objective was to create an awareness of the project, promote participation by all staff, and reach a target audience of physicians—cardiologists, internists, family practice, and all others who care for patients with AMI. The event typically was a presentation at a normally scheduled or specially convened physician meeting with additional staff invited to the “ACC AMI-GAP Kickoff.” In the three GAP projects, we found that using an already existing meeting was the best forum to maximize attendance. Having the nationally visible and local cardiologists as guest speakers, and advertising their presentations, was a drawing card for physician attendance. Many hospital teams created a very enthusiastic event that was well marketed, and with upbeat promotions from the

chief executive officers or institutional leaders as well as presentations from emergency medicine and cardiology physician champions and project leaders.

Participation in a multihospital collaborative project such as the ACC AMI-GAP collaborative is not required to have a successful project kickoff. Any hospital project can be kicked off in this manner. Featuring a prominent local expert as a guest speaker can serve as a drawing card for the target audience, and the project leaders can use the event to reach a large number of people with one event.

3.7c. Implementation of New Care Tools. Many QI specialists recommend that changes be tested on a small scale before spreading to a larger scale (17,20). This is an effective strategy for many problems, but may be less than ideal for certain aspects of the GAP initiative. If, for example, the team decided to use the new tools on only select units, there would be inconsistent use of standard orders between units, thus contradicting the term “standard order” and causing confusion about using them. This is especially true if teams were to design a project that overlapped the use of old and newly modified standing orders. It is recommended that teams select a start date on which all staff on all units will start using the new tools. Teams will need to develop plans for removal of old forms, placement of new forms, and follow-up to determine that the new care tools are being used. If the team has unit champions, they often can accept accountability for this part of the project. Then, having unit managers and clerical support staff assume responsibility for ensuring the availability of tools is important.

The process by which the care tools are made available to the physicians and nurses needs to be determined. Do the emergency department physicians start the standing orders? That decision is very dependent on the usual practices at each site. Will the discharge orders be placed with the nurses notes, or will the nurse have to go hunting for the new special AMI form? Will the nurse be required to complete the general discharge form as well as the new AMI discharge form? These last two questions are examples of issues that should be defined before the project begins. Both of these, care forms not on the charts and requiring two separate discharge forms, were considered barriers to tool use in previous GAP projects and should be taken into consideration when planning tool implementation.

An important component of the implementation plan is the start date for use of the new tools. This should be part of the plan and announced during the educational events. Caution should be used to avoid dates that conflict with other important events in the hospital, holidays, high vacation periods, and so on.

3.8. Planning for Monitoring Tool Use Phase

Monitoring clinical care tool use is critical because the tool use rate is a determination of project success. During the planning for this phase, the team will need to create a mechanism to monitor use of the care tools, develop a

sampling strategy, determine who will collect the data, and at what intervals. Frequent monitoring, such as every two weeks, should occur in the first few months of a project, until the team is confident that the majority of barriers have been identified. The plan should allow the team to answer the following questions:

- At what rate are the care tools being used?
- What are the barriers to tool use?
- What are the successes to tool use?
- Are there patterns of high rates?
- Are there patterns of resistance?
- Are there successes in one unit that can be applied to units where there is resistance?
- What changes are needed to increase tool use?

This concept was first tested in the second GAP project and became an expectation in the third project. Teams that monitored tool use were best able to increase the clinical care tool use as the project progressed.

The first challenge is to determine how to identify a sample of records to monitor. Some teams had the clinical laboratories generate a daily or weekly list of patients with elevated serum troponin levels and then this list was used to create a sample of charts for review. Other teams used unit champions to track cases and review charts for tool use. Some teams asked the hospital chart coders to check for tool use, and others asked the clerical staff to keep a list at discharge. A few teams with more resources reviewed all records concurrently and provided individual feedback to physicians and nurses regarding the use of standard orders and discharge documents.

The monitoring tool can be as simple as a checklist that includes the following information:

- Patient identifier
- Standard order
- Discharge documents
- Critical pathway
- Patient education
- Other

The leadership team also needs to create a forum for receiving feedback from the staff. The most valuable information is to determine why or why not the tools are being used. Feedback can be solicited one-on-one or in groups such as staff meetings. Quality improvement strategies that require active participation are often very useful, including brainstorming, identifying restraining forces to tool use, or open dialogue, to name a few (20). Team members who are comfortable leading discussions with staff and with whom the staff are relaxed and open are good facilitators for this very important task. Thoughtful planning in advance to select a method for soliciting feedback will allow the team member to be well organized and rehearsed before conducting the feedback meetings. Discussion about overcoming barriers in this phase is discussed in section 4.0.

3.9. *Planning for Remeasurement Phase*

Several aspects of the project need to be measured. The most obvious are measures of processes of care reflected in the rates of performance of the quality indicators such as those listed in section 3.4. Most hospitals implementing the AMI-GAP project have identified this clinical topic as a priority area and may be collecting and submitting the core measures for AMI care to the JCAHO. In the previous GAP projects, there have been occasions when project leaders were not aware of how AMI cases were identified and/or how the data were collected or rates calculated. Including someone from the “core measures process” on the leadership team provides valuable local insight to the measurements of the quality indicators. Those teams who are not collecting data via the core measures tools will need to develop an abstraction tool that defines the patient population, defines exclusion and inclusion criteria for each indicator, and collects the variables that allow for measurement of the criteria, and then determine an analysis plan. Defining the components of the data collection is beyond the scope of this manual. However, a good source of information for such an activity can be found under performance measures on the JCAHO website (22).

Many leadership teams want to measure aspects of the care process that go beyond the quality indicators, such as the care provided to those patients transferred from other emergency departments or acute care centers. This group of patients, by definition, is eliminated from the early treatment indicator measures in the core measures, and would not be measured in the core measures report. The team thus will have to develop an additional strategy to collect information on those transferred to their site. In another example, some teams will want to measure timely reperfusion for all patients, including those coming directly to the emergency department and those transferred from others. This distinction is obviously important because the flow for the patients is different and the actions to increase guideline-based care will also be somewhat different.

There may be other indicators that the team wants to measure, such as referral to cardiac rehabilitation, or the test indicators of measuring and treating cholesterol, or dietary counseling. Leadership teams might be interested in the documentation of contraindications to the recommended treatments with aspirin, beta-blockers, angiotensin-converting enzyme inhibitors, or reperfusion. These may not be captured with the core measures abstraction tool, so the team will have to define how these variables will be abstracted and rates calculated.

As previously mentioned, the initial GAP experiences have shown the importance of monitoring tool use rates both during a baseline period and during the remeasurement phase. In all three GAP projects, there was a significant increase in the quality indicator rates when the clinical care tools were consistently used. Some leadership teams may wish to identify the rate of clinical tool use among

various types of physician groups such as cardiologists, family practitioners, and internists. If the measurement plan and abstraction mechanism does not include measurement of care tool use, such observations are not possible. An important exercise that the team must consider is to develop a grid that lists the variables being collected and cross matches these with the quality indicators and other measures used to evaluate the project.

Remeasurement may be predetermined or may occur after the tool use rates are at or near the goal established by the team. If the remeasurement time period is predetermined, it is best to allow a several-month period for the new tools to become part of the systematic process of care. If the quality indicators are being measured as part of the core measures submission to the JCAHO, the remeasurement time period may coincide with one of the routine quarterly measurement periods.

3.10. *Planning for the Results Phase*

This phase is meant not only to analyze the data that were collected, but also to determine successes and next steps. Oversight teams should collectively review the analysis and draw conclusions about the status of the project relative to the targets that were established in the planning phase. Decisions and recommendations about new processes or changes implemented for the project could include:

- Adopt the change;
- Abandon the change; or
- Alter and continue cycles of improvement;
- Continue until target is reached.

Or perhaps the desired state has been achieved, in which case the team needs to make plans for sustaining improvement and monitoring the care tool use and indicator rates to ensure the improvements are sustained.

During the results phase it is important to provide feedback to all of the involved staff and departments. This can be done with presentations at departmental meetings or staff meetings, but planning in advance for these activities will help them with budgeting and scheduling. Some previous GAP participants have used newsletters, reports in pay checks, and poster story boards. Certainly this should be a time to celebrate the successes and acknowledge those who have supported the project! A strategy used by one previous GAP team was to have the marketing department plan a special event for sharing the results.

3.11. *Measures of Successful Planning*

At the conclusion of this phase of the project, team leaders should create and review a checklist to determine if they have planned for all aspects of the project. An example of a planning checklist is included in Appendix B, but each oversight team should create their own unique and inclusive list to capture all of their planning needs. Measures of successful planning include:

- Physician champion identified
- Project leader identified
- Team members and team structure finalized
- Meeting schedule determined
- Forms modified or created
 - Standing orders
 - Discharge document
 - Critical pathway
 - Patient information form
 - Back from printer
- QIs selected and QI calculation plan determined
- Data collection methodology determined
- Plan and tool for monitoring care tool use designed
- Baseline data collected and reviewed; aim statement written
- Tool implementation start date determined
- Kickoff scheduled
- Educational plans written and sessions scheduled
- “Learning sessions” planned
- Evaluation plan written
- Reporting plans determined, report format designed
- Project plan written

3.12. Potential Barriers in Planning Phase

Numerous barriers may surface during the planning phase. The best defense is to be very well organized and detailed in the planning phase, stay alert to barriers, and strategize to overcome the barriers. Being alert to prevent the occurrence of the following barriers that were identified in previous GAP projects will help prevent problems (Table 4).

4.0. IMPLEMENTATION PHASE

If a project is thought of as one big implementation phase, leaders and team members can feel very overwhelmed. Breaking the project into phases including planning, implementation, monitoring, remeasurement, and result, helps narrow the focus. Success in one phase will support success

in the subsequent phase. This is particularly true of the implementation phase. A successful and thorough planning phase will support the success of the implementation phase. The implementation phase includes educating the staff about the project and the initial introduction of the care tools into practice. As mentioned, measuring the success of each of the activities and planning for additional activities is necessary to achieve best success.

After completing the educational plan, the oversight team should review the attendance and evaluations (if part of the plan) and then decide if there is a need for additional educational presentations. This will complete a plan-do-study-act cycle (PDSA) (17) related to the educational plan.

- Plan = the educational plan
- Do = execute the educational plan
- Study = review the attendance and determine if 100% of the *involved* staff have been reached
- Act = develop plans to reach those who have not attended an educational event

In all three Michigan AMI-GAP projects, a portion of the nursing staff needed additional presentations, such as those on the midnight shifts, as well as clerical staff and resource pool nurses. One hospital actually contacted the resource pool manager and asked that they arrange for the presentations. Another team prepared story boards that could rotate to units and reach the evening and night shifts. One team asked the central orientation department to include the project and the clinical care tools as part of central orientation to reach new staff.

Physician staff that are important to inform about the process but may be difficult to schedule may include residents rotating on the cardiology service, and non-cardiologists who admit patients with AMI. In a large teaching hospital, the chief resident sent out monthly e-mails and held orientation classes for those physicians rotating to the cardiology service. The physician champion recorded attendance at the monthly meetings to identify the non-cardiologists that had not yet been reached. Several teams had one-on-one follow-up by the physician champion to physicians unable to attend the presentations.

Once the team has planned for implementation of the new tools, the start date represents a busy day for team leaders because ideally they visit each unit on each shift, determine if the tools are being used, determine what the barriers are, and make plans to immediately overcome the barriers. Some of the barriers related to the start up were unpredictable, but are offered as lessons learned because if one can predict them then it may be possible to prevent them from happening. For example, one unit did not start using the new clinical care forms because the clerk thought that the priority should be to avoid waste and use all of the old forms before using the new forms. This was further complicated by the fact that the clerk had a “stash” of old care forms hidden in the ceiling tiles so that she always had a ready supply! In a subsequent project, after hearing this

Table 4. Barriers of Planning Phase

Barriers During Planning Phase	Strategies to Overcome Barriers
1. Project leaders may: <ul style="list-style-type: none"> • Feel overwhelmed • Have competing priorities 	1. Organize approach to project <ul style="list-style-type: none"> • Prepare a detailed checklist with time line • Reference the GAP implementation manual
2. Project leaders may: <ul style="list-style-type: none"> • Lack necessary QI skills, and comfort level to lead the project • Anticipate a lack of support 	2. Obtain support <ul style="list-style-type: none"> • List help needed, and potential supporters • Include these “supporters” as ad hoc team members • Recruit unit champions • Define physician champion role
3. Medical Forms Committee <ul style="list-style-type: none"> • Lengthy approval process • Slow process may jeopardize start date 	3. Forms approval process <ul style="list-style-type: none"> • Physician champion to facilitate approval • Approval may be more rapid if defined as “pilot”

story, a team decided that they would go to each unit, remove the old forms, and replace them with the new forms. Another team, unfortunately, forgot to check that the forms were back from the printer on time, and had to delay their project for three weeks.

Several major lessons were learned about the design and process of using some of the care tools. Specific lessons to the standard order set is to determine if they will be used in the emergency department and, if so, then the emergency department medical staff needs to be involved in the planning process. Some sites in GAP already had standing order sets and assumed that the order sets were being used consistently by all physicians and with all patients. In these situations the early treatment quality indicators influenced by the standing orders did not improve. The data analysis indicated that the standing orders were not being used consistently. Thus, rather than assuming a high rate of use of pre-existing order sets, an assessment should be completed that includes current tool use rate and identifying barriers to tool use.

Another barrier experienced by several hospitals was a predetermined notion not to advocate for use of the order set among physicians in training, thinking that standard orders would interfere with their learning, and also by groups of hospitalists who thought that they did not need the “crutch” of standing orders. The care culture at each site will influence the ability to overcome these barriers. By far, the most often sited barrier was physicians’ resistance to do what is perceived as “cookbook medicine.” Sometimes physician champions were able to overcome the resistance with one-on-one discussions and data feedback. When introducing the standard order sets, it is important to emphasize that the orders do not dictate the care; decisions regarding patient care still need to be made on an individual patient basis. The standard orders simply make those decisions easier to remember and to document. In the GAP experience, the sites with the highest standard order set use were the hospitals with electronic order entry as well as those sites that had very active physician champions and emergency department involvement.

The standardized discharge documents in all but a few hospitals were designed to be used by the nursing staff. Those sites that required nurses to use two discharge forms, the old general form and the new AMI specific form, had a low use of the discharge tools. There were a few sites that designed a form to be used by the physician alone or by the physician and the nursing staff. These sites had the lowest rates of discharge tool use across all three projects. The sites with the highest discharge document rate were those sites that made standard use by nurses in every AMI patient a clear expectation, monitored the use, and provided feedback.

4.1. Measures of a Successful Implementation Phase

Before moving on to the monitoring phase, the oversight team should pause and determine if they have successfully

completed the implementation phase. The following list was common to most GAP participating hospitals, but each oversight team must develop their own checklist. Examples include:

- Educational plans completed
- Attendance evaluated to determine those who were not reached
- Additional education sessions scheduled as needed
- New care tools having been implemented
- Staff concerns/issues discussed by team
- Resistance and barriers identified
- New strategies developed and implemented

4.2. Potential Barriers in the Implementation Phase

After determining the clinical tool use rate and identifying barriers to tool use, the oversight team can develop strategies to overcome the barriers. Several barriers have already been discussed; those that were most common in Michigan GAP projects are summarized in Table 5 with recommended strategies to overcome them.

5.0. MONITORING TOOL USE PHASE

This phase of the project is critical because it is the measurement of the process change. Rather than just one PDSA cycle, it should include multiple PDSA cycles until a high rate of tool use is obtained. The PDSA cycles in the monitoring phase are defined as:

- Plan = use the care tools at a very high rate
- Do = actually use the tools in practice, monitoring the rates and getting feedback from the staff that helps identify barriers and successes
- Study = evaluate the rate of tool use, determine if the rate has reached the target or if additional efforts are required
- Act = create new plans to overcome the barriers, and the next PDSA cycle starts

As mentioned, these cycles are repeated until the tools are being used consistently at a high rate. This seems simple, but this phase can take as long as three to six months, based on the cooperative nature and culture of the hospital staff and the oversight team’s ability to overcome the barriers. Teams that are struggling with meeting their goals will need to be careful to avoid “aim drift” defined as deliberately decreasing or “drifting away” from a challenging aim (20). A team that is struggling with reaching high tool use may want to refocus and perhaps consider continuing with a focus on just one or two of the tools, such as the discharge document and the standing orders.

5.1. Measures of a Successful Monitoring Tool Use Phase

It is appropriate for the oversight team to pause at the end of each PDSA cycle within the monitoring phase, and review a checklist of successful completion of this phase. The checklist may seem obvious, but again needs to be

individually developed. Measures of successful monitoring include:

- Conduct monitoring
 - Sample identified
 - Patient records examined
- Results analyzed
- Rates and trends reviewed
- Barriers and successes determined
- New strategies to overcome barriers incorporated into plan
- Repetitive PDSA cycles are conducted

5.2. Potential Barriers in the Monitoring Phase

As in the other phases, there are potential barriers that are unique to the monitoring phases. Some of these are related to tool use and were mentioned in section 3.7, but are repeated here, because they are most commonly found in this phase (Table 6).

6.0. REMEASUREMENT PHASE

This phase should prove to be the reward for all of the hard work that has gone into the project. If a team has been monitoring the tool use and successfully overcoming barriers so that the tool use rate is high, it follows that the quality

indicator rates are high as well. It is important in this phase to follow plans for the sampling strategy and that data collection is completed in a timely manner. Occasional quality checks to ensure that the sample is adequate and that the data collection is completed correctly are warranted. Early during the remeasurement phase, the team leaders should meet with the abstractors to determine if the medical records are complete and that data abstraction is not being hampered by incomplete records. When QI teams want to measure care in a rapid-cycle project such as the GAP project, a common barrier is that the medical records are still being processed by coders, or physicians are taking their time before completing records, delaying closure of the records and making them unavailable for abstraction. Both of these barriers can be overcome, but it is important to identify early during the remeasurement phase, not after all of the data has been collected.

Some unique lessons learned during the ACC AMI-GAP projects bear mentioning here. One site had a lower than expected discharge tool use rate. This was confusing because the records had been checked concurrently during the admission, and there was a high rate of discharge tool use. During review of the results, it was discovered that some of the medical records staff were disposing of the discharge form, thinking that they were a pilot form that

Table 5. Barriers of Implementation Phase

Potential Barriers in the Implementation Phase	Strategies to Overcome Barriers
1. Physician resistance to standing orders	1. Physician champion role <ul style="list-style-type: none"> • Address one-on-one and with personal feedback • Provide data feedback
2. Staffing issues <ul style="list-style-type: none"> • Shortage and turnover • Unreceptive to change • Unavailable for project education sessions 	2. In-service presentations <ul style="list-style-type: none"> • Short presentations using templates provided • Emphasize previous GAP project results and that GAP tools support complete and consistent care • Tools trigger care when the staff are busy or new and/or pool staff are used. • Use poster in-services in high profile places
3. Confusion about clinical data	3. Provide information about inclusion and exclusion criteria, and how rates were calculated
4. Staff perceive extra or additional documentation is necessary for new forms	4. Forms designed with simple check boxes and replace (not add to) existing forms
5. Lack of buy-in by some staff	5. Promoting project buy-in <ul style="list-style-type: none"> • Administration to publicly support and identify the project as a priority • Marketing department publicizes project with table tents, posters, newsletters, and so on
6. ED not incorporated into GAP projects	6. ED buy-in <ul style="list-style-type: none"> • Recruit an ED physician champion and project leader to lend credibility and influence • May develop ED GAP tools and process
7. New forms not being used <ul style="list-style-type: none"> • Incorrect use • Failure to use new forms 	7. Promoting form use <ul style="list-style-type: none"> • Obtain feedback, input and support during planning and design phase • Unit champion to monitor status and address unit-specific issues • Evaluate availability of forms • Provide in-services for unit clerk staff (who usually place forms on charts) • Focus on ease of documentation • Re-energize with posters, examples, in-services, or one-to one feedback
8. ACS patients identified as AMI patients late in stay and standing orders are not started early on	8. Some hospitals are using ACS standing orders and including a special page or section for AMI (ACS patients will usually receive aspirin and beta-blocker unless contraindicated)

ACS = acute coronary syndrome; AMI = acute myocardial infarction; ED = emergency department.

Table 6. Barriers of Monitoring Phase

Potential Barriers in Monitoring Phase	Strategies to Overcome the Barriers
1. Difficulty identifying “patient monitoring sample” promptly after discharge and/or while still hospitalized	1. Monitoring sample <ul style="list-style-type: none"> • Obtain a list of elevated serum troponins from the laboratory and create a monitoring sample from this list • Secure an AMI list from admissions department, or review list of admits each morning or each week • If there are staff who follow these patients such as a CNS or “rounding nurses”, ask for their patient list to create a monitoring sample list
2. Time constraints for monitoring tool use	2. Monitoring strategies <ul style="list-style-type: none"> • Enlist the help of staff already reviewing the records and provide a simple form to easily track tool use • Request that the unit clerks complete tool use forms as they work with the records
3. Samples are very small in low volume hospitals	3. Sample 100% of the AMI patients <ul style="list-style-type: none"> • Trend “missed opportunity” cases rather than low denominator rates
4. Monitoring results are lower than expected.	4. Determine trends of tool use <ul style="list-style-type: none"> • For example, are certain nursing units not using the discharge document? Are certain physicians not using the standing orders? • Examine the reasons for lack of use. Are the forms available on the chart? Were all staff in-serviced? • Follow-up with those not using the forms. Addressing their concerns early, and modifying the process will lead to increased tool use.
5. Physician resistance to standing orders	5. Physician champion to address <ul style="list-style-type: none"> • Address one-on-one and with personal feedback • Provide data feedback
6. Staffing issues <ul style="list-style-type: none"> • Shortage and turnover • Unreceptive to change • Unavailable for project education sessions 	6. In-service presentations <ul style="list-style-type: none"> • Short presentations using templates provided • Emphasize previous GAP project results and that GAP tools support complete and consistent care • Tools trigger care when the staff are busy or new and/or pool staff are used. • Use poster in-services in high profile places
7. Confusion about data	7. Provide information about inclusion and exclusion criteria, and how rates are calculated
8. Staff perceive extra or additional documentation is necessary for new forms	8. Forms designed with simple check boxes and replace (not add to) existing forms
9. Lack of buy-in by some staff	9. Promoting project buy-in <ul style="list-style-type: none"> • Administration to publicly support and identify the project as a priority • Marketing department publicizes project with table tents, posters, newsletters, and so on
10. New forms not being used <ul style="list-style-type: none"> • Incorrect use • Failure to use new forms 	10. Promoting form use <ul style="list-style-type: none"> • Obtain feedback, input, and support during planning and design phase • Unit champion to monitor status and address unit-specific issues • Evaluate availability of forms • Provide in-services for unit clerk staff (who usually place forms on charts) • Focus on ease of documentation • Re-energize with posters, examples, in-services, or one-to one feedback
11. ACS patients identified as AMI patients late in stay and standing orders are not started early on	11. Some hospitals are using ACS standing orders and including a special page or section for AMI (ACS patients will usually receive ASA and beta-blockers unless contraindicated)

ASA = aspirin; CNS = clinical nurse specialist; other abbreviations as in Table 5.

was not to be a permanent part of the records. Including the medical records department in the planning phase can help overcome this sort of barrier.

Engaging the medical records department in physician feedback helped one site overcome the delayed closure of records. Coders applied special “GAP notes to physicians” to records that needed to be completed in a timely manner for the rapid-cycle project.

During the remeasurement phase, it is important to track AMI patients that received PCI or cardiac surgery. In the GAP projects, it was observed that the patients that went for PCI actually had high rates for the discharge indicators.

However, those that received cardiac surgery had lower rates for tool use and for evidence-based therapy for AMI at discharge. Collecting data at this level of detail allows for a much more focused action to improve the rates for a subset of patients.

The remeasurement phase is not a time that the leadership team can “sit back and take it easy.” There are still barriers that need to be overcome, and early on to ensure that the sample and data collection are complete and accurate. This is a good example of the potential use of a subgroup to assume responsibility for a certain aspect of the project.

Once again, a PDSA cycle needs to be completed early in the phase:

- Plan = plans were created to measure post-intervention
- Do = sample is created, data collection is completed
- Study = determine if sample is correct, records are available and complete, and data collection is completed within time line and is accurate
- Act = develop plans to overcome any barriers that have surfaced during this phase, repeat PDSA cycle if necessary

6.1. Measures of a Successful Remeasurement Phase

It seems that as the completion of the project becomes nearer, the lists grow shorter, and the list of measures of a successful remeasurement phase is indeed shorter than that for previous phases. Project leaders should create a checklist that references the plan for remeasurement and minimally consists of:

- GAP medical record process requirements met
- Sample is correctly and completely created
- Deficient record process altered to met project requirements
- Data collection completed correctly

6.2. Potential Barriers in the Remeasurement Phase

Some of these have been cited previously but are listed here again for emphasis (Table 7).

7.0. RESULTS PHASE

This phase is meant not only to analyze the data that were collected, but also to determine successes and next steps, and to celebrate. Often teams adopt an attitude of “we will plan for it when we get there” and then overlook this important phase. A strategy used by a previous GAP team was to

include planning for this phase of the project in the marketing plan.

Teams should collectively review the analysis and draw conclusions about the status of the project relative to the targets that were determined in the planning phase. Decisions and recommendations about the new processes or changes implemented for the project could include:

- Adopt the change;
- Abandon the change; or
- Alter and continue cycles of improvement;
- Continue until target is reached.

Or perhaps the desired state has been achieved, in which case the team needs to make plans for sustaining improvement and monitoring the tool use rates and indicator rates to ensure that the improvements are sustained.

It is also important during this project phase to provide feedback to all of the involved staff and departments. This can be done with presentations at departmental meetings or staff meetings. Some previous GAP participants have used newsletters, reports in paychecks, and poster story boards. Certainly this should be a time to celebrate the successes! It is also the time to prepare a final summary report to the executive leadership team. The summary report can cite the original aims of the project, comparative baseline and remeasurement data, barriers and strategies that were used to overcome the barriers, successes and lessons learned, and a conclusion statement with recommendations for next steps.

7.1. Measures of a Successful Results Phase

As previously mentioned, the lists are getting shorter in the later phases of project implementation, but this does not minimize the importance of these activities. The PDSA cycle and the measures of successful results phase are one and the same:

- Plan = plans are made for analysis and report, and for sharing results and giving feedback and acknowledgements
- Do = analysis completed and report prepared
- Study = results reviewed by the team, determine if project is successful and what the course of action will be, celebrate and/or continue with PDSA cycles
- Act = share results and next steps with staff, implement plans for sustaining or continued improvement

7.2. Potential Barriers in the Results Phase

Barriers in this phase are related to planning or lack thereof. Failure to design an analysis plan and report, or failure to dedicate resources for a celebration or determine a mechanism to share the results with the staff is the usual source of barriers in this phase. Strategies to overcome the barriers are to develop the plans that are missing. Unfortunately, waiting until this phase of the project to develop plans for this phase may lead to delay because analytical staff may not be

Table 7. Barriers to Remeasurement Phase

Potential Barriers in Remeasurement Phase	Strategies to Overcome Barriers
1. Normal medical record processing takes longer than the rapid cycle demands of the AMI GAP project	1. Define a special GAP medical record process in collaboration with medical records department
2. Physicians sometimes take (the allowed) 60 days to reconcile deficient charts	2. Outline a special effort to decrease the normal time for deficient AMI chart completion <ul style="list-style-type: none"> • Provide the “incomplete” record list to the physician champion for direct and timely follow up with attending physicians • Make special announcements about deficient records at the medical staff meetings • Consider special GAP notices in physician mailboxes

AMI = acute myocardial infarction.

available or there may not be any resources available for a celebration.

8.0. SUSTAINING THE GAIN

When hospitals are successful and have reached their targeted goals, it is important to develop a plan for sustaining the gains they have made. Monitoring the quality indicators on a quarterly basis or once a year will indicate if there is a slacking of performance. If the indicator rates do start to fall below a threshold predetermined by the team, then it is time to monitor tool use rates, identify trends of use and barriers to use, and develop strategies to increase the tool use to the previously successful state.

9.0. SUMMARY

The ACC AMI-GAP projects were collaborative efforts of national and local leaders and hospital care teams. The projects showed that a systematic process of care that included the use of standardized order sets and discharge documents improved the adherence and consistency of evidence-based therapies such as aspirin, beta-blockers, angiotensin-converting enzyme inhibitors, statins, cholesterol-lowering medications, and smoking cessation and dietary counseling. Follow-up data analysis indicates that there is a reduction in deaths in-hospital and at 30 days and 1 year after discharge when the GAP standardized tools were used. Using the GAP methodology and approach and applying GAP hospitals lessons learned that are presented in this supplement may help the hospital teams that are implementing QI strategies to improve care of patients with AMI. Successful project implementation will produce a broader use of standardized tools that will in turn lead to a higher rate of application of evidence-based therapies.

Reprint requests and correspondence: Dr. Kim A. Eagle, University of Michigan Cardiovascular Center, 300 North Ingalls, 8B02, Ann Arbor, Michigan 48109. E-mail: keagle@umich.edu.

10.0. REFERENCES

1. Orza M, Gibbons R, Eagle KA. The American College of Cardiology's Guidelines Applied in Practice (GAP) program: seeking partners to improve the quality of cardiovascular care. *Prev Med* 2001;33:S32.
2. Eagle KA, Montoye CK. Mini-Course Session 100. The ACC AMI GAP Project and the AHA GWTC Pilot Project on CAD: Practical Lessons for Real Improvement. Presented at: American College of Cardiology Scientific Session, Atlanta, GA: March 2002.
3. Montoye CK, Eagle KA, Baker PL. The ACC AMI GAP southeast Michigan expansion project: baseline indicator rates and collaborative improvement model. Presented at: American Heart Association Quality Forum, Washington, DC: October, 2002.
4. Montoye CK, Baker P, Eagle KA, et al., on behalf of the GAP Investigators. ACC AMI GAP (guidelines applied in practice) collaborative model: early measurements during implementation of quality improvement collaborative. Presented at: Institute for Healthcare Quality Improvement National Forum, Orlando, FL: December 2002.

5. Eagle KA, Montoye CK, DeFranco AC, et al., on behalf of the GAP Investigators. The American College of Cardiology acute myocardial infarction guidelines applied in practice projects to improve the quality of AMI care in Michigan: lessons learned from 3 projects in 33 hospitals. Presented at: American College of Cardiology Scientific Session, Chicago, IL: April 2003.
6. Riba AL, Montoye CK, Mehta RH, et al., on behalf of the ACC GAP Steering Committee. The American College of Cardiology (ACC) Acute Myocardial Infarction (AMI) Guidelines Applied in Practice (GAP) southeastern Michigan expansion project: a collaborative quality improvement (QI) model. Presented at: European Society of Cardiology Conference, Berlin, Germany: September 2003.
7. Eagle KA, Gallogly M, Mehta RH, et al. Taking the national guideline for care of acute myocardial infarction to the bedside: developing the Guidelines Applied in Practice (GAP) initiative in southeast Michigan. *Jt Comm J Qual Improv* 2002;28:5–19.
8. Mehta RH, Montoye CK, Gallogly M, et al. Improving the quality of care for acute myocardial infarction: the Guidelines Applied in Practice (GAP) initiative. *JAMA* 2002;287:1269–76.
9. Mehta RH, Montoye CK, Faul J, et al. Enhancing quality of care for acute myocardial infarction: shifting the focus of improvement from key indicators to process of care and tool use: American College of Cardiology AMI GAP project in Michigan: Flint and Saginaw expansion. *J Am Coll Cardiol* 2004;43:12:2166–73.
10. Montoye CK, Mehta RH, Baker PL, et al. A rapid-cycle collaborative model to promote guidelines for acute myocardial infarction. *Jt Comm J Qual Saf* 2003;29:468–78.
11. Fraser SW. *Accelerating the Spread of Good Practice: A Toolkit for Health Care*. United Kingdom: Kingsham Press, 2002.
12. Institute for Healthcare Improvement. *Breakthrough Series College (syllabus)*. Boston, MA: Institute for Healthcare Improvement, 2001.
13. Eagle KA, Montoye CK, Riba AL, et al. Guideline-based standardized care is associated with substantially lower mortality in Medicare patients with acute myocardial infarction. *J Am Coll Cardiol* 2005;46:1242–8.
14. Scholtes PR, Joiner BL, Streibel BJ. *The Team Handbook*. Madison, WI: Oriel Inc. Publishers, 2000.
15. Institute for Healthcare Improvement. Resources Overview. Available at: www.IHI.org. Accessed June 21, 2004.
16. Gaucher EJ, Coffey RJ. *Breakthrough Performance, Accelerating the Transformation of Health Care Organizations*. San Francisco, CA: Jossey-Bass Publishers, 2000.
17. Langley GJ, Nolan KM, Nolan TW, Norman CL, Provost LP. *The Improvement Guide*. San Francisco, CA: Jossey-Bass Publishers, 1996.
18. Rogers EM. *Diffusion of Innovations*. New York, NY: The Free Press, 1996.
19. Eagle KA, Garson AJ, Beller GA, et al. Closing the gap between science and practice: the need for professional leadership. *Health Aff* 2003;22:196–201.
20. Institute for Healthcare Improvement. *Improvement Methods*. Available at: www.QualityHealthcare.org. Accessed September 4, 2003.
21. American College of Cardiology. *Guidelines Applied in Practice, ACC AMI GAP Toolkit*. Available at: www.acc.org. Accessed September 4, 2003.
22. Joint Commission on Accreditation of Healthcare Organizations. *Performance Measures*. Available at: www.JCAHO.org. Accessed September 4, 2003.11.0.

11.0. APPENDIX A: PROJECT PHASES GRID

Included here is the ACC AMI-GAP project phases implementation grid, designed as an outline of the narrative contained in this manual. It is not intended that the grid will provide all the information required for successful project implementation, but is a quick reference guide for project leaders.

AMI GAP Quality Improvement Project: Phases of Project Implementation

Project Phase	Focus	Output	Measurement of Successful Implementation of Project Phase	Potential Barriers
Planning	Identify focus and secure support and approval	Decision has been made to conduct AMI GAP project and implement the ACC AMI tool kit using standard orders, AMI discharge document, critical pathway, patient information forms, and measure project success with quality indicator data collection and tool use monitoring. Resources: • ACC AMI GAP articles (see reference list) • ACC AMI GAP tool kit forms at www.acc.org	Agreement to provide resources for the project has been obtained from the leadership of: • Administration, • Cardiology, • Nursing, • Emergency, and • Quality improvement	• Failure to gain support from leadership may lead to potential lack of resources or recognition. Lack of agreement/support may also contribute to competing priorities.
	Establish team	Physician champion and project leader have been identified and they convene a team with representatives from all areas (those who know and work with the process, or are customers of the process). The team will determine members' contributions and responsibilities for various aspects of project. Sub teams are identified. Meeting frequency and schedules will be agreed upon. Resources and tools: • Stakeholders list • "High level" process flow chart • Physician champion role description • Project leader role and responsibilities description	• Team membership list with physician champion(s) and project leader(s) identified. • Team structure has been designed • Members agree to roles and responsibilities • Team meeting frequency and schedule has been determined	• Project leaders may feel overwhelmed • Physician champion and/or project leader may lack necessary QI skills and comfort level to lead the project • Project leaders may anticipate lack of support • Project leaders may have priorities competing for available time and energy for project oversight
	Identify goals: answering question #1: What are we trying to accomplish? and question #2: How will we know that a change is an improvement? Determine aim	Team members review baseline data report and identify opportunities for improvement. Baseline report should include data for all quality indicators and if any of the tools are already being used, determine the rate at which they are being used. If individual units (such as the Emergency Department, Cath lab, critical care, and general care units) will be developing an action plan, then each should review a baseline report for the aspect of care that they will be impacting or focusing on. After identifying opportunities for improvement, an aim statement should be written. Each quality indicator and how that indicator is calculated should be clearly written and agreed upon. Some teams may want to expand their definitions beyond the current CMS or JCAHO core measures quality indicators.	• Baseline data reviewed • Opportunities for improvement are prioritized • A clear, focused statement of the intended improvement is developed • Quality indicator(s) statement is written • Quality indicator(s) calculation plan is developed • Well-defined aim statement is written (if various units have individual plan, each unit should have an aim statement)	• Assuming the current status instead of reviewing baseline data may prevent team from identifying all opportunities for improvement • Failure to review the quality indicator statements and calculations may lead to failure to capture all the data and information that the team determines as important. • Failure to write an aim statement makes it difficult to motivate the staff to work towards achieving a certain target.

Resources and tools:

Langley GJ, Nolan KM, Nolan TW, Norman CL, Provost LP. *The Improvement Guide*. San Francisco, CA: Jossey-Bass Publishers, 1996.

Improvement Method Available at:

www.QualityHealthcare.org. Institute for Healthcare Improvement, Boston, MA.

- Data reports
 - Internal, external
- Data variability
 - Use data for discovery
- External triggers
- Guidelines
- QI tools; process flow, fishbone (cause and effect), decision matrix

The team will generate a list of possible improvements to address the selected variances and then select specific actions.

Plans are also written for tool development or modifications, tool approval and printing, implementation of tools, educating the staff, monitoring tool use, identifying barriers to successful project implementation, remeasurement, studying results and reporting the status of the project. The plan should include specific actions, who is responsible and when the task should be completed. The plan may also include actions related to identifying the focus and goals and team issues.

QI tools that may be used in developing plan:

- Reverse brainstorming
- Contingency diagram
- List of strategies
- Impact analysis
- Decision matrix
- Action plan
- PERT or GANTT chart
- Microsoft project
- Calendar
- CQI activity report

Develop action plan;
answering question #3:
What changes can we
make that will result in
improvement?

- A detailed plan for implementation with:
 - Tasks identified
 - Responsible person(s) indicated,
 - Time frames set and time line is completed and shared
 - Milestones identified (major events that indicate progress)
 - Evaluation criteria and checklist
- If already using standardized order form or AMI specific discharge form, then:
- A change is planned *after* measuring current rate of tool use and identifying barriers

- Failure to write an action plan may lead to oversight of important tasks, or conflicting scheduling of aspects of the project implementation.
- Medical forms committee process may be longer than anticipated and jeopardize start date of new tool implementation

Continued on next page

Project Phase	Focus	Output	Measurement of Successful Implementation of Project Phase	Potential Barriers
Determine methods to monitor the rate of tool use and strategy to remeasure the quality indicators	Plan educational “roll out”	Plans for monitoring the tool use rates are made and include a sampling criterion to identify records to be examined, determination of who will review the records for tool use, and a strategy to identify barriers to tool use. Team members then create strategies to overcome the barriers. And repeat the monitoring after implementing the new strategies. A remeasurement plan is developed to measure improvement in the quality indicator rates. Tools: • Monitoring tools • Data collection • Information collection • Reverse brain storming The team should develop a mechanism (and contents) to reach all those caring for patients with AMI. This may include sessions for physicians, nursing, and all others who will be impacted by the new tools and or processes of care. A marketing plan may be developed to promote the project’s importance and increase visibility. Tools: • Standard educational package • Storyboards • Fliers • Staff meeting schedules • Content outline	<ul style="list-style-type: none"> Clearly stated measurement plan for the targeted improvement including: <ul style="list-style-type: none"> Data collection methods, Data analysis plan, and Responsible parties Plan to monitor tool use and identify resistance and/or barriers Plan for developing strategies to overcome barriers <ul style="list-style-type: none"> Educational plan and evaluation tool written Educational sessions scheduled Key question to answer: Who wasn’t in attendance? <ul style="list-style-type: none"> Plans to follow up with those not in attendance are made Plans to follow up with those not in attendance are made 	<ul style="list-style-type: none"> Failure to monitor the tool use rates and identify barriers to tool use may prohibit successful project implementation. Inability to successfully and completely implement a new process may not sustain the new process. <ul style="list-style-type: none"> Failure to educate the staff about the new tools/process and expectations for use may lead to inconsistent tool implementation.
Plan for reporting project progress, data, successes, barriers, and lessons learned		Quality improvement projects should be reported to an oversight or executive committee and plans for the report and reporting need to be developed. Determine if project warrants IRB approval or just reported to IRB as “for your information.” Resources and tools: • Project timeline • Project reporting form (phases measurements) • Barriers and strategies listing • Quality indicator progress report and data forms	<ul style="list-style-type: none"> Project reporting plans (to whom, when, and format) Responsible parties and due dates are identified Mechanism for gathering information is determined 	<ul style="list-style-type: none"> Failure to report status and results threatens recognition of the project successes.

	Evaluation of planning period	<p>Complete a PDSA cycle: The team should collectively review the written plan for completion of details and identify issues overlooked and then modify the plan as needed.</p> <p>Resources and tools:</p> <ul style="list-style-type: none"> • Planning checklist • Written action plan • Project timeline 	<ul style="list-style-type: none"> • Outstanding issues identified and written plan modify to include the outstanding details. 	<ul style="list-style-type: none"> • Team may overlook important details if the plan is not reviewed for completeness.
Implementation of (plan) education and implementation of new tools	Educational plan implemented and evaluated Marketing strategies completed	<p>Complete PDSA cycle of education and marketing roll out. Determine if plans were instituted and also review attendance and evaluations for those not in attendance or issues that need to be addressed.</p> <p>Resources and tools:</p> <ul style="list-style-type: none"> • Educational schedule • Kickoff checklist • Evaluation forms • Attendance lists 	<ul style="list-style-type: none"> • Education plan implementation and marketing strategies evaluated • Follow-up plans made to address those not yet reached 	<ul style="list-style-type: none"> • Not reviewing attendance may lead to failure to reach all those impacted by and depended upon to carry out the project.
	Test changes, new process	<p>Review implementation of the tools and changes (PDSA cycle). Determine if all the units start using the tools as planned and identify successes and barriers to starting new process.</p> <ul style="list-style-type: none"> • Implementation checklist • Implementation unit report 	<ul style="list-style-type: none"> • Tools have been implemented • Change/improvement has been implemented • Each unit reports on the successes and barriers to implementation • Evaluate implementation • Determine if changes to implementation need to be made. • Tool use rates reported • Tool use driving and restraining forces are identified (barriers, issues, and successes). 	<ul style="list-style-type: none"> • Failure to determine early on if the tools were indeed implemented may lead to inconsistent use.
Monitoring tool use	Monitor tool use, identify barriers and strategies to overcome them	<p>Measure the rate at which the tools are being used on all units. Acknowledge success and identify barriers to tool use. Develop strategies to overcome barriers (Repetitive PDSA cycles until target rate of tool use is achieved and maintained.)</p> <p>Resources and tools:</p> <ul style="list-style-type: none"> • Monitoring plan • Monitoring tool use forms • Reverse brainstorming • Force field analysis 	<ul style="list-style-type: none"> • Tool use rates reported • Tool use driving and restraining forces are identified (barriers, issues, and successes). 	<ul style="list-style-type: none"> • Failure to monitor the tool use rates and identify barriers to tool use may prohibit successful and consistent project implementation. • Failure to use the tools at a high rate will diminish the quality indicator rates. • The improvements and new process can not be sustained if the process is not successfully and consistently implemented.
Remeasurement	Collect and analyze post measurement data	<p>Measurement plan is carried out and reviewed to determine if the measurement was completed as planned for. If not, then make modifications and complete measurement (PDSA cycle)</p> <p>Resources and tools:</p> <ul style="list-style-type: none"> • Data collection tools • Data reporting forms • Graphs and charts • Process variation 	<ul style="list-style-type: none"> • Measurement data is collected as described in the plan • Data results are: <ul style="list-style-type: none"> • Tabulated, • Analyzed and • Interpreted in relation to the aim statements • Lessons learned are listed • Conclusion statement of success or failure with explanation(s) completed 	<ul style="list-style-type: none"> • Incomplete or inaccurate measurement will lead to erroneous conclusions.

Appendix A Continued

Project Phase	Focus	Output	Measurement of Successful Implementation of Project Phase	Potential Barriers
Results	New plans developed based on results	Team should collectively review the analysis and draw conclusions and recommendations for modifications to new process.	<ul style="list-style-type: none"> • Decision/recommendation to: <ul style="list-style-type: none"> • Adopt the change, • Abandon the change, or • Alter and continue cycles of improvement • Next PDSA cycle • Feedback to involved staff and departments is completed • Celebrate the success! 	
	Desired state achieved	<ul style="list-style-type: none"> • Data reports • Tool use rates report • List of barriers and successes • Presentation • Storyboarding 		

AMI = acute myocardial infarction; IRB = Institutional Review Board; PDSA = plan, do, study, act cycle; QI = quality improvement.

12.0. APPENDIX B: AMI-GAP PROJECT PLANNING FORMS (WRITTEN WORK PLAN TEMPLATE, TEAM MEMBER LIST, PLANNING CHECKLIST)

Team Member List

Physician champion
 Project leader
 Physicians (cardiology, family practice, internist, emergency)
 Nurse managers (critical care, telemetry units, general units, emergency)
 Emergency department (physician and nursing)
 “Unit champions” of unit-based leaders
 Clerical staff
 Pharmacy department
 Collaborative quality improvement director
 Catheterization laboratory manager
 Cardiopulmonary
 Clinical laboratory
 Medical records

ACC AMI-GAP Project Planning Checklist

- Physician champion
- Project leader
- Team members and team structure
- Meeting schedule
- Forms are completed
 - Standing orders
 - Discharge document
 - Critical pathway
 - Patient information form
 - Back from printer
- QI selected and QI calculation plan determined
- Data collection methodology determined
- Plan and tool for monitoring designed
- Baseline data collected and reviewed, aim statement written
- Tool implementation start date determined
- Kickoff scheduled
- Educational plans written and sessions scheduled
- “Learning sessions” planned
- Evaluation plan written
- Reporting plans determined, report format designed
- Project plan written

AMI GAP Project Work Plan

Topic	Assessment Statement	Plan/Strategies	Timeline	Accountable Person(s)
Team				
Team members				
Meetings (frequency, established, etc.)				
Other				
Aim statement				
Tools				
Standing orders				
Discharge document				
Critical pathway				
Patient information form				
Pocket guide and card				
Implementation plan				
Educational plan				
Grand rounds (date, established meeting?)				
Inservices (packet will be distributed at the kickoff)				
Monitoring tool use				
Remeasurement				
Identifying the universe				
Medical records process				

ACE Inhibitor

- lisinopril 5 mg p.o. daily titrate upward p.r.n. for BP
- captopril 6.25 mg p.o., then 12.5 mg 2 hrs later and 25 mg three times daily
- enalapril 2.5 mg twice daily
- ramipril 5-10 mg every day
- _____
- ACE inhibitor contraindicated because: _____

Cholesterol-Lowering Drug

- niacin
- gemfibrozil
- statin (preferred for isolated increase in LDL): _____, _____ mg/p.o. with evening meal

Diuretic: _____, _____ mg p.o. IV _____

Compazine 5-10 mg IV every 4 h p.r.n. for nausea/vomiting

Stool softeners 100 mg p.o. twice daily

Antacids 30 cc p.m. daily

Acetaminophen 2 tabs every 4-6 h p.r.n.

STUDIES: (If not done in ED)

- CBC with diff repeat in a.m.
- BUN, creatinine, Lytes repeat in a.m.
- Mg, Ca, Phos
- Glucose
- PT, INR, aPTT

Cardiac markers: troponin-T, troponin-I CK, CK-MB—as per hospital protocol

Lipid profile now (if not performed in past 4 months)

Fasting lipid profile in a.m.

ECG upon arrival to Unit and in a.m. Right-sided ECG

ECG with recurrent chest pain

Portable chest X-ray

INTERVENTIONS

- Patient Education Form/Program
 - Smoking cessation instruction and counseling program—for all patients who smoke
 - Nutritional counseling
 - Secondary prevention counseling
 - Discharge contract re: understanding and complying with evidence-based therapy
 - Cardiac rehabilitation
 - Notify MD immediately for recurrent symptoms/ECG ischemia/CHF/hemodynamic decompensation/ventricular arrhythmias
 - Cardiac catheterization: primary PCI, rescue for the failed thrombolysis, clinical conditions, cardiogenic shock/hemodynamic instability/CHF, suspected mechanical complications, e.g. VSD, acute MR, malignant ventricular arrhythmia, ischemia in-hospital or pre-discharge ETT, recurrent ischemia at rest with ECG changes (or repeated episodes without ECG changes), recurrent MI, high-risk non-STEMI patient
-

Critical Path			
	Emergency Department and First 24 Hours	Next 24 Hours—Discharge Day	At Discharge
Consults	Cardiology consult in ED		
Tests	12 lead ECG within 10 min of arrival in ED; cardiac serum markers; admission blood work	Pre discharge ETT—for uncomplicated patient, plan on 4-5 days	Cath ¹ patients with significant ischemia (in-hospital or pre-discharge ETT)
Aspirin	Echo for CHF/shock/suspected mechanical complications chewed in ED (325 mg)	Echo or MUGA prior to discharge if no I V gram	81-325 mg daily indefinitely
Reperfusion for ST ↑ or new LBBB ≤12 hrs of symptom onset	Front loaded thrombolytics ² or Primary PTCA	160-325 mg daily alteplase/reteplase, can be repeated for recurrent occlusion	
Heparin	IV in alteplase/reteplase or PTCA treated patients; for large anterior MI, AF, prior embolus, LV thrombus; subcutaneous heparin for streptokinase IV heparin in LMWH subcutaneous for non-ST-elevated MI	48 h in alteplase/reteplase, or emergency cath treated patients. Consider subcutaneous heparin minidose for all until ambulatory.	Coumadin -For 3-6 mos if LV thrombus seen or thromboembolism; -Chronically for AF
Beta-blockers ³	IV metoprolol (up to 15 mg in 3 divided doses) or IV Atenolol (10 mg in 2 divided doses) Calcium channel blockers if beta-blockers ineffective or contraindicated	Oral metoprolol 50-100 mg daily Atenolol 50-100 mg QD, or other beta blocker	Oral daily indefinitely
ACE inhibitors	Start within hours if BP >100, no renal failure	Daily for up to 6 weeks	Longer if Sx CHF or LVEF <40% Consider in all patients
GP IIb/IIIa	For primary PTCA or high risk, non-ST-elevated MI		
Nitroglycerin	IV for 24-48 h, unless HR <50, BP <90	Only for ongoing ischemia or uncontrolled hypertension	Oral for residual ischemia
Statins			Indefinitely if LDL-C >100 mg/dl
Activity	Strict bedrest	Start exercise	Refer to rehab program near their home
Cardiac rehab	Bedrest/bedside commode as tolerated	Hallway ambulation	
Diet		Education on low fat diet	Recommend low fat diet low chol, low saturated fat, no added salt as tolerated
Patient/family teaching	<ul style="list-style-type: none"> • Explain treatments • Allay fears • Sx recognition and reporting • Pain scale • Orient to unit and room; waiting room; Family Group, Survival Guide, Telecare, MI Patient Hospital Stay Information and AHA series 	Prepare for all Discharge procedures, explain treatments Prepare for transfer off CICU; review Sx recognition and reporting Initiate as early as possible Reinforce smoking cessation	Orient patient to: AHA Active Partnership workbook/video series CHD section of workbook Videos Taking Control and Understanding CHD Heart Attack Discharge document Videos Taking Control and Understanding CHD Heart Attack Discharge document Home VCR?
Discharge planning		Direct family to business office Notify discharge planners	

¹**Indications for a Cardiac Cath:**

- Primary PTCA
- Rescue for the failed thrombolysis
- Clinical conditions
- Cardiogenic shock/hemodynamic instability/CHF
Suspected mechanical complications (e.g, VSD, acute MR)
- Recurrent symptomatic arrhythmia
- Ischemia in-hospital or pre-discharge ETT
Recurrent ischemia at res with ECG changes (repeated episodes without ECG changes)
- Recurrent MI

²**Contraindications/Cautions to Thrombolytics:**

Contraindications

- Known prior hemorrhagic CVA
- IC trauma
- Active internal bleeding
- Suspected aortic dissection

Cautions

- Persistent BP $\geq 80/110$ mm Hg
- Prior cerebrovascular accident/intracerebral pathology
- Current use of anticoagulants in therapeutic doses
- Current use of anticoagulants in therapeutic doses
- Trauma or surgery within 2 weeks
- Noncompressible vascular punctures
- Recent (within 2-4 weeks) internal bleeding
- Pregnancy
- Active peptic ulcer disease
- History of chronic severe hypertension

²**Thrombolytic Drug Dosing**

Alteplase 15 mg bolus; 0.75 mg/kg over 30 min (max 50 mg); 0.5 mg/kg over 60 min (max 35 mg) anistreplase 30 in 5 min reteplase, double bolus 10 units 30 min apart streptokinase, 1.5 million units infused over 60 min

³**Relative Contraindications to Beta-Blockers**

Heart rate < 60 bpm

SBP < 100 mm Hg

Signs of peripheral hypoperfusion

Severe LV failure

PR interval > 0.24 s

Secondary or tertiary AV block

Severe COPD

Hx of asthma

Severe PVD

IDDM

Information for Heart Attack Patients

Dear Patient:

You are in the hospital because you may have had a heart attack. You will probably spend about 3–4 nights in the hospital. This is a list of what you can expect to happen during your stay, but please remember that this is only a general guide. Your care may vary from the guide because of your individual needs. Throughout your hospital stay always let the staff know if you have any chest discomfort, pain, or heaviness, shortness of breath, nausea, or weakness. Always ask any and all questions you have.

Day 1:

- You will probably be in the Cardiac Care Unit or in the Cardiology Unit
- You will receive oxygen and medications to keep you comfortable and help your heart work.
- You will be connected to a heart monitor and will have frequent blood pressure checks, blood tests, and ECGs. You may have other tests scheduled, too.
- You will have at least one IV (intravenous) line. We will tell you if you can eat or drink.
- You may be on bed rest the first day—your doctor will determine your activities.
- We will begin to teach about your condition, your medicines, and how you can lower the risk of having another heart attack. If you smoke, we will counsel you about how to stop.
- Visiting hours in the Cardiac Care Unit are:

Day 2:

- If you have been in the intensive care unit, you may be transferred to a general unit
- Blood pressure checks, blood draws and tests will be less frequent
- You may be able to increase your activity
- Eating and drinking will probably increase
- We will check your cholesterol levels and you may be started on a medication to lower your cholesterol. We will teach you about the diet that is best for you
- We will continue to teach you about your condition and how you can best take care of yourself
- You may have an exercise test or heart catheterization to test your heart function.
- Visiting hours in the cardiology unit are:

Day 3 through discharge:

- We will start getting you ready for discharge. We will teach you about:
 - the medicines you will take at home,
 - a diet that's best for you,
 - exercise, activity and rest, and returning to work,
 - any follow up appointments and tests you will need,
 - and a Cardiac Rehabilitation Program.

HEART ATTACK DISCHARGE FORM

I know that I have had a heart attack and that I need to do the following:

1. Take medicine. I understand that there are certain medications which may help to prevent a future heart attack and may help to extend my life.

Aspirin - _____ mg daily Yes Does not apply to me because:

ACE inhibitor - _____ Yes Does not apply to me because:

A measure of how well my heart is pumping is
my *ejection fraction*. My ejection fraction =
_____ %

Beta-blocker - _____ Yes Does not apply to me because:

Cholesterol lowering - _____ Yes Does not apply to me because:

My cholesterol values are as follows:

Total Cholesterol (TC) = _____ (goal: less than 200)

Low Density Cholesterol (LDL) - _____ (goal: less than 100)

High Density Cholesterol (HDL - "good" cholesterol) = _____ (goal: between 40-96)

Sublingual nitroglycerin tablets _____ Yes Does not apply to me because:

2. Quit smoking. I understand that smoking increases my chances of suffering from a future heart attack and that smoking causes other illnesses which may shorten my life.

I smoke and have been counseled to stop. Yes I do not smoke

I will stop smoking by (date) _____

I have been given medication to help me stop: _____

Referral to smoking cessation classes:

Call _____ at phone _____

3. Eat a low-fat diet. I understand that a diet that is low in cholesterol and fat may help to reduce my chances of suffering a future heart attack.

I have received counseling about a low fat diet. Yes No Does not apply to me because

Nutrition Services Contact: Call _____ at phone _____

4. Exercise regularly.

I have received activity instructions for the next 4-6 weeks, before I start cardiac rehabilitation. Yes No

I have received a referral to an outpatient cardiac rehabilitation program. Yes No

Cardiac rehabilitation contact: _____ Call at phone: _____ Does not apply because

5. Learn about heart disease.

I have received cardiac education (AHA packet) during my hospitalization. Yes No

I know warning signs and symptoms of heart attack and action to take if they occur. Yes No

I have received instructions on my discharge medications. Yes No

6. Follow-up with my physician.

I have a follow-up appointment made with my physician. Yes No Does not apply

The number to call if I have not received a follow-up appointment in 2 weeks is _____-_____.

Nurse/Physician Signature/Date:

Patient Signature/Date: