



*The **U**se of **P**rocedural **S**tandardization to **R**educe
Recognition to Reperfusion (R2R) **T**ime in STEMI*

Provider Training and Education: An overview

*(An review of the staff education process and the
UPSTART Provider Training Module)*

Knowledge: The most important component!

Q: Provider education –how important is it?

A: Extremely! It often determines your success.

Change can be challenging and education can be difficult! Yet the quality of education and training is a vital factor in a successful process change. The two are interlinked: Successful change requires successful education. And sustainable education leads to sustainable success.

Despite its importance, adequate education is often the rate limiting step in many process improvement efforts. Consider the emergency department: Staff work rotating and irregular shifts and turnover can be high. In this environment, a flexible and sustainable education process is essential for success.

As a result, we have developed the UPSTART **Provider Training Module**. It was designed as an innovative, internet-based approach to maximizing the flexibility of the education process. Easily accessible at www.projectupstart.com (or via DVD) the Provider Training Module consists of three integrated sections:

I. The UPSTART Provider Training Tutorial. This concise written overview of the UPSTART process provides a basic explanation of key concepts and ideas. It also stresses the importance of cooperative effort during a STEMI ALERT and the key role that staff play in the early detection of STEMI.

II. The UPSTART Provider Training Video. Professionally produced and filmed at the University of Virginia, this 14-minute video carefully explains the UPSTART approach and demonstrates the process in action. It further emphasizes the importance of key actions and concepts, reinforcing the importance of a systematic approach.

III. The UPSTART Provider Competency Exam. After staff members have viewed the tutorial and video they can complete this short exam, easily accessed at the project website. It can then be turned in to their site coordinator (or other person) for verification of training. Some sites give education credit to staff.

The result is an easy and efficient education process. Send your staff to school at projectupstart.com!

Once they complete the Provider Education Module they will have received the education and training necessary for successful implementation of Project UPSTART. New personnel can be educated in the same manner. This innovative approach minimizes the effort required to optimize your education efforts.

Time required -including exam? < 45 minutes!

Key Point: Excellence in STEMI management requires the efforts and vigilance of your entire ED staff. All staff working clinically within the ED should complete the Provider Training Module.

The following pages contain sample copies of the Provider Training Tutorial and Provider Competency Exam (Sections I & III of the Provider Training Module). Complete versions (as well as Section III -The Provider Training Video) can be accessed at www.projectupstart.com under Provider Education. These materials are also available on DVD for home use or for uploading to hospital-based computer systems, etc.

The Project UPSTART Provider Training Module

.....A “just the facts” intro to the UPSTART program

Welcome! The Provider Training Module has been designed to provide a focused introduction to the emergent treatment of acute myocardial infarction (heart attack). We don't spend much time on “theory” - you can find that at other locations. Instead, our focus is on **actions** –clearly defined actions that will allow you to “**Recognize**” and then “**Reperfuse**” your next STEMI patient as quickly as possible!

Project UPSTART provides a systematic approach to STEMI that has been very successful (Figure 1). You will learn that success is not difficult –it's really just based on key actions done consistently and accurately – time after time. Even though these actions appear simple, careful execution is the key. After completing this module you will be ready to “do your part” in identifying and treating these seriously ill patients more quickly.

This module is designed for all levels of emergency providers including physicians, nurses, unit secretaries, EMS providers, etc. In order to function best as a team, we all must understand the overall plan, not just our individual roles. STEMI is difficult to detect and requires immediate treatment, therefore close teamwork is essential.

The UPSTART Provider Training Module is divided into three sections:

- I. Provider Training Tutorial:** A written introduction and explanation.
- II. Provider Training Video:** A short overview and demonstration video.
- III. Provider Competency Exam:** A brief test to verify your understanding of Project UPSTART.

The three sections function together, so you will want to complete them in sequence. First, read the Provider Training Tutorial (15 - 20 minutes). Next, view the Provider Training Video (15 minutes). This is accessible via the web site or DVD. It demonstrates the STEMI ALERT process and provides information not found in section I. Finally, complete the Provider Competency Exam (section III). You may be asked to submit this exam to verify that you have completed your training. Don't worry; it's not that difficult – if you have completed sections I and II!

The entire process will take you approximately 45 minutes.

Thank you!

Section I. The Project UPSTART Provider Training Tutorial

As you proceed, always remember two important principles of STEMI care:

- **In acute heart attack: “Time = muscle”**
- **Without early recognition, there can be no progression to early reperfusion.**

Keeping in mind these two basic statements will help you understand the true value of seemingly simple actions and ideas that at first glance may not seem important. Optimizing STEMI management in the emergency setting has much less to do about finding “the exactly right treatment” than it does about “doing all the small things just exactly right!”

This module explains in detail specific actions and processes that are essential for success. Sustaining success is ultimately dependent on a systematic approach, not on individual provider excellence or good luck. Every action or idea included in the process is important and therefore can not be neglected or omitted without decreasing your effectiveness.

Remember: Each action we discuss is important to success; even if the reason is not immediately obvious!

What exactly is STEMI: (ST-Segment Myocardial Infarction)?

Definition: A subset of heart attacks that is identified by characteristic changes on the electrocardiogram (ECG). This

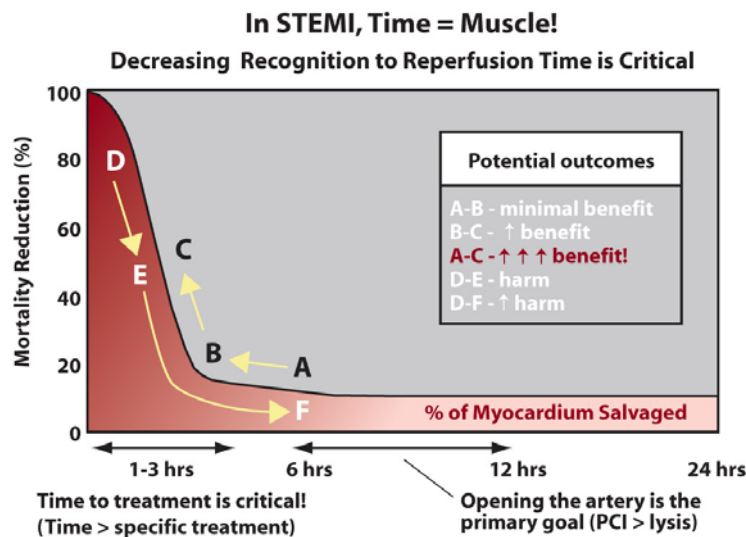
usually occurs as an unusual elevation of the ST segments in various leads. Most commonly, ST-segment elevation occurs in multiple leads that are measuring electrical changes in a region(s) of the heart supplied by a specific coronary artery. For example you might hear of an inferior (figure 2), anterior (figure 3), or anterior-lateral (figure 4) STEMI, each defining a specific region of the heart that is being damaged.

In addition to STEMI, other forms of heart attack occur that do not show up on the ECG as ST-segment elevation. These heart attacks also need to be treated quickly and efficiently but they don't necessarily benefit from immediate emergency reperfusion like STEMI patients do. So the ECG is key, helping us quickly discover those exact heart attacks that demand emergent catheterization or thrombolytic therapy.

Remember: It's the ECG that will tell you: "STEMI or not!"

STEMI treatment: The theory behind the "need for speed"

Project UPSTART was designed as a program to help detect and treat ST-segment elevation myocardial infarction (STEMI) more quickly. This is extremely important; the longer a coronary artery remains blocked (as occurs during a heart attack) the greater the amount of cardiac muscle that is damaged or destroyed.



Gersh BJ, et al. *JAMA*. 2005;293:979

In STEMI, is a treatment time of 45 minutes *really* better than 90 minutes? What about 45 vs. 60, or 40 vs. 58?

In most cases, the answer is YES, YES and YES! Time = Muscle!

The above graph clearly shows the curve of time vs. potential cardiac muscle salvage. Once an artery is blocked, cell death starts immediately and most damage is done in the first 2 - 3 hours. Therefore, early treatment can have a major payoff. Once an infarct is even several hours old, much of the damage is permanent. That is why early recognition is so important. No recognition = no progress to reperfusion.

This leaves little room for error or indecision. Once we lose time we cannot get it back! What if this was your heart?

Treatment of STEMI:

Treatment of acute MI may involve angioplasty (PCI) or the use of "clot buster" drugs (thrombolytics). Which one is better? It depends on the patient and situation. Studies have shown that PCI is somewhat better than thrombolytics (all other things being equal) *unless* there is a delay in getting that patient to the PCI lab. If the delay is too great, the benefits of PCI over thrombolytics can be lost. This brings us to a very important point: *In treating STEMI, the focus should usually be on time to reperfusion rather than the exact reperfusion strategy selected!* A key role of project UPSTART is to streamline the routine preparation and management of STEMI patients so the physician has more time to carefully answer this exact question!

So, just how do we improve treatment times in STEMI? One would think we should have all the solutions, since so much research has been done in this area. However, it's not that simple! People who study quality improvement understand the key to improvement is often not new knowledge, but better strategies for applying existing knowledge. Project UPSTART was created for this reason. "**We**" have designed a standardized process based on "*the best available knowledge*" and "**you**" have customized it "*in the best available manner*" to fit your institution. No sense in re-inventing the wheel!

Remember:

- **During a heart attack: "Time = Muscle!"**
- **The more recent the myocardial infarction (MI) - the more this applies.**
- **Early recognition and early reperfusion are critical.**



What exactly is "Project UPSTART"?

UPSTART is an acronym. It's short for: "The **U**se of **P**rocedural **S**tandardization to **R**educe Recognition to Reperfusion (R2R) **T**ime in ST-elevation Myocardial Infarction (STEMI)."

What exactly is "R2R"?)

Recognition to Reperfusion: The interval between STEMI recognition and opening of the blocked artery.

Our motto: Excellence in R2R!

Recognition may occur in the ED, in an EMS vehicle, at Grandma's house - anywhere you can do an ECG!

Reperfusion occurs via the use of thrombolytic drugs or heart catheterization. The faster the better!

Regardless of where (or how) "the two "R's" actually occur on each patient; we continually strive to bring them closer together: Early recognition followed by early reperfusion.

"Pulling the two R's together" requires a clear plan of action and quick decision making. When a STEMI is detected, everything should occur as if we do this all the time. However, STEMI is usually a rare event – not that many chances to practice! The secret to success is to set up a carefully designed system in advance (remember fire drills in elementary school?) that has key decisions built into the process. When a STEMI is identified, we can simply "pull the trigger" and follow pre-established instructions and not waste precious time on non-critical actions.



The four keys to STEMI identification and management

To help standardize your approach to STEMI management, we have condensed the day-to-day detection and management of STEMI into a simple process involving the four key steps depicted on this flowchart (Figure 5). Please review carefully! These actions are at the "heart" of success! They simply must become "hardwired" into the day-to-day flow of your emergency department. Are they?

The importance of these "critical" actions can not be overestimated. Sustained success in treating STEMI is dependent on these actions being repeated 24/7, every single shift of the year. If this doesn't happen, sooner or later you will miss a STEMI or have a preventable delay. However, the reverse is also true; if you can do these four actions consistently, you can't help but improve!

Remember this: Standardization and simplification reduce error. Doesn't every pilot use a pre-flight checklist? Absolutely! They know that simple actions done the same way every time are the best way to avoid "simple" errors. And simple errors are usually at the root of large errors!

Remember: The four key steps are the secret to success. Follow them 24/7.

Recognition: the first Key Step

To treat a STEMI, you must first detect it, right? **But "only an ECG that's done" can detect a STEMI.** That seems obvious. But no ECG gets done by itself and the ED is always a busy place. In addition, patients presenting with STEMI often have "atypical" symptoms, so history and physical exam really aren't that helpful. This combination is a potential disaster as we are often tempted to "skip just this one ECG!"



To help solve this problem, the "UPSTART Screening ECG Protocol" has been designed (Figure 6). Please review

carefully. Look familiar? It will soon be displayed in your emergency department. Always obtain screening ECGs on patients that fit its criteria, even if you think they don't need it. Sooner or later, you will have a patient who appears to be fine, but with an ECG that tells you otherwise.

Consistently obtaining screening ECGs is one of the most critical parts of the entire process. It's your only defense against a missed STEMI and a possible disastrous outcome! It's an underappreciated, but heavy responsibility.

Remember: When in doubt, do the ECG! Never rely on your clinical "guestimation" to determine who is having a STEMI.

THE STEMI ALERT Packet: The Trigger for Reperfusion

Once a patient is diagnosed with a STEMI, the clock starts ticking, right? Delay equals cell death and every minute counts. However, the ED is such a busy place – how do you instantly shift focus from "everyone" (all your other patients) to "the one" (your newly diagnosed STEMI patient)? Not only that, but then how do you remember to do all the right things in the right order? Now that's pressure!



To help solve this problem, a STEMI ALERT PACKET has been developed for your hospital. It contains all the information necessary to treat STEMI patients at your facility as efficiently as possible. What exactly does it contain?whatever works best at your facility! The STEMI ALERT Packet is your trigger for reperfusion. When a STEMI is recognized, someone (anyone) should immediately open a STEMI alert packet and pass out the enclosed forms.

Please review figure 6 for a view of a typical STEMI ALERT Packet. Yours will look very similar. STEMI ALERT Packets will be placed in one or more easily identified locations in your ED. *Do you know where they are in your facility?*

Remember: Whenever a STEMI is recognized; open "the red packet" – your "trigger" for reperfusion!

Inside the STEMI ALERT Packet:

The forms in each STEMI ALERT Packet have been carefully customized to reflect what treatment processes and practices work best at your hospital. Your packets may be slightly different than shown, but each packet will typically contain versions of the following:

- **Physician Checklist**, blue (Figure 8)
- **Nurse Checklist**, fuchsia (Figure 9)
- **STEMI Scribe Checklist**, green (Figure 10)
- **Data Sheet A**, orange (Figure 11)
- **Data Sheet B**, yellow (Figure 12)



Carefully study these forms. It's important for you to understand the function of each one. They appear rather simple. That's our goal: simplicity. In this stressful situation we are striving for perfect execution of perfectly simple processes. So, we do whatever it takes to improve the process - including color-coded sheets for faster recognition!

Remember: When a STEMI is recognized, open a red STEMI ALERT Packet and distribute the enclosed color-coded checklists. These documents allow each person to perform their essential tasks-free of error with minimal supervision. Everyone will be functioning as a team but with clear individual duties – leaving you much closer to accomplishing your goal of the earliest possible reperfusion!

Individual roles of the STEMI care team:

To simplify things, we have divided the tasks of treating a STEMI patient in the ED among three providers: Physician, nurse and scribe. (Hopefully, there will be others helping you)! The physician oversees the general process and guides treatment. The nurse is responsible for preparation of the patient, including IV access, dosing of medications and other vital tasks. Exact details will depend on **your** institution and what is best for **your** patients.

The "STEMI scribe" coordinates communication, contacts EMS, registers the patient and is responsible for completing paperwork, etc. Essentially, their number one priority is to make sure *nothing is missed*. A scribe can be a nurse, secretary, ED technician or other staff member. Note: If a designated scribe is not available, everyone simply works together to perform the "scribe's" functions. This may be the case in your ED.

This "parallel processing approach" allows each person involved to work as quickly as possible, minimizing error and delays. Everyone knows what their job is. And if you can't quite rememberlook at your sheet –it's all right in front of

you! The important thing to remember is that everyone is working as a team.

Completing Data Sheets A & B:

“Have you ever been in training for a race? How do you know if you are improving?”

In addition to the checklists we have just discussed, the STEMI ALERT Packet also contains two data sheets - Data Sheet A (bright orange) and Data Sheet B (bright yellow). They collect vital information and must be completed during the STEMI ALERT process. It is the responsibility of ED staff to fill out the top portion (section I) of both forms. They are very simple so this takes just a few moments. Each sheet has a different function:

Data Sheet A (orange) will stay in the ED. After the STEMI ALERT is over it is collected and sent to your ED quality improvement person. The black box on Data Sheet A will give you exact instructions.

Data Sheet B (yellow) is always sent with the patient when they leave the ED, whether they are going to the catheterization lab or are transferred to another hospital. Section II of Data Sheet B will be completed at the final treatment site. Again, refer to the black box for instructions specific to your hospital.

Remember: You can't improve what you don't measure - complete Data sheets A and B. Refer to “the black box” for exact instructions!

Data Sheets A and B: The Key to Continued Success

People ask “Why more paperwork? I thought you are trying to make this easier!” The answer is simple: **The information you record on Data Sheets A & B is very important in reviewing each STEMI case.** This continuing reassessment allows us to look for little things that will improve future STEMI alerts. It also lets us identify problem events and prevent them from happening again. There is simply no easier way to collect this data than to write it down as it occurs. In reality, having everything right in one location actually **decreases** your paperwork! No more hunting around for forms.

We do realize your time is very important (we work in the ED too) so we have made completing these forms as simple as possible. Plus, completing these sheets is one more way of cuing you to do the right thing – in the right order.

Why two data sheets instead of just one?

So, why do we need both Data Sheet A and B if the documents are essentially the same? Because each one has a different function and they end up in different locations. Plus, what happens if one gets lost? It's like having a spare key under the rock near your front door.

Having two data sheets is particularly important if the patient is transferred to the cath lab or to another hospital. Data Sheet B is that continuing link that allows us to calculate each patient's total reperfusion time – regardless of where (or how) reperfusion occurs. And having that information is the way we measure our success!

Remember: The yellow sheet (Data sheet B) is always sent with the patient when they leave the ED.

STEMI ALERT Data Management: Put That Data to Work!

Data sheet B: Once the STEMI ALERT is over, remember that Data Sheet B goes with the patient. Make sure it's not left in the ED. It should go to the cath lab or with the transferring EMS agency, etc. Where the patient goes, it goes! Instructions are within the black box.

Data Sheet A and the provider checklists: If you are helping with a STEMI ALERT, write comments about the STEMI ALERT on your provider checklist or on Data Sheet A. Data Sheet A and the provider checklists will be collected, placed in an envelope and sent for immediate case review. By helping complete the data sheets and writing comments on your form, you will help improve the process for the next patient. We need to know the bad!and the good!

Remember: We can't improve what we don't measure! And we can't measure what you don't write down! Take those few minutes to complete the data sheets and provide comments!

A final review of the four keys steps

As a final review, please examine the “Basic Processes Flowchart” one more time (figure 5). Do all the little details now make more sense?

1. Obtain screening ECGs on all patients who meet criteria, not just those who look sick.
2. When a STEMI is recognized, open a STEMI ALERT PACKET and follow the instructions.
3. During the STEMI alert, remember to complete Data Sheets A and B.
4. after the STEMI alert, record your comments and turn in documents as directed.

Your hospital or system may utilize other Project UPSTART forms such as the Cath Lab Checklist (Figure 13) or EMS STEMI Guide Sheet (Figure 14). Similar in appearance to other Project UPSTART forms, they are used to fully integrate EMS and the cath lab into the STEMI treatment process.

Section II: Project UPSTART Provider Training Video

This video was developed to further explain the UPSTART process. It is available at www.projectupstart.com.

Section III: Project UPSTART Provider Competency Exam (Sample version)

(Downloadable version available at www.projectupstart.com)

Please complete the following questions and turn in as directed by your institution. You may refer to the provider training text and video for assistance during the exam.

Name: _____

Institution: _____

Date: _____

() *(Initial please)* I certify that I have read the provider training text and have viewed the training video prior to completion of this exam.

- 1) **True / False (circle one) Time to reperfusion in patients with ST-Elevation MI (STEMI) is one of the most important factors in successful treatment – particularly early in an infarct. This is because most damage happens quickly after blockage first occurs.**
- 2) **Which one of the following is NOT one of the four keys essential in STEMI detection and treatment utilizing Project UPSTART?**
 - a. Consistent utilization of the “UPSTART Screening ECG Protocol” as a guide for obtaining screening ECGs.
 - b. Immediate opening of a STEMI ALERT PACKET whenever a STEMI is detected.
 - c. Completion of Data Sheets A & B during a STEMI ALERT.
 - d. Insuring proper Data Management – making sure that forms go where they need, allowing for evaluation and feedback.
 - e. Always calling the cardiologist before treating the patient.

- 3) **Why is the use of a STEMI ALERT PACKET so important when a STEMI is detected?**
- The checklists in the packet give each person involved in treating that STEMI a very clear idea of what they need to do.
 - It allows coordination of effort between the physician, nurse and STEMI scribe; this permits the patient to be treated quickly and efficiently with minimal wasted effort.
 - Completion of the data sheets within the packet allow for reliable collection of certain information that is very important for quality improvement.
 - Opening the packet alerts the nursing supervisor that a STEMI is in progress.
 - A, B & C are all important benefits of opening the STEMI ALERT PACKET.
- 4) **True / False (*circle one*) It is easy to tell by history taking and physical exam if a STEMI is occurring; the screening ECG merely confirms the diagnosis.**
- 5) **Which of the following answers is correct?**
- Patients with STEMI always benefit from treatment with PCI (heart catheterization) as compared to thrombolytic drugs - even if they have to wait several hours to get to a PCI lab.
 - Obtaining screening ECGs on all patients who fit criteria is the only way to reliably avoid missing STEMI in patients with “atypical symptoms”.
 - During a STEMI ALERT it’s important that the patient be treated as quickly and efficiently as possible: TIME =MUSCLE!
 - Data Sheet B (yellow) is completed during the STEMI ALERT and is always sent with the patient to their final treatment site (i.e. the Cath lab or to another facility).
 - B, C & D are all true.

Questions 6 – 10 are matching. Use each answer only once.

- | | |
|--------------------------------|---|
| 6) ___ R2R | a. The STEMI ALERT PACKET. It contains data sheets A & B and the provider checklists; it should be opened for every STEMI ALERT. |
| 7 ___ Accurate data collection | b. “ <i>Recognition to Reperfusion</i> ” The interval between STEMI detection and reperfusion treatment. Shortening this interval is our goal. |
| 8) ___ STEMI Scribe | c. Orange in color. Filled out during a STEMI ALERT; it is then sent to the ED QI person. |
| 9) ___ Data Sheet A | d. The key to improving any complicated process such as the STEMI ALERT process. |
| 10) ___ Bright red in color | e. A key member of the STEMI treatment team. They insure nothing gets overlooked and play a key role in communication. Can be any member of the ED staff. |

11) **True / False (*circle one*) Data Sheets A & B are complicated and take a great deal of time to complete during a STEMI ALERT. It’s therefore better to complete them after the alert is over.**

12) **All of the following regarding Data Sheets A & B are true *except*:**

- The use of two data sheets prevents the loss of valuable data if one is misplaced.

- b. All ED staff members involved in a STEMI ALERT should work together to complete Data Sheets A & B during the alert, not afterwards.
- c. Its very important that the data sheets are completed; they help improve the next STEMI ALERT thru provider feedback based on the information on the sheets.
- d. Data sheet B is always sent with the patient when they leave the ED; the second part of the form is filled out by the Cath lab or receiving hospital.
- e. Data sheets A & B are part of the medical record. Therefore, never fill them out if a delay has occurred in the process. This will protect the hospital from liability.

13) True / False (*circle one*) The role of the nurse is extremely important during a STEMI ALERT. They are the key person responsible for fast and efficient preparation of the STEMI patient for the PCI lab or for administration of thrombolytic medications.

14) True / False (*circle one*) Early detection of STEMI on screening ECG is the essential first step of STEMI care since without early recognition there can be no progress towards early reperfusion!

15) All of the following are key components of Project UPSTART except:

- a. The careful measurement of *Recognition to Reperfusion* time on every STEMI patient, even if they are transferred to another institution.
- b. The emphasis on aggressive use of screening ECG's to detect STEMI early!
- c. The use of data collection to find the individual responsible for each delay and punish them.
- d. The emphasis on working closely with each institution to determine what works best for STEMI patients presenting at their institution and then customizing the UPSTART process to incorporate these best practices.
- e. The use of prompt provider feedback to rapidly address problems or concerns.
- f. A focus on a systematic approach to improvement rather than looking at individual error.

16) True /False (*circle one*) Time to treatment is extremely important in STEMI. ¹Therefore we should do our best to minimize R2R time for every patient, even if we are currently meeting national 13standards.