

# Using Performance Tools to Improve Door-to-Balloon Times in the ER

## Outcomes

Door-to-balloon times have improved from 50% to more than 70%. Suspicion is that the number is even better, and that improved documentation of patients exempt from the 90-minute requirement—another Lean project—will reflect even greater improvement.

In the vernacular of the cardiologist, when a patient enters the Emergency Room (ER) with chest pain, “Time is muscle.” During each moment of a heart attack, or myocardial infarction, heart muscle may be dying.

In the case of the ST segment elevation myocardial infarction or STEMI, guidelines call for a tiny catheter to break through the blockage in the blood vessel that’s causing it within 90 minutes of the time the patient arrives at the ER. This procedure, called percutaneous coronary intervention or PCI, is sometimes called balloon angioplasty. The 90-minute “door-to-balloon” guideline is recommended by several respected medical organizations<sup>1</sup>.

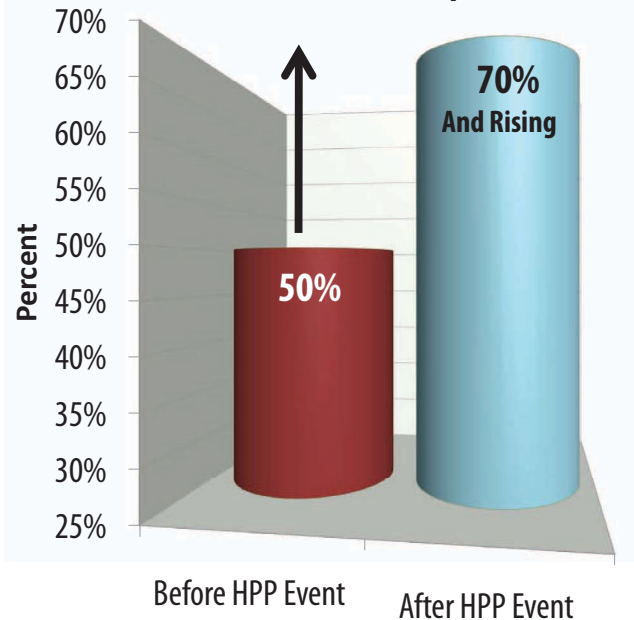
Everyone agrees that this guideline is a good idea, that the clinical information supports it. It’s doing it that poses the challenge.

### Making work easier

One of Oklahoma’s largest healthcare facilities had already decided to embark upon a Lean journey, adopting Lean methods throughout their hospital network. To accomplish this they hired HPP’s team of healthcare consultants with years of experience in healthcare.

The ER at the hospital averages 6,500 visits per month, the highest ER volume in the state. Achieving 90-minute door-to-balloon times in this fast-paced and complicated environment would require just the kind of help that Lean can provide. This predisposition toward efficiency of the private physician group in the ER creates a fertile environment for Lean improvements.

## Door-To Balloon Goal Compliance



### The drill as observation

The first task in any Lean encounter is to observe the process. Because observing a real patient walking into the ER experiencing a STEMI would not have been possible, the team decided to conduct an authentic simulation as a drill. With the HPP consultant as the “patient,” the drill uncovered glitches in the system. Staff could not quickly locate a wheelchair, the EKG monitor, or the ultrasound machine. Without a checklist, efforts weren’t as coordinated as well as the staff would have wished.

Trying to do her best for the “patient,” a short-statured nurse removed a monitor from high on a wall, only to have it fall to the ground. This event was captured on videotape and used in a later 5-day Kaizen learning session. Staff would have the chance to contemplate how they would have felt had the nurse been injured, had the

<sup>1</sup> Organizations recommending this guideline include the American College of Cardiology (ACC) and the American Heart Association (AHA). A door-to-balloon time of 90 minutes is also a core measure of the Joint Commission (formerly JCAHO).

### MAJOR AREAS OF TIME SAVINGS

	Current	Future	Diff	%
Door to EKG	10	8	-2	<b>-20%</b>
Cath Lab Setup and Transport	21	10	-11	<b>-52%</b>

delay impeded patient care, or less significantly, had the expensive machine been damaged. And they would have a chance to brainstorm solutions that would ensure that no nurse would ever go through that frustrating and potentially dangerous experience again, and that each patient would have the monitor available when and where needed.

#### Building on change

During a 5-day Kaizen event, the staff attacked the problems that had impeded them during the drill. The solutions included:

- Creating a labeled parking place for a wheelchair specific for chest pain patients. Not only is there a sign on the wall, but the floor is taped to mark the spot.
- Labeled and taped parking places for EKG and ultrasound machines.
- Installed monitors in each room, and keep one transportable monitor in a labeled parking place.
- Created a door-to-balloon tracking tool and checklist. This list includes a way to document patients who, for clinical reasons, are excluded from the 90-minute requirement.

Because people doing the work devised the changes after due analysis and deliberation, and because they have made it easier for staff to do the right things, the improvements have been sustained and built upon.

#### RESULTS

Door-to-balloon times have improved from 50% to more than 70%. Suspicion is that the number is even better, and that improved documentation of patients exempt from the 90-minute requirement—another Lean project—will reflect even greater improvement.