Abstract 28

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Title: Every Minute Counts: Identifying Phases to Shorten Door-to-Balloon Time

Background:
SUMMATIVE STATEMENT Data analysis of research studies from the National Registry of Acute Myocardial Infarction (NRMI) shows that the lowest mortality rate detected was in patients who have undergone percutaneous coronary intervention (PCI) within 60 minutes from presentation. Higher mortality occurred if patients had interventions beyond 120 minutes (2004). Every minute counts to lower the risk of death and avoid serious irreversible damage to the heart muscles. Multidisciplinary coordinated effort optimizes patient outcome and quality improvement in reducing door-to-balloon (D2B) time. OBJECTIVES Identify each phase of the process that potentially contributes to the timeliness of reperfusion. Obtain a multi-disciplinary ownership, support, and coordination to help achieve the goal of less than 60 minutes or better D2B at Bayshore Community Hospital (BCH). Develop strategy to reduce delays for patients with Acute Myocardial Infarction requiring angioplasty. Implement changes in the current process to achieve a better D2B time that exceeds National Bench Mark for ST-Elevation Myocardial Infarction (STEMI) patients. Evaluate causes of delay and suggest recommendations to correct the problems.

Methods:
Coordinating multidisciplinary team including Cardiologist, Nursing Supervisor, Hospitalists, Emergency Department (ED) Physicians, Intensive Care Unit (ICU), ED, Cath Lab team, and Technician staff. Reviewing 61 cases of Action-eligible STEMI patients at BCH paying close attention to ED Pause and Lifenet alert system in an attempt to modify the STEMI notification process and improve outcome. Improving awareness among physicians, nurses, and tech staff on attaining the target goal of less than 60 minutes D2B time or better. Educating physicians and other multi-disciplinary team of Cath lab operation, documentation, procedural preparation and one-push protocol (Lifenet) enhancing D2B timing. Concurrent and monthly peer review to assess the completeness and effectiveness of the process; feedback and recommendations reviewed and implemented when applicable. The following phases were reviewed: 1. First medical contact (FMC) to door 2. Door to Arrival at Cath Lab 3. Arrival at Cath lab to Device activation 4. STEMI activation and notification time interval.
Results:
Figure 1. BCH D2B time in 2014; multi-disciplinary and inter-departmental coordinated effort in 2014. Our median D2B time in 2014 was 50 minutes. Figure 2. 2014 ED Pause minutes versus conservative trend. The median ED Pause cases is 34 minutes comparatively much lower than the conservative trend of 50 minutes (p<0.005). Figure 3. Demonstrates the time wasted during ED STEMI code notification process. There is 2-16 minutes time elapsed during notification. Without Lifenet alert system there is 2-16 minutes time elapsed during notification. Without Lifenet alert system this process is 34 minutes comparatively much lower than the conservative trend of 50 minutes (p<0.005). Figure 4. First medical contact to device process in 2014. An average FMC to Door is 29.7 minutes; Door to Cath lab arrival is 27.8 minutes, while Cath lab arrival to Device is 24.3 minutes. Figure 5. STEMI orientation Cath lab form used in multi-disciplinary training.

Conclusion:
DISCUSSION We launched a concerted coordinated multi-disciplinary team effort aiming to reduce and improve D2B time. ED pause is implemented at BCH based on a patient's clinical criteria and Physician/Nurse Practitioner availability. STEMI cases that were transferred out to cath lab within 13 minutes are labeled ED Pause, while the cases beyond this time were considered regular conservative care. Cases requiring stabilization, cases that have PCI contraindication, and cases with nonobstructive coronary findings were not included in the calculation. D2B time improved greatly with the application of ED Pause. It had 34 minutes median time compared to 50 minutes median time in conservative treatment (p<0.005). The addition of Lifenet alert notification system this year (2015)saved an additional average of 7.2 minutes spent in notification process. We also implemented an ED/ICU/Nursing and supervisor cross training; STEMI orientation checklist (Figure 5)which reduces any unnecessary waiting time and allows the cardiologist to work as soon as possible, ultimately helping to decrease D2B time. CONCLUSION Every minute counts to improve the outcome of patients suffering with Acute Myocardial Infarction. On-going multi-disciplinary team effort, collaborative initiative, and quality improvement intervention all aim to reduce door-to-balloon time. Assuming ED Pause shall continue--and possibly in the future ED Bypass--a reduction of more or less 15 minutes is expected. Lifenet alert system saves an additional (average 7.2 minutes) time. At BCH we already achieved D2B time of less than 60 minutes. With the implementation of the current process we strive to achieve a goal of less than 50 minutes.