Asset Management–Defibrillator Dashboard
The Cost of Not Being Code-Ready

ZOLL MEDICAL CORPORATION

One of the many responsibilities of Biomedical Engineering is maintaining the fleet of defibrillators in the hospital to ensure they are always ready to use for resuscitation events, monitoring critically ill patients, or for daily procedures performed in the cardiac cath lab or electrophysiology lab. Defibrillators are classified as Life Support Equipment by The Joint Commission, so the utmost care is needed to guarantee that these devices are reliable and ready to use when needed. Asset management tools such as ZOLL's Defibrillator Dashboard™ are exceptionally valuable to Biomedical Engineering. They can save time and add value by helping hospital staff ensure that the defibrillator is ready to use the second it is needed.

The following scenarios provide a glimpse into how Defibrillator Dashboard can help Biomedical Engineering face problems when managing a fleet of defibrillators.
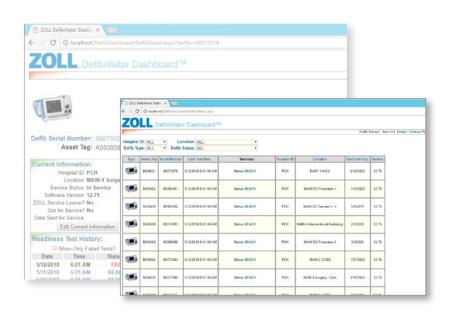
- *It's 7:00 a.m. on a spring morning in March, and the clock has sprung ahead to greet daylight saving time. The daunting task of changing all 180 defibrillator clocks ahead by one hour lurks—consuming nearly a full day of work for a biomedical engineer.*

- *Rush hour in Westchester County, N.Y., can be a nightmare. In a multi-building hospital campus, driving from one site to another to investigate a defibrillator that has been reported as having an unknown issue can be time consuming. Sometimes the issue is something as simple as plugging the defibrillator into AC power so that the battery remains fully charged.*

- *No electrodes were preconnected to the defibrillator; the clinical team is forced to make a tough decision and defibrillate an adult patient with the only electrodes they could find in the crash cart—a set of pediatric electrodes.*

Defibrillator Dashboard is an asset management tool that can help Biomedical Engineering avoid situations like the ones just described. Some other benefits include:

Time Saver – The number of defibrillators in large hospitals can easily exceed 100. Moses Cone in Greensboro, N.C., has 180 defibrillators spread across several satellite hospitals, some as far as 35 miles away from central Biomedical Engineering. If an issue arises with a defibrillator in one of the more remote locations, a staff member has to spend a minimum of an hour just to drive there, plus additional time to investigate the issue. If the problem is something as simple as checking the expiration date on the electrodes to ensure they haven't expired, this could easily be corrected by nursing staff and eliminate the drive to remote locations.

Economic Benefit – A survey of five hospitals explored the cost of maintaining defibrillator readiness. Taking into account the four most typical "readiness" activities, it was reported that each defibrillator can consume as many as 76 hours of nursing and clinical engineering time each year, with an associated annual cost of $2,622 per unit.[1] This includes the two full days required to change the clocks in the spring and the fall because of daylight saving time.

Code Readiness – Resolve problems before the defibrillator is needed in a code. The most common issue with a defibrillator not being code-ready is the lack of electrodes. Defibrillator Dashboard not only alerts Biomedical Engineering if the electrodes are missing, it will also send an alert if the electrodes have expired. The American Heart Association 2010 Guidelines recommend that a defibrillator should be "maintained in a state of readiness." And for good reason: Delay to therapy because of a missing electrode could adversely affect the likelihood of an effective first shock being delivered in a timely manner.

Simplified Maintenance and Support – Biomedical Engineering can opt to receive emails when a defibrillator fails the daily automated self-test or view the Dashboard every day to understand the code-readiness of the defibrillator fleet. An issue will be identified instantly, as will the assigned location of the defibrillator, the severity of the issue, and if it can be resolved remotely (e.g., not plugged in would initiate a telephone call to the nursing station to alert someone to plug in the device) or if it needs attention from the Biomedical Engineering staff (e.g., a battery fault message would require Biomedical Engineering to collect the battery and condition it in the battery charger).

Defibrillator Dashboard Features

Clock Sync – Accurate clock sync on a daily basis. Provides foundation for accurate reporting. Eliminates biannual time clock sync required for daylight saving time.

Remote Viewing and Administration – Web-based application provides ability to log in from any computer within the hospital equipped with a web browser or computers outside the hospital network with a VPN connection. All functions of the system are available, including viewing of individual readiness tests and the ability to manage, set up, and configure the system.

Report on Readiness Items – Including Defib, Pacer, ECG, AC Power, Battery, 30-joules Test, OneStep™ Cable, Electrode Attached, and Electrode Expiration.

Customized For Quick Identification – With the ability to add customized asset tags and hospital ID tags, Biomedical Engineering can view defibrillators from a particular building, location, or functional area. And a sortable chart can identify defibrillators that have electrodes that will expire soon so that they can be rotated to an area of the hospital where they can be used quickly. The sortable feature can also help determine if there are defibrillators that are not running the latest software; valuable information at the click of a mouse button.

Instant History of Readiness – Indefinite history logs displaying daily readiness checks provide up-to-date records, as required by The Joint Commission.

Semiautomated Support – Ability to send detailed device check log to ZOLL Technical Support for further analysis via the web application.

Three Levels of Users – (1) Alert-only users who receive emails detailing specific device issues. (2) Users who can access the web application on a limited level and receive emails detailing specific device issues. (3) Administrative users who have access to all features of the web application, including setup and configuration, in addition to receiving emails detailing specific device issues.

Alert Routing Based on Severity – Alert emails can be sent based on the severity of the device issue. For example, expired electrodes may not warrant a response from Biomedical Engineering; an email message sent to the nurse's desk may be better. On the other hand, a 30-joules test shock failure could alert specific members of the Biomedical Engineering team instead of the nurse's desk. The ability to send alerts to more than one address based on severity of the issue is available as well.

Sort by Readiness Failure – Ability to display only those R Series® Monitor/Defibrillators that failed the previous evening's Readiness Test.

Delineate R Series based on Service State – Allows for loaners to be identified, integrated, and removed from the system when returned to ZOLL. The system also allows for customized service states that can be associated with any R Series. In addition, R Series devices sent to ZOLL for service can include the date sent in for enhanced tracking.

Search – Ability to Access any R Series Readiness record via a search query tool and ability to list those R Series that have not reported successfully.

Defibrillator Dashboard is a valuable asset management tool that allows Biomedical Engineering to identify a problematic defibrillator before it becomes an issue. It saves time by remotely trouble-shooting easy-to-fix issues and provides a quick snapshot of the overall health of the defibrillator fleet—whether they're all located in one building, scattered throughout an urban city campus, or even if they're located in several small communities in a rural area.

References

[1]Benson D., et al. The cost of maintaining defibrillator readiness, A five-hospital survey. *J. Clinical Engineering.* 2010; 35:1:32-38.

[2]Link, MS, et al. *Circulation.* 2010;122[suppl 3]: S706 –S719