

Looking for Trouble: Proactive Troubleshooting

James Fanning

Biomedical technicians spend a great deal of time inspecting and repairing clinical equipment, and managing the technical resources of their hospitals and accounts. Much of the time, biomedical technicians are reactive, responding to device failures as they troubleshoot equipment. However, there are also many ways that techs can be proactive in their efforts to increase the uptime of a device.

To be proactive means that one takes measures before an event happens to mitigate or lessen the effects or negative consequences of that event, whether it be a loss of an ECG waveform or an IV pole tipping over and damaging an infusion pump. Anything that is done beforehand to help troubleshoot and repair equipment could be considered proactive. In preventive maintenance (PM), one seeks to reduce the occurrence of failure, for example by lubricating a drive screw or replacing a worn belt. With proactive troubleshooting, the goal is to reduce the time spent evaluating and correcting the problem.

Become an Equipment Expert

Ensuring that all technicians are thoroughly familiar with the hospital's equipment is one way to be proactive. Some clinical or biomedical engineering managers may assign technicians who are new to the hospital or even the biomedical field to perform preventive maintenance inspections for a length of time. This assignment helps the technicians become familiar with most of the equipment in the inventory. With this experience, they should be more prepared to troubleshoot problems with the devices they have been inspecting as they have become more knowledgeable about their operation and function.

James Fanning has worked in the clinical engineering department of Corning Hospital in upstate New York for 20 years. He has been a CBET since 1987 and achieved the CRES in June 2003. Fanning recently traveled to Venezuela with Operation Smile (www.operationssmile.com).



Check Points

Fix small problems before they become bigger by:

- ✓ Learning as much as possible about equipment.
- ✓ Building strong relationships with users.
- ✓ Ensuring equipment problems and repairs are documented.
- ✓ Keeping up with software upgrades.

For example, in one situation a biomed was paged stat to a procedure room where nurses were frantically troubleshooting an electrosurgical unit that wouldn't work. The biomed was quickly able to see, even in the darkened room, that one wire to the disposable patient pad was broken at the connector. He replaced the pad and the procedure was able to continue. The biomedical technician was familiar with the most probable causes of difficulty with this particular equipment since he had set it up and performed inspections on it several times prior to this event. In this case, familiarity bred confidence in his ability to fix the equipment and allowed him to gain the trust of the clinical staff.

You can also make it a point to shadow a vendor's field service representatives as they perform new equipment installations, conduct preventive maintenance, or perform repairs during the warranty period. You can learn a huge amount about the equipment by tagging along and observing his or her actions, comments, troubleshooting technique, and repair strategy. While some field service reps discourage being observed, most are willing to share their knowledge. This is the time to ask questions and clarify things read in an operator's or service manual. While it may not be good for the vendor's bottom line if an expensive service contract is declined, it is in the best interest of the patient and the hospital if the equipment can be repaired quickly.

Another great way to be proactive is to make it a priority to stay abreast of any manufacturer's software upgrades that may be available. Many times a problem is encountered and the tech finds out that there has been an upgrade available for some time that addresses that very issue.

Good documentation of the symptoms and actions taken to troubleshoot an intermittent problem is another way to be proactive. If technician A checks out a failed monitor and it begins to work properly, he may verify its performance, do a safety inspection, and put it back into service. Two weeks later, the monitor experiences the same problem and technician B gets the service call. Unless technician A took the time to document the symptoms and what he did to diagnose the problem, technician B will have to start from scratch. Good communication will help narrow down the failure and decrease the time to correct it. Similarly, proper reporting and documentation of problems by the user of the device are also key.

Biomed techs can also help themselves in their efforts to troubleshoot equipment problems by using biomed societies and e-mail forums to stay informed of issues in the field.

Build Relationships with Users

Take the time to establish relationships with those who use and have contact with the equipment. This is called recruiting allies. It involves building relationships with more than the nurses, technicians, or technologists who operate the instrument, but also those folks like housekeepers who clean it or aides who may transport it.

Some nurses champion the cause of ensuring safe equipment and will report problems on a regular basis. Encourage this behavior and foster these partnerships. Someone who notices a strange odor or unusual sound and actually takes the time to report it is the biomed's best friend. Often, a minor problem can be addressed before it turns into a major one. It may be frustrating to look for a problem that doesn't exist, but a thorough evaluation may reveal one that does. Reinforce the policy of red-tagging defective equipment and entering information like the contact person's name, a good description of the problem, and the equipment's control or asset number.

Consistent use of "rounding" is a great way to establish and maintain these relationships. Rounding involves making rounds with the intent of discovering equipment

issues, establishing relationships with staff, being aware of the department needs, and maintaining a presence on the front lines. Every biomed has been collared as they walk through a department and told about problems with this or that piece of equipment. It's not that there weren't any problems, but that the problems were not being reported. Rounding puts you there, in the department, and encourages reporting.

During rounding, one might be called to do some impromptu inservice training for a new staff member or tighten a screw on an equipment cart. This is an opportunity to help the staff understand a biomed's lingo or vice versa. In one instance, a nurse commented to a technician on his way through the department that there was a problem with "the accordion thing" on an infusion pump. He finally understood that she meant the peristaltic pump mechanism, which turned out to be broken and could have resulted in a serious over-infusion incident had it not been reported.

The Goal: Fix Problems Early

Troubleshooting is all about solving problems, and solving them before they result in patient injury is what being proactive means. Disasters are often the result of several small failures that are left unreported or unresolved. It's the biomed technician's responsibility to be aware of and address the small problems in a proactive manner, before they have a chance to become bigger. ■

Keys to Proactive Troubleshooting

- Use PMs to become an equipment expert
- Shadow vendor field service representatives
- Keep up with software upgrades
- Use biomed societies and e-mail forums to stay informed
- Document equipment problems and repairs
- Recruit allies from device users and others
- Support the champions of safe equipment
- Reinforce policies of red-tagging defective equipment
- Use "rounding" to establish and maintain relationships