

Bedside barcoding for the blood bank

By Paul Sharman

Barcodes have become the standard means of identification in many industries ever since one appeared on a package of Wrigley's gum sold in Ohio in June 1974. So, why have hospitals been so slow to embrace a technology made popular at the same time as polyester pants?

When it comes to barcode verification at the bedside, the blood-transfusion process is particularly well suited. By using the latest mobile personal digital assistants (PDAs) with integrated barcode scanners, caregivers easily can scan their I.D. badges, the patient's wristband, and the blood unit to ensure the right blood is going to the right patient. They can even record vitals, reactions, and the volume transfused.



Our staff refused to give up the initial pilot equipment because it improved patient care and safety so much.

Implementation of these systems has been slow because as Dr. Jay Brooks of the University of Oklahoma Health Sciences Center correctly states, "Efforts to make blood transfusion as safe as possible have focused on making the blood in the bag as disease-free as possible. The results have been dramatic, and the costs have been correspondingly high. ... We should turn our attention to enhancing overall blood safety by focusing on improving the pro-

cess of blood transfusion."¹

Traditional approaches to improving safety at the point of blood transfusion have mostly resulted in adding yet another check in an already-complicated procedure. In contrast, new barcode-based bedside-verification systems consistently lead the caregiver through the correct process and, in many cases, reduce the number of steps.

In order to facilitate bedside verification, barcodes need to be printed on the caregiver badge, the patient wristband, and the blood unit. Fortunately, barcoded caregiver I.D. badges are now commonplace, blood units come from the blood-donor center pre-barcoded, and barcoding wristbands is easier than lab personnel may think. Unfortunately, selecting the right system and implementing it effectively can be tricky. So, the following top 10 tips to implementing barcoding verification at the bedside should help.

1. Select easy-to-use software.

Carefully consider the end-user of any upcoming software purchase. Too many software applications are purchased based on the extensive number of features that they may contain

and not on the user's ability to efficiently use the 10% of features that he will end up using 90% of the time. Easy-to-use software leads the end-user through a series of steps that ensure the standard operating procedures (SOP) of the hospital are followed. Scan the caregiver I.D., scan the patient wristband, and scan the blood unit. Complicated menu screens should be avoided at all costs. Many IT projects have failed because they do not recognize that

older workers do not want to have to learn a complicated software application in order to complete a traditionally simple task.

2. Use 2D barcodes. Modern barcodes fall into two symbology groups, one-dimensional (1D) and two-dimensional (2D). A 1D barcode is what you would find on a pack of gum. It can only contain a small number of characters. A 2D barcode on the other hand can contain thousands of characters in half the space. This makes it ideal for identifying patients because with just one scan, the patient's hospital number, last name, first name, date of birth, and gender can be read — which more than exceeds the 2007 JCAHO (Joint Commission on Accreditation of Healthcare Organizations) recommendation of two patient identifiers. 2D barcodes are also easier to scan on a curved wristband and, due to their smaller footprint, multiple copies of the same barcode can be used on different places of the wristband to further increase the ease of scanning.

3. Use software that does not require wireless infrastructure.

Handheld software falls into two categories. The first is a thick-client approach, which means that a traditional software application is installed on the handheld, and it processes patient data independent of a wireless (802.11x) connection (e.g., users do not need to be connected to a network to use Microsoft Word). Most well-designed applications will communicate with the server only when necessary (e.g., retrieve information from the laboratory information system [LIS], upload records, and so forth) while ensuring that configuration and application updates can be done automatically from the central server. This reduces traffic on the network and ensures that the staff can continue to use the system if there is a network problem.

The second approach is called a thin-client which means that the data processing is done on a server, and the end-user essentially uses the handheld's Web browser just to display information. This means that the handheld must always be connected to the

server via a wireless connection. For most hospitals, wireless is just beginning to become a reality; even if full implementation has been achieved, there may be wireless shadows that can interrupt usage. When it comes to building confidence in a new process, avoiding any possible technical disruption is critical.

4. Do not wait for RFID. Much media attention has been paid to radio frequency identification (RFID) in the last few years. Although the concept of RFID is quite appealing, the additional cost is not. Following the initial implementation, barcode printing is a proven technology that is essentially free. With RFID, not only are the initial implementation costs higher, but each RFID tag used must be paid for (approximately \$1). Why spend the additional money when 2D barcodes can contain just as much information and are almost as easy to scan?

5. Track blood before it gets to bedside. The bedside check is the last opportunity to discover an error but incorporating checks throughout the process is equally important. A few vendors provide systems that include tracking and verifying blood at the refrigerators. By linking the blood bank to the remote refrigerators to the bedside, the laboratory can truly close the loop on blood transfusion.

6. Think beyond blood transfusion. Select a system that includes modules for sample collection, mother's milk verification, and more. This enables the hospital or laboratory to have one device from one vendor. The implementation costs will be lower and can be shared across multiple departments.

7. Do not wait for the large LIS companies. Large LIS companies move slowly. They move even more slowly when developing solutions outside of their core competencies. A few companies specialize in bedside verification; their expertise and attention to detail will be key to a successful implementation. Not only will the lab's bedside solution be tied to its LIS provider (i.e., changing an LIS requires changing the bedside solution, which will affect users outside of the lab), but also the lab or the hospital will be limited by the number of modules the vendor can provide; refer back to Point 6.

8. Involve nursing early in the process. Nobody wants to be forced into changing her current process so consult with the end-users as soon as possible.

Emphasize the benefits of patient safety and time savings (once users become familiar with the system) while keeping everyone up-to-date with the progress of the implementation. Nursing "buy-in" is critical to the success of the bedside solution for the blood bank.

9. Appoint a project manager. For an implementation that involves multiple departments, such as bedside checking, one person within the hospital must be directly accountable for the project. If the laboratory is heading up the project for its blood bank, this person should co-ordinate among the laboratory, the vendor, IT, and nursing, and ensure the project remains on schedule. Post-implementation, the project manager should continue to follow-up to ensure the system is being used effectively.

10. Training is key. Once users begin to use the equipment, three types of users will begin to emerge. Thirty-three percent of them will require almost no training and will have no problem adapting to the new technology. Another 33% will require one or two training sessions. The last 33% will require constant training and follow-up. These users may provide significant push-back early on in the process but, after a period of time, will gain confidence with the system and may end up being the bedside barcode solution's biggest supporters.

Dr. Jeannie Callum of Toronto's Sunnybrook Hospital successfully followed these guidelines and reports, "Our staff refused to give up the initial pilot equipment because it improved patient care and safety so much. That success has spurred an overall organizational initiative to pursue barcoding on a larger scale."

So, by adhering to these tips, any laboratory or hospital can afford patients the same level of identification and traceability as that pack of gum while improving workflow and compliance to SOPs. Remember that the ultimate goal is safer, simpler healthcare. □

Reference

1. Brooks JP. Reengineering transfusion and cellular therapy processes hospitalwide: ensuring the safe utilization of blood products. *Transfusion*. 2005; 45(suppl 4):1595-1715.

Paul Sharman graduated in applied science and is currently a project manager for Neoteric Technology Ltd. in Vancouver, British Columbia. The company (www.neoterichtech.com) specializes in blood tracking, dispensing and verification systems. Its BloodTrack product recently achieved FDA clearance for sale in the United States.

BLEACH tedium



VS.



efficiency

Automatically dilutes bleach to 10%

***Because your staff has
better things to do!***

ACTIVATE™

BLEACH DILUTION SYSTEM



deardorff fitsimmons corporation
www.activatebleach.com
1-888-582-2700

Visit www.rsleads.com/701ml-004