Photo courtesy of Health Care Logistics

By Ron Schneider, Jonathan Bagby, Ruth Petrich, and Nancy Smestad

Resolving **Bar Code** Issues in a **BCMA System**

Medications or patient wristbands that do not scan at the point-of-care can be frustrating for end-users of bar code medication administration (BCMA) systems and can lead to potentially dangerous workarounds. It is important to understand that the bar code is not always the problem. Many variables impact the ability of a scanner to effectively and correctly decode a medication or wristband bar code, including bar code quality, scanner malfunction, medication missing from the data dictionary, order input and/or finishing errors, incorrect medication dispensed, incorrect units dispensed, or human error. Knowing how to effectively troubleshoot these issues will help resolve the problem quickly.

Troubleshooting problematic bar codes requires skills not normally taught in pharmacy or nursing school, rather these skills are generally learned through experience, and require an understanding of work processes outside an individual's normal work discipline. Solving a scanning problem requires knowledge of the complete system integration of physician orders, pharmacy medication order input and/or finishing, the steps needed to add medications to the data dictionary, medication delivery processes, and medication administration. With comprehensive training and experience, successful troubleshooting can be consistently maintained.

Photo courtesy of Honeywell

Remember to include hardware issues in training materials and competency reviews.

Training across Disciplines

Too often it is assumed that BCMA is primarily a nursing tool and thus only nursing staff require training on the system. This assumption is inaccurate and will lead to circumvention of the system when problems are not solved in an expedient manner. If other disciplines do not understand the system, the nurses are left on their own to interpret and troubleshoot problems, many of which are outside their scope of practice. While nursing staff should be familiar with the entire BCMA process, they cannot be expected to have expertise on pharmacy issues, such as order finishing and bar code labeling. All staff interacting with the BCMA system must understand the system basics and be thoroughly trained. In addition to nurses, staff trained on the system should include all pharmacy staff, respiratory therapists, clinicians (nurse practitioners, providers, etc), and IT personnel.

Multiple end-users from all the departments using the system should become proficient with it so there will be help available should a problem arise on any of the shifts. For example, a part-time nurse having a problem scanning a medication bar code during the weekend shift should not have to be told to wait until Monday to correct the problem because there is no one available to help troubleshoot the issue. This approach inevitably creates a workaround that can potentially cause a patient safety issue.

Pharmacists Ensure Success

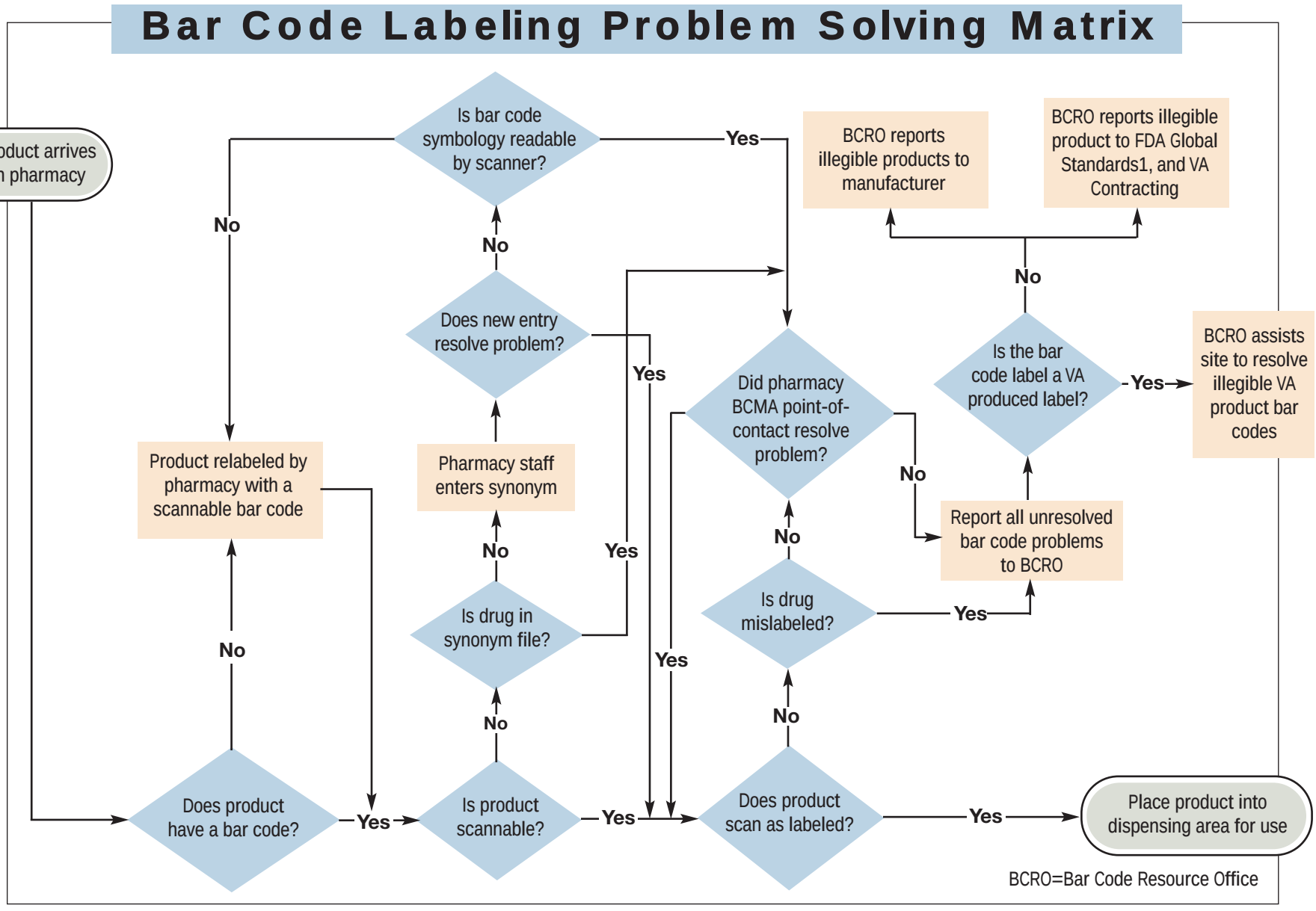
Pharmacists play a key role in ensuring the success of BCMA and—as the suppliers of medication—are often called upon to solve bar coding issues. In most BCMA systems, the order does not appear in the system until it has been reviewed and finished by a pharmacist. A pharmacist trained in BCMA problem solving should be present on all shifts. This will ensure swift resolution to most problems that arise. Pharmacy staff with the authority to add medications to the data dictionary should be available during major medication administration times. Ensure that all pharmacy computers have access to the BCMA system so pharmacy staff can view the same screens as nursing to better assist when problems arise.

Bar Code Education

Assuming training materials are not provided or updated by the vendor, a bar code educator position should be established. This person should be experienced with the system and have good verbal and written communication skills. The educator's responsibilities should include developing lists of BCMA processes established by the multidisciplinary committee, creating training guides and checklists for new staff orientation, and designing the yearly competency review test for the staff. Keep in mind that the training materials must review both software and hardware issues; basic hardware issues are often overlooked in training end-users in problem solving.

The bar code educator should develop a verbal, written, and hands-on introduction to the institution's BCMA software. The education should be geared toward all BCMA end-users, but may have more detailed instructions for nursing and pharmacy staff. The initial competency process begins with software orientation in a classroom setting, away from the distractions of the workplace. Upon completion of the training, the end-user should be able to demonstrate the ability to navigate key features of the BCMA system, describe and demonstrate scanning functionality, enter medication administration documentation, and access/submit reports. In addition, all end-users must be able to verbalize and

Table 1: Problem Solving Matrix



demonstrate the importance of bar code technology in reducing medication errors and enhancing patient safety. Following the initial classroom training, end-users also should receive hands-on training on the units to learn about practices at the point of care. The end-users should be knowledgeable about BCMA contingency plans and be able to troubleshoot common BCMA software and hardware problems upon completion of orientation. While it is important to provide information and training on how to troubleshoot issues with computers, scanners, and printers, it is not expected that the end-user will be able to solve every technology-related problem. The training should establish a contact for problems that cannot easily be solved by staff on the floor.

BCMA Multidisciplinary Team

In addition to required training, every facility using BCMA should form a multidisciplinary team comprising BCMA stakeholders. The team is responsible for defining policies; identifying process improvement issues; and setting standards for quality, appropriate use, support, and operating procedures. For example, the team should establish a pharmacy bar code quality check policy and procedure to ensure all unit-of-use medications delivered to the point of care contain a machine- and human-readable bar code. This quality check should encompass all facets of pharmaceutical dispensing, including IV admixtures, manufacturer unit-of-use medications, controlled substances, and pharmacy packaged unit-of-use medications. Any quality or performance improvement initiatives developed by the multidisciplinary committee also should include clearly stated, measurable performance goals. Continuously reviewing performance and revising goals are fundamental to maintaining the momentum of the committee.[1]

Bar Code Quality Monitoring Program

Facilities should establish a pharmacy bar code quality monitoring program to ensure all unit-of-use medications delivered to the point of care contain a machine- and human-readable bar code.[2] The bar code multidisciplinary committee should establish and set quality monitoring parameters and performance improvement measures.[1] Bar code quality measures should ensure at least a 95% success rate with reading of bar codes at the point of care. Bar code labeling should encompass all facets of pharmaceutical dispensing: unit dose, IV admixtures, manufacturer unit-of-use medications, controlled substances,

and pharmacy packaged unit-of-use medications. Quality measures should be established to troubleshoot and correct all non-recognizable bar codes ensuring these do not reach the patient bedside. A trouble shooting matrix was developed by the Department of Veterans Affairs (VA) and can be used as a model to establish a specific troubleshooting guide (Table 1).[2]

Reporting Bar Code Failures

Establishing a procedure for staff to report bar code failures is crucial. You should also designate a bar code failure coordinator. Any medication that cannot be scanned should be saved and sent to the coordinator for follow-up. The reporting mechanism must be easy for the end-user to complete while still obtaining precise information to allow for effective resolution. Start with a template that includes the information needed to follow through on a problem, such as manufacturer, lot number, and expiration date. Also, include instructions on how, and to whom, the information should be communicated to. If it is determined that a failure is due to the bar code print quality, the quality assurance department at that supplier should be contacted to investigate the problem. Once resolved, staff members should be notified by e-mail or a posting on the bulletin board in the medication rooms. Letting staff know that their input in reporting problematic bar codes has made a difference will encourage this process.

Photo courtesy of RxScan

Reporting problem bar codes to the manufacturer is key to improving overall bar code quality.

Reporting problem products discovered by pharmacy and end-users to the manufacturer is often overlooked as a mechanism to improve bar code quality. If one health care system is having an issue with a particular product, other systems will be as well. Most medications used in a hospital pharmacy should have a bar code on the unit of use product under the FDA's April 2006 mandate, although compliance is still not 100%.[3] Whenever there is not a bar code on a unit-of-use medication, the product should be reported to the FDA through its online Med Watch reporting program. The more reports of problems that the FDA receives, the sooner problems will be solved. Poor print quality issues should be reported directly to the manufacturer's quality control department; in addition, records should be kept about the problem and any rectification. The American Society of Health-System Pharmacists has developed an online reporting system as well, but it currently just collects data and does not report issues to pharmaceutical manufacturers. Global Standards 1 US (GS1) has developed a reporting system that will verify the print quality of a product and send the facility a report delineating specific problems. GS1 often contacts pharmaceutical manufacturers about specific problems. The VA has developed its own internal reporting system, which verifies print quality and notifies pharmaceutical manufacturers about problematic bar codes. The VA also includes a clause in all purchase agreements requiring manufacturers to comply with international print quality standards.

Conclusion

There are still numerous challenges to implementing a BCMA system, including the absence of manufacturer bar codes on units of administration, a lack of universal bar code data standardization for health care, and a dearth of contractually mandated bar code quality standards communicated to manufacturers/packagers. Continuous quality improvement programs are an important part of any BCMA project, and will ensure end-user needs are addressed. Performance improvement relative to quality measures is an essential component of the BCMA process to quantify improved patient safety and quality outcomes. ■

Ronald Schneider, RPH, MHA, is the pharmacist consultant for the Department of Veterans' Affairs Bar Code Resource Office. He has an extensive background in pharmacy automation systems and operations. He holds a BS in pharmacy and a master's degree in health care administration from the University of Maryland.

Jonathan Bagby, RN, MSN, MBA-HCM, is a nurse consultant for the Department of Veterans Affairs' Bar Code Resource Office and has a background in medical, surgical, and orthopedic nursing. Jonathan holds a BS in nursing from Virginia Commonwealth University and a MS in nursing and business administration from the University of Phoenix.

Ruth Petrich graduated from Dallas Baptist College in 1983 with a BSN and Texas Woman's University in 1997 with a master of science. She has 26 years experience in the nursing profession. Ms. Petrich's work focuses on the use of technology in improving patient care and facilitating end-user workflows.

Nancy Smestad has worked as a pharmacist for the Department of Veterans Affairs for 25 years. She is currently the pharmacist consultant to the Veterans Health Administration Office of Information Patient Safety/Information Technology. Ms. Smestad evaluates medication management issues arising from software related scenarios, and serves as a technical advisor for the Office of Information (OI) in matters relating to improving patient safety within OI information systems. Ms. Smestad received her BS in Pharmacy (1978) and her MS in Pharmacy Practice (1981) from North Dakota State University College of Pharmacy.

References

1. The VA's multidisciplinary approach to bar coded medication administration implementation. *Pharm Purch Prod*. 2009;5:42-44.
2. Quality monitoring program for bar code assisted medication administration. *Am J Hosp Pharm*. 2009; 66:1125-1137.
3. Bar code label requirement for human products and biological products. *Food and Drug Administration*. 2004 21 CFR 201,606 and 610.