



## Pharmacy Informatics Task Force

### Managing a Barcoded Medication Inventory

Fully bar coded inventories are prerequisites for numerous patient safety and pharmacy automation solutions. Often, **barcoded medications are obtained through multiple channels and used with multiple systems** creating a complex management scenario. This document is intended to provide initial guidance for institutions managing a fully barcoded medication inventory.

The primary goal of this process is to ensure that all medications are accompanied by an accurately mapped and readable barcode. Inaccurate or incomplete mapping can render barcode safety checks unavailable, or worse provide a false positive check that may contribute to a medication error. Unreadable barcodes may result in treatment delays, workarounds and a loss of confidence in the system. **In this guidance document we consider the sources of variation that lead to inaccurately mapped or unreadable barcodes** and suggest methods to address them. Our focus is limited to variations that can be managed or intercepted by departments of pharmacy.

This guidance document is narrow in scope and of a general nature. As such, it is not an exhaustive treatment of the subject and should be supplemented with additional resources. Further, it is assumed that readers have a functional understanding of barcode symbologies, 1-D and 2-D scanners and “one-to-many” barcode mapping.

**Recommended reading:** Neuenschwander M, Cohen MR, Vaida AJ, Patchett JA, Kelly J, Trohimovich B. Practical guide to bar coding for medication safety. *Am J Health-Syst Pharm.* 2003;60:768-79.

#### Variations leading to inaccurate barcode mapping

- **Receiving new items into inventory** - Formulary changes, generic availability, substitutions during shortages and other common events can introduce new manufacturer barcodes or new candidates for internal repackaging. These barcodes should be identified and mapped into the appropriate downstream systems before being stocked into general inventory. Accommodations for non-formulary or a patient's own medications may be necessary.
- **Internal repackaging errors** – Many pharmacies must repackage medications into barcoded unit-dose packages. Due to the ‘batch’ nature of the process a single error may result in several hundred inaccurate doses. Strategies including automated packaging devices or incorporating medication imprint / picture / bulk package barcode databases into the repackaging process should be considered.

**Recommended reading:** Cina J, Fanikos J, Mitton P, McCrea M, Churchill W. Medication errors in a pharmacy-based bar-code-repackaging center. *Am J Health-Syst Pharm.* 2006; 63:165-8

### **Specific Examples:**

- *Partial Dose Forms* – Partial packages including half tablets and unit dosed liquids from a bulk bottle usually require a unique barcode value for that partial package. The barcode of the original package is insufficient since that does not relate back to the specific the dose / strength in the partial package.
- *IV Medication Doses* – In the case of compounded products, the pharmacy dispensing label may be used to assign a patient specific barcode to the item. In these cases the identifiers for these doses must be flexible enough to allow for changes. For example, if the pharmacy system generates a new order number (used as the barcode value) with a frequency change, the current label on previously dispensed doses may not be accepted by the barcode check at the bedside even though the product and dose are appropriate.
- **Incomplete or erroneous mapping into downstream systems** – Often, medication barcodes must be mapped into several systems. Regardless of how new or updated mappings are propagated throughout these systems, a mechanism to ensure all systems are synchronized should be established.

### **Variations leading to unreadable barcodes**

- **Incompatible barcode symbologies** – Modern 1-D scanners will read the majority of linear barcodes used on medication packaging. However, newer symbologies such as reduced space symbology (RSS) may have to be specifically enabled on each scanner.
- **Printing issues** – Poor quality barcodes may be produced by manufacturers as well as by internal equipment. Samples of unit-dose barcodes received into inventory should be checked with the scanner(s) used for downstream systems. Different scanners may have different tolerances for various imperfections or barcode density (i.e. how compact the barcode is). Readability issues discovered with manufacturer supplied barcodes should be reported to the manufacturer.

**Recommended resource:** ASHP drug product bar-code problem reporting center  
[http://www.ashp.org/s\\_ashp/doc1c.asp?CID=4060&DID=7025](http://www.ashp.org/s_ashp/doc1c.asp?CID=4060&DID=7025). Last accessed May 2007.

## General workflow process

The following flowchart is a generalized workflow for ensuring medications received or packaged by the pharmacy contain usable barcodes and are mapped correctly for downstream medication safety processes. Annotations denote where potential sources of variation can be identified and possible strategies to address them.

## Barcoded Medication Inventory Workflow

