



# Selecting a Tabletop Unit Dose Packaging Machine:

## An Essential Component of Your BCMA Initiative



Photo courtesy of Pearson Medical Technologies

WHILE MOST WOULD ARGUE THAT PROGRESS IS GOOD, FEW GET EXCITED about the changes required to create progress, and many even resist them. If you are the pharmacy director of an organization that has decided to implement the proven patient safety technology of bar coded medication administration (BCMA), your department will change significantly. But try to remember – and remind your staff – it is for progress that you are changing.

As a pharmacy manager, your department's most important change will be to ensure that every dose leaving the pharmacy has a bar code identifier that indicates the specific pharmaceutical product. Some drugs can be purchased from suppliers already in bar coded unit dose packages, and some will require in-house repackaging. There are three basic ways to provide bar coded unit dose packages:

- Purchase bar coded unit dose packages of drugs, either from a pharmaceutical distributor or from a third-party packaging service provider, so that most drug therapies are in bar coded unit dose packages when they are received
- Purchase and implement one of the several major automated unit dose packaging machines
- Purchase and implement a tabletop unit dose packager, which utilizes a more manual process than the aforementioned machines

### High-Volume Automated Packagers vs. Tabletop Packagers

If you need to package a large quantity of product from bulk, it may be very desirable to use sophisticated, high-volume automated packaging equipment for the majority of your unit dose packaging. These high-end systems contain varying numbers of cubes that store bulk medications. Packaging runs can be scheduled for preset times, and other than manually maintaining a stock of bulk medications in the

cubes, these highly sophisticated machines produce bar coded unit dose packages with little to no manual intervention. Even if you are fortunate enough to have the budget and space for these systems, you will still need another piece of packaging equipment – a tabletop unit dose packaging machine. These devices, when interfaced with a computer, create bar coded unit dose packages for oral solids and most often require immediate manual supervision. “Why,” you ask, “would I still need a tabletop machine if I choose one of the first two options?” Good question, simple answer.

### The Value of Tabletop Packagers

While many of the highly automated packaging machines have trays for small runs, it is not practical to pack everything using this equipment. The most important reason is the risk of cross-contamination between pharmaceutical products. Tabletop packagers should nearly always be used for packaging “cross contaminants”, as the residue from these therapies would contaminate the therapies in the next run if the equipment is not properly cleaned. The average cleaning time between runs for high-end automation systems is around 30 minutes – a prohibitive amount of downtime, as well as a lot of effort. Cleaning tabletop packagers is much more efficient, requiring only a few minutes to do a thorough job. You also need a tabletop packager for emergent, small packaging runs, such as those for investigational drugs or a patient's own medications – tasks for which you will not want to interrupt a scheduled run on high-end equipment.

This is not a knock on high-end automation. Any pharmacy with high packaging volumes and available space and funds should seriously consider this equipment for efficiency of operations and staff satisfaction, among other reasons. However, these systems are not required to create bar coded unit dose packages in any but the largest hospitals. At Providence Health System in Oregon, two of our 500-bed hospitals manage all of their in house packaging operations with tabletop packagers. While both would like highly automated equipment, capital funds have been directed to more strategically urgent initiatives.

So, understanding you need a manual packager, what do you need to consider when selecting one for your organization? Start by evaluating your needs. Next evaluate the alternatives to better understand what you are looking for, and then evaluate the market. Once

Photos courtesy of Medical Packaging Inc.





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you have completed these steps, it is then time to evaluate the vendors.

### Evaluating Your Needs

There are some baseline decisions to be made, starting with the volumes you expect to handle. If you currently use a high-volume packager, contract with a repackaging service provider, or purchase most of your drugs in unit dose packages, you may not need a manual packager with a high capacity. However, keep in mind that a higher-capacity tabletop packager can be part of your disaster plan if your high-volume automation system breaks down.

If you do not have these alternatives available, determine how many manual packagers are required to keep up with your annual volumes. Our two 500-bed hospitals manage just fine with one tabletop each, operating about four hours per day, seven days a week to produce about 70,000 packages a month.

You also need to determine if you will need a "hot spare" in case the main tabletop packager breaks. Compare your typical amount of packaged inventory against your vendor's standard repair time: For instance, if you usually have 15 days of stock on the shelf, and your vendor averages seven days to or less to make repairs, you may not need a spare packager. Also consider your vicinity to another facility with the

same basic formulary. Fortunately, Providence has seven hospitals in the region that can provide back-up for each other up if one of our tabletop packagers fails. That said, most tabletop packagers are very well made and infrequently experience technical problems. However, if you determine you need a hot spare, purchase the same model as your primary packager so staff will not have to learn new equipment under pressure.

You will also need to decide what your specific package size and configuration requirements are. Smaller package sizes take up less space in automated dispensing cabinets and in pharmacy storage areas, but you may end up damaging larger tablets by trying to fit them in smaller packages. Some tabletop packagers allow you to switch sizes between runs, while others are engineered for specific package sizes.



Photo courtesy of Pentapack NA Corp.

Table 1. Tabletop Unit Dose Packaging Machines: Product Specifications

Vendor	Product Name	Dimensions (width, height, depth)	Weight (pounds)	Power Source Requirements	Drug Information Database	Packaging Speed (packages per minute)	Standard Oral Solid Package Size	Bar Code Symbologies	Reader Service Number
Accu-Chart Plus Healthcare	Cadet	39" x 12" x 14"	95	110 V	Pulls drug information from hospital's existing formulary database	60	1.5" x 2.0"	Linear and 2-D	1
Accu-Chart Plus Healthcare	Cadet Twin Cadet Twin 2X2	42" x 13.5" x 17"	130	110 V	Pulls drug information from hospital's existing formulary database	120	1.5" x 1.5" 1.5" x 2.0"	Linear and 2-D	2
Medical Packaging Inc.	Auto-Print Packaging System	36" x 14" x 15"	100	120 V	Standalone, based on hospital formulary	60	2" x 1.5"	Linear and 2-D	5
Pearson Medical Technologies	intelliPack2	47" x 61" x 30"	80	120 V	First DataBank	30	2" x 2" 3" x 4" 3" x 8"	Linear and 2-D	6
Pentapack NA Corp.	HP500	5' 9.33" x 2' 8.29" x 5' 9.29"	775	110 V	Pharmacy's choice of third-party database	100	1" x 2"	Linear and 2-D	7

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Choose one that can handle the package sizes your formulary requires.

It is also important to consider your pharmacy dispensing system when selecting a tabletop packager. For example, if you are using a robot to facilitate your fill process, a packager that hole-punches its packages is very useful.

In addition, determine where you will place the packager in your pharmacy. How large is it, and does it require a dedicated PC and keyboard? What are its power requirements (See Table 1.)? Where should it be placed to facilitate efficient workflow?

### Evaluating the Alternatives

As it relates to integration, there are basically three varieties of tabletop packagers:

- Those that are interfaced to pull drug information from your formulary
- Those that use drug databases, such as First DataBank and others, to pull drug information
- Those that operate with a standalone drug database – most often based on your formulary

The last two options often require that a PC be connected to the packager in order to extract the data. So consider this when determining how much space you will eventually need for your packaging operations.

If you opt to go with a packager interfaced with your pharmacy information system, I suggest working with a vendor who has already partnered with your pharmacy information system vendor. This way, the interfaces will already be developed, saving you the time and effort of working with the vendors to develop and verify the interface between their systems. You should ensure the vendors plan to continue working together in the foreseeable future. Remember, the packaged drugs need to be recognized by your pharmacy information system and point-of-care nursing information system.

If you decide to go with a packager that relies on a drug database, ensure your selection uses the same drug database as your pharmacy and point-of-care information systems. In some cases, products from the same drug database companies are incompatible, so you will likewise want to ensure compatibility at the product-line level. Finally, understand the frequency that you will receive and apply drug database

Photo courtesy of Accu-Chart Plus Healthcare



updates to both your pharmacy information system and your packager. If your pharmacy system gets monthly updates and your packaging system gets quarterly updates, consider how this may affect your data coordination.

If you determine that a separately built and maintained database is the way to go, you need to determine who will create it, what data will be used to create it, and who will maintain it. The vendors who offer this alternative frequently work with you to get an extract of your formulary database and then create your “starter set” database using information from the extract. After your packager is installed, the vendor will provide user training so you can maintain the database going forward. In most cases, you will need to make updates upon installation of the software, as there will have been changes to your formulary from the time the extract was sent to the time the file was created and loaded in your environment.

Bar code verifiers measure the quality of a bar code to ensure ease of scanning at the bedside.

We chose this last alternative, because the separately built and maintained database is less dependent on our vendors maintaining a good working relationship, and it avoids the difficulties associated with disjointed drug databases between systems, which would be contractually out of our control. With the manually built and maintained database, we value the additional control we have, however, it is important to consider the additional staff time required to maintain the database as well as the additional space required for a computer and keyboard.

### Packaging Options

You will certainly need a packager that can handle tablets and capsules, but you will also want to consider how you will handle the unit-dose packaging of syringes, vials, and liquid medications.

Syringes, vials, and ampoules can be bar coded with either standard or flag labels. Alternatively, you can use an over-wrapping machine to handle these types of doses. With an overwrapper, the packaging material is fed through the machine, the bar code and relevant drug information is printed on each unit dose bag. Then an internal air source blows the bag open, allowing one dose to be dropped into it with relative ease. The bags are then sealed at the top, creating a bar coded unit dose package for your syringes, vials, and ampoules. Machines are also available to package your oral liquids in bar coded unit dose cups of varying sizes. Most of these devices allow slight over-dosing of the drug product, as some of the medication will remain in the cup after the dose is administered.

Before choosing a device, evaluate your space needs. Be sure your equipment operator will have sufficient room to work, and that you will be able to access both incoming stock and packaged inventory. In addition to the oral solid packager, the equipment operator will need room to work, and you may need room for a PC to manage the device. You should consider placing a bar code reader nearby to validate the bar codes printed on your packages. The bar codes must be read and recognized by both your pharmacy and nursing systems in order for your BCMA initiative to be successful. Finally, consider purchasing a bar code verifier to ensure the quality of your bar codes and the bar codes on vendor-supplied unit dose packages. A verifier measures the quality of a bar code and assigns it a grade (A, B, C, D, or F), based on established American National Standards Institute (ANSI) criteria. Bar codes with a grade of less than “C” are not considered commercially viable. Locate your verifier in the immediate vicinity of your packaging machines.

### WHERE TO FIND Bar Code Verifiers:

Vendor	Website	Reader Service Number
Axicon Auto ID	<a href="http://www.axicon.com">www.axicon.com</a>	92
Barcode Planet	<a href="http://www.barcodeplanet.com">www.barcodeplanet.com</a>	93
Hand Held Products	<a href="http://www.hhp.com">www.hhp.com</a>	94
Label Vision Systems	<a href="http://www.lvs-inc.com">www.lvs-inc.com</a>	96
Printronix/RJS	<a href="http://www.rjs1.com">www.rjs1.com</a>	97
Stratix Corporation	<a href="http://www.stratixcorp.com">www.stratixcorp.com</a>	98
Webscan, Inc.	<a href="http://www.webscaninc.com">www.webscaninc.com</a>	99



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### Evaluate the Vendors

Even after you have determined your packaging needs, familiarized yourself with the available products, and determined the type of machines you need, you still have more to do. You are going to enter into a relationship with a vendor, so do your homework and evaluate the company, as well as its products. What is their market share? What is their product history? Is this the first product they have developed, or have they been in the market for a while? Is the company stable? What is their standard delivery timeframe? Who provides training, and how much training do you get? Do they have a good support structure? If there is a problem, do they come to you – and at what cost – or do you have to send the device in for repair? What is the normal turn-around time for repairs? Do they provide service after hours, on weekends, and on holidays? And finally, what is the total cost of the purchase?

From my point of view, if you get to the point where cost is the sole determining factor, you probably have not evaluated the available products thoroughly enough. In the process of doing your homework, the differentiation between vendors should become relatively evident, and the companies should fall into a priority ranking. If you choose to do business with someone based solely on a product's end cost, you may have put the least important concern first and will have to live with the consequences.

### Summary

If you are moving ahead with BCMA, you will need the ability to create bar coded unit dose packages and will most likely require a tabletop unit dose packager, even if you are fortunate enough to have high-end packaging automation. Your selection of manual packagers should be made based on your needs and a survey of what is available to address those needs. There are many options, and having a clearer picture about what to consider can help you make a decision you will be content with for years to come. ■



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