McKESSON

White Paper

Unit Dose vs. Bulk Oral Solid Medication Purchasing Patterns and Repackaging: Sampling and Analysis

Executive Summary

In 2009, independent consulting firm Shack & Tulloch, Inc., conducted a survey of 24 hospitals to ascertain purchasing patterns and rationales pertaining to pre-packaged unit dose oral solid and bulk oral solid medications.

By far, the single most surprising finding was the purchase level of pre-packaged unit dose solids overall. While levels were expected to be reasonably high, the survey showed that at 21 of the 24 hospitals, manufacturer-packaged unit dose medications make up an average of 81% of all oral solid purchases. In addition, the 14 of 21 hospitals that were consciously maximizing their purchases of manufacturer-packaged unit dose medications were purchasing an average of 88% of their oral solid medications in that form. The remaining three hospitals represented unusual cases where purchasing decisions fall outside the norm based on specifics of the pharmacy operations.

The high levels of manufacturer-packaged unit dose purchases were especially unexpected since specific medications from any given manufacturer may or may not be available in pre-packaged form at any given time. This uncertainty was previously thought to have a possible dampening effect on unit dose purchasing, but the survey results suggest this is hardly the case.

Instead, it may be that the drive toward bedside bar code scanning may be trumping most if not all objections to pre-packaged unit dose. Certainly, for hospitals that have yet to maximize their unit dose purchases, the main obstacles are manufacturer labeling considerations such as bar codes that are not readable by bedside scanning systems, based on format or contrast quality. Furthermore, while hospitals claim to make unit dose/bulk decisions based primarily on acquisition cost delta, 43% admit to relying on human judgment rather than hard numbers. So while pre-packaged dose purchasing is already high, opposition to further growth would seem to be based on technical or relatively "soft" considerations.

Indeed, the survey results seem to suggest that in the great majority of instances, unit doses are or soon will be the preferred choice whenever available. The question, then, becomes less one of whether to purchase unit dose versus bulk medications, and more of how to take greatest advantage of pre-packaged unit dose oral solids within the entire hospital environment, from the pharmacy to the patient's bedside.

Introduction

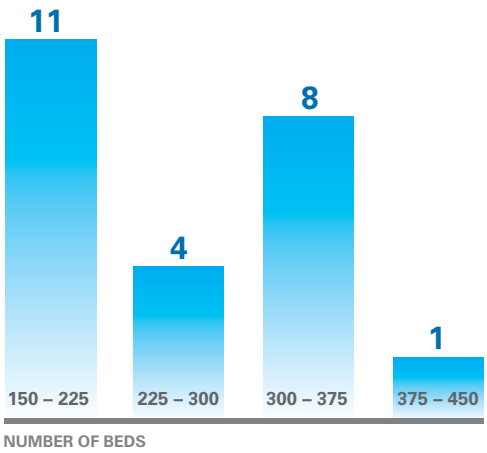
Shack & Tulloch surveyed the Director of Pharmacy at 24 hospitals. The blind sampling study included 11 community hospitals with 150–225 beds and 13 hospitals with more than 225 beds (fig. 1).

Interviews were conducted to discover quantitative and qualitative data pertaining to purchasing patterns. Participants were asked basic questions related to pharmacy purchasing:

- What percentage of total oral solid medication doses do you purchase already packaged as unit doses?
- What percentage of total oral solid medication doses do you purchase in bulk, then repackage at the hospital?
- How much of the bulk purchases could be purchased pre-packaged, if the goal was to maximize unit dose purchases?
- What is the reason for NOT maximizing unit dose purchases?
- Is there a cost delta per dose between bulk and unit dose above which bulk purchases are made?

Hospitals in Study by Number of Beds

fig. 1

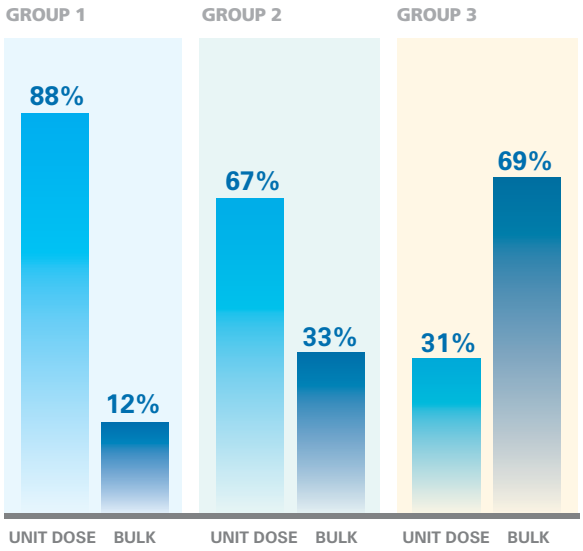


Purchasing Patterns

As information and insights were gathered, three distinct groups emerged (fig. 2).

Percentage of Oral Solid Medications Purchased as Unit Dose vs. Bulk

fig. 2

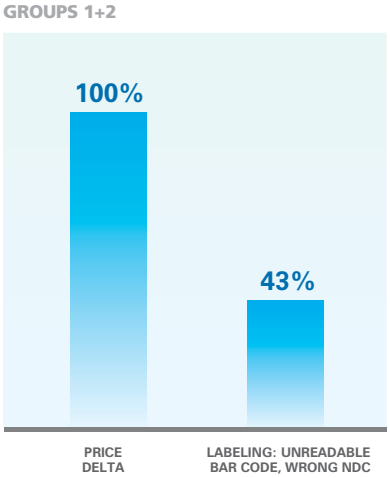


Group 1 consisted of 14 hospitals that consciously maximize unit dose purchases, buying 88% of oral solids in pre-packaged unit dose form and 12% in bulk. These hospitals have very few bulk purchase exceptions when a unit dose is available. Most Group 1 hospitals expressed a desire to purchase close to 100% unit dose solids and eliminate nearly all repackaging operations if the price delta was reasonable.

Group 2 included seven hospitals that do not maximize unit dose purchases, buying 67% of oral solids in pre-packaged unit dose form. The rest are bought in bulk and repackaged. Price delta is given as the main consideration by all hospitals in the group. Other factors include labeling concerns (bar codes that are not readable by bedside scanning systems based on format or contrast quality), shelf life and dose diversity (fig. 3).

Reasons for Not Maximizing Unit Dose Purchases

fig. 3

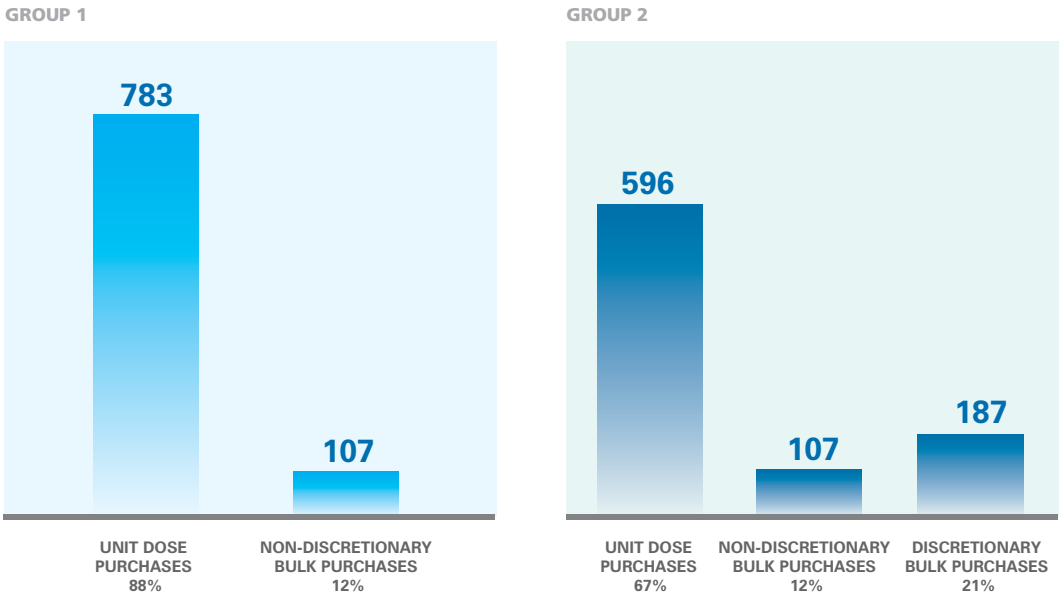


— Respondents could give multiple reasons.

Unit Dose Volumes vs. Discretionary and Non-Discretionary Bulk Purchase Volumes

fig. 4

Assumes 890,000 oral solid doses administered per year (average of Group 1 and 2 hospitals)

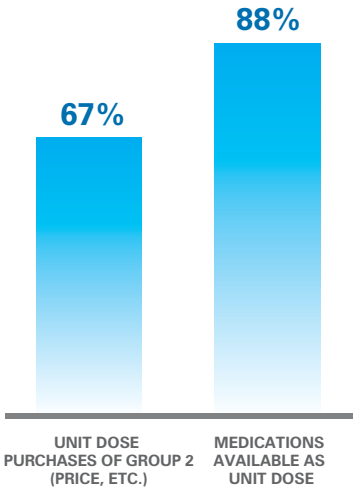


Assuming 890,000 oral solid doses administered per year, both Group 1 and Group 2 hospitals buy 107,000 doses, or 12%, as non-discretionary bulk purchases due to very high cost deltas or other factors. Group 2 hospitals, however, also buy 187,000 doses in discretionary bulk purchases, 21% of their total oral solids buy (fig. 4). If those hospitals chose to maximize the use of pre-packaged unit doses, they could replace 64% of their bulk purchases by doing so. This would bring them to the same level of pre-packaged usage as Group 1 (fig. 5).

Only three hospitals made up Group 3. These organizations also do not maximize unit dose purchases, buying only 31% of their oral solids as pre-packaged unit doses and 69% in bulk. They differ from Group 2 by utilizing robotics and high-speed packagers for operation- and patient-specific picking of bulk medications for perceived labor efficiency and accuracy. The lower price of bulk medications is not a major consideration, and is perceived as only an additional benefit.

Group 2 Bulk Purchases Available as Unit Dose

fig. 5



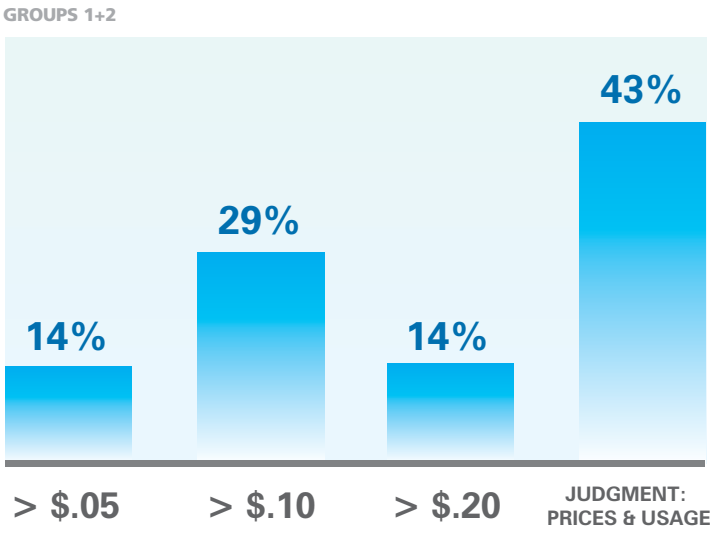
— 64% of the bulk purchases could be purchased as unit dose
— Bulk purchases could drop from 33% to 12%

The Economics of Repackaging

In Groups 1 and 2, the key decision-making factor given was the price delta between discretionary bulk and unit dose purchases. The determinate cost delta per dose varied (fig. 6). In 14% of the hospitals, bulk purchases were triggered if the acquisition cost difference was above $0.05 per dose. In 29%, the figure rose to >$0.10. In another 14%, it was >$0.20.

Cost Delta Per Dose Above Which Bulk Purchases Are Made

fig. 6



However, interviews showed that the great majority of hospital pharmacies lack the resources to conduct a thorough, all-in analysis of repackaging costs. Tellingly, the study found that of Group 1 and 2 hospitals, 43% used "buyer judgment" when determining price and usage, not a strict price delta that considered repackaging costs.

To determine true cost, Shack & Tulloch comprehensively analyzed all repackaging costs including labor, equipment and maintenance, packaging supplies and inventory effects. Shack & Tulloch's comprehensive approach was able to ascertain each hospital's repackaging cost per dose by determining the following costs:

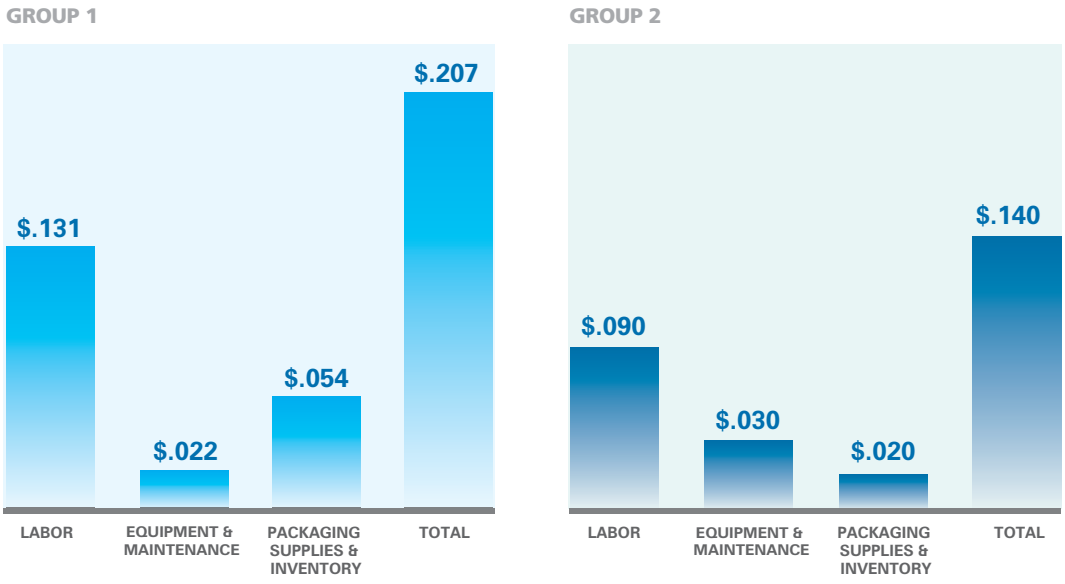
- Packaging labor (FTEs)
- Pharmacist quality control labor (FTEs)
- Materials planning/supply chain labor (FTEs)
- Other labor, e.g., NDC number in sync in various databases, systems, etc. (FTEs)
- Equipment capital cost (amortized over life)
- Equipment maintenance
- Packaging supplies
- Increased inventory carrying costs

All of these were judged to be "real" costs for the hospital. For example, packaging supplies and inventory changes represent real cash flows. Packaging equipment must also be replaced and maintained as necessary. Pharmacist time spent on packaging quality control could otherwise be spent on clinical intervention. Technicians could likewise be redeployed to other functions, and so on.

Using this analysis, all-in repackaging costs per dose averaged $0.207 at Group 1 hospitals and $0.140 in Group 2, which benefitted from volume efficiencies (fig. 7). The packaging volume efficiencies were focused in labor costs ($0.131 versus $0.090) and packaging supplies and inventory ($0.054 versus $0.020). Group 2 hospitals, which do a greater proportionate amount of self-packaging, had higher equipment and maintenance costs ($0.030 versus $0.022). As expected, Group 2 hospitals spent significantly more on repackaging as a percentage of their pharmacy operating budget than Group 1.

Repackaging Cost per Dose

fig. 7



Conclusions

Superficially, there may be a small economic advantage to buying in bulk and repackaging discretionary oral solid medications when the acquisition cost differential approaches $0.20 or more per dose. However, this advantage may be offset or more than offset by the increased risk inherent in the additional packaging responsibility, since any medication packaging error can affect patient care and safety.

In specific cases, there may be large cost differentials between bulk and unit dose that make bulk the only rational choice. Also, at any given time of purchase, certain specific medications may not be available in unit dose form from their manufacturer. For these reasons, hospitals would do well to study their actual need for repackaging equipment or outsourced packaging resources and budget accordingly.

While details within specific organizations may differ, the overriding conclusion of this survey is the ascendance of manufacturer-packaged unit dose oral solids as the variety of choice at most hospitals. This appears to coincide with the commitment of many hospitals to the deployment of bedside bar code scanning initiatives. The challenge now is to find methods that allow the hospital to realize the greatest efficiencies, productivity and accuracy from the purchase of manufacturer-packaged unit dose oral solids in all departments involved with the medication distribution process.

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