

# Special REPORT

## Vial2Bag Advanced<sup>®</sup> 20mm Admixture Device: Prioritizing Waste Reduction in IV Medication Distribution

### Faculty

#### William L. Calhoun Jr, BS Pharm

Clinical Affairs Manager  
Progressive Medical, Inc  
Fenton, Missouri

**Overall pharmacy experience:** 33 years

**Hospital experience:** 18 years

**Last role/title in hospital setting:** Director of Pharmacy

**Previous hospital:** North Mississippi Medical Center in Tupelo

**Type of previous hospital:** Level 2 trauma center, teaching

**Number of beds:** 750

**Annual drug volume:** More than \$40 million

**When was V2B<sup>a</sup> adopted at previous center:** 2011

**Why was V2B adopted:** To improve pharmacy workflow and meet nursing needs for timeliness of medication delivery from pharmacy

**How did V2B affect processes at your previous center:** Improved the time to first dose and improved pharmacy score on nursing satisfaction annual score, and improved pharmacy workflow by allowing technicians to compound what was necessary and decreased interruptions

#### Anna Cunningham, PharmD

Clinical Affairs Director  
Progressive Medical, Inc  
Fenton, Missouri

**Overall pharmacy experience:** 17 years

**Hospital experience:** 8 years

**Last role/title in hospital setting:** Clinical Pharmacist, focused on perioperative medicine

**Previous hospital:** St. Louis University Hospital in Missouri

**Type of previous hospital:** Level 1 trauma center, research, academic, and tertiary care medical center

**Number of beds:** 365

#### Jennifer Anderson-Fung, PharmD

Pharmacy Business Coordinator  
Infirmiry Health  
Mobile, Alabama

**Overall pharmacy experience:** 26 years

**Hospital experience:** 12 years

**Role/title at previous hospital:** Pharmacy Manager

**Previous hospital:** Thomas Hospital, part of Infirmiry Health, in Fairhope, Alabama

**Previous hospital type:** Acute care hospital

**Number of beds:** 189

**Annual drug volume:** 1.25 million doses dispensed; average of \$7 million in spending

**When was V2B adopted at previous center:** Spring 2015

**Why was V2B adopted:** To provide better customer service to our end users and reduce waste of medications

**How has V2BA<sup>b</sup> affected processes at your center:** Improved workflow in our IV room

#### Jeff Thompson, PharmD

Chief Clinical Officer  
Freeman Health System  
Joplin, Missouri

**Overall pharmacy experience:** 30 years

**Hospital experience:** 30 years

**Hospital type:** Acute care community teaching hospital

**Number of beds:** 425

**When was V2B adopted at current center:** 2015

**Why was V2B adopted:** To decrease medication waste

**How has V2BA affected processes at your center:** V2BA has improved efficiency and decreased waste

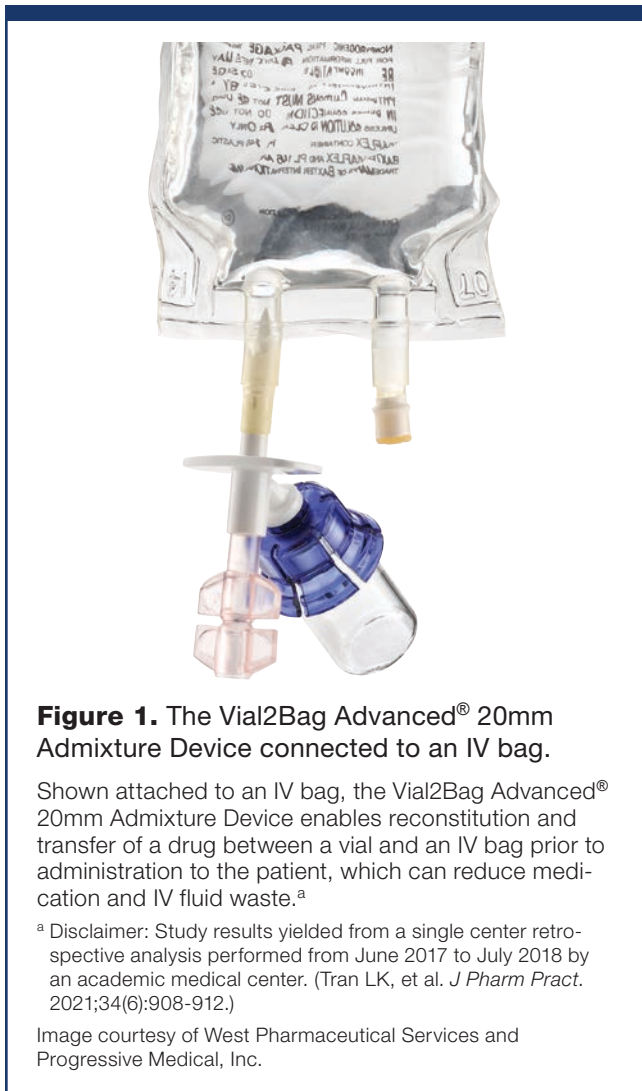
V2B, Vial2Bag Admixture Device; V2BA, Vial2Bag Advanced<sup>®</sup> 20mm Admixture Device

<sup>a</sup> The Vial2Bag Admixture Device is different from the Vial2Bag Advanced<sup>®</sup> Admixture Device. The Vial2Bag Admixture Device is no longer commercially available and has been replaced with the Vial2Bag Advanced<sup>®</sup> Admixture Device in commerce.

## Introduction

Large-scale drug waste is an ongoing problem in health care settings,<sup>1</sup> and often includes discarded IV medications that have been prepared for possible use during surgery that can expire if not used within hours.<sup>2</sup> Many pharmacists consider waste-reducing activities to be of great importance, and particularly in the dispensing stage.<sup>3</sup> By decreasing the amount of medication given to the patient or by using technology—such as the Vial2Bag Advanced<sup>®</sup> 20mm Admixture Device (West Pharmaceutical Services; Figure 1)—that better manages drug distribution, pharmacists work with the health care team to counteract medication waste while providing optimal patient care.<sup>3-5</sup> This special report will review the need for drug waste minimization in the hospital setting, factors affecting waste in IV drug distribution, and methods for reducing drug waste for providers and pharmacists.

The Vial2Bag Advanced<sup>®</sup> 20mm Admixture Device is indicated to serve as a connection between a 50, 100, or 250mL IV bag, vial with 20mm closure, and an external IV administration set. The integrated vial adapter makes it possible to reconstitute and/or admix drugs prior to administration to the patient.<sup>4</sup> The Vial2Bag Advanced<sup>®</sup> 20mm Admixture Device is designed to make it possible for medications that must be diluted before IV use at the point of care to be reconstituted and/or admixed



**Figure 1.** The Vial2Bag Advanced<sup>®</sup> 20mm Admixture Device connected to an IV bag.

Shown attached to an IV bag, the Vial2Bag Advanced<sup>®</sup> 20mm Admixture Device enables reconstitution and transfer of a drug between a vial and an IV bag prior to administration to the patient, which can reduce medication and IV fluid waste.<sup>a</sup>

<sup>a</sup> Disclaimer: Study results yielded from a single center retrospective analysis performed from June 2017 to July 2018 by an academic medical center. (Tran LK, et al. *J Pharm Pract.* 2021;34(6):908-912.)

Image courtesy of West Pharmaceutical Services and Progressive Medical, Inc.

with optimized efficiency<sup>5</sup> and less risk for drug waste.<sup>b</sup> (For more information, please see Important Product Information on page 4.)

## Compounded Sterile Medication Waste: Improving Existing Procedures

The time-consuming process of compounding medication that may never be used<sup>2</sup> can be frustrating to pharmacy managers, pharmacists, and technicians, according to Jennifer Anderson-Fung, PharmD, pharmacy business coordinator with Infirmiry Health in Mobile, Alabama. Studies conducted at urban-area hospitals have shown that when pharmacies compound medications in batches to be administered during a set period of time, a large majority (80%) of orders for these locally compounded sterile products (LCSPs) are canceled within 7 days following a request.<sup>6</sup> LCSPs and other drugs can be wasted because the medication is improperly stored or the beyond-use date is exceeded.<sup>6</sup> Additionally, increasing the frequency of LCSP batches created so that drugs will be compounded closer to when they are needed has shown only some improvement in wasting.<sup>2</sup> A 2017 study in an approximately 500-bed hospital found that doubling LCSP batch creation frequency from twice per day reduced wasted doses by 0.4% or 14 doses over 7 days.<sup>2</sup>

Formerly the pharmacy manager at Thomas Hospital, in Fairhope, Alabama, Dr Anderson-Fung first encountered the Vial2Bag admixture device<sup>b</sup> at a medical conference in 2014, and was impressed by its point-of-care admixing features and ease of use. West's Vial2Bag Advanced<sup>®</sup> 20mm Admixture Device replaced the Vial2Bag admixture device in commerce, the latter of which is no longer available. (For more information, please see Important Product Information on page 4.)

Dr Anderson-Fung stated that, at the time, her team conducted return on investment reviews on medications they believed could be used with the Vial2Bag admixture device. "A particular medication for reducing blood pressure and bleeding during surgery cost the hospital hundreds per vial then," she said. "We were compounding it for every open-heart surgery case we were performing at Thomas Hospital, which was about 4 to 5 days a week. Nine times out of 10, the medication was not needed and would end up being wasted." In 2015, the team at Thomas Hospital began using the Vial2Bag admixture device with the aforementioned medication and others. She reported that although ready-to-use medications can limit waste, there were increased costs of using such medications compared with using the Vial2Bag admixture device to admix medications.

## Health Care Provider Benefits to Compounding And Drug Waste Reduction

By avoiding compounding medications and having them delivered to the point of care, the Vial2Bag Advanced<sup>®</sup> 20mm Admixture Device<sup>a</sup> can help nurses and other health care providers focus on patient satisfaction and safety, which can be improved with the use of automated dispensing machines.<sup>7</sup> The compounding process may delay nursing staff receiving needed medications for patients, potentially affecting overall patient satisfaction. "When medication is available at the bedside, workflow for nursing staff can improve. Patients are getting medication on time, right at the point of care," Dr Anderson-Fung said.

Another benefit of using the admixture device instead of LCSPs is that it has potential to save on labor costs associated with compounding.<sup>7</sup> William L. Calhoun Jr, BS Pharm, the clinical affairs manager at Progressive Medical, Inc, in Fenton, Missouri, noted that compared with compounding, "using the

Vial2Bag Advanced® 20mm Admixture Device, medication components already are stocked in the automated dispensing machines. As soon as the pharmacist verifies the order is correct, the medication becomes immediately available to the nurse to retrieve, assemble, admix, and administer to the patient. The workload being performed in the pharmacy and slowing patient care is no longer there, which also frees up more hands. Pharmacy staff members may be able to apply this freed-up time to other important services.” His first experience with this product type was using the Vial2Bag admixture device<sup>a</sup> in 2010. He noted that using the device led to improved pharmacy workflow by allowing technicians to compound only those medications that were necessary, thus decreasing interruptions to drug delivery.

The Vial2Bag Advanced® 20mm Admixture Device aims to help standardize admixture procedures to improve the efficiency of point-of-care drug delivery for nurses and other health care providers.<sup>5</sup>

### Drug Shortages and Medication Waste

Ongoing drug shortages in the United States, caused by a variety of supply, regulatory, and manufacturing issues, have prompted organizations including the American Society of Health-System Pharmacists to recommend that health systems work toward the reduction of drug waste, particularly IV fluid waste.<sup>8,9</sup> Initiatives to reduce drug waste should be aimed not only at patients and providers, but also manufacturers and distributors (Figure 2).<sup>10</sup>

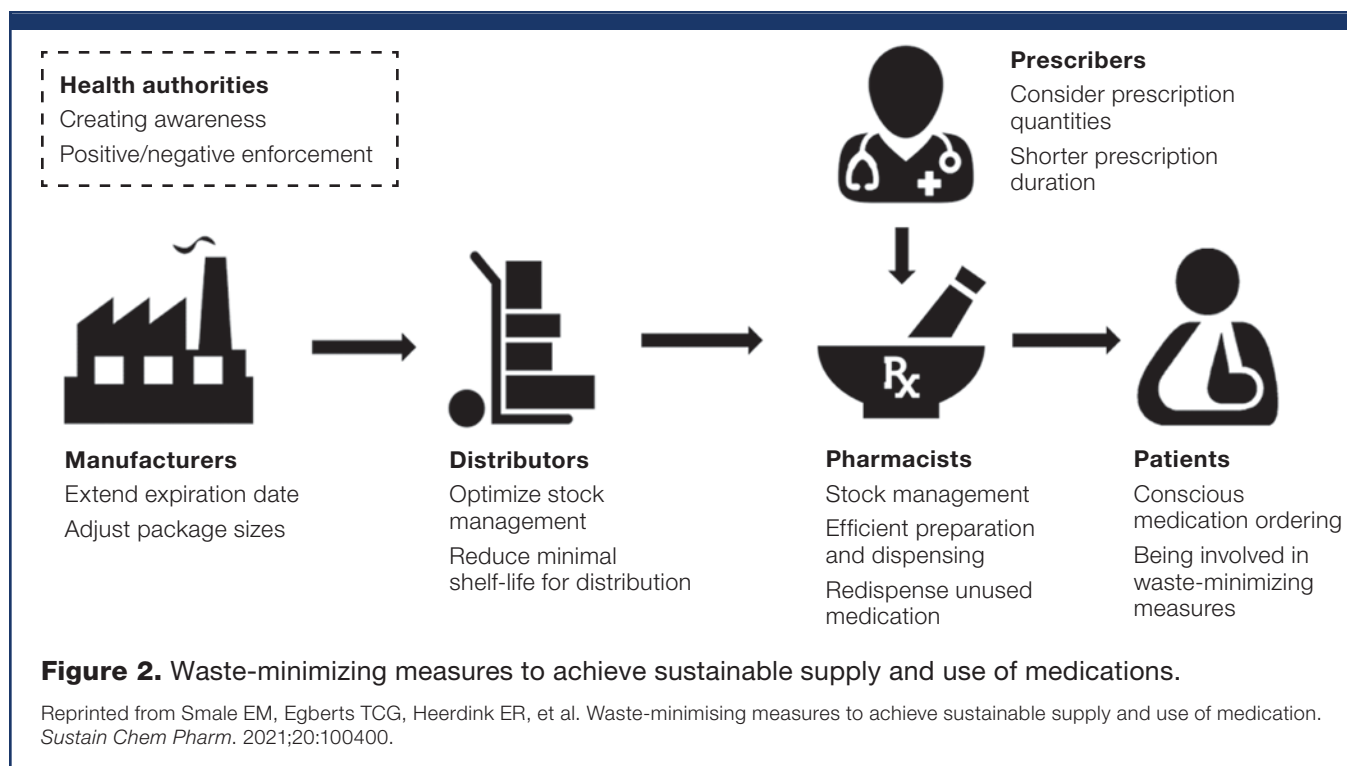
Jeff Thompson, PharmD, the chief clinical officer at Freeman Health System in Joplin, Missouri, began seeking an alternative to standard drug administration approximately 10 years ago during a shortage of a necessary antibiotic. At the time, his center was using a proprietary vial and bag system: IV bags and vials had to be purchased from the same manufacturer. “You were locked in,” he said. “Our center paid more for the

vials, and this system also drove more waste because it was not something that was readily put together on the floor.” When the needed antibiotic became unavailable in the type of vial that his center needed, Dr Thompson found that he could not use as many bags as had been ordered.

A few years later, Dr Thompson stated that he also encountered issues with IV bag shortages. “If you are committed to a proprietary brand and the IV bags are short, then you need a solution for that problem. Shortages mean you must completely retool your procedures because the bag and the attaching device really are one unit. In order to use it, you must have both,” he said. “This is why the Vial2Bag admixture device<sup>a</sup> became so attractive. Using this admix device, my hospital was allowed to be bag agnostic; we could use the vial adapter with almost any bag.”

During the COVID-19 pandemic in 2020, West’s Vial2Bag Advanced® 20mm Admixture Device replaced the Vial2Bag admixture device in commerce (the latter of which is no longer available), helping to meet supply challenges at an important time. “If we, as a country, do not have enough IVs or saline, we don’t want to throw away 25% of our LCSPs<sup>11</sup> because we’re compounding and placing an expiration date on it,” said Anna Cunningham, PharmD, the clinical affairs director at Progressive Medical, Inc, in Fenton, Missouri.

Launching the Vial2Bag Advanced® 20mm Admixture Device at that time meant the device was available and gave hospitals some flexibility with supply challenges, Dr Cunningham noted. She added that it also was helpful to some clinics providing monoclonal antibodies because the Vial2Bag Advanced® 20mm Admixture Device would work with any brand of IV bag, and many of these clinics needed a 250-mL volume. “They did not want to have pharmacy making many of these in advance and throwing them away if they weren’t used,” she said. “But these clinics also had patients lined up out the door and didn’t want to wait for pharmacy to make these products using other methods.”



**Figure 2.** Waste-minimizing measures to achieve sustainable supply and use of medications.

Reprinted from Smale EM, Egberts TCG, Heerdink ER, et al. Waste-minimising measures to achieve sustainable supply and use of medication. *Sustain Chem Pharm.* 2021;20:100400.

## Waste-Related Benefits of Point Of Care/Immediate Use

Another feature of the Vial2Bag Advanced® 20mm Admixture Device is that the device can be stocked on the floor, separate from the IV bags, so it does not take up space in the automated dispensing cabinet. “It’s very easy to put together on the floor,” Dr Thompson said. “Also, most IV bags have an expiration date and the volume starts to decrease in the bag over time. I might have a \$2 bag stowed away with a \$50 drug attached to it, and I don’t want to throw it away. With many of the other devices, the clock starts ticking the moment you attach the bag, especially after USP <797> decreased the shelf time to 24 hours at controlled room temperature for many items.”<sup>12</sup>

At Thomas Hospital, prior to 2015, Dr Anderson-Fung noted that if the compounded medication for reducing blood pressure and bleeding went unused completely, the amount of drug waste would total to approximately \$15,000 a month.<sup>13</sup> “After we implemented the Vial2Bag admixture device,<sup>a</sup> we were able to



reduce our spending significantly because we were not compounding medication to have available just in case,” she said. “Plus, you will not take up valuable shelf space with extra inventory or waste drugs as often. Rather, you order exactly what you need for the patient.” (For more information, please see Important Product Information below.)

## Conclusion

Pharmacy waste reduction, in all of its forms, can help improve pharmacy workflow, patient safety, and reduce costs,<sup>7</sup> particularly when point-of-care tools such as the Vial2Bag Advanced® 20mm Admixture Device are used to facilitate drug delivery optimization.<sup>5</sup> Lastly, as the health care field continues to focus on medication waste in relation to ongoing drug shortages,<sup>8</sup> limiting the need for LCSPs and use of updated technology such as the Vial2Bag Advanced® 20mm Admixture Device to provide immediate access to medications may help contribute to overall waste reduction and improved operating room efficiency.

## References

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13. Internal data on file. West Pharmaceutical Services, Inc. The calculation of savings is based on observations of single-drug usage from April 2014 to August 2015 of the Vial2Bag device, which has been discontinued and replaced by the Vial2Bag Advanced® 20mm admixture device.

## Important Product Information

- <sup>a</sup> The Vial2Bag Admixture Device is different from the Vial2Bag Advanced® Admixture Device. The Vial2Bag Admixture Device is no longer commercially available and has been replaced with the Vial2Bag Advanced® Admixture Device in commerce.
- <sup>b</sup> The Vial2Bag Advanced® 20mm admixture device is 510(k) cleared by the United States Food and Drug Administration (FDA). The use of the Vial2Bag Advanced® 20mm admixture device should not be interpreted as modifying, extending, or superseding a drug manufacturer’s labeling recommendations for storage and expiration dating, unless otherwise limited by USP <797> compounding standards. Refer to drug manufacturer’s labeling and use instructions for recommendations, USP <797>, and applicable institution policy for shelf life and sterility information of reconstituted product and admixture device compatibility. Compatibility of the Vial2Bag Advanced® 20mm admixture device with all drug products has not been confirmed. Do not use the Vial2Bag Advanced® 20mm admixture device with lipids. Failure to follow the instructions provided may result in inadequate medication reconstitution, dilution, and/or transfer, possibly leading to overdose or underdose and/or delay in therapy. Products shown are for INFORMATION purposes only and may not be approved for marketing in specific regions.
- <sup>c</sup> The Vial2Bag Advanced® 20mm admixture device is indicated to serve as a connection between a 50, 100, or 250mL IV bag with an ISO standard IV port compatible with an ISO 8536-4 standard IV spike.
- <sup>d</sup> This article and the Vial2Bag Advanced® 20mm admixture device are intended for U.S. healthcare professionals only.

Prescription use only.

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Disclosures: Mr Calhoun is the clinical affairs manager at Progressive Medical, Inc. Dr Cunningham is the clinical affairs director at Progressive Medical, Inc. Drs Anderson-Fung and Thompson reported no relevant financial conflicts of interest.

PMI is an authorized distributor of Vial2Bag Advanced® admixture devices in the United States.

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