

The Case for Prefilled Syringes

Ready-to-use preparations increase quality, decrease waste and save time.

Prefilled syringes don't just prevent staff from cutting corners, they eliminate the corners altogether. That's what Mike MacKinnon, DNP, FNP-C, CRNA, an anesthesia provider for Northeastern Anesthesia in Show Low, Ariz., says about the single-use, ready-to-administer medications many facilities swear by.

From a safety standpoint, prefilled syringes remove the most error-prone steps of the medication process, such as drawing up, diluting and handwriting labels, while also supporting barcode scanning for an added layer of verification. On the efficiency side, they speed up induction and crisis management.

"In one facility I worked with, first-case starts consistently stayed on time once vasopressors and induction agents were stocked as prefilled, barcoded syringes," says Dr. MacKinnon. "Compare that to a facility with an automated label printer tied to the Pyxis. Every safeguard was there, but clinicians still skipped using the labels. That's the Swiss cheese effect in action, when multiple small breakdowns align to cause medical errors."

For providers, prefilled syringes can dramatically reduce a workload that could be problematic. "If you spend a lot of time drawing up, reconstituting and diluting drugs while also caring for patients, your mental load increases," says Dr. MacKinnon. "If all you have to do is grab a prefilled syringe, most of that work is already done, your cognitive load goes down, and so do your opportunities for error."

While prefilled syringes can carry a higher upfront cost, the long-term value is clear: reduced waste, greater efficiency and improved patient safety.

What are prefilled syringes?

Prefilled syringes are sterile, single-use devices that come with an exact, premeasured dose of medication or fluid. By eliminating steps such as drawing up and measuring, they reduce preparation time,



READY TO ROLL Prefilled syringes remove the steps of drawing up, diluting and handwriting labels, reducing staff's cognitive load — and the opportunity for errors.

contamination risk and waste.

In practice, a prefilled syringe can remain in the anesthesia cart until needed, offering both convenience and reliability. They are particularly beneficial for emergency settings and self-administration applications, as well as for injections and line flushing.

Safety and beyond

The primary advantage of prefilled syringes is patient safety. They reduce the risk of contamination, dosing errors and preparation mistakes, making them ideal for both hospital and home use.

"Ready-to-administer syringes reduce the need for manual preparation steps that can be a source of error risk," says Rita K. Jew, PharmD, MBA, BCPPS, FASHP, president of the Institute for Safe Medication Practices (ISMP). "Practitioners do not need to create or label the syringe, only verify the dose before administration. Because ready-to-administer syringes come pre-labeled by the manufacturer, they can help lower the risk of wrong medication or wrong concentration errors. Scannable barcode labels can alert practitioners to any discrepancy in dosage or medication being used."

Of course, there additional benefits of prefilled syringes, as well. These include:

- **Accuracy:** Dosage errors are reduced because the exact amount is already in the syringe.

- **Convenience:** Reduces preparation time and the number of steps needed for administration.
- **Reduced waste:** Prevents overfilling expensive medications and lessens waste from expired or improperly drawn-up doses.
- **Self-administration:** Simplifies injections for patients, especially for in-home settings.
- **Savings on medication supplies:** It might not seem like much but imagine not needing to stock as many alcohol swabs, syringes and needles.
- **Eliminate almost all unsafe injection practices:** You won't need to worry about staff using multi-dose vials on more than one patient, accessing medication in non-patient treatment areas, or not using a new needle and new syringe to enter medication vials.

Be diligent

If available from a pharmaceutical manufacturer, organizations should prioritize purchasing ready-to-administer syringes directly from them, says Dr. Jew. If only available through 503B outsourcing facilities, healthcare leaders should carefully review regulatory and inspection histories, recall records, labeling practices and beyond-use dating to ensure compliance with USP and FDA standards.

Dr. MacKinnon emphasizes label clarity and usability. "Labels should clearly state the full drug name, concentration and barcode compatibility," he says. "Evaluate whether syringes are easy to differentiate, especially for high-risk medications, and verify stability data for your storage conditions."

He also advises testing syringes within your actual workflow before fully converting. "Ask suppliers about recall history and supply chain reliability. The last thing you want is to switch to pre-filled syringes only to find your vendor can't keep you stocked," he says.

When sourcing from 503B partners, visit or audit the facility when possible, or have a consultant pharmacist do so on your behalf. Choose vendors that follow USP <7> labeling practices and incorporate barcode verification into final products.

Cost-effectiveness

Do the benefits of prefilled syringes outweigh the

extra cost? In most cases, experts say yes.

"Medications may not always be available in pre-filled form, but when they are, the benefits often outweigh the added expense, especially for high-volume or high-alert drugs," says Dr. Jew.

Dr. MacKinnon agrees. "They may cost more upfront, and tight margins make that hard to swallow. But what's the cost of a drug error, wasted vials or delayed cases? Once you factor in fewer steps, fewer mistakes and faster turnover, the ROI becomes clear."

Risk avoidance

Ready-to-administer syringes from compounding facilities may express doses differently, for example, per mL rather than total syringe dose, which can lead to confusion or overdose.

When switching to ready-to-administer syringes, healthcare organizations also need to consider workflow integration and human factors.

"If staff are used to vials, switching may introduce confusion if the processes are not adapted," says Dr. Jew. "For example, prefilled vaccine diluents intended to be mixed with the vaccine before administration have been mistaken for the actual vaccine."

Storage space and compatibility with other equipment also needs to be considered. Prefilled syringes require more storage volume, and potentially refrigeration or specialized storage. Finally, some ready-to-administer syringes may not be compatible with existing IV pumps or other equipment.

It's all about patient safety

At the end of the day, Dr. MacKinnon believes that prefilled syringes aren't merely about convenience. This option is all about stacking the deck in favor of patient safety.

That comes down to reducing the opportunities for mistakes in any way that you can.

"In anesthesia, the margin for error is razor thin," says Dr. MacKinnon. "Prefilled, barcoded, ready-to-administer medications don't make us perfect, but they make it a lot harder for the holes in the Swiss cheese to line up." **OSM**