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Tips for **Sterility Testing**

Q&A with Lou Diorio, RPh and David Thomas, RPh, MBA LDT Health Solutions

Pharmacy Purchasing & Products: **How should health-system pharmacies approach sterility data when it comes to beyond-use dating?**

LDT Health Solutions: We generally recommend that compounding pharmacies use the USP <797> matrix (see Figure 1) and avoid implementing a large-scale sterility testing program. The added costs in personnel time and testing supplies, the potential for false-positive test results, as well as the larger question of added value versus added risk should all be factored into your decision. Before venturing down this path it is important to examine your organization's goals. Simply pushing for the longest BUD possible as a way to reduce drug waste is not a good plan. A better approach is to first analyze the compounding workloads and practices of the pharmacy, and then develop a plan with batch sizes that strike a balance between the workflow and BUDs, eliminating the need to do sterility testing for each batch.

Figure 1. BUD Matrix

	Controlled Room Temperature (15 to 30° C)	Cold Temperature (2 to 8° C)	Frozen (solid state) (-25 to -10° C)
Low Risk	< 48 hrs	<14 days	<45 days
Low Risk (with 12 hr or less BUD)	< 12 hrs	n/a	n/a
Medium Risk	< 30 hrs	< 9 days	< 45 days
High Risk	< 24 hrs	< 3 days	< 45 days

Adapted from USP General Chapter <797>

PP&P: **What are the considerations for using an outside lab to conduct sterility testing with the intent to extend the BUD on certain products?**

LDT: Conducting sterility testing alone will *not* support extending the BUD; stability data must be in place first. If stability data supports an extended BUD (greater than the matrix in Figure 1) then testing would allow for longer BUDs. We recommend taking this approach only in limited cases. Preferably, pharmacy should examine the batch sizes that are being compounded and the rationale behind those batch sizes. It is important to determine whether extended beyond-use dating is truly necessary. The better approach is to look for other distribution models that will accomplish your goals without requiring extra testing.

To conduct this testing, you must be familiar with the appropriate guidelines in USP <71>, USP <797>, and USP <731>, among other applicable sections. The expertise necessary to ensure that the guidelines are properly followed is extensive. In addition, the sterility testing required depends upon the specific preparation; USP <71> provides guidance for this. An outside testing lab can help you better understand the guidelines and how to comply with them.

PP&P: **Are there certain products (e.g., epidurals, TPA syringes) that are particularly risky when considering beyond use dating?**

LDT: If compounded incorrectly, all compounded preparations by their nature are inherently dangerous. USP <797> states in its opening paragraph that "Contaminated CSPs are potentially most hazardous to patients when administered into body cavities, central nervous and vascular systems, eyes, and joints, and when used as baths for live organs and tissues." Since epidurals and TPA preparations are often used in high-risk patients, the potential for disaster is even more heightened.

PP&P: **When is end product testing required?**

LDT: In the section on Responsibility of Compounding Personnel, USP <797> states that "The dispenser shall, when appropriate and practical, obtain and evaluate results of testing for identity, strength, purity, and sterility before a CSP is dispensed." Therefore it is the responsibility of the compounder to use their professional expertise to determine when this testing is required. However, we would recommend that the testing automatically be deemed necessary whenever the limits of the BUD matrix in the chapter are exceeded and when any high-risk level CSPs are compounded.

PP&P: **How should a pharmacy prepare to respond to a positive culture?**

LDT: Under USP <797> it is allowable to dispense CSPs "at risk," in other words before the sterility test is complete, and the conditions under which this is permitted are outlined in the Sterility Testing section of the chapter. The customer receiving these preparations (the patient and their physician) must have a thorough understanding as to why this approach is being taken, and procedures must be in place outlining how to interpret a failed sterility test in order to implement a recall of unused preparations. Of course the implications of already infused units also must be understood in order to respond appropriately. The need for a rapid and systematic investigation of all controls involved to identify sources of the contamination and quickly resolve any gaps in methods or processes is also emphasized in the chapter.

In our experience, we have found that sterility testing by its nature is a highly risky proposition. Too often the tests themselves are contaminated during the collection, leading to false positive results. It is imperative that any pharmacy choosing to take this approach be an "educated consumer," to ensure that they can handle the possibility of a recall and all of its incumbent consequences. ■

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