Building a Smart Pump Drug Library: A First-Timer's Guide

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Congratulations! By taking the first step towards building a comprehensive drug library, you have the opportunity to minimize infusion programming errors and reduce patient harm[1].

This checklist provides an overview of the process to build a drug library for your infusion clinic[2,3].

	Task	Comment	Complete?
	Establish the team Collaboration from all stakeholders is a key success factor for a well-built drug library[3]. Collaborate early and often.		
	Identify individual(s) with medication expertise, including knowledge of parenteral admixture practices	E.g., pharmacist	
	Identify individual(s) with expertise in current infusion delivery practices and procedures	E.g., nursing team leads, nurse educators, nurse managers	
	Identify individual(s) with authority to approve the drug library	E.g., program director, pharmacy director, director of nursing	
	Develop Terms of Reference for the drug library working group	Define roles, ways of communication, time commitments	
	Set guiding principles: general philosophy to guide decision making for developing the drug library	E.g., to what degree should the drug library accommodate individual unique practices versus facilitate standardization across the organization?	
	Define the scope Ideally all medications and fluids should be delivered using a smart infusion pump[4]. If this is not possible, determine which clinical settings and which medications will be included for the initial drug library build. Prioritize high risk medications[4].		
	Identify the clinical settings where the smart pump will be used	E.g., clinics, home infusions	
	Review pump specifications to understand relevant container types, sizes, routes of administration, flow rates and accuracy, infusion modes.	Drugs not compatible with the pump specifications should be considered out of scope.	
	Create list of drugs and fluids to be included in scope of drug library build		
	Collect relevant information Gather information about current infusion practices, policies, and procedures. This is a **key** step because it helps you build a drug library that matches current processes (where appropriate)[3,4]. This promotes change adoption.		

	Task	Comment	Complete?
	All manufacturers' administration recommendations	E.g., product monograph, prescribing information	
	All internal IV administration policies and procedures	E.g., independent double-checks, observation period IV hydration	
	Details of current real-life infusion delivery practices	○ What is the physical set-up for infusion bag(s) and lines? ○ How are infusion reactions managed? ○ What is the process for priming? ○ What is the process for flushing at end-of-infusion?	
	Admixture steps / references	Where are medications mixed? E.g., if hazardous drugs are mixed and primed in the pharmacy, the drug library should be adapted to consider this workflow	
	Medication labels	Bag volumes (mL) should match between medication label and Volume-To-Be-Infused (VTBI) programmed on the pump	
	Data on drug usage and medication errors	E.g., incident reporting system, to identify high risk medications that should be prioritized	
	Program drug library Each drug should be set up in a way consistent with how it is prescribed, how it is labeled on the medication container, and how it is intended to be administered.		
	Decide convention for drug display names	E.g., Tallman lettering, generic vs brand name, single entry for "IV fluids" or not	
	Decide convention for clinical advisories	Excessive or un-useful advisories can lead to alert fatigue and cause clinicians to bypass them	
	Decide which infusion modes will be used and when to use each	E.g., decide which drugs should utilize the sequential mode to facilitate stepwise titration	
	Decide convention for display of concentration and/or dilution	E.g., 4 mg/mL or 1000 mg/250 mL? Should match the medication label.	
	Decide standard concentrations and/or volumes for each drug	Standardizing and limiting the number of drug concentrations available promotes patient safety[4]. Implementation of a smart pump drug library is an opportunity to start standardizing, if you haven't done so.	

	Task	Comment	Complete?
	Decide hard and soft limits for each drug	Depending on your infusion system: limits can be implemented on different parameters, such as rate, volume, dose, concentration. Be careful of excessive limits, which can contribute to alert fatigue and drive users to operate outside the drug library[5].	
	Decide convention for setting default volumes to be infused (VTBI)	E.g., do VTBI's include drug + overfill volumes?	
	Decide device configuration settings for each profile		
	Test iteratively during build As you build the drug library, test how it translates into workflow on the smart pump. Do so regularly and engage key stakeholders, e.g., representative users. Use feedback to optimize build of the entire drug library.		
	Create a sample "mini" drug library for test scenarios	Consider following test scenarios: ○ Infusion of a pre-medication ○ Infusion of a medication that is titrated ○ Infusion of a non-titrated medication ○ Rescue protocol for infusion reaction	
	Engage users to test workflow using sample drug library. Obtain feedback.		
	Iteratively adjust your build and re-test as needed.		
	Clinical validation Representative users should test <u>every</u> entry on the pump in a non-patient environment to confirm the drug library is complete and accurate.		
	Engage participants to participate in clinical validation sessions	Consider diverse perspectives: educators, end users, super users, experienced and new clinicians, different regions	
	Have relevant manuals and protocols available during validation		
	Test common scenarios, alternate workflows, and edge cases		
	Track all change requests and confirmed revisions using Change Control Log	Maintain an audit trail for all revisions to the drug library	

	Task	Comment	Complete?
	Go-Live with infusion pumps		
	Finalize drug library		
	Obtain formal approval & sign-off		
	Implement pumps into clinical practice		
	Update and maintain drug library The drug library must be kept up-to-date and current in order to be effective[2,3].		
	Identify structure for longitudinal drug library oversight	E.g., multidisciplinary nursing/pharmacy committee	
	Develop process for drug library change control	• Guiding principles for decision making • Frequency of routine vs emergency updates • Communication strategy: change request handling, communication of changes to pump users • Documentation of revisions and rationales • Process for data set transfer to pumps and tracking	

References

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