Supplementary tables (1): Implementation of mandatory requirements, standards and the best practice recommendations of Institute for Safe Medication Practices (ISMP) for sterile preparations compounding

Mandatory requirements that should be established by law or regulations	Implemented N (%)	Not implemented N (%)	I do not know N (%)
Written policies and procedures that guide the compounding of sterile preparations exist.	37 (94.9%)	2 (5.1%)	0
All orders entered into a pharmacy system are verified by a pharmacist prior to medication administration, except in emergency situations.	29 (74.4%)	10 (25.6%)	0

Minimum Safety Standards	Implemented N (%)	Not implemented N (%)	I do not know N (%)
Chemotherapy, parenteral nutrition (PN), and other selected high-alert medications orders are verified by a second pharmacist.	30 (76.9%)	9 (23.1%)	0
Concentrated (undiluted) electrolytes are removed from all patient care areas, and they are not available outside the pharmacy for any reason.	28 (71.8%)	8 (20.5%)	3 (7.7%)
Labeled red box are used to stock all concentrated (undiluted) electrolytes in pharmacy and clearly identified as High-Alert Medications.	30 (76.9%)	7 (18%)	2 (5.1%)
All compounded parenteral products are prepared in pharmacy.	28 (71.8%)	11 (28.2%)	0
Standard base solutions (e.g., dextrose 5%) are used for preparing compounded sterile products.	31 (79.5%)	3 (7.7%)	5 (12.8%)
Formulas are established and standardized to guide the compounding of complex sterile preparations, such as cardioplegia or dialysis solutions.	30 (76.9%)	7 (18%)	2 (5.1%)
Only one staff member is permitted to work in the compounding area during compounding chemotherapy and complex sterile preparations.	23 (59%)	12 (30.8%)	4 (10.2%)
Two staff members are permitted to work in the compounding area if the products being compounded are non-chemotherapy.	29 (74.4%)	5 (12.8%)	5 (12.8%)
Computerized label runs for pediatric and neonatal parenteral preparations are printed separately from adult parenteral preparations.	24 (61.5%)	14 (35.9%)	1 (2.6%)
The preparation of intravenous products for each population is separated by time, location, or use of different color bins.	15(38.5%)	21(53.8%)	3(7.7%)
Drugs, diluents, and base solutions are placed in a separate container (e.g., a basket or bin) for each batch to be prepared.	30 (77%)	9 (23%)	0
No two drugs are in the same hood at the same time.	23 (58.9%)	15 (38.5 %)	1 (2.6%)

All compounding staff pharmacists are certified and passed the competency evaluation for all aspects of sterile compounding (e.g., aseptic technique practical test, calculations, etc.)	29 (74.4%)	10 (25.6%)	0
A visual check is conducted to all diluents and drugs, including volumes and concentrations, prior to addition to the final container.	33 (84.6%)	5 (12.8%)	1 (2.6%)
For all sterile preparations, the final volume (e.g., bag volume plus additive volume) to be infused is present on the label.	31 (79.5%)	7 (17.9%)	1 (2.6%)

Best Practice Recommendations	Implemented N (%)	Not implemented N (%)	I do not know N (%)
A drug conservation policy that addresses the handling and disposition of drugs that may be in short supply because of market conditions.	26 (66.7%)	11 (28.2%)	2 (5.1%)
Sufficient space for drug storage is provided to segregate each drug concentration and look-alike/sound-alike medications.	35 (89.7%)	3 (7.7%)	1(2.6%)
Labeling of bins includes generic drug name and concentration.	34 (87.2%)	5 (12.8%)	0
Labeling of bins includes brand name for combination products, for example, Septrin (trimethoprim/sulfamethoxazole).	28 (71.8%)	11 (28.2%)	0
Tall man lettering is employed for look-alike drug names and is incorporated into computerized prescriber order entry (CPOE), pharmacy information systems and product labels.	22 (56.4%)	14 (35.9%)	3 (7.7%)
When available, commercially premixed parenteral products are used over manually compounded sterile products.	27 (69.2%)	11 (28.2%)	1 (2.6%)
Standard operating procedures (SOPs) for compounding all parenteral preparations including ophthalmic solutions compounding are updated.	30 (77%)	7 (17.9%)	2 (5.1%)
Only one parenteral preparation is prepared at a time, except if preparing the same doses of the same drug with the same route of administration.	33 (84.6%)	6 (15.4%)	0
Partially used multi-dose vials, bulk containers, or single-dose containers are not left in the hood for future use.	29 (74.4%)	8(20.5%)	2 (5.1%)
The organization has a strategic plan for implementation of automation and technology, such as bar code verification or intravenous robotics for the sterile products service.	23 (59%)	14 (35.9%)	2 (5.1%)
Technology and automation are utilized as much as possible for preparing and verifying parenteral preparations.	12 (30.8%)	27 (69.2%)	0
Intravenous workflow software (e.g., DoseEdge, ScriptPro Telepharmacy, and Intravenous Soft or similar technology) is used.	13 (33.3%)	25 (64.1%)	1 (2.6%)
Information about medication errors, from sources such as Institute for Safe Medication Practices (ISMP), are reviewed and used to modify practices and procedures as needed.	33 (84.6%)	5 (12.8%)	1 (2.6%)

Errors that occur during the compounding of parenteral preparations, including near misses, are reported through the organization's reporting system for analysis.	31 (79.5%)	8 (20.5%)	0
Bold patient name, generic drug name, and patient specific dose on all labels.	23 (58.9%)	12 (30.8%)	4 (10.3%)
Yellow labels are usually utilized for epidurals and high-alert drugs (e.g., chemotherapeutic agents).	23 (58.9%)	15 (38.5%)	1 (2.6%)
All potentially dangerous abbreviations for drug names, dosing units, routes of administration, and frequencies are not used.	35 (89.7%)	4 (10.3%)	0
Records used for preparing batch parenteral preparations are kept.	31 (79.5%)	7 (17.9%)	1 (2.6%)