

**UNIVERSITY OF CALIFORNIA, SAN FRANCISCO  
AUDIT & ADVISORY SERVICES**

**Clinic Operations – Pharmacy Inventory  
Project #23-019**

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University of California  
San Francisco

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**SUBJECT: Clinic Operations – Pharmacy Inventory**

As a planned internal audit for Fiscal Year 2023, Audit & Advisory Services (“A&AS”) conducted a review of pharmacy inventory management at select Faculty Practice Organization Clinics. The purpose of this review was to assess the processes and internal controls in place for the management of pharmaceuticals at ambulatory clinic locations.

Our services were performed in accordance with the applicable International Standards for the Professional Practice of Internal Auditing as prescribed by the Institute of Internal Auditors (the “IIA Standards”).

Our review was completed and the preliminary draft report was provided to department management in March 2023. Management provided their final comments and responses to our observations in April 2023. The observations and corrective actions have been discussed and agreed upon with department management and it is management’s responsibility to implement the corrective actions stated in the report. A&AS will periodically follow up to confirm that the agreed upon management corrective actions are completed within the dates specified in the final report.

This report is intended solely for the information and internal use of UCSF management and the Ethics, Compliance and Audit Executive Committee, and is not intended to be and should not be used by any other person or entity.

Sincerely,

Irene McGlynn  
Chief Audit Officer  
UCSF Audit & Advisory Services



## EXECUTIVE SUMMARY

### I. BACKGROUND

As a planned audit for Fiscal Year (FY) 2023, Audit & Advisory Services conducted a processes and controls review to ensure appropriate pharmaceutical inventory control and management in the clinics.

UCSF Pharmaceutical Services was established in 1965 with its first clinical pharmacy at Moffit Hospital. Since then, it has continued to lead the profession through integration of advanced technology, comprehensive pharmaceutical care and clinical services at a national level. Today, the department employs over 400 staff who work at multiple campus locations in San Francisco, both at the main pharmacies and at several satellite pharmacy locations.

UCSF Pharmaceutical Services is responsible for procuring and receiving inventory, with four buyers and nine Inventory Management Technicians dedicated to these functions at the main pharmacy locations. Generally, drug orders are ordered either through Amerisource Bergen (ABC), a wholesaler vendor, or various direct vendors.

Per the Pharmaceutical Services Purchasing Policy (220.200 – Purchasing), drugs that are not available from ABC are ordered by the Pharmacy Purchasing Manager (PM) or delegate directly from the vendor (direct orders). Once prescription drug orders are delivered to the pharmacy, Inventory Management Technicians perform receiving functions to ensure prescription drugs are received and delivered to the appropriate location. There are different processes for receiving ABC and direct ordered drugs, but all require Inventory Management Technicians scanning the package label and reconciling it with the contents. Invoices are sent with ABC orders; whereas direct orders include a packing slip with order information, which are forwarded to Pharmacy Accounts Payable for payment processing.

For Ambulatory clinics with a Pyxis Automated Dispensing Cabinet (Pyxis), Pharmacy manages the drug inventory and delivers medications. Pyxis captures the removal and return of medications, as well as allows for capturing wastage. Ambulatory clinics without Pyxis order medications through ABC's online portal, which is then sent to Pharmacy staff to review and approve the order before it is sent for fulfillment. Drug shipments are received by the Pharmacy and repackaged for clinic staff to pick up their orders. Clinic personnel (RN, LVN, MA, and other ancillary personnel) pick-up the order and transport it back to the clinics. They then are responsible for reconciling orders with shipments and monitoring inventory usage and re-ordering supplies as necessary.

### II. AUDIT PURPOSE AND SCOPE

The purpose of this review was to ensure that pharmaceuticals transferred to and from select clinics and Pharmacy are appropriately accounted for and managed in the clinic inventory. Processes reviewed included receiving and transport, usage and documentation, wastage and returns of pharmaceuticals.

The scope of the review covered transactions and activities for FY22 at the following locations:

Clinic	FY 22 Pharmaceutical spend as of xx/xx/2022	Average monthly pharmaceutical spend	Pyxis or Non-Pyxis
General Pediatrics at Mount Zion	\$1,242,610.89	\$112,964.63	Non-Pyxis
Pediatrics Endocrinology at Mission Bay	\$2,829,951.06	\$257,268.28	Pyxis
The Migraine Center at Mount Zion	\$1,237,463.06	\$112,496.64	Non-Pyxis
Weill Neuro-Surg MVMT Disorder at Mission Bay	\$1,157,399.64	\$105,218.15	Pyxis

Procedures performed as part of the review included reviewing current process flows related to obtaining pharmaceuticals from the Pharmacy and how inventory is received and managed by the clinic and returned to Pharmacy when necessary. For more detailed steps, please refer to Appendix A.

Work performed was limited to the specific activities and procedures described above. As such, this report is not intended to, nor can it be relied upon to provide an assessment of compliance beyond those areas specifically reviewed. Fieldwork was completed in December 2022.

**III. SUMMARY**

Based on work performed, controls are in place and operating effectively for monitoring purchasing and receiving activity. Regular reconciliation is occurring, and discrepancies are being investigated. Inspections of clinic pharmaceutical areas are being performed regularly by Pharmacy, and items identified are followed-up and resolved. Physical security of medications is controlled, with limited access and logging of access (in Pyxis clinics only).

Opportunities for improvement exist in the areas of separation of duties, medication administration/wastage documentation and charging, transport of medications, and streamlining operational processes.

The specific observations from this review are listed below.

1. Separation of duties is not always maintained at non-Pyxis clinics.
2. Medication documentation was not always consistent between the encounter notes, the Medication Administration Record (MAR), and the charges.
3. Transportation of medications at non-Pyxis clinics introduces risk of medication loss and safety concerns.
4. Manual efforts required at non-Pyxis clinics create operational burden and reduce staff availability for patient care.

Additionally, during the course of this review, a potential opportunity for improvement was noted for improving temperature controls for non-refrigerated medications.

**IV. OBSERVATIONS AND MANAGEMENT CORRECTIVE ACTIONS (MCAs)**

<b>No.</b>	<b><u>Observation</u></b>	<b><u>Risk/Effect</u></b>	<b><u>Recommendation</u></b>	<b><u>MCA</u></b>
1	<p><b><i>Separation of duties is not always maintained at non-Pyxis clinics.</i></b></p> <p>At clinics without Pyxis, separation of duties is not being maintained between ordering, receiving, and dispensing of medications. At the Migraine Center, Medical assistants are responsible for ordering medications, picking up medications from pharmacy, and performing manual counts of medications twice a day in the clinic logbook. They are also able to pull meds from the refrigerator and give them to providers. At the General Pediatrics clinic, there is one individual primarily responsible for ordering, receiving, and managing inventory, with two others functioning as backups; however, the functions may also be performed by the Clinic Manager, depending on the level of staffing and availability of staff.</p>	<p>Insufficient separation of duties may result in diversion going undetected.</p>	<p>Pyxis implementation is evaluated on a cost and risk basis; clinics should consult with Pharmacy to determine if the medications in use at their locations would qualify. If not, clinics should evaluate leveraging administrative staff or implementing compensating controls in consultation with Pharmacy.</p>	<p>The non-Pyxis clinics will consult with Pharmacy as to whether they meet the criteria for implementing Pyxis; if not, what leading practices can be put in place to mitigate risks.</p> <p><b>Responsible Party:</b> Clinic Director  <b>Target Completion Date:</b> 7/1/2023</p>
2	<p><b><i>Medication documentation was not always consistent between the encounter notes, the Medication Administration Record (MAR), and the charges.</i></b></p> <p>While substantial monitoring is performed for the purchasing of drugs, and dashboards, reports, and other tools have been implemented to assist clinics in this monitoring, the final portion of inventory management relating to administering and charging for drugs does not have the same visibility associated with it. Review of 10 medications from each of the four clinics identified the following discrepancies between drug administration/wastage documentation and charges:</p> <p><u>Migraine Center</u></p>	<p>Revenue opportunities may be missed, and patient safety compromised if not all medications administered are documented centrally.</p> <p>Insufficient administration or wastage documentation may lead to diversion</p>	<p>Clinics should emphasize the need for consistent medication documentation and perform regular checks to ensure medication is being documented accurately.</p>	<p>General Pediatrics has previously identified issues relating to ordering that can affect MAR documentation and will investigate reporting options to compare orders to MAR to determine if additional issues</p>

No.	Observation	Risk/Effect	Recommendation	MCA
	<ul style="list-style-type: none"> <li>5 cases where medications documented in the encounter notes (but without lot number or expiration date) were not on the MAR and did not have charges (5 lidocaine, 3 bupivacaine, 1 marcaine)</li> </ul> <p><u>Weill Neuro-Surg MVMT Disorder</u></p> <ul style="list-style-type: none"> <li>1 case where waste in the encounter notes does not match MAR and charges (onabotulinum toxin A)</li> </ul> <p><u>Pediatrics Endocrinology</u></p> <ul style="list-style-type: none"> <li>2 cases where lidocaine injection was in the notes, but lidocaine cream was documented in the MAR and charged</li> <li>1 case where lidocaine cream was on MAR and charges, but was not in the notes</li> </ul> <p><u>General Pediatrics</u></p> <ul style="list-style-type: none"> <li>4 cases where the quantity in notes and MAR do not match the quantity charged (2 albuterol, 2 dexAMETHasone)</li> <li>1 case where the strength in notes is 80mcg for albuterol; however, the MAR and charges have 90 mcg strength</li> <li>7 cases where medication is not documented in the notes (2 ibuprofen, 1 medroxyPROGESTERone, 1 albuterol, 1cefTRIAxone, 1 lidocaine, 1 acetaminophen, 1 influenza vaccine)</li> </ul>	<p>going undetected, as the ability to reconcile usage with purchasing is inhibited.</p>		<p>need to be addressed.</p> <p><b>Responsible Party:</b> Clinic Director  <b>Target Completion Date:</b> 7/1/2023</p> <p>Clinics will reiterate the requirements for consistent medication documentation and periodically review to ensure medication is documented appropriately, providing feedback when issues are identified.</p> <p><b>Responsible Party:</b> Clinic Director  <b>Target Completion Date:</b> 7/1/2023</p>
3	<p><b><i>Transportation of medications for at non-Pyxis clinics introduces risk of medication loss and safety concerns.</i></b></p>	<p>Insufficient chain of custody reduces accountability if</p>	<p>The General Pediatrics clinic is assessing use of existing</p>	<p>Clinics will assess options for implementing dual custody or escorts</p>

No.	Observation	Risk/Effect	Recommendation	MCA
	<p>At non-Pyxis clinics, clinic staff are responsible for picking up medications from Pharmacy. Limited staffing does not allow for the pickups to occur in dual custody, and there is no chain of custody maintained between the Pharmacy and clinics, resulting in a lack of accountability for missing or damaged drugs. Additionally, some of the drugs transported by clinic staff have significant street value, and the lack of dual custody/escort may compromise the physical security of the clinic staff while transporting these drugs.</p> <p>Several of the drugs being picked up by clinic staff from Pharmacy require refrigeration; however, they are in non-refrigerated bags for transport, which may compromise the drugs stability if any delays or extreme weather conditions occur during transport.</p>	<p>drugs are missing or damaged.</p> <p>Absence of adequate measures to ensure physical safety may increase the risk that employees carrying drugs may be physically harmed by individuals seeking to obtain those drugs.</p> <p>Insufficient temperature controls may result in damaged or ineffective drugs.</p>	<p>transportable coolers to maintain temperature of the vaccines during transport.</p> <p>For transport, clinics should evaluate dual custody or security escort when warranted.</p>	<p>for medication transportation.</p> <p><b>Responsible Party:</b> Clinic Director  <b>Target Completion Date:</b> 12/01/23</p>
4	<p><b>Manual efforts required at non-Pyxis clinics create operational burden and reduce staff availability for patient care.</b></p> <p>Non-Pyxis clinics do not have official par usage processes for all medications, so additional efforts are required. The General Pediatrics clinic has par levels set for vaccines but uses an informal visual inventory assessment twice a week for other drugs. The Migraine Center does not have formal par levels set, but manually tracks inventory levels twice daily, and uses the patient schedules to determine ordering needs on a weekly basis.</p> <p>Expirations are also checked manually at the non-Pyxis clinics. The General Pediatrics clinic has a paper printout of medications and expiration dates that is updated and reviewed monthly, while the Migraine Center does a check every two weeks on the Code Carts/E-kits (other medications are used with sufficient frequency that expiration dates have not been a problem).</p>	<p>Manual, labor intensive activities reduce time available for staff to conduct patient care.</p>	<p>Clinics should consult with Pharmacy to identify leading practices that can be implemented at their locations and determine if implementing Pyxis would be feasible.</p>	<p>The non-Pyxis clinics will consult with Pharmacy as to whether they meet the criteria for implementing Pyxis; if not, what leading practices can be put in place to more efficiently mitigate risks.</p> <p><b>Responsible Party:</b> Clinic Director</p>

No.	Observation	Risk/Effect	Recommendation	MCA
	Inventory reconciliations are also being performed manually; however, there are challenges with out of stock or alternative drugs, and investigation is often required to validate completeness and accuracy of items ordered and received.			Target Completion Date: 7/1/2023

**V. OPPORTUNITIES FOR IMPROVEMENTS**

No.	Observation	Risk/Effect	Recommendation
6	<p><b><i>Improving temperature control can reduce the risk of damage to medications and burden on staff.</i></b></p> <p>At the Migraine Center, the air conditioning was turned off during the weekends due to noise concerns. In a period of excessive heat, the non-refrigerated medications ended being stored at a temperature outside the appropriate range. This required the Clinic Manager to return to the Migraine Center during the weekend, pack up the relevant medications, transport them to the Pharmacy, and retrieve them at the beginning of the work week when the air conditioning was back on and the storage room had returned to an appropriate temperature.</p> <p>While the temperature monitoring control functioned as designed to alert the Clinic Manager to the issue, the time needed to travel to the Migraine Center and pack and transport the medications created the risk of the medications being at an inappropriate temperature beyond their tolerance, as well as being an additional operational burden on staff and potentially creating a delay in the schedule when the medications were returned.</p> <p>This risk of temperature excursions applies to the Pediatric Primary and Acute Care Clinics as well, as the air conditioning is regularly turned off on weekends and the designated medication rooms do not have independent temperature control.</p>	<p>Medications staying at a temperature outside their tolerance could cause damage to the medications and lessen their usability. Additionally, this may result in additional cost if the medications are unusable and would need to be replaced.</p>	<p>Clinics should assess their ability to regulate temperature for medications and consider instituting additional safeguards when unusual weather events are predicted to occur.</p>



**APPENDIX A**

To conduct our review the following procedures were performed for the areas in scope:

- Obtained and reviewed relevant policies and procedures related to obtaining pharmaceuticals from the Pharmacy and how inventory is received and managed by the clinic and returned to Pharmacy if and when necessary
- Interviewed key clinic personnel and performed walkthroughs to gain and understanding of the tracking of pharmaceuticals and assess the accurate accounting of drugs
- Reviewed criteria used to determine if inventory management is consistent and ensure documentation in patient accounts is appropriate
- Validated that dispensed drugs were documented appropriately in patient accounts.