November 9, 2011

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Subject: *Major Supply Inventory Management – Operating Rooms*
                   Audit & Management Advisory Services Project 2011-15

The final audit report Major Supply Inventory Management– Operating Rooms, Audit Report 2011-15, is attached. We would like to thank all Operating Room personnel for their cooperation and assistance during the audit.

Because we were able to reach agreement regarding corrective actions to be taken in response to the audit recommendations, a formal response to the report is not requested.

The findings included in this report will be added to our follow-up system. While management corrective actions have been included in the audit report, we may determine that additional audit procedures to validate the actions agreed to or implemented are warranted. We will contact you to schedule a review of the corrective actions, and will advise you when the findings are closed.

UC wide policy requires that all draft audit reports, both printed and electronic, be destroyed after the final report is issued. Because draft reports can contain sensitive information, please either return these documents to AMAS personnel, or destroy them, at the conclusion of the audit exit conference. AMAS also requests that draft reports not be photocopied or otherwise redistributed.

                                         Stephanie Burke
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Attachment

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AUDIT & MANAGEMENT ADVISORY SERVICES

University of California
SanDiego

Major Supply Inventory Management – Operating Rooms
November 2011

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Project Number: 2011-15

Major Supply Inventory Management – Operating Rooms
Audit & Management Advisory Services Project 2011-15

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Attachment A – Inventory Management Controls Matrix

I.   Background

Audit & Management Advisory Services (AMAS) has completed a review of the Operating Rooms (ORs) major supply inventory management processes as part of the approved audit plan for Fiscal Year 2010-11.   This report summarizes the results of our review.

UCSD Health System (UCSDHS) Perioperative Services are provided at the UCSD Medical Center Hillcrest (Hillcrest) and La Jolla (Thornton); and the Shiley Eye Center. Hillcrest maintains seven operating rooms within the Main OR, and four within Same Day Surgery (SDS). Thornton and the Shiley Eye Center have seven and four operating rooms, respectively.   The Sulpizio Cardiovascular Center (CVC) includes four new operating rooms, which opened on August 8, 2011. All ORs operate under the direction of the Interim Director.

Supply inventory is managed on a daily basis by the OR Buyers who complete a visual inspection of the supply levels in each storage area. A review of the operating schedule is conducted frequently to ensure that the needed supplies are available. High value inventory items are available on consignment, or through direct purchase. A number of high value items, such as some surgical implants, are unique to the surgical procedure and to the patient. In many cases, those items are delivered to the ORs by a vendor representative on the day of surgery, and are not maintained in inventory. A full physical inventory count is conducted annually by the OR Buyers and submitted to Financial Services. Near the end of each fiscal year, Financial Services makes adjustments to the OR inventory asset account to reflect the inventory balance on hand based on the summary total of the annual physical inventory conducted.

For purposes of this review, major supply items were defined as individual items with a cost of $1,500 or greater. Thornton and Hillcrest were the only locations that stock high value supply items for their respective ORs. Each of these locations is managed by two dedicated Buyers and one assistant.

The UCSDHS utilizes the *MediClick for the Supply Chain* (MediClick) system as a tool to manage supply chain operations. The OR Buyers utilize "par carts"[1] within the MediClick system to facilitate submission of supply requisitions and to assist them with conducting inventory management activities. OR supply expenditures for the period July 1, 2010 through April 30, 2011 are provided in the following table.

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[1] Most hospital departments maintain a small local inventory of standard items that they used frequently. The quantity of each item to be kept on hand is the "par quantity" or "par level". As items are used, they are replenished up to the par level defined for each item. In this way, quantities of local supplies are maintained at a standard level. MediClick has developed "par carts" to assist departments with managing inventory par levels.

Account	Hillcrest Main (714)	Hillcrest SDS (646)	Thornton (150)	Shiley Eye Center (717)	Total
138031 – Prosthesis	$8,195,689	$1,639,106	$6,827,275	$774,036	$17,436,106
138032 – Suture and Surgical Needles	$539,506	$98,382	$680,417	$76,417	$1,394,722
138033 – Surgical Pack, Sheet	$716,470	$148,115	$654,960	$79,106	$1,598,651
138034 – Surgical Supplies, General	$2,930,306	$565,413	$3,526,836	$1,059,230	$8,081,785
138041 – Other Medical Materials, Supplies	$1,583,987	$251,812	$1,282,803	$122,586	$3,241,188
137284 – Inventory Adjustment	$236	$0	$0	$0	$236
TOTAL	**$13,966,194**	**$2,702,828**	**$12,972,291**	**$2,111,375**	**$31,752,688**

II. Audit Objective, Scope, and Procedures

The objective of our review was to evaluate the major supply inventory management infrastructure in the OR to verify that process controls were adequate to ensure product availability, and to ensure that inventory shrinkage and product outdates were minimized.

We completed the following audit procedures to achieve the project objectives:

- Interviewed staff involved in OR inventory management and/or oversight of OR inventory processes;
- Observed Hillcrest Main OR, Hillcrest SDS OR, and Thornton OR Buyers performing their daily activities at their respective inventory storage locations;
- Obtained financial information and inventory detail records for Fiscal Year 2010/11;
- Summarized the inventory management controls for Hillcrest and Thornton *(Attachment A)*;
- Selected a sample of 74 of the highest valued supply items within the par carts at the Hillcrest Main OR, Hillcrest SDS ORs, and Thornton ORs to evaluate par cart management;
- Selected a sample of 135 high value supplies from OR supply purchase records for the Fiscal Year 2009-10 and the MediClick catalogue to verify the disposition and inventory location for each item; and,
- Analyzed a judgmental sample of 88 inventory items at the Hillcrest Main OR, Hillcrest SDS ORs, and Thornton ORs to verify that outdated products were not retained in inventory.

The UCSD Ambulatory Surgery Center, LLC was excluded from this review as it is managed by Surgical Care Affiliates. In addition, the CVC ORs were not operational

during audit fieldwork, and Shiley Eye Center ORs did not stock supplies that met the audit criteria. Therefore, those locations were also excluded from the audit scope.

III.   Conclusion

We concluded that inventory management process controls, as depicted in *Attachment A*, were generally adequate to ensure product availability, and to minimize inventory shrinkage, and product outdates. In addition, OR major supply expenditures have been within the respective location budgets during Fiscal Year 2010/11.

However, we noted additional opportunities to improve inventory management and further assist in meeting business objectives, which are discussed in more detail in the remainder of this report.

IV.   Observations and Management Corrective Actions

A.   Inventory Management

Although supply items were generally available when needed, additional inventory management process improvements would provide safeguards against stock-outs, and help to ensure efficient use of supply funds.

The Operating Room Scheduling Office System[2] (ORSOS) has been used for a number of years to schedule procedures and bill for perioperative services. However, because ORSOS inventory functionality was not implemented, the OR Buyers utilized the MediClick par cart function, along with supply information queries to assist with completing daily supply monitoring and purchase order preparation.   A separate, comprehensive list of inventory items was not maintained to help determine the actual product quantity on hand at each location. Therefore, if an inventory item was not included in a par cart, it was difficult to determine where the item was located and how many were in stock without assistance from the OR Buyers.

Generally, par carts have been established for most major supply items. Individual par carts included supplies, and the maximum quantity associated with each item. Barcodes were placed in the physical storage location for the majority of supply items included in the par carts, which were used by the Buyers to generate supply requisitions. To generate a requisition, the buyer scanned product barcodes, identified the number of items needed, and adjusted the scanner's inventory quantity on hand to generate a requisition for the number of items needed. When the scanner was synced with the Buyer's computer, a requisition

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[2] ORSOS is a rules-based software system that automatically manages all aspects of surgical services operations including complex scheduling, and resource and inventory management.

for all inventory items within the par cart was generated and submitted to Purchasing.

To determine if established par carts included an accurate list of supply items and associate par levels, AMAS selected a judgmental sample of high value supply items from the par carts at each location for focused review. The following table summarizes the audit test results.

Location	Number of Supply Items Tested	Number of Exceptions Noted	Test Results
Hillcrest Main OR	35	30	The par cart had not been updated to reflect: • changes in the service location associated with an inventory item, • changes in providers and associated inventory preferences; • changes in consignment items; and, • changes in inventory usage and supplies.
Hillcrest SDS OR	24	19	The par cart had not been updated to reflect: • order quantities rather than item counts; • changes in the service location associated with an inventory item, or changes in inventory location; • changes in providers and associated inventory preferences; and, • changes in supply usage.
Thornton OR	15	9	Product par levels included in the par cart had not been updated to reflect changes in supply usage.

OR Buyers within the various locations were familiar with OR supplies and relied on their experience and familiarity of usage and physician preferences to ensure that supplies were available when needed, and inventory costs were controlled. However, because successful inventory management was reliant on the effectiveness of current personnel, any personnel changes could impact the availability of supply items without continuous updates to par cart data.

UCSDHS has selected the Epic[3] electronic medical record (EMR) system as its primary clinical information system. Epic ambulatory and inpatient modules have been implemented in selected patient care areas over the past five years. Management intends to replace the ORSOS system with the Epic OpTime module within the next twelve to eighteen months. Additional opportunities for the automation of supply inventory management based on OpTime supply tracking capabilities will be available as a result of this conversion.

Management Corrective Actions:

1. OR Buyers are establishing new par carts for the Hillcrest and Thornton ORs to assist with managing inventory. OR Buyers will periodically update par carts to ensure that that they reflect re-order points, and changes associated with inventory usage, location, consignments, and physician preferences for all major supply inventory items.

2. OR management has advised AMAS that Information Services will interface the MediClick system with Epic OpTime during the OpTime implementation. OR management will consider implementing supply inventory management functions as opportunities for improving inventory process efficiency are identified.

B.   Hillcrest Main OR Physical Access

Major supply inventory items were accessible to anyone with access to the Hillcrest Main ORs, which were not fully secured during business hours.

The configuration of the Hillcrest Main ORs, and the distribution of supply storage areas throughout the Hillcrest OR suite have created supply security challenges. Supplies were stored in areas closest to the ORs where they would be used most frequently. Therefore, personnel with access into the OR suites also had access to most supply items.

Management has implemented additional security in the Hillcrest OR suite to prevent major supply items from being borrowed by other procedure areas or misappropriated. Two of the three main access doors into the Hillcrest OR suite had additional security installed. One door was secured with badge swipe technology, and a second door was controlled using a code lock. A locking cage

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[3] Epic is a product of Epic Systems Corporation of Verona, Wisconsin. The Epic application offers an integrated suite of health care software centered on a hierarchical object-oriented database system. All Epic applications leverage the same central database. Epic data can be queried using built-in reporting tools for research and other analyses.

was installed in the Nurse Manager's Office to protect the high cost supply items stored there. However, we noted that a code lock would improve security in two storage areas; and additional personnel access controls, or modification of Buyer responsibilities would help to decrease the number of non-OR personnel entering the Hillcrest OR suite through the third main door.

High cost supply items were stored in the Hillcrest Neurology and Cardiology OR anterooms, which remained unlocked during normal business hours. AMAS noted that the cost for a number of the items stored in these locations exceeded $5,000. Therefore, installation of code locks or another similar technology would provide an additional level of security needed to minimize the risk of supply loss from these two areas. When the CVC opened in August 2011, the Cardiology anteroom was re-purposed, and a significant amount of the Cardiology supply items were transferred to the CVC.

A third main access point into the Hillcrest OR suite was located across from the Buyers' office. The door was left unlocked during business hours to allow vendors to access to the Buyers' Office and hospital staff to access the Instrument Room. Throughout the day, vendors visiting the ORs or Anesthesia Preparation areas, and other hospital floors or departments were directed to the OR Buyers' office to obtain clearance, and staff from other procedure areas in the hospital delivered instrument trays for sterilization. Vendor presence in the OR was considered critical to appropriate product selection in some cases, and many of the vendors were known to OR personnel. However, assigning OR Buyers the responsibility for clearing all vendors visiting hospital units increases the number of non-OR personnel entering the Hillcrest OR suite, and also increases the risk of unauthorized access to those ORs, and other supply storage locations.

During audit fieldwork, Medical Center Security confirmed that four cameras had been installed at OR management's request to monitor access to the Hillcrest Main OR at the main access point, and the activity within each interior hallway. Medical Center Security was responsible for monitoring the cameras, and to retain the video back-up tapes for one week to allow for review in the event that a loss is reported. Security cameras provide a detective control to assist management with determining personnel involvement in theft or other prohibited activities. However, limiting access to ORs to the extent possible would be more effective as it would help prevent incidents from occurring.

Management Corrective Actions:

1. A periodic comparison of between physical inventory and par cart inventory quantities will be completed for a sample of Neurology

anteroom high value supply items to evaluate and investigate any discrepancies in physical inventory levels.

2. Signs have been installed notifying vendor representatives that the OR vendor clearance location serves the Hillcrest Main OR, Outpatient Surgery Center, and Anesthesia Monitoring areas. OR Buyers request that vendor representatives obtain clearance from the Storehouse location for other sites.

C. Product Outdate Monitoring

Expired product costs (product outdates) were not being monitored by OR management.

Other procedure areas, such as Interventional Radiology, have implemented a monthly reporting of product outdates. Periodic monitoring of the cost and identification of items associated with outdates may assist OR management in communicating with physicians regarding standardization of products and in monitoring the effectiveness of inventory management.

In order to evaluate product outdate management, AMAS selected a judgmental sample of the highest valued par cart items and judgmental sample of items from the physical inventory to ensure that the product had not expired. AMAS testing of product outdates provided reasonable assurance that items were removed from inventory and not used. OR Buyers prepared lists that valued Thornton OR outdates for the fiscal year as of June 14, 2011 at approximately $193,000 and Hillcrest OR outdates for the fiscal year as of June 15, 2011 at approximately $172,000. However, these lists were not provided to OR management to facilitate monitoring of the type of products that outdate and their associated value. In addition, OR provided the value of expired products to Financial Services annually with the physical inventory records. However, Financial Services did not separately identify the value of expired products in OR inventory reports.

Management Corrective Actions:

OR management will:

1. Review product outdates details monthly to verify the expired products are consistently identified, and to identify trends in expired products and associated costs.

2. Request that Financial Services record the value of expired products in the general ledger to capture data for analysis of expired products over time.

D.   Returned Goods

Buyers coordinate with vendors to obtain returned good authorizations (RGAs) for replacement supplies or credits.   However, the "Returned Goods/Shipping Document" was not provided to notify the Storehouse or Account Payable of the return.
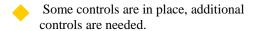
In accordance with *Medical Center Policy (MCP) 710.1, Returned Goods, Revised December 1, 2010*, the OR Buyers coordinate with vendors regarding the return of a non-stock (buyout) supply item and the subsequent item replacement, department credit or repair.   However, the OR Buyers were not providing the "Returned Goods/Shipping Document" to the Storehouse.   This document is necessary for the Storehouse to properly document the return within MediClick and to notify Accounts Payable of the return.   When the document is not provided, ORs may be inappropriately charged for return items or may not receive invoice credits.

Management Corrective Action:

As of June 2011, OR Buyers were completing the "Returned Goods/Shipping Document" for each buyout supply return and providing this document to the Storehouse with the return to comply with MCP 710.1.

Inventory Control Procedure		*Required by Policy[i]*	*Strongly Preferred*	*Recommended*	Control Present		Report Reference
					Thornton	*Hillcrest*	
GENERAL	1. Procedures or systems to provide sufficient periodic information and data to permit effective monitoring of inventory supply costs by management.	X			🔶	🔶	Finding C (page 7)
	2. Procedures to identify problem areas disclosed by the monitoring process.		X		🟢	🟢	
	3. Procedures to remedy problem areas disclosed by the monitoring process.		X		🟢	🟢	
	4. A process for evaluating inventory risk and reporting to appropriate levels of management.		X		🟢	🟢	
	5. Separation of Duties within key inventory processes.	X			🟢	🟢	
MATERIAL	1. Procedures to reasonably assure that only the supplies required to be purchased are in fact purchased.	X			🟢	🟢	
	2. Procedures to reasonably assure that purchase activities are appropriately authorized by management.	X			🟢	🟢	
	3. Procedures to reasonably assure that changes in inventory supply requirements are implemented timely to preclude acquiring improper items.	X			🟢	🟢	

🟢 Control is present. 🟥 Control is not present. 🔺 Additional controls are planned or pending. 🔶 Some controls are in place, additional controls are needed.

	Inventory Control Procedure	Required by Policy[i]	Strongly Preferred	Recommended	Control Present Thornton	Control Present Hillcrest	*Report Reference*
MATERIAL *(continued)*	4. Procedures to reasonably assure that inventory ordering procedures consider whether what is on hand and what is needed is sufficient, but not in excessive quantities.	X			🔶	🔶	Finding A (page 3)
	5. Procedures to identify and monitor supply of critical inventory. (Including consideration of the cost of carrying inventory versus the cost resulting from stock outages.)			X	🔶	🔶	Finding A (page 3)
	6. A procedure to promptly notify suppliers when there is a change in requirements and specifications.			X	🟢	🟢	
	7. Procedures to reasonably assure that only supplies that are ordered are accepted.		X		🟢	🟢	
	8. Procedures to reasonably assure that the acceptance of delivered materials is contingent upon sufficient inspection to verify the description and quantity.		X		🟢	🟢	
	9. Procedures to reasonably assure that inventory supplies received are sufficiently controlled until issued, including:						

🟢 Control is present.   🟥 Control is not present.   🔺 Additional controls are planned or pending.   🔶 Some controls are in place, additional controls are needed.

Inventory Control Procedure		*Required by Policy[i]*	*Strongly Preferred*	*Recommended*	*Thornton*	*Hillcrest*	*Report Reference*
					Control Present		
MATERIAL *(continued)*							
	a. Storage in designated areas pursuant to procedures that require:						
	1. Restricting access only to custodians;		X		🟢	🟢	
	2. Identification system that facilitates subsequent location;			X	🔶	🔶	Finding A (page 3)
	3. Orderly arrangement and storage;			X	🟢	🟢	
	4. Periodic physical counts and subsequent comparison to written records by individuals independent of the custodians;	X			🟢	🟢	
	5. Adequate physical protection.	X			🟢	🔶	Finding B (page 5)
	b. Procedures to provide reasonable assurance that all inventory issued transactions are accurately recorded, including physical counts.	X			🟢	🟢	
	c. Procedures to identify and use or otherwise dispose of obsolete and slow-moving supplies.	X			🟢	🟢	

🟢 Control is present. 🟥 Control is not present. 🔺 Additional controls are planned or pending. 🔶 Some controls are in place, additional controls are needed.

		Required by Policy[i]	Strongly Preferred	Recommended	Control Present		Report Reference
Inventory Control Procedure					**Thornton**	**Hillcrest**	
MATERIAL *(continued)*	d. Procedures to reasonably assure that dispositions of inventory are recorded (wastage, returns, etc.).	X			🟢	🟢	
	e. Procedures to reasonably assure that returns are appropriately recorded with respect to physical inventory and financial credit.	X			🟥	🟥	Finding D (page 7)
FINANCE	1. An accounting system that reasonably assures the following transactions pertaining to inventory are recorded in compliance with University Medical Center Policy and Generally Accepted Accounting Principles (GAAP): a. Purchase of supplies; b. Adjustments to record differences in comparison of physical counts with corresponding recorded amounts.	X			🟢 🟢	🟢 🟢	
	2. Procedures for minimizing the financial risk associated with long-term commitments to suppliers. a. Establishing appropriate funding through constant & timely negotiating and approval of contracts; 3. Timely payment of invoices.	X			N/A N/A	N/A N/A	

🟢 Control is present.   🟥 Control is not present.   🔺 Additional controls are planned or pending.   🔶 Some controls are in place, additional controls are needed.

					Control Present		
Inventory Control Procedure		*Required by Policy[i]*	*Strongly Preferred*	*Recommended*	***Thornton***	***Hillcrest***	***Report Reference***
SAFEGUARDING	1. Procedures that provide reasonable assurance that investment in inventory is sufficiently protected from theft, sabotage, and physical damage from acts of God.	X			●	◆	Finding B (page 5)
	2. Procedures that provide reasonable assurance that access to patient identifiable information is restricted to authorized individuals.	X			●	●	
INFORMATION SYSTEMS	1. User's manual that describes the applicable procedures, forms, and descriptions.		X		●	●	
	2. Controls that ensure user access is restricted to only data that is required for the user to fulfill his or her assigned responsibilities.		X		●	●	
	3. Controls to associate each transaction with the user that initiated that transaction entry.		X		●	●	

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[i] Required by Policy: MCP 703.1F – Centralized Purchasing; Campus PPM 520 – Material Management; BUS-54 – Operating Guidelines for University Supply Inventories.

● Control is present.	■ Control is not present.	▲ Additional controls are planned or pending.	◆ Some controls are in place, additional controls are needed.