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M E M O R A N D U M

DATE: October 9, 2007

TO: Metropolitan King County Councilmembers

FROM: Cheryle A. Broom, County Auditor

SUBJECT: Jail Health Services Pharmacy Operations and Medication Administration Performance Audit

Attached for your review is the Jail Health Services Pharmacy Operations and Medication Administration Performance Audit. The objective of the audit was to evaluate Jail Health Services' controls over medications (including narcotics and other controlled substances), assess the effectiveness of quality assurance activities, and review staffing and scopes of practice within the context of medication administration and pharmacy operations.

The general audit conclusion was that Jail Health Services' (JHS) patients are at no greater risk due to medication errors than patients in other healthcare settings. However, opportunities exist for JHS to increase accountability in its medication processes. With regard to staffing, we found that JHS has developed a viable staffing model based on workload and productivity data for pharmacy shifts and has begun to do so for nursing. We also found that the new Electronic Health Record system at JHS should provide program staff with the workload and productivity data necessary to strengthen current nurse staffing practices.

The County Executive concurred with the audit findings and recommendations. The executive's official response is included in the appendices of this report.

The auditor's office sincerely appreciates the cooperation received from the staff and management of Jail Health Services and the Department of Adult and Juvenile Detention.

CB:CD:jl

PERFORMANCE AUDIT

JAIL HEALTH SERVICES' PHARMACY OPERATIONS & MEDICATION ADMINISTRATION

Presented to
the Metropolitan King County Council
General Government and Labor Relations Committee
by the
County Auditor's Office

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Report No. 2007-04
October 9, 2007

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EXECUTIVE SUMMARY

Introduction

Audit Conducted in Response to Ombudsman's Concerns about Medication Administration Practices

This performance audit was conducted in response to a motion passed by the King County Council directing the King County Auditor's Office to review Jail Health Services' pharmacy operations and medication administration practices. The council's concerns focused on issues raised in the King County Ombudsman's Office November 2006 Report on Jail Health Medication Errors and State Inspection Results. Key issues raised in the Ombudsman's report included:

- Inmate complaints regarding the timeliness and accuracy of medication administration;
- Jail Health Services staff concerns regarding heavy workloads, understaffing, reliance on temporary agency nurses, and an ineffective quality improvement program; and
- Washington state Board of Pharmacy inspection report findings citing medication-related process deficiencies from 2004, 2005, and 2006.

General Conclusions

Overall, we found that Jail Health Services' patients are at no greater risk due to medication errors than patients in other healthcare settings. However, opportunities exist for Jail Health Services to increase accountability in its medication processes.

With regard to staffing, we found that Jail Health Services (JHS) has developed a staffing model based on workload and productivity data for pharmacy shifts and has begun to do so for nursing. Implementation of the new Electronic Health Record system by JHS should provide program staff with the workload and productivity data necessary to strengthen current nurse staffing practices.

Scope and Objectives

This performance audit evaluated Jail Health Services' medication administration and pharmacy operations, including an independent evaluation of the quality, accuracy, and efficiency of practices. The objectives were to evaluate Jail Health Services' medication-related processes, quality assurance activities, and staffing and workload trends.

Summary of Key Findings

Inmate Safety Is at No Greater Risk Due to Medication Errors than Patients in Other Healthcare Settings

Our consultant's assessment of pharmacy operations and medication administration processes identified the need for additional controls over medications. Their review also concluded that county inmates are at no greater risk of harm due to medication errors than patients in other healthcare settings.

Opportunities Exist to Improve Medication Accountability

Within the current operating model, there are opportunities for medications to be lost, and no controls or limited controls exist to detect and monitor such events. Additional controls for narcotics are in place, but these controls could be strengthened.

Another notable theme highlighted during our audit was that the primary mission of a jail is to secure custody, not to provide health services. These disparate objectives make it critical for correctional staff and healthcare staff to coordinate activities. During our site visits, we observed that opportunities exist for Jail Health Services and the Department of Adult and Juvenile Detention (DAJD) to improve collaboration during the medication administration process.

Finally, our review of Jail Health Services' quality improvement program concluded that Jail Health Services is developing and implementing an array of activities that are consistent with healthcare industry best practices for quality improvement. However, our best practices research suggested that

performance measures could be strengthened to increase emphasis on outcomes rather than process outputs.

Pharmacy Staffing Model Needs to Be Updated to Reflect Current Processes and Workload

Our audit also reviewed Jail Health Services' staffing practices. Although the current pharmacy staffing model is based on an analysis of workload and productivity data, the model was developed prior to significant changes in operations and should be updated to ensure it reflects the demands of the current workload. Additionally, the current pharmacy staffing plan does not include relief for employees who call in sick or take vacation.

Nurse Staffing Model Could Be Improved if It Were Linked to Workload Demands and Productivity Goals

Jail Health Services has begun to develop a nurse staffing model that is based on nurse workload and productivity; however, the limited amount of electronic data accessible to JHS program staff has made development of this kind of model difficult. Jail Health Services is currently replacing its paper-based medical record system with electronic health records. With the new system, program staff will be able to access electronic information about the patients served and the productivity of nurses. Once workload and productivity data are available, Jail Health Services needs to evaluate the factors that impact its staffing needs and link its nurse staffing plan to those factors.

Audit Identified a Pattern of Shifts Worked by Fewer Nurses Than Planned

Additionally, we identified a pattern of shifts worked by fewer nurses than specified in the current staffing plan, particularly at the King County Correctional Facility (KCCF). Because JHS has not set nurse staffing levels using workload and productivity data, we could not determine whether a shift worked by fewer nurses than planned is not sufficiently staffed to meet the demands of the workload. Rather, our results indicate only that nursing shifts are frequently staffed by fewer nurses than the current plan specifies. In order to improve staffing on nursing shifts, Jail Health Services needs to ensure nursing schedules align with nurse staffing plans; work to reduce vacancies and unscheduled

leave; and develop a staffing model that includes coverage for nurses on leave.

Summary of Key Recommendations

Jail Health Services Should Strengthen Inventory Controls and Transfer Greater Responsibility to the Pharmacy

We recommended that Jail Health Services enhance accountability for medications by strengthening inventory controls and transferring responsibility for filling the carts with inmate medications from nursing to pharmacy staff. Additionally, Jail Health Services should conduct a feasibility analysis to evaluate centralizing its pharmacy operations.

We also recommend that JHS work with DAJD to modify their Memorandum of Understanding to include regular joint reviews of medication administration performance. JHS should identify key publicly reportable performance measures, including outcome-based measures, and monitor these through the joint Jail Health Services and DAJD reviews.

Staffing Models Should be Updated and Linked to Workload Demands and Productivity Goals

Jail Health Services should update its pharmacy staffing model to ensure it reflects the demands of the current workload and accounts for staff on vacation or sick leave. Nurse staffing should be improved through development of a model that is systematically linked to workload demands and productivity goals. Additionally, JHS should ensure that nurse schedules align with staffing plans and that the nurse staffing model also incorporates the need to cover employees on leave.

Jail Health Services should improve its management of vacation leave by specifying the maximum number of staff who can take vacation from each shift. JHS should also consider improving current leave policies to create an incentive for employees to save their sick leave.

Summary of Executive Response

The county executive has provided a response to the recommendations and concurs with all of them. The response also includes proposed implementation timelines. See the appendices section for the complete text of the Executive Response.

Acknowledgement

The Auditor's Office appreciates the work of our consultant on this audit, Westcoast Consulting Group, LLC. We thank the management and staff of Jail Health Services and Public Health – Seattle and King County for their cooperation and willingness to dedicate their time to assist with this audit. We also wish to acknowledge the information and assistance provided to us by the King County Ombudsman's Office.

1 INTRODUCTION AND BACKGROUND

Audit Conducted in Response to Council Motion

This performance audit was conducted in response to a motion passed by the King County Council directing the King County Auditor's Office to review Jail Health Services' pharmacy operations and medication administration practices. The council's concerns focused on issues raised in the King County Ombudsman's Office November 2006 Report on Jail Health Medication Errors and State Inspection Results. Key issues raised in the Ombudsman's report included:

- Inmate complaints regarding the timeliness and accuracy of medication administration;
- Jail Health Services staff concerns regarding heavy workloads, understaffing, reliance on temporary agency nurses, and an ineffective quality improvement program; and
- Washington state Board of Pharmacy inspection report findings citing medication-related process deficiencies in 2004, 2005, and 2006.

After the Ombudsman's Office issued its report on medication concerns, the King County Council requested that the King County Auditor's Office conduct a performance audit to confirm and further assess the problems identified and to determine whether these problems were the result of systemic weaknesses.

Jail Health Services Overview

Jail Health Services provides health services at the King County Correctional Facility (KCCF) in Seattle and the Norm Maleng Regional Justice Center (RJC) in Kent. While the Department of Adult and Juvenile Detention operates the two jails, Jail Health Services organizationally resides within Public Health – Seattle

and King County. According to the *Hammer* settlement agreement, KCCF must be accredited by the National Commission on Correctional Health Care (NCCHC). Both jails, KCCF and RJC, were most recently accredited by NCCHC in 2005; and Jail Health Services and the Department of Adult and Juvenile Detention are currently preparing for the next accreditation survey in 2008.

Jail Health Services Provides Broad Range of Health Services

Jail Health Services is staffed 24 hours per day, 7 days per week, and 365 days per year. Jail Health Services provides an intake health assessment to individuals booked into KCCF and RJC to identify and respond to health needs during their incarceration. Additionally, a broad range of health services is available to all inmates, including:

- Medication verification
- Pharmacy services and medication administration
- Nursing health assessment, monitoring, and treatment
- Acute medical care
- Chronic disease management
- Diagnostic testing and services (lab and x-ray)
- Emergency care
- Referral for specialty medical care
- Infection control and wound care
- Women's health care
- Mental health screening, case management, and crisis counseling
- Psychiatric treatment
- Dental care
- HIV/Sexually Transmitted Disease testing and counseling
- Withdrawal management
- Social work assessment, case management, and release planning

Jail Health Services Is Implementing Electronic Health Records and Undergoing a Major Remodel

Jail Health Services is currently undergoing two major initiatives that significantly impact its operational processes. First, Jail Health Services is in the process of implementing an electronic health record system (EHR) to replace its existing paper-based medical record system. The EHR should improve healthcare staff's access to health care information during clinical encounters and improve the overall management of patient information. The new system is expected to streamline work processes by automating many healthcare functions. For example, pertinent patient data will be readily available to healthcare staff without needing to locate a paper chart. The system also includes automated controls, such as notification when a staff member does not provide complete information on a patient's record.

In addition, KCCF is currently being remodeled as part of the Integrated Security Project (ISP). The ISP is replacing KCCF's electronic security systems and redesigning Jail Health Services' workspaces, including the addition of a new health assessment clinic and expansion of the pharmacy. All work is scheduled to be completed by October 2008.

Ombudsman's Office 2006 Report

The Ombudsman's Office regularly receives allegations of medication errors from inmates, which generally involve the following issues:

Ombudsman Receives Allegations of Medication Errors from Inmates

- Timeliness of verification of outside prescriptions after booking;
- Interruptions in supply of prescriptions for critical and non-critical medications;
- Wrong medications being delivered or administered;
- Timeliness in providing psychiatric evaluations and medications; and

- Responses to medication-related kites (requests for medical service) and grievances.

In addition to complaints from inmates, the Ombudsman's Office has also handled issues raised by Jail Health Services staff. In its November 2006 report, the Ombudsman's Office discussed JHS staff allegations that patient care and working conditions have deteriorated in recent years. Nurses and pharmacists indicated that workload is increasing and that shifts are frequently short-staffed.

Finally, the Ombudsman's Office report summarized recent state Board of Pharmacy inspection reports, which identified deficiencies in Jail Health Services practices.[1] The board inspector's primary concerns centered on security of pharmacy and medication rooms, adequacy of controls in the automated storing and dispensing system, controls for narcotics, issues related to transfer of inmates between KCCF and RJC, and the lack of an ongoing quality improvement program.

Audit Scope, Objectives, and Methodology

This performance audit evaluated Jail Health Services' medication administration and pharmacy operations, including an independent evaluation of the quality, accuracy, and efficiency of practices. The audit objectives were to:

1) Evaluate Jail Health Services' processes for:
   - Securing and tracking of medications, including narcotics and other controlled substances;
   - Ensuring that critical medications are appropriately dispensed and distributed; and
   - Monitoring the accuracy of medication dispensation and distribution.

[1] Washington Administrative Code 246-869-190 authorizes the state Board of Pharmacy to periodically inspect pharmacies to assess their compliance with state laws. The Board of Pharmacy issued non-passing scores to KCCF in October 2004 and to RJC in March 2006, but it subsequently issued passing scores upon re-inspection.

2) Assess the effectiveness of the Jail Health Services' quality assurance activities.

3) Review Jail Health Services staffing and scopes of practice within the context of medication administration and pharmacy operations, including reviews of existing policies and procedures and workload and staffing trends.

We retained a consultant, Westcoast Consulting Group, LLC, to provide technical and healthcare expertise in the evaluation of Jail Health Services' controls over medications.

The methodology included the following audit activities:

- Reviewing current policies, procedures, and processes for dispensing and administering medications, as well as reviewing planned process changes, such as implementation of electronic health records
- Reviewing relevant state laws and regulations
- Interviewing officials and managers from Public Health, Jail Health Services, and Department of Adult and Juvenile Detention
- Shadowing pharmacy and nursing staff and observing actual practices
- Surveying other jurisdictions to identify innovative jail pharmacy and medication administration practices
- Analyzing available data on medication issues, including Jail Health Services Medication Incident Report data and aggregate grievance data, as well as Ombudsman grievance logs
- Identifying best practices for healthcare organizations' quality assurance programs
- Analyzing data on workload, including prescription volumes, average daily inmate population (ADP), and the number of inmates receiving a prescription, to identify trends

- Assessing Jail Health Services' nursing and pharmacy staffing practices, and determining whether shifts are staffed in accordance with planned staffing levels
- Comparing the costs of full-time permanent (career service) nurses and temporary agency nurses

We conducted this audit in accordance with Generally Accepted Government Auditing Standards.

Scope of Work on Internal Controls and Data Reliability

During this audit, we evaluated internal controls related to the audit objectives. Our review of internal controls focused on controls related to pharmacy operations and medication administration practices. Our conclusions on the effectiveness of these controls are detailed in Chapter 2 of this report.

Our analysis relied on computer-generated data related to prescription volumes, average daily inmate population (ADP), staff leave usage, and staff attendance. As part of our analysis, we assessed the reliability and accuracy of the data. We identified errors in the staff attendance data, but we were able to work with Jail Health Services to correct the errors. With regard to the other data sources, we concluded that the data were sufficiently reliable.

2 PHARMACY AND MEDICATION ADMINISTRATION PROCESSES

This chapter focuses on Jail Health Services' processes for securing and tracking medications, ensuring that critical medications are appropriately dispensed and distributed, and monitoring the accuracy of medication dispensation and distribution. This chapter also discusses Jail Health Services' quality assurance activities and assesses them in relation to best practices.

Our audit focused on answering the following questions:

1) Is inmate safety at risk due to Jail Health Services' medication practices?
2) What are the key causes of medication incidents and errors?
3) Are medications, including narcotics and other controlled substances, missing or lost?
4) What other process improvements can be implemented to increase accountability for medications at King County's jails?
5) How do Jail Health Services practices compare to other jails?
6) What are other jails doing to reduce medication errors?
7) What quality assurance activities does Jail Health Services engage in and are these activities consistent with best practices?

Inmates Are Not at Greater Risk of Medication Errors

Overall, we found that Jail Health Services' patients are at no greater risk of medication-related errors than patients in other healthcare settings. However, opportunities exist for Jail Health Services to increase accountability in its medication processes.

Jail Health Services' Medication Processes

Jail Health Services providers (e.g., physicians or nurse practitioners) prescribe new medications or prescribe verified

prescriptions from community-based practitioners before they are dispensed by the pharmacy. Medications are either administered by nursing staff in single doses or delivered to inmates for self-administration (keep-on-person), depending on criteria established by Jail Health Services.

Jail Health Services has recently initiated changes to its medication administration processes.[2] At the time of the Ombudsman's Office report, Jail Health Services' medication processes were implemented as follows:

- Providers submitted an order to the pharmacy for an inmate's medication using a paper Medication Order form.
- The pharmacy printed a Medication Administration Record (MAR) for each single-dose medication and filled the medication order. The pharmacy filled up to seven days of the medication, placed the medication in a plastic bag, and transferred the MAR and the medication to the medication cart room. The medication cart room is where nurses prepare their carts to administer single-dose medications to inmate housing units ("medication pass").
- Nurses typically prepared their carts by tearing off individual doses from the seven-day supply for each inmate, transferring the daily doses into a small envelope for each inmate, and clipping the envelope to the inmate's MAR. Nurses would then wheel their carts to the assigned housing units and administer the medications to each inmate with a prescription in the housing units. Nurses conduct medication passes three times each day or more often if needed.

[2] Our review of controls over the medication processes primarily focused on medications administered by nurses (single-dose medications), because of increased opportunities for Jail Health Services staff to err in their administration.

Key Process Improvement Is Being Piloted at KCCF

During the audit, Jail Health Services began piloting a key process improvement at KCCF. The KCCF pharmacy now fills and refills each single-dose medication on a one-day basis ("24-hour fill") rather than a seven-day basis. This change was implemented to:

- Reduce delays in dosing that can occur when inmates are transferred between KCCF and RJC,
- Strengthen medication accountability,
- Decrease wastage and loss of inventory, and
- Reduce pharmacy staff time spent investigating and refilling missing medications, as well as nursing staff time spent preparing medications.

This new process is discussed in more detail under Question 2 on Page 13.

1. IS INMATE SAFETY AT RISK DUE TO JAIL HEALTH SERVICES' MEDICATION PRACTICES?

Our consultant's assessment of pharmacy operations and medication administration processes concluded that county inmates are at no greater risk of harm due to medication errors than patients in other healthcare settings. This conclusion was based on an analysis of the two sources of medication error data that were available to assess patient risk.[3] One source is the Ombudsman's Office inmate grievance log that documents patient complaints. The other source is Jail Health Services Medication Incident Reports that document incidents reported by JHS staff whenever a medication problem occurs.

[3] A third source of data is the Jail Health Services' internal grievance logs, which are reviewed as part of its quality improvement program; but Jail Health Services provided only aggregate grievance totals due to state confidentiality requirements.

Analysis of the Ombudsman's Office grievance logs involving Jail Health Services identified approximately 500 inmate grievances over a three-year period from January 2004 through November 2006. Of these inmate grievances, our consultants verified that 171 involved specific issues or concerns regarding Jail Health Services' medication administration.[4]

A Clinical Assessment Was Performed to Categorize Ombudsman Grievances

For the purposes of this audit, a clinical assessment was performed to categorize the complaints based on their severity. Using an industry-wide index for classifying medication errors by severity, a registered nurse from the Westcoast Consulting Group reviewed and categorized each of the medication complaints made to the Ombudsman's Office from January 2004 through November 2006. The results of this analysis are summarized in Exhibit A below. (The full results and more detailed descriptions of each category are included in Appendix 1.)

EXHIBIT A
2004 – 2006 Medication-Related Inmate Complaints to King County Ombudsman's Office

	35-Month Total	Percent by Category
No Error	53	31.1%
Error but No Harm	111	64.9%
Error that May Have Contributed to or Caused Harm	7	4.1%
Error that Caused Death	-	0%
Total	171	100%

* **Note**: Index based on Medication Errors Reporting Methodology by the United States Pharmacopoeia Medication Error Reporting Program.

SOURCE: King County Ombudsman's Office complaint logs and Westcoast Consulting Group analysis.

[4] The Ombudsman's Office report identified 192 medication-related complaints from January 2004 through November 2006. Consultants assessed only 171 of these complaints, excluding complaints in which it appeared that the inmate had not yet seen a provider or been prescribed a medication or for which the logs requested from the Ombudsman's Office included only general information about the complaint. The Ombudsman's Office maintains more detailed records of complaints in case notes, but those were not reviewed as part of this analysis.

Majority of Incidents Did Not Cause Harm to the Inmate

As shown in Exhibit A above, 96 percent of the incidents were not errors or were errors that did not cause harm to the inmate. The majority of incidents (64.9 percent) were categorized as errors that reached the inmate, but did not cause harm. These could include delays in medication administration that occur due to verification processes or inter-facility transfers. Seven inmates complained to the Ombudsman's Office over the last three years about medication errors that may have contributed to or actually caused harm, and none of the cases involved deaths. Those incidents represent 4.1 percent of the medication complaints.[5]

Another source of information on medication incidents is Jail Health Services' internal medication incident reporting process. Jail Health Services nursing and pharmacy staff submit Incident/Accident Reports when they identify medication incidents and potential errors. Beginning in 2007, nursing supervisors and the Jail Health Services Medical Director began to review these reports and categorize each incident's cause and severity, using the same national index. The categorizations are documented on Medication Incident Report forms.[6]

Exhibit B below summarizes the Jail Health Services Medication Incident Report data we analyzed for 2006 and 2007. A more detailed version is provided in Appendix 2. (A 10-percent random sample of 2006 Medication Incident Reports was prepared specifically for the audit.)

[5] In assessing the complaints, the consultant categorized incidents in the higher severity category when incidents could potentially be classified in two different categories based on the available information.
[6] Incidents are categorized according to severity based on the United States Pharmacopoeia Medication Error Reporting Program classifications.

EXHIBIT B
Jail Health Services Medication Incident Reports

	Random Sample **2006***	Percent by Category **2006**	Quarter 1 Actuals **2007**	Percent by Category **2007**
No Error	7	10.6%	28	17.7%
Error but No Harm	59	89.4%	128	81.0%
Error that May Have Contributed to or Caused Harm	0	0.0%	2	1.3%
Error that Caused Death	0	0.0%	0	0.0%
Total	66	100%	158	100%

*** Note:** A sample of 75 incidents was initially selected for analysis, but eight had been mistakenly categorized as medication-related, and a ninth incident could not be categorized according to the medication error index using available information. The audit team, including a registered nurse from Westcoast Consulting Group, observed and validated Jail Health Services' process for categorizing select incidents for the 2006 sample.

SOURCE: Medication Incident Reports prepared by Jail Health Services.

Jail Health Services' Harmful Medication Errors Were Consistent With National Averages

Jail Health Services' data indicate that harmful medication errors represented 1.3 percent of the medication-related incidents from the first quarter of 2007. This is consistent with national averages, which indicate that harmful medication errors represented 1.3 percent of total self-reported medication errors for 2004 and 2005. This suggests that Jail Health Services' patients are at no greater risk of harm due to medication errors than patients in other healthcare settings.[7]

Furthermore, we estimated that 1.9 percent of inmates receiving medications in 2006 experienced a medication incident, based on audit staff estimates of inmates receiving prescriptions[8] and incidents reported by Jail Health Services staff. We compared the 1.9 percent incident rate to a national benchmark on medication errors reported in a 2001 study of 1,116 hospitals

[7] While the Ombudsman's complaint data show that a larger percentage (4.1 percent) of inmates was harmed by medication incidents, the complaint data is not likely to reflect incidents that do not reach inmates, resulting in larger percentages for other categories of incidents.

[8] Information systems in place could not produce data identifying the number of inmates receiving medications or the number of prescriptions received by inmates. The audit team analyzed sample data for 2006 to estimate this information.

by *Pharmacotherapy*. The study indicated that 5.1 percent of patients experienced a medication error, which is more than twice the incident rate we estimated for Jail Health Services.[9]

It is important to point out that our analysis included data on Jail Health Services' medication *incidents*, which include some incidents that are not actually considered *errors* based on the nationally accepted criteria. An incident is when circumstances or events occur that have the capacity to cause an error, but an error does not actually occur (e.g., a nurse may drop a medication, which then cannot be administered, but may obtain a replacement in time to administer the dose without a delay to the inmate). As a result, the 1.9 percent incident rate somewhat overstates the percentage of inmates receiving medications who experience an error.[10]

2. WHAT ARE THE KEY CAUSES OF MEDICATION INCIDENTS AND ERRORS?

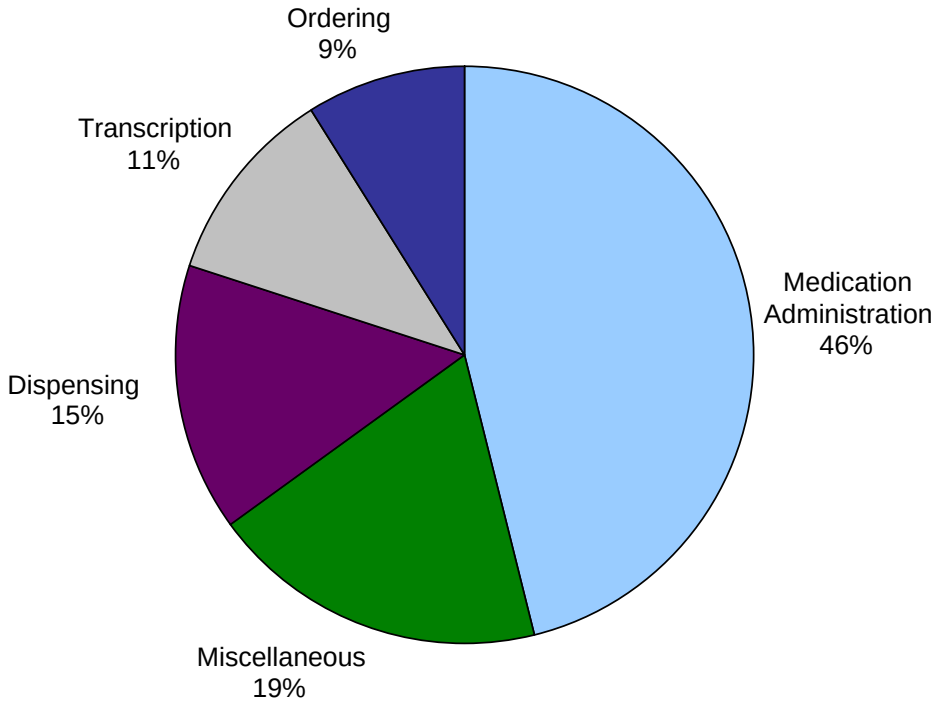
Individual Staff Error Was the Primary Reason for Medication Errors

Analysis of the Jail Health Services Medication Incident Reporting data indicated that individual staff error was reported as the primary reason for medication errors. During the first quarter of 2007, 81 percent of Jail Health Services' reported incidents were classified as individual staff errors as opposed to systemic errors, which would reflect deficient policies, procedures, and protocols.

We also examined data on where medication incidents occurred in the medication process, as shown in Exhibit C below.

[9] Pharmacotherapy 21(9):1023-1036, 2001. © 2001 Pharmacotherapy Publications
[10] Incidents are self-reported by staff and may underestimate the true number of incidents. However, under-reporting is likely to occur in all healthcare settings that use self-reported data on incidents and errors.

EXHIBIT C
Medication Incidents Categorized by Process Step



SOURCE: Jail Health Services, Medication Incident Report Data, First Quarter of 2007.

As shown in the exhibit above, incidents most commonly occurred during medication administration (46 percent). Medication administration issues typically involved medications being administered late but also include incorrect or missed dosages or medications administered to the wrong patient.

Transfers Between Facilities Results in Errors

One of the most frequently cited reasons for medication administration errors involves transfers between facilities. Jail Health Services' medication administration processes did not ensure that inmates' medication orders were continued in a timely manner following a transfer between facilities. One cause for delays when an inmate transfers between facilities has been Jail Health Services' reliance on paper charts and records, which must be physically located and moved between facilities. Effective implementation of the electronic health record system (EHR) will eliminate the need to physically locate an inmate's

chart. Providers, pharmacists, and nurses at both facilities will be able to review any inmate's chart from their computers.

Jail Health Services Implemented a Pilot Program to Fill Prescriptions on a 24-Hour Cycle

In addition, as briefly discussed previously, JHS has begun filling prescriptions on a 24-hour fill cycle at KCCF, and plans to expand the process to RJC. Under the previous process, prescriptions were filled on a seven-day basis. If an inmate was transferred a few days into the seven-day cycle, the remaining dosages were transferred to the receiving facility once JHS learned of the transfer (except narcotics and other controlled substances, which were returned to the pharmacy inventory and re-filled at the receiving facility). The inmate could experience delays in receiving the prescribed medication in the new facility. However, under the new process, single-dose medication orders are re-filled every day. This means the pharmacy learns of a transfer in a timelier manner. This should help ensure that a transferred inmate will receive a dose without significant delay. Further, these changes should reduce medication errors associated with inter-facility transfers.

Miscellaneous incidents comprised the next largest category (19 percent). This category includes narcotic count discrepancies, missing Medication Administration Records, unsecured narcotics, and use of expired medications. *Dispensing incidents* (15 percent) include incorrect medications or dosages dispensed but not administered, medications dispensed for the incorrect inmate but not administered, delays in delivery from pharmacy to nursing staff, and medications dispensed without an order. *Transcription incidents* (11 percent) include duplicate or inaccurate Medication Administration Records or missing orders. *Ordering incidents* (9 percent) include confusing orders, an order written on the incorrect chart, and incomplete orders.

3. ARE MEDICATIONS, INCLUDING NARCOTICS AND OTHER CONTROLLED SUBSTANCES, MISSING OR LOST?

Audit Identified Opportunities for Medications to Be Lost or Diverted

Jail Health Services' medication process lacks the verification practices needed to identify lost or missing medications. However, we identified eight opportunities within the current operating model for medications to be lost with no controls, or limited controls, to detect and monitor such events. These opportunities are summarized in Exhibit D below.

EXHIBIT D
Jail Health Services' Current Pharmacy and Medication Administration Operating Model

Medication Process Steps	Opportunities for Lost or Diverted Medications
Pharmacy purchases and stores medications and manages inventory.	1) There is infrequent monitoring of inventory and reconciliation of controlled substances only to the medications that have been purchased, dispensed, or returned.
Providers submit orders to pharmacy and pharmacy reviews and approves orders. Pharmacy prepares single-dose and keep-on-person medications and batches them in a bin to be taken to the medication cart room. Controlled substances are placed into the locked narcotic cabinet in the medication cart room by pharmacy staff and witnessed by nursing staff. Both individuals count and sign a document indicating the updated inventory amounts. Pharmacy also prints and transmits Medication Administration Records (MARs) for each inmate receiving single-dose medications, and places those with the medication carts.	2) Although the medication cart room is locked with key access limited to licensed personnel, many people have access throughout the day.
Nurses stock the medication carts with the medications in the bin and take the medications and Medication Administration Records to the housing units for delivery. Urgent medications are obtained from the Omnicell* machine when the pharmacy is closed.	3) There are no inventory controls for stock of medications maintained in the carts. 4) A nurse could lose or divert a medication and indicate on the MAR that it was administered. 5) The Omnicell machine lacks controls to prevent or detect medications that are removed inappropriately.
After administering the medication, the nurse documents that the single-dose medications were administered on each inmate's MAR. If a non-controlled substance medication is not administered on the pass, nurse keeps unused doses to administer later during the shift, returns doses to the cart for the next pass, or deposits doses in pharmacy return bin to be disposed of (if opened) or restocked (if unopened). Controlled substances are disposed of in specific labeled envelopes that are returned directly to the pharmacy or kept in a secure lockbox if the pharmacy is not open.	6) Pharmacy may not have knowledge of whose orders were not administered since documentation is not always attached to returned medications as required by policies and procedures. 7) No documentation is maintained to account for non-controlled medications that are returned to pharmacy for disposal, and no monitoring is in place to detect inappropriate behavior. 8) No documentation is maintained to account for non-controlled substance medications that are returned to pharmacy for restocking, and no monitoring is in place to detect inappropriate behavior.

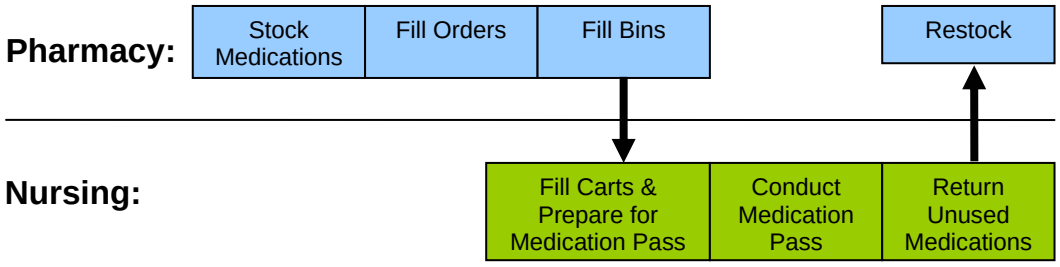
*** Note:** Omnicell is an information technology network system and physical cabinet that dispenses and houses pharmaceuticals. Jail Health Services nurses "pull" medications from Omnicell when the pharmacy is closed (i.e., if an inmate's prescription has not yet been filled when it is time to administer medications).

SOURCE: Observation by audit team during site visits from April through August 2007 at the King County Correctional Facility and the Regional Justice Center.

The most significant opportunities identified for medications to be lost or diverted involve "handoffs" between the pharmacy and nursing staff. Significant opportunities to lose or divert medications arise whenever the pharmacy relinquishes responsibility for the medications to the nursing staff and vice versa.

These handoffs should be the areas of focus for future process improvements to increase control over medications at both RJC and KCCF. Accountability for medication security should be assigned and monitored at the appropriate staff level, and staff access to medications should be minimized or controlled. Exhibit E shows the two key handoffs in the current process that present opportunities for medications to be lost or diverted.

EXHIBIT E
Identification of Key Handoffs Between Pharmacy and Nursing



SOURCE: Observation by audit team during site visits from April through August 2007 at the King County Correctional Facility and the Regional Justice Center.

The arrows represent the key handoffs between pharmacy and nursing staff. Once pharmacy staff transfer the medication bins to the medication cart room, they do not monitor or oversee nurses' handling of medications. Similarly, once nurses return unused medications to the pharmacy, there is no process in place to ensure proper handling of the medications. No single position or function is accountable for the entire process and no

mechanisms are in place to cross-check inventory as it moves from the pharmacy to the medication room or from the medication carts back to pharmacy for restocking of unused medications.

Our audit identified numerous deficiencies in the medication cart rooms. The medication cart rooms are typically locked and can only be opened by licensed clinical staff. However, the medication cart rooms are poorly designed with medications stored in open bins and are accessed by many people throughout the day. Again, there is no way to verify that anyone is actually taking advantage of these opportunities, because there is no medication reconciliation process or inventory management process in place to monitor and control behavior.

Additional Controls for Narcotics Are in Place but Could Be Improved

Additional controls for narcotics are in place, but these controls could be strengthened. Narcotics are stored in locked cabinets in the medication cart rooms, but the cabinet is typically left open while nurses prepare their carts for a medication pass. Nurses are also required to manually log each narcotic dose that is removed from the cabinet and the log is reconciled at the end of each shift. However, at KCCF narcotics are stored in a fraying cardboard accordion file where they could easily fall out and be lost.

Routine instances occur in which nurses are not able to administer medications because the inmate has been released, is in court, or refuses a medication. Processes are in place to document this, but there are no safeguards to prohibit a nurse from losing or taking the medication and noting in the Medication Administration Record that it was actually administered to the patient or returned to stock. Examples of potential safeguards, ranging from low technology requirements to higher technology requirements, include:

- Periodic reviews of patient records against inmate location by day and time to determine whether inmates were physically present to receive a medication at the time of a specific medication pass
- Establishing controls in the EHR system that prevent recording that a medication has been administered if the inmate has been released or is in court
- Bar-coding technology that requires nurses to scan the barcode on the medication as well as the barcode on an inmate's wristband to document that the inmate was present to receive the medication

In addition, as noted in the Board of Pharmacy reports and the Ombudsman's Office report, the current Omnicell machines are poorly designed and provide an opportunity for diversion. When the current machines are opened, non-controlled medications inside are accessible and can be removed. Some processes are in place to monitor the Omnicell inventory, but opportunity for diversion still exists. When the machine is opened for a valid medication order, other medications in the machine are also accessible, and diversion of dosages of other medications may not be caught through existing reconciliation procedures.

Jail Health Services has indicated that it is aware of the risks associated with the Omnicell machines and is in the process of acquiring a new automated storage and dispensing machine, which will allow nurses to remove only the medications needed for a specific inmate. (At the time of the audit, Jail Health Services and the vendor were formalizing the lease contract for the new machines.)

Periodic Audits and Enhanced Inventory Controls Would Improve Medication Accountability

The risks discussed in this section could be reduced by conducting periodic control audits to verify that medications not administered (e.g., because an inmate was released or in court) are consistent with data on inmates' locations during the medication pass. Procedures should also be established that move Jail Health Services toward being able to account for all medications at any point within the process. This includes medications that are administered to the patient as documented in the MAR and EHR, wasted due to contamination or expiration, and returned unused to inventory. With the implementation of EHR, Jail Health Services could consider ways to automate inventory tracking.

RECOMMENDATION 1 Jail Health Services should conduct periodic audits and strengthen inventory controls to enhance accountability for medications ordered, dispensed, administered, disposed of, and maintained in stock.

4. WHAT OTHER PROCESS IMPROVEMENTS CAN BE IMPLEMENTED TO INCREASE ACCOUNTABILITY FOR MEDICATIONS AT KING COUNTY'S JAILS?

A number of additional process improvements are recommended for Jail Health Services for implementation.

- **Transfer responsibility for filling the carts with inmate medications to pharmacy staff.** This would eliminate the need to transfer filled orders to the nurses to stock the carts. Pharmacy technicians should be responsible for stocking the carts, the nurses should be responsible for inspecting the carts, and both will electronically sign off on the carts' contents as each takes possession of the cart (i.e., nurses would sign off at the beginning and end of each medication

pass and pharmacy technicians would sign off upon return of the cart to the pharmacy.)

- **Expand the pilot process of filling medications on 24-hour cycles rather than 7-day cycles.** This process is currently being piloted at KCCF and Jail Health Services plans to expand it to include RJC. The 24-hour fill cycle reduces the opportunity for losing medications or the need to return medications when inmates are transferred or released before their 7-day medication supply runs out.

- **Reconfigure medication carts to increase accountability.** Medication carts should be prepared on a 24-hour cycle. Each cart, similar to the current process, should hold medications for a specific jail unit or group of units. However, we recommend that drawers should be assigned to each inmate on the unit who requires medication, and each drawer should be segregated into three compartments, one for each of the daily medication passes. Any medications not administered to an inmate should remain in the inmate's compartment for that specific medication pass. This would allow pharmacy staff to easily determine which pass an inmate missed, verify drug usage against the MAR, and improve inventory management practices. The nurse should document on the MAR any dose that is not administered and the reason. JHS has indicated interest in purchasing an automated medication packaging system that would achieve a similar level of accountability and could explore this idea further for future implementation.

- **Utilize portable electronic devices to document medications administered.** Jail Health Services indicated that it plans to equip and train nurses to use portable devices (such as laptop computers or hand-held devices) to capture

medication administration data during the medication pass and download the data into EHR upon return to the medication room. This process change would give the pharmacy access to the electronic MAR to verify drug usage, monitor loss and wastage, and manage and reconcile inventory.

Implementation of the process improvements described above would strengthen the pharmacy's control over and accountability for medications issued to inmates. Using technology to capture data about administration at the point of service will increase control over medication dispensing and disposal and will reduce the potential for loss or diversion. The combination of improved processes and new technology should allow the pharmacy to establish a medication reconciliation process to monitor all medication inventories.

A benefit specific to the transferring of responsibility for filling the medication carts to pharmacy staff is the reduction in time nurses spend preparing for medication passes. Eliminating the need for nurses to prepare the carts will increase the nurse staff time available for patient care or may reduce the overall workload for nurses. However, additional pharmacy staff resources may be needed to take on the responsibility of filling the carts.

Consolidation of Pharmacy Operations Could Be Considered for Future Improvement

We also identified a potential future improvement for consideration, which is centralization of the KCCF and RJC pharmacy operations and cart preparation activities. This would concentrate JHS pharmacy expertise and resources in one place and eliminate the need to maintain two separate medication inventories, thereby reducing the waste generated from unused and expired medications. Critical medications could still be stocked in the on-site storage and dispensing machines for after-hours needs at both facilities.

However, additional pharmacy space may be needed given the constraints of the current jail facilities, and secure transportation capabilities would also be required to move medications from the central pharmacy to the jails. Further analysis is needed to comprehensively assess the costs and benefits of this option.

RECOMMENDATION 2 Jail Health Services should transfer responsibility for filling the carts with inmate medications to pharmacy staff.

RECOMMENDATION 3 Jail Health Services should expand the pilot process of filling medications on 24-hour cycles rather than 7-day cycles.

RECOMMENDATION 4 Jail Health Services should reconfigure medication carts to increase accountability.

RECOMMENDATION 5 Jail Health Services should utilize portable electronic devices, such as laptops or hand-held devices, to improve documentation of the medication administration process.

RECOMMENDATION 6 Jail Health Services should conduct a feasibility analysis to evaluate centralizing KCCF and RJC pharmacy operations.

5. HOW DO JAIL HEALTH SERVICES' PRACTICES COMPARE TO OTHER JAILS?

Information on medication practices was collected from jails in four other Washington counties: Clark, Pierce, Snohomish, and Yakima. Two major differences between Jail Health Services and the other jails are that none of the other jails operate on-site pharmacies or provide the same breadth or depth of health services as that provided by King County. This makes it difficult

to compare Jail Health Services' practices to other jail healthcare operations.

Jail Health Services Provides More Complex Scope and Range of Services Than Other Jails

Compared to the other county jails in Washington, Jail Health Services provides a significantly more complex scope and range of healthcare services. For example, none of the other jails operate infirmaries with 24-hour, daily coverage by skilled nursing staff. Instead, inmates in need of medical care are transported and treated by local hospitals. In addition, none of the other jails provide the broad range of mental health services and treatment units that King County does.

Most interestingly, none of the other in-state jails operate on-site pharmacies. They either contract with private vendors or receive pharmacy services through a local health center. This shifts to a contractor the responsibility and risks associated with managing medication inventory, stocking medication carts and dispensing machines, and reconciling medications. This is an option that Jail Health Services could consider the costs and benefits of when it studies the feasibility of consolidating pharmacies.

Another notable theme highlighted during our survey was that the primary mission of a jail is to provide 24-hour secure custody, not to provide health services. This mission drives the facility's physical layout and operations in contrast to hospitals and other institutions where health care is the primary mission. In a jail, considerations of order, safety, and security take precedence over other functions, and this can make managing medication processes especially challenging.

Healthcare and Corrections Staff Interaction Impacts Medication Administration Process

These disparate objectives make it critical for correctional staff and healthcare staff to coordinate activities. In the other Washington jails, healthcare operations are performed by the correctional departments, which could promote greater operational collaboration between custodial and healthcare staff. During our site visits at KCCF and RJC, we observed that interactions between Jail Health Services nursing staff and Department of Adult and Juvenile Detention (DAJD) corrections officers varied substantially, and these interactions influenced how efficiently nurses were able to conduct medication passes. Opportunities exist for Jail Health Services and DAJD to improve collaboration during the medication administration process.

RECOMMENDATION 7

Jail Health Services should work with DAJD to modify their Memorandum of Understanding to include regular joint reviews of medication administration performance and to identify opportunities for improvement. The joint reviews should incorporate line staff involvement and/or input from both Jail Health Services and DAJD.

6. WHAT QUALITY ASSURANCE ACTIVITIES DOES JAIL HEALTH SERVICES ENGAGE IN AND ARE THESE ACTIVITIES CONSISTENT WITH BEST PRACTICES?

Healthcare organizations establish internal quality improvement programs (QIP) to collect and analyze relevant performance data and determine the risks associated with their practices. Our review of Jail Health Services' QIP, which is part of a broader Public Health – Seattle and King County QIP, concluded that Jail Health Services is developing and implementing an array of activities that are consistent with healthcare industry best practices for quality improvement.

Jail Health Services Recently Established a Pharmacy Committee to Address Medication Issues

These practices should allow JHS to measure and document healthcare improvements, including improvements in medication practices. Most notably in regard to our audit objectives, Jail Health Services has established a multi-disciplinary Pharmacy Quality Assurance Committee that meets monthly to address medication-related issues and has implemented a new process that will allow management to more easily track and monitor incidents by their severity and cause.

In Washington, a QIP is voluntary for healthcare organizations other than hospitals. However, if an organization implements a QIP, it can submit its plan to the Washington state Department of Health for review and approval. State approval allows a healthcare organization to exempt data collected and maintained for QIP purposes from public disclosure. The exemption encourages healthcare organizations and their staff to candidly report and evaluate their practices.

Public Health cited confidentiality issues and its exemption from publicly disclosing QIP-related information in its decision to withhold some JHS information and studies that were needed to more fully assess QIP practices. However, as noted above, activities that are being implemented according to Jail Health Services' QIP plan are consistent with QIP best practices. Exhibit F below summarizes the results of our comparison of Jail Health Services' QIP activities with best practices.

EXHIBIT F
Comparison of Jail Health Services Quality Improvement Program Practice to Best Practices

QIP Component	Best Practices	Jail Health Services (JHS) Practice
QIP Plan and Policies	QIP plan and policies direct organizations to evaluate healthcare outcomes.	**Consistent with best practices and national accreditation standards**
	Plan is approved by Washington Department of Health, providing legal exemption from public disclosure to encourage candid evaluation of practices.	**Consistent with best practices and state requirements**
Data Collection and Analysis	Relevant data is collected and categorized by cause and severity.	**Consistent with best practices, as of 2007** – In 2007, JHS began tracking medication incidents by cause and severity.
	Clinical experts from multiple disciplines are involved in assessing the data.	**Consistent with best practices**
	Data are continuously monitored.	**Inconclusive** – JHS has only recently improved its tracking of relevant medication incident data, but it plans to review and trend the data quarterly.
Measuring Impacts	Annual studies are conducted to measure healthcare quality, access, outcomes, and processes, and all critical incidents should be reviewed.	**Inconclusive** – JHS did not provide studies conducted due to confidentiality issues; however, we verified that NCCHC reviewed these studies during the 2005 accreditation process and that they satisfied accreditation requirements.
	Performance measures are established to assess outcomes.	**Could be strengthened to better adhere to best practices** – Current performance measures focus on process outputs rather than outcomes.

Source: King County Auditor's Office best practices literature review on healthcare quality improvement programs.

As shown in Exhibit F above, Jail Health Services' QIP plan, policies, data collection, and planned data analysis activities are consistent with best practices. Jail Health services' QIP has been approved by the state Department of Health and satisfied a National Commission on Correctional Health Care (NCCHC) accreditation review in 2005.

New Medication Incident Report Process Provides Useful Information on Medication Errors

Consistent with best practices and practices recommended by the jurisdictions we surveyed, Jail Health Services' new Medication Incident Report form process should provide useful information for management to assess medication processes and outcomes. The audit team, including a registered nurse from Westcoast Consulting Group, observed the JHS Medical Director and a nursing supervisor to verify their cause and severity categorizations for a sample of Medication Incident Reports. We concluded that the Medical Director and nursing supervisor used consistent standards and methods for evaluating the incidents. We encourage Jail Health Services to continue to utilize this method for categorizing medication incidents and to ensure that reviews of the medication incident data are conducted regularly as planned.

However, Jail Health Services' practices for measuring impacts could be improved. Although Public Health did not provide process and outcome studies due to confidentiality concerns, we verified that NCCHC reviewed these studies during the 2005 accreditation process and that they satisfied accreditation requirements. To demonstrate the results of their QIP studies, Jail Health Services indicated that numerous improvements have been made as a result of the QIP. In addition to the new process for tracking and categorizing medication incidents, Jail Health Services cited implementation of the Pharmacy Quality Assurance Committee and development of the printed Medication Administration Record as improvements that have resulted from the QIP.

Performance Measures Could Place Greater Emphasis on Outcomes

Our best practices research also suggested that performance measures could be strengthened to increase emphasis on outcomes rather than process outputs. Jail Health Services has identified numerous performance measures in its Strategic Business Plan that primarily focus on outputs (e.g., number of

treatments per day). We emphasize that publicly reportable measures that focus on outcomes (e.g., number of adverse drug events per 1,000 doses) are also important and would allow for greater external monitoring of healthcare outcomes in the jails, as well as the impact of quality improvement activities. Publicly reportable performance measures would also help increase the transparency and accountability of Jail Health Services' healthcare program, particularly given the public disclosure exemptions for information developed for QIP purposes.

We found through our research that measures and benchmarks are not widely available for healthcare performance in correctional settings. Still, some measures have been identified by national accrediting organizations, such as the NCCHC and the American Correctional Association (ACA). For example, ACA requires correctional facilities to track the annual rate of dispensing errors and the annual rate of errors in medication administration. The expectation is that each facility will monitor its rates over time to determine whether they are decreasing in response to changes made in policies, procedures, staffing, or training to improve performance.

Implementation of EHR in conjunction with improved processes for reporting medication incidents provides an opportunity for Jail Health Services to begin using performance data to better manage medication processes and support its Quality Improvement Program.

RECOMMENDATION 8

Jail Health Services should continue to utilize the new method of categorizing medication incidents based on cause and severity, and ensure that reviews of the medication incident data are conducted regularly as planned.

RECOMMENDATION 9 Jail Health Services should identify key publicly reportable performance measures, including outcome-based measures, for medication administration and monitor these through the joint Jail Health Services and DAJD reviews.

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3 NURSING AND PHARMACY STAFFING

This chapter discusses our review of Jail Health Services' nurse and pharmacy workload and staffing practices. In its November 2006 report, the Ombudsman's Office described allegations from Jail Health Services nurses and pharmacy staff that workloads are increasing and shifts are frequently understaffed. In response to these allegations, we evaluated how Jail Health Services measures workload for its pharmacy and nursing shifts, how it sets staffing levels to meet the demands of its workload, and whether nursing shifts are frequently understaffed.

We found that although the current pharmacy staffing model is based on an analysis of workload and productivity data, the model was developed prior to significant changes in operations and may not reflect the demands of the current workload. Additionally, the current pharmacy staffing plan does not provide coverage for employees who call in sick or take vacation.

Jail Health Services has begun to develop a nurse staffing model that is based on workload and productivity; however, the limited amount of electronic data accessible to JHS program staff has made development of this kind of model difficult. As described in Chapter 1, Jail Health Services is currently replacing its paper-based medical record system with electronic health records. With the new system, program staff will be able to access electronic information about the patients served and the productivity of nurses. Once workload and productivity data are available, Jail Health Services needs to evaluate the factors that impact its staffing needs and link its nurse staffing plan to those factors.

Additionally, through our review of staffing on a sample of almost 1,000 nursing shifts in 2006 and 2007, we identified a pattern of shifts worked by fewer nurses than specified by the current plan, particularly at the King County Correctional Facility (KCCF). However, because JHS has not set nurse staffing levels using workload and productivity data, we could not determine whether a shift worked by fewer nurses than planned is actually insufficiently staffed to meet the demands of the workload. In order to improve staffing on nursing shifts, Jail Health Services needs to ensure nursing schedules align with nurse staffing plans; work to reduce vacancies and unscheduled leave; and develop a staffing model that includes coverage for nurses on leave.

In the following pages we answer many key questions about Jail Health Services nurse and pharmacy workload and staffing.

PHARMACY AND NURSING WORKL0AD

1. IS MEDICATION-RELATED WORKLOAD INCREASING FOR NURSES AND PHARMACY STAFF?

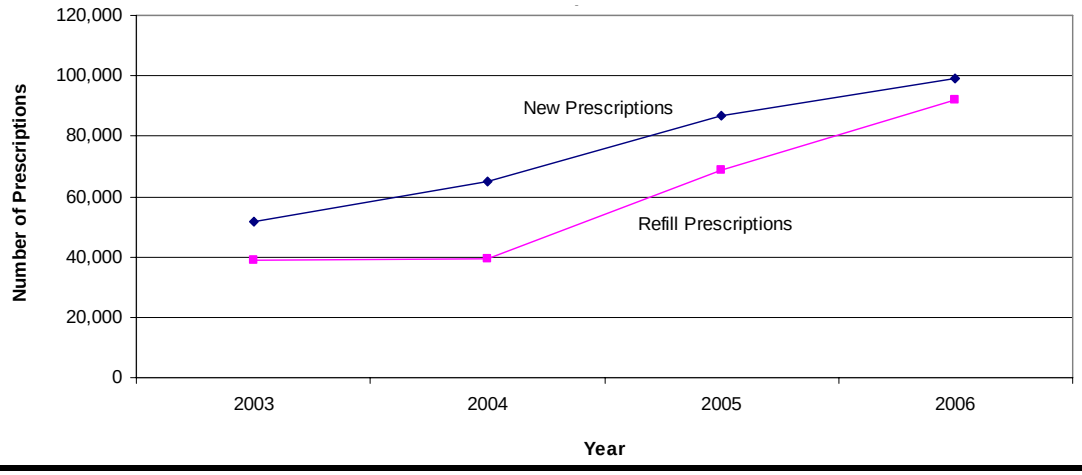
Although there is limited data available to document changes in workload, data related to prescription volumes indicate that pharmacy and medication administration workload has been steadily increasing since 2003.

Pharmacy Volumes Have Increased Significantly Since 2003

Jail Health Services data on the number of prescriptions filled annually indicates that the number of new prescriptions increased by over 26 percent in 2004 and by over 33 percent in 2005. The increase in new prescription volume slowed to over 13 percent in 2006. As can be seen in Exhibit G, data on refill prescriptions show an even steeper increase in volumes in 2005 and 2006; however, the 2005 decision to reduce the number of

days covered by a prescription from 14 days to 7 days is also reflected in the refill data.

EXHIBIT G
Jail Health Services Prescription Volumes, 2003–2006

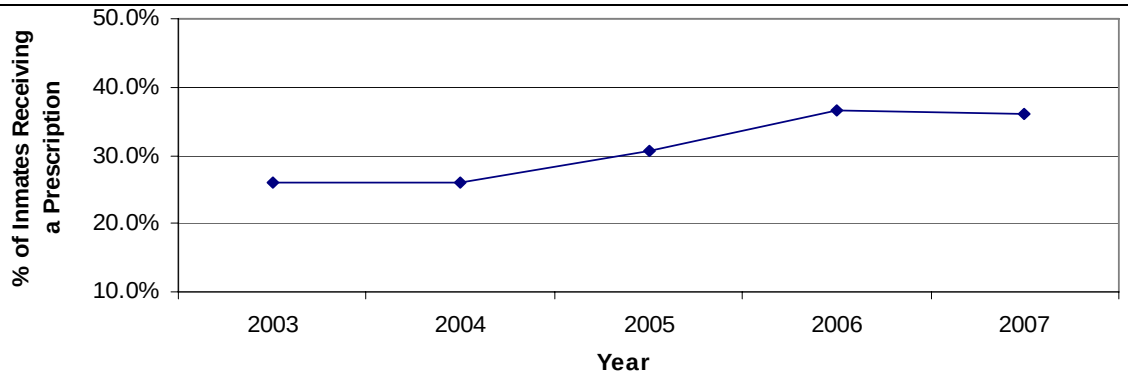


SOURCE: Jail Health Services

Percentage of Inmates Treated by JHS Appears to Be Increasing

Jail Health Services staff reported to us that they suspect they are also treating a higher percentage of inmates than they were five years ago. Since the information systems in place at the time of our audit did not allow Jail Health Services to track easily the number of inmates served, we attempted to do so as part of this project. We looked at inmate and prescription data for the first two weeks of April between 2003 and 2007. We found that during the same two-week period in April, the percentage of inmates who received a prescription increased from 26 percent in 2003 to over 36 percent in 2007.

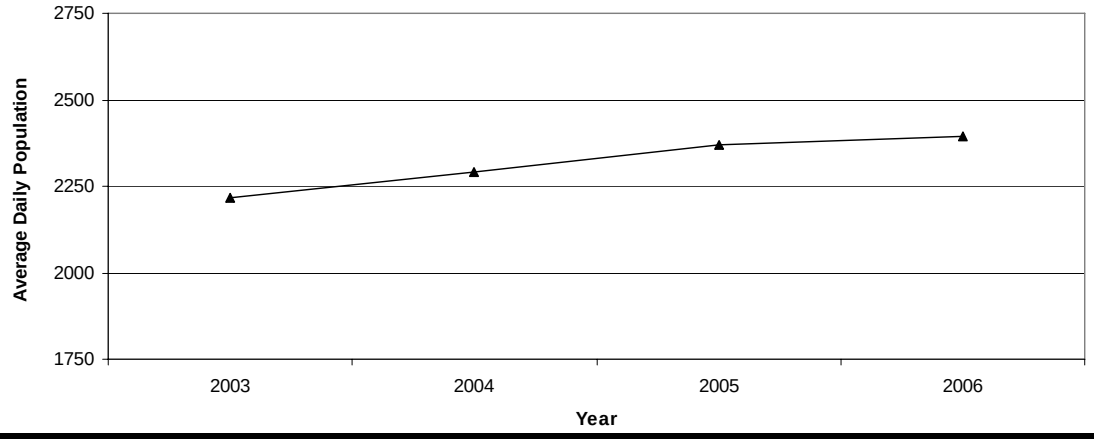
EXHIBIT H
Percentage of Inmates Receiving a Prescription, KCCF and RJC
April 1–14, 2003–2007



SOURCE: Auditor analysis of data from Jail Health Services

As can be seen in Exhibit I, the Average Daily Population in the jails also increased between 2003 and 2006.

EXHIBIT I
Average Daily Population, KCCF and RJC
2003–2006



SOURCE: Department of Adult and Juvenile Detention

This means that as the average daily population was increasing, the percentage of jail inmates receiving a prescription was also increasing.

Key Workload Measures Need to Be Developed and Monitored

Although prescription volume is an important measure of the workload of both pharmacy staff and nurses, there are other key measures of workload. For example, the volume of inmates through Intake, Transfer, and Release[11]; the average number of inmates in isolation; and the number of inmates with diseases such as diabetes all indicate changes in Jail Health Services workload. As the electronic health record system is implemented and program staff can access detailed electronic data about patients, services, and other demands on resources, Jail Health Services needs to develop meaningful workload measures to monitor changes in demands on their staff and the impacts of changes in operating procedures and standards of care.

See Recommendation 11 related to developing and monitoring key workload measures under Question 3.

PHARMACY STAFFING PLAN

2. IS THE PHARMACY STAFFING PLAN BASED ON ANALYSIS OF WORKLOAD AND PRODUCTIVITY DATA?

The pharmacy staffing plan is based on an analysis of workload and productivity data; however, the current plan is based on a study completed prior to significant changes in operations.

In order to evaluate whether the current level of staff in the pharmacies was sufficient, Jail Health Services (JHS) completed a time and motion study of pharmacy operations in October 2006. Using staff estimates and also by timing actual pharmacy procedures, JHS program staff calculated the average time necessary to complete each task associated with filling a prescription. Staff also attempted to calculate the average time pharmacy staff spend on non-volume based tasks, such as

[11] Jail Health Services nurses conduct an initial health screening on all inmates booked into the jails.

meetings, quality improvement activities, and supervisory responsibilities. The result is an estimate of the total number of full-time equivalents (FTE) necessary to operate each pharmacy each day of the week.

The 2006 model was the first staffing model completed for the pharmacies. Prior to this model, pharmacy staff numbers were set during the budget process and were based on historic levels and changes in the inmate population.

Pharmacy Staffing Model Does Not Account for Staff Away From Work on Leave

There are important limitations to the pharmacy staffing model. The first is that it assumes the pharmacists and technicians working in the pharmacy do not take any leave—the model does not include any staff to cover employees on sick leave or vacation. Additionally, the model assumes that all employees working in the pharmacies are equally well trained. When individuals are on leave or there are vacancies, Jail Health Services covers its absences with overtime, temporary agency pharmacy staff, or staff employed by other public health pharmacies. These individuals may not be as well trained or as efficient as JHS pharmacists and technicians. Additionally, they usually do not perform the same duties as regular pharmacy staff; for example, agency staff do not perform quality assurance or other administrative tasks.

Model Has Not Been Updated Since Significant Changes in Operations

Another important caveat to the current model is that it is based on a time and motion study of processes that have changed and are continuing to change. The recent procedural change to a 24-hour fill process and the new electronic health record system are already changing the workload of pharmacy technicians and pharmacists. The remodeling of the KCCF pharmacy space will further impact workload at this facility. As new systems and processes are fully implemented, Jail Health Services will need

to monitor workload changes closely and adjust staff as necessary.

The program staff we met with were aware of both the inherent weaknesses of a time and motion study and the need to incorporate into the staffing plan coverage for leave. They have already begun to update their FTE estimates to reflect the added workload of the 24-hour fill process, and they are exploring methods of ensuring they provide sufficient coverage for employees on leave.

We recommend that Jail Health Services continue its update of the pharmacy staffing model to ensure it reflects the demands of the current workload. Additionally, we recommend Jail Health Services develop a staffing model that incorporates relief for employees on leave through an analysis of past leave use and future staffing needs. As we will discuss further in Question 5, Jail Health Services can develop a model that will help program staff predict future leave use and project the most cost-effective mix of staffing resources (full-time employees, overtime, and temporary agency staff).

RECOMMENDATION 10 Jail Health Services should continue its update of the pharmacy staffing model to ensure staffing estimates are based on current processes and workload demands.

See Recommendation 13 at the end of Question 5 regarding the need to factor employees on leave into the pharmacy staffing model.

NURSE STAFFING PLAN

3. IS THE JAIL HEALTH SERVICES NURSE STAFFING LEVEL BASED ON AN ANALYSIS OF WORKLOAD AND PRODUCTIVITY DATA?

Nurse Staffing Level Is Not Based on Analysis of Workload and Productivity Data

The current Jail Health Services nurse staffing level is not based on an analysis of workload and productivity data. Rather, the level is based on a subjective estimate of the number of FTE necessary to complete the workload on each shift. In 2006, Jail Health Services program staff began by documenting the different types of nursing work on each shift at each facility. These tasks were then grouped into "bodies of work," such as administering medications, working in the infirmary, and conducting health assessments. Nurse supervisors estimated the minimum level of nurses sufficient to meet the workload for each body of work. The result is the current staffing plan, as summarized in Exhibit J.

EXHIBIT J
Current Jail Health Services Nurse Staffing Matrix
Registered Nurse (RN) and Licensed Practical Nurse (LPN) Full-Time Equivalents

	Monday-Friday			Saturday			Sunday		
	Day	Eve	Night	Day	Eve	Night	Day	Eve	Night
KCCF	15	15.5	5	15.5	12	5	12.5	12	5
RJC	10	5.5	2	5.5	5	2	5.5	5	2

Note: The numbers of nurses listed includes both RNs and LPNs.

SOURCE: Auditor analysis of data from Jail Health Services.

In order to support budget requests for staff and plan for future increases in workload, Jail Health Services program staff have also developed a number of threshold models that link nurse staffing needs with the Average Daily Population (ADP) of inmates in the jails. These models have also been based on feedback from nursing supervisors.

The advantage of the current approach is that it is grounded in the experience of the nurse supervisors who work directly with the nurses and see the impact of a growing workload and changes in policies and procedures. The weakness of the approach is that it is not based on an analysis of detailed workload and productivity data. Additionally, as Jail Health Services program staff and nurse supervisors explained to us, inmate ADP is only one indicator of overall workload. Trends in ADP may or may not correlate to trends in inmate health needs and changing standards of care.

Program Staff Have Had Access to Limited Data Related to Nurse Workload and Productivity

As we discussed earlier in this report, until the recent implementation of the electronic health record system, Jail Health Services has had little data related to nursing workload. Program staff could not easily access detailed health information about their patients or the inmate population as a whole (e.g., percentage of inmates with mental health needs, diabetes, or HIV). They could determine that prescription costs are increasing, but they did not have the data necessary to answer basic questions about whether they are treating a greater number or percentage of inmates and whether the inmates they treat require more care.

Electronic Health Records System Should Improve Access to Data

Additionally, Jail Health Services had no data related to nurse productivity. For example, because all patient treatments were recorded in paper charts and not tracked electronically, program staff and nurse supervisors could not determine the average number of medications administered by nurses and how this number varied by nurse, shift, inmate group, or facility. With the implementation of the electronic health record system, data such as this will be tracked automatically.

Jail Health Services will need to develop meaningful workload and productivity measures as this kind of data becomes

available. Analysis of these factors will allow management to develop productivity goals and then link staffing levels to these goals.

Jail Health Services management is aware of the need to link staffing levels to workload indicators and productivity goals and is working closely with the vendor of its electronic health records system to ensure it gets the data necessary to strengthen staffing practices.

RECOMMENDATION 11 Jail Health Services should develop a nurse staffing model that is systematically linked to workload demands and productivity goals. This model should incorporate the development and monitoring of key workload and productivity measures and be used for both staffing and scheduling analyses.

SCHEDULING

4. ARE NURSING SHIFTS FREQUENTLY UNDERSTAFFED IN THE JAILS?

Nursing Shifts Are Frequently Worked by Fewer Nurses Than Planned

We analyzed the daily scheduling records for a sample of almost 1,000 nursing shifts from July 2006 through June 2007, and we found that nursing shifts at both jails are frequently worked by fewer nurses than specified in the current staffing plan. For the shifts in our sample, one in five KCCF nursing shifts were worked by at least 20 percent fewer nurses than planned. This means that if the staffing plan stated that 10 nurses were needed on a particular shift, that shift would have been worked by only eight nurses. We found a lower rate of understaffing at RJC, where one in ten of the shifts in our sample were worked by 20 percent fewer nurses than planned.

We want to emphasize that because Jail Health Services does not currently use workload and productivity data to set its nurse

staffing levels, we could not determine with the data available whether a shift worked by fewer nurses than planned is actually insufficiently staffed to meet the demands of the workload. Rather, our results indicate that Jail Health Services nursing shifts are frequently staffed by fewer nurses than the current plan specifies.

When Jail Health Services has nursing vacancies, when nurses schedule vacations, or when a nurse is out on leave for a long time (such as some leave protected under the Family and Medical Leave Act), program staff try to schedule overtime or temporary agency nurses to provide coverage. When this is not possible, or when nurses call in sick only a few hours before their shift, a shift is understaffed and the shift charge nurse attempts to prioritize the workload among the available nurses.

The data we used for our analysis were records of which nurses worked each day of the year. Using scheduling software, Jail Health Services updates this data manually at the end of each day for each facility. The records include information about when Jail Health Services and temporary agency nurses worked; but they include very limited data about why nurses were absent. This means that we were not able to determine the relationship between staffing levels and types of leave or vacancies, although both influence Jail Health Services' ability to cover nursing shifts. Additionally, because the software that produced this data is intended for scheduling purposes only, Jail Health Services management can not easily manipulate the data to evaluate current staffing trends, such as the amount of overtime worked or the percentage of hours worked by temporary agency nurses. In order to calculate this information, program staff would need to manually transfer the scheduling data into another application.

Some Shifts Are Worked by More Nurses Than Were Scheduled

Although we focused on identifying shifts on which too few nurses worked in order to evaluate complaints regarding understaffing, we also identified a number of shifts on which too many nurses worked. Overstaffing may allow nurses to catch up on work not completed during understaffed shifts; however, it can also indicate that resources are not being utilized efficiently or cost-effectively. We did not quantify the frequency or degree of overstaffing of nursing shifts; however, Recommendation 12 at the end of this question addresses the issue of overstaffed shifts as well as that of understaffed shifts.

Nurse Schedules Were Not Updated to Match Staffing Plan

We identified three reasons for the under- and overstaffing issues we found in our sample. The first is that Jail Health Services did not update nurse schedules at the same time that it updated its staffing plan. Following the approach described in Question 3, Jail Health Services program staff updated their staffing plan in 2006 and again at the beginning of 2007. However, they did not formally change nurse schedules to meet current demands until August 2007. Instead of formally changing nurses' schedules, Jail Health Services program staff asked nurses to alter their schedules informally, asked nurses to work overtime, and brought in temporary agency staff when possible. Additionally, program staff tried to ensure that vacancies were filled by nurses who would work schedules that aligned better with current staffing needs.

When we asked why it took so long to formally change the nursing schedules, program staff explained that their attempts to follow the process outlined in the Collective Bargaining Agreement between Jail Health Services and the nurses' union led to delays in updating the schedules. Ultimately, the union streamlined the process, and Jail Health Services is now implementing new schedules that match the desired staffing level.

Nurse Staffing Plan Does Not Include Adequate Coverage for Nurses on Leave

The second reason we identified for the fluctuations in staffing is that Jail Health Services has not fully incorporated into its staffing plan the need to cover nurses on leave. Although Jail Health Services tries to cover expected absences (such as vacation or maternity leave) by scheduling overtime or temporary agency nurses, it has not developed a staffing plan that consistently includes adequate relief for nurses absent from work. As we describe in Question 5, it is possible to develop a model that predicts future leave patterns using past leave use and leave policies.

Nurse Vacancies Impact Coverage

The third main factor impacting staffing levels at the jails is nurse vacancies. Exhibit K shows vacancy rates in 2006 and 2007 for all nursing positions in Jail Health Services and specifically for RN positions.

EXHIBIT K
Vacancy Rates for Nursing Positions

	1st Quarter 2006	2nd Quarter 2006	3rd Quarter 2006	4th Quarter 2006	1st Quarter 2007
Jail Health Services Nurse Vacancy Rate	8.4%	11.2%	4.2%	7.0%	15.9%
RJC RN Vacancy Rate	11.1%	11.1%	0.0%	0.0%	0.0%
KCCF RN Vacancy Rate	11.6%	17.3%	8.7%	11.5%	29.1%

SOURCE: Auditor analysis of data from Jail Health Services.

The high vacancy rate for KCCF in 2007 reflects the creation of four new RN positions. Without these new positions, the rate at the end of the first quarter of 2007 would have been 21.5%.

From our research into the national nursing shortage, we found that these numbers are not inconsistent with the national nursing vacancy rate for RNs at hospitals. Studies conducted over the past five years identify the current RN vacancy rate to be

between 8.5 and 16.1 percent, and according to a study prepared for the American Hospital Association in 2002, over one in seven hospitals reported a severe RN vacancy rate of over 20 percent.

Nonetheless, high vacancy rates at KCCF can make scheduling a sufficient number of nurses for each shift extremely difficult and increase the need for temporary agency nurses. (We discuss the higher costs and other drawbacks to relying on temporary nurses in Question 7.) Jail Health Services has taken the following steps in recent years to try to reduce the number of vacancies:

- Along with all of Public Health, implemented a new online job posting and application system to improve the number and quality of applications received and reduce the time between application submission and interviews.
- Verified that nursing salaries are competitive with other area employers.
- Hired a consultant to create a nursing recruitment plan and brochure. Jail Health Services implemented the plan, including utilizing targeted advertising and outreach methods.

Jail Health Services has also worked to improve working conditions for nurses and to develop systems that allow nurses to be more efficient. For example, both the electronic health record system and the 24-hour prescription fill process should reduce nursing workload.

Jail Health Services should continue its efforts both to recruit nurses and to identify new processes that allow nurses to be more efficient. As we explained above, when Jail Health Services cannot find enough nurses to cover its vacancies, shifts are not fully staffed. Program staff reported that staffing levels are further reduced by nurses calling in sick, because it is extremely unlikely to hire a temporary agency nurse on short notice as most

agencies schedule their nurses weeks or months in advance. For this reason, Jail Health Services does occasionally require nurses to work mandatory overtime.

RECOMMENDATION 12 Jail Health Services should continue to ensure staff schedules align with staffing plans and workload demands.

Additional recommendations to improve nurse scheduling are at the end of Question 5.

5. HOW CAN JAIL HEALTH SERVICES IMPROVE ITS STAFF PLANNING TO ACHIEVE THE DESIRED STAFFING LEVEL?

A Staffing Model Based on Leave Practices Can Predict the Most Cost Effective Mix of Staffing Resources

In order to improve staff planning, Jail Health Services could develop a staffing model based on the minimum staffing level for each shift, as determined by an analysis of workload and productivity measures and current leave practices. This kind of model uses historic leave use to project how many hours of unscheduled leave a particular number of FTE are likely to take. This approach can help management determine whether they currently have a sufficient number of nurses to cover for nurses on leave, and it can also be used to predict the most cost-effective mix of full-time staff and temporary agency staff or overtime.

This kind of model requires that Jail Health Services implement two improvements to their current staffing practices:

- Accurately track all leave taken and hours worked by employee. Currently, Jail Health Services does not have a database that tracks hours worked and leave taken for each employee. Additionally, Jail Health Services payroll data does not include a record of leave without pay, which is a significant amount of leave for Jail Health Services nurses.

We estimated that the average Jail Health Services RN took over 40 hours of leave without pay in 2006.

- Improve management of vacation leave. Neither the Collective Bargaining Agreement between Jail Health Services and its nurses nor internal policies specify the number of nurses who can be away on vacation from each shift. Although one nurse supervisor has developed a guideline of allowing two nurses to be on vacation each day, this is not a formal policy and has not been implemented consistently. Additionally, this guideline does not specify how many nurses can be on leave from each shift. This flexibility has some benefits for the employee and the employer, but it also makes it difficult for JHS to develop a staffing model that will ensure coverage for nurses on vacation. A policy that includes a specified number of leave slots on each shift would allow management to formally factor vacations into staff planning.

Further, to be most efficient, Jail Health Services should try to minimize unscheduled absences. Unscheduled leave includes any absence that was not planned and mostly consists of sick leave. In 2006, the average full-time (1.0 FTE) RN took over one full shift of unscheduled leave for every 10 shifts for which they were scheduled. Although Jail Health Services cannot restrict unscheduled leave, it should try to reduce it by developing incentives that encourage nurses to save their leave and come to work. The current collective bargaining agreement between nurses and Jail Health Services provides nurses with the opportunity to convert 16 hours of accrued sick leave to two vacation days if they use fewer than 33 hours of sick leave over the calendar year. One problem with this policy is that it is not an effective incentive for nurses to save their sick leave. Nurses can either use their sick leave as unscheduled leave whenever they

wish, or they can convert it to vacation leave and take it when it will be approved by management. Converting the leave into vacation actually reduces the employee's flexibility in when they can use it.

Alternatives to this policy might include allowing employees to cash out accrued sick leave, rewarding employees who save their leave with something other than additional leave, or restricting a nurse's ability to earn overtime in periods that the nurse also takes unscheduled leave. Jail Health Services will have to weigh their options carefully on this issue to encourage nurses to minimize unscheduled absences without hurting morale. This is especially important in the context of the current nursing shortage.

RECOMMENDATION 13 Jail Health Services should incorporate the need to cover employees on leave into its staffing plans. Jail Health Services should use statistical analyses to assess its current staffing level and to model the most cost-effective mix of full-time staff, overtime, and temporary agency staff.

RECOMMENDATION 14 Jail Health Services should develop a method to track all hours of employee work and leave.

RECOMMENDATION 15 Jail Health Services should improve management of vacation leave by specifying the maximum number of staff who can take vacation from each shift. Additionally, Jail Health Services should consider improving current leave policies to create an incentive for employees to save their sick leave.

STAFFING OPTIONS

6. WHAT ARE THE AVERAGE HOURLY COSTS OF THE NURSES WHO STAFF THE JAILS?

We found that the average cost per hour worked of a temporary agency nurse is generally higher than that of a Jail Health Services (JHS) nurse, that the cost per hour worked of a part-time JHS nurse is about four percent higher than that of a full-time JHS nurse, and that the hourly cost of a JHS nurse working overtime is between 8 and 15 percent more than for a JHS nurse working a regular shift.

We analyzed the average hourly rate, cost of benefits, hours worked, and hours of leave for all Jail Health Services nurses and calculated the average cost per hour worked for regular full-time (1.0 FTE) RNs, regular part-time (0.8 FTE) RNs, regular RNs working overtime, and temporary agency RNs working three different shifts in the jails. We looked at three different shifts, because nurses earn between $2.50 and $7.75 more for working in the evening or on the weekend than they do for working a regular day shift during the week. We focused on RNs in this analysis because they make up the majority of Jail Health Services regular employees and the majority of agency staff. The results of our analysis can be seen in Exhibit L.

EXHIBIT L
2006 Average Cost per Hour Worked of Jail Health Services Registered Nurses (RN)

	Day Shift, Monday-Friday	Night Shift, Monday-Friday	Night Shift, Weekend
1.0 FTE Jail Health Services RN	$51.71	$56.47	$61.55
0.8 FTE Jail Health Services RN	$53.83	$58.64	$63.77
Jail Health Services RN working overtime	$58.16	$64.39	$71.03
Agency RN who works 1,000 hours in 12 months	$64.72	$64.72	$64.72

Note: Nurses earn a shift differential in addition to their regular rate of pay for each hour they work during an evening, night, or weekend shift. The evening differential is $2.50 per hour, the night differential is $3.75 per hour, and the weekend differential is $4.00 per hour. Nurses can earn both a shift and a weekend differential for the same shift. This means that a nurse who works a night shift on the weekend would earn $7.75 per hour in addition to his or her regular hourly rate.

SOURCE: Auditor analysis of Jail Health Services payroll data.

In our analysis of 2006 nurse staffing costs, we found that the average hourly wage for RNs was $35.02. When we added the cost of benefits and the cost of paying nurses for the time they are away on leave, we found that nurses who worked five day shifts during the work week (1.0 FTE) cost $51.71 per hour worked and nurses who worked four day shifts per week (0.8 FTE) cost $53.83 per hour worked. The amounts increased for the night and weekend shifts, but they remained within four percent of each other.

It was surprising to us that the final cost per hour was so similar for both groups. We had expected to see a greater difference in cost because the department pays for full medical and dental benefits for 0.8 FTE nurses while those nurses work fewer annual hours. However, in 2006, the part-time (0.8 FTE) nurses took significantly fewer hours of unscheduled leave, and so the county did not pay these nurses for as much time away from work as they did full-time nurses. The results of this analysis would change if leave use changed.

Exhibit L also shows that the cost of paying a regular Jail Health Services RN to work overtime costs Jail Health Services between 8 and 15 percent over the regular hourly rate. Although nurses working overtime are paid at the rate of time and one half the nurse's regular hourly wage, the county does not have to pay full benefits and cover the cost of leave in addition to the wage. Thus, the full cost of paying a nurse to work overtime is significantly less than one and one half times the actual hourly cost per hour worked.

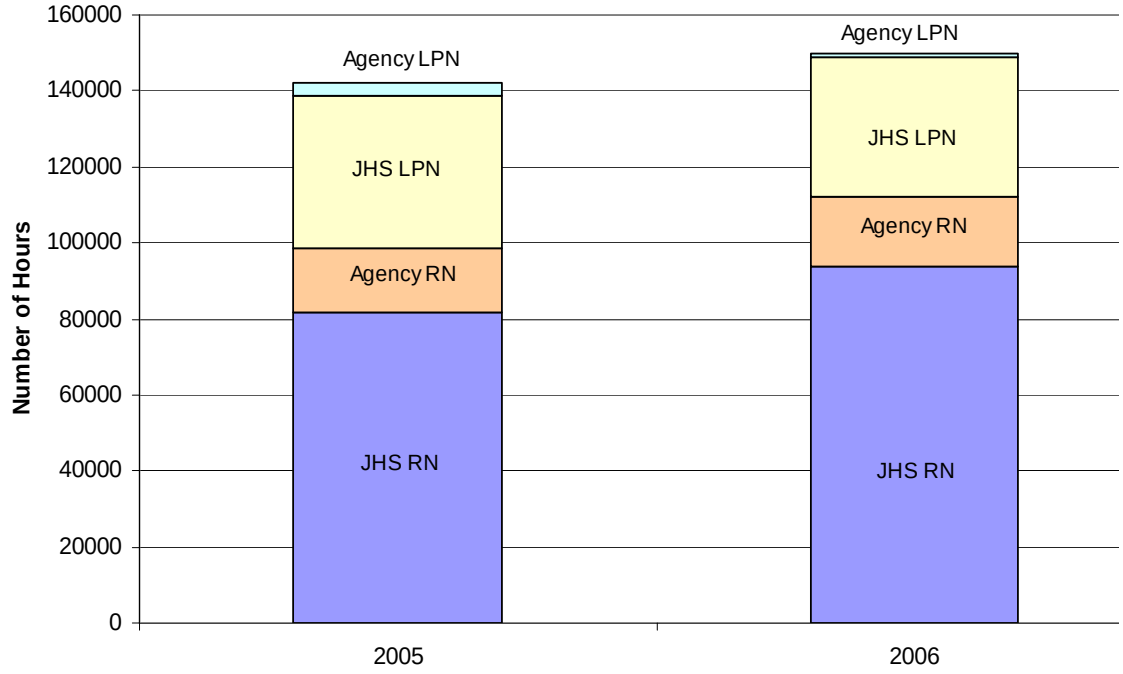
We found that the average cost of a temporary agency RN is almost $65 per hour worked if that nurse works 1,000 hours for the jails in a 12-month period. Under current law, temporary employees can work for the county up to 1,100 hours in a twelve-month period without receiving benefits. Jail Health Services stops using an agency nurse after the nurse works 1,000 hours in order to ensure that temporary nurses do not exceed the hour limit. However, Jail Health Services program staff reported to us that many agency nurses do not work a full 1,000 hours at the jails. As the number of hours worked by an agency nurse decreases, the cost per hour worked increases. This is because Jail Health Services has to pay for an orientation period for each agency nurse regardless of how long the nurse works at the jails. For example, if a temporary agency nurse works in the jails for only 40 hours, the cost per hour worked increases to $83.14. Although we identified several agency nurses who worked at the jails for less than one week, the average agency RN worked at Jail Health Services for about 380 hours in 2006. The cost of an agency RN who works the average number of hours is approximately $66 per hour worked.

7. WHAT ARE THE IMPACTS OF HAVING AGENCY NURSES WORKING IN THE JAILS?

As can be seen in Exhibit M below, temporary agency nurses worked a significant portion of total Jail Health Services nursing hours in 2005 and 2006.

EXHIBIT M

JHS Nursing Hours, 2005 - 2006



SOURCE: Auditor analysis of data from Jail Health Services

Temporary Agency Nurses Work a Significant Portion of Total Nursing Shifts

In 2006, Jail Health Services paid temporary agency RNs almost $1,170,000 to work over 18,000 hours in the jails. These nurses covered vacancies and shifts left open by JHS nurses who were out sick or on vacation.

The option of using agency nurses provides Jail Health Services with valuable flexibility in covering vacancies and absences. Additionally, agency nurses can provide additional coverage during short term increases in workload, such as the recent transition to the electronic health records system. However, as can be seen in Exhibit L under Question 6, the average agency

nurse working a day shift costs the county over 10 dollars per hour more than a regular full-time nurse. If all agency nurses worked the full number of hours allowed under the law, in 2006 JHS would have paid over $100,000 more for agency RNs who worked day shifts than they would have paid full-time nurses to cover these shifts.

Additionally, Jail Health Services management indicated that because some agency nurses work only periodically or for just a few weeks, many are trained in only one area of the jail and may be limited in the type of work they can perform. For example, some agency nurses are trained only to administer medications or to work in the infirmary, but not to do both. Finally, program staff reported to us that because temporary agency nurses are limited in the number of hours they can work for the county, Jail Health Services spends a significant amount of time recruiting and orienting new temporary nurses.

Jail Health Services management is aware of the issues with using agency nurses and is actively working to reduce its dependence on them. Recent steps taken by Jail Health Services in this area include reducing funds for agency staff in order to create more full-time nursing positions, increasing efforts to reduce vacancies (as described in greater detail in Question 4), and filling open positions with nurses willing to work full-time (1.0 FTE rather than 0.8 FTE). In addition, new systems and processes at Jail Health Services, such as the electronic health records system and the 24-hour prescription fill, should help nurses be more efficient.

Steps such as these, in addition to implementation of our recommendations to improve staff planning and scheduling, should help Jail Health Services use its staffing resources more efficiently and more cost-effectively.

APPENDICES

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APPENDIX 1

2004 – 2006 MEDICATION-RELATED INMATE COMPLAINTS TO KING COUNTY OMBUDSMAN'S OFFICE

	Description*	2004	2005	2006	3-Year Total	Percent by Category
No Error	A. Circumstances occurred that have capacity to cause error but no error occurred	10	24	19	53	31.0%
Error but No Harm	B. Error occurred but did not reach patient	-	-	-	-	-
	C. Error reached patient but did not cause harm	11	61	28	100	58.5%
	D. Error reached patient and required monitoring to confirm that it resulted in no harm and/or required intervention to preclude harm	1	3	7	11	6.4%
Error that May Have Contributed to or Caused Harm	E. Error may have contributed to or resulted in temporary harm and required intervention	-	1	-	1	0.6%
	F. Error may have contributed to or resulted in temporary harm and required hospitalization	1	1	2	4	2.3%
	G. Error may have contributed to or resulted in permanent harm	1	-	-	1	0.6%
	H. Error occurred requiring intervention to sustain life	-	1	-	1	0.6%
Error that Caused Death	I. An error occurred that may have contributed to or resulted in the patient's death	-	-	-	-	-
Total		24	91	56	171	100%

* Note: Index based on Medication Errors Reporting Methodology by the United States Pharmacopoeia Medication Error Reporting Program.
Source: King County Ombudsman's Office complaint logs and Westcoast Consulting Group analysis. The Ombudsman's Office report identified 192 medication-related complaints from January 2004 through November 2006. Consultants assessed only 171 of these complaints, excluding complaints in which it appeared that the inmate had not yet seen a provider or been prescribed a medication or for which the logs requested from the Ombudsman's Office included only general information about the complaint. The Ombudsman's Office maintains more detailed records of complaints in case notes, but those were not reviewed as part of this analysis.

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APPENDIX 2

JAIL HEALTH SERVICES MEDICATION INCIDENT REPORTS

	Description	10-Percent Sample 2006*	Percent by Category 2006	Quarter 1 Actuals 2007	Percent by Category 2007
No Error	A. Circumstances occurred that have capacity to cause error but no error occurred	7	10.4%	28	17.7%
Error but No Harm	B. Error occurred but did not reach patient	36	53.7%	18	11.4%
	C. Error reached patient but did not cause harm	17	25.4%	91	57.6%
	D. Error reached patient and required monitoring to confirm that it resulted in no harm and/or required intervention to preclude harm	6	9.0%	19	12.0%
Error that May Have Contributed to or Caused Harm	E. Error may have contributed to or resulted in temporary harm and required intervention	0	0.0%	2	1.3%
	F. Error may have contributed to or resulted in temporary harm and required hospitalization	0	0.0%	0	0.0%
	G. Error may have contributed to or resulted in permanent harm	0	0.0%	0	0.0%
	H. Error occurred requiring intervention to sustain life	0	0.0%	0	0.0%
Error that Caused Death	I. An error occurred that may have contributed to or resulted in the patient's death	0	0.0%	0	0.0%
Total		66	100%	158	100%

* Note: The audit team, including a registered nurse from Westcoast Consulting Group, observed and validated Jail Health Services' process for categorizing select incidents for the 2006 sample.
Source: Medication Incident Reports prepared by Jail Health Services.

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LIST OF RECOMMENDATIONS & IMPLEMENTATION SCHEDULE

Recommendation 1: Jail Health Services should conduct periodic audits and strengthen inventory controls to enhance accountability for medications ordered, dispensed, administered, disposed of, and maintained in stock.

Implementation Date: Audits will begin in 2008

Estimate of Impact: Enhanced controls will improve accountability for medications and reduce the likelihood of medications being lost or diverted.

Recommendation 2: Jail Health Services should transfer responsibility for filling the carts with inmate medications to pharmacy staff.

Implementation Date: Implemented as of September 10, 2007

Estimate of Impact: Transferring responsibility for filling the carts to pharmacy staff will create a single point of accountability for the medications at all points in the medication dispensing and administration processes. The pharmacy will be accountable for medications until nurses take possession of the medication carts to conduct their medication passes. This will also increase efficiency by eliminating the time nurses spend on stocking the carts and shifting this responsibility to pharmacy technicians.

Recommendation 3: Jail Health Services should expand the pilot process of filling medications on 24-hour cycles rather than 7-day cycles.

Implementation Date: Implemented as of September 10, 2007

Estimate of Impact: This will improve medication process efficiency and effectiveness when inmates are transferred between facilities. Efficiency will be improved because less staff time will be devoted to researching transferred inmates' medication requirements. Effectiveness will be improved because inmates should experience fewer delays in receiving medications once they have been transferred.

Recommendation 4: Jail Health Services should reconfigure medication carts to increase accountability.

Implementation Date: Implemented as of September 10, 2007

Estimate of Impact: The recommended cart configuration would allow the pharmacy to easily identify which inmates did not take their medications and during which pass. This strengthens medication administration process accountability and may allow for better patient care by enhancing pharmacists' ability to identify patients who do not take their medications are prescribed.

LIST OF RECOMMENDATIONS & IMPLEMENTATION SCHEDULE (Continued)

Recommendation 5: Jail Health Services should utilize portable electronic devices, such as laptops or hand-held devices, to improve documentation of the medication administration process.

Implementation Date: Feasibility analysis to be completed in 2008

Estimate of Impact: Use of portable electronic devices would allow data from each medication pass to be efficiently uploaded into the electronic health record system, thereby enabling better oversight by the pharmacy.

Recommendation 6: Jail Health Services should conduct a feasibility analysis to evaluate centralizing KCCF and RJC pharmacy operations.

Implementation Date: Feasibility analysis to be undertaken in early 2009

Estimate of Impact: A feasibility analysis would provide valuable information on the potential efficiencies and process improvements of centralization of the pharmacies, as well as information on the potential costs or drawbacks.

Recommendation 7: Jail Health Services should work with DAJD to modify their Memorandum of Understanding to include regular joint reviews of medication administration performance and to identify opportunities for improvement. The joint reviews should incorporate line staff involvement and/or input from both Jail Health Services and DAJD.

Implementation Date: December 31, 2007

Estimate of Impact: Joint reviews will enable line staff from Jail Health Services and the Department of Adult and Juvenile Detention to discuss issues or concerns related to medication administration. This will allow staff from both agencies to collaborate on identifying solutions to increase medication administration process efficiency and effectiveness.

Recommendation 8: Jail Health Services should continue to utilize the new method of categorizing medication incidents based on cause and severity, and ensure that reviews of the medication incident data are conducted regularly as planned.

Implementation Date: Implemented in January 2007 and currently ongoing

Estimate of Impact: Continued use of the new medication incident reporting process will enable Jail Health Services to track medication incidents and improve the accountability and effectiveness of its medication practices.

Recommendation 9: Jail Health Services should identify key publicly reportable performance measures, including outcome-based measures, for medication administration and monitor these through the joint Jail Health Services and DAJD reviews.

Implementation Date: June 30, 2008

Estimate of Impact: Publicly reportable performance measures will increase transparency and accountability of Jail Health Services' medication practices.

LIST OF RECOMMENDATIONS & IMPLEMENTATION SCHEDULE (Continued)

Recommendation 10: Jail Health Services should continue its update of the pharmacy staffing model to ensure staffing estimates are based on current processes and workload demands.

Implementation Date: December 31, 2008.

Estimate of Impact: Updating the pharmacy staffing model with current workload and productivity data will ensure that Jail Health Services pharmacies are staffed at the level necessary to meet the demands of the workload.

Recommendation 11: Jail Health Services should develop a nurse staffing model that is systematically linked to workload demands and productivity goals. This model should incorporate the development and monitoring of key workload and productivity measures and be used for both staffing and scheduling analyses.

Implementation Date: In process

Estimate of Impact: Developing a nurse staffing model that is linked to workload demands and productivity goals will allow Jail Health Services to ensure staffing levels are sufficient to meet the demands of the workload and also adjust staffing levels as workload changes.

Recommendation 12: Jail Health Services should continue to ensure staff schedules align with staffing plans and workload demands.

Implementation Date: Ongoing

Estimate of Impact: Once the staffing plan is linked to workload demands and productivity goals (Recommendation 11), aligning staff schedules with the staffing plan will ensure nursing shifts are staffed at the level that is appropriate for the workload. This will reduce both understaffing and overstaffing on nursing shifts.

Recommendation 13: Jail Health Services should incorporate the need to cover employees on leave into its staffing plans. Jail Health Services should use statistical analyses to assess its current staffing level and to model the most cost-effective mix of full-time staff, overtime, and temporary agency staff.

Implementation Date: December 31, 2008

Estimate of Impact: Improved planning for employees on leave will reduce understaffing on shifts when employees call in sick. Additionally, an assessment of current leave trends and the costs of various staffing options can help JHS budget for the cost of covering employees on leave and determine the most cost-effective mix of staffing resources.

Recommendation 14: Jail Health Services should develop a method to track all hours of employee work and leave.

Implementation Date: Subject to Peoplesoft installation

Estimate of Impact: Accurately tracking all hours of employee work and leave is an essential step to developing a model that can be used to predict future leave use.

Recommendation 15: Jail Health Services should improve management of vacation leave by specifying the maximum number of staff who can take vacation from each shift. Additionally, Jail Health Services should consider improving current leave policies to create an incentive for employees to save their sick leave.

Implementation Date: Vacation guidelines will be updated January 1, 2008. Leave policy changes will be subject to collective bargaining negotiations.

Estimate of Impact: Determining the maximum number of employees who can take vacation from each shift is an essential step in planning for employee leave. Reducing sick leave use will result in a decrease in the need for overtime or temporary agency staff and will lead to cost savings.

EXECUTIVE RESPONSE

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October 5, 2007

Cheryle Broom, County Auditor
King County Auditor's Office
Room 1033
COURTHOUSE

RE: Proposed Final Report – Jail Health Services Performance Audit

Dear Ms. Broom:

Thank you for the opportunity to review your proposed final report. The audit objective was to evaluate Jail Health Services' controls over medications including narcotics and other controlled substances, assess the effectiveness of quality assurance activities and review staffing and scopes or practices within the medication administration and pharmacy operations.

While we are always looking for opportunities to improve all of our practices, it is reassuring to note your conclusion that Jail Health Services' patients are at no greater risk than patients in other healthcare settings. We appreciate your acknowledgement that Jail Health Services has developed a staffing model that will effectively strengthen current nurse staffing practices.

We concur with your recommendations and, as you will see in the attached detailed responses, some of them have already been implemented. Please note that Jail Health Services is requesting your technical assistance in implementing your recommendation pertaining to the use of statistical analysis to assess its current staffing level and to model the most cost-effective mix of full-time staff, temporary agency staff and overtime.

We appreciate the courteous and professional manner in which your staff conducted its work.

Sincerely,

Ron Sims
King County Executive

Attachment

cc: Kurt Triplett, Chief of Staff, Office of the King County Executive
Bob Cowan, Director, Office of Management and Budget (OMB)
David Fleming, Director and Public Health Officer, Public Health – Seattle & King County (PHSKC)
Bette Pine, Jail Health Services Manager, PHSKC
Reed Holtgeerts, Director, Department of Adult and Juvenile Detention (DAJD)
Hikari Tamura, Deputy Director, DAJD
David Lawson, Manager, Executive Audit Services

Jail Health Services Pharmacy and Medication Administration Performance Audit
Executive Response 10/5/07

Category	Recommendation	Agency Position	Schedule for Implementation	Comments
Pharmacy Services	1) Jail Health Services should conduct periodic audits and strengthen inventory controls to enhance accountability for medications ordered, dispensed, administered, disposed of, and maintained in stock.	Concur	Pharmacy QI Committee will design an audit tool by the end of 2007 and begin audits in 2008.	Jail Health Services also meets the State of Washington's regulation related to inventory control (WAC 246-887-020). We also meet the NCCHC standard related to Pharmacy Operations (J-D-01).
Pharmacy Services	2) Jail Health Services should transfer responsibility for filling the carts with inmate medications to pharmacy staff.	Concur	Fully implemented as of September 10, 2007.	In April of 2007 a Jail Health Services Pharmacist recommended implementation of the 24-hour fill process for all inmates on single dose medications. Under this process pharmacy personnel are responsible for filling the medication carts. This change was recommended to bring about the following benefits: 1) Increase pharmacy's ability to track and be accountable for medications dispensed 2) Reduce medication errors 3) Free up time for both nursing and pharmacy staff 4) Reduce missing medications
Pharmacy Services	3) Jail Health Services should expand the pilot process of filling medications on 24-hour cycles rather than 7-day cycles.	Concur	See Recommendation #2.	See Recommendation #2.
Pharmacy Services	4) Jail Health Services should reconfigure medication carts to increase accountability.	Concur	See comment.	Under the 24-hour fill process Jail Health Services has already reconfigured the medication carts. We are aware of technology solutions that would further improve accountability. We believe it would be prudent to analyze the potential added value of these options.
Pharmacy Services	5) Jail Health Services should utilize portable electronic devices, such as laptops or hand-held devices, to improve documentation of the medication administration process.	Concur	Feasibility analysis is on the EHR work plan for 2008.	Jail Health Services is investigating both wireless functionality and a vendor software program redesign to use laptops for medication administration.
Pharmacy Services	6) Jail Health Services should conduct a feasibility analysis to evaluate centralizing KCCF and RJC pharmacy operations.	Concur	Feasibility analysis will be undertaken in early 2009.	As reported in the 2007 Budget Proviso response to Council Jail Health Services plans to "Analyze the feasibility of consolidating the KCCF and RJC pharmacy sites in order to realize potential cost savings through

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				efficiency gains. Operating and staffing two relatively small pharmacies results in expensive backfill when a single employee is out for illness or vacation. Considerations will include: 1. Availability of space; 2. Method for transporting medications between facilities; and 3. Systems to allow prescription orders to be transmitted between facilities." This analysis is dependant upon and will be undertaken following full implementation of the EHR Pharmacy module and completion of the remodel at KCCF.
Pharmacy Services	7) Jail Health Services should work with DAJD to modify their Memorandum of Understanding to include regular joint reviews of medication administration performance and to identify opportunities for improvement. The joint reviews should incorporate line staff involvement and/or input from both Jail Health Services and DAJD.	Concur	Incorporation of this recommendation by end of 2007.	
Pharmacy Services	8) Jail Health Services should continue to utilize the new method of categorizing medication incidents based on cause and severity, and ensure that reviews of the medication incident data are conducted regularly as planned.	Concur	The MIR was implemented in January 2007. The data is analyzed and presented at each quarterly JHS Quality Improvement Committee meeting.	In 2006 Jail Health Services developed the Medication Incident Report (MIR) to categorize medication incidents based on cause and severity. This new process was created to provide the data necessary to support quality improvement in the pharmacy and medication administration programs.
Pharmacy Services	9) Jail Health Services should identify key publicly reportable performance measures, including outcome-based measures, for medication administration and monitor these through the joint Jail Health Services and DAJD reviews.	Concur	Develop measures by 2nd quarter, 2008.	We will review published national standards to develop key reportable performance measures to review with JHS and DAJD staff.
Staffing	10) Jail Health Services should	Concur	Pharmacy staffing	Before revising the formal pharmacy staffing model the following

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	continue its update of the pharmacy staffing model to ensure staffing estimates are based on current processes and workload demands.		model will be updated once major pharmacy operational changes are fully implemented and stable. We project that this will be in the 2nd half of 2008.	major changes must be fully implemented and operating smoothly: • Printed MAR • 24-hour medication cart fill • Pharmacy module of Electronic Health Record In the mean time JHS continues to work with the Supervising Pharmacist to monitor changes in work processes and volume and adjust staffing accordingly.
Staffing	11) Jail Health Services should develop a nurse staffing model that is systematically linked to workload demands and productivity goals. This model should incorporate the development and monitoring of key workload and productivity measures and be used for both staffing and scheduling analyses.	Concur	In process, fully implemented after remodel is complete and EHR is completely functional.	The staffing plan will continue to be reviewed and updated pursuant to any major operational changes.
Staffing	12) Jail Health Services should continue to ensure staff schedules align with staffing plans and workload demands.	Concur	In process, fully implemented after remodel is complete and EHR is completely functional.	The staffing plan will continue to be reviewed and updated pursuant to any major operational changes.
Staffing	13) Jail Health Services should incorporate the need to cover employees on leave into its staffing plans. Jail Health Services should use statistical analyses to assess its current staffing level and to model the most cost-effective mix of full-time staff, overtime, and temporary agency staff.	Concur	2008 (dependant upon the availability of the Auditor's office)	Jail Health Services requests technical assistance from the King County Auditor's Office to complete this body of work. This work will depend upon availability of data described in Recommendation #14.
Staffing	14) Jail Health Services should develop a method to track all hours of employee work and leave.	Concur	Implementation dependant upon Peoplesoft installation.	Peoplesoft is a county-wide system which will allow us to track this information.
Staffing	15) Jail Health Services should improve management of vacation leave by specifying the maximum	Concur	Vacation guidelines: implement change effective 1/1/08.	Jail Health Services will amend current vacation guidelines to specify the maximum number of staff who can take vacation from each shift.

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	number of staff who can take vacation from each shift. Additionally, Jail Health Services should consider improving current leave policies to create an incentive for employees to save their sick leave.		Leave policy: any proposed changes to the union contract will be negotiated as the contract is renewed.	Jail Health Services will investigate ways to encourage employees to save their sick leave.

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