

VA Office of Inspector General

OFFICE OF AUDITS AND EVALUATIONS



Veterans Health Administration

*Audit of Imaging Service
Scheduling Practices
at the South Texas
Veterans Health Care
System*

August 17, 2017
16-00597-279

ACRONYMS

| | |
|--------|----------------------------------------------------|
| CID | Clinically Indicated Date |
| CT | Computed Tomography |
| FY | Fiscal Year |
| NVC | Non-VA Care |
| OHI | Office of Healthcare Inspections |
| OIG | Office of Inspector General |
| SOP | Standard Operating Procedures |
| STVHCS | South Texas Veterans Health Care System |
| VA | Department of Veterans Affairs |
| VHA | Veterans Health Administration |
| VistA | Veterans Integrated System Technology Architecture |

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Highlights: Audit of VHA's Imaging Service Scheduling Practices in the South Texas VA Health Care System

Why We Did This Audit

In October 2015, Congressman Mike Coffman, the then-Chairman of the Subcommittee on Oversight and Investigations, House Committee on Veterans' Affairs, requested the OIG conduct an audit of the South Texas Veterans Health Care System's (STVHCS) Imaging Service. The Subcommittee received an allegation that about 20,000 pending radiology orders were past due and required action.

What We Found

We substantiated the allegation that the STVHCS Imaging Service had a significant number of past due radiology orders. STVHCS's Veterans Integrated System Technology Architecture (VistA) showed an inventory of 20,443 pending orders as of January 5, 2016. Of the 20,443 pending orders, 17,790 were potentially past due with a clinically indicated date (CID) before January 1, 2016.

Our review of a statistical sample of 292 of the 17,790 potentially past due pending orders in VistA as of January 2016 identified 56 orders that were completed, scheduled for completion, or still pending within 30 days of the CID. These orders were timely based on the Veterans Health Administration's Radiology Standard Operating Procedure that recommended VA medical facilities complete routine exam requests within 30 days.

The remaining 236 orders that were not timely included:

- 144 past due orders belonging to 114 patients that either were not completed or not scheduled for completion within 30 days of the CID. These patients waited for their tests an average of 86 days beyond the Veterans Health Administration timeliness guideline of within 30 days of the CID. We projected that about 7,200 orders for approximately 5,500 patients were not timely managed.
- 92 pending orders that should have been canceled because they were no longer needed due to changing circumstances or treatment decisions. We projected that the pending order inventory may have included as many as 9,500 orders that were no longer needed and should have been canceled.

During the audit, the Office of Healthcare Inspections (OHI) reviewed a total of 196 radiology orders belonging to 144 patients where the orders were not timely managed. These orders included completed orders, pending orders, non-VA care referrals, and orders where an alternate or duplicate exam had potentially been completed. OHI's clinical reviews confirmed that delays had a minor clinical impact on 14 patients and an intermediate clinical impact on the care provided to one patient.

This occurred because the STVHCS Imaging Service staff did not effectively manage hard copy and electronic orders and scheduling processes to ensure patients' exams were properly scheduled and tracked. These practices within the STVHCS Imaging Service had developed over time

due to STVHCS's lack of a defined process for the follow-up and cancellation of unneeded orders. As the pending radiology order inventory grew over time, STVHCS Imaging Service staff had a difficult time distinguishing between true pending orders and unnecessary orders. The passage of time made it difficult to track STVHCS Imaging Service management and policy decisions. Thus, we could not identify the specific STVHCS management officials responsible for the inventory of past due pending orders.

As of May 2016, when we completed our review, the STVHCS Imaging Service could not ensure the timely provision of radiology exams and quality health care to patients. By April 19, 2017, however, the STVHCS Imaging Service reported that it had reduced the number of pending radiology orders to 366.

What We Recommended

We recommended the STVHCS Director address the STVHCS's current pending radiology order inventory and strengthen radiology exam scheduling, management, and monitoring controls to prevent delayed exams in the future.

Agency Comments

The STVHCS Director concurred with our report and recommendations, and provided completed actions that were taken to address the recommendations. We considered the actions acceptable.



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INTRODUCTION

Objective

The objective of the audit was to determine whether the South Texas Veterans Health Care System (STVHCS) had past due radiology orders that required action and adversely affected patients' quality of care.

Why We Did This Audit

In October 2015, the OIG received a request from Congressman Mike Coffman, the then-Chairman of the Subcommittee on Oversight and Investigations, House Committee on Veterans' Affairs, to audit the STVHCS Imaging Service due to an allegation that STVHCS had about 20,000 past due pending radiology orders requiring action.

Exam Request Process

The STVHCS Imaging Service provides a wide range of diagnostic exams including general radiology and specialty exams including Computed Tomography (CT) and Magnetic Resonance Imaging. STVHCS clinicians request exams electronically through the Veterans Integrated System Technology Architecture (VistA) Radiology/Nuclear Medicine package and select a clinically indicated date (CID) for each exam ordered. The CID, formerly known as the desired date, is the clinician's requested date, not the patient's preferred date.

The STVHCS Imaging Service staff print, collect, and sort the radiology orders, and use the hard copy orders to manage patients' general radiology and specialty exams. They use this manual process because the VistA Scheduling and Radiology systems do not exchange information with one another. Also, the VistA Radiology scheduling system does not allow radiologists to electronically annotate their reviews or instructions for ordered exams.

Walk-in and Scheduled Appointments

The STVHCS Imaging Service staff provide radiology exams on a walk-in and appointment basis based on the type of exam. As part of its local radiology exam procedures, STVHCS staff instruct patients who need general radiology exams to walk in for their exams or schedule specialty exams within 30 days of the orders' CIDs.

The Veterans Health Administration (VHA) Radiology Program Office lacked formal timeliness standards for the completion of radiology exams. However, VHA provided general guidance on the timeliness of exams in VHA's *Radiology Program Office Online Radiology Guide, Standard Operating Procedures (SOPs)* "3.1 Ordering, Approving, and Scheduling Studies," updated on June 11, 2014. The Radiology SOP recommended VA medical facilities complete routine exam requests within 30 days of the desired date (now known as CID) of the appointment. For example, a patient with a CID of January 2, 2017 for a routine exam should have the exam completed by February 1, 2017.

RESULTS AND RECOMMENDATIONS

Finding **STVHCS Imaging Service Had A Significant Number of Past Due Radiology Orders and Delayed Exams**

We substantiated the allegation that the STVHCS Imaging Service had a significant number of past due radiology orders; however, we found fewer past due orders than the 20,000 alleged by the complainant. As of January 5, 2016, STVHCS had an inventory of 20,443 pending orders in VistA. However, only 17,790 of these pending orders were potentially past due with a CID before January 1, 2016. Our review of a statistical sample of 292 pending orders in VistA as of January 2016 identified 56 timely orders that were either completed, scheduled for completion, or still pending within 30 days of the CID. The remaining 236 orders that were not timely included:

- 144 past due orders belonging to 114 patients where the orders either were still pending action or were not timely completed within 30 days of the CID at STVHCS or through the Non-VA Care (NVC) Program. These patients waited an average of 86 days beyond the VHA timeliness guideline of within 30 days of the CID.
- 92 pending orders that should have been canceled because they were no longer needed due to changing circumstances or treatment decisions.¹

During the audit, we identified 196 radiology orders belonging to 144 patients that required an Office of Healthcare Inspections (OHI) clinical review. These 196 orders that were not timely managed included completed orders, pending orders, NVC referrals, and orders where an alternate or duplicate exam had potentially been completed. Clinicians in OHI reviewed these cases to assess the clinical impact delayed exams had on the care provided the patients. OHI's clinical review determined that the delays had a minor clinical impact on 14 patients and an intermediate clinical impact on the care provided to one patient.²

STVHCS's significant number of past due orders, delayed exams, and unnecessary pending orders were attributable to the VA medical facility's inadequate radiology exam management processes and controls. STVHCS lacked:

¹ Twenty-eight of these pending orders were also not timely completed within 30 days of the CID, but they were counted only once as not properly canceled.

² OHI defined minor impact on patient care as an impact that was self-limited and resolved without medical treatment and an intermediate impact as an impact that required medical intervention but did not result in long-term consequences to the patient's health.

- An effective manual hard copy radiology exam scheduling process in Imaging Service
- A means of ensuring that pending orders that were no longer needed were canceled
- A routine procedure to address delays in radiology exams and prevent duplicate orders

As a result, we projected that about 5,500 patients who had about 7,200 pending orders in VistA as of January 5, 2016 experienced delays in the completion of their exams. We also projected that STVHCS's pending radiology order inventory in VistA as of January 5, 2016 may have included as many as 9,500 orders that were no longer needed and should have been canceled. The inclusion of unneeded orders in STVHCS's VistA pending order inventory hampered the staff's ability to effectively distinguish between true pending orders that required attention and unnecessary pending orders. Consequently, STVHCS needs to implement comprehensive local radiology exam management and scheduling controls to reduce its existing inventory of pending radiology orders and improve the timeliness of radiology exams. In response to this audit, STVHCS took action to reduce the number of pending radiology orders and reported it had only 366 pending radiology orders as of April 19, 2017.³

**Past Due
Radiology
Orders**

We found 144 orders belonging to 114 patients were not completed, scheduled for completion, or referred to NVC to ensure completion of the exams within the timeliness guideline in the VHA Radiology SOP. These patients waited on average 86 days beyond the VHA timeliness guideline of within 30 days of the CID.

³ During our audit, STVHCS implemented Imaging Order Management Policy Memorandum 11-15-99 (December 30, 2015), allowing staff to review and cancel pending orders that had been completed or were no longer needed.

Table 1 categorizes the 144 past due radiology orders based on the disposition of the order when we completed our review in May 2016.

Table 1. Past Due Pending Radiology Orders

| Order Type | Orders | Patients | Average Days Beyond 30-Day Timeliness Guidance ⁴ |
|-----------------|------------|-------------|-------------------------------------------------------------|
| Completed Exams | 40 | 35 | 32 |
| Pending Orders | 56 | 47 | 168 |
| NVC Referrals | 48 | 45 | 33 |
| Totals | 144 | 114* | 86** |

Source: VA OIG analysis of patients with past due pending radiology orders as of January 5, 2016.

*Some patients had orders in more than one order type.

**This is the average days beyond the timeliness standard calculated using the data from the 144 individual orders.

The OHI review of 196 orders, including completed orders, pending orders, NVC referrals, and orders where an alternate or duplicate exam had potentially been completed, disclosed that delays in the completion of the orders had a minor to intermediate clinical impact on the quality of care provided to 15 of the reviewed 144 patients.

Completed Exams

We found that 35 patients with 40 pending orders experienced delays in the completion of their exams. STVHCS staff did not complete these patients' exams, on average, until 32 days beyond the timeliness guideline in the VHA Radiology SOP. Based on these results, we projected that about 310 patients experienced delays in the completion of just over 440 exams at the STVHCS.

Pending Orders

As of May 2016, when we completed our review, we found that 47 patients had 56 overdue pending general and specialty exam orders. Subsequently, the orders belonging to these 47 patients had already been pending an average of 168 days beyond the timeliness guideline. The overdue general radiology orders that required patients to walk in for their exams consisted of x-ray orders for various parts of the body, such as the spine, chest, knee, shoulder, and feet. Similarly, the overdue specialty exams that still needed to be scheduled involved orders for ultrasounds or computed tomography scans

⁴ This column reflects the average number of days after excluding the 30 days allowed in VHA's timeliness guidance. For example, the total average days for NVC Referrals are 63 days before excluding the 30-day timeliness guidance.

of various parts of the body and studies or tests of the patients' vascular or heart function.

The following case provides an example of the type of overdue orders identified.

Example 1

In 2015, a clinician ordered a cardiology rest/stress test exam for a patient after abnormal results from a prior test detected problems with the electrical activity of his heart. The specialty exam should have been completed within 30 days of the CID, based on VHA's Radiology SOP timeliness guideline. However, the patient was still waiting 173 days after the recommended time frame in the VHA's Radiology SOP for an appointment at the time of our audit. STVHCS eventually scheduled the exam but canceled it when the patient did not show for the exam.

Based on our review of the 56 overdue pending orders, we projected that the STVHCS pending radiology inventory included about 4,800 patients with approximately 6,300 overdue pending orders.

Non-VA Care Referrals

We also found that STVHCS staff had referred 45 patients with 48 orders to NVC. However, the patients were not timely referred to the Patient-Centered Community Care or Veterans' Choice Programs in accordance with Public Law 113-146 and the exams were not completed within 30 days of the CID as recommended in VHA's Radiology SOP.⁵ Under Public Law 113-146, VA medical facilities are required to refer patients to NVC if they cannot be scheduled for needed medical care within 30 days or receive it within 40 miles of their residence. If the patient accepts the NVC referral, a request is created by STVHCS staff and approved by a second-level review. Upon approval, the exam request is forwarded to NVC for appointment scheduling. Once the exam is completed, the exam images are provided to STVHCS for review.

These referrals also occurred after the patients' wait times for the exams had already exceeded the VHA Radiology SOP timeliness guideline by an average of 33 days. After the NVC referrals, these patients waited on average an additional 65 days before their exams were scheduled, canceled, or completed. This was a conservative estimate of the patients' waiting times after the NVC referrals because 15 of the patients were still waiting for their exams at the time we conducted our audit.

As a result, we projected that about 340 patients referred to the NVC Program did not have their radiology exams timely completed in accordance with VHA's Radiology SOP timeliness guideline.

⁵ Public Law 113-146 is the Veterans Access, Choice, and Accountability Act of 2014, August 7, 2014.

Clinical Impact of Delays

During the audit, we identified 144 patients with 196 radiology orders that required OHI's clinical review. These 196 orders that were not timely managed included completed orders, pending orders, NVC referrals, and orders where an alternate or duplicate exam had potentially been completed. Clinicians in OHI reviewed these cases to assess the clinical impact delayed exams had on the care provided the patients. OHI's clinical review determined that the delays had a minor clinical impact on 14 patients and an intermediate clinical impact on the care provided one patient. Table 2 summarizes the results of OHI's review of the 196 orders.

Table 2. Impact of Delays on Patients' Care

| Impact Rating | Orders | Patients |
|-------------------------------|---------------|-----------------|
| Level 1 - No Impact | 180 | 130 |
| Level 2 - Minor Impact | 15 | 14 |
| Level 3 - Intermediate Impact | 1 | 1 |
| Total Reviewed | 196 | 144* |
| Total Impacted | 16 | 15 |

Source: VA OIG July 11, 2016 Summary of OHI's clinical review of the impact of delays on patient care

** One patient had multiple orders in more than one impact rating.*

Level 1 in Table 2 denotes cases where the delays had no impact on the patient's care. Level 2 denotes cases where the delays had a minor or self-limited impact and the patient recovered without medical intervention. Level 3 denotes cases where there was an intermediate impact and the patient needed medical intervention but there were no long-term consequences.

OHI's review of the one order where a delayed radiology exam had an intermediate clinical impact on the patient's quality of care is summarized below:

Example 2

A patient presented to the STVHCS Emergency Department in late 2015 complaining of pain in his right arm after suffering a fall earlier that day. X-rays completed during that visit reported negative for a fracture. The patient was seen two additional times, once at the STVHCS Pain Clinic, and again at the STVHCS Emergency Department, where he complained of persistent pain and swelling in the right arm. The Pain Clinic ordered a CT scan of the right upper

extremity and the Emergency Department advised him to apply warm compresses and follow-up with his primary care provider.

Just over two months later the patient's CT scan was completed, 63 days beyond VHA's Radiology timeliness standards, and the results indicated that he had a complete or "near complete" tear of his right biceps tendon. He was then evaluated by an orthopedic surgeon two weeks later, who indicated surgical intervention was not an appropriate option and would adversely affect the patient's recovery, because the patient was already 2 months into the healing process. Although not all biceps tendon ruptures are managed surgically, a more timely scheduling of the CT scan may have prompted an orthopedic surgeon to offer this option to the patient.

Orders Not Properly Canceled

STVHCS Imaging Service staff also did not always properly cancel pending orders after changing circumstances made the orders unnecessary. Consequently, the 292 pending orders we randomly selected from VistA included 92 orders where the patients no longer needed the exams. Twenty-eight of the pending orders that were no longer needed occurred due to the STVHCS staff's use of duplicate or alternate radiology orders to address delays in the completion of prior orders. The remaining 64 orders were no longer needed. We determined an order was no longer needed if the medical record contained evidence that:

- A change in the patient's care or a treatment decision made the exam unnecessary
- The patient declined the exam
- The patient did not show up for the scheduled specialty exam
- The exam request was input in error

The following example demonstrates how an ordered exam can become unnecessary due to changing circumstances.

Example 3

A clinician ordered an ultrasound of the chest for a patient as part of a podiatry surgical pre-operation procedure. The patient canceled the surgery and, therefore, no longer needed the exam. However, the order was still pending in VistA 73 days after the CID at the time of our review because STVHCS staff had not canceled the order.

Consequently, we projected based on our review results that as of January 5, 2016, VistA contained approximately 9,500 pending radiology orders that were no longer needed and should have been canceled. Lapses in the cancellation of unnecessary orders overstated the STVHCS pending radiology order inventory and made it more difficult for Imaging Service staff to monitor and ensure the timely completion and scheduling of exams for patients who still needed exams.

Factors Which Contributed to Delays

The STVHCS Imaging Service had a significant inventory of past due orders and delayed exams because it did not effectively manage its pending order inventory in VistA and manual hard copy scheduling processes to ensure the efficient and accurate scheduling and tracking of patients' exams. STVHCS Imaging Service staff allowed pending orders to accumulate after patients did not show up for exams, received alternate or duplicate exams, or no longer needed the exams. This resulted in inaccurate electronic and hard copy radiology exam records and an inability to distinguish between true pending orders that required attention and unnecessary pending orders.

For example, if patients did not show up for their general radiology exams within 30 days of the CID, Imaging Service staff shredded the hard copy orders but left the corresponding electronic orders in VistA. These pending general radiology orders remained in VistA indefinitely because STVHCS Imaging Service staff neither performed follow-up with the patients nor canceled the orders. Over time, this practice contributed to the accumulation of 20,443 pending radiology orders in STVHCS's VistA inventory.

STVHCS also lacked policies and procedures to follow up on delayed specialty exams and to cancel duplicative pending orders for specialty exams. Instead of following up on delayed exams, STVHCS clinicians had resorted to submitting duplicate orders or alternate orders to ensure exams were completed. When the re-ordered or alternate exams were completed, STVHCS Imaging Service staff would mark one order "completed" but not cancel the duplicate pending orders that were no longer needed.

During our review period of 2014 and 2015, VHA had recommended guidelines for the timely completion of radiology exams in its VHA Radiology SOP. However, VHA did not provide adequate guidance related to the cancellation of orders and unneeded pending orders.⁶ The STVHCS Imaging Service Policy Memorandum 136-13-09, *Appointment Scheduling*, also lacked adequate guidance related to the cancellation of unneeded pending orders. Subsequently, duplicate or alternate pending orders that were no longer needed accumulated over time in VistA.

The lack of a defined process for following up and canceling unneeded orders contributed significantly to the STVHCS's inventory of pending orders. This lack of a defined process also prevented STVHCS staff from effectively managing pending radiology orders in need of attention. Moreover, the passage of time made it difficult to track STVHCS Imaging Service management and policy decisions. Thus, we were unable to identify

⁶ VHA did not provide national guidance on the cancellation of orders until the issuance of the *Veterans Health Administration (VHA) Outpatient Radiology Scheduling Policy and Procedures and Interim Guidance* on February 25, 2016.

the specific STVHCS management officials responsible for the inventory of past due pending orders.

STVHCS management also indicated in interviews that staffing challenges in Imaging Service had contributed to the significant inventory of pending orders requiring action:

- High turnover in Imaging Service management, such as the Chief of Imaging Service and Imaging Administrator
- Lack of sufficient scheduling clerks
- Lack of sufficient radiologists due to the university affiliate terminating its sole-source contract with STVHCS in July 2015 and the loss of the affiliate's medical residents who had been providing radiology services

Conclusion

Based on these results, we projected that 5,500 patients with 7,200 pending orders in STVHCS's VistA inventory as of January 5, 2016 were not timely managed within 30 days of the CID. Finally, we also projected that STVHCS's pending radiology orders inventory included as many as 9,500 pending orders that should have been canceled.

The STVHCS Imaging Service's inability to provide patients with timely radiological care adversely affected the quality of care provided some patients. For these reasons, the STVHCS Imaging Service needs to review its pending order inventory to ensure timely action is taken on pending orders and to cancel unnecessary orders. Moreover, STVHCS needs to strengthen controls to improve the management of electronic and hard copy radiology orders and radiology exam scheduling processes to ensure patients receive timely radiology exams and to prevent the proliferation of unnecessary pending orders.

Recommendations

1. We recommended the South Texas Veterans Health Care System Director require staff to review all pending orders that are past due to identify those orders which are active and those which need to be canceled because they have been completed or are no longer needed.
2. We recommended the South Texas Veterans Health Care System Director develop a plan to address any pending exams that are past due to ensure patients who have experienced significant delays receive needed exams.
3. We recommended the South Texas Veterans Health Care System Director ensure staff review the health care system's current hard copy scheduling process to reduce inefficiencies related to duplicate orders, inaccurate record keeping, and the inventory of pending orders.

4. We recommended the South Texas Veterans Health Care System Director ensure Imaging Service staff implement VHA's Outpatient Radiology Scheduling Policy and Procedures and establish monitoring mechanisms where staff review pending orders at designated intervals and remove duplicate exams to facilitate the timely completion of exams.
5. We recommended the South Texas Veterans Health Care System Director implement a program to educate and remind clinicians of the processes they should use to avoid the creation of unnecessary duplicate orders.

**Management
Comments**

The STVHCS Director concurred with our recommendations and provided actions that were taken to address these recommendations. STVHCS staff reviewed, addressed, and canceled, if appropriate, all 20,443 orders that were pending and past due. In March 2016, STVHCS staff finalized a process for addressing any pending exams that were past due to ensure appropriate disposition and any necessary follow-up.

In addition, STVHCS implemented a new scheduling workflow and developed an electronic dashboard to validate and monitor the VA paper-based radiology scheduling process to completion. STVHCS designated staff to review the pending radiology order inventory daily using this dashboard. Finally, duplicate radiology orders have been eliminated and STVHCS provided verbal instruction to clinical service leadership and distributed written education to all medical staff to avoid the creation of unnecessary duplicate orders.

OIG Response

The STVHCS Director's completed actions in response to our recommendations are acceptable. STVHCS staff has taken actions to address our recommendations and we consider them closed. Appendix D contains the full text of the STVHCS Director's comments.

Appendix A Background

General Radiology Exam Scheduling Process

Patients with pending general radiology orders were managed as walk-in appointments and did not have scheduled appointments. After the orders were printed at the STVHCS Imaging Service's front desk, patients received copies of the exam orders when they checked in for the exam. Patients typically received general radiology exams the same day they showed up at Imaging Service for the requested exam.

Specialty Exam Scheduling Process

Specialty exams were scheduled in advance by STVHCS scheduling staff. Staff hand-delivered hard copy orders for specialty exams to radiologists for review to confirm or modify the exams clinicians ordered and add any additional instructions for exam preparation. Staff picked up the hard copy orders and returned them to the scheduler's office for appointment scheduling. If a patient did not show up for a specialty exam, the STVHCS Imaging Staff returned the hard copy order to the schedulers for follow-up.

Limited National Guidance on Exam Scheduling

At the time of our review, VHA's Radiology Program Office lacked official guidance regarding the scheduling of radiology exams. Informal guidance provided in VHA's *Radiology Program Office Online Radiology Guide, Standard Operating Procedures (SOPs) 3.1* (updated on June 11, 2014) recommended VA medical facilities complete routine radiology exam requests within 30 days of the desired date (now known as CID) of the appointment.

In addition, on November 5, 2014, patients with pending radiology exams also became subject to Public Law 113-146 that required patients to be referred to NVC if they could not be scheduled to receive medical care in VA within 30 days or within 40 miles of their residence.

New National Guidance

VHA issued *Veterans Health Administration (VHA) Outpatient Radiology Scheduling Policy and Procedures and Interim Guidance* on February 25, 2016. The national guidance established the following:

- **Scheduling process.** Staff will make three documented attempts to contact each veteran. Staff are not permitted to blind schedule without patients' consent.
- **Timeliness metrics.** Staff will make first contact with the patient within seven days of the CID. Urgent exams timeliness metrics will be determined locally.
- **Monitoring of scheduling.** Staff will review the Pending Log in the VistA Radiology/Nuclear Medicine Package daily.
- **Disposition of orders that are not performed.** Veteran "no-shows" for exams must be addressed through follow-ups and cancellation.

- **Timeliness of clinician notification.** Clinicians will be notified of cancellations.
- **Veterans' Choice Program for radiology exams.** Patients will be referred to the Veterans Choice Program when they cannot be seen within VHA's Wait Time Goals of 30 days or for patients residing more than 40 miles from a VA facility.

This new national guidance was not in effect during the period of our audit but VHA required implementation before our audit was completed.

***New Local
Guidance***

At the start of the audit, STVHCS's *Imaging Order Management Memorandum* 136-13-09, lacked adequate procedures to ensure the cancellation of unneeded radiology orders. During our audit, the STVHCS Imaging Service implemented *Imaging Ordering Management Policy Memorandum* 11-15-99, effective December 30, 2015. This new local guidance addressed some of the issues identified by the audit because it established procedures for the review and cancellation of pending orders that were completed or no longer needed.

Appendix B Scope and Methodology

Scope

We performed our audit work from December 2015 through May 2017 and conducted a site visit to the STVHCS Imaging Service, San Antonio, TX. On January 5, 2016, we obtained the universe of all patients with pending radiology orders requested in STVHCS's VistA Radiology/Nuclear Medicine package from January 1, 2014 through December 31, 2015. We used these data to obtain a stratified sample of patients with pending radiology orders. The patients' orders were reviewed to determine if they were past due, to identify if any actions were taken or still needed, and to assess the effect of any delays on the quality of care provided to patients.

Methodology

To complete our audit objectives, we interviewed ordering and Imaging Service management and staff and obtained an understanding of the policies, processes, oversight, and internal controls related to the scheduling of radiology orders. To determine whether patients had pending radiology orders that required action, we obtained and analyzed a stratified sample of patients with pending radiology orders that had CIDs before January 1, 2016. We reviewed patient appointment schedules, radiology orders submitted, radiology reports, and clinical notes in VistA. For each sample, we identified the:

- Status of patients' orders
- Total wait time for patients with unscheduled orders from CID to January 1, 2016
- Total elapsed time for patients with scheduled orders with delayed appointments (from CID to appointment date)
- Total elapsed time for patients with delayed exams and delayed referrals to NVC (from CID of appointment to exam completion or referral date)
- Morbidity or hospitalization status of patient

OHI Review

To assist in our assessment of pending orders and to determine if any confirmed delays in the provision of the exams adversely affected the patients' health, we referred patients with potential timeliness issues to OHI for clinical review. OHI developed a clinical impact scale as a tool for OHI registered nurse reviewers to classify the significance, if any, of a patient receiving a delayed imaging study. The scale was based on the clinical experience and training of the physician and registered nursing staff. OHI assessed patients using a clinical impact grading scale with six levels defined as:

- Level 1 – No impact
- Level 2 – Minor or self-limited

- Level 3 – Intermediate: patient needed a medical intervention but there was no long term consequence
- Level 4 – Serious: patient needed medical intervention with some long-term consequence
- Level 5 – Severe: major organ dysfunction, severe long-term consequence
- Level 6 – Death

***Fraud
Assessment***

The audit team assessed the risk that fraud, violations of legal and regulatory requirements, and abuse could occur during this audit. The audit team exercised due diligence in staying alert to any fraud indicators by taking actions such as:

- Inquiring of STVHCS Imaging Service management and staff concerning potential fraudulent activities within the scope of our objectives
- Reviewing and assessing documentation in electronic data systems

We did not identify any instances of fraud during this audit.

***Data Reliability
Government
Standards***

We relied on computer-processed data from VistA and data provided by OIG's Data Analysis Division, which obtained data related to patients with pending past due radiology orders. We tested the reliability of the data by comparing certain elements, such as the patient's name and order number, to information available in patients' electronic health records. Additional data reliability tests included steps to identify any missing data in key fields, illogical relationships, and data outside of our period of performance. Based on our reliability assessments, we concluded the data were appropriate and sufficient for our audit purposes.

***Government
Standards***

Our assessment of internal controls focused on those controls relating to our audit objectives. We conducted this performance audit in accordance with generally accepted government auditing standards. These standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objective. The evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objective.

Appendix C Statistical Sampling Methodology

Population

The audit focused on patients with pending radiology orders that were still pending as of January 5, 2016, and that were requested at the STVHCS during calendar years 2014–2015 with a CID before January 1, 2016. We selected the calendar years 2014–2015 population based on the parameters of the audit objective and identified an inventory of 20,443 pending orders in VistA, of which 17,790 were potentially past due with CIDs before January 1, 2016.

Sampling Design

We developed a stratified sampling design where the 17,790 orders with potentially past due pending orders were placed into 11 scan categories identified in coordination with OHI.

1. Chest X-Ray
2. Cervical Spine X-Ray
3. All Other – General Radiology
4. Angiography
5. Computed Tomography
6. Magnetic Resonance Imaging
7. Mammography
8. Nuclear Medicine Studies
9. Ultrasound
10. More Than One Scan Category – Specialty
11. More Than One Scan Category – General Radiology

Each category was further divided into urgent and non-urgent orders, for a total of 22 strata. The sampling design was representative and ensured projections describe the entire population. The sampling methodology resulted in the review of 200 statistically selected patients and their 303 pending radiology orders. However, due to the lack of a set timeliness guideline for urgent and STAT orders, our report excludes the results of five patients with 11 pending urgent and STAT orders.

Additionally, OHI clinicians concluded that nine of the 11 orders were misclassified routine orders where the delays did not affect the quality of the patients' care. Therefore, while these patients and pending orders were included in our review, our report presents the findings for 195 patients with 292 orders.

Weights

We calculated estimates in this report using weighted sample data. Sampling weights are computed by taking the product of the inverse of the

probabilities of selection at each stage of sampling. Patients with specialty services (categories 4–10) were oversampled to focus on higher-risk orders, but sampling weights were adjusted to take this into account for population estimates.

**Projections
and Margins of
Error**

The margins of error and confidence intervals are indicators of the precision of the estimates. If we repeated this audit with multiple samples, the confidence intervals would differ for each sample, but would include the true population value 90 percent of the time. We used the point estimate amounts for each of the projections. Tables 3 and 4 provide the projections associated with patients and delayed radiology orders.

Table 3. Statistical Projections Summary for Patients

| Error Types | Lower Limit | Point Estimate | Upper Limit | Margin of Error |
|---------------------------|-------------|----------------|-------------|-----------------|
| Past Due Radiology Orders | 2,144 | 5,529 | 8,914 | 3,385 |
| Completed Exams | 234 | 313 | 392 | 79 |
| Pending Orders | 1,413 | 4,797 | 8,181 | 3,384 |
| Non-VA Care Referrals | 260 | 344 | 428 | 84 |

Source: *OIG statistical analysis performed in consultation with the Office of Audits and Evaluations statistician on July 13, 2017*

Note: Projected using a 90 percent confidence interval.

Table 4. Statistical Projections Summary for Radiology Orders

| Error Types | Lower Limit | Point Estimate | Upper Limit | Margin of Error |
|------------------------------|-------------|----------------|-------------|-----------------|
| Past Due Radiology Orders | 2,834 | 7,241 | 11,649 | 4,407 |
| Completed Exams | 337 | 441 | 546 | 104 |
| Pending Orders | 1,860 | 6,266 | 10,673 | 4,407 |
| Orders Not Properly Canceled | 5,073 | 9,493 | 13,912 | 4,420 |

Source: *OIG statistical analysis performed in consultation with the Office of Audits and Evaluations statistician on July 13, 2017*

Note: Projected using a 90 percent confidence interval.

Appendix D Management Comments

Department of Veterans Affairs Memorandum

Date: June 27, 2017

From: Director, South Texas Veterans Health Care System (671/00)

Subj: VAOIG – Audit of Imaging Service Scheduling Practices, South Texas Veterans Health Care System (STVHCS), San Antonio, Texas

To: Assistant Inspector General for Audits and Evaluations (52)

Thru: Network Director, VA Heart of Texas Health Care Network; Arlington, TX. (10N17)

The South Texas Veterans Health Care System (STVHCS) is appreciative of the review of open radiology orders conducted by the OIG. In late 2015, the facility identified the potential impact of the inventory of open radiology orders, and we immediately began work to resolve the issue. Shortly thereafter, the OIG initiated its investigation into this important opportunity to improve care.

As explained in the OIG report, there are multiple reasons that orders may remain open, such as the following:

- A change in the patient's care or a treatment decision made the exam unnecessary
- The patient declined the exam
- The patient did not show up for the scheduled specialty exam
- The exam request was input in error

STVHCS is grateful to the VA National Radiology Program for providing clear guidance on management of pending radiology orders in 2016. STVHCS has diligently implemented the requirements of the VHA Radiology Scheduling Guidance. With the adjustments made to our standard operating procedures, the facility has significantly reduced delays in access to radiology services.

By the close of the investigation, STVHCS addressed all 20,443 open radiology orders referenced in the OIG report. While the OIG found no lasting harm to patients as the result of our prior approach to managing radiology orders, the facility identified an opportunity to increase access and quality of care as expected and deserved by the Veterans we serve.

We continue to offer open access (walk-in appointments) for x-rays and will adhere to the national scheduling policy to ensure radiology orders are individually addressed in a timely fashion. We are committed to ensuring that this issue does not reoccur in the future.

STVHCS concurs with the findings in this report and has attached the completed actions that were taken to address the recommendations.

(Original signed by)

Robert M. Walton
Director

Jeff Milligan
VISN 17 Network Director

Attachment

VETERANS HEALTH ADMINISTRATION (VHA)
Action Plan

VAOIG – Audit of Imaging Service Scheduling Practices at the South
Texas Veterans Health Care System

Date of Draft Report: May 15, 2017

| Recommendations/ Actions | Status | Completion Date |
|-----------------------------|--------|--------------------|
|-----------------------------|--------|--------------------|

OIG Recommendations

Recommendation 1. We recommended the South Texas Veterans Health Care System Director require staff to review all pending orders that are past due to identify those orders which are active and those which need to be canceled because they have been completed or are no longer needed.

VHA Comments: Concur

STVHCS has diligently addressed this issue since 2015. A process was developed to cancel orders for exams already completed or no longer needed. At the time of this response, all 20,443 orders have been reviewed, addressed, and cancelled if appropriate. STVHCS has fully implemented the guidance in "Management of Pending Orders- Supplement to the August 12, 2016 VHA Radiology Scheduling Guidance."

| | |
|----------|------------------|
| Status: | Completion Date: |
| Complete | May 19, 2017 |

Recommendation 2. We recommended the South Texas Veterans Health Care System Director develop a plan to address any pending exams that are past due to ensure patients who have experienced significant delays receive needed exams.

VHA Comments: Concur

During the course of STVHCS' review of pending radiology orders, a process was finalized in March 2016 for addressing any pending exams that are past due to ensure appropriate disposition and any necessary follow-up. At the time of this response, all 20,443 orders have been reviewed by a provider and rescheduled with the patient or returned to the ordering clinician for reconsideration as appropriate. STVHCS has fully implemented the guidance in "Management of Pending Orders- Supplement to the August 12, 2016 VHA Radiology Scheduling Guidance."

| | |
|----------|------------------|
| Status: | Completion Date: |
| Complete | May 19, 2017 |

Recommendation 3. We recommended the South Texas Veterans Health Care System Director ensure staff review the health care system's current hard copy scheduling process to reduce inefficiencies related to duplicate orders, inaccurate record keeping, and the inventory of pending orders.

VHA Comments: Concur

Since 2015, STVHCS has recruited new radiology leadership committed to innovation and customer service, an entirely new staff of subspecialty-trained radiologists, five (5) additional scheduling clerks and twelve (12) additional radiology technologists. STVHCS has implemented new scheduling workflow in compliance with the August 12, 2016, "VHA Outpatient Radiology Scheduling Policy and Interim

Guidance.” STVHCS has locally developed an electronic dashboard to validate and monitor the VA paper-based radiology scheduling process to completion.

Status:
Complete

Completion Date:
December 5, 2016

Recommendation 4. We recommended the South Texas Veterans Health Care System Director ensure Imaging Service staff implement VHA’s Outpatient Radiology Scheduling Policy and Procedures and establish monitoring mechanisms where staff review pending orders at designated intervals and remove duplicate exams to facilitate the timely completion of exams.

VHA Comments: Concur

STVHCS has revised and standardized the local radiology scheduling process in compliance with the August 12, 2016, “VHA Outpatient Radiology Scheduling Policy and Interim Guidance.” Per local Standard Operating Procedure, STVHCS has designated staff to review the pending radiology order inventory daily utilizing the electronic dashboard to ensure appropriate disposition of all pending orders, including duplicates.

Status:
Complete

Completion Date:
December 5, 2016

Recommendation 5. We recommended the South Texas Veterans Health Care System Director implement a program to educate and remind clinicians of the processes they should use to avoid the creation of unnecessary duplicate orders.

VHA Comments: Concur

Through improved efficiency and timeliness, duplicate radiology orders have already been virtually eliminated. STVHCS has provided verbal instruction to clinical service leadership and distributed written education to all medical staff to avoid the creation of unnecessary duplicate orders.

Status:
Complete

Completion Date:
May 19, 2017

For accessibility, the format of the original memo and its attachment has been modified to fit in this document.

Appendix E **OIG Contact and Staff Acknowledgments**

| | |
|---------|-----------------------------------------------------------------------------------------------------------|
| Contact | For more information about this report, please contact the Office of Inspector General at (202) 461-4720. |
|---------|-----------------------------------------------------------------------------------------------------------|

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|-----------------|----------------------------------------------------------------------------------------------------------------------------------------------|
| Acknowledgments | Janet Mah Rhiannon Barron Gregory Gladhill Julie Kroviak, MD Andrea Lui Simonette Reyes, RN Andrea Sandoval Leslie Yuri |
|-----------------|----------------------------------------------------------------------------------------------------------------------------------------------|

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