DEPARTMENT OF VETERANS AFFAIRS

OFFICE OF INSPECTOR GENERAL

Office of Healthcare Inspections

VETERANS HEALTH ADMINISTRATION

Delayed Cancer Diagnosis of a Veteran Who Died at the Raymond G. Murphy VA Medical Center in Albuquerque, New Mexico

HEALTHCARE INSPECTION | REPORT #20-03700-35 | NOVEMBER 23, 2021

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Executive Summary

The VA Office of Inspector General (OIG) conducted an inspection to assess concerns related to delays in clinical care and deficiencies in care coordination that led to a delay in the diagnosis of lung cancer in a patient who died at the Raymond G. Murphy VA Medical Center (facility) in Albuquerque, New Mexico. The OIG also evaluated facility leaders' responses to quality and timeliness of care concerns. During the inspection, the OIG discovered limitations in the facility's teleradiology processes. Contract teleradiologists do not have the same access and awareness of available relevant prior radiology images compared to facility radiologists.[1]

The OIG determined that as a result of poor oversight of resident physicians (residents), delays in care most likely contributed to the patient's delayed lung cancer diagnosis.[2] As part of the patient's ongoing surveillance for cancer, a resident ordered an abdomen and pelvis computed tomography (CT) scan in mid-summer 2017. The radiologist noted a possible spiculated lung nodule and recommended a chest CT scan in 90 days. Those results were alerted to the resident who ordered the scan but were not acknowledged or acted upon until late 2017, when another resident noted the results. There was also no documented evidence of oversight of the decision to order a CT or the follow-up on the CT results by a supervising provider.

Although recommended within 90 days, it took 175 days to complete the chest CT scan, which was ultimately ordered by a Primary Care provider. The chest CT scan noted resolution of the spiculated lung nodule but also revealed opacities in the lung representing a possible cavitary infection or cancer. The radiologist recommended a positron emission tomography/computed tomography (PET/CT) scan for further evaluation. A Primary Care provider ordered a Pulmonary e-consult, and a resident recommended a face-to-face visit in the Pulmonary Clinic in four to six weeks with pulmonary function tests and a PET/CT scan to be completed prior to the visit.

The PET/CT scan was ordered with a desired date of early spring 2018. As a result, six weeks elapsed before additional imaging was performed for this patient who had a high risk of malignancy due to a history of smoking and underlying lung disease. The PET/CT scan showed a

[1] The underlined terms are hyperlinks to a glossary. To return from the glossary, press and hold the alt and left arrow keys together.

[2] VHA Handbook 1400.01, *Resident Supervision*, December 19, 2012. For this report, the term *resident* refers to both *residents* and *fellows* who are in training at the facility. "The term "resident" includes individuals in their first year of training, who are sometimes referred to as "interns," and individuals in approved subspecialty graduate medical education programs, who are also referred to as "fellows." VHA requires that the patient's EHR contain documentation of resident supervision by an attending (supervising) physician. This is achieved through a progress note in the patient's EHR written by the supervising physician; an addendum to the resident's note by the supervising physician; the supervising physician co-signing a resident's note; or the resident documenting in the progress note the name of the physician with whom the resident discussed the patient and that the supervising physician is agreeable with the resident's assessment and treatment plan.

lesion in the right lung apex that appeared to invade the chest wall and extend into the spinal canal possibly putting pressure on the spinal cord. The radiology report noted that the lesion was "presumed to represent a primary malignancy unless proven otherwise."

The patient was scheduled to be seen in the Pulmonary Clinic in spring 2018. A week before this appointment, the patient was seen in the facility's Emergency Department due to worsening symptoms. The Emergency Department provider performed a limited review of the patient's medical history but did not look at recent imaging studies, because of not thinking the symptoms warranted a review. The patient was sent home and then a week later, the patient was too sick to attend the Pulmonary appointment. A Pulmonary fellow called the patient and discussed the results of the PET/CT scan. Despite the results of the PET/CT scan, a biopsy was not arranged. Instead, the Pulmonary fellow ordered an infection workup and antibiotics and rescheduled the patient for a late spring 2018 Pulmonary appointment. The OIG found no documented evidence of supervisory oversight of the fellow. The patient continued to decline and had visits with the Primary Care provider. Finally, the patient sought care at two non-VA hospitals, where a biopsy was done, and a diagnosis of cancer was made six weeks after the PET/CT scan report noted the cancer.

Deficiencies in imaging follow-up and clinical decision-making contributed to a delay in the patient's diagnosis. However, the OIG was unable to determine if the patient's outcome would have changed with a shorter time to diagnosis. Given the patient's age, smoking history, and previous cancer history, the development of a cavitary lesion in the right lung apex warranted prompt and thorough evaluation. While there is no prescribed timeline for the investigation of a highly suspicious mass, one multi-site retrospective study revealed a median time of 52 days from presentation of possible lung cancer to treatment.[3] This patient's case fell far outside that average with a time lag of 110 days from the abnormal chest CT scan in early 2018 to the non-VA facility's diagnosis of lung cancer in late spring 2018.

The inadequate oversight by a supervising provider was compounded by the residents' failure to follow-up on abnormal test results in a timely manner. The lack of communication between the fellow and a supervising provider caused a delay in the execution of an appropriate plan of care.

The OIG concluded that supervising providers did not comply with Veterans Health Administration (VHA) requirements for resident supervision because test results were not viewed in a timely manner by supervising providers, clinical decisions were made and implemented by residents without documentation of appropriate oversight, and patient notification of abnormal test results was not documented by either the resident or supervisor on multiple occasions.

[3] Regina Vidaver, et al., "Typical Time to Treatment of Patients With Lung Cancer in a Multisite, US-Based Study," *American Society of Clinical Oncology* 12, no. 6, (June 2016) e643–653, accessed August 25, 2020, https://ascopubs.org/doi/pdf/10.1200/JOP.2015.009605.

Although the supervising providers expressed hesitancy to accept responsibility for their lack of resident oversight and their lack of test result awareness, they were, by VHA policy, accountable for all care provided by their trainees.

The OIG concluded that the patient's lung cancer was first evident on the early 2018 chest CT scan, and a tissue sample (biopsy) was recommended in early spring 2018. However, the patient was not diagnosed with lung cancer until late spring 2018 when a non-VA hospital performed a lung biopsy and diagnosed the patient with primary squamous cell lung cancer with chest wall invasion.

The OIG concluded that deficiencies in care coordination between Primary Care, Pulmonary, and Emergency Departments' staff contributed to delays in the patient's care and determined that providers did not consider all available prior medical history information when making health care decisions and treatment plans. Contract teleradiologists did not use available prior studies for comparison in interpreting the four imaging tests ordered for the patient.[4] The OIG determined that the process for obtaining prior images for review was easier for staff radiologists and VA National Teleradiologists in comparison to the contracted teleradiologists. The OIG reasoned that, in this patient's case, if the patient's radiology images had been interpreted by VHA Staff Radiologists or VA National Teleradiologists, prior images would likely have been viewed and compared to the four imaging tests ordered in the Emergency Department, possibly resulting in an earlier diagnosis and treatment.

The OIG determined that facility leaders did not conduct a thorough evaluation of the patient's delay in diagnosis and failed to review the patient's care at the time concerns were brought forward by the family. Further, there were no patient safety event reports submitted by staff when the delays were identified, thus, no further evaluations were conducted. The OIG concluded that the facility failed to use quality management and patient safety processes to evaluate the care of the patient within their response to the OIG and when opportunities presented along the patient's continuum of care.

The OIG made six recommendations to the Facility Director related to supervising providers' oversight of care provided by residents and fellows; care coordination between primary, emergency, and specialty care; review of care delivered to the patient; leader's review of facility responses provided to the OIG; consistency in the review of relevant radiological images by facility radiologists and contract teleradiologists; and entry of concerns regarding delay in diagnosis into the patient safety reporting system with follow-up.

[4] Four radiology exams were ordered by the Emergency Department provider in early spring 2018 including a chest x-ray, right shoulder, CT of the abdomen and pelvis without contrast, and CT of the head without contrast. Merck Manual Professional Version, "Radiographic Contrast Agents and Contrast Reactions," accessed January 12, 2021, https://www.merckmanuals.com/professional/special-subjects/principles-of-radiologic-imaging/radiographic-contrast-agents-and-contrast-reactions#v13948359. Contrast is "used in radiography and fluoroscopy to help delineate borders between tissues with similar radiodensity. Most contrast agents are iodine based."

Comments

The Veterans Integrated Service Network and Facility Directors concurred with recommendations 1 and 3–6 and concurred in principle with recommendation 2. Acceptable action plans were provided (see appendixes B and C). The OIG will follow up on the planned and recently implemented actions to ensure that they have been effective and sustained.

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Contents

Abbreviations

CBOC	community-based outpatient clinic
CT	computed tomography
EHR	electronic health record
MRI	magnetic resonance imaging
OIG	Office of Inspector General
PET/CT	positron emission tomography/computed tomography
VHA	Veterans Health Administration
VISN	Veterans Integrated Service Network

Introduction

The VA Office of Inspector General (OIG) conducted an inspection to assess concerns related to delays in clinical care and deficiencies in care coordination that led to a delay in diagnosis of lung cancer in a patient who died at the Raymond G. Murphy VA Medical Center (facility) in Albuquerque, New Mexico. The OIG also evaluated facility leaders' responses to quality and timeliness of care concerns. During the inspection, the OIG discovered limitations in the facility's teleradiology processes.

Background

The facility is part of Veterans Integrated Service Network (VISN) 22 and includes 13 community-based outpatient clinics (CBOCs).[5] The facility provides primary, specialty, acute, mental health, and emergency care services. From October 1, 2019, through September 30, 2020, the facility served 55,967 patients. The facility is affiliated with the University of New Mexico School of Medicine and "nearly 70 other academic institutions for associated health training opportunities." The Veterans Health Administration (VHA) classifies the facility as Level 1b-high complexity.[6]

Prior OIG Reports

The OIG published the report, *Lack of Follow-Up Care for Positive Colorectal Cancer Screening, New Mexico VA Health Care System Albuquerque, New Mexico*.[7] A complainant alleged that laboratory staff had a list of 300 patients who tested positive for blood in their stools, but no follow-up was done. The OIG did not substantiate the allegation; however, the OIG did determine that laboratory staff flagged positive results in patients' electronic health records (EHRs), which generated a view alert to providers, and providers did not consistently notify patients of the test results.[8] The OIG determined it was the providers' responsibility to ensure test results were communicated to patients and timely follow-up care was initiated. The OIG made four recommendations that were closed as of December 7, 2020.

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[5] The facility has one CBOC in Durango, Colorado, and 12 CBOCs located in New Mexico: Alamogordo, Artesia, Espanola, Farmington, Gallup, Las Vegas, Northwest Metro-Rio Rancho, Raton, Santa Fe, Silver City, Taos, and Truth or Consequences, accessed December 16, 2020, https://www.albuquerque.va.gov/locations/directions.asp.

[6] VHA Office of Productivity, Efficiency and Staffing. The VHA Facility Complexity Model categorizes medical facilities by complexity level based on patient population, clinical services offered, educational and research missions, and administrative complexity. Complexity levels include 1a, 1b, 1c, 2, or 3. Level 1a facilities are considered the most complex and Level 3 facilities are the least complex.

[7] VA OIG, *Lack of Follow-Up Care for Positive Colorectal Cancer Screening, New Mexico VA Health Care System, Albuquerque, New Mexico*, Report No. 15-00018-349, September 27, 2016.

[8] The underlined terms are hyperlinks to a glossary. To return from the glossary, press and hold the alt and left arrow keys together.

The OIG also published the report, *Alleged Care Delays and Inadequate Instrument Pre-Cleaning at the New Mexico VA Healthcare System,* on September 23, 2019.[9] A complainant alleged gastroenterology providers, particularly fellows, did not provide test results to patients. The OIG substantiated that gastroenterology providers did not consistently communicate test results to patients per facility policy. The OIG identified three factors that may have contributed to the failure to timely communicate test results: a lack of knowledge regarding test result communication requirements, an absence of a standardized process for delegating responsibility, and a failure of gastroenterology leaders to address known issues. The OIG made 13 recommendations. As of June 28, 2021, all recommendations were closed.
Two recommendations are relevant to this inspection:

- The New Mexico VA Health Care System Director ensures that Gastroenterology Department-ordered test results are communicated timely in accordance with Veterans Health Administration and facility policy and the timeliness is monitored through the ongoing peer review process as required by facility policy.
- The New Mexico VA Health Care System Director ensures that the Gastroenterology Department Service Chief develop a process for delegating responsibility and accountability for test results and follow-up when multiple providers are involved, and monitors compliance.

Both reports indicated that there have been concerns related to delegating responsibility and accountability for test results, follow-up with patients, documentation, and when multiple providers are involved.[10]

Concerns

On April 17, 2020, the OIG received concerns stemming from a prior Albuquerque Hotline inspection that nine patients experienced a delay in care prior to their deaths. After review of the nine patient's EHRs, the OIG determined there were continued concerns of delayed care and quality of care for four of the nine patients.[11] On May 8, the OIG contacted the VISN 22 Director and requested a review of these four patients' care.

The OIG received the facility's response on July 9, 2020, and determined that the facility's response was adequate for three of the four patients, but it did not include a review of the

[9] VA OIG, *Alleged Care Delays and Inadequate Instrument Precleaning at the New Mexico VA Health Care System, Albuquerque, New Mexico*, Report No. 18-03526-230, September 23, 2019.

[10] A facility leader told the OIG of addressing the communication processes used to notify patients of laboratory results and chartering a workgroup to outline requirements for ensuring a provider's surrogate was identified to respond to patients' test results.

[11] After further review by the OIG Hotline Working Group, five of the patients were determined to have had appropriate care.

fourth patient's early spring 2018 positron emission tomography/computed tomography (PET/CT) scan that noted an abnormality "presumed to represent a lung malignancy, unless proven otherwise." The facility acknowledged delays in care and patient notification of the CT Scan results performed in mid-summer 2017 and determined these concerns did not change the patient's outcome and corrective actions were unnecessary.[12] The OIG determined the facility's response regarding the fourth patient's delay in diagnosis and cancer treatment was inadequate, and on July 22, 2020, opened an inspection to review this patient's

- delays in diagnosis,
- deficiencies in Care and Care Coordination, and
- inadequacies in Quality Management Processes.

During the inspection, the OIG also identified an additional concern regarding limitations with the facility's teleradiology processes that may have precluded contract radiologists from accessing prior images to compare with scans performed for the patient.

Scope and Methodology

The OIG initiated the inspection on July 22, 2020. The OIG conducted a virtual site visit October 5–9, 2020.

The OIG conducted virtual interviews with facility leaders, managers, and staff familiar with the patient's care and relevant processes that included the Facility Director, Chief of Staff, and selected department chiefs, supervisory physicians, residents, and registered nurses for the Emergency Department, Internal Medicine, Oncology-Hematology, Pulmonary, Primary Care, Radiology, and Urology services. Also interviewed were the Associate Chief of Staff for Education; the Director of Quality, Safety and Value and relevant staff: a Peer Review Coordinator (retired), Patient Safety Manager, Risk Manager, and Patient Advocate; and Radiology personnel including teleradiologists; and a Clinical Applications Coordinator.[13]

[12] There was no evidence of timely referral or patient notification by Urology providers for the finding of the spiculated nodule in the lung identified in the CT scan mid-summer 2017. VA OIG, *Alleged Care Delays and Inadequate Instrument Precleaning at the New Mexico VA Health Care System, Albuquerque, New Mexico*, Report No. 18-03526-230, September 23, 2019. The facility received a recommendation on the surrogate process and patient notification of test results, and therefore, the OIG did not make a similar recommendation for this inspection. As of October 8, 2020, the facility informed the OIG of continued work on improving these processes.

[13] Interviews were conducted virtually using online meetings due to the COVID-19 pandemic. WHO Director-General's opening remarks at the media briefing on COVID-19 - 11 March 2020, accessed March 14, 2021, World Health Organization, https://www.who.int/dg/speeches/detail/who-director-general-s-opening-remarks-at-the-media-briefing-on-covid-19---11-march-2020. Merriam Webster, "Definition of pandemic", accessed March 14, 2021, https:/www.merriam-webster.com/dictionary/pandemic. A pandemic is a disease outbreak over a wide geographic area that affects most of the population.

The OIG reviewed relevant VHA and facility policies, patient safety and peer review documents, the initial facility response to the OIG, and email messages and attachments. The OIG reviewed relevant 2017–2018 entries in the patient's EHR to evaluate identified delays in care. Other items reviewed included professional literature related to radiology and lung cancer.

In the absence of current VA or VHA policy, the OIG considered previous guidance to be in effect until superseded by an updated or recertified directive, handbook, or other policy document on the same or similar issue(s).

Oversight authority to review the programs and operations of VA medical facilities is authorized by the Inspector General Act of 1978, Pub. L. No. 95-452, 92 Stat. 1101, as amended (codified at 5 U.S.C. App. 3). The OIG reviews available evidence within a specified scope and methodology and makes recommendations to VA leaders, if warranted. Findings and recommendations do not define a standard of care or establish legal liability.

The OIG conducted the inspection in accordance with *Quality Standards for Inspection and Evaluation* published by the Council of the Inspectors General on Integrity and Efficiency.

Patient Case Summary

The patient was in their 70s with a history of high blood pressure, chronic lung disease, tobacco use disorder; and cancer of the bladder, ureter, and kidney.[14] The patient lived 45 minutes from the Artesia CBOC, where the patient received outpatient Primary Care, and just over three hours from the facility where the patient received outpatient specialty and inpatient care.

In early 2013, the patient underwent a cystoscopy that revealed bladder cancer and possible ureteral cancer. Subsequently, in early summer 2013, the patient had surgery at the facility to remove the left kidney and ureter. The patient saw an Oncology provider to discuss possible chemotherapy and opted against it. In early spring 2015, a follow-up cystoscopy exam revealed a 1.5 centimeter tumor at the bladder neck. Later that summer, the patient underwent surgery to remove the bladder tumor. In early 2017, a Primary Care provider urged the patient to schedule a follow-up appointment with Urology. The patient had a follow-up cystoscopy in late spring 2017 that showed a 3–4 millimeter lesion concerning for a recurrence of bladder cancer. The patient was scheduled for surgery in mid-summer 2017, but the surgery was canceled because the patient did not have transportation.

A Urology resident (Urology resident 1) entered a telephone note, which documented contact with the patient regarding rescheduling the surgery for the following month. In conjunction with the call, Urology resident 1 ordered an abdomen and pelvis computed tomography (CT) scan to look for evidence of recurrence of kidney cancer. The CT scan was completed in mid-summer 2017 and showed no evidence of cancer in the kidney, but did reveal a 6-millimeter possible spiculated nodule in the left lung. The radiologist recommended a follow-up chest CT scan in three months. The next month, the patient underwent surgery to remove the new bladder tumor that was identified on cystoscopy three months earlier. The pathology was high-grade urothelial carcinoma with no invasion of the underlying muscle. The patient remained in the hospital overnight following the cystoscopy and was discharged the next day with plans for follow-up in the Urology clinic two days later. At the follow-up visit, the Urology resident discussed different treatment and surveillance options for bladder cancer with the patient, and they decided to pursue repeat cystoscopy in three months. The patient canceled the cystoscopy scheduled for late fall 2017. In late 2017, the patient underwent a cystoscopy that showed no evidence of a tumor. At this visit, the Urology resident noted the results of the abdomen and pelvis CT scan done in mid-summer 2017 showing a lung nodule and added the patient's Primary Care provider as an additional signer to the progress note as an alert for the abnormal finding. The Primary Care provider signed the Urology clinic note and entered an order for a follow-up chest CT scan two days after the cystoscopy.[15]

[14] The OIG uses the singular form of they (their) in this instance for patient privacy.

[15] These EHR notifications are known as view alerts (EHR notifications).

In late 2017, the patient saw the Primary Care provider at the Artesia CBOC. The patient reported a one-month history of right shoulder pain and was diagnosed with rotator cuff tendinitis. In the progress note for the visit, the Primary Care provider mentioned a lung finding and documented that a chest CT scan was pending. The chest CT scan was completed in early 2018, and showed interval clearing of the previously seen left lung nodule. In addition, the study showed opacities in the lung apices, which were felt to represent either scarring, an infectious process, or a cancer. The radiologist's report suggested performing a PET/CT scan to distinguish between scarring and infection or cancer.

The patient's Primary Care provider called the patient two days later with the results of the chest CT scan. The Primary Care provider informed the patient of the need for a Pulmonary consult to obtain a recommendation for additional work up. A Pulmonary electronic consult (e-consult) request was entered 11 days later, and a response was documented in the patient's EHR the following day. Medical resident 1, who was on rotation in the Pulmonary Department, responded to the e-consult, and contacted the patient by telephone to discuss exposure history.[16] The patient reported smoking one pack of cigarettes per day for the last 50 years and exposure to asbestos while in the military. The patient denied symptoms of cough, shortness of breath, chest pain, fever or chills, night sweats, or weight loss. The resident's note stated, "It is reassuring that patient is asymptomatic" and, additionally, concluded the patient's lung changes "were present as far back as 2011 but appear to have worsened since then." The resident recommended a face-to-face visit in Pulmonary Clinic in four to six weeks and stated that pulmonary function tests and a PET/CT scan would be ordered prior to the visit. The PET/CT scan was ordered with a desired date in early spring 2018 and was performed on that date. The study showed a lesion in the right lung apex that appeared to invade the chest wall and extend into the spinal canal, possibly putting pressure on the spinal cord. The report stated that the lesion was "presumed to represent a primary malignancy unless proven otherwise."

The patient called the nurse triage telephone line two weeks after the PET/CT scan complaining of severe right shoulder pain that radiated to the patient's elbow and wrist and included right-hand weakness. The nurse advised the patient to go to the Emergency Department for further evaluation. The patient presented to the facility's Emergency Department later that day with complaints of right shoulder pain radiating to the wrist, nonproductive cough with shortness of breath, and recent weight loss. A family member added that the patient was intermittently confused at home. Vital signs were stable. The patient underwent multiple imaging studies, which included (1) a chest x-ray that showed right apical pleural thickening, but no acute findings; (2) a shoulder x-ray that showed mild degenerative changes; (3) an abdomen and pelvis CT scan that showed no acute findings; and (4) a head CT scan that showed no acute abnormalities. No comparisons were made to any prior studies. The Emergency Department

[16] Residents rotate through different services during their medical training, these are referred to as rotations.

physician noted these results as well as the patient's lab results and prescribed pain medication for the patient's arm pain, an antibiotic for a possible urinary tract infection, and a diuretic for possible congestive heart failure. The Emergency Department physician also placed a consult request for neuropsychological testing.

The patient was scheduled to be seen in the Pulmonary Clinic the next week but did not go to the appointment. A Pulmonary fellow contacted the patient by telephone and the patient reported not feeling well enough to travel and described a 12-pound weight loss, but denied cough or shortness of breath on the call. The fellow reviewed the results of the PET/CT scan from three weeks prior and noted that the patient had not had an infection work up. The fellow ordered numerous tests, including sputum cultures and a blood test for tuberculosis, and prescribed an antibiotic for four weeks. The patient was advised to see the Primary Care provider or go to the Emergency Department if pulmonary symptoms developed. A new face-to-face appointment for the Pulmonary Clinic was scheduled for seven weeks later with a follow-up chest CT scan ordered for the same day.

In mid-spring 2018, the patient's family contacted the nurse triage telephone line and reported concerns with the patient's weight loss and lack of appetite. The patient's family was informed that the message would be passed on to the patient's Primary Care team. The patient was seen three days later in the Primary Care Clinic for a follow-up visit and informed the provider of "several" recent Emergency Department visits related to urinary tract infection, dehydration, and right shoulder and arm pain. The patient's family added that the patient's oxygen level had been low at one point leading to questions regarding home oxygen therapy. The patient weighed 110 pounds, which was a loss of 24 pounds over a one-year period. The Primary Care physician ordered a nutrition consult for weight loss, a soft cervical collar and pain medication for presumed cervical nerve compression, and an inhaler and overnight oximetry for the patient's chronic lung disease.

Ten days later, the patient's family called the nurse triage line stating the patient had diarrhea all night, requiring frequent bathing. The nurse offered a telephone visit with the patient's Primary Care provider, which was accepted. The Primary Care provider called the family later that day, discussed their concerns and noted that the patient was on an extended course of antibiotics for a pulmonary lesion and was scheduled for a follow-up chest CT scan for the next month. The Primary Care provider recommended a probiotic for the diarrhea and ordered diapers and bed pads.

Prior to the facility's scheduled CT scan, the patient went to a non-VA facility for evaluation of confusion and bowel and bladder incontinence. Later that day, a representative from the hospital called to request transfer of the patient to the facility due to a mass found in the patient's right lung on chest CT scan. The patient opted to transfer to another non-VA facility for care and was transferred in late spring 2018.

A biopsy was performed that revealed squamous cell carcinoma of the lung. In addition, an abdomen and pelvis CT scan showed a probable left adrenal gland mass. Eight days later, the facility's transfer coordinator documented the family's request to transfer the patient to the facility and the Chief of Integrated Care documented the patient's need for Oncology evaluation to address the possibility of chemotherapy and radiation therapy for a recently diagnosed Pancoast tumor in the right lung. The admitting provider deemed the cancer incurable based on the characteristics of the tumor identified on biopsy and the suspected spread of the cancer to the adrenal gland. The patient deferred medical decision-making to family members who wished to consider palliative chemotherapy or radiation therapy to help with the patient's pain control. The patient was accepted for transfer and arrived at the facility two days later. A Life Sustaining Treatment Note was entered upon arrival indicating that the patient did not want cardiopulmonary resuscitation but did desire the full scope of treatment in circumstances other than cardiopulmonary arrest. The palliative care team evaluated the patient three days after admission and recommended additional pain medication and consideration of palliative radiation therapy for the right shoulder pain. An Oncology consult was requested, but not completed.[17] An oncologist at the facility met with the patient's family and the palliative care nurse practitioner to discuss a treatment plan. The oncologist agreed to arrange radiation therapy at a non-VA facility to help the patient with pain control. A Community Care-Radiation Oncology consult was entered three days later. The next day, the patient was transferred to the hospice unit at the facility. A repeat chest CT scan was performed three days after the transfer, which showed an increase in size of the right lung cavitary lesion from 3.9 centimeters to 6.1 centimeters. Eight days later, the palliative care physician met with the patient and family. They decided at this meeting not to pursue radiation therapy as previously planned, as the patient's pain medication was currently adequate and could be augmented, if needed. The patient remained in the facility's hospice unit for intensive end-of-life care and died four days later.

[17] The consult was administratively closed without the patient being seen.

Inspection Results

1. Delays in the Patient's Diagnosis and Care

The OIG confirmed that the patient experienced delays in diagnosis of lung cancer and identified contributing factors for these delays. Specifically, the OIG found deficiencies in supervisory oversight of residents in Urology and Pulmonary clinics when managing diagnostic test follow-up and providing care.[18] Further, the OIG determined that deficiencies in care provided by Primary Care, Pulmonary, and Emergency physicians and care coordination also contributed to the delay in diagnosis of the patient's lung cancer.

Deficiencies in Supervisory Oversight of Test Results and Care Provided

The OIG determined that supervising providers did not consistently provide oversight of residents contributing to the delay in diagnosing the patient's lung cancer.[19]

VHA policy states that supervising providers are ultimately responsible for the care provided by residents and must ensure that documentation of the care and oversight of the care is entered into the patient's EHR.[20] Documentation of oversight must be entered into the patient's EHR by the supervising provider or the resident in one of several ways: the supervisor may enter a separate note, co-sign the resident's note, or add an addendum to the resident's note. Alternatively, the resident may include in their progress note the name of the supervising provider; and a summary of the discussion held with the supervisor and a statement detailing the supervisor's guidance with respect to the assessment, diagnosis, and plans for evaluation and treatment.[21]
VHA requires ordering providers to assign a designee to receive test results when the ordering provider will not be available to address the results themselves and further specifies that supervising providers are the designee when residents or other trainees order tests. Supervising providers have the responsibility to initiate clinical action and follow-up on test results to ensure the required communication to the patient and documentation occurs.[22]

The OIG found that the supervising provider could have been electronically assigned to receive a test alert after an order has been placed in one of two ways. If the ordering trainee goes off

[18] VHA Handbook 1400.01, *Resident Supervision*, December 19, 2012. For this report, the term *resident* refers to both *residents* and *fellows* who are in training at the facility. "The term "resident" includes individuals in their first year of training, who are sometimes referred to as "interns," and individuals in approved subspecialty graduate medical education programs, who are also referred to as "fellows."

[19] VHA Handbook 1400.01.

[20] VHA Handbook 1400.01.

[21] VHA Handbook 1400.01.

[22] VHA Directive 1088, *Communicating Test Result to Providers and Patients*, October 7, 2015.

service or on leave, the ordering trainee can assign a designee using the surrogate function within the EHR to receive their alerts. With this action, the surrogate receives all alerts intended for the trainee starting on a given date. The second option for sending alerts directly to the supervising provider requires either the ordering provider or the supervising provider to use the "alert when results" function in the EHR. This function allows any provider to direct a specific test result alert, regardless of who ordered the test, to themselves or to an additional recipient. With the surrogate function, the result only goes to the designated surrogate. With the "alert when results" function, the test result alert goes to both the ordering provider and the designated recipient.

Urology Clinic

Urology resident 1 spoke to the patient by telephone mid-summer 2017, regarding rescheduling surgery for the next month and, in conjunction with the call, ordered an abdomen and pelvis CT scan to look for evidence of recurrence of kidney cancer.[23] The resident entered a telephone note documenting the telephone call as well as the plan to obtain a CT scan, but there was no evidence of oversight by a supervisory provider (see appendix A, table A.1).

Eight days after the telephone call, an abdomen and pelvis CT scan was completed, and a view alert went to the ordering provider, Urology resident 1.[24] The abdomen and pelvis CT scan showed no evidence of kidney cancer; however, the study revealed a new 6-millimeter possible spiculated nodule in the left lung. The radiologist who read the scan recommended a follow-up chest CT scan in three months to reassess the nodule.[25] At a post-procedure appointment, nearly five months after the CT scan of the abdomen and pelvis was completed, another resident (Urology resident 2) noted the (mid-summer 2017) results of the CT scan of the abdomen and pelvis and added the patient's Primary Care physician and a supervising provider as additional signers to the progress note.[1] It took 175 days to complete the recommended follow-up chest CT that was ultimately ordered by the Primary Care provider.

The OIG determined that the supervising provider did not ensure that the required communication, documentation, and follow-up occurred. Neither the Urology resident, nor the supervising provider documented notifying the patient of the results or placing an order for a follow-up chest CT scan. The OIG was unable to determine if the ordering resident viewed the alert or was unavailable to receive the alert.[26] The Quality Manager told the OIG of not knowing

[23] The resident ordered an abdomen and pelvis CT that was performed in mid-summer 2017.

[24] The OIG was unable to interview the contract radiologist who read the CT scan of the abdomen and pelvis to verify what criteria was used for the follow-up recommendation and lack of notification of test results to the attending physician. The terms *supervising provider* and *attending* are used interchangeably in this report to describe a physician who supervises residents.

[25] The CT scan of the abdomen and pelvis was ordered pre-operatively for cancer surveillance (screening).

[26] The facility's resident schedule listed the Urology resident as scheduled in the Urology Department during the time of interest. The OIG was unable to interview the Urology resident because the resident no longer provided care at the facility.

who the supervising practitioner was in this situation because any of the providers present on the day the test was ordered and the day the results were available could have been considered a supervising provider. One of the supervising practitioners told the OIG that not knowing when tests are ordered and not receiving view alerts when test results are available for review contributed to overlooking results.

The OIG concluded that failures in resident supervision in the Urology clinic contributed to the patient not being notified of the CT results or the need for repeat imaging. The OIG identified no documentation indicating that Urology resident 1 notified the patient of the CT scan results or the recommended follow-up (see appendix A, table A.1).

Pulmonology Clinic

In early 2018, a resident (medical resident 1), while rotating in the Pulmonary Department, responded to an e-consult requesting guidance regarding follow-up imaging for the abnormal chest CT scan and contacted the patient by telephone to discuss exposure history. The patient reported a history of smoking and asbestos exposure, but denied pulmonary symptoms including cough, shortness of breath, chest pain, fever or chills, night sweats, or weight loss. Medical resident 1 documented being reassured by the patient's lack of symptoms and recommended a face-to-face visit in the Pulmonary Clinic in four–six weeks with pulmonary function tests and a PET/CT scan to be completed prior to the visit. The PET/CT scan was ordered for early spring 2018, and an in-person visit was scheduled for three weeks later. Medical resident 1 documented discussing the patient with a supervisor (Pulmonary attending 1) who added an addendum to the note. Neither the e-consult note nor the addendum contained a discussion of the possible causes of or treatments for the patient's cavitary lung lesion found on the early 2018 chest CT scan.[27]

The PET/CT scan was performed in early spring 2018, and showed evidence of a cavitary lesion in the right lung that was invading the chest wall and the thoracic spinal canal with possible mass effect on the spinal cord. The radiologist concluded that the lesion was presumed to be a primary lung malignancy unless proven otherwise and recommended a tissue sample (biopsy) and a magnetic resonance imaging (MRI) scan of the patient's thoracic spine to characterize spinal canal involvement.

A view alert was sent to medical resident 1 who ordered the PET/CT scan. The OIG learned that the resident was not at the facility in early spring 2018, and therefore, did not review the view alert.[28] Pulmonary attending 1 did not receive a view alert, because of not being assigned as a

[27] Facility *By Laws, Rules, & Regulations of the Medical Staff*, March 25, 2015, was replaced by Facility *By Laws, Rules, & Regulations of the Medical Staff*, August 17, 2018. Both documents contain the same or similar language regarding documentation in the EHR.

[28] A resident rotating on the Pulmonary Department told the OIG of not receiving the view alert. The OIG confirmed the resident was not working at the facility in early spring 2018.

designee on the order. Through EHR review, the OIG determined that neither medical resident 1 nor supervising Pulmonary attending 1 documented reviewing the results, discussing the results with the patient, or establishing a follow-up plan.[29]

When asked about the process for receiving results for tests ordered by residents, Pulmonary attending 1 described being unable to access results because only the ordering provider receives the view alert. When asked about the "alert when results" function in the EHR, Pulmonary attending 1 responded of not being aware of it in the past, but was now aware. The Pulmonary attending did not know whether the residents and fellows were aware of the function because the attending did not know what their training entails. The OIG confirmed that, while the result alert for the PET/CT scan went only to the resident, the supervising attending was aware that the scan was ordered, as indicated by the signature on the resident's note and on the order for the scan.

Due to the patient not keeping the mid-spring 2018 Pulmonary Clinic appointment, Pulmonary fellow 1 contacted the patient by telephone. The patient reported not feeling well enough to travel and described a 12-pound weight loss. The patient denied cough or shortness of breath. The fellow made a progress note entry stating the fellow reviewed the results of the PET/CT scan from three weeks prior and noted that the patient had not been evaluated for infection. The fellow ordered numerous tests, including sputum cultures and a blood test for tuberculosis, prescribed an antibiotic for four weeks, and ordered a repeat chest CT scan for the same day as the rescheduled Pulmonary Clinic appointment seven weeks later. The documentation reported that, if experiencing pulmonary symptoms, the patient would go to the Emergency Department or Primary Care provider. The Pulmonary fellow also documented the intent to "call…in two weeks to see how [the patient] is feeling."[30]

Pulmonary fellow 1 did not arrange for a biopsy or order an evaluation, either in the form of a thoracic spine MRI or a neurosurgery consult, of the possible mass effect on the spinal cord revealed by the PET/CT scan. Notably, the Pulmonary fellow's documentation did not indicate that the probable lung cancer or recommendation for a biopsy were considered or discussed with the patient. Further, there was no documentation of oversight by a supervisory provider of the fellow's telephone note in the EHR, although a plan for evaluation and treatment was initiated.

The OIG was unable to identify the supervising Pulmonary attending for the Pulmonary fellow's telephone encounter, and therefore, unable to gain insight on the decision-making process regarding the timing of planned next steps.

The Associate Chief of Staff for Education told the OIG that "A telephone call doesn't [*sic*] require any particular level of supervision" or any documentation of oversight even if the

[29] VHA Directive 1088, *Communicating Test Result to Providers and Patients*, October 7, 2015.

[30] A Pulmonary fellow rescheduled the patient's appointment for late spring 2018, but this appointment was not completed.

resident is discussing test results or treatment plans with a patient. The Associate Chief of Staff for Education stated it was rare for a resident to call a patient without the supervising provider telling them to call and follow-up with test results or call and schedule a surgery. However, VHA policy states the responsible supervising practitioner must be clearly identifiable in the documentation of a patient encounter. The note must include the name of the supervising provider, a statement regarding oversight of any assessment, diagnosis, plan for evaluation, or plan for treatment, and a summary of the discussion.[31] There were no further notes from the Pulmonary Department in the EHR until after the patient was diagnosed with lung cancer at a non-VA facility. The OIG did not find consistent documentation of oversight by the supervising attending for the telephone notes entered by the Urology resident and the Pulmonary fellow. Additionally, clinical decisions were made regarding treatment, evaluation, and follow-up without documentation of oversight. The OIG determined that this absence of involvement by the supervising attendings (providers) contributed to a delay in scheduling the follow-up chest CT scan and to a delay in performing a malignancy evaluation. However, the OIG was unable to determine if the patient's outcome would have changed with a shorter time to diagnosis.

Deficiencies in Care

In addition to deficiencies in the supervisory oversight of residents and fellows, the OIG determined that deficiencies in the care provided by Primary Care, Pulmonary, Radiology, and Emergency physicians further exacerbated the delay in diagnosing the patient's lung cancer. The OIG identified the following missed opportunities to provide prompt and tailored care that might have resulted in an earlier diagnosis of the patient's lung cancer.

Lack of Adequate Assessment of Malignancy Risk

The patient had multiple risk factors for lung cancer including age, smoking history, and underlying lung disease. In addition, the specific characteristics of the cavitary lung lesion noted on imaging pointed toward a diagnosis of cancer. However, the patient's providers did not prioritize a malignancy evaluation over an infection evaluation and did not expedite either evaluation, despite the seriousness of the diagnoses under consideration.[32]

[31] VHA Handbook 1400.01.

[32] Adam H. Fox, Nichole T. Tanner, "Approaches to lung nodule risk assessment: clinician intuition versus prediction models." *Journal of Thoracic Disease* 12, no. 6 (2020) 3296–3302, accessed December 18, 2020, https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7330782/. Annette McWilliams, et al., "Probability of Cancer in Pulmonary Nodules Detected on First Screening CT," *The New England Journal of Medicine* 369, no. 10 (September 5, 2013) 910–919, accessed October 20, 2020, https://www.nejm.org/doi/pdf/10.1056/NEJMoa1214726?articleTools=true from. Khalid Gafoor, et al., "Cavitary Lung Diseases: A Clinical-Radiologic Algorithmic Approach," *Chest* 153, no. 6, (2018) 1443–1465, accessed December 16, 2020, https://www.sciencedirect.com/science/article/pii/S0012369218303945.

Excessive Wait Times for Pulmonary Clinic Appointments

The patient was at high risk of malignancy; however, the Pulmonary Department scheduled the patient's initial Pulmonary Clinic appointment for nine weeks after the e-consult was placed.

When the patient did not show for this appointment, the Pulmonary Department rescheduled the visit for seven weeks later.

Deficiency in Timeliness of Diagnostic Tests

As part of the early 2018 e-consult, the Pulmonary Department provider requested the patient's PET/CT scan appointment for six weeks after the Pulmonary e-consult was placed, and did not arrange for any diagnostic tests to evaluate the possibility of an infectious cause of the patient's cavitary lung lesion.

It was an additional three weeks after the PET/CT scan before the Pulmonary Department provider ordered laboratory tests, including a test for tuberculosis, to assess for infection.

Although the radiologist reported that the imaging was highly suggestive of malignancy and that tissue sampling was warranted, Pulmonary Department providers had not arranged for a biopsy.

Deficiency in Timeliness of Treatments

The Pulmonary Department provider started treatment for a possible cavitary lung infection, nine weeks after reviewing the chest CT scan, that revealed cavitary opacities in the lung apices, which may represent scarring, an infectious process, or a cancer.[33]

Although the PET/CT scan showed invasion of the spinal canal with possible mass effect on the spinal cord, the Pulmonary Department did not evaluate the patient further with an MRI as recommended by radiology or obtain a neurosurgery consult to further evaluate the possible invasion of the spinal cord by the lung mass.

Lack of Thorough History and Physical Exam

The patient presented to the Emergency Department in early spring 2018 with multiple concerning symptoms including weight loss, mental status changes, shortness of breath, cough, and progressive pain and weakness in the right arm. The Emergency Department physician did not document review of the patient's recent medical history or imaging results in the evaluation of the patient.[34]

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[33] Patrick Rendon, et al., "What Is the Best Approach to a Cavitary Lung Lesion?" *The Hospitalist* 3, (2015), accessed December 22, 2020, https://www.the-hospitalist.org/hospitalist/article/122550/what-best-approach-cavitary-lung-lesion.

[34] Facility, *Bylaws, Rules, & Regulations of the Medical Staff*, March 25, 2015, was replaced by Facility, *Bylaws, Rules, & Regulations of the Medical Staff*, August 2018. The 2015 and 2018 policies had the same or similar language regarding documentation requirements.

Twenty days later, the patient and a family member presented to the Primary Care Clinic and reported multiple recent Emergency Department visits, right arm and shoulder pain, dehydration, and problems with low oxygenation. The Primary Care provider did not document review of the patient's visit to the facility Emergency Department, the conversation with the Pulmonary fellow regarding the patient's PET/CT scan results, or recent imaging results.

Lack of Review of Comparison Imaging Studies

Contract teleradiologists did not compare chest x-ray images or the abdomen and pelvis CT scan images from the patient's Emergency Department visit to prior relevant studies. These prior studies included a PET/CT scan performed two weeks earlier, a chest CT scan performed two months earlier, an abdomen and pelvis CT scan performed eight months earlier, and a chest x-ray performed three years earlier. The lack of review of comparison studies meant both the radiologist and the Emergency Department provider were uninformed about the patient's probable malignancy and, consequently, unable to contribute to an accurate diagnosis of the patient's condition.

Failure to Offer Easier Access to Care

The patient lived 45 minutes from the Artesia CBOC, where the patient received outpatient Primary Care, and just over three hours from the facility, where the patient received specialty care. The patient missed numerous appointments between early spring 2016 and late spring 2018, sometimes due to transportation difficulty. The patient's Primary Care and specialty providers did not offer the patient easier access to care through the Community Care program. Additionally, neither the Emergency Department provider nor the Pulmonary staff offered the patient admission to the hospital for evaluation of the cavitary lung mass even though the mass was causing significant symptoms and appeared on the PET/CT scan to be invading the chest wall and possibly putting pressure on the spinal cord.

The missed opportunities detailed above most likely contributed to the facility's failure to diagnose the patient's lung cancer. The decisions made regarding this patient's care, from the timing of appointments to the conveying of results and the initiation of treatments, suggest a lack of sense of urgency, despite the patient's numerous symptoms, worrisome imaging results, and repeated visits to both VA and non-VA facilities.

Deficiencies in Coordination of Care

The Patient Aligned Care Team Handbook outlines that care coordination involves open communication among health care providers and helps patients receive the care they need and to avoid potential delays. Patient Aligned Care Team staff are to collaborate with staff supporting specialty care services to establish comprehensive care management plans for patients receiving

specialty care.[35] In addition, care coordination involves assisting patients in accessing other services to help the patient receive the care they want and need.[36]

As far back as late 2017, the patient had signs and symptoms that may have been related to the undiagnosed lung cancer.[37] In early spring 2018, a PET/CT scan was completed and determined that the patient likely had primary lung cancer. The OIG found that the patient was experiencing symptoms that spring and seeking care from the facility; however, there was no documented communication between Primary Care and Pulmonary after the e-consult response in early 2018.

In mid-spring 2018, Pulmonary fellow 1 documented speaking to the patient by telephone and the patient agreeing to an infection work up.[38] The OIG was unable to determine if the fellow was aware that the patient had been having intermittent confusion and right shoulder pain for three months. The note also did not specify if the patient had been made aware of the results of the PET/CT scan that indicated primary lung cancer with chest wall and spinal canal involvement.

The Primary Care provider told the OIG that if the Pulmonary notes from mid-spring 2018 and the PET/CT scan results had been reviewed prior to the patient's appointment approximately two weeks later, there may have been a better understanding of the patient's clinical condition (lung cancer), but there was not a specific concern for a pulmonary problem.

Facility leaders and staff told the OIG that they were unaware of any Care Coordination Agreements (service agreements) between Primary Care and Pulmonary. The Chief of Staff stated there were inpatient service agreements, but of not being aware of outpatient service agreements. The Primary Care provider and Pulmonary attending 1 did not know if there was a service agreement between Primary Care and Pulmonary.

Two weeks after the PET/CT, the patient's family called the nurse telephone triage line and was directed to the facility's Emergency Department. The patient was seen at the Emergency

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[35] VHA Handbook 1101.10(1), *Patient Aligned Care Team (PACT) Handbook*, February 5, 2014. Collaboration between specialty provider staff and Patient Aligned Care Teams should occur with follow-up calls, clarification of treatment plans, and education regarding specialty care recommendations.

[36] VHA Handbook 1101.10(1). Care Coordination Agreements are written documents that define an understanding between services' workflow rules. The terms *Care Coordination Agreement* and *service agreement* are used interchangeably in this report.

[37] The chief complaint was right shoulder pain with no recent acute injury; examination revealed distant breath sounds, and pulse oximetry of 92 percent. The normal range for pulse oximetry is 95 to 100 percent, and values below 90 percent are considered low and may be related to breathing problems. Mayo Clinic, *Pulse Oximetry*, accessed March 14, 2021, https://www.mayoclinic.org/symptoms/hypoxemia/basics/definition/sym-20050930. Malak Al Shammari et.al, "Pancoast Tumor: The Overlooked Etiology of Shoulder Pain in Smokers," *The American Journal of Case Reports 21* (2020) accessed on July 20, 2021, https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7508304/.

[38] An infectious evaluation consisted of ordering labs to see if there was an infection in the patient's lungs and performing tests for tuberculosis and sputum cultures.

Department with complaints of right shoulder pain for three months, cough, weight loss, and confusion. The patient underwent laboratory tests and multiple imaging studies in the Emergency Department including an abdomen and pelvis CT scan for reported weight loss.[39] The radiology reports noted no comparisons were made to any prior studies. An Emergency Department provider told the OIG that this patient was essentially stable with normal vital signs and saw no reason to look at prior images. As a result, the provider did not know a chest CT scan was done in early 2018 or a PET/CT was done two weeks prior to the patient's Emergency Department visit.

The OIG determined that although the Primary Care provider physically assessed the patient and the Pulmonary providers ordered tests for the patient, there was no documented evidence in the EHR of consistent communication or collaboration between the Pulmonary and Primary Care departments. A comprehensive care management plan was not established for the patient. A review of EHR documentation revealed that the Pulmonary team proposed a diagnostic evaluation and, later, treatment without ever physically assessing the patient, and the patient's Primary Care provider treated the patient without reviewing the results of diagnostic tests and treatment ordered by the Pulmonary team that had been consulted. Furthermore, there was no evidence of direct verbal or written communication between Primary Care and Pulmonary providers regarding the patient's care, such as there was no documentation of a verbal discussion and no evidence that progress notes were sent to one another for additional signature to acknowledge receipt of information.

Due to a lack of documentation, the OIG did not find that a possible lung cancer or the recommendation for a biopsy was discussed with the patient prior to seeking care in the community. The OIG concluded that deficiencies of care coordination caused delays when Primary Care, Pulmonary, and Emergency Departments did not consider all available information when making healthcare decisions and prior to mid-spring 2018, did not assist the patient in obtaining the care that was needed.

In addition, the OIG found that there was no collaboration with staff supporting specialty care services to establish comprehensive care management plans for patients receiving specialty care, such as follow-up calls, clarification of treatment plan, and education regarding specialty care.

[39] Laboratory tests included a complete blood count, chemistry panel, cardiac enzymes, influenza screen for type A and B, urinalysis, and a valproic acid level. The imaging studies ordered and performed while in the Emergency Department included a CT head scan without contrast that showed no abnormalities, a CT scan of the abdomen and pelvis that showed no acute findings, a shoulder x-ray that showed mild degenerative changes, and a chest x-ray that showed right apical pleural thickening, but no acute findings. Merck Manual Professional Version, "Radiographic Contrast Agents and Contrast Reactions," accessed January 12, 2021, https://www.merckmanuals.com/professional/special-subjects/principles-of-radiologic-imaging/radiographic-contrast-agents-and-contrast-reactions#v13948359. Contrast is "used in radiography and fluoroscopy to help delineate borders between tissues with similar radiodensity. Most contrast agents are iodine based."

Given the patient's age, smoking history, and previous cancer history, the development of a cavitary lesion in the right lung apex warranted prompt and thorough evaluation. While there is no prescribed timeline for the investigation of a highly suspicious mass, one multi-site retrospective study revealed an average time, from presentation of possible lung cancer to treatment, of 52 days.[40] This patient's case fell far outside that average with 110 days from the abnormal chest CT scan in early 2018 to the diagnosis of lung cancer in late spring 2018. The patient was not diagnosed with lung cancer by a facility provider nor did the patient receive treatment for cancer at the facility, although it was offered by an oncologist at the non-VA hospital.

2. Deficient Facility Response Processes

The OIG determined that the facility failed to evaluate the patient's care using routine quality management processes. Specifically, a patient safety report regarding the delays in diagnosis was not reported to the Patient Safety Manager, and the providers' care of the patient was not considered for peer review until after the facility learned of this OIG inspection.

Patient Advocacy

VHA states that significant patient complaints should be sent to the "appropriate staff to trigger assessment" of the need for "facility system analysis" or follow-up or both.[41]

After the patient's cancer diagnosis, the patient's family contacted the facility's Artesia CBOC and voiced frustration with the facility for not identifying or treating the patient's condition sooner and requested the patient's medical record. Artesia CBOC staff emailed the family a release of information form and provided the name and telephone number of a Patient Advocate at the facility.

A Patient Advocate informed the OIG that the patient's family had contacted the facility and asked how to submit a grievance and bring action against the facility or providers due to delayed care and failure to diagnose. The Patient Advocate gave the family information on how to submit a grievance and provided the contact information for the facility's Risk Manager.

Peer Review

Peer reviews for quality management are confidential, non-punitive, focused reviews of providers' clinical decision-making by similarly qualified providers with the intent of promoting

[40] Regina Vidaver, et al., "Typical Time to Treatment of Patients With Lung Cancer in a Multisite, US-Based Study," *American Society of Clinical Oncology* 12, no. 6, (June 2016) e643–653, accessed August 25, 2020, https://ascopubs.org/doi/pdf/10.1200/JOP.2015.009605.

[41] VHA Directive 1003.04, *VHA Patient Advocacy*, September 2, 2005, was rescinded and replaced by VHA Directive 1003.04, *VHA Patient Advocacy*, February 7, 2018. The 2005 and 2018 directives have the same or similar language for events that trigger facility system analysis.

quality of care. According to VHA, certain clinical events, including abnormal imaging tests not addressed by a clinician, require consideration of peer reviews within three business days of the identification of an event.[42]

The Risk Manager reported that a clinical care review was completed in 2018; however, the Risk Manager was unable to provide the OIG with a copy of the review.[43] The Chief of Quality reviewed the patient's EHR and reported the facility did not consider conducting a peer review at that time. After the OIG initiated this inspection, the facility completed four peer reviews related to care provided by Primary Care, Radiology, Urology, and Pulmonary providers.

In September 2020, the facility conducted peer reviews of the care provided to the patient between early summer 2017 and mid-summer 2018. The OIG is concerned that the failure to conduct the peer reviews in proximity to when the care occurred reduces the potential benefit of the program. Further, the failure to identify that the patient's care required peer review consideration suggests a possible systemic facility-level issue.

Adverse Event Reporting

VHA requires staff to identify and report adverse events, such as a failure to make a timely diagnosis, to the patient safety manager through an electronic reporting system.[44] Any staff member can enter a patient safety report. The patient safety manager facilitates a review of the adverse event and determines appropriate next steps, such as a root cause analysis.[45]

The OIG learned that the patient's family made a complaint about a delay of care and failure to diagnose to the Patient Advocate, who in turn notified the Risk Manager.

During interviews, the Patient Safety Manager reported performing a search of both reporting systems, the Electronic Patient Event Report and Joint Patient Safety Reporting, and found no record of patient safety receiving notification of any complaints regarding delays in the patient's care or failure to diagnose.[46]

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[42] VHA Directive 2010-025, *Peer Review for Quality Management,* June 3, 2010, was rescinded and replaced by VHA Directive 1190, *Peer Review for Quality Management,* November 21, 2018.

[43] The Risk Manager told the OIG in an interview of searching the office and computer files and was unable to find notes or any information from the review.

[44] VHA Handbook 1050.01, *VHA National Patient Safety Improvement Handbook*, March 4, 2011. Adverse events may result from acts of commission or omission (such as administration of the wrong medication, failure to make a timely diagnosis or institute the appropriate therapeutic intervention, and adverse reactions or negative outcomes of treatment).

[45] VHA Handbook 1050.01.

[46] Prior to 2018, VHA used the Electronic Patient Event Reporting System (ePER) and in 2018, the facility switched to using the Joint Patient Safety Reporting system or JPSR. Both systems provided a standardized method for capturing events and managing data for medical errors and close calls/near misses.

The OIG concluded that the adverse events were not reported to the Patient Safety Manager; therefore, the Patient Safety Manager did not conduct a patient safety review to determine appropriate next steps.

Institutional Disclosure

VHA policy for institutional disclosure of adverse events "is a formal process by which facility leader(s) together with clinicians and others, as appropriate, inform the patient or the patient's personal representative that an adverse event has occurred during the patient's care that resulted in, or is reasonably expected to result in, death or serious injury." After determining through an investigation of a sentinel event, a routine quality review, or look-back review that an adverse event resulted in death or a serious injury, an institutional disclosure is required.[47]

During meetings with facility leaders and managers, they made a decision not to contact the patient's family for an institutional disclosure. On December 20, 2020, the facility notified the OIG that an institutional disclosure would not be completed as "the patient had advanced disease at the time of presentation and earlier intervention would not have changed the ultimate outcome."

The OIG concluded that the Patient Advocate and Risk Managers' awareness of the adverse event, regarding the failure to make a timely diagnosis, should have resulted in a patient safety event report that may have resulted in a patient safety review, such as a root cause analysis. Additionally, once the delay in the patient's diagnosis was brought to the attention of the Risk Manager, an assessment should have been completed to determine if a peer review was required sooner. The patient's suffering was extended due to the diagnosis and care delays and should have warranted further investigation of the causes of these delays. The OIG suggests that an institutional disclosure should be reconsidered.

3. Additional Concern: Limitations in Contract Teleradiology

The OIG determined that the inability to compare previous images to current images is a limitation for the contract teleradiologists as compared to the facility's staff radiologists or the teleradiologists from the VA National Teleradiology Program who have electronic access to all prior images.

[47] VHA Handbook 1004.08, *Disclosure of Adverse Event to Patients,* October 2, 2012, was rescinded and replaced by VHA Directive 1004.08, *Disclosure of Adverse Events to Patients,* October 31, 2018. Both the 2012 and 2018 policies contain the same or similar language regarding institutional disclosure requirements.

According to the facility's 2017–2018 teleradiology contract, the contract radiologist "should meet or exceed nationally recognized standards."[48] The contract also states that "contract physician(s) shall compare the exam being interpreted to at least the most recent previous exam of the same modality and include appropriate references to this comparison exam in the interpretation. Contractor shall be responsible for accessing and obtaining prior reports from [the] VA system." The American College of Radiology established a standard used by VHA that states, "whenever possible, previous reports and images should be available for review and comparison with the current study."[49] The American College of Radiology Teleradiology Task Force noted "there should be a single high professional standard of quality for both teleradiology providers and on-site radiologists. Using different standards based on the location of the radiologist does not support the best patient care."[50] When comparisons are available but not viewed, critical information regarding disease status, may be missed, putting patients at risk for delayed diagnosis and adverse clinical outcomes.[51] VA facilities use teleradiology when they are limited in the ability to provide 24/7 radiological services for reasons that include rural health, insufficient radiologist recruitment, lack of subspecialty, inability to secure reasonably priced contracts, or leave coverage.[52] VA facilities receive teleradiology services from the VA National Teleradiology Program or contract with teleradiology companies.[53]

[48] The American College of Radiology, ACR Practice Parameter for Communication of Diagnostic Imaging Findings. Revised 2014 (Resolution 11). "The American College of Radiology, with more than 30,000 members is the principal organization of radiologists, radiation oncologists, and clinical medical physicists in the United States." "The ACR periodically defines practice parameters which are considered educational tools to assist providers in improving the quality of service to patients," accessed November 24, 2020, https://www.acr.org/Clinical-Resources/Practice-Parameters-and-Technical-Standards. The OIG defines relevant for this report as radiological images in the same area of the body. VHA Directive 1156, *Accreditation of VHA Radiation Oncology Services/Sections*, June 20, 2018.

[49] The American College of Radiology, ACR Practice Parameter for Communication of Diagnostic Imaging Findings. Revised 2014 (Resolution 11), accessed November 24, 2020, https://www.acr.org/Clinical-Resources/Practice-Parameters-and-Technical-Standards.

[50] Ezequiel Silva, et al., "ACR White Paper on Teleradiology Practice: A Report from the Task Force on Teleradiology Practice," *Journal American College of Radiology* 10, no. 8 (August 2013) 575-585, accessed November 24, 2020, https://www.acr.org/Advocacy-and-Economics/Legislative-Issues/Teleradiology.

[51] Silva, August 2013; Interpretations should be made with complete availability of relevant collateral information, including previous imaging studies, EHRs, and information about the patient's clinical symptoms and suspected diagnosis. Access to relevant collateral information may be a challenge for contract teleradiology companies and may negatively affect the teleradiologist's ability to determine if a finding is important.

[52] VA, Radiology, Teleradiology*, What is the National Teleradiology Program?* accessed January 18, 2021.

[53] NTP [VA National Teleradiology Program] Quality Assurance Plan and Critical Results/Critical Tests Policy. January 27, 2007. "The VA National Teleradiology Program (NTP) is a telehealth program that provides final interpretations of radiologic imaging studies referred from any of the 158 VA medical centers or their clinics. This is accomplished by electronically transmitting images from the originating medical center to the interpreting teleradiologists located in NTP's reading centers. The report of interpretation is then electronically transmitted back to the originating medical center."

The facility uses contract teleradiologists on weekdays after 4:30 p.m., on weekends, and on Federal Holidays. The facility contracts with an outside teleradiology vendor.

The Chief of Radiology provided a list of images within each modality, such as digital x-ray, ultrasound, CT head, and nuclear medicine, that are automatically sent to the contract teleradiologist for emergent studies; however, large CT files are only routed on demand by Picture Archiving and Communication System personnel due to network speed constraints. In addition, radiological comparisons older than five years are not automatically sent but are routed upon request. Contract teleradiologists may request that the facility provide previous studies for comparison.[54] The facility's Chief of Radiology indicated to the OIG in interviews that it would not be reasonable to send all images as it would delay patient care.

Both the Acting Director of the VA National Radiology Program and the Director of the VA National Teleradiology Program said review of comparison studies is considered a best practice.

In early spring 2018, the contract teleradiologists interpreted four imaging studies which included chest and shoulder x-rays, an abdomen and pelvis CT, and a head CT. In all of these studies, the teleradiologists documented "No relevant prior studies available."[55] According to the algorithm used by the facility for sending comparison studies to the contract teleradiologists, the prior chest and shoulder images should have been sent automatically, and the prior abdomen and pelvis CT images would have been available upon request. (The patient did not have a prior head CT report in the EHR.) The contract teleradiologists explained that they do not have access to the patient's EHR or receive a list of available prior images and, therefore, do not know what images are available for comparison unless sent automatically. For this case, the contract teleradiologist did not see anything abnormal to prompt the request for prior images but may have requested the PET/CT scan if the availability of the PET /CT from two months prior had been known.

The facility's staff radiologists or the teleradiologists from the VA National Teleradiology Program would have had access to the patient's EHR and a review of prior imaging studies would have alerted them of the recent PET/CT scan. Furthermore, the images from the scan would have been readily available, allowing the contract teleradiologist to make a comparison and alert the ordering provider to the presence of a likely malignancy.

The OIG determined that the inability to compare previous images to current images is a limitation for the contract teleradiologists as compared to the facility's staff radiologists or the teleradiologists from the VA National Teleradiology Program who have electronic access to all prior images. The inability of contract teleradiologists to readily view or know what images are available to request for comparison, creates a different standard of quality of the interpretation of

[54] The OIG was informed that contract teleradiologists work for an outside vendor as compared to the VA National Teleradiologists who are VA employees with access to a patient's EHR.

[55] Four radiology exams were ordered by the Emergency Department provider in early spring 2018 including a chest x-ray, right shoulder, CT abdomen and pelvis without contrast, and CT head without contrast.

images that may impact patient care. The OIG also determined that the process used by the facility to ensure that contract teleradiologists have knowledge of and access to relevant comparisons was unreliable. The OIG was unable to establish why the process failed the day the patient presented to the Emergency Department.

Conclusion

The OIG determined that deficiencies in supervisory oversight of test results and care provided by residents and a fellow, in addition to deficiencies in care and care coordination, led to a delay in the patient's diagnosis of lung cancer. A Urology resident ordered surveillance imaging but did not add the supervising Urology provider as a designee to receive the results. Therefore, the supervising provider was not alerted to the results and neither the resident nor the supervising provider acted on the radiologist's recommendation for a follow-up chest CT scan to be completed in three months.

Another resident (Urology resident 2) noted the mid-summer 2017 results of the CT scan of the abdomen and pelvis and added the patient's Primary Care physician and a supervising provider as additional signers to the progress note. The chest CT was completed nearly three months past the recommended date.

After receipt of the chest CT results, the Primary Care provider consulted Pulmonary, and a medical resident rotating in the Pulmonary Department ordered a PET/CT scan. The supervising provider was not alerted to the results and neither the resident nor the supervising provider acted on the radiologist's recommendation for tissue biopsy and MRI. The OIG concluded that the deficiency in oversight of residents and fellows by supervising providers likely contributed to the failure to timely follow-up on abnormal test results and caused delays in the patient's diagnosis.

A Pulmonary fellow contacted the patient via telephone, discussed the cavitary lung lesion found on PET/CT scan, and ordered additional studies and antibiotics. The OIG was unable to determine if a supervising provider was aware of the plan of care. The OIG was told that the facility does not require supervisory oversight of residents' telephone notes. The deficiency in oversight of the fellow's treatment plan as conveyed in the telephone note may have caused a delay in execution of an appropriate plan of care.

The OIG concluded there were deficiencies in care coordination among Primary Care, Pulmonary, and Emergency Department staff that contributed to delays in care. The Emergency Department provider and the Primary Care provider did not consider recent available medical information when making health care decisions and treatment plans. The OIG reasoned that if the patient's images had been interpreted by facility radiologists or VA National Teleradiologists, the chest x-ray would have likely been compared to the previous chest CT, changing the interpretation of the chest x-ray.

Deficiencies in the care provided to the patient and deficiencies in supervisory oversight of the residents contributed to the delay in the patient's diagnosis. Given the patient's age, smoking history, and previous cancer history, the development of a cavitary lesion in the right lung apex warranted prompt and thorough evaluation. While there is no prescribed timeline for the investigation of a highly suspicious mass, one multi-site retrospective study revealed a median

time from presentation of possible lung cancer to treatment of 52 days.[56] This patient's case fell far outside that median with a time lag of 110 days from the abnormal chest CT scan to a non-VA facility's diagnosis of the patient's lung cancer.

In addition, the OIG determined that the facility did not conduct a thorough evaluation of the delay in diagnosis when requested by the OIG, and failed to review the patient's care at the time concerns were brought forward by the family. Further, there were no patient safety event reports submitted by staff when the delays were identified, thus, no further evaluations were conducted. The OIG concluded that the facility failed to use quality management and patient safety processes to evaluate the care of the patient within their response to the OIG and when opportunities presented along the patient's continuum of care.

The OIG determined that the process used by the facility to ensure that contract teleradiologists have knowledge of and access to relevant comparisons was unreliable. The OIG was unable to establish why the process failed the day the patient presented to the Emergency Department.

Recommendations 1–6

1. The Raymond G. Murphy VA Medical Center Director ensures supervising providers oversee all clinical decisions made by residents and the oversight is reflected within the documentation, including telephone notes.

2. The Raymond G. Murphy VA Medical Center Director ensures supervising providers establish a reliable way to receive alerts for the results of all tests ordered by residents.

3. The Raymond G. Murphy VA Medical Center Director ensures that Primary Care and Specialty Care staff coordinate care for shared patients and evaluates the need for Outpatient Care Coordination Agreements.

4. The Raymond G. Murphy VA Medical Center Director ensures that patient, family, or staff concerns regarding delay in diagnosis are entered into the patient safety reporting system and appropriate follow-up is completed.

5. The Raymond G. Murphy VA Medical Center Director coordinates a comprehensive review of the patient's care, takes action as warranted, and reconsiders an Institutional Disclosure.

6. The Raymond G. Murphy VA Medical Center Director ensures consistency between the relevant prior radiological images reviewed when staff radiologists and contract teleradiologists interpret imaging scans for Raymond G. Murphy VA Medical Center patients.

[56] Regina Vidaver, et al., "Typical Time to Treatment of Patients With Lung Cancer in a Multisite, US-Based Study," *American Society of Clinical Oncology* 12, no. 6, (June 2016) e643–653, accessed August 25, 2020, https://ascopubs.org/doi/pdf/10.1200/JOP.2015.009605.

Appendix A: Diagnostic Tests

Table A.1. Diagnostic Tests

Test ordered	Ordered by	Completed On	View Alert Sent to	Follow-up Recommended	Patient Notification	Documented Oversight by Supervising Provider
CT scan of the abdomen and pelvis	Urology Resident	mid-summer 2017	Urology Resident	CT scan of the Chest in three months	No	No oversight on the note
Chest CT scan	Primary Care Provider	early 2018	Primary Care Provider	PET/CT scan	Two days after scan	N/A, not a resident or fellow
PET/CT scan	Medical Resident in the Pulmonary Department	early spring 2018	Medical Resident in the Pulmonary Department	Tissue sample, multiphase MRI[57]	No	Pulmonary Supervising Provider co-signed the e-consult

Source: OIG review of the patient's EHR.

[57] A tissue sample is obtained through a biopsy procedure.

Appendix B: VISN Director Memorandum

Department of Veterans Affairs Memorandum

Date: September 9, 2021

From: Director, VA Desert Pacific Healthcare Network (10N22)

Subj: Healthcare Inspection—Delayed Cancer Diagnosis of a Veteran Who Died at the Raymond G. Murphy VA Medical Center in Albuquerque, New Mexico

To: Director, Office of Healthcare Inspections (54HL08)
Director, GAO/OIG Accountability Liaison Office (VHA 10B GOAL Action)

1. The Healthcare Inspection—Delayed Cancer Diagnosis of a Veteran Who Died at the Raymond G. Murphy VA Medical Center in Albuquerque, New Mexico, has been reviewed and approved for submission.

2. If you have any additional questions, please contact me or VISN 22 Quality Management Officer (QMO).

(*Original signed by:*)

Michael W. Fisher
VISN 22 Network Director (10N22)
VA Desert Pacific Healthcare Network

Appendix C: Facility Director Memorandum

Department of Veterans Affairs Memorandum

Date: September 8, 2021

From: Interim Director, Raymond G. Murphy VA Medical Center (501/00)

Subj: Healthcare Inspection—Delayed Cancer Diagnosis of a Veteran Who Died at the Raymond G. Murphy VA Medical Center in Albuquerque, New Mexico

To: Director, Desert Pacific Healthcare Network (10N22)

1. We appreciate the Office of Inspector General's review of the allegations of delayed cancer diagnosis. The facility has already worked on many of the recommendations based on the understanding of the issues at the time of the site visit.
2. I have reviewed and concur with findings, recommendations, and action plan as submitted. The action plans will be followed through to completion and sustainment.
3. If you have any questions or require additional information, please contact Chief, Quality, Safety, and Value (QSV).

(*Original signed by*:)

Jean J. Gurga, MA, OTR/L
Interim Medical Director, NMVAHCS

Facility Director Response

Recommendation 1

The Raymond G. Murphy VA Medical Center Director ensures supervising providers oversee all clinical decisions made by residents and the oversight is reflected within the documentation, including telephone notes.

Concur.

Target date for completion: February 2022

Director Comments

The Raymond G. Murphy VA Medical Center Director reviewed the process for resident supervision based on Medical Center Memorandum 14-1 *Resident Supervision* and 14-2 *Monitoring of Resident Supervision*. Quality Safety Value will conduct audits of resident notes in the Electronic Health Record, including telephone notes, ensure documentation of oversight until greater than 90% compliance has been sustained for 6 months.

Recommendation 2

The Raymond G. Murphy VA Medical Center Director ensures supervising providers establish a reliable way to receive alerts for the results of all tests ordered by residents.

Concur in Principle.

Target date for completion: April 2022

Director Comments

The Raymond G. Murphy VA Medical Center Director will form a workgroup to determine if there is a way that is consistent with national policy for the Electronic Health Record to alert more than one provider of test results. The workgroup, in collaboration with VHA's Office of Operations, will notify VHA's Offices of Health Information, Primary Care, and VA's Office of Electronic Health Record Modernization of the concern regarding notification of test results ordered by residents. Raymond G. Murphy VA Medical Center continues to comply with current national VHA guidance, policies, and processes and will comply with any new guidance, policy, and processes when available.

Recommendation 3

The Raymond G. Murphy VA Medical Center Director ensures that Primary Care and Specialty Care staff coordinate care for shared patients and evaluates the need for Outpatient Care Coordination Agreements.

Concur.

Target date for completion: August 24, 2021 – Request Closure

Director Comments

The Raymond G. Murphy VA Medical Center Director reviewed the process for coordination of care and evaluated the need for outpatient care coordination agreements between Primary Care and Specialty Care. Agreements have been developed with the following service lines: Cardiology, Hematology-Oncology, Physical Medicine and Rehab, Pain Clinic, and Surgical Service. Actions on this recommendation have been completed. The Medical Center Director asks OIG to consider closing it.

OIG Comment

The OIG considers this recommendation open to allow time for the submission of documentation to support closure.

Recommendation 4

The Raymond G. Murphy VA Medical Center Director ensures that patient, family, or staff concerns regarding delay in diagnosis are entered into the patient safety reporting system and appropriate follow-up is completed.

Concur.

Target date for completion: August 24, 2021 – Request Closure

Director Comments

The process was reviewed for reporting patient safety events in Joint Patient Safety Reporting System. The Risk Manager ensures that all reports of delays in diagnosis are entered into the system. Risk Management and Patient Safety will track, and report delays in diagnosis. Actions on this recommendation have been completed. The Medical Center Director asks OIG to consider closing it.

OIG Comment

The OIG considers this recommendation open to allow time for the submission of documentation to support closure.

Recommendation 5

The Raymond G. Murphy VA Medical Center Director coordinates a comprehensive review of the patient's care, takes action as warranted, and reconsiders an Institutional Disclosure.

Concur.

Target date for completion: August 24, 2021 – Request Closure

Director Comments

The New Mexico VA conducted comprehensive review of the patient's care and took the following actions: Updates/revisions to Critical Result Policy, Ordering and Reporting Test Results Policy, and the procedures for offboarding residents. Implemented Brillions software to assist providers with identification of abnormal findings within their view alerts. Care Coordination Agreements were developed. The Veteran's family was informed and provided all pertinent, relevant medical information, and information on tort claims. In consultation with the Office of General Counsel (Pacific District) and the Facility Chief of Staff, it was determined that an Institutional Disclosure would not benefit the family at this time. Actions on this recommendation have been completed. The Medical Center Director asks OIG to consider closing it.

OIG Comment

The OIG considers this recommendation open to allow time for the submission of documentation to support closure.

Recommendation 6

The Raymond G. Murphy VA Medical Center Director ensures consistency between the relevant prior radiological images reviewed when staff radiologists and contract teleradiologists interpret imaging scans for Raymond G. Murphy VA Medical Center patients.

Concur.

Target date for completion: August 25, 2021 – Request Closure

Director Comments

The Raymond G. Murphy VA Medical Center Director reviewed the process for sending relevant studies to contract teleradiologists. Relevant imaging studies are automatically sent with the current imaging study for review. Actions on this recommendation have been completed. The Medical Center Director asks OIG to consider closing it.

OIG Comment

The OIG considers this recommendation open to allow time for the submission of documentation to support closure.

Glossary

To go back, press "alt" and "left arrow" keys.

additional signer. Additional signer refers to "a communication tool used to alert a clinician about information pertaining to the patient. This functionality is designed to allow clinicians to call attention to specific documents and for the recipient to acknowledge receipt of the information. Being identified as an additional signer neither constitutes a co-signature nor implies responsibility for the content of or concurrence with the note."[58]

adrenal gland. "Small, triangular-shaped glands located on top of both kidneys" that "produce hormones to help regulate metabolism, immune system, blood pressure, response to stress and other essential functions."[59]

antibiotic. "Drugs used to treat a bacterial infection."[60]

apex. "The narrowed or pointed end." A pleural form of apex is apices.[61]

asbestos. "Any of several minerals…that readily separate into long flexible fibers," that "have been implicated as causes of certain cancers, and that have been used especially formerly as fireproof insulating materials."[62]

biopsy. Diagnostic process of removing and examining cells, fluids, or tissues from a living organism.[63]

bladder. A membranous sac that serves as the receptacle of liquid, such as urine in a urinary bladder.[64]

carcinoma. A malignant tumor of epithelial origin.[65]

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[58] VHA Handbook 1400.01, *Resident Supervision,* December 19, 2012.

[59] "Adrenal Glands," Johns Hopkins Medicine, accessed December 17, 2020, https://www.hopkinsmedicine.org/health/conditions-and-diseases/adrenal-glands.

[60] "Overview of Antibiotics," Merck Manual, accessed December 21, 2020, https://www.merckmanuals.com/home/infections/antibiotics/overview-of-antibiotics?query=antibiotic#.

[61] Merriam-Webster, "Definition of apex," accessed November 20, 2020, https://www.merriam-webster.com/dictionary/apex.

[62] Merriam-Webster Medical Dictionary, "Definition of asbestos," accessed November 20, 2020, https://www.merriam-webster.com/dictionary/asbestos.

[63] Merriam-Webster, "Definition of biopsy," accessed December 17, 2020, https://www.merriam-webster.com/dictionary/biopsy.

[64] Merriam-Webster, "Definition of bladder," accessed November 23, 2020, https://www.merriam-webster.com/dictionary/bladder.

[65] Merriam-Webster, "Definition of carcinoma," accessed November 20, 2020, https://www.merriam-webster.com/dictionary/carcinoma.

cavitary. Relating to or "characterized by bodily cavitation;" "(the formation of cavities in an organ or tissue especially in disease)."[66]

cervical. Relating to the area of the neck.[67]

chemotherapy. A drug treatment that is used to kill rapidly dividing cells such as cancer.[68]

chronic lung disease. "A chronic inflammatory lung disease that causes obstructed airflow from the lungs."[69]

computed tomography. "Radiography in which a three-dimensional image of a body structure is constructed by computer from a series of plane cross-sectional images made along an axis."[70]

congestive heart failure. Occurs when the heart muscle is unable to pump blood as efficiently as it should to maintain adequate circulation to the body tissues.[71]

culture. To grow microorganisms in a prepared medium.[72]

cystoscopy. Procedure performed by a physician that allows examination of the lining of the bladder and the tube that carries urine out the body.[73]

dehydration. Occurs when the body utilizes more fluid than consumed and does not have enough fluids to function.[74]

[66] Merriam-Webster, "Definition of cavitary," accessed July 12, 2021, https://www.merriam-webster.com/dictionary/cavitary. Merriam-Webster, "Definition of cavitation," accessed July 12, 2021, https://www.merriam-webster.com/dictionary/cavitation, accessed July 12, 2021.

[67] Merriam-Webster, "Definition of cervical," accessed November 23, 2020, https://www.merriam-webster.com/dictionary/cervical.

[68] Mayo Clinic, "Chemotherapy," accessed November 17, 2020, https://www.mayoclinic.org/tests-procedures/chemotherapy/about/pac-20385033.

[69] "Chronic Obstructive Pulmonary Disease," Mayo Clinic, accessed November 17, 2020, https://www.mayoclinic.org/diseases-conditions/copd/symptoms-causes/syc-20353679.

[70] Merriam-Webster, "Definition computed tomography," accessed November 12, 2020, https://www.merriam-webster.com/dictionary/computed%20tomography.

[71] "Congestive Heart Failure," Johns Hopkins Medicine, accessed December 18, 2020, https://www.hopkinsmedicine.org/health/conditions-and-diseases/congestive-heart-failure-prevention-treatment-and-research.

[72] Merriam-Webster, "Definition culture," accessed November 20, 2020, https://www.merriam-webster.com/dictionary/culture.

[73] Mayo Clinic, "Definition cystoscopy," accessed November 19, 2020, https://www.mayoclinic.org/tests-procedures/cystoscopy/about/pac-20393694.

[74] Mayo Clinic, "Definition dehydration," accessed November 19, 2020, https://www.mayoclinic.org/diseases-conditions/dehydration/symptoms-causes/syc-20354086.

diuretic. Medication, sometimes referred to as a water pill, that promotes the release of salt and water from the body.[75]

electronic consult. Allows consultation (e-consult) with a provider in response to request for clinical collaboration without face-to-face examination of the patient.[76]

electronic patient event report. Electronic patient event reporting system referred to as ePER was an internal software program created in 2012 by the VA to capture medical errors, close calls or near misses within VHA.[77]

fellow. Resident "appointed to a position granting a stipend and allowing for advanced study or research."[78]

high blood pressure. "A common condition in which the long-term force of the blood against artery walls is high enough that it may eventually cause health problems, such as heart disease."[79]

incontinence. "Inability of the body to control the evacuative functions of urination or defecation."[80]

joint patient safety reporting. A computer application that "standardizes event capture and data management on medical errors," close calls or "near misses for the Military and Veterans Health Systems."[81]

kidney. A pair of organs that filters waste products of metabolism from the body.[82]

lesion. "An abnormal change in structure of an organ or part due to injury or disease."[83]

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[75] Mayo Clinic, *Diuretics,* accessed December 21, 2020, https://www.mayoclinic.org/diseases-conditions/high-blood-pressure/in-depth/diuretics/art-20048129.

[76] VHA Directive 1232(2), *Consult Processes and Procedures*, August 24, 2016.

[77] VA National Center for Patient Safety, *Electronic Patient Event Reporting System (ePer) An Introduction -June 2012,* Emory University, "Incident Reporting Systems," accessed July 15, 2021, https://med.emory.edu/vamc/quality-safety/incident-reporting.html#:~:text=The%20Electronic%20Patient%20Event%20Report%20%28ePER%29%20is%20a,report%20both%20close%20calls%20and%20actual%20patient%20events.

[78] Merriam-Webster, "Definition fellow," accessed December 21, 2020, https://www.merriam-webster.com/dictionary/fellow.

[79] Mayo Clinic, "High Blood Pressure," accessed November 19, 2020, https://www.mayoclinic.org/diseases-conditions/high-blood-pressure/symptoms-causes/syc-20373410.

[80] Merriam Webster, "Definition incontinence," accessed November 23, 2020, https://www.merriam-webster.com/dictionary/incontinence.

[81] VHA National Center for Patient Safety, *Joint Patient Safety Reporting (JPSR) System,* accessed December 16, 2020*,* http://vaww.ncps.med.va.gov/tools.html#jpsr.

[82] Merriam Webster, "Definition kidney," accessed November 23, 2020, https://www.merriam-webster.com/dictionary/kidney.

[83] Merriam Webster, "Definition lesion," accessed November 23, 2020, https://www.merriam-webster.com/dictionary/lesion.

magnetic resonance imaging. A "medical imaging technique that uses a magnetic field and computer-generated radio waves to create detailed images of the organs and tissues in" the body.[84]

malignancy. "A term for diseases in which abnormal cells divide without control and can invade nearby tissues."[85]

mass effect. A term used to explain how the tumor volume, surrounding edema and infiltration areas cause symptoms or consequences to adjoining structures within the body.[86]

neuropsychological. Pertaining to a "science concerned with the integration of psychological observations on behavior and the mind with neurological observations on the brain and nervous system."[87]

nodule. "A small mass of rounded or irregular shape."[88]

oncology. A branch of medicine concerned with the prevention, diagnosis, treatment, and study of cancer.[89]

oximetry. An instrument used to continuously measure the degree of oxygen saturation in circulating blood.[90]

palliative. "Something that reduces the effects or symptoms of a medical condition without curing it."[91]

Pancoast tumor. A malignant tumor formed at the upper extremity of the lung.[92]

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[84] Mayo Clinic, "Magnetic Resonance Imaging," accessed January 11, 2021, https://www.mayoclinic.org/tests-procedures/mri/about/pac-20384768.

[85] National Cancer Institute, "Malignancy," accessed December 21, 2020, https://www.cancer.gov/publications/dictionaries/cancer-terms/def/malignancy.

[86] Monica Dallabonna, et. al. "Impact of mass effect, tumor location, age, and surgery on the cognitive outcome of patients with high-grade gliomas: a longitudinal study," Neuro-Oncology Practice, Published by Oxford University Press on behalf of the Society for Neuro-Oncology and the European Association of Neuro-Oncology, January 17, 2017, accessed July 17, 2021, https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6655475/pdf/npw030.pdf.

[87] Merriam Webster, "Definition neuropsychological," accessed December 17, 2020, https://www.merriam-webster.com/dictionary/neuropsychology.

[88] Merriam Webster, "Definition nodule," accessed November 23, 2020, https://www.merriam-webster.com/dictionary/nodule.

[89] Merriam Webster, "Definition oncology," accessed November 17, 2020, https://www.merriam-webster.com/dictionary/oncology.

[90] Merriam Webster, "Definition oximetry," accessed December 17, 2020, https://www.merriam-webster.com/dictionary/oximetry.

[91] Merriam Webster, "Definition palliative, accessed November 18, 2020, https://www.merriam-webster.com/dictionary/palliative#medicalDictionary.

[92] Merriam Webster, "Definition Pancoast tumor," accessed November 19, 2020, https://www.merriam-webster.com/medical/pancoast%20tumor.

Picture Archiving and Communication System. A digital image storage system which involves acquiring, transmitting, and archiving of digital medical images. Picture Archiving and Communication System (PACS) "handles images from all modalities, including ultrasonography, radiography, magnetic resonance imaging, positron emission tomography, and computer tomography." This system allows off-site viewing.[93]

pleural. "The delicate serous membrane that lines each half of the thorax of mammals and is folded back over the surface of the lung of the same side."[94]

positron emission tomography/computed tomography. An imaging study that utilizes a radioactive drug and three-dimensional images of the body to determine how tissues and organs are functioning. PET/CT is useful in evaluating body parts for cancer.[95]

probiotic. A microorganism that when ingested restores beneficial bacteria to the digestive tract.[96]

root cause analysis. "An event review that focuses on systems and processes to reduce the risk of harm. In order to prevent the problem from reoccurring, the root cause of the problem needs to be eliminated or corrected."[97]

rotator cuff. A support structure for the shoulder joint, made up of tendons and muscle attached to bone.[98]

spiculated. Covered with small spikes.[99]

spinal canal. "A canal in the spinal column through which the spinal cord passes and is delimited dorsally by the arches on the dorsal side of the vertebrae."[100]

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[93] Oregon Tech Online, "Definition PACS," accessed January 20, 2021, https://www.oit.edu/online/degrees/picture-archiving-and-communication-systems-pacs-certificate.

[94] Merriam Webster, "Definition pleura," accessed January 17, 2021, https://www.merriam-webster.com/dictionary/pleura.

[95] Mayo Clinic, "Positron Emission Tomography Scan," accessed November 23, 2020, https://www.mayoclinic.org/tests-procedures/pet-scan/about/pac-20385078. Jennifer M. Renaud, et al, "Characterization of 3-Dimensional PET Systems for Accurate Quantification of Myocardial Blood Flow", *Journal Nuclear Medicine 58*, (2017).

[96] Merriam Webster, "Definition probiotic," accessed December 17, 2020, https://www.merriam-webster.com/dictionary/probiotic.

[97] VHA National Center for Patient Safety, "Root Cause Analysis," accessed December 16, 2020, http://vaww.ncps.med.va.gov/Education/PS101/RCA%20Guidebook_10212020.pdf.

[98] Merriam-Webster, "Rotator cuff," accessed December 17, 2020, https://www.merriam-webster.com/dictionary/rotator%20cuff.

[99] Merriam Webster, "Definition spiculate," accessed November 23, 2020, https://www.merriam-webster.com/dictionary/spiculate.

[100] Merriam Webster, "Definition spinal canal," accessed November 20, 2020, https://www.merriam-webster.com/dictionary/spinal%20canal.

spinal cord. "The cord of nervous tissue that extends from the brain lengthwise along the back in the spinal canal, gives off the pairs of spinal nerves, carries impulses to and from the brain, and serves as a center for initiating and coordinating many reflex acts."[101]

sputum. Secretions coughed up from the respiratory system; composed of mucous but may contain "pus, blood, fibrin" or bacteria.[102]

squamous cell. A non-small cell lung cancer that is "relatively insensitive to chemotherapy and radiation."[103]

teleradiologist. A physician who provides interpretative services for diagnostic images transmitted to a location in the United States, beyond the immediate vicinity of where the images were acquired.[104]

tendinitis. Inflammation or irritation of a tendon which is the thick, fibrous cords that attach muscle to bone. The condition causes pain and tenderness just outside of a joint.[105]

tobacco use disorder. A substance use disorder involving an individual who is dependent upon nicotine, a stimulant found in tobacco products.[106]

tuberculosis. An infectious lung disease that is easily spread through small droplets released into the air by coughing.[107]

tumor. "An abnormal benign or malignant new growth of tissue that possesses no physiological function and arises from uncontrolled usually rapid cellular growth."[108]

ureter. "The paired ducts that carry the urine from the kidney to the bladder."[109]

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[101] Merriam Webster, "Definition spinal cord," accessed December 17, 2020, https://www.merriam-webster.com/dictionary/spinal%20cord.

[102] Merriam Webster, "Definition sputum," accessed November 20, 2020, https://www.merriam-webster.com/dictionary/sputum.

[103] "Non-Small Cell Lung Cancer Treatment," National Cancer Institute, accessed November 20, 2020, https://www.cancer.gov/types/lung/hp/non-small-cell-lung-treatment-pdq.

[104] American College of Radiology, "ACR White Paper on Teleradiology Practice: A Report From the Task Force on Teleradiology Practice," *Journal of the American College of Radiology*, Volume 10 No. 8 August 2013, accessed November 24, 2020, https://www.acr.org/Advocacy-and-Economics/Legislative-Issues/Teleradiology.

[105] Mayo Clinic, "Tendinitis," accessed November 20, 2020, https://www.mayoclinic.org/diseases-conditions/tendinitis/symptoms-causes/syc-20378243.

[106] VA Whole Health Library, "Tobacco Use Disorder," accessed December 16, 2020, https://www.va.gov/WHOLEHEALTHLIBRARY/tools/tobacco-use-disorders.asp.

[107] Mayo Clinic, "Tuberculosis," accessed November 20, 2020, https://www.mayoclinic.org/diseases-conditions/tuberculosis/symptoms-causes/syc-20351250.

[108] Merriam Webster, "Definition tumor," accessed November 20, 2020, https://www.merriam-webster.com/dictionary/tumor.

[109] Merriam Webster, "Definition ureter," accessed November 20, 2020, https://www.merriam-webster.com/dictionary/ureter#medicalDictionary.

urinary tract. The pathway through which urine flows from the kidneys, to the ureters, to the bladder and lastly through the urethra.[110]

urology. A specialty field of medicine that diagnoses and treats problems "involving the male and female urinary tract and the male reproductive organs."[111]

urothelial. Tissue that lines most structures of the urinary tract.[112]

view alert. EHR notifications that provide information to staff about clinical or administrative events to review and determine whether further action is needed.[113]

[110] Merriam Webster, "Definition urinary tract," accessed December 17, 2020, https://www.merriam-webster.com/medical/urinary%20tract.

[111] Mayo Clinic, "Urology," accessed November 20, 2020, https://www.mayoclinic.org/departments-centers/urology/home/orc-20336012.

[112] Merriam Webster, "Definition urothelium," accessed January 18, 2021, https://www.merriam-webster.com/medical/urothelium.

[113] VA Office of Information & Technology (OI&T), *Computerized Patient Record System (CPRS) User Guide: GUI Version*, July 2020.

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