



US DEPARTMENT OF VETERANS AFFAIRS OFFICE OF INSPECTOR GENERAL

Office of Healthcare Inspections

VETERANS HEALTH ADMINISTRATION

Care Deficiencies and Leaders' Inadequate Reviews of a Patient Who Died at the Lt. Col. Luke Weathers, Jr. VA Medical Center in Memphis, Tennessee

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Executive Summary

The VA Office of Inspector General (OIG) conducted a healthcare inspection to assess the quality of care provided during a patient's hospitalization, which ended with the patient's death, at the Lt. Col. Luke Weathers, Jr. VA Medical Center (facility) in Memphis, Tennessee.¹ The OIG also evaluated facility leaders' response to the care the patient received.²

The OIG found deficiencies in communication and a failure to follow facility processes in response to the patient's deterioration, preceding death. Nursing Service staff's failures contributed to delays in initiating a [blue alert](#), which may have affected the patient's outcome.³ Additionally, an intensive care unit (ICU) fellow failed to document a response to a critical care [consult](#).⁴ Furthermore, facility leaders conducted reviews of the patient's care, but the reviews failed to identify systemic and causal factors, such as the aforementioned communication deficiencies and non-compliance with facility processes.

When a patient exhibits signs of immediate clinical deterioration, a rapid response is called to "assess and treat the patient with the goal of preventing intensive care unit transfer, cardiac arrest, or death."⁵ Patients who receive an immediate rescue response to cardiac arrest, such as early initiation of [cardiopulmonary resuscitation](#), have an increased chance of survival; however, the advantages gained can be reduced if patients experience subsequent delays in a blue alert team response.⁶

¹ The OIG originally received an allegation that facility nursing staff failed to recognize the need for and provide timely medical intervention; however, after further review, the OIG opened the inspection to review the overall care the patient received.

² "Memphis VA Named in Honor of Tuskegee Airmen," VA Memphis health care (web page), accessed May 23, 2023, <https://www.va.gov/memphis-health-care/stories/memphis-va-named-in-honor-of-tuskegee-airmen/>. The facility was formerly named the Memphis VA Medical Center until signed into law on January 20, 2023.

³ VHA Directive 1177, *Cardiopulmonary Resuscitation*, January 4, 2021; Facility Policy MCP 11-51, *Cardiopulmonary Resuscitation Policy*, June 17, 2021. When a patient experiences cardiac arrest, such as asystole, a blue alert is called for advanced cardiac life support interventions.

⁴ VHA Directive 1400.01, *Supervision of Physician, Dental, Optometry, Chiropractic, and Podiatry Residents*, November 7, 2019. Fellows are physicians pursuing studies in a specialized field of medicine, such as critical care, after completion of initial medical education and residency.

⁵ Agency for Healthcare Research and Quality, Patient Safety Network, "Rapid Response Systems," accessed June 30, 2023, <https://psnet.ahrq.gov/primer/rapid-response-systems>.

⁶ Nicholas G. Bircher, Paul S. Chan, and Yan Xu, "Delays in Cardiopulmonary Resuscitation, Defibrillation, and Epinephrine Administration All Decrease Survival in In-hospital Cardiac Arrest," *Anesthesiology* 130, no. 3 (March 2019): 414-22. The underlined terms are hyperlinks to a glossary. To return from the glossary, press and hold the "alt" and "left arrow" keys together.

Patient Case Summary

In mid-spring 2022, the patient was in their late seventies with a medical history that included [cutaneous T-cell lymphoma](#). The patient was diagnosed with severe [sepsis](#) with acute [cholecystitis](#) and [atrial flutter](#) and admitted to a medical floor with [telemetry monitoring](#). From the ninth to the eleventh day of admission, the patient's respiratory status declined. The patient experienced shortness of breath and [hypoxic](#) episodes requiring a [rapid response team](#) (RRT) to be called and supplemental oxygen. Electronic health record (EHR) documentation reflected the patient had [acute hypoxic respiratory failure](#) and received intermittent [bilevel positive airway pressure](#) (BiPAP). An attempt to wean the patient from BiPAP was unsuccessful.

On the patient's 12th day of admission, an internal medicine resident (intern) placed a critical care consult for evaluation of the patient's acute hypoxic respiratory failure and continued lack of significant improvement on intermittent BiPAP.⁷ The critical care consult asked whether the patient would benefit from [continuous BiPAP](#) support, which is only available in the ICU and would require a transfer to the ICU.⁸ The intern documented that, "per ICU," the patient had significant [pulmonary edema](#). In a late EHR entry, an ICU resident documented that, "ICU was called for evaluation" and patient was "deemed stable for floor" with plans for a continued regimen of intermittent BiPAP and oxygen via [high flow nasal cannula](#) when not on BiPAP.⁹ On day 13, the intern documented that the patient demonstrated intermittent [pursed lip breathing](#).

The next day (day 14), shortly after midnight, a telemetry monitor technician (telemetry technician) observed the patient's heart rate as 74 beats per minute (bpm) by telemetry monitor. Documentation notes nearly an hour later, that the patient continued to have a normal heart rate of 73 bpm.¹⁰ About two- and one-half hours later, alarms alerted the telemetry technician that the patient's heart rate had dropped to 38bpm. The telemetry technician made more than one attempt to reach the patient's assigned nurse. The telemetry technician was subsequently able to alert nursing staff. Per responding nurses, the first responding nurse found the patient unresponsive (with a faint pulse) and called out for an RRT, while the second responding nurse called out to initiate a blue alert. Both nurses recalled that, after a nearby physician responded to the nurse's call for an RRT, the patient became pulseless and chest compressions were initiated.

⁷ At the facility, physicians utilize critical care consults to seek evaluation and consultation from the facility ICU fellow.

⁸ Continuous BiPAP is a treatment option that is not available on the facility's medical floor and requires transfer to the ICU.

⁹ The ICU resident documented this information in the patient's EHR on day 14.

¹⁰ The OIG learned that three nurses, including the patient's assigned nurse, went off the floor to attend a one and a half hour mandatory training session in the facility. The medical floor nurse manager told the OIG three replacement nurses were scheduled to take over patient care for the off-going nurses. However, the charge nurse shared not assigning the replacement nurses to specific patients when the off-going nurses left the medical floor.

Approximately five minutes after the patient's heart rate dropped, the telemetry monitor showed the patient developed asystole and the telemetry technician called the facility operator for the RRT.¹¹ Two minutes later the facility operator paged the blue alert team to respond.¹² The blue alert team arrived within three minutes of the page, continued administering cardiopulmonary resuscitation, and successfully intubated the patient. The patient regained a pulse and, several minutes later, facility staff transferred the patient to the ICU where the patient, again, became asystolic. Facility staff restarted cardiopulmonary resuscitation. The ICU resident contacted the patient's next-of-kin and, together, decided to end resuscitative care. Shortly thereafter, the patient was pronounced dead.

Inspection Results

1. Staff Deficiencies in Communication and Failure to Follow Facility Processes Affected Quality of Care

The telemetry technician failed to follow a series of communications within the time frame outlined by facility policy, and never initiated a blue alert when the patient's heart rate fell below 50 bpm as required.¹³ Rather than call a blue alert, the telemetry technician made more than one attempt to reach the patient's assigned nurse and initiated an RRT. The OIG asked why the telemetry technician called an RRT and not a blue alert, and the telemetry technician responded "[b]ecause I'm not there and I don't know if the patient is unconscious or not." The OIG would have expected the telemetry technician to initiate a blue alert at two instances: (1) within approximately one minute of starting the series of communications when unable to reach nursing staff, and (2) when the patient became asystolic.

The OIG also found that, when the patient's assigned nurse left the medical floor for approximately two hours to attend a mandatory training, a charge nurse failed to assign a nurse to the patient and communicate accurate nursing assignments to the telemetry technician, which furthered the telemetry technician's inability to successfully reach the nurse assigned to the patient. An established and important role of charge nurses is to make nursing assignments and to ensure safe patient care.¹⁴ According to facility policy, charge nurses are responsible for

¹¹ Cleveland Clinic, "Asystole" (web page), accessed April 4, 2023, <https://my.clevelandclinic.org/health/symptoms/22920-asystole>. Asystole occurs when the heart stops pumping due to a failure of the heart's electrical system. Without immediate life-saving intervention, asystole results in death within minutes.

¹² The OIG was unable to determine who notified the facility operator to call the blue alert; however, the telemetry technician confirmed not having called for one.

¹³ Facility Standard Operating Procedure (SOP) 118-07, "Remote Cardiac Telemetry Monitoring," March 2, 2022.

¹⁴ Heather Cathro, "A Practical Guide to Making Patient Assignments in Acute Care," *The Journal of Nursing Administration* 43, no. 1 (January 2013): 6-9.

communicating nursing assignments to telemetry technicians. When the OIG asked the charge nurse who was responsible for the patient's care during the training, the charge nurse said, ". . . all of us [nurses on the medical floor]."

Additionally, the OIG determined that an ICU fellow failed to document a response to a critical care consult. Facility bylaws require that when a physician is consulted regarding a patient, the physician must respond with a "written opinion" in the patient's EHR.¹⁵ The OIG reviewed the critical care consult request in the patient's EHR and found no evidence of a response (written opinion) from an ICU physician. The OIG determined that, more likely than not, an ICU physician evaluated the patient but did not document the evaluation. EHR notes written by the intern and the ICU resident, alluded that ICU staff had evaluated the patient.¹⁶ However, during interviews, the intern was unable to recall who evaluated the patient, and the ICU resident could not recall who determined the patient as stable for the medical floor. The ICU fellow who was on call at the time of the consult, could not recall evaluating the patient. Because the ICU fellow failed to document an evaluation and did not recall the patient, the OIG was unable to determine the rationale for declining the patient's transfer to the ICU and whether the patient needed a higher level of care.

2. Leaders' Response

The OIG determined that facility leaders conducted a factfinding and a root cause analysis (RCA), which failed to identify systemic and causal factors, such as the deficiencies in communication and failure to follow facility processes.¹⁷ The OIG found process deficiencies with the reviews that may have hindered the depth of the evaluations.

The OIG also found that the Associate Director of Patient Care Services did not issue an authorization letter after initiating the factfinding. According to VA policy, when a facility leader tasks someone else to conduct a factfinding, an authorization letter is required to provide the factfinding investigator clear guidance on the focus of the investigation.¹⁸ The authorization letter provides a blueprint for the review and may include details such as the issues to be

¹⁵ Facility Bylaws and Rules, *Bylaws and Rules of the Medical Staff of Veterans Health Administration (VHA)*, December 2021.

¹⁶ The intern documented that, overnight, the ICU was consulted and provided treatment recommendations. The next day, the ICU resident wrote that, prior to the patient's transfer to the ICU that day, "ICU was called for evaluation" and the patient was "deemed stable for floor."

¹⁷ VHA Directive 1320, *Quality Management and Patient Safety Activities That Can Generate Confidential Records and Documents*, July 10, 2020; VA Handbook 0700, *Administrative Investigation Boards and Factfindings*, August 17, 2021. A factfinding is a type of unprotected administrative review used to determine facts about a situation or event and may be used when investigating potential disciplinary actions.

¹⁸ VA Handbook 0700.

investigated, evidence already gathered, and names of witnesses or potential interviewees.¹⁹ According to the factfinding investigator, the Associate Director of Patient Care Services did not provide an authorization letter. When the OIG asked about the authorization letter, the Associate Director of Patient Care Services, explained sending an email “to please initiate a factfinding out of the [Associate Director of Patient Care Services] office.” The OIG concluded that an authorization letter would have likely assisted the factfinding investigator to focus the investigation and determine causal factors.

The RCA team did not interview some staff members who were directly involved with the patient event (the necessary individuals). Veterans Health Administration guidance for conducting an RCA includes interviewing employees directly involved in the adverse event to gather facts and information to establish the sequence of events.²⁰ The chief of Quality Management and Performance Improvement told the OIG that Nursing Service leaders prohibited the RCA team from interviewing individuals that were also interviewed by the factfinding team. The Quality Management and Performance Improvement Service decided to proceed with the RCA, knowing components would be missing. Not interviewing the necessary individuals in an RCA is a repeat finding from a September 2020 OIG report.²¹

The OIG found that neither the factfinding nor the RCA identified the telemetry technician and the charge nurse’s failure to follow the telemetry monitoring policy and that the reviews had conflicting findings regarding staffs’ response to the blue alert. The absence of thorough reviews hindered the facility leaders’ ability to identify causal factors and implement corrective actions to prevent a similar occurrence in the future.

The OIG made five recommendations to the Facility Director related to ensuring Nursing Service staff adhere to the cardiac telemetry monitoring policy; medical floor charge nurses make nursing assignments; ICU physicians document and complete written responses to critical care consults; and Quality Management and Performance Improvement Service conduct

¹⁹ VA Handbook 0700.

²⁰ VHA Handbook 1050.01, *VHA National Patient Safety Improvement Handbook*, March 4, 2011. This handbook was in place during the time of events discussed in this report. The handbook was rescinded and replaced by VHA Directive 1050.01 *VHA Quality and Patient Safety Programs*, March 24, 2023. Both the handbook and directive contain similar language about RCAs: the directive references RCA resources, including the RCA Step-By-Step Guide; however, the directive does not specify who to interview; “Root Cause Analysis (RCA) Step-By-Step Guide,” VA National Center for Patient Safety, accessed July 27, 2022, http://vaww.ncps.med.va.gov/Tools/RCAToolbox/RCA_Step_By_Step_Guide_REV7.1.16_Final.pdf. (This website is not publicly accessible.) This guide has been removed from the website.

²¹ VA OIG, *Deficiencies in Care, Care Coordination, and Facility Response to a Patient Who Died by Suicide, Memphis VA Medical Center in Tennessee*, Report No. 19-09493-249, September 3, 2020. The OIG closed report recommendations as of February 2022.

administrative reviews and root cause analyses in accordance to policy, as well as consider completion of another RCA to review the patient event.

VA Comments and OIG Response

The Veterans Integrated Network and Facility Directors concurred with the findings and recommendations and provided acceptable action plans (see appendixes A and B). The OIG will follow up on the planned actions until they are completed.



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Abbreviations

ADPCS	Associate Director of Patient Care Services
EHR	electronic health record
ICU	intensive care unit
OIG	Office of Inspector General
RCA	root cause analysis
RRT	rapid response team
SOP	standard operating procedure
VHA	Veterans Health Administration
VISN	Veterans Integrated Service Network



Introduction

The VA Office of Inspector General (OIG) conducted a healthcare inspection to assess the quality of care staff provided during a patient's hospitalization, which ended with the patient's death, at the Lt. Col. Luke Weathers, Jr. VA Medical Center (facility) in Memphis, Tennessee. The OIG also evaluated facility leaders' response to the care the patient received.¹

Background

The facility is part of Veterans Integrated Service Network (VISN) 9, within the Memphis VA Health Care System, which includes 10 community-based outpatient clinics located in Tennessee, Arkansas, and Mississippi. From October 1, 2021, through September 30, 2022, the facility served 68,739 patients and operated 176 hospital beds. The facility is classified as a level 1a complexity facility.²

Prior OIG Report

In a September 2020 report, the OIG found that facility staff failed to conduct a sufficient quality review when individuals directly involved in the care of a patient who committed suicide were not interviewed as required.³ The OIG determined that excluding input from key staff involved in the patient's care increased the likelihood that the same or similar situations may reoccur. The OIG made a recommendation related to the process of a root cause analysis (RCA), which resulted in facility revisions to RCA team training about interviewing. The recommendation has been closed.⁴

¹ "Memphis VA Named in Honor of Tuskegee Airmen," VA Memphis health care (web page), accessed May 23, 2023, <https://www.va.gov/memphis-health-care/stories/memphis-va-named-in-honor-of-tuskegee-airmen/>. The facility was formerly named the Memphis VA Medical Center until the bill was signed into law on December 20, 2022.

² VHA Office of Productivity, Efficiency and Staffing (OPES), "Facility Complexity Model Fact Sheet," January 28, 2021. The Facility Complexity Model classifies VHA facilities at levels 1a, 1b, 1c, 2, or 3, with level 1a being the most complex and level 3 being the least complex.

³ VHA Handbook 1050.01, *VHA National Patient Safety Improvement Handbook*, March 4, 2011. This handbook was in place during the time of events discussed in this report. The handbook was rescinded and replaced by VHA Directive 1050.01, *VHA Quality and Patient Safety Programs*, March 24, 2023. Unless otherwise specified, the 2023 directive contains the same or similar language regarding RCAs and adverse events as the rescinded 2011 handbook.

⁴ VA OIG, *Deficiencies in Care, Care Coordination, and Facility Response to a Patient Who Died by Suicide, Memphis VA Medical Center in Tennessee*, Report No. 19-09493-249, September 3, 2020; VHA Handbook 1050.01; VHA Directive 1050.01. VHA's definition for adverse events includes "adverse occurrences directly associated with care or services provided within. . . a medical facility, outpatient clinic, or other VHA facility." An RCA is a type of confidential quality improvement process, which identifies system vulnerabilities to an adverse event and determine whether potential process or system improvements would decrease the likelihood of a similar event in the future.

Allegations and Related OIG Concerns

The OIG received an allegation that facility nursing staff failed to recognize the need for and provide timely medical intervention, which may have contributed to the patient's death after a sudden deterioration in the patient's status. However, the OIG reviewed the complaint and identified concerns with the patient's medical care and facility leaders' response. On December 12, 2022, the OIG opened a hotline to evaluate

- the quality of care the patient received during facility admission in mid-spring 2022, and
- facility leaders' response to the care the patient received.

Scope and Methodology

The OIG initiated the inspection on December 12, 2022, conducted an on-site visit February 14–16, 2023, and continued virtual interviews February 23–March 27, 2023. The OIG team interviewed the Facility Director; Chief of Staff; Associate Director of Patient Care Services (ADPCS), chief of Quality Management and Performance Improvement, the risk manager, the patient safety manager and the nurse manager. Additionally, physicians and Nursing Service staff involved in the patient's care were interviewed. The OIG team also corresponded via email with the facility chief of Pulmonary, Critical Care & Sleep Service (chief of critical care).

The OIG team reviewed the patient's electronic health record (EHR). The team also reviewed relevant Veterans Health Administration (VHA) and facility policies and procedures, facility administrative and quality review documents, and committee meeting minutes from mid-2022 to early 2023.

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).

The OIG substantiates an allegation when the available evidence indicates that the alleged event or action more likely than not took place. The OIG does not substantiate an allegation when the available evidence indicates that the alleged event or action more likely than not did not take place. The OIG is unable to determine whether an alleged event or action took place when there is insufficient evidence.

Oversight authority to review the programs and operations of VA medical facilities is authorized by the Inspector General Act of 1978, as amended, 5 U.S.C. §§ 401–424. The OIG reviews available evidence to determine whether reported concerns or allegations are valid within a specified scope and methodology of a healthcare inspection and, if so, to make recommendations

to VA leaders on patient care issues. 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, who was in their late seventies, had a medical history that included [cutaneous T-cell lymphoma](#).⁵ In mid-spring 2022 the patient presented to the facility's Emergency Department complaining of [epigastric](#) abdominal pain, shortness of breath on exertion, chills, sweating, nausea, and poor appetite for several days. The patient, who normally performed [activities of daily living](#) independently, reported becoming mostly bedbound due to the shortness of breath upon exertion. An Emergency Department nurse triaged and found the patient was [afebrile](#) with low blood pressure, an elevated heart rate, and normal respiratory rate and [oxygen saturation](#). An Emergency Department provider documented that laboratory results revealed an elevated [white blood cell count](#), negative [troponin](#), and an elevated [bilirubin](#). An [electrocardiogram](#) showed [atrial fibrillation with rapid ventricular response](#). Imaging studies included a chest x-ray that was negative for lung abnormalities and a [computerized tomography scan](#) of the abdomen that revealed acute [cholecystitis](#). The internal medicine resident diagnosed the patient as having severe [sepsis](#) with acute cholecystitis and [atrial flutter](#). The patient was admitted to a medical floor with [telemetry monitoring](#).

Gastroenterology physicians evaluated the patient and assessed a [magnetic resonance cholangiopancreatography](#), which revealed a large stone at the neck of the gallbladder. The patient received antibiotic therapy and responded well. General surgery physicians planned a [cholecystectomy](#) in eight weeks to remove the patient's gallbladder. Cardiology physicians evaluated the patient for new onset atrial fibrillation and recommended medications for control of the heart rate and [anticoagulation](#), as well as continued telemetry monitoring.

On Day 4 of admission, the patient underwent a [transthoracic echocardiogram](#) and was diagnosed with [diastolic heart failure](#) and moderate [pulmonary hypertension](#). The next day, geriatric-rehabilitation physicians evaluated the patient for possible transfer to the facility's geriatric-rehabilitation unit. An internal medicine attending physician (attending physician) noted the patient was "medically stable for transfer." The patient was transferred to the geriatric-rehabilitation unit the same day as the evaluation.⁶

⁵ The OIG uses the singular form of they (their) in this instance for privacy purposes.

⁶ The OIG obtained facility guidance, "Geriatric Evaluation and Management Unit (GEM-REHAB) Transfer Guidance," which originated from the facility Deputy Chief of Staff. The geriatric-rehabilitation unit does not have telemetry monitoring capabilities.

During the patient's initial three days in the geriatric-rehabilitation unit, the patient maintained an oxygen saturation level of 94 percent or greater and did not require supplemental oxygen. However, on the morning of the fourth day, the patient experienced an episode of dizziness and was found to be [hypoxic](#). The nurse administered oxygen via nasal cannula (3L/minute) and saturation improved to 95 percent.

Within an hour, the patient began to complain of shortness of breath and chest tightness upon breathing. A medical officer of the day examined the patient and ordered a chest x-ray, troponin level, and electrocardiogram. The patient's chest x-ray was interpreted to show the patient had mild [pulmonary edema](#). The patient's electrocardiogram showed atrial fibrillation and the troponin level was normal. Later that morning, a second medical officer of the day examined the patient and noted that the patient appeared to be "resting comfortably in bed."

About an hour after midnight the next day, the patient's fifth day in the geriatric-rehabilitation unit, nursing staff initiated a [rapid response](#) after the patient again experienced hypoxia with oxygen saturation in the 60s, which exacerbated with movement or activity. A medical officer of the day responded to the rapid response and observed [pitting edema](#) of the lower extremities, up to the hips. The medical officer of the day ordered the patient to receive [bilevel positive airway pressure](#) (BiPAP) "4 hours off/on" (intermittent BiPAP), and an [intravenous diuretic](#). A subsequent medical officer of the day noted the patient to have [acute hypoxic respiratory failure](#) and documented a plan to transfer the patient to the medical floor.

Seven hours after the rapid response, a respiratory therapist trialed the removal of BiPAP and placed the patient on supplemental oxygen therapy by nasal cannula; however, the patient became hypoxic with oxygen saturation levels falling to the lower 80 percent range. The respiratory therapist placed the patient back on BiPAP at 60 percent oxygen concentration, and the patient's oxygen saturation improved. Due to the patient's continued need for BiPAP, the internal medicine team was contacted to transfer the patient back to the medical floor.⁷ The patient was transferred back to the medical floor with telemetry monitoring in the early afternoon of the same day.

The day after returning to the medical floor, the patient underwent a [computed tomography angiogram](#) of the chest that showed small [pulmonary emboli](#) and [interstitial airspace disease](#). An internal medicine intern (the intern) assessed the results to be "suggestive of pulmonary edema."⁸ The intern documented a plan of care that included continuation of intermittent BiPAP and intravenous diuretics twice a day. The attending physician noted that the patient appeared

⁷ "Geriatric Evaluation and Management Unit (GEM-REHAB) Transfer Guidance." Patients who require frequent BiPAP use cannot be treated on the geriatric-rehabilitation unit.

⁸ COVID-19 tests completed during the patient's hospitalization were negative.

improved with less anxiety and documented a plan to decrease the use of BiPAP over the next day.

The following morning, a respiratory therapist removed the patient from BiPAP. The patient was placed on oxygen via nasal cannula at 6 liters per minute with an oxygen saturation of 95 percent. Later that morning, a physical therapist noted the patient was exhibiting increased shortness of breath with minimal exertion while still in bed. The patient's oxygen saturation ranged from 85 to 88 percent while still on oxygen via nasal cannula at 6 liters per minute. A couple of hours later, a respiratory therapist documented finding the patient "on room air" with an oxygen saturation of 75 percent, and placed the patient on oxygen via nasal cannula at 6 liters per minute. The patient's oxygen saturation increased to 84 percent, requiring the patient return to BiPAP. In the early evening hours, the patient was removed from BiPAP and placed back on oxygen via nasal cannula at 6 liters per minute. The attending physician documented that the patient was "resting comfortably" but "unable to speak in complete sentences secondary to [dyspnea](#)."

The intern placed a critical care [consult](#) for evaluation of the patient's ongoing, acute hypoxic respiratory failure and continued lack of significant improvement on intermittent BiPAP.⁹ The critical care consult request included a question whether the patient, who was now suspected to have [acute respiratory distress syndrome](#), would benefit from [continuous BiPAP](#) support, rather than the limited regimen of intermittent BiPAP.¹⁰

The intern documented that, "per ICU," the patient had significant pulmonary edema on a bedside heart [ultrasound](#). In a late EHR entry, an intensive care unit (ICU) resident documented that, "ICU was called for evaluation" and the patient was "deemed stable for floor" with plans for a continued regimen of intermittent BiPAP and oxygen via [high flow nasal cannula](#) when not on BiPAP.¹¹ That evening a respiratory therapist placed the patient on high flow nasal cannula at an oxygen concentration of 60 percent, and the intern ordered the patient to start steroids twice daily.

The next day, the attending physician documented the patient as "look[ing] a little bit better," and a radiologist noted the day's chest x-ray result as compatible with "pulmonary edema with perhaps marginal improvement." The intern documented that the patient had [crackles](#) in the lower lung fields on examination and observed the patient to demonstrate intermittent [pursed lip breathing](#). Due to a drop in blood [hemoglobin](#) level, the patient received a blood transfusion that

⁹ At the facility, physicians utilize critical care consultation to assist in the management of patients who may benefit from more detailed observation and the additional support and treatment options available in the ICU.

¹⁰ Continuous BiPAP treatment was not available on the medical floor and required transfer to the ICU.

¹¹ The ICU resident documented this information in the patient's EHR on day 14.

afternoon, with vital signs remaining stable. That evening, a respiratory therapist noted the patient continued on intermittent BiPAP with alarms described as “set [and] functioning.”

Shortly after midnight (Day 14 of the patient’s admission from the Emergency Department), a telemetry monitor technician (telemetry technician) observed the patient’s heart rate as 74 beats per minute (bpm) by telemetry monitor. Nearly an hour later, documentation reflects the patient had a normal heart rate of 73 bpm. About two- and one-half hours later, monitor alarms alerted the telemetry technician that the patient’s heart rate had dropped to 38 bpm. The telemetry technician notified nursing staff via [Vocera](#). (See next section for nurses’ responses.) Five minutes later, the patient developed [asystole](#) and one minute later the facility operator activated the call for the [rapid response team](#) (RRT). One minute after that, the facility operator paged for a [blue alert](#) team response.¹² The blue alert team arrived within 3 minutes of the page, administered [cardiopulmonary resuscitation](#), and successfully intubated the patient. The patient regained a pulse after ten minutes. Several minutes later, facility staff transferred the patient to the ICU where the patient, again, became asystolic. Facility staff restarted cardiopulmonary resuscitation. The ICU resident contacted the patient’s next-of-kin and, together, decided to end resuscitative care. Shortly thereafter, the patient was pronounced dead. The family declined an autopsy.

Nurses’ Responses to the Telemetry Technician’s Vocera Broadcast

Per responding nurses, upon hearing the Vocera broadcast, two medical floor nurses responded to the patient.¹³ The nurses told the OIG that the first responding nurse went to the patient’s room, found the patient unresponsive (with a faint pulse), and called out for someone to alert the RRT. The second responding nurse called out for staff to initiate a blue alert. Both nurses recalled that a nearby physician responded to the nurse’s call for an RRT, and when the patient became pulseless, chest compressions were initiated.

Inspection Results

1. Staff Deficiencies in Communication and Failure to Follow Facility Processes Affected Quality of Care

The OIG determined there were deficiencies in communication and a failure to follow facility processes in response to the patient’s deterioration, preceding death. Nursing Service staffs’

¹² The project manager responsible for facility operator functions provided the OIG with a review of records that confirmed facility operator activities related to the patient’s care. The OIG was unable to determine who notified the facility operator to call the blue alert; however, the telemetry technician confirmed not having called for one.

¹³ The section is based on staff testimony, other than one set of vital signs and the blue alert team response; the OIG found no nursing documentation of the patient’s care in the EHR during the shift the event occurred.

actions contributed to delays in initiating a blue alert, which may have affected the patient's outcome. Specifically, the telemetry technician failed to follow a series of communications as outlined by facility policy. Additionally, a charge nurse failed to assign an interim nurse to cover the patient when the assigned nurse was off the floor for approximately two-hours, pre-authorized absence, which was not communicated to the telemetry technician, hampering the technician's ability to successfully contact a nurse at the point-of-care.

The OIG learned that on the day of the patient's death, three nurses, including the patient's assigned nurse (off-going nurses), went to another floor of the facility to attend a mandatory training session.¹⁴ The medical floor nurse manager told the OIG that three additional nurses were scheduled to take over patient care for the off-going nurses. However, the charge nurse told the OIG about not assigning the additional nurses to specific patients when the off-going nurses left the medical floor. Additionally, the OIG learned the telemetry technician was unaware the off-going nurses had gone to training.

Nursing Service Staff Failures

When a patient exhibits signs of immediate clinical deterioration, a rapid response is called to "assess and treat the patient with the goal of preventing intensive care unit transfer, cardiac arrest, or death."¹⁵ Should the patient experience cardiac arrest, such as asystole, a blue alert is called for provision of advanced cardiac life support interventions, as required.¹⁶ Patients who receive an immediate rescue response to cardiac arrest, such as early initiation of cardiopulmonary resuscitation, have an increased chance of survival; however, the advantages gained can be reduced if patients experience subsequent delays in a blue alert team response.¹⁷

Telemetry Technician's Failure to Follow Facility Policy

According to a facility telemetry policy, to ensure a timely rescue response when a patient's cardiac condition triggers a clinical alarm, such as a heart rate below 50 bpm, the telemetry technician starts a series of communications.

¹⁴ The medical floor nurse manager told the OIG the training was mandatory and located away from the patient's medical floor. Additionally, for this report, the OIG uses "off-going nurses" when referring, collectively, to the three nurses who left the medical floor for training and "the patient's assigned nurse" when referring to the nurse assigned to care for the patient prior to leaving for training; Facility Standard Operating Procedure (SOP) 118-1-26, "Nursing Communication – (Inter-ward Nursing Hand-off and Beside Shift Report)," June 26, 2018.

¹⁵ Agency for Healthcare Research and Quality, Patient Safety Network, "Rapid Response Systems," accessed June 30, 2023, <https://psnet.ahrq.gov/primer/rapid-response-systems>.

¹⁶ VHA Directive 1177, *Cardiopulmonary Resuscitation*, January 4, 2021; Facility Policy MCP 11-51, *Cardiopulmonary Resuscitation Policy*, June 17, 2021.

¹⁷ Nicholas G. Bircher, Paul S. Chan, and Yan Xu, "Delays in Cardiopulmonary Resuscitation, Defibrillation, and Epinephrine Administration All Decrease Survival in In-hospital Cardiac Arrest," *Anesthesiology* 130, no. 3 (March 2019): 414-22.

- The telemetry technician calls the patient's assigned nurse by Vocera for immediate assessment of the patient.
- If the telemetry technician cannot reach the nurse within 30 seconds, the telemetry technician calls the charge nurse.
- If the telemetry technician cannot reach the charge nurse within 15 seconds, the telemetry technician calls the landline (nurse's station) on the medical floor.
- If the telemetry technician cannot reach nursing staff, within 15 seconds the telemetry technician calls a blue alert.¹⁸

Similarly, if at any time a patient's cardiac condition triggers the critical clinical alarm of asystole, nursing staff on the medical floor receive an automated Vocera broadcast. If a response from nursing staff is not received within 15 seconds, the telemetry technician initiates a blue alert by calling the operator.¹⁹

While the off-going nurses were in training, the patient's heart rate decreased to 38 bpm. The OIG found that when the patient's heart rate fell below 50 bpm, the telemetry technician did not follow the policy's outlined steps but took other actions. Within the first minute after the patient's heart rate decreased, the telemetry technician attempted to contact the assigned nurse twice and then initiated a Vocera broadcast to nursing staff on the medical floor. Approximately four minutes later, the patient developed asystole. The telemetry technician attempted to contact the assigned nurse again and then notified the facility operator to call an RRT.

The OIG determined that the telemetry technician never initiated a blue alert. Based on facility policy, the OIG would have expected the telemetry technician to initiate a blue alert at two instances: (1) within approximately one minute of starting the series of communications when unable to reach nursing staff, and (2) upon the critical alarm signaling that the patient was in asystole. Had facility policy been followed, the telemetry technician likely would have initiated a blue alert at the first instance, and the facility operator would have paged for a blue alert approximately six minutes earlier.²⁰ The OIG learned that nursing staff responded to the Vocera announcement and when the patient developed asystole, they started cardiopulmonary resuscitation and requested a blue alert. The blue alert team arrived within 3 minutes of the operator's page and continued resuscitation efforts.

¹⁸ Facility SOP 118-07, "Remote Cardiac Telemetry Monitoring," March 2, 2022. Facility telemetry technicians utilize telemetry monitors to track patients' heart rates and rhythms from a room off the medical floor using telemetry monitor screens. Telemetry monitor screens are also centrally located at the nurses' station on the medical floor.

¹⁹ Facility SOP 118-07; Facility SOP 11-2023-01, "Procedures for Blue Alert," January 19, 2023.

²⁰ The telemetry technician contacted nurses; however, the telemetry technician told the OIG of not being aware that nurses had responded, therefore, believed nursing staff had not been reached.

During an interview, the telemetry technician recalled being unable to reach the patient's assigned nurse for a rescue response. The OIG learned the telemetry technician successfully reached the patient's assigned nurse in training; thus, discovering the assigned nurse was off the floor. The OIG asked why the telemetry technician called an RRT and not a blue alert, and the telemetry technician responded "[b]ecause I'm not there, and I don't know if the patient is unconscious or not." The OIG questions the telemetry technician's reasoning for calling an RRT as the patient was in asystole for approximately one minute before the facility operator paged for an RRT when a blue alert was warranted.

The OIG found that nurses responded to the telemetry technician's Vocera broadcast and started emergency care; however, the telemetry technician was unaware of the response and should have continued to follow policy and initiated a blue alert.

A Charge Nurse's Failure to Assign a Nurse to the Patient

The OIG determined the charge nurse failed to designate a nurse to care for the patient while the assigned nurse was in training.

An established and important role of a charge nurse is to make nursing assignments and to ensure safe patient care.²¹ According to facility policy, charge nurses are responsible to communicate nursing assignments to telemetry technicians.²²

When the OIG asked the charge nurse who was responsible for the patient's care during the mandatory training, the charge nurse said, ". . . all of us [nurses on the medical floor]." According to the ADPCS, patients are at risk when nursing assignments do not reflect a designated nurse responsible for a patient's care, adding, "I like the team mentality, but we can't do that with patients. We have to have someone assigned to patients." The OIG determined that more likely than not, if the charge nurse had made nursing assignments and communicated this information to the telemetry technician, the telemetry technician would have reached nursing staff sooner.

The OIG estimates that facility policy permits less than a minute for the telemetry technician to complete the series of communications, including calling a blue alert when nursing staff cannot be reached or a critical clinical alarm is triggered. If the telemetry technician called for a blue alert within approximately one minute of not reaching nursing staff or when the patient became asystolic, the blue alert team would likely have been initiated sooner. Thus, the OIG concluded failures of the telemetry technician and the charge nurse contributed to a delay in initiating the blue alert for decreased heart rate and asystole, which may have affected the patient's outcome.

²¹ Heather Cathro, "A Practical Guide to Making Patient Assignments in Acute Care," *The Journal of Nursing Administration* 43, no. 1 (January 2013): 6-9.

²² Facility SOP 118-07.

An ICU Fellow's Failure to Document a Response to the Consult

The OIG determined that an ICU fellow failed to document a response to the critical care consult.²³

Per VHA guidance, EHR documentation ensures the continuity of patient care and communication of health information between providers. Incomplete EHR documentation may affect providers' ability to develop comprehensive diagnoses and treatment plans at future points in patients' care.²⁴ Facility bylaws require that when a physician is consulted regarding a patient, the physician must respond with a "written opinion" in the patient's EHR.²⁵

Two days prior to the patient's death, the intern on the medical floor requested a critical care consult to assess the patient's need for continuous BiPAP. At the time of the request, the patient was receiving oxygen by high flow nasal cannula with intermittent and "at night and napping" BiPAP; however, the patient was experiencing occasions of decreased oxygen saturation when off BiPAP. During an OIG interview, the intern recalled the patient's respiratory status as "difficult to control" but "better" when receiving BiPAP support. The intern further explained "trying to ensure [for the patient] the highest amount of time possible [on BiPAP]" while admitted to the medical floor since continuous BiPAP use is only available in the ICU.²⁶

The OIG reviewed the critical care consult request in the patient's EHR and found no evidence of a response (written opinion) from an ICU physician. The OIG found EHR notes, written by the intern and the ICU resident, alluded to ICU Service staff having evaluated the patient.²⁷ The OIG determined an ICU physician most likely evaluated the patient but did not document the evaluation. During interviews, the intern was unable to recall who evaluated the patient; and the ICU resident could not recall who determined the patient as stable for the medical floor. The ICU fellow, who was on call at the time of the consult, could not recall evaluating the patient.

²³ VHA Directive 1400.01, *Supervision of Physician, Dental, Optometry, Chiropractic, and Podiatry Residents*, November 7, 2019. Fellows are physicians pursuing studies in a specialized field of medicine, such as critical care, after completion of initial medical education and residency.

²⁴ VHA Office of Health Informatics, *VHA Clinical Documentation Integrity Program Guide*, updated January 2022.

²⁵ Facility Bylaws and Rules, *Bylaws and Rules of the Medical Staff of Veterans Health Administration (VHA)*, December 2021.

²⁶ Facility SOP 123-05, "Standard Operating Procedure Noninvasive Positive Pressure Ventilation," June 24, 2020. Facility policy allows the use of intermittent, not continuous, BiPAP outside of the ICU for patients experiencing respiratory failure.

²⁷ The intern documented that, overnight, ICU staff were consulted and provided treatment recommendations. The next day, the ICU resident wrote that, prior to the patient's transfer to the ICU that day, "ICU was called for evaluation" and the patient was "deemed stable for floor."

The Chief of Staff and the chief of critical care confirmed that an ICU physician should have documented the consult response in the EHR but supported the decision not to transfer the patient for ICU care, which could have included the use of continuous BiPAP.

The OIG was unable to determine whether the patient needed a higher level of care because the consultation process was incomplete. The ICU fellow failed to document an evaluation and was unable to recall the patient. Therefore, the OIG was unable to determine the rationale for declining the patient's transfer to the ICU.

2. Leaders' Response

The OIG determined that facility leaders conducted a factfinding and an RCA, both of which failed to identify systemic and causal factors, such as the deficiencies in communication and failure to follow facility processes presented in section 1. The OIG found process deficiencies with the reviews that may have hindered the depth of the evaluations.²⁸

VHA uses administrative and quality management reviews, such as factfindings and RCAs, when a thorough analysis of an event is needed.²⁹ VHA requires that medical facilities investigate sentinel events and identify causal factors.³⁰

Factfinding

The OIG found that the ADPCS did not issue an authorization letter after initiating the factfinding.

According to VA policy, when a factfinding is conducted by someone other than the facility leader initiating the review, an authorization letter is required to provide the factfinding investigator clear guidance on the focus of the investigation.³¹ The authorization letter provides a blueprint for the review and may include details such as the issues to be investigated, evidence already gathered, and names of witnesses or potential interviewees.³²

²⁸ VHA Directive 1320, *Quality Management and Patient Safety Activities That Can Generate Confidential Records and Documents*, July 10, 2020; VA Handbook 0700, *Administrative Investigation Boards and Factfindings*, August 17, 2021. A factfinding is a type of administrative review used to determine facts about a situation or event and may be used when investigating potential disciplinary actions. The OIG learned from facility leaders that a peer review of a medicine physician was also conducted. A peer review is a type of confidential, non-punitive quality review in which another clinician evaluates an episode of care and may identify system and process issues; VHA Directive 1190, *Peer Review for Quality Management*, November 21, 2018.

²⁹ VHA Directive 1320; VA Handbook 0700.

³⁰ VHA Handbook 1050.01; VHA Directive 1050.01. Both the handbook and directive contain similar language about the investigation of sentinel events.

³¹ VA Handbook 0700.

³² VA Handbook 0700.

According to the factfinding investigator, in late spring 2022, the ADPCS initiated a factfinding investigation into the patient's death. The factfinding investigator told the OIG that the ADPCS did not provide an authorization letter. When asked about the authorization letter, the ADPCS, with uncertainty, confirmed not having issued a "charter letter" to the factfinding investigator but sent an email "to please initiate a factfinding out of the ADPCS office." The OIG found no evidence that the ADPCS provided an authorization letter to the factfinding investigator. The ADPCS told the OIG of being new to the role and the facility and feeling overwhelmed during this time.³³

The OIG reviewed the outcome of the factfinding to determine the thoroughness of the investigation. The factfinding investigator concluded that the nurses' response to the blue alert was appropriate but the charge nurse did not follow the nurse manager's plan to utilize the replacement nurses. Furthermore, there were possible delays in care due to the telemetry technician's inability to timely reach nursing staff.³⁴ The factfinding investigator recommended action to address the lack of the assigned nurse's documentation in the patient's EHR and the charge nurse's failure to follow the staffing plan.³⁵ However, the factfinding investigator emphasized to the OIG that "the biggest issue" found was a lack of nursing documentation in the EHR, which could not be related as a causal factor in the patient's death.

The OIG concluded that an authorization letter would have likely provided assistance with pursuing alternative ways to ascertain facts or related evidence to determine causal factors.

³³ Of note, the Deputy ADPCS told the OIG of starting this role approximately one month after the ADPCS.

³⁴ During an OIG interview, the medical floor nurse manager recalled communicating with the assistant nurse manager that the additional nurses would cover the off-going nurses' patients. The assistant nurse manager of the medical floor recalled that, although the nurse manager communicated additional nurses would be staffed during the shift, the assistant nurse manager did not receive communication regarding making specific assignments.

³⁵ During the onsite inspection, the OIG informed facility leaders about delays in the telemetry technician's communication to nursing staff as well as the failure to call a blue alert in accordance with facility policy. As a result, nursing leaders required all telemetry technicians to review the cardiac telemetry SOP.

RCA

The OIG found that the RCA team did not interview some staff members who were directly involved with the patient event (the necessary individuals).³⁶

VHA guidance for conducting an RCA includes interviewing employees directly involved in the adverse event to gather facts and information to establish the sequence of events.³⁷ Additionally, if administrative investigation and quality review teams are each, respectively, performing a factfinding and an RCA for the same event, the investigations are completed separately to prevent disclosure of protected information. However, policy does not preclude the separate teams from interviewing the same individuals.³⁸

After approximately 8 weeks, facility leaders determined the patient's death was a sentinel event, the Facility Director chartered an RCA to determine the root cause and contributing factors, if any, to the patient's death. According to the chief of Quality Management and Performance Improvement, the outcome of the RCA identified concern with staff responses to the blue alert and facility leaders identified action items to address the concern.

The chief of Quality Management and Performance Improvement told the OIG that Nursing Service leaders prohibited the RCA team from interviewing individuals that were also interviewed by the factfinding team, which "hamper[ed] our RCA." Although separate teams performed the factfinding and RCA concurrently, the chief of Quality Management and Performance Improvement told the OIG that "nursing [leaders]" were adamant that, because the factfinding had not concluded, the RCA team could not interview "certain folks" also interviewed for the factfinding. After consulting with VISN staff, Quality Management and Performance Improvement Service leaders decided to proceed with the RCA, knowing

³⁶ VA Handbook 0700, *Administrative Investigation Boards and Factfindings*, August 17, 2021; VA OIG, *Deficiencies in Care, Care Coordination, and Facility Response to a Patient Who Died by Suicide, Memphis VA Medical Center in Tennessee*, Report No. 19-09493-249, September 3, 2020. Staff conducting an RCA not interviewing individuals directly involved in a patient event is a repeat OIG finding; VHA Handbook 1050.01; VHA Directive 1050.01. Both the handbook and directive contain similar language about RCAs: the directive references RCA resources including the RCA Step-By-Step Guide; "Root Cause Analysis (RCA) Step-By-Step Guide," VA National Center for Patient Safety, accessed July 27, 2022, http://vaww.ncps.med.va.gov/Tools/RCAToolbox/RCA_Step_By_Step_Guide_REV7.1.16_Final.pdf. (This website is not publicly accessible.) As of September 14, 2023, "Root Cause Analysis (RCA) Step-By-Step Guide" has been removed from the website.

³⁷ VHA Handbook 1050.01; VHA Directive 1050.01. Both the handbook and directive contain similar language about RCAs: the directive references RCA resources including the RCA Step-By-Step Guide; however, the directive does not specify who to interview. "Root Cause Analysis (RCA) Step-By-Step Guide," VA National Center for Patient Safety, accessed July 27, 2022, http://vaww.ncps.med.va.gov/Tools/RCAToolbox/RCA_Step_By_Step_Guide_REV7.1.16_Final.pdf. (This website is not publicly accessible.) This guide has been removed from the website.

³⁸ VA Handbook 0700; VHA Handbook 1050.01; VHA Directive 1050.01. Both the handbook and directive contain similar language about administrative and quality reviews conducted at the same time.

components would be missing. The ADPCS and Deputy ADPCS told the OIG of having no recollection or knowledge of providing instruction for prohibiting RCA interviews or of any other nursing leader precluding those interviews.

Without interviewing the necessary individuals involved in the patient's care at the time surrounding the patient event, especially in the absence of related documentation, the OIG questions the RCA team's ability to establish a sequence of events and perform a comprehensive quality review. Not interviewing the necessary individuals in an RCA is a repeat finding from the September 2020 OIG report.³⁹ The OIG would have expected Quality Management and Performance Improvement Service leaders to advise the RCA team to interview the necessary individuals, regardless of the alleged guidance from nursing leaders.

The OIG found that neither the factfinding investigation nor the RCA identified concerns with the telemetry technician's and charge nurse's actions and the reviews had conflicting findings regarding staffs' response to the blue alert. The OIG concluded that an authorization letter for the factfinding would have likely provided direction on alternative ways to ascertain facts, in the absence of nursing documentation, to determine causal factors. Furthermore, not interviewing staff directly involved in a patient event hindered the facility leaders' ability to complete a thorough review. The lack of a thorough review may result in failure to identify causal factors and implement corrective actions to prevent a similar occurrence in the future.

Conclusion

The patient's quality of care was affected by deficiencies in communication and failure to follow facility processes. Nursing Service staffs' actions contributed to the delayed initiation of a blue alert, which may have affected the patient's outcome. Specifically, at two points in time, the telemetry technician failed to call for a blue alert as outlined by facility policy. Additionally, a charge nurse's failure to assign a nurse to the patient and communicate accurate nursing assignments to the telemetry technician reduced the telemetry technician's ability to successfully reach a nurse assigned to the patient. Although the telemetry technician's Vocera broadcast successfully reached nurses on the medical floor, the telemetry technician was unaware that nurses responded and initiated needed emergency care. Rather than calling for a blue alert when the telemetry technician could not reach nursing staff or when the patient experienced asystole, the telemetry technician called for an RRT and continued efforts to reach the assigned nurse. Had facility policy been followed, the telemetry technician would have initiated a blue alert when unable to reach nursing staff, and the facility operator would have been notified to initiate a blue alert approximately six minutes earlier.

³⁹ VA OIG, *Deficiencies in Care, Care Coordination, and Facility Response to a Patient Who Died by Suicide, Memphis VA Medical Center in Tennessee*.

An ICU fellow's failure to document a response to the critical care consult exemplified another communication deficiency. The OIG found no evidence of a written response from an ICU physician in the patient's EHR. Furthermore, the ICU fellow was unable to recall the patient or comment on the rationale for declining the patient's transfer to the ICU. Because the consult process was incomplete, the OIG was unable to determine whether the patient needed a higher level of care.

Although facility leaders completed the factfinding and RCA, deficiencies with the processes hindered the depths of the evaluations, which did not identify systemic and causal factors, such as the communication deficiencies and failure to follow facility processes presented in this report. The ADPCS did not provide the factfinding investigator with an authorization letter and the RCA team did not interview the necessary individuals, which is a repeat finding from a previous OIG report.

Recommendations 1–5

1. The Lt. Col. Luke Weathers, Jr. VA Medical Center Director ensures Nursing Service staff comply with the cardiac telemetry monitoring policy.
2. The Lt. Col. Luke Weathers, Jr. VA Medical Center Director ensures the medical floor charge nurses create nursing assignments and communicate this information to the telemetry technician and monitors for compliance.
3. The Lt. Col. Luke Weathers, Jr. VA Medical Center Director ensures that Intensive Care Unit Service physicians document and complete written responses to critical care consults as required and monitors for compliance.
4. The Lt. Col. Luke Weathers, Jr. VA Medical Center Director ensures that the Quality Management and Performance Improvement Service conduct administrative reviews and root cause analyses in accordance with Veterans Affairs and Veterans Health Administration policy and monitors for compliance.
5. The Lt. Col. Luke Weathers, Jr. VA Medical Center Director consider completion of another root cause analysis to ensure additional system vulnerabilities that may have contributed to this patient event are identified and action plans completed, as applicable, to prevent reoccurrence of similar patient events.

Appendix A: VISN Director Memorandum

Department of Veterans Affairs Memorandum

Date: November 9, 2023

From: Director, VA MidSouth Integrated Service Network (10N9)

Subj: Healthcare Inspection—Care Deficiencies and Leaders' Inadequate Reviews of a Patient Who Died at the Lt. Col. Luke Weathers, Jr. VA Medical Center in Memphis, Tennessee

To: Director, Office of Healthcare Inspections (54HL04)
Director, GAO/OIG Accountability Liaison Office (VHA 10BGOAL Action)

1. I have reviewed the OIG Draft Report, "Care Deficiencies and Leaders' Inadequate Reviews of a Patient Who Died at the Lt. Col. Luke Weathers, Jr. VA Medical Center," discussed the matter with the Medical Center Director, and concur with the five OIG recommendations
2. Reviewing the report reminded me of the sadness we collectively experienced learning of the events, and it reinforced our commitment to ensuring every team member's diligence to deliver safe, quality care to our Veterans consistently. We, VISN 9, are committed to a culture of zero patient harm, where cultural norms include clear communication, psychological safety, and continuous process improvement. To that end, the Network and the Medical Center will continue to work together to evaluate and refine processes, enhance professional development evaluation systems, and integrate patient safety into multiple aspects of the healthcare culture.
3. I want to thank the OIG Team for their insight and the opportunity to respond to these findings. If there are any questions regarding this response, please get in touch with VISN 9, Quality and Patient Safety.

(Original signed by:)

Gregory Goins, FACHE
Network Director

OIG comment: The OIG received the above memorandum from the VISN Director on December 11, 2023.

Appendix B: Facility Director Memorandum

Department of Veterans Affairs Memorandum

Date: November 9, 2023

From: Director, Lt. Col Luke Weathers, Jr. VA Medical Center (614/00)

Subj: Healthcare Inspection—Care Deficiencies and Leaders' Inadequate Reviews of a Patient Who Died at the Lt. Col. Luke Weathers, Jr. VA Medical Center in Memphis, Tennessee

To: Director, VA Integrated Service Network (10N9)

1. Attached please find the Memphis VA Medical Center's response to the OIG Draft Report, Care Deficiencies and Leaders' Inadequate Reviews of a Patient Who Died at the Lt. Col. Luke Weathers, Jr. VA Medical Center.
2. I was saddened to hear of the events regarding this tragic loss of life. I will not forget the events of that day. I am ensuring we do everything possible to prevent something like this from happening again. Thorough reviews have been conducted to discover the contributing factors on that fateful day and steps taken to improve the systemic issues, including communications, hospital policy, staff training, and management.
3. On behalf of everyone at Lt. Col. Luke Weathers, Jr. VAMC, I extend my deepest condolences. If there are any further questions, please contact Quality and Patient Safety, Lt. Col Luke Weathers, Jr. VA Medical Center.

(Original signed by:)

Joseph Vaughn, MBA, FACHE
Medical Center Director

OIG comment: The OIG received the above memorandum from the VISN Director on December 11, 2023.

Facility Director Response

Recommendation 1

The Lt. Col. Luke Weathers, Jr. VA Medical Center Director ensures Nursing Service staff comply with the cardiac telemetry monitoring policy.

Concur

Nonconcur

Target date for completion: May 1, 2024

Director Comments

The policy for Cardiac Monitoring was revised for clarification and training provided. The Nursing Managers (acute care) will verify that Standard Operating Procedure (SOP) 118-07 (Cardiac Monitoring) was provided to all current and new nursing employees. The Nurse Manager will require a receipt of the SOP acknowledgment indicating they had read and understand the policy. The algorithm for actions needed for rhythms that require notification was posted in Monitor Tech room for quick reference. The Nursing Managers audits all Rapid Response Team (RRTs) and Blue Alerts (BAs) of patients on continuous telemetry monitoring to ensure appropriate actions were aligned with the SOP for the rhythm or issue identified. The monitor tech supervisor will perform 15 monthly audits of telemetry rhythm strip which warranted notification to ensure compliance with the SOP and reinforce any variances. The results of both audits will be reported at Quality & Patient Safety Committee (QPSC) monthly until six consecutive months with 95% compliance have been achieved.

Recommendation 2

The Lt. Col. Luke Weathers, Jr. VA Medical Center Director ensures the medical floor charge nurses create nursing assignments and communicate this information to the telemetry technician and monitors for compliance.

Concur

Nonconcur

Target date for completion: December 31, 2023

Director Comments

Training occurred for the monitor techs and charge nurses regarding the policy of how nursing assignments are communicated for change of shifts as well as when a nurse has vacated their position for any reason. The monitor techs have also had reinforcement to contact the charge nurse when any delays occur. The monitor tech supervisor will maintain a folder of nursing

assignment sheets which will be randomly audited for all shifts to assure that assignments are consistently communicated to the monitor room. The monitor tech supervisor will complete 20 audits and submit monthly to the Chief Nurse Critical Care. The nurse manager audits the nurse assignment for appropriate adjustments of coverage when staffing plan was altered. The Charge Nurse on the Medical/Surgical floors will submit assignment sheets to monitor rooms and maintain a folder of faxed/emailed copies to ensure current nursing assignments are provided to the monitor room. These audits were initiated in June of 2023. Both audit results and actions taken will be reported quarterly to QPSC.

OIG Comments

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

Recommendation 3

The Lt. Col. Luke Weathers, Jr. VA Medical Center Director ensures that Intensive Care Unit Service physicians document and complete written responses to critical care consults as required and monitors for compliance.

Concur

Nonconcur

Target date for completion: September 23, 2023

Director Comments

The Chief of Staff reviewed with the Clinical Service Chiefs the importance of completing all clinical consults with written documentation at the Clinical Practice Group (CPG) meeting in April 2023. To ensure compliance that all critical care consults were appropriately answered with written responses, the Deputy Chief of Staff (DCOS) audited all critical care consults that occurred between March 2023 to September 2023. Audits revealed that all critical care consults in that time were completed with written documentation to reflect the answer to the question posed in the consult. There was a total of 46 critical care consults in that audit time; 44 of them had the appropriate written documentation. Of the two that did not, one was discontinued as a duplicate order, and needed no written documentation. The second one was placed in error and discontinued by the Intensive Care Unit (ICU) 45 minutes after it was placed; the Veteran was already in the ICU. To ensure ongoing sustainment of written documentation for all critical care consults, the audit results will be reported at QPSC monthly until six consecutive months with 95% compliance have been achieved.

OIG Comments

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

Recommendation 4

The Lt. Col. Luke Weathers, Jr. VA Medical Center Director ensures that the Quality Management and Performance Improvement Service conduct administrative reviews and root cause analyses in accordance with Veterans Affairs and Veterans Health Administration policy and monitors for compliance.

Concur

Nonconcur

Target date for completion: October 1, 2023

Director Comments

Patient safety events were addressed in Joint Patient Safety Reporting (JPSR) to determine the level of harm associated with the event. All JPSRs were assigned the appropriate safety assessment code (SAC) and required actions were done in accordance with VHA Directive 1050.01. If review of the event met the SAC scoring of an actual or potential 3 according to the SAC matrix, a root cause analysis (RCA) was chartered. The RCA quality assessment tool (QAT) was utilized to determine the quality of the any RCA from March 2023 until October 2023, in accordance with National Center of Patient Safety and VHA guidelines. All RCAs between March 2023 and October 2023 received a score of Good to Excellent, and based on their QAT score were compliant. This monitoring process will be continued to verify sustainment and reported in QPSC. If any RCA scores below Good, a consultation session will be scheduled with the NCPS analyst to discuss areas for improvement.

OIG Comments

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

Recommendation 5

The Lt. Col. Luke Weathers, Jr. VA Medical Center Director consider completion of another root cause analysis to ensure additional system vulnerabilities that may have contributed to this patient event are identified and action plans completed, as applicable, to prevent reoccurrence of similar patient events.

Concur

___ Nonconcur

Target date for completion: October 20, 2023

Director Comments

The Root Cause Analysis (RCA) related to the event revealed system issues associated with resuscitation roles, training, and documentation during the Blue Alert (BA). This was a unique and extremely serious situation that was identified as involving both managerial and process components. A Fact Finding (FF) was initiated in June of 2022 but after further discussion about the event in July by the Medical Center Director (MCD), Associate Director of Patient Care Services (ADPCS), Chief Quality and Patient Safety (QPS) and Chief of Staff, it was determined that a Root Cause Analysis (RCA) could also help in preventing this type of “failure to rescue” event. Although performing two reviews concurrently is not ideal, leadership felt it paramount to identify and improve any contributing systems issues to improve safety and reduce ongoing risk. While the Fact Finding (FF) was in progress, care was taken to protect information and integrity of the processes, this included coordinating a few employee interviews to occur after completion of their FF interviews. This did not impact the timeliness of the RCA which was completed within the 45-day target including completion of all appropriate interviews. The RCA revealed systemic issues associated with resuscitation roles, training, and documentation during the Blue Alert. The staff interviewed in the RCA did not recognize the issue of calling the Blue Alert in lieu of a Rapid Response Team (RRT) because they were not aware of the policy change. The charge nurse assignment, telemetry and the reckless behavior concerns were addressed through managerial reviews. As a result of the RCA action item, extensive mock codes and training were completed and have been sustained in the months since that time. The weekly mock code training reports are sent to the Patient Safety Manager who then reports on those in QPSC. After consideration of OIG’s recommendation to conduct a second RCA, the Medical Center Director believes it would not be beneficial given the amount of time which has passed since the event, the departure of the majority of the staff involved, the potential for hindsight bias, and degeneration of actual memory regarding the event. Evidence supports that the improvements have been sustained. The initial Mock Code training was completed September 2022 and included clear role delineations for all levels of staff. Since completion of the initial mock code education, staff competency is maintained via ongoing training with mock code scenarios provided by Memphis’ mock code program coordinator. Weekly training status reports are provided to the Patient Safety Officer. Quarterly reports are provided through the Quality and Patient Safety Committee up to the Executive Leadership Council. Since these actions were implemented, there have been no further patient safety events associated with failure to rescue and the clinical competency of the Blue Alert team identified.

OIG Comments

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.

activities of daily living. Activities related to personal care, including bathing, dressing, toileting, and eating. A person who has difficulty performing an activity without assistance (from others or from special equipment) is considered to have limitations in that activity.¹

acute hypoxic respiratory failure. A condition when the exchange of gas between the lungs and blood results in insufficient oxygen at the tissue level to properly maintain support of the body's functions.

acute respiratory distress syndrome. Otherwise known as ARDS, acute respiratory distress syndrome is an "inflammatory lung injury" caused by fluid build-up in the air sacs of the lungs resulting in "dangerously low oxygen levels in the blood." ARDS patients may need ICU level of care and a ventilator to help them breathe.²

afebrile. Having no fever, without a fever.³

anticoagulation. The use of medication to prevent blood from clotting.⁴

asystole. Occurs when the heart stops pumping due to a failure of the heart's electrical system. Also known as "flat-line" or "flat-lining" referring to the flat-line that shows on an electrocardiogram. Without immediate life-saving intervention, asystole results in death within minutes.⁵

atrial fibrillation with rapid ventricular response. Atrial fibrillation is a type of abnormal heartbeat caused by extremely fast and irregular contractions of the upper chambers of the heart. In some cases, the rapid contraction of the upper chambers results in the lower chambers of the heart contracting too quickly. This is known as atrial fibrillation with rapid ventricular response; when this occurs, the heart cannot meet the body's needs for oxygenated blood and can lead to heart failure.⁶

¹ Centers for Medicare and Medicaid Services, "Activities of Daily Living," accessed April 4, 2023, https://www.cms.gov/research-statistics-data-and-systems/research/mcbs/downloads/2008_appendix_b.pdf.

² Cleveland Clinic, "Acute Respiratory Distress Syndrome (ARDS)" (web page), accessed May 19, 2023, <https://my.clevelandclinic.org/health/diseases/15283-acute-respiratory-distress-syndrome-ards>.

³ Merriam-Webster.com Dictionary, "afebrile," accessed April 26, 2023, <https://www.merriam-webster.com/dictionary/afebrile>.

⁴ Merriam-Webster.com Dictionary, "anticoagulation," accessed August 30, 2023, <https://www.merriam-webster.com/medical/anticoagulation#social-links>.

⁵ Cleveland Clinic, "Asystole" (web page), accessed April 4, 2023, <https://my.clevelandclinic.org/health/symptoms/22920-asystole>.

⁶ "What is Afib?" (web page), Johns Hopkins Medicine, accessed April 4, 2023, <https://www.hopkinsmedicine.org/health/conditions-and-diseases/atrial-fibrillation#:~:text=What%20is%20A%20fib%20with%20RVR,body's%20need%20for%20oxygenated%20blood>.

atrial flutter. This is an abnormal heart rhythm that happens when a short circuit of the heart's electrical pathway causes the right upper chamber of the heart to pump fast and can prevent the heart's chambers from filling completely.⁷

bilevel positive airway pressure. A device that assists a patient's breathing using a mask or nasal plugs to open the lungs by pushing pressurized air into the airways. With BiPAP, a patient receives pressurized air both when breathing in and breathing out, but the pressure received when breathing in is higher.⁸

bilirubin. A yellow pigment in bile fluid that normally circulates in the blood. Bilirubin levels in the blood are controlled by the liver and high or low levels "might indicate that some part of the process of breaking down and clearing old red blood cells isn't working correctly."⁹

blue alert. An announcement (also known as a code blue) that is used to alert hospital personnel that a patient is experiencing a medical emergency, such as a cardiac or respiratory arrest. Responding hospital personnel are trained to use various methods, including cardiopulmonary resuscitation, defibrillation, and medications, to revive the patient. The announcement also informs hospital personnel where the emergency is located within the hospital.¹⁰

cardiopulmonary resuscitation. An emergency procedure that uses chest compressions and rescue breathing to restore a person's breathing after cardiac arrest.¹¹

cholecystectomy. The surgical removal of the gallbladder.¹²

cholecystitis. Inflammation of the gallbladder, most often due to gallstones blocking the tube leading out of the gallbladder.¹³

⁷ Johns Hopkins Medicine, "atrial flutter" (web page), accessed June 26, 2023, <https://www.hopkinsmedicine.org/health/conditions-and-diseases/atrial-flutter>.

⁸ Johns Hopkins Medicine, "BiPap" (web page), accessed April 4, 2023, <https://www.hopkinsmedicine.org/health/treatment-tests-and-therapies/bipap#:~:text=What%20is%20BiPap%3F,expand%20when%20you%20breathe%20in>.

⁹ Cleveland Clinic, "bilirubin test" (web page), accessed April 4, 2023, <https://my.clevelandclinic.org/health/diagnostics/17845-bilirubin>.

¹⁰ Cleveland Clinic, "code blue hospital" (web page), accessed April 10, 2023, <https://my.clevelandclinic.org/health/articles/23532-code-blue-hospital>.

¹¹ Merriam-Webster.com Dictionary, "cardiopulmonary resuscitation," accessed April 10, 2023, <https://www.merriam-webster.com/dictionary/cardiopulmonary%20resuscitation>.

¹² Merriam-Webster.com Dictionary, "cholecystectomy," accessed April 4, 2023, <https://www.merriam-webster.com/dictionary/cholecystectomy>.

¹³ Mayo Clinic, "cholecystitis" (web page), accessed April 17, 2023, <https://www.mayoclinic.org/diseases-conditions/cholecystitis/symptoms-causes/syc-20364867>.

computed tomography angiogram. An imaging test used to check for heart conditions, by viewing the heart's blood vessels and tissues, using injected contrast dye and specialized x-rays.¹⁴

computerized tomography scan. "Combines a series of x-ray images taken from different angles around [the] body and uses computer processing to create cross-sectional images (slices) of the bones, blood vessels and soft tissues."¹⁵

consult. "A request for clinical services on behalf of a patient."¹⁶

continuous BiPAP. Utilization of a BiPAP device to provide cycles of higher and lower levels of positive airway pressure in an ongoing, rather than intermittent, manner.

crackles. Very fine sounds, high-pitched and discontinuous, produced when small airways pop open and associated with various lung conditions, such as pneumonia, heart failure, fibrosis, or acute respiratory distress syndrome.

cutaneous T-cell lymphoma. A rare type of cancer that causes the body's germ-fighting white blood cells, known as T cells, to develop abnormalities that cause the cells to attack the skin.¹⁷

diastolic heart failure. Occurs when the heart's main pumping chamber, or left ventricle, is prevented from filling properly, which happens when left ventricle becomes stiff and cannot relax between heartbeats.¹⁸

diuretic. Also known as water pills, diuretics help to remove water from the blood to decrease the amount of fluid in the body.¹⁹

dyspnea. Also known as shortness of breath, dyspnea is the feeling of being unable to get enough air into the lungs.²⁰

¹⁴ Cleveland Clinic, "CT angiogram" (web page), accessed May 19, 2023, <https://my.clevelandclinic.org/health/diagnostics/16899-coronary-computed-tomography-angiogram>.

¹⁵ Mayo Clinic "CT scan" (web page), accessed April 4, 2023, <https://www.mayoclinic.org/tests-procedures/ct-scan/about/pac-20393675>.

¹⁶ VHA Directive 1232(5), *Consult Processes and Procedures*, August 24, 2016, amended December 5, 2022.

¹⁷ Mayo Clinic, "cutaneous T-cell lymphoma" (web page), accessed April 4, 2023, <https://www.mayoclinic.org/diseases-conditions/cutaneous-t-cell-lymphoma/symptoms-causes/syc-20351056>.

¹⁸ Cleveland Clinic, "diastolic heart failure" (web page), accessed April 4, 2023, <https://my.clevelandclinic.org/health/diseases/22950-diastolic-heart-failure>.

¹⁹ Mayo Clinic, "diuretics" (web page), accessed April 4, 2023, <https://www.mayoclinic.org/diseases-conditions/high-blood-pressure/in-depth/diuretics/art-20048129#:~:text=Diuretics%2C%20sometimes%20called%20water%20pills,This%20reduces%20blood%20pressure>.

²⁰ Cleveland Clinic, "dyspnea" (web page), accessed April 4, 2023, <https://my.clevelandclinic.org/health/symptoms/16942-dyspnea>.

electrocardiogram or EKG. A medical device used to record the electrical activity in the heart.²¹

epigastric. The abdominal region lying above the umbilical region.²²

hemoglobin. A protein in the red blood cells responsible for transporting oxygen to organs and tissues and carrying carbon dioxide from organs and tissues back to the lungs.²³

high flow nasal cannula. A method of delivering heated and humidified supplemental oxygen at a high flow (40 to 60 liters per minute) through a tube to the patient's nostrils.²⁴

hypoxic. "Having too little oxygen."²⁵

interstitial airspace disease. Scarring of the airspaces (alveoli) where gas exchange normally occurs allowing oxygen to enter, and carbon dioxide to leave, the blood.

intravenous. "Intravenous usually refers to a way of giving a drug or other substance through a needle or tube inserted into a vein. Also called IV."²⁶

magnetic resonance cholangiopancreatography. Also known as a MRCP, a type imaging test of the pancreatic and bile duct (biliary) systems that uses a dye (infused through an intravenous line) to produce clear images of the organs and connecting tubes.²⁷

oxygen saturation. The amount of oxygen circulating in the blood; also known as blood oxygen level. For individuals without lung disease, normal levels range from 95 to 100 percent.²⁸

pitting edema. "Edema is swelling caused by too much fluid trapped in the body's tissues." Pitting edema occurs when skin holds a dimple after being "pressed for a few seconds."²⁹

²¹ Mayo Clinic, "electrocardiogram (ECG or EKG)" (web page), accessed April 4, 2023, <https://www.mayoclinic.org/tests-procedures/ekg/about/pac-20384983>.

²² Merriam-Webster.com Dictionary, "epigastric," accessed April 4, 2023, <https://www.merriam-webster.com/dictionary/epigastric#medicalDictionary>.

²³ Mayo Clinic, "Hemoglobin test" (web page), accessed April 4, 2023, <https://www.mayoclinic.org/tests-procedures/hemoglobin-test/about/pac-20385075>.

²⁴ Ewan C. Goligher and Arthur S. Slutsky, "Not Just Oxygen? Mechanisms of Benefit from High-Flow Nasal Cannula in Hypoxemic Respiratory Failure," *American Journal of Respiratory and Critical Care Medicine* 195, No. 9 (May 1, 2017): 1128-1131.

²⁵ NIH National Cancer Institute, "hypoxic," accessed April 4, 2023, <https://www.cancer.gov/publications/dictionaries/cancer-terms/def/hypoxic>.

²⁶ NIH National Cancer Institute, "intravenous," accessed April 4, 2023, <https://www.cancer.gov/publications/dictionaries/cancer-terms/def/intravenous>.

²⁷ Cleveland Clinic, "magnetic resonance cholangiopancreatography (MRCP)" (web page), accessed April 4, 2023, <https://my.clevelandclinic.org/health/diagnostics/24457-magnetic-resonance-cholangiopancreatography-mrctp>.

²⁸ Cleveland Clinic, "Blood Oxygen Level" (web page), accessed April 4, 2023, <https://my.clevelandclinic.org/health/diagnostics/22447-blood-oxygen-level>.

²⁹ Mayo Clinic, "edema" (web page), accessed April 4, 2023, <https://www.mayoclinic.org/diseases-conditions/edema/symptoms-causes/syc-20366493>.

pulmonary edema. A condition that causes difficulty breathing when too much fluid collects in the air sacs of the lungs. In most cases, pulmonary edema is caused by heart problems, but it can have other causes, including pneumonia, medications, or chest wall trauma.³⁰

pulmonary emboli. Blood clots that block and obstruct blood flow to an artery in the lung.³¹

pulmonary hypertension. “A type of high blood pressure that affects the arteries in the lungs and the right side of the heart.”³²

pursed lip breathing. A method of breathing where the patient inhales slowly through the nose and exhales gently through pursed, or puckered, lips to inhale and exhale more air. This type of breathing helps bring more oxygen into the lungs and is a way to control shortness of breath.³³

rapid response team. A rapid response team (RRT) consists of “expert clinicians who provide additional care for patients on acute care units who are experiencing unexpected, sudden changes in their conditions.”³⁴ When contacted by nursing staff, the facility operator makes an announcement that is used to alert the rapid response team (which includes an ICU registered nurse and a registered respiratory therapist), who then evaluates the patient and provides interventions as needed. Rapid response team members remain with the patient until the patient’s condition is stabilized, or the patient is transferred to a higher level of care, such as the ICU.³⁵

sepsis. Sepsis occurs when the body’s immune system tries to fight infection but, instead, starts damaging normal tissues and organs leading to widespread inflammation throughout the body. Sepsis is a life-threatening medical emergency.³⁶

telemetry monitoring. Telemetry monitoring is a continuous waveform display of a patient’s heart’s rhythm, which is “transmitted to a remote surveillance device [or monitor] located at a [nurses’] station, in the patient’s room, or both.”³⁷

³⁰ Mayo Clinic, “pulmonary edema” (web page), accessed April 4, 2023, <https://www.mayoclinic.org/diseases-conditions/pulmonary-edema/symptoms-causes/syc-20377009>.

³¹ Mayo Clinic, “pulmonary embolism” (web page), accessed April 4 2023, <https://www.mayoclinic.org/diseases-conditions/pulmonary-embolism/symptoms-causes/syc-20354647>.

³² Mayo Clinic, “pulmonary hypertension” (web page), accessed April, 4, 2023, <https://www.mayoclinic.org/diseases-conditions/pulmonary-hypertension/symptoms-causes/syc-20350697>.

³³ Cleveland Clinic, “pursed lip breathing” (web page), accessed April 4, 2023, <https://my.clevelandclinic.org/health/articles/9443-pursed-lip-breathing>.

³⁴ Deonni P. Stollendorf and Cheryl B. Jones, “The Deployment of Rapid Response Teams in U.S. Hospitals,” *The Joint Commission Journal on Quality and Patient Safety* 41, no. 4 (2015): 186-183.

³⁵ Facility SOP 11-2022-01, “Rapid Response Team (RRT) Program,” March 3, 2022.

³⁶ Cleveland Clinic, “sepsis” (web page), accessed April 17, 2023, <https://my.clevelandclinic.org/health/diseases/12361-sepsis>.

³⁷ VHA Specialty Care Services and Office of Nursing Services, “VHA Telemetry Guidebook 2020,” February 2020.

troponin. Troponins are a type of protein found only in heart muscle cells. When damage to heart cells occurs, like during a heart attack, the heart muscle cells leak troponins into the blood. Troponin testing can be used to diagnosed heart attacks or other heart problems.³⁸

transthoracic echocardiogram. A non-invasive or minimally invasive test that uses sound waves to create images of the heart. Transthoracic echocardiograms may use a form of ultrasound, known as Doppler ultrasound, to “assess blood flow through [the] heart’s chambers and valves.”³⁹

ultrasound. “An imaging method that uses sound waves to produce images of structures within your body.”⁴⁰

Vocera. A wireless, hands-free communication device used and worn by health care staff to make outgoing calls or answer incoming calls using verbal commands. Additionally, the device is capable of broadcasting messages to multiple staff, such as an entire nursing floor.⁴¹

white blood cell count. White blood cells circulate in the blood and protect the body from infection. As part of the immune system, white blood cells also respond to injury or illness. The white blood cell count is the number of white blood cells per microliter of blood and can normally range from 4,000 to 11,000 cells per microliter.⁴²

³⁸ Cleveland Clinic, “troponin test” (web page), accessed April 4, 2023, <https://my.clevelandclinic.org/health/diagnostics/22770-troponin-test>.

³⁹ Cleveland Clinic, “echocardiogram: transthoracic (TTE)” (web page), accessed April 17, 2023, <https://my.clevelandclinic.org/health/diagnostics/13477-echocardiogram-transthoracic-tte>.

⁴⁰ Mayo Clinic, “ultrasound” (web page), accessed April 4, 2023, <https://www.mayoclinic.org/tests-procedures/ultrasound/about/pac-20395177>.

⁴¹ Joshua E. Richardson and Joan S. Ash, “The Effects of Hands Free Communication Devices on Clinical Communication: Balancing Communication Access Needs with User Control,” *AMIA Annual Symposium Proceedings Archive*, (2008): 621-625.

⁴² Cleveland Clinic, “Function of White Blood Cells” (web page), accessed April 4, 2023, <https://my.clevelandclinic.org/health/body/21871-white-blood-cells>.

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