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VETERANS HEALTH ADMINISTRATION

Facility Leaders' Failures in Communications, Construction Oversight, Emergency Preparedness, and Response to an Oxygen Disruption at the West Haven VA Medical Center in Connecticut

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Executive Summary

The VA Office of Inspector General (OIG) conducted a healthcare inspection at the West Haven VA Medical Center (facility) in Connecticut to assess allegations regarding a disruption to the facility's oxygen line, subsequent patient safety concerns, and facility leaders' response. The OIG specifically assessed whether patients experienced adverse clinical outcomes, the implementation of emergency procedures, the decision to continue providing care to patients without a central oxygen supply (wall oxygen), and the quality of the construction oversight and emergency preparedness.[1] The inspection also included a review of an additional OIG concern related to facility leaders' review of the events through the use of administrative and quality review tools.

The OIG confirmed that the facility's oxygen line was unintentionally cut (oxygen disruption) during planned demolition, and found that a patient experienced a period of time without adequate oxygen while relying on portable oxygen tanks.[2] Although emergency procedures were implemented in accordance with Veterans Health Administration (VHA) and facility policy, there was a lack of communication between facility leaders, frontline staff, and patients when the decision was made to continue providing care for patients requiring oxygen at the facility. Further, construction oversight and emergency preparedness requirements were not met. In addition, the OIG found deficiencies in facility leaders' use of administrative and quality reviews to assess the oxygen disruption and incident regarding the patient.

Review for Adverse Clinical Outcomes

The OIG confirmed that a construction company unintentionally cut the facility's oxygen line during excavation in early 2022, which caused a disruption to the facility's wall oxygen for three days. The OIG was unable to determine whether the unresponsiveness or death experienced by the patient discussed in this report was associated with the provision, or attempted provision, of oxygen utilizing the alternate oxygen sources. However on the third day, while the facility relied on portable oxygen tanks and concentrators, the patient, an 88 year old, with do not resuscitate/do not intubate status, COVID-19 pneumonia, hypoxic respiratory failure, and co-morbidities to include chronic obstructive pulmonary disease, atrial fibrillation, heart failure, chronic kidney disease, diabetes mellitus, dysphagia and hearing loss, experienced an adverse

[1] Within the context of this report, the OIG considers an adverse clinical outcome as an occurrence of inpatient harm directly associated with the provision, or attempted provision, of oxygen support utilizing the alternate oxygen sources that were necessitated by the lack of wall oxygen. Wall oxygen refers to the facility bulk oxygen supply that is dispersed to patient care units through a piping system. This oxygen supply remains available for patient care through connections in the wall.

[2] The exact period the patient did not receive an adequate oxygen supply is not known due to the multiple varying accounts of events from staff.

event, a period of inadequate oxygen supply. The patient's clinical condition materially changed during this time going from alert, but not oriented or responding to questions, to becoming unresponsive. The patient died several hours later.

The OIG interviewed nursing staff, respiratory therapy staff, and the day resident who provided care to the patient during the morning hours of the third day. While there were varying accounts of the incident, staff reported the following events:

- The patient was transferred to the medical intensive care unit on bi-level positive airway pressure (BiPAP) around 7:20 a.m. and was responsive.
- A nursing staff member found the patient desaturating after arrival in the medical intensive care unit, and the H-tank connected to the BiPAP was empty.[3]
- The day respiratory therapist went to retrieve a new H-tank.
- While awaiting the new H-tank, staff attempted alternative means of supplying oxygen to the patient that included placement of a non-rebreather mask connected to an E-tank, basic life support / advanced life support with an ambubag, and placement back on BiPAP connected to the E-tank.[4]
- The day respiratory therapist returned with the new H-tank but did not have the H-tank wrench necessary for changing the tank.[5]
- Additional respiratory therapy staff arrived with the H-tank wrench, and the H-tank was changed without substantial improvement to the patient's blood oxygen levels.
- After staff changed out the patient's mask, lowered the BiPAP pressure, and made adjustments, the patient's blood oxygen level started to improve, but the patient was unresponsive.
- The day resident contacted the patient's family, and it was decided that the patient's comfort would be the focus of the care provided.

The day resident and day nurse reported to the OIG that the initial H-tank was empty, while respiratory therapy staff stated that the oxygen tank was not empty. Although the OIG is not able to determine whether the oxygen tank was empty, there was a defined period that documentation supported that the H-tank did not provide the patient with adequate oxygen, which coincided with a drop in blood oxygen levels.

[3] An H-tank is generally utilized as a stationary source of oxygen supply and contains 6,226 liters of oxygen when full.

[4] An E-tank is smaller than the H-tank, more portable, and contains 679 liters of oxygen when full.

[5] A wrench of the correct size is critical to operating and changing out the cylinder.

VHA policy designates responsibility to the Facility Director for ensuring staff have the appropriate training and equipment to respond during emergencies.[6] The OIG found that a lack of accessible equipment to manage patients utilizing portable oxygen tanks, and a lack of training related to H-tanks, contributed to the patient's adverse event. The chief of respiratory care told the OIG that backup oxygen tanks were placed on inpatient units after the facility oxygen line was cut. Additionally, respiratory therapy staff told the OIG that H-tank wrenches were supposed to be stored on units where patients were receiving an oxygen supply from H-tanks. Despite this plan, staff were delayed in replacing the patient's H-tank when an H-tank and H-tank wrench were not located on the medical intensive care unit. The chief of respiratory care and night respiratory therapist explained that a backup H-tank was not on the medical intensive care unit because there were no other patients on the unit using a high-flow oxygen device that required an H-tank before the patient's arrival.

Because patients were transitioned from wall oxygen to a limited supply provided by portable oxygen tanks, increased monitoring was required to ensure that patients continued to receive oxygen. Although there is no policy requirement, the OIG determined that due to the limited number of respiratory therapy staff on duty, nursing staff had a role in monitoring and managing H-tanks in urgent situations. However, the Associate Director of Nursing and Patient Care Services and multiple nursing staff reported not receiving training on how to manage H-tanks prior to or during the oxygen disruption. Specifically, nursing staff were unaware that as the oxygen level in a tank decreases, the pressure also decreases and can cause a BiPAP device to malfunction. Further, nursing staff were unaware that connecting E-tanks to the BiPAP would not adequately support the level of supplemental oxygen requirement intended for the patient.

The OIG determined that there were no adverse clinical outcomes experienced by other patients related to the oxygen disruption. During interviews, facility leaders, nursing staff, and respiratory therapy staff denied that other patients experienced adverse clinical outcomes related to the oxygen disruption. The OIG found that no rapid response calls or code blue alerts occurred for life-sustaining interventions as a result of the oxygen disruption.

Failures in Emergency Response Communication

Nursing staff heard an alarm when the oxygen disruption occurred and notified respiratory therapy staff. Respiratory therapy staff transitioned patients requiring oxygen to portable oxygen tanks and oxygen concentrators and facility senior leaders initiated the incident command system (incident command) that continued through the duration of the oxygen disruption.

The OIG found deficiencies in communication between facility leaders, frontline staff, and patients when deciding to provide care at the facility to patients requiring oxygen without wall

[6] VHA Directive 0320, *VHA Comprehensive Emergency Management Program,* July 6, 2020. The OIG considers the emergency time frame to be from when the oxygen line was cut until wall oxygen was restored.

oxygen. The facility went on ambulance diversion for the duration of the oxygen disruption, and facility leaders decided to not transfer patients requiring oxygen because alternate sources of oxygen were available, and because there were a limited amount of available beds in the community. However, during interviews with the OIG, front line staff voiced concerns for patient safety related to the decision to not transfer patients requiring oxygen to other hospitals. Although the Chief of Staff and chief of respiratory care reported a belief that patients and their families had been notified about the lack of wall oxygen by frontline staff, the chief nurse of acute care reported the belief that nurses were not involved with communications with patients or families. The OIG learned that the Chief of Staff and chief of respiratory care's perception of notification was not accurate as a nursing staff member reported not communicating with families while the night respiratory therapist reported not communicating with patients about the oxygen disruption.

Failures in Construction Oversight and Emergency Preparedness

The OIG found that the construction safety plan included instructions to dig by hand while working around an underground utility. One week prior to the oxygen disruption, the facility project engineer-contracting officer's representative (COR) emailed the site supervisor of the construction company warning the construction team to exercise caution when excavating around the oxygen line. Despite the plan and warning, the construction company utilized excavation machinery near the oxygen line. The Directors of VHA's Office of Healthcare Engineering and Capital Asset Management reported to the OIG an expectation that the Facilities Management Service (FMS) engineer directly observe the contractor's work when digging around utilities, to protect "existing assets." However, the FMS engineer reported conducting periodic inspections at the construction site, and the facility project engineer-COR explained that it was not the responsibility of FMS staff to directly observe the contractor's work at all times. The OIG determined that more frequent oversight and diligent attention by FMS staff should have been considered. The Veterans Integrated Service Network (VISN) Capital Asset Manager acknowledged that while overnight construction creates a visibility concern, it is not uncommon for construction to take place overnight. The OIG determined that facility leaders chose overnight hours for demolition and excavation to take into consideration the impact to patients and visitors.

VHA requires a multi-disciplinary Construction Safety Committee that includes a representative from patient safety to conduct a pre-construction risk assessment that summarizes potential hazards to treatment and services.[7] The facility project engineer-COR reported that the risk assessment was not completed due to a misunderstanding that it was not required because the construction project was a non-recurring maintenance project. However, the Directors of VHA's Office of Healthcare Engineering and Capital Asset Management, as well as the VISN Capital

[7] VHA Directive 7715, *Safety and Health During Construction*, April 6, 2017.

Asset Manager, reported that the risk assessment was required and is used to help mitigate risks and increase quality of projects. Further the OIG found that there was an overall absence of patient safety staff participation in the Construction Safety Committee meetings due to competing work obligations.

Facility policy requires training and periodic exercises to prepare staff for utility emergencies, and for portable oxygen tanks to be secured in a stand or cart.[8] During the OIG's review for emergency preparedness, nursing and respiratory therapy staff reported an absence of drills or exercises for an unplanned oxygen disruption. The facility emergency manager reported no drills had been completed because of the focus of efforts on COVID-19. Respiratory therapy staff reported relying on their general respiratory therapy knowledge at the oxygen disruption's onset. The OIG also found that there was a shortage of equipment necessary to respond to the oxygen disruption. In addition to a shortage of H-tank wrenches, there was a shortage of H-tank carts resulting in a fire hazard risk when an H-tank was secured to a wall as opposed to being on a cart.

Facility Leaders' Response

The OIG determined that facility leaders failed to ensure timely joint patient safety reports (JPSRs) and root cause analyses (RCAs) were completed after the oxygen disruption and the incident regarding the patient. VHA requires adverse events and close calls within the facility be reported to the facility's patient safety manager or acting patient safety manager.[9] These events may be entered by any staff member through any locally accepted method including the electronic JPSR system.[10] The patient safety manager conducted a search and confirmed that patient safety concerns were not initially submitted for either event. The chief of quality management told the OIG that a JPSR was not entered for the oxygen disruption because "the oxygen issue itself was known based on the response at the time of the event." Facility leaders and quality management staff provided varying explanations on the lack of a JPSR for the incident regarding the patient that included both an inaccurate belief that the incident was not an adverse event, and that the incident was being investigated. Two separate JPSRs were later entered during the course of this inspection for both the oxygen disruption and incident regarding the patient.

VHA requires an RCA to be chartered for events categorized as actual high-risk, and events that are classified as potential high-risk that are not related to falls, medications, and missing patients.[11] Although both incidents were designated as high-risk or potential high-risk events that

[8] Facility Emergency Operations Plan, *Appendix O Utility Failures Plan,* April 21, 2016. Facility Policy 186-009, *Safe Storage and Handling of Oxygen Cylinders,* January 21, 2021.

[9] VHA Handbook 1050.01, *VHA National Patient Safety Improvement Handbook*, March 4, 2011.

[10] VHA Handbook 1050.01.

[11] VHA Handbook 1050.01.

should have generated RCAs, only one RCA was chartered for the incident regarding the patient.[12]

The patient safety manager explained that an RCA was not chartered for the facility-wide oxygen disruption because of the beliefs that staff actions were completed according to emergency oxygen operating procedure, there was enough oxygen supply available, and there were no associated patient issues. The OIG reviewed the completed RCA, the details of which are not discussed pursuant to 38 U.S.C. § 5705.[13]

VHA requires peer reviews to be conducted for a "Death that was preceded by a change in the patient's condition when there are questions regarding response to, management of, and/or communication related to the referenced change."[14] The incident regarding the patient prompted peer reviews, however, the peer reviews were not comprehensive because multiple providers failed to enter complete documentation of the event into the patient's electronic health record. The risk manager initiated a peer review for the night nurse and night respiratory therapist, but later discontinued the peer review for the night respiratory therapist after learning that the day respiratory therapist provided care during the incident. The risk manager reported the attending physician overseeing the day resident was not peer reviewed as there were no concerns related to the care the resident provided to the patient.[15] The risk manager also noted that the lack of documentation and pending administrative investigation prevented the day respiratory therapist from being peer reviewed. The OIG found that the second and third day respiratory therapists, and second day nurse, did not enter documentation in the patient's electronic health record, prohibiting the risk manager's ability to assess the need to peer review these staff.

The OIG determined that facility leaders and staff failed to complete a clinical disclosure of the incident regarding the patient. VHA policy warrants the disclosure of harmful or potentially harmful adverse events to patients or their personal representatives, including those that have had "an effect on the patient that is perceptible to either the patient or the healthcare team."[16] The attending physician confirmed that a disclosure did not occur. The Chief of Staff believed the incident did not impact the patient's outcome. The risk manager and attending physician reported

[12] The incident regarding the patient was categorized as a high-risk event requiring an RCA. The incident related to the oxygen disruption was categorized as potential high-risk event not related to medications, falls, and missing patients and, therefore, required an RCA be chartered.

[13] Confidentiality of medical quality-assurance records, 38 U.S.C. § 5705.

[14] VHA Directive 1190, *Peer Review for Quality Management*, November 21, 2018. In the context of protected peer reviews, "protected" refers to the designation of review as a confidential quality management activity under 38 U.S.C. § 5705 as "a Department systematic health-care review activity designated by the Secretary to be carried out by or for the Department for improving the quality of medical care or the utilization of health-care resources in VA facilities."

[15] VHA Directive 1190. "Health care profession trainees, acting within the scope of their training program, are not independent clinicians" and are not subject to peer review. "If the supervision of the trainee was deemed inappropriate the Level of Care is assigned to the supervising clinician."

[16] VHA Directive 1004.08, *Disclosure of Adverse Events to Patients*, October 31, 2018.

that the incident was an adverse event. When asked about clinical disclosure, the Chief of Staff noted that the decision was at the discretion of the clinical team. The risk manager expressed the belief that the incident did not significantly contribute to the patient's death and the attending physician reported it was not necessary to disclose citing the belief that nothing permanently adverse occurred. The OIG found that the patient experienced a period without an adequate oxygen supply due to difficulties changing the H-tank, which likely would not have occurred if wall oxygen had been available. The patient's condition materially changed, being described as "unresponsive" when the H-tank was found to be empty, and remained so during and after the incident.

After receiving concerns that the day respiratory therapist was delayed in changing out the patient's H-tank, the chief of respiratory care removed the day respiratory therapist from patient care and initiated a fact-finding review (fact-finding) that included requesting statements from staff. The OIG identified concerns related to the authenticity and veracity of statements used in the fact-finding. Specifically, some staff denied having written select statements and disputed the authenticity of the signatures. Additionally, the OIG learned that the chief of respiratory care did not have the minimum needed training to serve as a fact finder and had a potential conflict of interest due to being responsible for ensuring the availability of adequate tools, equipment, and staff.

During the inspection, the OIG learned that a facility staff member created a document titled "SBAR" (Situation Background Assessment Recommendation), at the direction of the Acting Facility Director, that was emailed to facility staff and leaders before interviews with the OIG.[17] Preparation for OIG interviews in this manner has the potential to influence staff to provide responses consistent with the information noted within the document, as opposed to providing an independent perspective. The document included information related to the oxygen disruption, the patient, and recommendations and opportunities for improvement. Although the document included varying descriptions of the period involving the replacement of the H-tank, key information related to the patient's clinical deterioration on the third day of the oxygen disruption was missing, including documentation of the patient's change in cognition before and after the incident, a note from the electronic health record indicating that the tank was empty, the delay to obtain an H-tank wrench, staff actions in the patient's room, and the delay to obtain a replacement H-tank. The OIG found that the document included inaccurate information related to when the patient was found to be hypoxic, and conflicting information on whether or not the patient's blood oxygen levels improved after the H-tank was replaced.

[17] Martin Mueller et al., "Impact of the communication and patient hand-off tool SBAR on patient safety: a systematic review," *BMJ Open* 8, (August 23, 2018):8. SBAR (situation, background, assessment, recommendation) is a communication tool developed to increase quality and safety during patient handoff among clinical staff and this document was not utilized for that typical use.

The OIG made one recommendation to the VISN Director related to facility leaders' and staffs' involvement in the preparation and use of the referenced SBAR document.

The OIG made 11 recommendations to the Facility Director to ensure communication with patients, families, and staff throughout emergency operations; confirmation that medical, nursing, and respiratory therapy staff have the equipment, education, and training for emergency oxygen procedures; completion of pre-construction risk assessments; participation from patient safety staff in facility Construction Safety Committee meetings and activities; increased oversight of contracted construction companies during high-risk or potential high-risk situations; annual drills and training to address utility emergencies; confirmation that JPSRs are entered for adverse events and close calls and chartering RCAs for high-risk or potential high-risk events not related to falls, medications, and missing patients; ensuring clinical staff document each event of a patient's care into the health record; reviewing the patient's episodes of care to determine the need for clinical disclosure; ensuring staff designated as a fact finder receive the needed training and do not have a conflict of interest; and considering administrative action for the chief of respiratory care.

VA Comments and OIG Response

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

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Contents

Abbreviations

BiPAP	bi-level positive airway pressure
CPAP	continuous positive airway pressure
EHR	electronic health record
MICU	medical intensive care unit
NFPA	National Fire Protection Association
OIG	Office of Inspector General
VHA	Veterans Health Administration
VISN	Veterans Integrated Service Network

Introduction

The VA Office of Inspector General (OIG) conducted a healthcare inspection at the West Haven VA Medical Center (facility) to assess allegations regarding a disruption to the facility's oxygen line, subsequent patient safety concerns, and facility leaders' response.

Background

The facility is part of the VA Connecticut Healthcare System (system) within Veterans Integrated Service Network (VISN) 1. The system is classified as level 1a-high complexity and includes the facility in West Haven, an ambulatory care center in Newington, eight community-based outpatient clinics, and four vet centers.[1] From October 1, 2021, through September 30, 2022, the system served 59,478 patients and had a total of 169 beds, including 119 inpatient beds, 10 domiciliary beds, and 40 community living center beds. The system is affiliated with the Yale University School of Medicine and the University of Connecticut Schools of Medicine and Dentistry.

Oxygen Therapy and Delivery Systems

Oxygen therapy is a treatment that delivers oxygen gas for patients to breathe when certain medical conditions cause blood oxygen levels to be too low.[2] Oxygen delivery systems are categorized as either low-flow or high-flow. Low-flow systems provide lower oxygen flow that is diluted with room air based on patient breathing and include a nasal cannula, simple face mask, and non-rebreather mask.[3] High-flow oxygen delivery systems provide higher oxygen flows not impacted by patient breathing patterns and include a rebreather mask, venturi mask, and high-flow nasal cannula.[4]

Mechanical ventilation is the use of a machine that provides the work of breathing when a patient cannot breathe independently.[5] Non-invasive mechanical ventilation uses a machine to supply oxygen through a mask placed over the patient's nose and mouth. Continuous positive airway

[1] VHA Office of Productivity, Efficiency and Staffing, "Facility Complexity Model Fact Sheet," January 28, 2021. The VHA Facility Complexity Model categorizes medical facilities by complexity level based on patient population, clinical services offered, and educational and research missions. Complexity Levels include 1a, 1b, 1c, 2, or 3. Level 1a facilities are considered the most complex; Level 3 facilities are considered the least complex.

[2] "Oxygen Therapy," National Institutes of Health, accessed June 29, 2022, https://www.nhlbi.nih.gov/health/lung-treatments.

[3] Georgia Hardavella et al., "Oxygen devices and delivery systems," *Breathe* 15, (September 2019): e108-e116.

[4] Hardavella et al., "Oxygen devices and delivery systems."

[5] "Mechanical Ventilation," Cleveland Clinic, accessed March 14, 2022, https://my.clevelandclinic.org/health/articles/15368-mechanical-ventilation#:~:text=A%20mechanical%20ventilator%20is%20mainly%20used%20to%20make,they%20have%20an%20unpredictable%20or%20unstable%20health%20condition.

pressure (CPAP) and bi-level positive airway pressure (BiPAP) are types of non-invasive mechanical ventilation. When breathing problems are more severe, invasive mechanical ventilation may be necessary and involves use of a ventilator that pushes oxygen through a tube into the patient's windpipe and directly into the lungs.[6]

Medical Gas and Vacuum System

Hospital medical gas and vacuum systems supply oxygen, compressed air, carbon dioxide, nitrous oxide, and nitrogen to patient care areas.[7] The facility bulk oxygen supply is contained in an outside storage tank. Oxygen is dispersed to patient care units through a piping system. Normally, this oxygen supply remains available for patient care through connections in the wall. Trained medical professionals typically administer oxygen from the wall connections.[8] The Veterans Health Administration (VHA) has adopted the National Fire Protection Association (NFPA) 99 Healthcare Facilities Code for all aspects of operation for medical gas systems, including oxygen at VHA medical facilities.[9] Incidents regarding piped medical gas systems include an inherent risk of death or injury; therefore, VHA mandates that each facility has established plans and procedures for management of such systems.[10]

Alternative Oxygen Sources

In the event there is a disruption to a facility's medical gas system, patients need to receive oxygen from an alternative source until the central oxygen supply (wall oxygen) can be restored.[11] Alternative sources may include oxygen concentrators and portable oxygen tanks. An oxygen concentrator is an electrically operated medical device that separates the nitrogen from room air and typically administers low-flow oxygen to the patient.[12] Oxygen concentrators run

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[6] VHA National Center for Ethics in Health Care, "Mechanical Ventilation," accessed June 14, 2022, https://www.ethics.va.gov/LST/MechanicalVentilationInformation.pdf#:~:text=One%20type%20of%20non-invasive%20mechanical%20ventilation%20is%20called,windpipe.%20The%20machine%20is%20often%20called%20a%20ventilator.

[7] VHA Directive 7515(1), *Medical Gas and Vacuum Systems*, September 27, 2019, amended January 6, 2020. A medical vacuum system is used for suction on drains (i.e., chest tubes, gastric tubes, abdominal drains, etc.), and pulmonary secretion removal. Procedures in Critical Care, "Chapter 1. The ICU Room and Equipment," accessed June 14, 2022, https://accessanesthesiology.mhmedical.com/content.aspx?bookid=414&sectionid=41840225.

[8] "Oxygen used at a hospital by technically qualified individuals," Environmental Protection Agency, accessed March 14, 2022, https://www.epa.gov/epcra/oxygen-used-hospital-technically-qualified-individuals.

[9] NFPA 99 develops criteria for varying degrees of medical services based on risk to minimize hazards of fire, explosion, and electricity at health care facilities.

[10] VHA Directive 7515(1).

[11] Facility Standard Operating Procedure 547-001 OX, *Emergency Oxygen Operating Procedure,* January 26, 2015. Procedures in Critical Care, "Chapter 1. The ICU Room and Equipment." Wall oxygen refers to the facility bulk oxygen supply that is dispersed to patient care units through a piping system. This oxygen supply remains available for patient care through connections in the wall.

[12] Hardavella et al., "Oxygen devices and delivery systems."

on electrical power and use room air; the devices require no refills and supply an unlimited amount of oxygen.[13]

Portable oxygen tanks are metal cylinders available in a range of sizes that determine the capacity for oxygen.[14] The two sizes of portable oxygen tanks in this report include E-tanks and H-tanks. An E-tank is smaller, more portable, and contains 679 liters of oxygen when full.[15] Due to the larger size, an H-tank is generally utilized as a stationary source of oxygen supply and contains 6,226 liters of oxygen when full.[16] Portable oxygen tanks, which contain compressed gas, need to be secured and transported by a specific type of cart designed to hold cylinders to reduce the risk of fire, explosion, or damage.[17] Additional equipment needed to use portable oxygen tanks are regulators and wrenches. An oxygen regulator is attached to the tank to adjust the rate of oxygen flow to the patient.[18] The gauge on the regulator displays how much oxygen remains in the cylinder and is used to estimate the remaining time of supply depending on how much oxygen the patient is using.[19] A wrench of the correct size is critical to operating and changing out the oxygen cylinder.[20]

Prior OIG Reports

In November 2019, the OIG published a report, *Deficiencies in Sterile Processing Services and Decreased Surgical Volume at the VA Connecticut Healthcare System, Newington and West Haven, Connecticut.* The OIG conducted an inspection at the request of Senator Richard Blumenthal to review issues related to Surgical and Sterile Processing Services after deficits were identified by The Joint Commission and VHA's National Program Office for Sterile Processing. The OIG found that system leadership and an aging building infrastructure contributed to inefficiencies and delays in Sterile Processing Services remediation efforts. The OIG determined that system leaders failed to proactively communicate or share decision-making related to Sterile Processing Services operations, which led to a divide between clinical staff and

[13] Hardavella et al., "Oxygen devices and delivery systems."

[14] Hardavella et al., "Oxygen devices and delivery systems."

[15] Ray H. Ritz and Joseph E. Previtera, "Oxygen Supplies During a Mass Casualty Situation," Respiratory Care, 53, (February 2008), 215-225., https://rc.rcjournal.com/content/respcare/53/2/215.full.pdf.

[16] Ritz and Previtera, "Oxygen Supplies During a Mass Casualty Situation."

[17] National Fire Protection Association, "Medical Gas Cylinder Storage," January 2018, accessed May 16, 2022, https://www.nfpa.org/~/media/4B6B534171E04E369864672EBB319C4F.pdf.

[18] Hardavella et al., "Oxygen devices and delivery systems." "Portable Oxygen Cylinders Training and Safety Guidelines," Intermountain Healthcare, accessed June 14, 2022, https://intermountainhealthcare.org/ckr-ext/Dcmnt?ncid=521117400.

[19] Hardavella et al., "Oxygen devices and delivery systems." "Portable Oxygen Cylinders Training and Safety Guidelines," Intermountain Healthcare.

[20] "Portable Oxygen Cylinders Training and Safety Guidelines," Intermountain Healthcare. "Oxygen Tank Regulators (Respiratory Therapy)," accessed November 30, 2022, https://elsevier.health/en-US/preview/oxygen-tank-regulators-respiratory-therapy. "Cylinder Regulator Change Out Procedures," Columbia University, accessed November 30, 2022, TechAirRegulatorChangeOutProcedureandOperatingInstructions.pdf (columbia.edu).

administration. The OIG made 11 recommendations that have been closed, including a recommendation that the system director implement a clear action plan to establish communication and collaboration to restore staff trust in system leaders.[21]

Allegations and Related Concerns

The OIG received two separate anonymous complaints, in January and February 2022, that included allegations related to the facility's oxygen line, which was cut during construction.

On January 12, 2022, the OIG received the first complaint alleging that the facility's oxygen line was cut during construction at a time when 28 patients with COVID-19, many of whom required oxygen, were receiving care.[22]

The OIG received the second complaint on February 2, 2022. The complainant alleged protocols were not in place during the oxygen disruption, the facility did not go on diversion, patients who required oxygen were not transferred out, and the construction was scheduled at an unsafe time. The complainant noted that the decision to care for patients using temporary oxygen sources resulted in the death of a patient.

The OIG opened a healthcare inspection to review the allegation that the oxygen line was damaged, placing patients at risk. Specifically, the OIG reviewed

- whether the patient or other patients experienced adverse clinical outcomes,[23]
- the implementation of emergency procedures after the oxygen line was cut,
- the decision to continue providing care to patients without wall oxygen,
- the quality of the facility's construction oversight, and
- emergency preparedness.

Due to the potential impact to patients, the inspection included a review of an additional OIG concern related to facility leaders' response to the oxygen disruption and subsequent patient safety concerns.

[21] VA OIG, *Deficiencies in Sterile Processing Services and Decreased Surgical Volume at the VA Connecticut Healthcare System, Newington and West Haven, Connecticut*, Report No. 19-00075-14, November 20, 2019.

[22] The first complaint did not include patient names, and therefore the OIG requested the VISN provide additional information regarding the oxygen line, impacted patients, and actions or plans to ensure an uninterrupted oxygen supply. The OIG received a reply from the VISN Director on March 16, 2022, after the OIG opened a healthcare inspection. The reply included information that the OIG reviewed and analyzed throughout this report.

[23] Within the context of this report, the OIG considers adverse clinical outcomes as occurrences of inpatient harm directly associated with the provision, or attempted provision, of oxygen support utilizing the alternate oxygen sources that were necessitated by the lack of a central supply line.

Scope and Methodology

The OIG initiated the inspection on March 7, 2022, and conducted a site visit from April 25 through 28, 2022. Additional interviews were conducted virtually prior to and after the site visit through June 7, 2022.

The OIG interviewed VHA Central Office leaders, the VISN 1 Capital Asset Manager, and Chief Supply Chain Officer; facility senior leaders, service chiefs, quality management staff, and frontline clinical staff; a patient advocate supervisor, an emergency management staff member, and a Facilities Management Service (FMS) staff member.[24]

The OIG reviewed VHA and facility policies, external standards, literature reviews, facility action plans, email correspondence, human resource and personnel documents, staff competencies, patient electronic health records (EHRs), quality management reviews, administrator and nursing on duty reports, contract documents, risk assessments, construction monitoring logs, and incident command system (incident command) committee meeting minutes.

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/review in accordance with *Quality Standards for Inspection and Evaluation* published by the Council of the Inspectors General on Integrity and Efficiency.

[24] Facility senior leaders include the Facility Director, Deputy Director, Chief of Staff, and Associate Director of Nursing and Patient Care Services. In spring 2022, the Facility Director was detailed to a position outside of the facility, and the Facility Deputy Director assumed the role as Acting Facility Director. In this report, the Facility Deputy Director is referred to as Acting Facility Director. VHA Central Office leaders include the Director of Healthcare Engineering and Director of Capital Asset Management.

Patient Case Summary

According to the EHR, the patient, in their 80s, presented to the facility's Emergency Department in early 2022, with complaints of generalized weakness, new onset cough, and increased dyspnea upon exertion.[25] The patient had a past medical history of chronic obstructive pulmonary disease, atrial fibrillation, heart failure, chronic kidney disease, diabetes mellitus, and severe hearing loss. At presentation, the patient was afebrile with a respiratory rate of 20 breaths per minute and a normal blood oxygen level on two liters of oxygen via nasal cannula. The patient was alert, oriented, and socially interacting. Laboratory data revealed a white blood cell count of 9,800 per cubic millimeter, hemoglobin 9.7 grams per deciliter, serum creatinine 3.0 milligrams per deciliter, normal electrolytes, blood glucose 121 milligrams per deciliter, and a d-dimer of 1,193 nanograms per milliliter. The patient was positive for COVID-19. Computed Tomography imaging of the chest (performed without contrast materials due to chronic kidney disease) showed patchy basilar opacities and a previously diagnosed right pleural effusion. The patient was admitted to the facility with a diagnosis of COVID-19 pneumonia and hypoxia.

The next day, the patient was noted to have a rapid respiratory rate with a low arterial blood gas partial pressure of oxygen of 66 millimeters mercury.[26] The patient was treated for suspected fluid overload and a thoracentesis was performed with removal of 600 cubic centimeters of clear, yellow pleural fluid. The patient was started on dexamethasone and baricitinib, medications used to treat the symptoms of COVID-19 superimposed on a chronic obstructive pulmonary disease exacerbation. The patient was then transferred to the medical intensive care unit (MICU) for application of BiPAP to assist breathing. Arterial blood gases were improved by midweek with a partial pressure of oxygen of 89 millimeters mercury, and the patient was removed from BiPAP, placed on 2 liters of oxygen via nasal cannula, then on room air and started use of CPAP at night. The facility pulmonary and critical care attending physician described the patient, as improved with diuresis, awake, and not critically ill, and approved transfer to the medicine floor.

By the end of the week the patient was described as interactive, comfortable, and tolerating the CPAP well. The next day the patient remained on room air or on oxygen via nasal cannula and was again described as "interactive." The following morning, the patient was more lethargic than baseline and responsive only to painful stimuli. The patient was noted to have a rising blood urea nitrogen level and hypernatremia.[27] The patient received additional intravenous fluids for hypernatremia, and by afternoon appeared more alert and more easily arousable being able to speak in sentences. The patient then became hypoxemic and was placed on a non-rebreather

[25] The patient's electronic health record is the primary source for the information contained within the Patient Case Summary. The OIG uses the singular form of they, "their" in this instance, for privacy purposes.

[26] "Arterial Blood Gas (ABG): What It Is, Purpose, Procedure & Levels" Cleveland Clinic, accessed August 29, 2022. https://my.clevelandclinic.org/health/diagnostics/22409-arterial-blood-gas-abg. The normal range for partial pressure of oxygen when measured in arterial blood gas is considered to be 75–100 mmHg.

[27] Some patients with high blood urea nitrogen levels may experience central nervous system symptoms to include lethargy.

mask, then a venturi mask. The next morning, the patient was documented to be "more interactive" and improved from the prior day but with a "decline in mental status of unknown etiology and increasing [oxygen] requirements."

On the day of the oxygen disruption, the patient was described as significantly more alert and conversant but confused. The Palliative Care service was consulted that day and noted that the patient's hospitalization had been complicated by a decline in mental status, worsening kidney function, hypernatremia, increasing oxygen requirements, dysphagia, and that the patient appeared fatigued and frail. Palliative Care raised concerns as to whether the patient would survive the hospitalization. The next day, the patient's mental status was documented as "more awake than previously but still very confused." The patient was on the venturi mask in the morning and later that afternoon on 4 liters of oxygen via nasal cannula.

Early the next morning the patient remained alert but was noted to be experiencing an increased work of breathing while on 5 liters of oxygen via nasal cannula. At approximately 6:00 a.m., due to desaturation and the ongoing increased work of breathing, the patient was again placed on BiPAP, transferred back to the MICU, and described by the night resident as alert though not oriented, able to nod head but not respond to questions. At approximately 7:30 a.m., the patient was noted to be hypoxic with a decreased blood oxygen level and the patient's oxygen tank was found to be empty. The day resident attempted to replace the oxygen tank and the blood oxygen level did not substantially improve with the patient having an unresponsive mental status. The BiPAP pressure settings were increased with no further improvement in blood oxygen levels. A chest X-ray results showed unchanged opacities. A pulmonary embolus was considered but the patient was not safe for travel to the computed tomography imaging scanner without intubation, which was not consistent with the patient's expressed, and confirmed, wishes for do not resuscitate/do not intubate status. The patient's family member was contacted at approximately 08:19 a.m. and affirmed the patient's expressed desire to exclude intubation from therapeutics. The patient was then transitioned to comfort measures only, ordered 6 mg dose of morphine to be administered once, and then to start morphine infusion at 2 mg/hr. The patient was pronounced dead at 11:18 a.m.

Inspection Results

In early 2022, at approximately 2:00 a.m., a construction contractor working outside removing a concrete pad unintentionally cut the facility's oxygen line (oxygen disruption) where it entered the building, placing patients who were on oxygen therapy at risk of harm.[28] Upon notification, facility leaders initiated an incident command and worked to secure wall oxygen while respiratory therapy staff transitioned patients on oxygen therapy to portable oxygen tanks and oxygen concentrators. Although facility leaders decided not to transfer patients who relied on oxygen to other facilities, multiple frontline staff expressed concern to the OIG about the lack of

[28] The disruption to wall oxygen lasted three days in early 2022.

adequate staffing and resources to safely manage patients during the event. The patient discussed in this report experienced an adverse event because of the potential harm associated with a period of inadequate oxygen on a frail, declining patient with active COVID-19 infection and numerous co-morbidities. No other patients experienced adverse clinical outcomes.

The OIG found deficiencies in both the oversight of the construction work and emergency preparedness. A required pre-construction risk assessment was not completed with involvement from patient safety staff, and the on-site FMS engineer was not directly observing the work at the time the oxygen line was severed. Additionally, there was a lack of drills and necessary equipment prior to the oxygen disruption. Facility leaders failed to adhere to VHA guidance that outlines tools to assess the overall management of the oxygen disruption, clinical care provided during the disruption, and the adverse patient event after the oxygen supply was restored. Appendix A, table A.1 shows a timeline for the oxygen disruption and related patient death while table A.2 shows a timeline of quality reviews completed after the oxygen disruption and incident regarding the patient.

1. Review for Adverse Clinical Outcomes

The OIG was unable to determine whether the unresponsiveness or death experienced by the patient was associated with the provision, or attempted provision, of oxygen utilizing the alternate oxygen sources. However, in early 2022, while the facility relied on portable oxygen tanks and concentrators, the patient experienced an adverse event—a period of inadequate oxygen supply. The patient became unresponsive during the event, a material change in clinical condition, and died several hours later. Although there were an alleged 28 patients with COVID-19 receiving care at the time of the oxygen disruption, the OIG determined that no other patients experienced adverse clinical outcomes related to the oxygen disruption.[29]

Facility standard operating procedure assigns respiratory therapy staff the responsibility for assuring all patients have the oxygen availability that is needed, and that the associated equipment is fully functional.[30] Operating high-flow devices such as CPAP and BiPAP machines on portable oxygen tanks, instead of wall oxygen, increases the risk for adverse events due to the possibility of running out of oxygen or not maintaining the pressure needed for the devices to function. Oxygen therapy is often necessary for patients with certain medical conditions to treat or prevent hypoxia. In the absence of oxygen therapy, patients may require immediate life-sustaining intervention to prevent permanent damage or death.[31]

[29] The "alleged 28 patients with COVID-19" was a reference to the allegations that led to this inspection.

[30] Facility Standard Operating Procedure 547-001 OX, *Emergency Oxygen Operating Procedure*, January 26, 2015.

[31] Ryan Choudhury, "Hypoxia and hyperbaric oxygen therapy: a review," *International Journal of General Medicine* 11, (2018): 431-442. Cleveland Clinic, "Hypoxia," accessed December 1, 2022, https://my.clevelandclinic.org/health/diseases/23063-hypoxia#prevention.

Patient Safety Event

On day three of the oxygen disruption, a series of events (incident) related to the changing of the patient's H-tank unfolded. The day resident, nursing staff, and respiratory therapy staff recalled the incident differently. While the OIG is unable to determine exactly what happened that morning, multiple staff characterized the incident as chaotic while working to provide the patient sufficient oxygen with E-tanks after the day resident found the H-tank to be empty.

Staff Recollections

The OIG interviewed the day resident, nursing staff, and respiratory therapy staff who provided care to the patient during the morning hours of that day.

Day Resident

During an interview with the OIG, the day resident noted that upon entering the room at approximately 7:30 a.m., the patient was unresponsive, tachypneic, in respiratory distress, and with an oxygen saturation of 55 percent. The day resident stated that the patient was wearing a BiPAP mask with a good seal and was hypoxic.[32] An H-tank was serving as the patient's oxygen source and an alarm was sounding indicating low oxygen in the tank, although the day resident described the tank as empty. The day resident reported disconnecting the patient from the H-tank and utilizing an E-tank available in the room while waiting for the H-tank replacement to be brought in by respiratory therapy staff. With access to the E-tank as an oxygen source, the patient's blood oxygen level slightly improved. After approximately 10 to 15 minutes, the replacement H-tank arrived in the patient's room, but an H-tank wrench was not immediately available.[33] After an additional estimated five minutes, an H-tank wrench was located and the BiPAP device was successfully connected to the H-tank. The patient's blood oxygen level improved but the patient remained unresponsive. The day resident contacted the patient's family member, and it was decided that the patient's comfort would be the focus of the care provided.

Nursing Staff

The night nurse reported to the OIG that the patient was transferred to the MICU at approximately 7:20 a.m., just before the end of the night shift, and noted that the patient was responsive. The day nurse reported noticing that the patient was desaturating upon arriving to the patient's room and upon entering the room indicated that the H-tank was empty and multiple staff were in the room attempting to oxygenate the patient.[34] At that time, the day respiratory therapist left to retrieve the H-tank. The day nurse told the OIG that staff placed the patient on a

[32] When applying a BiPAP mask to a patient, a good seal to the mouth and nose is important in order for the oxygen to be successfully administered.

[33] A wrench of the correct size is critical to operations and changing out the oxygen cylinder. The chief of respiratory care reported that a wrench is always needed to change or institute an H-tank.

[34] The night nurse explained that due to COVID-19 precautions, all staff entering the room were required to dress in personal protective equipment, which delayed immediate access to the room and the patient.

non-rebreather mask connected to an E-tank, with no improvement in blood oxygen level. A second day nurse reported providing basic life support/advanced life support with an ambubag. The day nurse reported that staff then placed the patient back on BiPAP connected to the E-tank. The day respiratory therapist returned with the H-tank, without the H-tank wrench needed to connect it, and attempted to connect the H-tank by hand but was unable to do so. When respiratory therapy staff connected the BiPAP to the H-tank, the patient's blood oxygenation did not improve. The second day respiratory therapist lowered the BiPAP settings, which resulted in the patient's improved blood oxygen level.

Respiratory Therapy Staff

During an interview with the OIG, the night respiratory therapist reported observing the patient in a conscious state in the MICU between 7:00 a.m. and 7:15 a.m. The night respiratory therapist reported notifying the day respiratory therapist at approximately 7:25 a.m. that the patient's H-tank would need to be changed by 8:30 a.m. The day respiratory therapist reported completing an assessment of the patient, noted that the patient was "breathing heavier," checked the H-tank, and determined there was time to obtain a replacement tank. The day respiratory therapist reported leaving the MICU to obtain a new H-tank, and upon returning noted that E-tank was improperly connected to the BiPAP. The day respiratory therapist called the respiratory office to request assistance. According to the second day respiratory therapist, two additional day respiratory therapy staff presented to the patient's room. The second day respiratory therapist located an H-tank wrench for the day respiratory therapist who worked to connect the H-tank while the second day respiratory therapist focused on adjusting the patient's BiPAP. The second day respiratory therapist reported seeing chaos upon entering the room and noted that the patient was not breathing synchronously with the BiPAP. Due to the patient being in a COVID-19 room, the third day respiratory therapist reported staying outside of the room in order to provide any needed supplies. The second day respiratory therapist explained that the patient's blood oxygen level started to improve after changing out the patient's mask, lowering the BiPAP pressure, and making adjustments.

Status of the Original H-tank in the MICU

The day resident and day nurse provided a different account than respiratory therapy staff, related to the status of the H-tank upon the patient's arrival to the MICU. The day resident told the OIG that the H-tank was empty and that an alarm was sounding from the BiPAP machine indicating low oxygen. The day nurse and day resident reported looking at the pressure gauge and noting that the tank was empty. However, respiratory therapy staff shared with the OIG that the tank was not empty, explaining that the BiPAP machine would not function if the H-tank was empty. Although the OIG is not able to determine whether in fact the tank was empty, there was

a defined period that documentation supported the H-tank did not provide the patient with adequate oxygen, which coincided with a drop in blood oxygen level.[35]

Contributing Factors

The OIG identified contributing factors related to the patient experiencing an adverse event that included limited access to equipment and training.

Accessibility of Equipment

The OIG determined that the portable oxygen tanks, transportation carts, and H-tank wrenches were not easily accessible.

Facility standard operating procedure states that respiratory therapy staff are responsible for distributing portable tanks for use and assuring there is a sufficient oxygen supply for all patients.[36]

Although staff recollections of the incident varied, multiple involved clinical staff believed that the H-tank needed to be replaced. The day respiratory therapist told the OIG that the patient was located in the MICU on the fifth floor while the cart needed to transport the H-tank and the key to enter the H-tank storage room were on the second floor. The H-tanks were located in a storage room on the ground floor. During an interview with the OIG, the chief of respiratory care reported staging backup tanks on the units with help from the respiratory therapy supervisor.[37] Despite this reported practice, the chief of respiratory care and the night respiratory therapist told the OIG that an H-tank was not staged in the MICU for the patient because there were no other patients on the unit using a high-flow oxygen device that required an H-tank before the patient's arrival.

Failure to stage an H-tank delayed the changing of the H-tanks and the improvement of the patient's blood oxygen level. The day resident told the OIG that after this incident occurred, facility leaders stated that tanks would be made readily available and accessible while the patients continued to rely on portable oxygen tanks.

To retrieve the new H-tank, the day respiratory therapist reported leaving the patient's bedside to obtain an H-tank cart and storage room key, and then proceeded to the ground floor storage area for the new H-tank. The day respiratory therapist expected an H-tank wrench to be located on the H-tank cart or in the respiratory office, however, an H-tank wrench was not at either of these locations. The second day respiratory therapist further reported not being able to locate an H-

[35] The defined period the patient did not receive an adequate oxygen supply is not known due to the multiple varying accounts of events from staff.

[36] Facility Standard Operating Procedure 547-001 OX.

[37] Staging back-up tanks consisted of transporting tanks and assuring that tanks were available in all locations in which oxygen was used.

tank wrench on the MICU unit. According to the day nurse, the day respiratory therapist returned to the patient's room without an H-tank wrench that was required to replace the H-tank.

Some respiratory therapy staff reported that H-tank wrenches were available in the main respiratory service office, while other respiratory therapy staff stated there should have been wrenches located on surgical intensive care unit, MICU, or wherever an H-tank was in use. One respiratory therapist also stated that there were not enough H-tank wrenches during the oxygen disruption. The chief of respiratory care told the OIG, at the time of the incident there were a total of four H-tank wrenches available. A respiratory therapy staff member told the OIG that later that day of the incident, the chief of respiratory care provided additional H-tank wrenches for respiratory staff.

The OIG concluded that respiratory therapy staff did not ensure that the H-tank was replaced timely to allow the patient an ongoing sufficient oxygen supply. Additionally, the H-tank and cart were not readily accessible and created an unnecessary delay, and the lack of an H-tank wrench in the MICU further extended the time necessary to connect the replacement tank.

Lack of Education and Training

The OIG determined that nursing staff in the room with the patient did not have sufficient education and training on H-tanks, oxygen pressure related to portable oxygen tanks, or BiPAP machines when the H-tank was not delivering an adequate supply of oxygen.

VHA policy designates responsibility to the Facility Director for ensuring staff have the appropriate training and equipment to respond during emergencies.[38]

Because patients were transitioned from wall oxygen to a limited supply through portable oxygen tanks, increased monitoring was required to ensure that patients continued to receive oxygen. Both a respiratory therapy staff member and nursing staff reported that respiratory therapy staff are primarily responsible for changing BiPAP settings and solely responsible for changing H-tanks. The chief of respiratory care informed the OIG that at the most, four respiratory therapy staff were on duty during the time the facility lacked wall oxygen. Although there is no policy requirement, the OIG determined that due to the limited number of respiratory therapy staff, nursing staff had a role in managing H-tanks in urgent situations. Despite the use of H-tanks for the duration of the oxygen disruption, the Associate Director of Nursing and Patient Care Services and multiple nursing staff reported not receiving training or information on how to manage H-tanks for patients on high-flow oxygen.

The second day respiratory therapist explained to the OIG that the equipment [BiPAP] is normally connected to wall oxygen, which has a constant pressure of 50 pounds per square inch. With H-tanks and E-tanks, pressure changes as the oxygen level in the tank becomes lower and can cause medical equipment to malfunction at a lower pressure. The second day respiratory

[38] VHA Directive 0320, *VHA Comprehensive Emergency Management Program,* July 6, 2020. The OIG considers the emergency time frame to be from when the oxygen line was cut until wall oxygen was restored.

therapist, who responded to the call to support the care of the patient, also reported that the pressure in the tank connected to the patient's BiPAP was getting lower. Subsequently, the driving pressure also decreased, which would cause the BiPAP machine to alarm that there was low oxygen. The Chief of Staff and the chief of respiratory care acknowledged that there were pressure related issues to address as patients were transitioned from wall oxygen to portable oxygen tanks. However, the OIG did not find that facility leaders made any accommodations, such as education or training, to minimize the risk for addressing equipment malfunction while on portable oxygen tanks. One nursing staff member who cared for the patient expressed concerns to the OIG "How did we not know that maybe the BiPAP wouldn't work with the tanks? As a nurse I wouldn't know that."

Additionally, the day nurse told the OIG that while the day respiratory therapist was out of the patient's room obtaining a new H-tank, nursing staff had a difficult time connecting the E-tank due to a missing regulator and that a respiratory therapy staff member later arrived with a regulator, which allowed staff to connect the E-tanks to the BiPAP machine.[39] The day nurse further noted that E-tanks were depleted within five minutes, and later learned that the E-tank does not adequately support the high oxygen output required when utilizing BiPAP.

Given that high-flow oxygen delivery is usually supported by wall oxygen, nursing staff lacked the knowledge to handle an emergency of this nature effectively and efficiently. Nursing staff struggled to connect the BiPAP to the E-tank, which further delayed the patient receiving a sufficient amount of oxygen. Multiple staff reported that this event would not have happened if there was access to wall oxygen.

The OIG concluded that the incident regarding the patient demonstrated that nursing staff lacked the knowledge necessary to manage H-tanks and connect E-tanks for high pressure use with the BiPAP.

Review for Other Adverse Clinical Outcomes

The OIG interviewed the Acting Facility Director, the Facility Director, and the Chief of Staff who either denied that there were other patient safety incidents or being aware of any other adverse clinical outcomes related to the oxygen disruption. Additionally, the patient safety manager (PSM) reported not receiving any related joint patient safety reports (JPSRs) and the patient advocate supervisor denied receiving any concerns or complaints prior to OIG's inspection.

The OIG asked facility nursing and respiratory therapy staff whether other patients were impacted as a result of the oxygen disruption. Multiple facility staff denied that other patients experienced adverse clinical outcomes as a result of the oxygen disruption. Specifically, the

[39] The chief of respiratory care told the OIG that specific regulators correspond to specific portable oxygen tanks in addition to special regulators being used to reduce the pressure in the tank to avoid damaging the oxygen device to which the tank is connected.

second day respiratory therapist stated that they were not aware of, nor had they heard of any patient safety incidents during the oxygen disruption.

The OIG learned through interviews that facility staff did not have a list of all patients on oxygen for the day of the disruption. Facility staff were unable to provide this list due to not having a tracking mechanism for patients on oxygen. The chief of respiratory care further explained that respiratory therapy service staff are not required to track patients on oxygen due to changes in hospital billing over the years, and as a result did not provide a comprehensive list of patients on oxygen during the time of the disruption.

The OIG reviewed a facility document and found that four patients required a rapid response call, and no patients required a code blue alert during the time of the oxygen disruption. The OIG found that none of the rapid response calls were related to the oxygen disruption.

The OIG concluded that there were no adverse clinical outcomes experienced by other patients as a result of the oxygen disruption. Facility leaders and staff did not identify additional patients who experienced harm as a result of patients being transitioned to portable oxygen tanks. The PSM and patient advocate supervisor received no related patient safety concerns. No rapid response calls or code blue alerts occurred for life-sustaining interventions as a result of the oxygen disruption.

2. Failures in Emergency Response Communication

The OIG reviewed the implementation of emergency procedures and actions taken after the oxygen line was severed.

Implementation of Emergency Procedures

The OIG determined that upon learning of the oxygen disruption, respiratory therapy staff transitioned patients on oxygen therapy to portable oxygen tanks and oxygen concentrators. In addition, facility senior leaders immediately initiated and continued incident command processes through the duration of the oxygen disruption.

Facility standard operating procedure requires patients to be transitioned to portable oxygen tanks and concentrators when there is a disruption to wall oxygen.[40] VHA requires that during an emergency, the Facility Director transition from a routine management structure to an incident command process until the situation is adequately addressed.[41] NFPA 99 requires healthcare

[40] Facility Standard Operating Procedure 547-001 OX.

[41] VHA Directive 0320.

facilities to have a greater than 24-hour supply of oxygen available for emergency situations based on the facility's average daily use.[42]

The OIG reviewed a facility issue brief and found that the oxygen line was severed during the demolition and excavation of a concrete pad. Through document review and interviews, the OIG learned nursing staff heard an alarm when the oxygen disruption occurred, which prompted communication with respiratory therapy staff. According to incident command minutes, there were 18 patients on oxygen at the onset of the oxygen disruption. The night respiratory therapist told the OIG that staff prioritized mechanically ventilated patients who were placed on H-tanks, and the remaining patients were transferred to E-tanks or oxygen concentrators.

During an interview with the OIG, the chief of FMS reported first learning of the oxygen disruption through a call from a facility staff member. The chief of FMS reported then notifying the Acting Facility Director.[43] The Facility Director reported being notified by the Acting Facility Director, which prompted the implementation of the incident command process by approximately 3:00 a.m.

The incident command team included facility senior leaders and staff representing Facilities Management, Logistics, Respiratory, Safety, Public Information, and Finance services. On the first day of the oxygen disruption, the incident command team met five times at a frequency of every two to four hours. By the second and third days of the oxygen disruption, the incident command team met twice each day. Wall oxygen was restored on the third day, and the incident command team had a final meeting the following day at 8:30 a.m. to review the status of facility operations related to the oxygen disruption. During incident command meetings, members discussed the number of patients requiring oxygen, the availability of portable oxygen, and progress on procuring a mobile bulk oxygen tank. Day one incident command meeting minutes reflected that the chief of respiratory care secured at least a 48-hour supply of portable oxygen tanks. A bulk oxygen tank was connected that restored wall oxygen on the third day at 11:30 p.m.[44]

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[42] National Fire Protection Association, *Health Care Facilities Code 99,* 5.1.3.10.3.2, 2021 Edition. "Cryogenic fluid central supply systems shall consist of the following: A reserve supply sized for greater than an average day's supply, with the size of vessel or number of cylinders determined after consideration of delivery schedules, proximity of the facility to alternative supplies, and the emergency plan."

[43] In spring 2022, the Facility Director was detailed to a position outside of the facility, and the Facility Deputy Director assumed the role as Acting Facility Director. In the report, the Facility Deputy Director is referred to as Acting Facility Director.

[44] "COVID-19 and Oxygen: Selecting Supply Options in LMICs that Balance Immediate Needs with Long-Term Cost-Effectiveness," Center for Global Development, accessed August 1, 2022, https://www.cgdev.org/publication/covid-19-and-oxygen-selecting-supply-options-lmics-balance-immediate-needs-long-term. Oxygen therapy is a core part of treatment for COVID-19. As COVID-19 outbreaks expanded across the country, oxygen consumption increased by 158 percent for hospitals in the United States resulting in higher supply demand, which "places a strain on the supply system to ensure timely resupply" of oxygen.

The OIG concluded that at the time of the oxygen disruption, respiratory therapy staff transitioned patients to portable oxygen tanks, and the Facility Director initiated incident command processes as required.

Provision of Care Without Central Oxygen Supply

The OIG determined that there was a lack of communication between facility leaders, frontline staff, and patients when the decision was made to continue to provide care to patients requiring oxygen at the facility without wall oxygen. The OIG found that facility leaders initiated ambulance diversion, but did not transfer patients or cancel appointments.

VHA recognizes the frequent need for facilities to transfer patients out of medical facilities when services are not available in order to maximize patient safety.[45] The VHA Emergency Management Program Guidebook emphasizes leaders should communicate with patients, families, and staff with the expectation that facility leaders provide open and honest information on emergency situations and response plans and maintain information-sharing throughout emergency operations.[46] The OIG acknowledges that clear communication and collaboration to staff, patients, and families instills a culture of trust and embodies VHA's commitment to respecting a patient's right to informed participation in their health care.[47] Facility standard operating procedure requires patients and families to be notified of a disruption to the wall oxygen and the transition to portable oxygen tanks and oxygen concentrators.[48]

Through document review, the OIG found that the facility went on ambulance diversion from the first day 3:10 a.m. through the third day at 10:00 a.m. The Acting Facility Director reported that patients were not transferred due to the lack of wall oxygen, and the Chief of Staff reported continued use of the operating room to perform certain procedures, as patients relied on portable oxygen tanks and oxygen concentrators.

The Chief of Staff reported that facility leaders made the decision to not transfer patients because alternate sources of oxygen were available, and that there was a limited amount of available beds in the community. The chief of respiratory care also told the OIG that there were enough portable oxygen tanks and oxygen concentrators available to patients when wall oxygen was not available.

The Chief of Staff reported that when considering the option of patient transfers, neighboring hospitals had limited bed availability during that time frame; however, the OIG reviewed the region's community hospital report and found that the community hospitals were not at

[45] VHA Directive 1094, *Inter-facility Transfer Policy,* January 11, 2017.

[46] VHA Guidebook, *Emergency Management Program Historical Guidebook*, August 31, 2020, updated March 26, 2021.

[47] VHA Guidebook, *Emergency Management Program Historical Guidebook*. VHA Handbook 1004.01(5), *Informed Consent for Clinical Treatments and Procedures*, August 14, 2009, amended September 17, 2021.

[48] Facility Standard Operating Procedure 547-001 OX.

capacity.[49] The Chief of Staff explained that since wall oxygen could be restored within two days of the oxygen disruption, facility leaders felt that the facility could manage on portable oxygen without transferring patients. Further, the Chief of Staff noted that facility leaders walked through the inpatient units on the hospital and did not recall observing any issues with the use of H-tanks.

In interviews, the Chief of Staff and chief of respiratory care reported a belief that patients and their families had been notified by frontline staff about the lack of wall oxygen and transition to portable oxygen tanks and oxygen concentrators. However, the chief nurse of acute care reported the belief that nurses were not involved with communications with patients or families. The OIG learned that the Chief of Staff and chief of respiratory care's perception was not accurate as a nursing staff member reported not communicating with families while the night respiratory therapist reported not communicating with patients about the oxygen disruption. While communication with patients and families was an expectation, the Chief of Staff told the OIG that facility leaders did not address communication with patients or families during incident command meetings.

Contrary to the views that facility leaders expressed to the OIG, multiple frontline staff voiced the opinion that patients requiring oxygen should have been transferred out of the facility. A respiratory therapist noted patients should have been transferred because of limited staff, and a nursing staff member reported the need to transfer patients due to the potential for a rapid increase in oxygen needs for COVID-19 patients without immediate and continuous access to wall oxygen.[50] One nursing staff member reported through experience in caring for COVID-19 patients, "I have seen them go from you know being on room air to being intubated an hour later." Frontline staff also reported concern about the ability to respond to a medical emergency for cardiac or respiratory arrest because of limited respiratory therapy staff and equipment availability. When questioned about the safety of maintaining patients on portable oxygen, the Chief of Staff stated, "it's preferable to have wall oxygen and to have continuous flow of oxygen and not have to switch people out [transitioning patients to portable oxygen tanks] and do all those things but that was the situation we had to deal with."

Communication between facility leaders and frontline staff may have provided additional insight into the concerns about staffing and equipment limitations, enhanced communication about decision-making, and promoted managerial response to resource needs.

[49] The community hospital report demonstrates patient volume and census for all hospitals in New Haven County where the West Haven VA Medical Center is located. This report does not include the number of patients in emergency departments awaiting beds or disposition.

[50] Hoyt Burdick et al., "Prediction of respiratory decompensation in Covid-19 patients using machine learning: The READY trial," *Computers in Biology and Medicine* 124, (September 2020): 1-6. Literature review demonstrates physician difficulty with predicting which COVID-19 patients are at high risk of rapid respiratory decompensation and will require emergency intubation.

The OIG concluded that while facility leaders were under the impression clinical operations could be sustained on portable oxygen tanks and oxygen concentrators, there was a disconnect between what frontline staff felt they could handle and what facility leaders understood facility staff were capable of managing during the lack of wall oxygen creating a patient safety risk. In addition, facility leaders did not ensure that patients were notified of the change to portable oxygen, limiting their shared decision-making ability when considering transfer to another facility.

3. Failures in Construction Oversight and Emergency Preparedness

The OIG reviewed the quality of the facility's construction oversight and whether staff and leaders were prepared to manage the emergency situation caused by the oxygen disruption.

Deficiencies in Construction Oversight

The OIG determined that the facility obtained a construction safety plan, reminded the contractor that they were going to be working near the oxygen line, and appropriately considered the time of day for the work to be completed. However, facility staff did not complete the required pre-construction risk assessment with involvement from patient safety staff, and the on-site FMS engineer was not directly observing the work at the time the oxygen line was severed.

VHA requires that construction activities are conducted with safeguards and practices that protect the health of employees, patients, and the public regardless of whether the work is performed by VHA or contracted staff.[51] While VHA policy does not specify to what extent FMS staff should supervise work performed by a contractor, the Directors of VHA's Office of Healthcare Engineering and Capital Asset Management reported there is an expectation that the FMS engineer directly observe the contractor's work when digging around utilities to protect "existing assets." VHA also requires a multi-disciplinary Construction Safety Committee, which includes a representative from patient safety, to conduct a pre-construction risk assessment and submit a written report that summarizes identified hazards to treatment and services.[52]

During interviews with the OIG, both the facility project engineer-COR and the Director of VHA's Office of Capital Asset Management reported that the construction planning process obligated the contractor to provide a safety assessment for excavation with a plan to protect underground utilities.[53] Through documentation review, the OIG confirmed the construction company submitted the safety assessment to the facility, which included a plan to dig by hand to determine the exact location of an underground utility, such as the oxygen line.

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[51] VHA Directive 7715, *Safety and Health During Construction*, April 6, 2017.

[52] VHA Directive 7715.

[53] "Federal Acquisition Certification Training for Contracting Officer's Representatives," Veterans Affairs Acquisition Academy (VAAA), accessed August 1, 2022, https://www.acquisitionacademy.va.gov/schools/ppm/corCertification.asp. The Contracting Officer's Representative ensures that contractors meet the commitment of their contracts.

The week before the oxygen disruption, the facility project engineer-COR emailed the site supervisor of the construction company warning the construction team to exercise caution when excavating around the oxygen line to which the site supervisor responded, confirming that safety around the gas lines would be reviewed with the construction team working on-site. In interviews, both the chief of FMS and the facility project engineer-COR stated that this follow-up communication was a reminder of the safety assessment and plan.

Despite the warning and instructions noted within the safety assessment, FMS staff reported learning that the contractor had utilized excavation machinery when the damage to the oxygen line occurred, as opposed to digging by hand. An FMS engineer reported being on-site in an engineering building when the oxygen disruption occurred and had conducted periodic inspections at the construction site. The facility project engineer-COR explained that it was not the responsibility of FMS staff to directly observe the contractor's work at all times. Additionally, the facility project engineer-COR reported that the FMS engineer was expected to conduct periodic site inspections. The FMS engineer reported going to the site every one and a half to two hours during the night shift, confirmed awareness that the excavation taking place was near the oxygen line (including the email reminder to the construction company about taking precaution near the oxygen line), and stated that the site rounds involved checking for any potential impact from the excavator fumes and assessing for any concerns during the concrete pad demolition. The FMS engineer told the OIG that there were no concerns throughout the entire shift but that excavation close to the oxygen line was not directly observed.

The facility project engineer-COR reported a misunderstanding that the Construction Safety Committee risk assessment was not required for the construction project that caused the oxygen disruption because it was a non-recurring maintenance project and not a major project. However, no documentation could be provided that supported this perception, and the Directors of VHA's Office of Healthcare Engineering and Capital Asset Management as well as the VISN Capital Asset Manager reported that there would be no exemption from this risk assessment process. When the OIG asked if the risk assessment could have prevented the oxygen disruption, the Director of VHA's Office of Healthcare Engineering noted that risk assessments mitigate some risks and improve the quality of projects.

In addition to the absence of the pre-construction risk assessment, the OIG found that there was an overall absence of patient safety staff participation in Construction Safety Committee meetings. Patient safety is part of the multi-disciplinary team that conducts pre-construction risk assessments with a goal to assess construction-associated risks that affect health care. The PSM reported membership to the committee several years prior, but later assigned this responsibility to the patient safety specialist. The OIG then interviewed the patient safety specialist who reported not attending the Construction Safety Committee meetings because of competing work obligations.

Through document review the OIG found that the demolition and excavation that damaged the oxygen line were scheduled to occur Monday until Friday, between 7:00 p.m. and 5:00 a.m. The

Facility Director and the facility project engineer-COR reported that this time was chosen as there would be fewer people present on the facility's campus and it would cause less disruption to the operating room or other procedure areas. The VISN Capital Asset Manager acknowledged that although construction during overnight hours can be a concern for visibility, it is not uncommon for construction to take place overnight. The Directors of VHA's Office of Healthcare Engineering and Capital Asset Management also concurred that it was acceptable to conduct activities overnight.

The OIG concluded that staff obtained a completed construction safety plan, reminded the contractor that they were going to be excavating near the oxygen line, and appropriately considered the time of day for the work to be completed. However, the Construction Safety Committee did not complete the required pre-construction risk assessment with involvement from patient safety that could have mitigated risks and improved the quality of the project. The OIG also identified that though required, patient safety staff had not been regularly attending the meetings. Although policy does not outline specific requirements, the OIG determined that more frequent oversight and diligent attention by FMS staff to ensure the contractual obligation, for hand digging to fully expose the oxygen line, should have been considered due to the potential for major operational impact to the facility.

Deficiencies in Emergency Preparedness

The OIG determined there was a lack of periodic drills for utility emergencies and a lack of knowledge of the facility's emergency oxygen standard operating procedure. In addition, the OIG found that there was a shortage of necessary equipment for managing patients on portable oxygen tanks.

Facility policy requires training and periodic exercises to prepare staff for utility emergencies.[54] Additionally, facility policy requires that portable oxygen tanks be secured in a tank stand or cart and kept in designated oxygen tank storage areas labeled with appropriate signage.[55]

Both nursing and respiratory therapy staff reported that they had either not participated in any training or drills for emergency oxygen procedures. The facility emergency manager acknowledged there had been no drills or exercises for an unplanned oxygen disruption, primarily because of the focus of emergency management efforts on COVID-19. During interviews with the OIG, respiratory therapy staff reported that they were not familiar with the facility's emergency procedures for an unplanned oxygen disruption and relied on their general respiratory therapy knowledge to respond at the onset of the oxygen disruption. The Associate Director of Nursing and Patient Care Services reported that nursing staff were not trained on the management of H-tanks.

[54] Facility Emergency Operations Plan, *Appendix O Utility Failures Plan,* April 21, 2016.

[55] Facility Policy 186-009, *Safe Storage and Handling of Oxygen Cylinders*, January 21, 2021.

Respiratory therapy staff told the OIG that some H-tanks were stored directly on inpatient units but storage on the units did not occur consistently, requiring respiratory therapy staff to obtain H-tank replacements from a ground floor storage room. Through document review, the OIG learned there was a shortage of carts needed to transport H-tanks. When questioned about this issue, the chief of respiratory care verified the shortage and the need to borrow carts from other facilities in the VISN and purchase additional carts based on what could be borrowed. The OIG learned through interviews with a respiratory therapist and a nurse that there was at least one known instance in which staff secured an H-tank to a wall with "tubing" while in patient use and not in a cart or stand as required by facility policy. Improperly securing portable oxygen tanks could risk a fire or explosion.[56]

The OIG concluded that facility staff were not adequately prepared for the oxygen disruption due to deficiencies in periodic drills, knowledge of the emergency oxygen standard operating procedure, and equipment availability creating safety risks to both staff and patients.

4. Facility Leaders' Response

The OIG reviewed facility leaders' use of JPSR and root cause analyses (RCAs), peer review, clinical disclosure, and fact-finding review (fact-finding) processes to conduct a comprehensive review of the oxygen disruption and incident regarding the patient. The OIG also reviewed facility leaders' preparation for OIG interviews for this inspection.

Joint Patient Safety Reporting and Root Cause Analysis

The OIG determined facility leaders failed to ensure JPSRs and RCAs were submitted after learning of the oxygen disruption and the incident regarding the patient. During the OIG site visit, facility staff entered JPSRs for both incidents and the Acting Facility Director chartered an RCA for the incident regarding the patient. No RCA was chartered for the oxygen disruption.

VHA requires adverse events and close calls within the facility be reported to the facility's PSM or acting PSM.[57] These events may be entered by any staff member through any locally accepted method including the electronic JPSR system.[58] Once entered, the first step taken by the PSM after any required immediate action is to analyze each reported event using severity and probability categories to assign a risk level. An RCA must be chartered for any events categorized as actual high-risk and for any events categorized as potential high-risk that are not related to falls, medications, and missing patients.[59]

During an interview with the OIG, the PSM reported not having specific information but vaguely hearing about an issue related to an empty tank during a huddle. The PSM reported conducting a

[56] National Fire Protection Association, "Medical Gas Cylinder Storage."

[57] VHA Handbook 1050.01, *VHA National Patient Safety Improvement Handbook*, March 4, 2011.

[58] VHA Handbook 1050.01.

[59] VHA Handbook 1050.01

search and confirmed that no patient safety concerns related to the oxygen disruption or related patient care issues had been submitted.

The chief of quality management explained that "Ideally yes, 2 would have been entered, 1 for the oxygen event itself and 1 for the concerns related to the [patient]. Often engineering issues are reported directly to Leadership or to the Safety Hotline run by the Safety Service. My best guess in this case, is that the oxygen issue itself was known based on the response at the time of the event and the activation of Incident Command so the need for the JPSR report may not have been appreciated."

Leading up to and during the OIG site visit at the facility, the OIG asked facility leaders, the chief of quality management, and an additional quality management staff member why a JPSR was not entered for the incident regarding the patient, and received the following replies:

- The Facility Director explained that a JPSR was not completed due to the belief that the patient's death was related to COVID-19 and other co-morbidities and not an adverse event.
- The Acting Facility Director reported believing that the incident was being investigated and noted that a JPSR should have been entered by anyone who felt empowered to enter it.
- The chief of quality management reported the belief that staff were likely more focused on writing reports of contact related to the day respiratory therapist involved with the care of the patient.[60]
- The risk manager reported that, "[The chief of respiratory care] was initiating a management review on the day respiratory therapist and there were statements that were collected from the staff involved. So, it's possible that they [staff] were writing up the event and assumed that everyone needed to know about it that did, but that was not really the case unfortunately."

The PSM reported completing an EHR review in preparation for the OIG interview and explained that upon evaluation, a JPSR should have been entered for the incident regarding the patient noting that, "It's part of our clinical duty to make sure that the patients have oxygen."

During interviews, the OIG learned that facility leaders were first made aware of the incident regarding the patient in early 2022, either at a huddle, incident command call, or an email sent by the chief of respiratory care. Later that day, the chief of respiratory care emailed a summary of the incident to the Acting Facility Director, Chief of Staff, Associate Director of Nursing and Patient Care Services, chief of anesthesiology service, and an additional staff member. The

[60] Reports of Contact are VA forms utilized as tools for documentation that allow users to include statements or information as needed for official record.

Associate Director of Nursing and Patient Care Services explained that a discussion then occurred among senior leaders to determine the root cause and understand what happened.

During the OIG's site visit at the facility, a staff member informed the OIG that two JPSRs were entered. Staff entered one JPSR for the incident regarding the patient mid-spring 2022, while another was entered two days later, related to the oxygen disruption. Although both incidents were designated as high-risk or potential high-risk events that should have generated an RCA, the Acting Facility Director only chartered an RCA for the incident regarding the patient.[61] Upon being asked why an RCA was not chartered for the facility-wide oxygen disruption, the PSM explained that all staff actions were completed according to the emergency oxygen operating procedure, there was enough oxygen supply available, and there were no reported patient issues directly associated with the oxygen disruption. The OIG reviewed the completed RCA, the details of which are not discussed pursuant to 38 U.S.C. § 5705.[62]

The OIG concluded that facility leaders failed to ensure an initial submission of JPSRs and RCAs related to the oxygen disruption and the incident regarding the patient. After the OIG completed multiple interviews, an anonymous staff member(s) submitted a JPSR for both events and the Acting Facility Director chartered an RCA for the incident regarding the patient. Failure to promptly enter JPSRs and charter RCAs create unnecessary barriers for facility leaders and staff to timely review and evaluate patient safety concerns. The failure to enter an RCA related to the oxygen disruption prevented facility leaders from analyzing and identifying the root cause in order to improve processes.

Peer Reviews

The OIG determined that the incident regarding the patient prompted peer reviews. However, multiple providers failed to enter complete documentation of the event into the patient's EHR; therefore, quality management staff were unable to evaluate whether peer reviews were necessary for those staff members.

VHA requires peer reviews to be conducted for a "Death that was preceded by a change in the patient's condition when there are questions regarding response to, management of, and /or communication related to the referenced change."[63] VHA defines peer review as a "critical review of care performed by a peer," to evaluate care provided by a clinician for a specific episode of care, identify learning opportunities for improvement, provide confidential communication of the results back to the clinician, and identify potential system or process

[61] VHA Handbook 1050.01. The incident regarding the patient was categorized as a high-risk event requiring an RCA. The incident related to the oxygen disruption was categorized as a potential high-risk event not related to medications, falls, and missing patients and therefore, also required an RCA.

[62] Confidentiality of medical quality-assurance records, 38 U.S.C. § 5705.

[63] VHA Directive 1190, *Peer Review for Quality Management*, November 21, 2018.

improvements.[64] Facility policy states that health care providers "must enter documentation of each event of a patient's care into the health record."[65]

During an interview, the risk manager reported completing an EHR review of the incident regarding the patient after receiving an email notification of the incident from the chief of quality management in spring 2022. The risk manager reported that peer reviews were initiated for the night nurse and night respiratory therapist. The risk manager later discontinued the peer review for the night respiratory therapist after being notified by the chief of respiratory care that the day respiratory therapist had provided care during the incident as opposed to the night respiratory therapist. When the OIG asked why other disciplines were not peer reviewed, the risk manager stated, "Peer reviews are based on documentation [EHR] only. So, it's not always clear who is in the room working on the patient at the time. So sometimes it's hard to do peer reviews when you don't know who is in there [the patient's room] and the people that were in there don't document because they're not the primary care providers assigned to the patient at the time."[66] The risk manager further noted that no EHR documentation indicated a need for other providers to be peer reviewed. Specifically, the risk manager provided the following rationale to support the decision not to peer review other staff who cared for the patient during the incident:

- The second night nurse was not peer reviewed due to lack of documentation.
- The day respiratory therapist was not peer reviewed due to a lack of documentation and an ongoing administrative investigation.
- The attending physician overseeing the day resident was not peer reviewed as there were no concerns regarding the care the resident provided to the patient during the incident.[67]

The OIG reviewed the patient's EHR and found that the second and third day respiratory therapists, and second day nurse did not enter documentation in the patient's EHR; therefore, prohibiting the risk manager's ability to assess the need to peer review these staff members.

The OIG inquired about peer review of the day nurse who provided care to the patient during the incident. The risk manager reported that documentation in the EHR reflected the incident occurred around 7:30 a.m. and understood that the day nurse assumed care of the patient at 8:00 a.m. However, the OIG learned that the day nurse had already assumed care of the patient. The OIG reviewed the day nurse's EHR entry and found that incomplete documentation

[64] VHA Directive 1190. In the context of protected peer reviews, "protected" refers to the designation of review as a confidential quality management activity under 38 U.S.C. § 5705 as "a Department systematic health-care review activity designated by the Secretary to be carried out by or for the Department for improving the quality of medical care or the utilization of health-care resources in VA facilities."

[65] Facility policy 11-111, *Medical Record Documentation Requirements, Standards for Completion of Medical Record and Correction of Medical Record*, February 9, 2018.

[66] The term primary care providers within this quote refers to the inpatient providers assigned to the patient.

[67] VHA Directive 1190. "Health care profession trainees, acting within the scope of their training program, are not independent clinicians" and are not subject to peer review. "If the supervision of the trainee was deemed inappropriate, the Level of Care is assigned to the supervising clinician."

prohibited the risk manager's ability to evaluate the need for a peer review of the day nurse. The risk manager told the OIG that a peer review of the day nurse was initiated after the chief nurse of acute care clarified that the day nurse cared for the patient during the incident.

The OIG concluded that multiple providers involved in the patient's care during the incident did not enter complete documentation; inhibiting the peer review process from identifying learning opportunities for improvement and identifying potential system or process improvements.

Disclosure of Adverse Events

The OIG determined that facility leaders and staff failed to complete a clinical disclosure for the incident regarding the patient. The OIG found that, on day three of the oxygen disruption, the patient experienced a period without an adequate oxygen supply. Documentation in the EHR reflected that the patient was "alert" prior to this period but was "unresponsive" during and after.

VHA policy warrants the disclosure of harmful or potentially harmful adverse events to patients or their personal representatives, including those that have had "an effect on the patient that is perceptible to either the patient or the healthcare team."[68] Clinical disclosure "is a process by which the patient's clinician informs the patient or the patient's personal representative, as part of routine clinical care, that a harmful or potentially harmful adverse event has occurred during the patient's care."[69]

The OIG reviewed email correspondences and found in early spring, the risk manager emailed the patient's attending physician inquiring whether or not disclosure of the incident had occurred with the patient's daughter. The attending physician confirmed through the day resident that disclosure did not occur and expressed the opinion that the tank running out of oxygen did not significantly contribute to the patient's death. The OIG noted that a prompt for disclosure of an adverse event is harm or potential harm to the patient, including those that have an effect on the patient.[70] Whether "the oxygen desaturation when the tank ran out" resulted in, or hastened, the patient's death is not determinable. However, this period of oxygen desaturation coincides with the patient's deterioration in mental status from "alert and able to nod head" to "unresponsive." The patient's unresponsiveness was unchanged until his death later that morning.

During interviews, the OIG asked the Chief of Staff, risk manager, and the patient's attending physician whether the incident regarding the patient was considered an adverse event and received the following replies:

- The Chief of Staff believed this incident did not impact the patient's outcome.
- The risk manager believed the incident was an adverse event.

[68] VHA Directive 1004.08, *Disclosure of Adverse Events to Patients*, October 31, 2018.

[69] VHA Directive 1004.08.

[70] VHA Directive 1004.08.

- The patient's attending physician stated "Yeah, it was an adverse event that did not in the long run impact his outcome. So, he didn't go into cardiac arrest. He didn't develop V-tach as he was desaturating to 65 percent. So, I would say it's a near miss."

Additionally, the OIG asked whether disclosure of the incident was warranted or why a disclosure did not occur and received the following replies:

- The Chief of Staff stated "So, I think clinical disclosure is at the discretion of the clinical team usually as I understand within 24 hours. There certainly could have been a clinical disclosure in this case."
- The risk manager noted that after discussion with the patient's attending physician "We felt that it didn't significantly contribute to his death that he likely would have passed even in the absence of that incident."
- The patient's attending physician noted that "It was transiently adverse. I don't know I just didn't. I honestly didn't think it was, I didn't scratch my head too much about having to tell the daughter about the oxygen tank either way. I really didn't. Could we have, disclosed it? I supposed we could have. But I guess because it didn't seem like my example of the patient going into V-tach. Because nothing permanently adverse had come of that. It didn't feel to me like it was necessary to disclose that."

The OIG found that there was a period when the patient did not receive adequate oxygen due to the delay and difficulties in changing the H-tank, which likely would not have occurred if wall oxygen had been available. The patient's condition materially changed, being described as "unresponsive" when the H-tank was found to be empty, and remained so during and after the incident.

The OIG concluded that facility leaders and staff did not conduct a clinical disclosure after the patient experienced an inadequate oxygen supply and respiratory distress, which coincided with a deterioration in mental status. The commitment to disclose harmful adverse events to patients or their representatives fosters ethical principles consistent with the VA core values of integrity, commitment, advocacy, respect, and excellence. Failure to disclose adverse events to patients or patient representatives erodes trust and effective communication, the foundation of quality care.

Fact-finding

The OIG determined upon receiving concerns related to the day respiratory therapist's care for the patient, the chief of respiratory care removed the day respiratory therapist from patient care, and then initiated a fact-finding to determine the validity of the concerns. Although a fact-finding was initiated, the OIG found that the chief of respiratory care did not have the needed training to conduct fact-finding procedures and had a conflict of interest serving as a fact finder.

VA requires employees to maintain high standards of conduct, integrity, and effectiveness. When such standards are not met, it is essential to take prompt and corrective action.[71] Facility leaders may gather available evidence through less formal reviews such as a fact-finding to address matters of interest to the VA.[72] Fact finders shall identify the specific issues for investigation, collect, preserve, and secure material evidence. Fact finders need to have a minimum of an hour of training approved by the Office of General Counsel, which includes a specific Talent Management System course to ensure a successful administrative investigation.[73] The decision to initiate a fact-finding cannot be made by an official who has a conflict of interest to the related issue.[74]

During an interview with the OIG, the chief of respiratory care reported first being made aware of the incident regarding the patient on day three of the oxygen disruption, by the MICU assistant nurse manager. Nursing staff alleged the day respiratory therapist was delayed in changing out an H-tank when the patient was hypoxic. The chief nurse of acute care reported being told by the MICU assistant nurse manager that the day respiratory therapist lacked urgency when managing the patient's respiratory distress and arrived to the unit without an H-tank wrench to connect the H-tank, further delaying an optimal oxygen supply. The second day nurse in the room during the hypoxic event reported that the day respiratory therapist was observing with no urgency or action while other staff attempted to address the patient's respiratory decline.

Upon being notified on that same day, the chief of respiratory care reported removing the day respiratory therapist from clinical care pending a fact-finding. The OIG learned through document reviews that the chief of respiratory care initiated a fact-finding, and contacted staff the following week to further investigate the events surrounding the day respiratory therapist. The chief of respiratory care emailed three nursing staff members requesting contact to discuss the incident regarding the patient that occurred in early 2022. The investigative file consisted of six witness statements from staff including one from the chief of respiratory care (fact finder), one from a day resident, two respiratory therapy staff members, and two nursing staff members.[75] The chief of respiratory care documented interviewing the day respiratory therapist to follow up on the incident. The chief of respiratory care reported documents related to the fact-finding were submitted to Human Resources and the recommendations were pending review. The OIG then requested the final disposition and learned through a review of documents that no disciplinary actions were taken.

[71] VA Handbook 5021/22, *Employee/Management Relations*, March 14, 2016.

[72] VA Handbook 5021/22. VA Handbook 0700, *Administrative Investigation Boards and Factfindings*, August 17, 2021.

[73] VA Handbook 0700.

[74] VA Handbook 0700.

[75] The chief of respiratory care was the initiating authority and fact finder and was therefore not interviewed. The chief's report of contact was a self-written statement.

The chief of respiratory care reported to the OIG the intention for the fact-finding to be used for possible administrative action. The OIG reviewed the reports of contact and found that the forms included statements and signatures. During interviews, the OIG reviewed the report of contact forms with some of the staff members and identified concerns related to the authenticity and the veracity of statements contained within the forms. Specifically, some staff denied having written select statements attributed to them or having signed or authorized signing of the document even though a representation of their signature was contained in the document.

Also, through document reviews and interview, the OIG learned that the chief of respiratory care served as both the initiating authority and the fact finder responsible for gathering evidence. Although serving in both roles is permitted, the OIG found that the chief of respiratory care did not have the training needed in order to serve as a fact finder.[76] During an interview, the chief of respiratory care reported being responsible for ensuring adequate supplies and availability of tools and equipment such as H-tank wrenches, oxygen tanks, and regulators, and ensuring adequate respiratory staffing to manage the oxygen disruption; therefore, the OIG had concerns for a potential conflict of interest.

The OIG concluded that the chief of respiratory care removed the day respiratory therapist from patient care upon receiving concerns and initiated a fact-finding. The chief of respiratory care served in the role as a fact finder for this investigation, despite not having completed the needed training. The chief of respiratory care was responsible for ensuring the availability of adequate tools, equipment, and staffing, creating a potential conflict of interest; therefore, the OIG has concerns related to the quality, validity, and accuracy of the fact-finding.

Preparation for OIG Interviews

The OIG determined that in preparation for OIG interviews, a facility staff member created a document that lacked complete and accurate information about the incident regarding the patient and disseminated the document to facility staff and leaders.

According to the Code of Federal Regulations, VA employees "will furnish information and testify freely and honestly" in response to OIG requests.[77] In addition, federal agencies should foster an environment where staff feel comfortable voicing concerns without fear of retaliation.[78]

During interviews, the OIG learned that a facility staff member created a document titled "SBAR" (Situation Background Assessment Recommendation) for the purpose of preparing

[76] VA Handbook 0700.

[77] 38 C.F.R. § 0.735-12.

[78] Office of Management and Budget memo, "Promoting Accountability through Cooperation among Agencies and Inspectors General," December 3, 2021.

facility staff and leaders for interviews with the OIG.[79] The facility staff member reported creating the document at the request of the Acting Facility Director, and emailed the documents in early spring to multiple leaders and staff who were going to be interviewed by the OIG. Facility leaders and staff then met for an "OIG prep" meeting, the week prior to OIG's site visit. The OIG found that the document included

- a summary of the events and actions taken to manage the oxygen disruption,
- a summary of the course of care the patient received during hospitalization,
- notation that a fact-finding was completed on the day respiratory therapist caring for the patient, and
- recommendations and opportunities for improvement.

The document offered varying descriptions of the period involving the replacement of the patient's H-tank, including:

- "On [early 2022], the patient's oxygen saturation dropped, and the respiratory therapist connected a new oxygen tank and BiPAP. After the new O2 supply was connected, the patient had slight improvement; however, the patient was placed on a non-Rebreather and Comfort Measures Only status. Patient passed at 11:25 a.m."
- "On [early 2022], at 8:19 a.m., the patient's O2 decreased to 65%. The nightshift respiratory therapist (RT) communicated to the dayshift therapist that the O2 tank would need to be changed within the hour. Currently, the patient was also on a BIPAP. The tank was changed, and the patient improved slightly."
- "The nightshift RT notified the dayshift RT that the O2 tank needed to be changed within the hour. The tank was changed by the dayshift RT."
- "At 8:19 a.m. on [early 2022], the patient's O2 decreased to 65% and with the BIPAP supply replenished, O2 sat improved to 72% with tachypnea and unresponsive mental status. BIPAP increased to 18/10 with no improvement. The patient continued to desaturate into the 60's."

The OIG determined that key information was missing related to the patient's clinical deterioration in early 2022, such as

- documentation of the change in the patient's cognition before and after the incident,

[79] Martin Mueller et al., "Impact of the communication and patient hand-off tool SBAR on patient safety: a systematic review," *BMJ Open* 8, (August 23, 2018):8. SBAR (situation, background, assessment, recommendation) is a communication tool developed to increase quality and safety during patient handoff among clinical staff and this document was not utilized for that typical use.

- notation that the patient's EHR included documentation that the tank was empty,
- the delay for the day respiratory therapist to locate a wrench in order to change the patient's H-tank,
- information related to staff actions in the patient's room, and
- the delay for the day respiratory therapist to obtain a replacement H-tank.

Additionally, the OIG noted that the document contained inaccurate information. For example, the document noted that the patient was found to be hypoxic with a decreased blood oxygen level at 8:19 a.m., while the patient's EHR noted the time found was around 7:30 a.m. The document also included conflicting information whether or not the patient's blood oxygen levels improved after the H-tank was replaced. During an interview, a quality management staff member also confirmed the document lacked complete information about the incident regarding the patient.

The OIG concluded that a facility staff member created and disseminated a document with incomplete and inaccurate information of the incident regarding the patient to interviewees. The OIG is concerned about the potential influence on staff to reply to OIG inquiries consistent with the information noted in the document, as opposed to providing an independent perspective.

Conclusion

The OIG was unable to determine whether the unresponsiveness or death experienced by the patient was associated with the provision, or attempted provision, of oxygen utilizing the alternate oxygen sources. However, the patient experienced an adverse event, a period of inadequate oxygen supply, while the facility was utilizing portable oxygen tanks and oxygen concentrators. Although the OIG is not able to determine whether in fact the tank was empty, there was a defined period of time when the H-tank did not provide the patient with adequate oxygen, which coincided with a drop in the patient's blood oxygen level.

Respiratory therapy staff did not ensure that the H-tank was replaced timely to allow the patient an ongoing sufficient oxygen supply. Additionally, the H-tank and cart were not readily accessible, which created an unnecessary delay, and the lack of an H-tank wrench in the MICU further extended the time necessary to connect the replacement tank. Furthermore, nursing staff lacked the knowledge necessary to manage H-tanks and connect E-tanks for high pressure use with the BiPAP.

The OIG determined that there were no adverse clinical outcomes experienced by other patients as a result of the oxygen disruption. Facility leaders and staff did not identify additional patients who experienced harm as a result of patients being transitioned to portable oxygen tanks. The PSM and patient advocate supervisor received no related patient safety concerns. There were no rapid response calls or code blue alerts that occurred for life-sustaining interventions as a result of the oxygen disruption.

At the time of the oxygen disruption, respiratory therapy staff transitioned patients to portable oxygen tanks, and the Facility Director initiated incident command processes as required. However, while facility leaders were under the impression clinical operations could be sustained on portable oxygen tanks and oxygen concentrators, there was a disconnect between what frontline staff felt they could handle and what facility leaders decided. In addition, facility leaders did not ensure that patients were notified of the change to portable oxygen, limiting their shared decision-making ability when considering patient transfers to another facility.

Facility staff obtained a construction safety plan, reminded the contractor that they were going to be working near the oxygen line, and appropriately considered the time of day for the work to be completed. However, the Construction Safety Committee did not complete the required pre-construction risk assessment with involvement from patient safety staff, which may have provided an opportunity for the facility to consider readiness for a potential oxygen disruption. The OIG also identified that patient safety had not regularly attended the meetings as required. Although specific requirements are not outlined by policy, the OIG determined that more frequent oversight and diligent attention by FMS staff to ensure the contractual obligation for hand digging to fully expose the oxygen line should have been considered due to the potential for major operational impact to the facility.

Facility staff were not adequately prepared for the disruption due to a lack of periodic drills, knowledge of the emergency oxygen standard operating procedure, and equipment creating potential safety risks.

Facility leaders initially failed to ensure submission of JPSRs and charter RCAs related to the oxygen disruption and the incident regarding the patient. After the OIG completed multiple interviews, an anonymous staff member(s) submitted JPSRs for both events and the Acting Facility Director chartered an RCA for the incident regarding the patient. Failure to promptly enter JPSRs and charter RCAs created unnecessary barriers for facility leaders and staff to timely review and evaluate patient safety concerns. The failure to charter an RCA related to the oxygen disruption was a missed opportunity for facility leaders to analyze the root cause of the incident in order to improve processes.

Multiple providers involved in the patient's care during the incident did not enter complete documentation, inhibiting the peer review process from identifying learning opportunities and potential system or process issues.

Facility leaders and staff did not conduct a clinical disclosure after the patient experienced an inadequate oxygen supply and respiratory distress, which coincided with a deterioration in mental status. Facility leaders and staff acknowledged the incident regarding the patient was an adverse event but did not believe it changed the patient's outcome thus deciding not to disclose. The commitment to disclose harmful adverse events to patients or their representatives fosters ethical principles consistent with the VA core values of integrity, commitment, advocacy, respect, and excellence. Failure to disclose adverse events to patients or patient representatives erodes trust and effective communication, the foundation of quality care.

The chief of respiratory care removed the day respiratory therapist from patient care upon receiving concerns and initiated a fact-finding. However, the chief of respiratory care served in the role as fact finder, despite not having completed the needed training. In addition, the chief of respiratory care was responsible for ensuring the availability of adequate tools, equipment, and staffing, creating a potential conflict of interest. Furthermore, the OIG reviewed the report of contact forms with some of the staff members and identified discrepancies related to the authenticity and the veracity of statements contained within the forms. Therefore, the OIG has concerns related to the quality, validity, and accuracy of the fact-finding.

A facility staff member created a document with incomplete and inaccurate information for the incident regarding the patient and disseminated the document to interviewees. The OIG is concerned about the potential influence on staff to reply to OIG inquiries consistent with the information noted in the document, as opposed to providing an independent perspective.

Recommendations 1–12

1. The West Haven VA Medical Center Director ensures communication with patients, families, and staff throughout emergency operations according to the Veterans Health Administration's Emergency Management Program Guidebook.

2. The West Haven VA Medical Center Director confirms that medical, nursing, and respiratory therapy staff have the equipment, education, and training to prepare for emergency oxygen procedures.

3. The West Haven VA Medical Center Director ensures completion of pre-construction risk assessments.

4. The West Haven VA Medical Center Director ensures patient safety staff participate in facility Construction Safety Committee meetings and activities.

5. The West Haven VA Medical Center Director evaluates the need for increased oversight of contracted construction companies during high-risk or potential high-risk situations such as construction around underground utilities.

6. The West Haven VA Medical Center Director ensures annual drills and training to address utility emergencies are completed.

7. The West Haven VA Medical Center Director confirms that joint patient safety reports are entered for adverse events and close calls and root cause analyses are chartered for high-risk events or potential high-risk events not related to falls, medications, and missing patients.

8. The West Haven VA Medical Center Director ensures clinical staff document each event of a patient's care into the health record.

9. The West Haven VA Medical Center Director ensures that the patient's episodes of care are reviewed to determine whether a clinical disclosure is needed in accordance with Veterans Health Administration requirements and takes action accordingly.

10. The West Haven VA Medical Center Director ensures that staff who are designated as a fact finder for a fact-finding investigation receive the needed training and do not have a conflict of interest.

11. The West Haven VA Medical Center Director determines whether administrative action should be taken with respect to the conduct and performance of the chief of respiratory care.

12. The Veterans Integrated Service Network Director reviews the content, accuracy, and intent of the Situation, Background, Assessment, Recommendation document and takes administrative action as warranted.

Appendix A: Timelines

Table A.1. Timeline of Oxygen Disruption and Patient Safety Event

Date	Time	Event
First day	2:10 a.m.	Oxygen line was damaged during construction resulting in wall oxygen disruption.
First day	2:10 a.m. – 3:00 a.m.	Patients were transitioned to portable oxygen tanks and oxygen concentrators.
First day	3:00 a.m.	First incident command meeting occurred.
First day	3:10 a.m.	Facility leaders placed facility on ambulance diversion.
Third day	7:30 a.m. – 8:15 a.m.	The patient experienced an inadequate supply of oxygen due to issues with the portable oxygen tank.
Third day	8:15 a.m.	Comfort care orders were placed after the day resident's discussion with the patient's daughter.
Third day	10:00 a.m.	Facility leaders ended ambulance diversion.
Third day	11:18 a.m.	The patient expired.
Third day	11:30 p.m.	Wall oxygen was restored through the emergency oxygen connection.
Following day	8:30 a.m.	The final incident command meeting occurred.

Source: OIG analysis of timeline using EHRs, OIG interviews, and review of facility documents.

Table A.2. Timeline of Leaders' Response

Date	Event
First day	An issue brief was completed related to the oxygen disruption.
Following week	The chief of respiratory care contacted staff related to a fact-finding investigation of the day respiratory therapist involved in caring for the patient.
Early spring	The OIG initiated a healthcare inspection.
One month later	A peer review was assigned for the night nurse.
Two weeks later	A JPSR was entered for the incident regarding the patient, and an RCA was chartered.
Two days later	A JPSR was entered for the oxygen disruption.
One month later	The RCA chartered for the incident regarding the patient was completed.
Summer 2022	A peer review was initiated for the day nurse.

Source: OIG analysis of timeline using OIG interviews and review of facility documents.

Appendix B: VISN Director Memorandum

Department of Veterans Affairs Memorandum

Date: May 22, 2023

From: Director, VA New England Health Care System, (10N1)

Subj.: Healthcare Inspection—Facility Leaders' Failures in Communications, Construction Oversight, Emergency Preparedness, and Response to an Oxygen Disruption at the West Haven VA Medical Center in Connecticut

To: Director, Office of Healthcare Inspections (54HL10)
Director, GAO/OIG Accountability Liaison Office (VHA 10BGOAL Action)

1. Thank you for the opportunity to review and comment on the draft report regarding the series of events following an unintentional oxygen supply disruption at the West Haven VA Medical Center in Connecticut. The VA New England Healthcare System is committed to providing exceptional healthcare to Veterans. This includes building a Just Culture that supports the prevention of patient harm and continuous process improvement as a High Reliability Organization.

2. I thank the OIG team for their recommendations which identified areas for improvement. While I concur with the recommendations, I support the facility's comments regarding the particular Veteran patient profiled by the OIG that experienced a disruption in oxygen supply during the changeover of the oxygen tank and [the patient's] overall clinical course. I likewise agree with Veteran's Health Administration physician experts who reviewed the case and noted that the Veteran's condition did not materially change subsequent to the change in oxygen source. Rather, this Veteran's condition had changed from baseline multiple times prior to the oxygen disruption, including on admission, and [the] overall clinical course was likely caused by multiple organ failure subsequent to multiple serious medical conditions. I offer my sincerest condolences to this Veteran's family and friends. It was our privilege and honor to care for [the patient].

3. I concur with recommendation 12 from the OIG.

4. The leadership teams at VA Connecticut Healthcare System and the Veterans Integrated Network Office are committed to implementing corrective actions and will diligently pursue all measures to ensure safe, high-quality care for the Veterans that we serve.

(*Original signed by:*)

Ryan Lilly, MPA
VISN 1 Network Director
VA New England Healthcare System

VISN Director Response

Recommendation 12

The Veterans Integrated Service Network Director reviews the content, accuracy, and intent of the Situation, Background, Assessment, Recommendation document and takes administrative action as warranted.

Concur.

Target date for completion: Completed

Director Comments

The Veterans Integrated Service Network Director reviewed the content, accuracy, and intent of the Situation, Background, Assessment, Recommendation document. Reviews included discussion with facility leaders involved in creation and distribution of the document, and direct review of the actual document including comparison to relevant facts found in the Electronic Health Record. It is noted that there are discrepancies within the document, related to the accuracy of certain clinical events in the Veteran patient's course of treatment and omission of certain specific events during the replacement of the H-tank oxygen source. However, the overall intent of the document was to employ a standard communication method to allow situational awareness for facility leaders and other staff involved in the Veteran's care.

The use of a Situation, Background, Assessment, Recommendation communication tool has become common practice not only at the VA Connecticut Healthcare System but also throughout the entire New England Veterans Integrated Service Network for clinical situations as well as communication of safety concerns during organized safety huddles in keeping with standard practices of a high reliability organization. The use of the Situation Background, Assessment and Recommendation tool increases effective communication and transparency while making recommendations known for follow-up action as needed. The intent was simply to continue to employ a known process to enhance communication and transparency within a just culture and in no way intended to influence recollection or testimony. The Veterans Integrated Service Network Director conferred with Workforce Management and Consulting who agreed that no administrative action is deemed necessary. Requesting the closure of this recommendation prior to publication based on the information provided.

OIG Comments

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

Appendix C: Facility Director Memorandum

Department of Veterans Affairs Memorandum

Date: May 22, 2023

From: Director, VA Connecticut Health Care System (689)

Subj.: Healthcare Inspection—Facility Leaders' Failures in Communications, Construction Oversight, Emergency Preparedness, and Response to an Oxygen Disruption at the West Haven VA Medical Center in Connecticut

To: Director, VA New England Health Care System, (10N1)

1. Thank you for the opportunity to review and comment on the draft report regarding the series of events following an unintentional oxygen supply disruption at the West Haven VA Medical Center in Connecticut. VA Connecticut Healthcare System is committed to providing exceptional healthcare to Veterans. The leadership team at the VA Connecticut Health Care System recognizes the importance of continued improvement in our systems and in our communications.

2. This complex situation occurred during a COVID surge throughout the Northeast. While no response can be considered perfect, our decisions were made critically and thoughtfully. VA Connecticut Health Healthcare System was able to maintain full operations and provide needed care to hundreds of inpatients despite this challenging situation.

3. The OIG report heavily outlines the clinical course of one oxygen-dependent patient; I would be remiss if I did not address the lack of context regarding the severity of this Veteran's clinical condition despite extensive verbiage describing [the patient's] inpatient stay. While I acknowledge operational transitions could have been optimized differently, extensive reviews of the clinical documentation clearly found that those operational deficiencies had no impact on this Veteran's clinical outcome. Two days prior to [the patient's] death, the Veteran experienced a documented change in mental status—specifically alertness/orientation. Our hospice providers, who had a strong relationship with the Veteran and family, called to express that it was unlikely that the Veteran would survive this admission. They again discussed goals of care and the Veteran's family re-iterated that the Veteran did not wish to be intubated. Due to the severity of decline, intubation likely would not have saved [the Veteran's] life, however this option would be the level of intervention proportionate to respond to respiratory distress. The day the Veteran passed, [the patient's] mental status remained consistently disoriented. When [the] oxygen saturation dropped to 55%, [the Veteran] was transferred to ICU [intensive care unit]. This result alone is not incompatible with life. What is missing from the OIG report is the severity of the Veteran's state prior to transfer: [the patient] was critically ill when desaturated, was admitted with COVID pneumonia, renal failure, congestive heart failure, and prior to transfer to the ICU, had inflammatory markers consistent with organ failure. The trajectory of this Veteran's clinical course was consistent with documentation of the family meeting that occurred two days prior. This Veteran was at end of life and the severity of comorbidities resulted in a terminally compromised state, leaving [the patient] unable to rebound from COVID pneumonia.

4. In response to the OIG report, VA Connecticut in conjunction with VHA Central Office, requested multiple external reviews performed by critical care physicians to evaluate the clinical course of this Veteran's admission. There was collective agreement across reviewers that there was no evidence of a change in the Veteran's mental status when comparing baseline state to post oxygen disruption status. The universal consensus of these physicians, based on documentation in the Veteran's chart, concluded there was no causal link between the disruption to the oxygen system and the Veteran's clinical decline. This is consistent with internal reviews performed by VA Connecticut physicians at the time of the patient's death. Our clinical teams were honored to provide this Veteran and family compassionate and dignified end of life care.

5. The VA Connecticut Health Care System concurs with facility recommendations 1-11, and we are determined to make all the Office of the Inspector General's recommended improvements.

(*Original signed by*:)

Brett Rusch, MD
Interim Medical Center Director
VA Connecticut Health Care System

Facility Director Response

Recommendation 1

The West Haven VA Medical Center Director ensures communication with patients, families, and staff throughout emergency operations according to the Veterans Health Administration's Emergency Management Program Guidebook.

Concur.

Target date for completion: November 2023

Director Comments

VA Connecticut Healthcare System will ensure timely communications with patients, families and staff throughout emergency operations by November 2023. Information and/or updates will be shared on the facility internet and social media pages. Staff communication will include postings on the facility intranet page, via all-user messages, virtual town halls, in-person meetings and the establishment of Teams channels if communications need to target a specific unit or service. Information from the facility incident command will be shared widely using available communication platforms with additional communications targeting the areas directly impacted by the emergency. The Public Affairs officer will track communications related to emergency operations until a target of 90% is achieved and report compliance rate to the Quality, Safety, Value Council (QSVC). Following achievement of the target, the Public Affairs Office will monitor the review rate for six consecutive months and report to the QSVC monthly.

Recommendation 2

The West Haven VA Medical Center Director confirms that medical, nursing, and respiratory therapy staff have the equipment, education, and training to prepare for emergency oxygen procedures.

Concur.

Target date for completion: November 2023

Director Comments

The Associate Director of Nursing and Patient Care Services and the Chief of Staff will evaluate and confirm that medical, nursing and respiratory therapy staff have the equipment, education and training to prepare for oxygen procedures. The Associate Director of Nursing and Patient Care Service and the Chief of Staff will track equipment levels and training completion until a target of 90% is achieved and report the compliance rate to the QSVC. Following achievement of the target, the Associate Director of Nursing and Patient Care Services and the Chief of Staff will monitor the rate for six consecutive months and report to QSVC monthly.

Recommendation 3

The West Haven VA Medical Center Director ensures completion of pre-construction risk assessments.

Concur.

Target date for completion: November 2023

Director Comments

The Chief of Facilities will ensure that pre-construction risk assessments are completed and are reviewed by the Construction Safety Committee. The Chief of Facilities will review the most recent version of VHA Directive 7715, Safety and Health During Construction, and ensure that the corresponding Medical Center SOP [standard operating procedure] is compliant and will educate engineers, engineering technicians and shop supervisors on the contents of the Medical Center SOP. The Chief of Facilities will track pre-construction risk assessment completion rates until a target of 90% is achieved and report the compliance rate to the QSVC. Following achievement of the target, Patient Safety/Risk Management staff will monitor review rate for six consecutive months and report to the QSVC monthly.

Recommendation 4

The West Haven VA Medical Center Director ensures patient safety staff participate in facility Construction Safety Committee meetings and activities.

Concur.

Target date for completion: November 2023

Director Comments

A representative from the Patient Safety staff will participate in facility Construction Safety Committee meetings and activities by April 2023. The Construction Safety Committee Chair will use a committee attendance sheet to document attendance and will track Patient Safety attendance rates until a target of 90% is achieved and report the compliance rate to the QSVC. Following achievement of the target, the Construction Safety Committee Chair will monitor Patient Safety attendance for six consecutive months and report to the QSVC monthly.

Recommendation 5

The West Haven VA Medical Center Director evaluates the need for increased oversight of contracted construction companies during high-risk or potential high-risk situations such as construction around underground utilities.

Concur.

Target date for completion: November 2023

Director Comments

The Chief of Facilities and Chief of Design and Development will evaluate the need for increased oversight of contracted construction companies during high-risk or potential high-risk construction activities as determined by the pre-construction risk assessment and will ensure that the project engineers have a subject matter expert or qualified representative on-site during high-risk construction activities. The Chief of Facilities and Chief of Design and Development will direct all engineers and engineering technicians to perform a site visit of all active construction projects at least once daily. The Chief of Facilities will track the number of high-risk or potential high-risk situations and the on-site presence of a subject matter expert or qualified representative rates until a target of 90% is achieved and report the compliance rate to the QSVC. Following achievement of the target, Chief of Facilities will monitor review rate for six consecutive months and report to the QSVC monthly.

Recommendation 6

The West Haven VA Medical Center Director ensures annual drills and training to address utility emergencies are completed.

Concur.

Target date for completion: November 2023

Director Comments

The Emergency Manager will ensure that annual drills and training to address utility emergencies are completed. The emergency management drills, exercises and training priorities are established from the annual Hazard Vulnerability Assessments (HVAs) and include the top ten priority areas of focus. The HVA is updated annually which will occur at the end of the fiscal year and will determine the specific drills, exercises and training programs to include utility emergencies for the next fiscal year. The Emergency Manager will track the schedule of planned drills and exercise completion rates until a target of 90% is achieved and report the compliance rate to the QSVC. Following achievement of the target, the Emergency Manager will monitor review rate for six consecutive months and report to the QSVC monthly.

Recommendation 7

The West Haven VA Medical Center Director confirms that joint patient safety reports are entered for adverse events and close calls and root cause analyses are chartered for high-risk events or potential high-risk events not related to falls, medications, and missing patients.

Concur.

Target date for completion: November 2023

Director Comments

Patient Safety/Risk Management staff will participate in daily facility-level huddles and will review daily reports from the Administrative Officer of the Day, Nursing Office of the Day, Police Services and Issue Briefs to ensure that all adverse events and class calls have joint patient safety reports entered. The Patient Safety Manager will ensure that all high-risk events or potential high-risk events not related to falls, medications and missing patients are reviewed and have root cause analysis chartered. Patient Safety/Risk Management staff will track daily review rates until a target of 90% is achieved and report the compliance rate to the QSVC. Following achievement of the target, Patient Safety/Risk Management staff will monitor review rate for six consecutive months and report to the QSVC monthly.

Recommendation 8

The West Haven VA Medical Center Director ensures clinical staff document each event of a patient's care into the health record.

Concur.

Target date for completion: November 2023

Director Comments

The Chief of Staff will ensure that clinical staff document each event of a patient's care in the health record. The Chief of Staff or designee will track medical record documentation compliance through the medical records committee and report the compliance to the QSVC. The Chief of Staff will track compliance for six consecutive months and report to the QSVC monthly.

Recommendation 9

The West Haven VA Medical Center Director ensures that the patient's episodes of care are reviewed to determine whether a clinical disclosure is needed in accordance with Veterans Health Administration requirements and takes action accordingly.

Concur.

Target date for completion: June 2023

Director Comments

The Chief of Staff will review the patient's episodes of care to determine whether a clinical disclosure is needed and will take action accordingly. The Chief of Staff will report the results of the review and corresponding actions to the QSVC.

Recommendation 10

The West Haven VA Medical Center Director ensures that staff who are designated as a fact finder for a fact-finding investigation receive the needed training and do not have a conflict of interest.

Concur.

Target date for completion: November 2023

Director Comments

Senior Leaders and Service Chiefs will ensure that staff who are designated as a fact finder for a fact-finding investigation receive the required training and do not have a conflict of interest. Senior Leaders will track compliance rates until a target of 90% is achieved and report the compliance rate to the QSVC. Following achievement of the target, Senior Leaders will monitor compliance rate for six consecutive months and report to the QSVC monthly.

Recommendation 11

The West Haven VA Medical Center Director determines whether administrative action should be taken with respect to the conduct and performance of the chief of respiratory care.

Concur.

Target date for completion: June 2023

Director Comments

The Medical Center Director will determine whether administrative action should be taken with respect to the conduct and performance of the chief of respiratory care and will take appropriate action accordingly. The Medical Center Director will report completion of the determination to the QSVC.

Glossary

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

afebrile. Not having a fever.[80]

adverse event. "Untoward incidents, therapeutic misadventures, iatrogenic injuries, or other adverse occurrences directly associated with care or services provided within the jurisdiction of a medical facility, outpatient clinic, or other VHA facility."[81]

ambubag. "A simpler form of ventilation support in case of emergencies is through manual resuscitation using artificial manual breathing unit (AMBU) bag or bag-valve-mask."[82]

arterial blood gas. "An arterial blood gas (ABG) test measures the oxygen and carbon dioxide levels in your blood as well your blood's pH balance. The sample is taken from an artery, not a vein, and healthcare providers typically order it in certain emergency situations."[83]

atrial fibrillation. An irregular heartbeat in which the heart's upper two chambers (the atria) beat irregularly and out of coordination with the heart's lower two chambers (the ventricles). It increases the risk of stroke and other heart-related complications.[84]

baricitinib. A disease modifying antirheumatic drug for which the Food and Drug Administration has issued an emergency authorization for the treatment of COVID-19 in hospitalized patients requiring supplemental oxygen in various forms.[85]

bi-level positive airway pressure (BiPAP). A form of non-invasive ventilation therapy used to facilitate breathing through a mask, pushing air into the lungs. BiPAP machines have air pressure settings, delivering more air pressure when the patient breathes in, and reduced air pressure when the patient breathes out. A BiPAP mask will cover the nose and some masks will also cover the mouth.[86]

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[80] *Merriam-Webster.com Dictionary*, "afebrile," accessed on June 16, 2022, https://www.merriam-webster.com/dictionary/afebrile.

[81] VHA Handbook 1050.01.

[82] Kshetry L. Rohan et al., "Design and Analysis of a Low-Cost Electronically Controlled Mobile Ventilator, Incorporating Mechanized AMBU Bag, for Patients during COVID-19 Pandemic," *Journal of Healthcare Engineering* 2022, (March 30, 2022): 1-15.

[83] Cleveland Clinic, "Arterial Blood Gas (ABG)," accessed July 5, 2022, https://my.clevelandclinic.org/health/diagnostics/22409-arterial-blood-gas-abg.

[84] Mayo Clinic, "Atrial fibrillation," accessed June 9, 2020, https://www.mayoclinic.org/diseases-conditions/atrial-fibrillation/symptoms-causes/syc-20350624.

[85] Eli Lilly and Company, "Fact Sheet for Patients, Parents and Caregivers Emergency Use Authorization (EUA) of Baricitinib," accessed December 22, 2022, https://www.fda.gov/media/143824/download.

[86] Johns Hopkins Medicine, "BiPap," accessed January 31, 2023, https://www.hopkinsmedicine.org/health/treatment-tests-and-therapies/bipap.

blood glucose. "Blood sugar, or glucose, is the main sugar found in your blood. It comes from the food you eat, and is your body's main source of energy. Your blood carries glucose to all of your body's cells to use for energy."[87]

blood oxygen. "After you breathe in oxygen, it goes through your lungs and into your bloodstream. The amount of oxygen in your blood is your blood oxygen level. Your body needs a certain amount of oxygen in order to function properly, and low blood oxygen levels can lead to serious complications."[88]

blood urea nitrogen. A common blood test that measures urea nitrogen, a waste product removed by the kidneys. The test helps clinicians assess how well the kidneys are working.[89]

cannula. "A small tube for insertion into a body cavity, duct, or vessel."[90]

chronic kidney disease. Also known as chronic kidney failure, is the gradual loss of kidney function with decreased ability of the kidneys to filter waste and remove excess fluids from the blood through the urine.[91]

chronic obstructive pulmonary disease (COPD). "A chronic inflammatory lung disease that causes obstructed airflow from the lungs. Symptoms include breathing difficulty, cough, mucus (sputum) production and wheezing. It's caused by long-term exposure to irritating gases or particulate matter, most often from cigarette smoke. People with COPD are at increased risk of developing heart disease, lung cancer and a variety of other conditions."[92]

clinical disclosure. "A process by which the patient's clinician informs the patient or the patient's personal representative, as part of routine clinical care, that a harmful or potentially harmful adverse event has occurred during the patient's care."[93]

contrast materials. Substances administered into the body orally, rectally, or intravenously prior to an imaging exam such as an X-ray, ultrasound, computed tomography, or magnetic resonance that "help distinguish or 'contrast' selected areas of the body from surrounding tissue." The contrast is "used to improve the diagnostic value of those imaging exams" and "temporarily

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[87] MedlinePlus, "Blood Sugar," accessed July 5, 2022, https://medlineplus.gov/bloodsugar.html.

[88] Cleveland Clinic, "Blood Oxygen Level," accessed August 4, 2022, https://my.clevelandclinic.org/health/diagnostics/22447-blood-oxygen-level.

[89] Mayo Clinic, "Blood urea nitrogen (BUN) test," accessed January 31, 2023, https://www.mayoclinic.org/tests-procedures/blood-urea-nitrogen/about/pac-20384821.

[90] *Merriam-Webster.com Dictionary*, "cannula," accessed December 1, 2022, https://www.merriam-webster.com/dictionary/cannula#:~:text=noun,into%20a%20duct%20or%20vessel.

[91] Mayo Clinic, "Chronic kidney disease," accessed May 14, 2020, https://www.mayoclinic.org/diseases-conditions/chronic-kidney-disease/symptoms-causes/syc-20354521.

[92] Mayo Clinic, "COPD," accessed September 27, 2019, https://www.mayoclinic.org/diseases-conditions/copd/symptoms-causes/syc-20353679.

[93] VHA Directive 1004.08.

change the way X-rays or other imaging tools interact with the body." The substance is later absorbed by the body or voided in urine or stools.[94]

creatinine. "Creatinine is a chemical compound left over from energy-producing processes in your muscles. Healthy kidneys filter creatinine out of the blood. Creatinine exits your body as a waste product in urine."[95]

computed tomography (CT). "A CT scan is a type of test that combines X-rays with a computer that produces many 3-dimensional (3D) images of the body part being scanned. A CT scan takes pictures of your bones, muscles, organs, and blood vessels."[96]

continuous positive airway pressure. A technique for relieving breathing problems (such as those associated with sleep apnea or congestive heart failure) by pumping a steady flow of air at constant pressure through the nose to prevent the narrowing or collapse of air passages or to help the lungs to expand.[97]

COVID-19. An infectious disease caused by the "severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2)."[98]

d-dimer test. "A protein fragment from the breakdown of a blood clot." Although an elevated d-dimer level is not normal, it does not necessarily mean that a patient has a blood clot as there may be other reasons for a positive test. Heart attack, cancer, and liver disease can cause an elevated d-dimer, more testing is usually needed.[99]

demolition. "The dismantling, razing, destroying, or wrecking of any building or structure or any part thereof."[100]

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[94] RadiologyInfo.org for patients, "Contrast Materials," accessed June 29, 2022. https://www.radiologyinfo.org/en/info/safety-contrast.

[95] Mayo Clinic, "Creatinine tests," accessed December 12, 2022, https://www.mayoclinic.org/tests-procedures/creatinine-test/about/pac-20384646?p=1.

[96] Cleveland Clinic, "Computed Tomography Scan (CT Scan) with Contrast for Children," accessed November 30, 2022, https://my.clevelandclinic.org/health/diagnostics/21106-computed-tomography-scan-ct-scan-with-contrast-for-children#:~:text=Computed%20Tomography%20Scan%20%28CT%20Scan%29%20with%20Contrast%20for,scans%20require%20contrast%20to%20make%20things%20more%20visible.

[97] *Merriam-Webster.com Dictionary*, "continuous positive airway pressure," accessed on March 22, 2022, https://www.merriam-webster.com/dictionary/continuous%20positive%20airway%20pressure.

[98] World Health Organization, "Naming the coronavirus disease (COVID-19) and the virus that causes it," accessed August 26, 2020, https://www.who.int/emergencies/diseases/novel-coronavirus-2019/technical-guidance/naming-the-coronavirus-disease-(covid-2019)-and-the-virus-that-causes-it.

[99] University of Rochester Medical Center, "D-Dimer," accessed on June 27, 2022, https://www.urmc.rochester.edu/encyclopedia/content.aspx?contentid=d_dimer&contenttypeid=167.

[100] Occupational Safety and Health Administration, "Demolition," accessed on June 28, 2022, https://www.osha.gov/demolition#:~:text=Demolition%20is%20the%20dismantling%2C%20razing,the%20hazards%20associated%20with%20construction.

desaturation. "A reduction in blood oxygen level."[101]

dexamethasone. "A synthetic adrenal corticosteroid with potent anti-inflammatory properties."[102]

diabetes mellitus. A group of diseases that impact how the body utilizes glucose. Too much blood glucose can lead to serious health issues.[103]

diversion. "A situation in which all patients or a selected group of patients who would normally be treated by the VA medical facility cannot be accepted for admission and evaluation because the appropriate beds are not available, needed services cannot be provided, staffing is inadequate, acceptance of another patient would jeopardize the ability to properly care for those already at the facility, or disaster has disrupted normal operations."[104]

dysphagia. "Difficulty in swallowing."[105]

dyspnea. Difficult or labored breathing.[106]

etiology. The cause of a disease or abnormal condition.[107]

excavation. A cavity formed by cutting, digging, or scooping.[108]

fact-finding review. A type of administrative investigation "for collecting and analyzing evidence, ascertaining facts and documenting complete and accurate information of interest to the initiating authority."[109]

[101] Harvard Medical School, "Understanding the Results," accessed on July 5, 2022, https://sleep.hms.harvard.edu/education-training/public-education/sleep-and-health-education-program/sleep-health-education-34#:~:text=Reductions%20in%20blood%20oxygen%20levels%20%28desaturation%29%20are%20recorded,not%20less%20than%2090%25%20usually%20are%20considered%20mild.

[102] National Cancer Institute, "Definition of Dexamethasone," accessed on June 23, 2022. https://www.cancer.gov/publications/dictionaries/cancer-drug/def/dexamethasone.

[103] Mayo Clinic, "Diabetes," accessed May 14, 2020, https://www.mayoclinic.org/diseases-conditions/diabetes/symptoms-causes/syc-20371444.

[104] VHA Directive 1101.05(2), *Emergency Medicine*, September 2, 2016, amended March 7, 2017.

[105] *Merriam-Webster.com Dictionary*, "dysphagia," accessed July 27, 2023, https://www.merriam-webster.com/dictionary/dysphagia.

[106] *Merriam-Webster.com Dictionary*, "dyspnea," accessed August 4, 2022, https://www.merriam-webster.com/dictionary/dyspnea.

[107] *Merriam-Webster.com Dictionary*, "etiology," accessed June 30, 2022, https://www.merriam-webster.com/dictionary/etiology.

[108] *Merriam-Webster.com Dictionary*, "excavation," accessed June 15, 2022, https://www.merriam-webster.com/dictionary/excavation.

[109] VA Handbook 0700.

heart failure. A condition in which the heart is unable to pump blood at an adequate rate or in adequate volume.[110]

hemoglobin. "A hemoglobin test measures the amount of hemoglobin in your blood. Hemoglobin is a protein that's the main component of red blood cells (erythrocytes). Hemoglobin contains iron, which allows it to bind to oxygen."[111]

huddle. To hold a consultation.[112]

hypernatremia. The presence of an abnormally high concentration of sodium in the blood.[113]

hypoxia. A deficiency of oxygen reaching the tissues of the body.[114]

incident command system. "The Incident Command System (ICS) is a component of NIMS [National Incident Management System] which provides a standardized organizational structure with common terminology to enable effective and efficient domestic incident management."[115]

intubation. "a procedure that can help save a life when someone can't breathe. A healthcare provider uses a laryngoscope to guide an endotracheal tube (ETT) into the mouth or nose, voicebox, then trachea. The tube keeps the airway open so air can get to the lungs. Intubation is usually performed in a hospital during an emergency or before surgery."[116]

joint patient safety report. "A secure, web-based application that can be used by any VA employee with an active PIV [personal identity verification] card to submit a patient safety event or concern."[117]

non-rebreather mask. "A non-invasive oxygen device that can provide supplemental oxygen at a concentration up to 100% and at a continuous oxygen flow."[118]

non-recurring maintenance project. "Projects designed to correct, replace, upgrade, and/or modernize existing infrastructure and utility systems. Projects may include, but are not limited

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[110] *Merriam-Webster.com Dictionary*, "heart failure," accessed June 15, 2022, https://www.merriam-webster.com/dictionary/heart%20failure.

[111] Cleveland Clinic, "Hemoglobin Test," accessed November 30, 2022, https://my.clevelandclinic.org/health/diagnostics/17790-hemoglobin-test.

[112] *Merriam-Webster.com Dictionary*, "huddle," accessed on October 12, 2022, https://www.merriam-webster.com/dictionary/huddle.

[113] *Merriam-Webster.com Dictionary*, "hypernatremia," accessed on June 16, 2022, https://www.merriam-webster.com/medical/hypernatremia.

[114] *Merriam-Webster.com Dictionary*, "hypoxia," accessed January 5, 2020, https://www.merriam-webster.com/dictionary/hypoxia.

[115] VHA Directive 0320.

[116] Cleveland Clinic, "Intubation," accessed April 13, 2023, https://my.clevelandclinic.org/health/articles/22160-intubation.

[117] VHA Principal Deputy Under Secretary for Health, "Joint Patient Safety Reporting System (JPSR)," January 30, 2018.

[118] Daniel Kramer, Michael Baram, "Non-Rebreather Mask: A Bridge Worth Crossing?" *The American Journal of the Medical Sciences* 361, (January 17, 2021): 409-410.

to, patient privacy corrections, life safety corrections, facility condition deficiency corrections, utility system upgrades, mental health improvements, window replacements, replacements of aging heating, ventilation and air conditioning systems and components, boiler system upgrades, and water conservation measures."[119]

opacities. Opacities are opaque spots in structures that are normally transparent.[120]

oriented. "Ability of patient to recognize his or her place in time and space."[121]

peer review. A critical review to determine "whether the clinical decisions and actions of a clinician during a specific clinical encounter met the standard of care."[122]

pleural effusion. "An exudation of fluid from the blood or lymph into a pleural cavity."[123]

pneumonia. "Pneumonia is an infection that inflames the air sacs in one or both lungs. The air sacs may fill with fluid or pus (purulent material), causing cough with phlegm or pus, fever, chills, and difficulty breathing."[124]

pulmonary embolism. "Obstruction of a pulmonary artery or one of its branches that is usually produced by a blood clot which has originated in a vein of the leg or pelvis and traveled to the lungs and that is marked by labored breathing, chest pain, fainting, rapid heart rate, cyanosis, shock, and sometimes death."[125]

root cause analysis. "An RCA is a specific type of focused review that is used for all adverse events or close calls requiring analysis."[126]

tachypneic. "Abnormally rapid breathing."[127]

thoracentesis. The aspiration of fluid from the chest (as in empyema).[128]

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[119] VHA Directive 1336, *Use of Prior-Year Funds for Non-Recurring Maintenance (NRM) Projects*, November 28, 2017.

[120] *Merriam-Webster.com Dictionary*, "opacity," accessed February 1, 2023, https://www.merriam-webster.com/dictionary/opacity.

[121] American Academy of Family Physicians, "The Mental Status Examination," accessed on July 5, 2022, https://www.aafp.org/pubs/afp/issues/2016/1015/p635.html.

[122] VHA Directive 1190.

[123] *Merriam-Webster.com Dictionary*, "pleural effusion," accessed June 16, 2022, https://www.merriam-webster.com/medical/pleural%20effusion.

[124] Mayo Clinic, "Pneumonia - Symptoms and causes," accessed April 26, 2019, https://www.mayoclinic.org/diseases-conditions/pneumonia/symptoms-causes/syc-20354204.

[125] *Merriam-Webster.com Dictionary*, "pulmonary embolism," accessed April 13, 2023, https://www.merriam-webster.com/medical/pulmonary%20embolism.

[126] VHA Handbook 1050.01.

[127] *Merriam-Webster.com Dictionary*, "tachypnea," accessed November 28, 2022, https://www.merriam-webster.com/dictionary/tachypneic.

[128] *Merriam-Webster.com Dictionary*, "thoracentesis," accessed on June 16, 2022, https://www.merriam-webster.com/medical/thoracentesis.

utility. Equipment that provides a service that includes light, power, or water.[129]

venturi mask. A face mask used to deliver supplemental oxygen to a patient at a specific rate by flowing oxygen into the mask through a narrow tube.[130]

white blood cell count. The count or the total number of the white blood cells in blood usually stated as the number in one cubic millimeter.[131]

[129] *Merriam-Webster.com Dictionary*, "utility," accessed on November 30, 2022, https://www.merriam-webster.com/dictionary/utility.

[130] Karina M. Soto-Ruiz, Frank Peacock, and Joseph Varon, "The men and history behind the venturi mask" *ClinicalKey* 82, (March 1, 2011): 244-246.

[131] *Merriam-Webster.com Dictionary*, "white blood cell count," accessed June 16, 2022, https://www.merriam-webster.com/dictionary/white%20blood%20cell%20count.

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