DEPARTMENT OF VETERANS AFFAIRS

OFFICE OF INSPECTOR GENERAL

Office of Healthcare Inspections

VETERANS HEALTH ADMINISTRATION

Critical Care Unit Staffing and Quality of Care Deficiencies at the Charlie Norwood VA Medical Center

Augusta, Georgia

HEALTHCARE INSPECTION | REPORT #19-08296-118 | MAY 12, 2020

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Executive Summary

The VA Office of Inspector General (OIG) conducted a healthcare inspection in response to allegations from an anonymous complainant that inadequate nurse staffing and inadequate nurse-to-patient ratios in the Critical Care Unit (CCU) were problematic, resulting in poor quality of care, adverse patient events and clinical outcomes, and other care management challenges at the Charlie Norwood VA Medical Center (facility) in Augusta, Georgia.

The anonymous complainant provided specific allegations regarding inadequate nurse staffing and inadequate nurse-to-patient ratios in the CCU:

- Patients 1–3 developed hospital-acquired pressure injuries.
- Patients 4–7 experienced unwitnessed cardiac arrest events.
- Patients 8–11 experienced adverse patient events such as respiratory failure, shock, traumatic Foley catheter decannulation and hemorrhage, and hypoxia (low oxygen levels).
- Patients 12–15 experienced other care management challenges such as unavailability of a sitter to provide patient supervision, nurses caring for a patient who required frequent intravenous medication changes in a nonintensive care bed, a physician having to "fight" to keep a seriously ill patient in an intensive care bed, and an intensive care bed not being available for a seriously ill patient.

The OIG team was unable to determine whether insufficient nurse staffing contributed to many of the patient events described in the allegations. The lack of consistent documentation regarding which bed a patient occupied and the nurse-to-patient assignment prevented the OIG from determining whether nurse staffing was central to the conditions outlined in this report. However, the OIG identified noncompliant practices and other deficits that contributed to care management challenges and adverse clinical outcomes.

Pressure Injury Prevention and Management

Although required by Veterans Health Administration (VHA) directive and facility policy, facility leaders failed to designate an Interprofessional Pressure Injury Committee (committee).[1] The committee's job was to develop, implement, monitor, and evaluate the Pressure Ulcer

[1] After receiving a draft of the OIG report, the facility provided documentation that pressure injuries were discussed in various committee meetings, but the meeting minutes did not demonstrate a robust attention to oversight and improvement actions.

Prevention Program.[2] Facility staff with relevant wound care knowledge met periodically. However, due to a lack of documentation, the OIG could not determine whether Pressure Ulcer Prevention Program functions, like education and training of staff, were being performed. CCU nursing staff received pressure injury education and training in 2015, but no ongoing training from 2016 through 2018. In 2019, less than half of the CCU nursing staff were assigned the online pressure injury training module, but those that had been assigned the module completed the training.[3] The acting Assistant Director for Patient Care Services (ADPCS) told the OIG of being aware that CCU staff had not completed all required competencies, including on pressure injuries, and that administrative action had been taken.

The OIG found that CCU nursing staff failed to initiate required wound care consults for Patients 1, 2, and 3, based on their low Braden Scale scores.[4] During interviews, the OIG discovered that some CCU nurses did not know about the facility policy to do so. Patient 1 developed, after admission, a pressure injury, which progressed to an unstageable injury by the time it was discovered.[5] While Patients 2 and 3 did not develop new pressure injuries after admission, nursing staff did not initiate wound care consults in response to low Braden Scale scores.[6]

Cardiac Arrest Events

While the OIG confirmed that Patients 4–7 experienced cardiac arrest events, the OIG was unable to determine whether the events were unwitnessed due to insufficient nurse staffing or some other factor.[7] The OIG determined that there was a nearly seven-minute delay in responding to and initiating resuscitative efforts for Patient 4's cardiac arrest event. Nurses

[2] VHA Handbook 1180.02 *Prevention of Pressure Ulcers*, July 1, 2011. This handbook was in effect during a portion of the timeframe discussed in this report. It was rescinded and replaced by VHA Directive 1352, *Prevention and Management of Pressure Injuries*, March 21, 2019, which contains the same or similar language related to the Braden Scale as the 2011 handbook. Facility Policy Memorandum 03-18-31.

[3] VHA Handbook 1180.02. VHA Directive 1352; Facility Policy Memorandum 03-18-31.

[4] Facility Policy Memorandum 03-18-31, *Prevention, Staging and Management of Pressure Ulcers,* October 26, 2018. The Braden Scale is a tool utilized by healthcare professionals to score or predict a patient's level of risk for developing pressure injuries while hospitalized. Scores range from 6–23. Lower scores indicate a higher risk of developing a pressure injury.

[5] Laura Edsberg, *et al*. Revised National Pressure Ulcer Advisory Panel Pressure Injury Staging System: Revised Pressure Injury Staging System. *Journal of Wound, Ostomy, and Continence Nursing* 43, no. 6 (November 2016): 585–597. Pressure injuries are classified and described through the use of a staging system that describe the physical appearance and extent of tissue damage. When a pressure injury is described as unstageable, the extent of the tissue damage cannot be determined because the injury is covered by dead skin tissue.

[6] Facility Policy Memorandum 03-18-31.

[7] The complainant was anonymous and not available to clarify terminology used in the allegations. The OIG interpreted the term "unwitnessed cardiac arrest" as used by the anonymous complainant in the setting of a monitored patient in the CCU to mean changes in a patient's heart rate and rhythm on the monitors that could lead to cessation of pulse and breathing that were not noticed by responsible staff.

assigned to care for Patient 4 were in another patient's room and did not hear Patient 4's cardiac monitor alarm sounding.[8] Further, tele-ICU staff who were remotely monitoring the facility's CCU patients did not alert CCU staff that Patient 4 was experiencing a life-threatening arrhythmia, reportedly because the tele-ICU monitoring system was set up to trigger when a patient's vital signs were in an "abnormal range."[9] The alerts were based on certain algorithms which, in this case, did not trigger an alert until after the cardiac arrest began.[10] Resuscitative efforts were unsuccessful, and Patient 4 died. Immediate recognition and response to Patient 4's life-threatening arrhythmia could have potentially changed Patient 4's adverse clinical outcome.

The OIG reviewed the electronic health records of Patients 5–7 and found no evidence of delayed response to the cardiac arrest events.

Adverse Patient Events

The OIG substantiated that Patient 8 did not receive continuous positive airway pressure (CPAP) treatment for two nights but did not substantiate that inadequate nurse staffing was a contributing factor. The primary responsibility for delivery of CPAP treatments belongs to the respiratory therapy department; however, the respiratory therapist assigned to Patient 8 during the timeframe at issue, told the OIG of not seeing the CPAP order. Consequently, CPAP treatments were not provided for two nights. In addition, the nurse caring for the patient on those nights did not ensure the patient received the ordered CPAP treatment. When interviewed by the OIG team, a supervising respiratory therapist who reviewed the case indicated that the missed CPAP treatments were due to human error.

The OIG was unable to determine whether Patient 8's subsequent respiratory failure and need for ventilator support were a result of the missed CPAP treatments due to other patient conditions. Patient 8 had a history of prior respiratory failures and other medical co-morbidities that may have contributed to the respiratory failure.

The OIG found no evidence in the electronic health record that Patients 9 and 10's intravenous infiltration and Foley catheter decannulation, respectively, occurred. The OIG found no documentation of the events in the nursing notes of either patient.[11] The OIG did not substantiate

[8] Two nurses were assigned to the patient, an experienced nurse and an orientee.

[9] The CCU at the Charlie Norwood VA Medical Center has a Memorandum of Understanding with an affiliate VA medical center to have critical care nurses and physicians remotely monitor patients and patient data from a tele-ICU monitoring center 24 hours per day, seven days a week. The OIG team noted several terms used for the remote monitoring of CCU patients. For the purposes of this report, the OIG uses the term tele-ICU.

[10] The facility has taken measures to address the monitoring and notification deficiencies including upgrading the CCU central cardiac monitoring station with anticipated completion in March 2020.

[11] Infiltration of intravenous fluids or medications occurs when improper placement or dislodgment of the intravenous catheter results in leakage into the surrounding tissue.

that Patient 11 had low oxygen levels due to not receiving supplemental oxygen during CPAP treatments.

Other Care Management Challenges

The OIG substantiated that a sitter was not consistently available for Patient 12, who experienced a fall during hospitalization that may have been prevented had a sitter been at the bedside. During interviews with facility staff, the OIG learned that sitters were not always available when requested. Facility policy requires 1:1 observation by a sitter for patients with homicidal or suicidal behaviors, neither of which was exhibited by Patient 12.[12] The OIG substantiated Patient 13, while assigned to a stepdown bed with a nurse-to-patient ratio of 1:4, was on an intravenous medication that required frequent changes. The required frequent medication changes were made. While Patient 13 did not experience an adverse clinical outcome, the OIG acknowledges the potential risk in managing complex intravenous medications when nurse-to-patient ratios do not support safe patient care. The OIG did not substantiate that a CCU physician had to "fight" to keep Patient 14, who had signs and symptoms of a severe allergic reaction, in an intensive care bed, or that Patient 15 died after cardiac arrest because an intensive care bed was unavailable.[13]

The OIG made six recommendations to the Facility Director related to compliance with VHA and facility requirements for pressure injury prevention and management including nursing documentation; processes for cardiac monitoring and tele-ICU services; evaluation of the circumstances surrounding Patient 8's respiratory care; processes for securing sitters; and CCU nursing staff assignment practices.

Comments

The Veterans Integrated Service Network and Facility Directors concurred with the recommendations and provided an acceptable action plan (see appendixes A and B). The OIG considers all recommendations open and will follow-up on the planned and recently implemented actions to ensure that they have been effective and sustained.

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[12] Facility Policy Memorandum 6016, *Management of a Patient Requiring 1:1 Supervision Status*, June 21, 2019.

[13] Patient 15's cardiac arrest occurred on a general medicine ward where resuscitative efforts were unsuccessful, and Patient 15 died. The OIG determined intensive care bed availability was not an issue in the patient's death.

Contents

Abbreviations

ADPCS	Associate Director for Patient Care Services
CCU	Critical Care Unit
CPAP	continuous positive airway pressure
EHR	electronic health record
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 in response to allegations from an anonymous complainant that inadequate nurse staffing on the Critical Care Unit (CCU) resulted in poor quality of care, adverse patient events and clinical outcomes, and other care management challenges at the Charlie Norwood VA Medical Center (facility) in Augusta, Georgia.[14]

Background

The facility, part of Veterans Integrated Service Network (VISN) 7, is a two-campus medical center providing tertiary care in medicine, surgery, neurology, psychiatry, rehabilitation medicine, and spinal cord injury. Veterans Health Administration (VHA) classifies the facility as Level 1a–High Complexity.[15] From October 1, 2018, through September 30, 2019, the facility served 46,350 patients and had a total of 407 hospital operating beds, including 215 inpatient beds, 60 domiciliary beds, and 132 Community Living Center beds. The facility has sharing agreements with Eisenhower Army Medical Center at Fort Gordon, Georgia, and is affiliated with Augusta University Medical College of Georgia.

The facility's intensive care beds and stepdown beds are co-located in a joint CCU. The current CCU floorplan includes nine stepdown beds along one wall of a horseshoe-shaped unit and 10 intensive care beds along the back and opposite wall. The intensive care beds are reserved for treatment of seriously ill patients using special medical equipment and services. The stepdown beds are reserved for those patients requiring less care than standard intensive care but more than what is available on the medical wards.[16] All of the facility's CCU beds can provide continuous bedside and remote monitoring. Additionally, the facility has an agreement with a separate VHA facility for the provision of tele-ICU services for patients admitted to the CCU.[17] From

[14] For the purpose of this report, an adverse patient event is an unexpected event that occurs during treatment, such as a fall. The OIG considers an adverse clinical outcome to be death, a change in the course of treatment or diagnosis, or significant change in the patient's level of care. Adverse clinical outcomes can generally be attributed to adverse patient events, but adverse patient events may or may not lead to adverse clinical outcomes.

[15] VHA facilities are categorized into one of five groups from most complex to least complex. The highest complexity, 1a facilities, have a high volume of patients, high-risk patients (based on severity of illnesses/diagnoses), the most complex clinical programs, and large research and teaching programs. http://opes.vssc.med.va.gov/Pages/Facility-Complexity-Model.aspx. (The website was accessed on July 8, 2019).

[16] Facility Policy Memorandum 03-17-34, *Admission and Discharge Criteria: Step Down Unit*, May 24, 2017.

[17] The OIG team noted several terms used for the remote monitoring of CCU patients. For the purposes of this report, the OIG uses the term tele-ICU. The CCU at the Charlie Norwood VA Medical Center has a Memorandum of Understanding with an affiliate VA medical center to have critical care nurses and physicians remotely monitor patients and patient data from a tele-ICU monitoring center 24 hours per day, seven days a week.

October 1, 2018, through September 30, 2019, there were 1,380 admissions and transfers into the facility's CCU.

Nurse Staffing

The link between adequate nurse staffing and patient outcomes is well established. VHA Directive 1351 provides guidance to facilities on how to establish nurse staffing levels that are individualized to a specific clinical setting, not based solely on fixed staffing models or staff to patient ratios, and support safe patient care.[18] Historically, the facility CCU nursing staffing was based on a nurse-to-patient ratio of 1:2 for patients assigned to an ICU designated bed and 1:3 for patients assigned to stepdown unit beds.[19]

Prevention and Management of Pressure Injuries

A pressure injury is damage to the skin and underlying tissues resulting from prolonged pressure, or pressure in combination with shear. The pressure injury usually occurs over a bony area of the body or is related to the use of a medical device. Pressure injuries are staged to indicate the extent of the tissue damage, with stage 1 being the least severe and stage 4 revealing full-thickness tissue loss with exposed bone, tendon, or muscle. Monitoring and increased surveillance of pressure injury depends on processes that are both defined in policy and implemented by medical staff.

Most pressure injuries are avoidable; however, a pressure injury may develop in a hospitalized patient despite appropriate care. When the pressure injury occurs or is discovered more than 24 hours after the patient's hospital admission, it is considered a hospital-acquired pressure injury. VHA policy identifies the basic requirements and a standardized approach for pressure injury prevention and management that includes completing a skin assessment, conducting a skin inspection, documenting the results, and recommending an individualized care plan. VHA requires facilities to use the Braden Scale to predict a patient's risk for developing a pressure injury while hospitalized.[20] The scale numerically evaluates six risk categories: sensory

[18] VHA Directive 1351, *Staffing Methodology for VHA Nursing Personnel*, December 20, 2017.

[19] The OIG noted and a previous CCU Nurse Manager acknowledged that, on occasion, the nurse-to-patient ratios exceeded preferred levels.

[20] VHA Handbook 1180.02 *Prevention of Pressure Ulcers*, July 1, 2011 This handbook was in effect during a portion of the timeframe discussed in this report. It was rescinded and replaced by VHA Directive 1352, *Prevention and Management of Pressure Injuries*, March 21, 2019, which contains the same or similar language related to the Braden Scale as the 2011 handbook.

perception, moisture, activity, mobility, nutrition, and friction/shear.[21] The lower the score, the higher the risk for a patient to develop a pressure injury. According to facility policy, if the Braden Scale score is 12 or less, the wound care nurse will be consulted.[22] Skin reassessments are to be completed by nursing personnel every shift for all patients on acute medical and surgical wards.[23] Additionally, pressure injuries noted at the time of admission, as well as new pressure injuries, require nursing staff to complete a patient safety event report.[24] Treatment of pressure injuries may include drainage of areas of infection, debridement of devitalized tissue, use of dressings and topical agents, control of wound contamination from stool and urine, and surgical interventions when appropriate.[25]

Previous OIG Report

On July 11, 2019, the OIG published *Leadership, Clinical, and Administrative Concerns at the Charlie Norwood VA Medical Center, Augusta, Georgia.*[26] The report outlined a variety of facility challenges including staffing deficits, inefficient processes, and leaders' failures to adequately address a range of long-term problems. The OIG team did not substantiate most of the allegations related to CCU-specific policies and patient care failures; however, the team confirmed that CCU nurse staffing could be problematic, and that communication about, and understanding of, certain policies was inadequate. The team also confirmed poor nursing morale in several areas, which interviewees attributed to inadequate nurse staffing levels, guidance, and accountability. The OIG made 27 recommendations, several of which concerned CCU nurse staffing and related issues. Specifically, the OIG recommended that CCU staffing decisions include contingencies for staff absences; efforts to recruit and hire for CCU nurse vacancies be

[21] Jenny Alderden et al., Midrange Braden Subscale Scores Are Associated With Increased Risk for Pressure Injury Development Among Critical Care Patients, *Journal of Wound, Ostomy and Continence Nursing* 44, no.5 (September/October 2017): 420–428. Friction and shear are mechanical forces contributing to pressure injury formation. Friction is the force of rubbing two surfaces against one another. Shear is a gravity force pushing down on the patient's body with resistance between the patient and the chair or bed.

[22] Facility Policy Memorandum 03-18-31, *Prevention, Staging and Management of Pressure Ulcers,* October 26, 2018. Braden Scale scores range from 6–23 where lower numbers correspond to higher risk of developing a pressure injury.

[23] Facility Policy Memorandum 03-18-31. "All Acute Care patients must be reassessed every shift and when care levels change."

[24] VHA medical centers used an electronic Patient Event Report to report both close calls and actual patient events until 2018 when it was replaced by the Joint Patient Safety Reporting System. For the purposes of this report, the OIG uses the term patient safety event report to refer to both reporting systems.

[25] Tatiana Boyko, Michael Longaker, and George Yang. Review of the Current Management of Pressure Ulcers, *Advances in Wound Care* 7, no. 2 (February 1, 2018): 57–67.

[26] VA OIG, *Leadership, Clinical, and Administrative Concerns at the Charlie Norwood VA Medical Center, Augusta, Georgia*, Report No. 19-00497-161, July 11, 2019.

continued and that, until optimal staffing was attained, alternate methods consistently be available to meet patient care needs; and that unexcused nursing absences be addressed.

At the time of the OIG's June 2019 site visit for the current review, facility leaders had taken actions to address several of the 27 recommendations, including hiring a CCU medical director, increasing nurse staffing by 2.7 full-time equivalent employees, and reassigning nurses unable to provide direct patient care back to the CCU to provide administrative support.[27]

In August 2019, the acting Associate Director for Patient Care Services (ADPCS) told the OIG that nurse-patient ratios would be maintained at 1:2 and 1:3 for the 10 ICU beds and 9 stepdown beds respectively. A hiring request for 12 intermediate care technicians to assist CCU nursing staff with patient care had also been submitted.[28]

Allegations

On May 5, 2019, the OIG received an anonymous complainant's allegations that included the names of 13 patients that inadequate nurse staffing and inadequate nurse-to-patient ratios in the CCU continued to be problematic, resulting in poor quality of care, adverse patient events and clinical outcomes, and other care management challenges. During the review, the OIG learned about two additional patients who allegedly experienced adverse events and clinical outcomes:[29]

- Patients 1, 2, and 3 experienced new pressure injuries because CCU nurses did not have time to "perform standard procedures."[30] Further, Patient 1's newly developed pressure injury was a "main factor in the withdrawal of care."

[27] Facility leaders received the OIG's draft report several weeks prior to publication, thereby allowing them to begin corrective actions prior to the report's publication.

[28] On August 8, 2019, the OIG learned that the previous ADPCS, Chief Nurse for Medicine, and CCU nurse manager had been reassigned to different positions. During a telephone interview, the acting ADPCS described intermediate care technicians as being "medics from the military" and "They're a higher level than a nurse tech." In December 2019, the CCU Director confirmed the number of CCU operational beds.

[29] During an on-site interview, the OIG learned about a fourteenth patient, and on August 7, 2019, after the OIG on-site review, the team received an anonymous allegation regarding a fifteenth patient. In 14 of the 15 patient case examples, the complainant(s) were anonymous; therefore, the OIG was unable to obtain clarification of some of the allegations. In those cases, OIG team members relied on their experience and expertise, and on interviews with facility staff, to determine the most likely concerns raised in the allegations.

[30] Georgia Rule 410-10-.01, *Standards of Practice for Registered Professional Nurses*. The Georgia Board of Nursing defines the minimal standards of acceptable nurse practice as including, but not limited to, assessing the patient in a systematic, organized manner; initiating nursing actions to assist the patient to maximize her/his health capabilities; and evaluating with the patient the status of goal achievement as a basis for reassessment, reordering of priorities, and revision of the plan of nursing care. Examples of standard procedures provided to patients in a critical care setting include regular physical assessments, providing physician-ordered treatments, bathing, and turning and positioning.

- Patients 4, 5, 6, and 7 experienced unwitnessed cardiac arrest events. Patient 4 developed a life-threatening arrhythmia that was not identified timely, resulting in cardiac arrest and death.
- Patients 8, 9, 10, and 11 experienced other adverse patient events and clinical outcomes:
    - Patient 8 experienced respiratory failure as a result of not receiving the physician-ordered nighttime continuous positive airway pressure (CPAP) treatment.
    - Patient 9 experienced infiltration from an intravenous infusion that was not identified by nursing staff until Patient 9 went into shock and developed hypoglycemia.
    - Patient 10 experienced an accidental and traumatic Foley catheter decannulation and hemorrhage.[31]
    - Patient 11 became hypoxic after not receiving supplemental oxygen via CPAP treatment despite a physician's order.
- Patients 12, 13, 14, and 15 experienced other care management challenges:
    - Patient 12 experienced multiple reintubations, intravenous infiltration, and falls because a sitter was not available to provide supervision.
    - Patient 13 was receiving intravenous norepinephrine and was in shock while in a stepdown bed despite policy requiring similar patients to be in an intensive care bed.
    - Patient 14 was admitted with angioedema but a CCU physician had to "fight" to keep Patient 14 in an intensive care bed.
    - Patient 15 died on a medical ward after cardiac arrest because a (staffed) intensive care bed was not available.

The original complaint contained additional allegations that inadequate CCU nurse staffing resulted in an increase in nurse injuries and an inability for CCU nurses, who were breastfeeding at home, to take breaks during their shifts to pump breast milk. As the OIG's July 2019 report identified CCU nurse staffing challenges and made recommendations to identify and address the unique factors that affected optimal CCU staffing, the OIG elected to defer review of the alleged nurse injuries and breastfeeding issues until the effectiveness of corrective actions could be

[31] The OIG medical consultant defined a traumatic Foley catheter decannulation as "damage, pain and/or bleeding to the urinary tract due to the forceful removal of a Foley catheter while the distal part of the catheter (the balloon) remains inflated."

evaluated. This report focuses on nurse staffing and nurse-to-patient ratios on the dates and during the events described in the complaints.

Scope and Methodology

The OIG initiated the inspection on June 11, 2019, and conducted a site visit June 25–27, 2019.

The OIG interviewed the facility's Chief of Staff, ADPCS, Chief Nurse of Medicine, Chief of Quality Management, CCU Medical Director, CCU Nurse Manager, CCU physicians and nurses, Patient Safety Coordinator, a wound care nurse, patient care coordinators, nursing staff, and others with knowledge of the issues.

The OIG reviewed VHA and facility documents including facility CCU daily assignment sheets; VHA Support Service Center admission and discharge data; and relevant directives, policies (facility memorandums), memorandums of understanding for tele-ICU services, guidelines, and protocols.[32] The OIG reviewed electronic health records (EHRs) for Patients 1–15 for timeframes relevant to each patient's care. The OIG toured the CCU during the site visit.

In this report, the OIG has generalized narratives and case scenarios and has de-identified protected patient and quality assurance information.

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.

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

[32] VHA's Support Service Center uses an electronic database to capture information used by VHA for the purpose of healthcare delivery analysis and evaluation.

Inspection Results

During this review, the OIG was unable to determine whether nurse staffing issues or nurse-to-patient ratios contributed to many of the adverse patient events and clinical outcomes described in the allegations due to insufficient evidence.[33] A CCU physician's opinion was that staffing issues were contributory factors; however, the CCU daily nurse assignment sheets were inconsistent regarding patient bed assignments, nurse staffing, and nurse-to-patient ratios on particular days and shifts. This lack of documentation prevented the OIG from determining whether staffing issues contributed to patients' adverse events.

The OIG identified deficits related to compliance with pressure injury policy and training, cardiac monitoring, and physician order implementation. Concerns related to sitter availability, and the management of intravenous medications that needed frequent dose modifications for a patient in the stepdown unit were also noted.

1. Pressure Injury Prevention and Management

This section of the report addresses the specific allegations related to Patients 1–3 and discusses pressure injury prevention and management program deficits including nursing staff compliance with facility policy requirements and staff education and training.

Patient 1

The OIG confirmed that the patient developed a hospital-acquired pressure injury after admission to the CCU, although the OIG did not substantiate that the pressure injury developed because nursing was short staffed and did not have time to "perform standard procedures." Based on a review of CCU nurse assignment sheets, the OIG determined that the patient was initially admitted to an intensive care bed, where it appears the patient remained for the duration of the hospital stay. The nurse-to-patient ratio ranged from 1:1 to 1:2, which aligns with a traditional intensive care bed staffing ratio.

The patient was in their 80s with a history of diabetes and cardiac and lung problems.[34] In mid-fall 2018, the patient presented to the Emergency Department for evaluation of a right knee injury. While in the Emergency Department, the patient developed respiratory distress requiring sedation and intubation. The patient was admitted to the CCU for ongoing management of sepsis, a skin infection of the right lower extremity, and acute respiratory failure.[35] A wound care consult related to the knee injury was placed at the time of the patient's CCU admission. The

[33] An adverse event is defined as an unanticipated patient event that resulted in, or is reasonably expected to result in, death or serious injury. https://www.psnet.ahrq.gov/primer/adverse-events-near-misses-and-errors. (The website was accessed on June 14, 2019.)

[34] The OIG uses the singular form of they (their/them) in the patient case summaries to protect the patient's privacy.

[35] The patient was sedated and required mechanical ventilation during most of the hospitalization.

morning following CCU admission, the patient was evaluated for the knee injury by a wound care nurse, who recommended CCU nursing staff perform twice-daily cleanings and dressing changes. The patient's knee wound was re-evaluated by the wound care nurse four times in the following 37 days.[36]

Nine days after admission, CCU staff noted a blister on the patient's right buttock for the first time. Two days later, a CCU nurse identified a device-related deep tissue injury to the patient's nose and described the previously identified blister on the patient's right buttock as a stage 2 pressure injury. The wound care nurse treating the patient's knee wound also treated the nose wound during late 2018. However, the OIG was unable to locate documentation from the wound care nurse assessing the right buttock pressure injury.

Over approximately six weeks in late 2018, CCU nurses documented daily skin assessments that inconsistently listed the location of injuries noted on the patient's body, and Braden Scale scores ranged from 9–15.

A CCU provider identified the buttock wound as an unstageable hospital-acquired pressure injury and requested a wound care consult in in late 2018.[37] The following day, the wound care nurse evaluated the (sacral) pressure injury and recommended treatment which consisted of daily wound dressing changes, gauze-packing, and on one occasion, surgical debridement.
Three weeks later, the buttock pressure injury had progressed, extending to the rectum. Because of the patient's poor nutritional status, surgical intervention was not recommended. Instead, staff continued to provide wound care and optimized the patient's nutrition to promote healing of the pressure injury.

In early 2019, CCU physicians met with the family to discuss the patient's medical status and prognosis. The patient was placed on hospice care at the family's request and remained in the CCU over the following week. The patient developed a fever and experienced low blood pressure. The family decided to discontinue use of the mechanical ventilation. The patient died eight days later. The cause of death documented in the EHR was attributed to multiple factors including respiratory failure and sepsis from pneumonia.

[36] A wound care nurse last saw the patient for the knee wound in fall 2018. The wound care nurse visited the patient four additional times to re-assess the knee injury and the pressure injury to the nose between wound care consults.

[37] When a pressure injury is described as unstageable, the extent of the tissue damage cannot be determined because it is covered by dead skin tissue. Once the dead tissue is removed, the actual stage of the pressure injury can be determined.

Although the OIG did not substantiate inadequate CCU nurse staffing or nurse-to-patient ratios, the OIG determined that CCU staff did not consistently follow portions of the facility's policy on the management and prevention of pressure injuries, which may have contributed to the patient's increased risk of developing a hospital-acquired pressure injury and/or its progression to an unstageable injury at the time it was discovered:

- Daily nursing reassessment documentation was inconsistent and did not clearly demonstrate the progression of the initial buttock blister to an unstageable pressure injury. Nursing staff who performed regular skin assessments had the opportunity to identify the developing buttock wounds and take appropriate action.
- Nursing documentation did not consistently reflect interventions such as turning and repositioning that are necessary to prevent pressure injuries.
- Risk assessment and Braden Scale scoring documentation was inconsistent, varying from day-to-day, shift-to-shift, and nurse-to-nurse. For example, over a 40-hour period in early November, CCU nurses documented Braden Scale scores of 13, 15, 13, 14, and 12 for the patient.
- Despite an initial Braden Scale score of 12 and the development of two different pressure injuries within 11 days of admission, staff did not initiate a wound care consult until 37 days after the patient's admission. By this time, the pressure injury was large and unstageable.
- The wound care nurse focused only on the patient's knee and nose wounds, even though the patient was bed-bound and at high risk for pressure injuries. The wound care nurse did not document a risk assessment using the Braden Scale to address the patient's other risk factors for development of additional pressure injuries.

The OIG was unable to determine whether the buttock pressure injury was the main factor in, or otherwise contributory to, the patient's poor prognosis and the family's decision to withdraw life-sustaining care. The cause of death documented in the EHR was attributed to multiple factors including respiratory failure and sepsis from pneumonia, with no mention of the pressure injury. At the OIG's request, the CCU Medical Director reviewed the care provided to the patient to determine if the pressure injury was the main factor in the decision to withdraw life-sustaining care. According to the CCU Medical Director's analysis, the presence of the pressure injury "added to the patient's morbidity, but likely not mortality...."[38]

[38] Morbidity refers to the state of being diseased or unhealthy; mortality refers to the number of deaths from a specific cause in a group of people.

Patient 2

The OIG did not substantiate that the patient developed a new pressure injury because CCU nurses were understaffed and did not have time to "perform standard procedures." The patient was admitted to the CCU with existing pressure injuries that were treated, prior to the admission, by the facility's Community Living Center wound care nurse.[39]

The patient, who was in their 60s, was admitted to the CCU with diagnoses of respiratory failure, sepsis, and possible aspiration pneumonia in early spring 2019.[40] The CCU attending physician's admission history and physical examination documented a history of pressure injuries and the CCU nurse's admission assessment identified the presence of a stage 2 pressure injury. The patient remained in the CCU for four days. At the time of transfer to the medical ward, the patient's condition had improved, and no new pressure injuries were identified.

When the patient was admitted to the CCU, staff documented a Braden Scale score of 10 indicating high risk for pressure injury formation. According to facility policy, this score should have prompted CCU nursing staff to initiate a wound care consult, but one was not initiated. Failure to initiate a wound care consult represented a missed opportunity for staff to intervene to prevent the development or progression of a pressure injury.

Patient 3

The OIG did not substantiate that the patient developed a new pressure injury because CCU nurses were understaffed and did not have time to "perform standard procedures." The OIG determined that the patient did not develop a new pressure injury while in the CCU.

The patient was in their 50s with a history of diabetes and high blood pressure. The patient was admitted to the CCU in early spring 2019 for sepsis due to a diabetic right toe infection. On hospital day one, the patient underwent surgical removal of the right toe and returned to the CCU post-operatively. Several hours after returning to the CCU, the patient developed breathing difficulty requiring intubation and mechanical ventilation. The patient remained on a ventilator for seven days. Following the patient's intubation, CCU staff documented a Braden Scale score of 12 for the next four days, yet no wound care consult was initiated as required by facility policy. On hospital day 13, the patient was transferred to the medical ward, and on hospital day 18, Patient 3 was transferred to the extended care unit for medical rehabilitation.

[39] A Community Living Center is a VA-based nursing home.

[40] Mayo Clinic, *Pneumonia Symptoms and Causes.* Aspiration pneumonia occurs when an individual inhales food, drink, vomit, or saliva into the lungs. "Aspiration is more likely if something disturbs [the] normal gag reflex, such as a brain injury or swallowing problem, or excessive use of alcohol or drugs." https://www.mayoclinic.org/diseases-conditions/pneumonia/symptoms-causes/syc-20354204. (The website was accessed on July 29, 2019.)

Compliance with Pressure Injury Policy Requirements

The OIG found that CCU nurses were not consistently aware of, nor did they comply with, select aspects of the facility's pressure injury prevention and management policy as required:

- CCU nursing staff did not initiate wound care consults for Patients 1, 2, and 3, despite each patient being at high risk for developing a pressure injury. Patient 1 was immobile, intubated, and on a ventilator for a prolonged period during the hospitalization. Patient 2 had a history of pressure injuries, was confined to a bed, and required assistance for all activities of daily living. Patient 3 experienced a respiratory arrest after admission, was immobile, intubated, and on a ventilator for seven days.
- The Patient Safety Coordinator told the OIG that education on patient event reporting was covered in new employee orientation and available as online training; however, multiple CCU nursing staff were not aware of the requirement to submit a patient safety event report if a pressure injury was noted upon admission and with each new occurrence. The patient safety event reports submitted from October 1, 2017, through June 25, 2019, did not include reports related to pressure injuries in the CCU although Patients 1–3 had pressure injuries that required reporting.

Further, facility leaders failed to designate an Interprofessional Pressure Injury Committee as required by VHA directive.[41] The acting ADPCS reported the facility had pressure injury-related committee meetings but was unable to provide the OIG with meeting minutes documenting oversight activities. Facility staff with relevant wound care knowledge met periodically as the Skin and Wound Care Committee and provided pressure injury data to other committees, but there was limited evidence of analysis, action, and/or follow-up. Pressure injury data were provided to facility leaders in May and June 2019 by the Chief of Nursing Education. The OIG determined the facility did not have a method to ensure that pressure injury program functions were being performed as required by VHA policy.[42]

Pressure Injury-Related Staff Education and Training

The OIG determined that the facility was not meeting requirements related to pressure injury education and training. Facility policy required staff to maintain competence in their identified areas of practice. The facility policy further required the ADPCS to ensure the development of a

[41] VHA Directive 1352. "The committee is an interdisciplinary body that implements and monitors the VA medical facility's Pressure Injury Prevention program using this directive as a guide."

[42] After receiving a draft of the OIG report, the facility provided documentation that pressure injuries were discussed in various committee meetings, but the meeting minutes did not demonstrate a robust attention to oversight and improvement actions.

defined and individualized plan for "each role, practice setting, and for initial and ongoing training" related to a broad range of pressure injury prevention and management activities.[43]

The OIG reviewed the education and training files for nursing staff who were assigned to the CCU at the time of this review. CCU nursing staff received pressure injury education and training in 2015, but no ongoing training from 2016 through 2018. In 2019, less than half of the CCU nursing staff were assigned the online pressure injury training module, but those that had been assigned the module completed the training. The acting ADPCS told the OIG of being aware that CCU staff had not completed all required competencies and that administrative action had been taken.

2. Cardiac Arrest Events

While the OIG generally confirmed that Patients 4–7 experienced cardiac arrest events as reflected in their EHRs, the OIG was unable to retrospectively determine whether the events were unwitnessed due to insufficient nurse staffing or some other factor. An unwitnessed cardiac arrest event increases the potential for a delayed response, which could place patients at greater risk for adverse clinical outcomes.[44]

Patient 4

The OIG substantiated that the patient developed a life-threatening arrhythmia that was unwitnessed and was not responded to timely. The patient subsequently experienced a cardiac arrest and died. The OIG determined that immediate recognition and response to the patient's life-threatening arrhythmia could have potentially changed the patient's adverse clinical outcome.

The patient was in their 60s with a history of high blood pressure, diabetes, and cardiac and liver problems. The patient was admitted to the CCU in mid-summer 2019 with concerns that the patient's altered mental status was due to hepatic encephalopathy, sepsis, chronic obstructive

[43] Facility Policy Memorandum 03-18-31 requires several facility leaders to ensure training plans are implemented for pressure injury prevention, administration of the Braden Scale, a complete skin assessment, and accurate and timely documentation.

[44] The OIG interpreted the term "unwitnessed cardiac arrest" as used by the anonymous complainant in the setting of a monitored patient in the CCU to mean changes in a patient's heart rate and rhythm on the monitors that could lead to cessation of pulse and breathing that were not noticed by responsible staff.

pulmonary disease (COPD), or congestive heart failure.[45] The patient's clinical condition improved through oxygen support, antibiotics, and diuretics.[46] One week later, the CCU physician transferred the patient to the general medical floor. However, within two days, a nurse called the facility's Rapid Response Team due to the patient's low oxygen levels and decreased responsiveness.[47] The patient returned to the CCU and the patient's condition stabilized and improved over the next four days. Mid-morning on the day the patient was going to transfer back to a medical ward, the CCU charge nurse found the patient unresponsive and without a pulse. The charge nurse called a code blue and initiated cardiopulmonary resuscitation (CPR).[48] Resuscitative efforts were unsuccessful, and the patient was declared dead.

The OIG found that there was a delay in recognizing and responding to the life-threatening arrhythmia by both facility and tele-ICU staff. For approximately seven minutes, the patient remained in cardiac arrest prior to a code blue response. The nurses assigned to care for the patient that shift told the OIG that they were in another patient's room at the time and did not hear the cardiac monitor alarm that would have alerted them to a change in the patient's condition.[49] Further, the nurses stated that they were not alerted by tele-ICU staff that the patient was experiencing a life-threatening arrhythmia. According to a clinical leader for the acute tele-ICU program, the tele-ICU monitoring system was set up to trigger when a patient's vital signs were in an "abnormal range." The alerts were based on certain algorithms which, in this case, did not trigger an alert until after the cardiac arrest began.

A charge nurse, who was not assigned to patient care duties, told the OIG of hearing an alarm which prompted the charge nurse to enter the patient's room. The charge nurse had been

[45] Shaker, Mina, Carey, William D. *Hepatic Encephalopathy,* Cleveland Clinic, Center for Continuing Education, June 2014. Hepatic encephalopathy is a condition describing a spectrum of potentially reversible neuropsychiatric abnormalities seen in patients with liver dysfunction after exclusion of unrelated neurologic and/or metabolic abnormalities. http://www.clevelandclinicmeded.com/medicalpubs/diseasemanagement/hepatology/hepatic-encephalopathy/. (The website was accessed on September 26, 2019.) Mayo Clinic, *Heart Failure, Symptoms and Causes.* Congestive heart failure occurs when the heart muscle does not pump blood as well as it should. https://www.mayoclinic.org/diseases-conditions/heart-failure/symptoms-causes/syc-20373142. (The website was accessed on August 5, 2019.)

[46] Mayo Clinic, *Diuretics.* Diuretics are sometimes called water pills and help rid the body of salt (sodium) and water. https://www.mayoclinic.org/diseases-conditions/high-blood-pressure/in-depth/diuretics/art-20048129. (The website was accessed on September 26, 2019.)

[47] Facility Policy Memorandum 02-17-17, *Rapid Response Team,* October 17, 2017. The Rapid Response Team is a small early intervention team available to respond to changes in a patient's conditions in an effort to prevent a more serious life-threatening event from happening.

[48] Facility Policy Memorandum 6004, *Cardiopulmonary Resuscitation Alert (Code Blue),* June 4, 2019. A code blue team responds to all cardiac arrest events.

[49] One of the nurses assigned to Patient 4 on the day the cardiac arrest event occurred was being oriented to the CCU by a more experienced CCU nurse. The nurses did not duplicate Patient 4's cardiac monitor in the other patient's room because they thought Patient 4 was stable and was due to be transferred to the medical ward after a procedure.

rounding with the CCU team and had gone back to the nurse's station, directly across from the patient's room, when the charge nurse heard the alarm.

The facility conducted an internal review of the event, including consideration of an institutional disclosure, and developed an action plan to address areas of concern.[50] The OIG was told in November 2019 that a centralized monitoring system would be installed by March 2020 to address the monitoring of patients assigned to the CCU. Additionally, facility leaders informed the OIG team that the tele-ICU agreement had been reviewed and the facility would continue to use tele-ICU services.

Patient 5

The OIG substantiated that the patient experienced an unwitnessed cardiac arrest event; however, the OIG found no evidence of a delayed response to the cardiac arrest.

The patient, who was in their 60s and had a history of multiple sclerosis, as well as kidney and cardiac problems, experienced a cardiac arrest event in early 2019 approximately five hours after admission to the CCU.[51] The patient was successfully resuscitated and CCU physicians ordered targeted temperature management therapy, which required 1:1 nurse staffing.[52] Because the CCU was unable to consistently provide this level of nursing care, the patient was transferred to a non-VA facility. The patient died at the non-VA facility from respiratory failure and sepsis four days after transfer.

In the context of limited nurse staffing, the OIG determined that the decision to transfer the patient to a non-VA facility for 1:1 care was appropriate. The OIG was unable to determine whether the patient's adverse clinical outcome would have been different if the cardiac arrest event had been witnessed.

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[50] VHA Directive 1004.08 *Disclosure of Adverse Events to Patients*, October 31, 2018. An institutional disclosure refers to the process used to inform patients or their designated representative about potentially harmful adverse events. The OIG determined the facility addressed consideration of an institutional disclosure. Ultimately, an institutional disclosure was not conducted because the facility searched for, but was unable to locate, the next-of-kin for Patient 4.

[51] Mayo Clinic, *Multiple sclerosis*. Multiple sclerosis is a disease where the immune system attacks the nerves and causes communication problems between the brain and the rest of the body. https://www.mayoclinic.org/diseases-conditions/multiple-sclerosis/symptoms-causes/syc-20350269. (The website was accessed on October 4, 2019.)

[52] Newsroom. *American Heart Association CPR Guidelines; quick action, more teamwork key to saving more lives.* Targeted temperature management is a guideline recommendation that helps prevent brain degradation during post-cardiac arrest care. Providers should select a temperature between 32–36 degrees Celsius and maintain it for at least 24 hours. https://newsroom.heart.org/news/american-heart-association-cpr-guidelines:-quick-action-more-teamwork-key-to-saving-more-lives. (The website was accessed on July 29, 2019.)

Patient 6

The OIG was unable to determine whether the patient experienced an unwitnessed cardiac arrest event. The patient's post-code resuscitation form reflected that the arrest was witnessed, although the EHR documentation was unclear on this point. The OIG found no evidence of a delayed response to the cardiac arrest event or that the patient suffered an adverse clinical outcome.

The patient was in their 60s and had a history of carotid artery stenosis, diabetes, and cardiac and kidney problems.[53] In spring 2019, the patient underwent a successful right carotid endarterectomy and was admitted to the CCU post-operatively.[54] Later that day, The patient was found unresponsive and without a pulse. The patient was resuscitated with a return of spontaneous circulation and did not require intubation. The patient remained in the CCU until discharged home on hospital day nine.

Patient 7

The OIG substantiated that the patient experienced an unwitnessed cardiac arrest event; however, the team found no evidence of a delayed response.

The patient was in their 80s with a history of multiple cardiac problems. In spring 2019, the patient presented to the facility Emergency Department with shortness of breath, decreased oxygen saturation levels, chills, and a fever. The patient was diagnosed with pneumonia and admitted to the medical ward for further treatment. In the morning of hospital day three, the patient was found unresponsive and without a pulse. A code blue was initiated, and resuscitation efforts resulted in the spontaneous return of circulation. The patient was transferred to the CCU but remained unresponsive. A limited bedside echocardiogram revealed severely reduced cardiac function.[55] After discussion with the family, and in accordance with the patient's advance directive, life support efforts were stopped, and the patient died a short time later.[56] The OIG was unable to determine whether the patient's adverse clinical outcome would have been different if the cardiac arrest event had been witnessed.

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[53] Mayo Clinic, *Carotid Artery Disease, Symptoms and Causes.* Carotid artery stenosis is the medical term for fatty deposits that clog the blood vessels that deliver blood to the brain and head. The blockage increases the risk of stroke. https://www.mayoclinic.org/diseases-conditions/carotid-artery-disease/symptoms-causes/syc-20360519. (The website was accessed on August 14, 2019.)

[54] Mayo Clinic, *Endarterectomy.* Carotid endarterectomy is a surgical procedure used to treat carotid artery stenosis. https://www.mayoclinic.org/tests-procedures/carotid-endarterectomy/about/pac-20393379. (The website was accessed on August 15, 2019.)

[55] Mayo Clinic, *Echocardiogram.* An echocardiogram is a procedure that uses sound waves to produce images of the heart. This test allows a physician to see if the heart is beating and pumping blood. https://www.mayoclinic.org/tests-procedures/echocardiogram/about/pac-20393856. (The website was accessed on August 8, 2019.)

[56] According to the death certificate, the patient died of ischemic cardiomyopathy and coronary artery disease, with metastatic prostate cancer and pneumonia as contributing factors.

3. Adverse Patient Events

Patient 8

The OIG substantiated that the Patient 8 did not receive CPAP for two nights, but did not substantiate that inadequate nurse staffing was a contributing factor.

The patient was in their 60s with a history of oxygen-dependent COPD, and cardiac and kidney problems. In early 2019, the patient was scheduled for surgical placement of a pacemaker. Upon admission, the patient was found to have a fever. Laboratory studies and a chest x-ray suggested multiple sources of infection requiring treatment with antibiotics. The patient had a prolonged hospital course complicated by repeated intubations (ultimately requiring a tracheostomy), sepsis from pneumonia, and placement of a temporary pacemaker for cardiac arrhythmias.[57] On hospital day four, the patient was noted to have atelectasis in the left lung and orders were written to treat the condition with medicated breathing treatments and nighttime CPAP therapy.[58] The breathing treatments were administered as ordered; however, the CCU physician documented that the patient did not receive the CPAP treatment on the two days following the initial CPAP orders. The patient subsequently developed acute respiratory failure requiring intermittent ventilator support for 10 days. The patient's respiratory status improved, and ventilator support was not required for the remainder of the CCU stay. In mid-summer 2019, the patient was discharged from the CCU to the facility's Community Living Center.

The OIG determined that neither the respiratory therapist nor the nurse caring for the patient on those nights ensured the patient received the ordered CPAP treatment.[59] The respiratory therapist, who had primary responsibility for initiating CPAP treatments, told the OIG of not seeing the order. A supervisory respiratory therapist told the OIG; however, that the oversight was human error. The failure to ensure CPAP treatments were conducted as ordered may have been a contributing factor to the patient being placed on intermittent ventilator support for 10 days.

Patient 9

The OIG determined that the patient experienced intermittent episodes of low blood pressures and a single episode of hypoglycemia during the CCU admission. The OIG was unable to determine if the patient experienced infiltration from an intravenous infusion or whether the infiltration was not identified due to insufficient nurse staffing. The OIG could not locate nursing

[57] Merriam-Webster, *Tracheostomy*. Tracheostomy is the surgical formation of an opening into the trachea through the neck specifically to allow the passage of air. https://www.merriam-webster.com/dictionary/tracheostomy. (The website was accessed on August 6, 2019.)

[58] Mayo Clinic, *Atelectasis Symptoms and Causes*. Atelectasis is the complete or partial collapse of the entire lung or the lobe of the lung. https://www.mayoclinic.org/diseases-conditions/atelectasis/symptoms-causes/syc-20369684. (The website was accessed on August 5, 2019.)

[59] The same nurse and the same respiratory therapist cared for the patient both nights.

documentation associated with the date or time of this alleged event. A nursing reassessment note in spring 2019 only identified "swelling" at the location of the infusion site with no documentation of a contributing cause. A CCU physician progress note on the same day stated, "I will request [nurse-to-patient] ratios that will help limit some of these [referring to care-related delays and issues] and limit poor outcomes." This statement implied that nurse staffing may have been insufficient at that time; however, the OIG could not confirm this condition.

The patient, who was in their 70s, had a history of paraplegia, diabetes, and respiratory problems. The patient was admitted in stable condition to an intensive care bed in spring 2019 from a community hospital after receiving treatment for respiratory failure and septic shock. The patient was found unresponsive and without a pulse two days after admission and was successfully resuscitated. Approximately a month later, the patient was placed on norepinephrine to treat periodic low blood pressures.

While the CCU physician's note attributed the patient's low blood pressure to infiltration of the norepinephrine intravenous infusion, the patient did not experience sustained low blood pressures while on the norepinephrine.[60] The patient experienced a single episode of hypoglycemia that was recognized by nursing staff and treated. The OIG determined that the patient was clinically stable during the episode of hypoglycemia and intermittent low blood pressures.

Patient 10

The OIG was unable to determine whether inadequate nurse staffing contributed to the patient's accidental and traumatic Foley catheter decannulation and hemorrhage. The OIG could not locate nursing documentation specific to this event but did find a CCU nursing reassessment note that referenced the patient's urine as "red" and "bloody." Red and bloody urine can be caused by a variety of conditions including urinary tract infections, kidney infections, or trauma to the kidneys or urethra.[61]

The patient, who was in their 90s with a history of chronic anemia, was admitted to the CCU in early spring 2019 for treatment of sepsis and urinary tract infection.[62] The day after admission, the CCU physician documented that the patient's Foley catheter had been "accidentally ripped out" while the patient was walking to the bathroom. While the nurse-to-patient ratio for

[60] Norepinephrine helps the body increase blood pressure along with other supportive measures such as intravenous fluids, and treatment of cardiovascular conditions or sepsis. The need for norepinephrine support may decrease over time as disease processes are stabilized.

[61] Mayo Clinic, *Blood in Urine (Hematuria).* https://www.mayoclinic.org/diseases-conditions/blood-in-urine/symptoms-causes/syc-20353432. (The website was accessed on October 9, 2019.)

[62] Anemia is a condition in which there are not enough healthy red blood cells to carry adequate oxygen to the body's tissues. Mayo Clinic, *Anemia, Symptoms and causes.* https://www.mayoclinic.org/diseases-conditions/anemia/symptoms-causes/syc-20351360. (The website was accessed on August 28, 2019.)

stepdown beds was 1:4 at the time of the alleged event, the OIG was unable to determine why the patient got out of bed without assistance.

Two days after admission, the patient left the hospital against medical advice.

Patient 11

The OIG did not substantiate that the patient became hypoxic because of not receiving supplemental oxygen via CPAP as ordered. While the patient refused physician-ordered CPAP treatment, the patient did not become hypoxic. Nurse staffing was not a factor in the patient not receiving nighttime CPAP treatment.

The patient, who was in their 70s with a history of heart problems, oxygen-dependent COPD, diabetes, and high blood pressure, was admitted to the CCU in early spring 2019 with a diagnosis of heart attack and respiratory failure. On hospital day three, the patient became somnolent (sleepy) and was not easily arousable.[63] Bilevel positive airway pressure treatment was ordered to improve the patient's respiratory and altered mental status.[64] Three days after admission, the CCU physician-ordered CPAP at night for untreated obstructive sleep apnea. The patient refused to wear the nighttime CPAP but agreed to receive oxygen via nasal cannula, which was acknowledged by the CCU physician. The CCU physician continued the orders for CPAP at night. On hospital day seven, the patient was transferred to the medicine ward with CPAP on "standby" if requested. The patient's oxygen saturation levels remained in the 90s throughout the CCU admission, with no evidence of hypoxia.[65]

The patient was discharged from the medicine ward to a nursing home.

4. Other Care Management Challenges

Patient 12

The OIG substantiated that a sitter was not consistently available for the patient as ordered by a CCU physician. The OIG substantiated that the patient experienced a fall while admitted to the CCU, which may have been prevented had a sitter been available. The OIG did not substantiate that the patient had multiple self-extubations and re-intubations due to the unavailability of a

[63] Symptoms of respiratory failure include confusion and sleepiness.

[64] Bilevel positive airway pressure (also referred to as BiPap or BPap) is a type of ventilator that helps with breathing. John Hopkins Medicine, *BiPAP.* https://www.hopkinsmedicine.org/health/treatment-tests-and-therapies/bipap. (The website was accessed on September 23, 2019.)

[65] Mayo Clinic, *Hypoxemia*. Normal blood oxygen saturation levels usually range from 95–100 percent. Values under 90 percent are considered low. https://www.mayoclinic.org/symptoms/hypoxemia/basics/definition/sym-20050930. (The website was accessed on October 2, 2019.)

sitter. The OIG could not locate EHR documentation regarding infiltration of the patient's intravenous line during the CCU admission.

The patient, who was in their 50s with a history of traumatic brain injury, was admitted in early spring 2019 for a possible drug overdose with altered mental status.[66] Both the Emergency Department and CCU physicians ordered soft restraints to manage the patient's aggression and confusion and to prevent falls.[67] Three days after admission, the CCU attending physician documented that it would be "best" if the patient had a sitter around-the-clock for 1:1 observation. The facility was unable to consistently provide a sitter, and the patient was in soft restraints, in keeping with facility policy for the use of restraints for patients getting out of bed without appropriate assistance, intermittently for most of the 22 days spent in the CCU.[68] Facility policy requires 1:1 observation of patients who exhibit homicidal or suicidal behaviors, neither of which were exhibited by Patient 12.[69]

On hospital day seven, CCU staff found the patient on the floor. The CCU post-fall nursing note documented that the patient's intravenous line was "broken in half," but that there were no other visible signs of injury. The post-fall note also documented the need for a sitter after the fall, but a sitter was not available so bilateral soft wrist restraints were applied. The next day, the patient developed respiratory distress and required intubation and ventilator support. The patient recovered from this initial respiratory distress event and was extubated. However, a few days later, the patient developed a second episode of respiratory distress requiring intubation and ventilatory support. The OIG found no documented evidence that the patient self-extubated and determined that both intubations were related to medical needs. The patient was discharged in spring 2019 to a non-VA long-term care facility.

Patient 13

The OIG substantiated that the patient, while assigned to a stepdown bed, was on an intravenous medication that required frequent dose adjustments. Admission criteria does not prohibit patients on the stepdown unit from receiving an intravenous medication requiring frequent dose adjustments.[70] However, the OIG team concluded that such patients may require closer

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[66] Mayo Clinic, *Traumatic Brain Injury, Symptoms and Causes*. Traumatic brain injury results from a violent blow or jolt to the head or body. More serious traumatic brain injury can result in bruising, torn tissues, bleeding, or other physical damage to the brain. https://www.mayoclinic.org/diseases-conditions/traumatic-brain-injury/symptoms-causes/syc-20378557. (The website was accessed on August 6, 2019.)

[67] Soft limb restraints are often used to keep agitated patients from pulling at life-saving medical devices. Sometimes hospital patients who are confused need restraints so that they do not scratch their skin; remove catheters and tubes that give them medicine and fluids; get out of bed, fall and hurt themselves; or harm other people.

[68] Facility Policy Memorandum 6008, *Restraint and Seclusion Use*, May 10, 2019.

[69] Facility Policy Memorandum 6016, *Management of a Patient Requiring 1:1 Supervision Status*, June 21, 2019.

[70] Facility Policy Memorandum 009-12, *Admission and Discharge Criteria: Critical Care Unit,* December 22, 2011. Facility Policy Memorandum 03-17-34.

monitoring than the facility's current staffing patterns allows. While the OIG confirmed that the patient experienced intermittent low blood pressure, the OIG team did not substantiate that the patient was in a hypotensive shock range.

The patient, who was in their 70s with a history of strokes, was treated in the facility Emergency Department in early spring 2019 for fever, rapid heart rate, and hypoxia. The Emergency Department physician made a diagnosis of sepsis and the CCU physician admitted the patient to a stepdown bed in the CCU for further treatment. The patient was initially admitted to a stepdown bed with a documented nurse-to-patient ratio of 1:4. Shortly after admission, physician orders included intravenous norepinephrine to be titrated every five minutes to maintain the patient's systolic blood pressure above 90 millimeters of mercury.[71] The patient remained on the norepinephrine for blood pressure support during the next 48 hours. The CCU attending physician wrote "best to keep patient on titrating doses of pressor not [in a stepdown bed]." Shortly after this note was written, the patient was transferred to an intensive care bed where the nurse-to-patient ratio was documented as 1:3. The patient's condition improved, and two days later, the patient was transferred to the medical ward for ongoing care. While facility policy did not prohibit patients on intravenous medications to receive this care while in a stepdown bed, and the patient did not experience an adverse clinical outcome, the OIG acknowledges the potential risk in managing complex intravenous medications when nurse-to-patient ratios do not support safe patient care.[72]

Patient 14

The OIG did not substantiate that a CCU physician had to "fight" to keep the patient, who had angioedema, in an intensive care bed. The OIG determined the term "fight" was subjective in this context, and the CCU physician did not characterize the repeated discussions about the patient's bed location as a "fight" in the EHR.

The patient, who was in their 40s, presented to the facility Emergency Department in early spring 2019 with right-sided facial swelling after starting a new medication for high blood pressure that morning. The patient was diagnosed with angioedema and admitted to the CCU for airway monitoring. Approximately one hour after CCU admission, the patient experienced respiratory distress requiring intubation and mechanical ventilation. On hospital day three, the patient improved, was extubated, and discharged later that day.

The CCU physician told the OIG that there "may have" been some dialog about placing the patient in a stepdown bed, although the CCU physician's EHR documentation reflected "The clinical decision was to admit [the patient] to ICU level of care despite several requests to place

[71] Blood pressure is measured in millimeters of mercury (mm HG). A blood pressure reading lower than 90 mm HG for the top number (systolic) or 60 mm HG for the bottom number (diastolic) is generally considered low blood pressure.

[72] Facility Policy Memorandum 009-12. Facility Policy Memorandum 03-17-34.

(the patient) in SDU [StepDown Unit].” The patient remained in an intensive care bed for the duration of the CCU stay.

Patient 15

The OIG did not substantiate that the patient died on a medical ward after cardiac arrest because a (staffed) intensive care bed was not available. CCU daily assignment sheets indicated a bed was available, but the patient did not survive resuscitation efforts on the medical ward.

The patient, who was in their 60s with a history of high blood pressure and COPD, was evaluated in the facility Emergency Department in spring 2019 after experiencing chest pain and dizziness. The Emergency Department physician determined that the patient’s complaints were not cardiac in nature but related to dehydration. The patient was admitted to the medical ward for further workup.

The patient was on a medical ward for evaluation of dehydration when the cardiac arrest event occurred. Resuscitation efforts were started; however, the efforts were not successful, and the patient was subsequently pronounced dead while still on the medical ward. The documented cause of death was acute hemorrhagic shock secondary to gastrointestinal bleed and acute hypoxic respiratory failure.

Conclusion

The OIG was unable to determine whether insufficient nurse staffing contributed to the patient events described in the allegations. The CCU daily nurse assignment sheets did not consistently document which bed a patient occupied or the nurse-to-patient assignment. The lack of documentation prevented the OIG from determining whether nurse staffing was central to the conditions outlined in this report. The OIG identified noncompliant practices and other deficits that contributed to care management challenges and poor clinical outcomes.

Although required by VHA directive and facility policy, the facility failed to designate an Interprofessional Pressure Injury Committee. The Committee’s job was to develop, implement, monitor, and evaluate the Pressure Ulcer Prevention Program. Facility staff with relevant wound care knowledge met periodically. However, due to a lack of documentation, the OIG could not determine whether Pressure Ulcer Prevention Program functions, like education of staff, were being performed. CCU nursing staff received pressure injury education and training in 2015, but no ongoing training from 2016 through 2018. In 2019, less than half of the CCU nursing staff were assigned the online pressure injury training module, but those that had been assigned the module completed the training. The acting ADPCS told the OIG of being aware that CCU staff had not completed all required competencies, including on pressure injuries, and that administrative action had been taken.

The OIG found that the CCU nursing staff failed to initiate required wound care consults for Patients 1, 2, and 3, based on their low Braden Scale scores. During interviews, the OIG discovered that some CCU nurses did not know about the facility policy requirement to do so. As a result of the failure, Patient 1 developed, after admission, a pressure injury which was unstageable by the time it was discovered. While Patients 2 and 3 did not develop pressure injuries after admission, nursing staff did not initiate required wound care consults in response to low Braden Scale scores.

While the OIG confirmed that Patients 4–7 experienced cardiac arrest events, the OIG was unable to determine whether the events were unwitnessed due to insufficient nurse staffing or based on some other factor. An unwitnessed cardiac arrest event increases the potential for a delayed response, which could potentially place patients at greater risk for adverse clinical outcomes.

Patient 4 developed a life-threatening arrhythmia that was unwitnessed and was not responded to timely. The patient experienced a cardiac arrest event and died. The OIG determined the facility adequately addressed consideration of an institutional disclosure based on the circumstances surrounding the patient's cardiac arrest. The nurses assigned to care for Patient 4 were in another patient's room at the time of the arrest and reportedly did not hear the cardiac monitor alarm, nor did tele-ICU staff alert the CCU staff that the patient was experiencing a life-threatening arrhythmia. To address the cardiac monitoring deficiencies, the facility reviewed the tele-ICU agreement, and initiated an upgrade of the CCU cardiac monitoring system that will be completed in March 2020.

The OIG reviewed the EHRs of Patients 5–7 and found no evidence of delayed response to the cardiac arrest events.

The OIG substantiated that the Patient 8 did not receive CPAP for two nights but did not substantiate that inadequate nurse staffing was a contributing factor. The respiratory therapist was responsible for ensuring Patient 8 received physician-ordered CPAP treatments; however, the treatments were not completed.

Patient 9 experienced infiltration from an intravenous infusion and Patient 10 experienced Foley catheter decannulation and hemorrhage; however, the OIG found no evidence that those events occurred due to insufficient nurse staffing. In both cases, nursing documentation about infiltration and decannulation was lacking. The OIG did not substantiate that Patient 11 became hypoxic due to not receiving supplemental oxygen via CPAP as ordered. While Patient 11 did not consistently receive physician-ordered CPAP treatment, Patient 11 did not become hypoxic.

The OIG substantiated that a sitter was not consistently available for Patient 12 as recommended by the CCU physician. Patient 12 experienced a fall while admitted to the CCU that may have been prevented had a sitter been available. The OIG did not substantiate, however, that Patient 12 had multiple self-extubations and re-intubations due to the unavailability of a sitter. The OIG substantiated that Patient 13, while assigned to a stepdown bed, was on an intravenous

medication that required frequent changes. Although current policy did not require a lower nurse-to-patient ratio, a patient requiring frequent intravenous medication changes may require closer monitoring than is possible with a 1:4 nurse-to-patient ratio.

The OIG did not substantiate that a CCU physician had to "fight" to keep Patient 14, who had angioedema, in an intensive care bed, or that Patient 15 died after a cardiac arrest because an intensive care bed was unavailable. Patient 15's cardiac arrest occurred on a general medicine ward where resuscitative efforts were unsuccessful, and Patient 15 died. The OIG determined intensive care bed availability was not an issue in this patient's death.

Recommendations 1–6

1. The Charlie Norwood VA Medical Center Director ensures compliance with requirements outlined in Veterans Health Administration and Charlie Norwood VA Medical Center policy memorandums for the prevention and management of pressure injuries, including nursing documentation requirements.
2. The Charlie Norwood VA Medical Center Director ensures Critical Care Unit nursing staff receive ongoing training to manage patients at risk for developing pressure injuries.
3. The Charlie Norwood VA Medical Center Director evaluates tele-ICU services, and makes changes as needed to ensure cardiac-monitored patients receive safe care.
4. The Charlie Norwood VA Medical Center Director ensures that a review to evaluate the circumstances related to Patient 8's respiratory care is conducted and takes action as indicated.
5. The Charlie Norwood VA Medical Center Director reviews current practices related to sitter availability when a physician orders a 1:1 sitter for Critical Care Unit patients and takes action as indicated.
6. The Charlie Norwood VA Medical Center Director reviews current practices related to Critical Care Unit nursing staff assignments and takes action as indicated to support safe patient care when intravenous medications that require frequent dose adjustments are prescribed.

Appendix A: VISN Director Memorandum

Department of Veterans Affairs Memorandum

Date: March 3, 2020

From: Deputy Network Director, VA Southeast Network (10N7)

Subj: Healthcare Inspection—Critical Care Unit Staffing and Quality of Care Concerns at the Charlie Norwood VA Medical Center, Augusta, Georgia

To: Director, Office of Healthcare Inspections, Rapid Response Team (54RR)
Director, GAO/OIG Accountability Liaison office (VHA 10EG GOAL Action)

1. I have had the opportunity to review the Draft Report: Healthcare Inspection of the Critical Care Unit and Quality of Care Deficiencies, Charlie Norwood VA Medical Center, Augusta, GA.
2. Charlie Norwood VA Medical Center and VISN 7 submits concurrence to recommendations 1-6. Charlie Norwood VA Medical Center and VISN 7 request closure of recommendations 2 and 6.
3. I appreciate the opportunity for this review as part of a continuing process to improve the care of our Veterans.
4. If you have any questions or require further information, please contact the VISN 7 Quality Management Officer.

(*Original signed by*:)
Benita K. Miller, LISW-CP, FACHE
Deputy Network Director

Appendix B: Facility Director Memorandum

Department of Veterans Affairs Memorandum

Date: February 21, 2020

From: Director, Charlie Norwood VA Medical Center (509/00)

Subj: Critical Care Unit Staffing and Quality of Care Concerns at the Charlie Norwood VA Medical Center, Augusta, Georgia

To: Director, VA Southeast Network (10N7)

1. In response to the VA Office of Inspector General (OIG) Inspection of the Charlie Norwood VA Medical Center Augusta, Georgia, we concur with the recommendations.
2. Augusta VA Medical Center submits the attached status update providing justification and documentation to recommendation numbers 1 through 6. I concur with Augusta VA Medical Centers action plan and ongoing implementation for recommendations 1 through 6 and request for closure of recommendations, 2 and 6.
3. I appreciate the opportunity for this review as part of a continuing process to improve the care of our Veterans.
4. If you have any questions or require further information, please contact Acting Chief, Quality Management at (706) 733-0188.

(Original signed by:)
Robin E. Jackson, PhD
Medical Center Director

Facility Director Response

Recommendation 1

The Charlie Norwood VA Medical Center Director ensures compliance with requirements outlined in Veterans Health Administration and Charlie Norwood VA Medical Center policy memorandums for the prevention and management of pressure injuries, including nursing documentation requirements.

Concur.

Target date for completion: June 2020

Director Comments

The Facility Director would like to thank the OIG for their recommendation.

The Director will task the acting ADPCS to review the VA and CNVAMC [Charlie Norwood VA Medical Center] policies for the prevention and management of pressure injuries to strengthen compliance and address any opportunities for improvement. This review will also review nursing documentation requirements and will include any needed action to improve the facilities education or training.

Recommendation 2

The Charlie Norwood VA Medical Center Director ensures Critical Care Unit nursing staff receive ongoing training to manage patients at risk for developing pressure injuries.

Concur.

Target date for completion: March 30, 2020

Director Comments

The Facility Director would like to thank the OIG for their recommendation.

The acting ADPCS has conducted a 100 % review of training/education for all CCU nursing staff related to pressure ulcer/wound care. This review showed all CCU RN [registered nurses] staff have completed initial competencies and ongoing competencies as required by National Guidelines. Ongoing education and training will also be provided as needed in CCU.

OIG Comment

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

Recommendation 3

The Charlie Norwood VA Medical Center Director evaluates tele-ICU services, and makes changes as needed to ensure cardiac-monitored patients receive safe care.

Concur.

Target date for completion: December 2020

Director Comments

The Facility Director would like to thank the OIG for their recommendation.

The Director has tasked the Biomed [biomedical engineering], IT [information technology] Chief of Staff, and acting ADPCS to evaluate Tele-ICU and provide recommendations. A new Tele-ICU agreement was signed in February 2019. The Director reviewed the recommendations from the Tele-ICU evaluation and approved funds to upgrade the Tele-ICU equipment to improve the care provided to cardiac-monitored patients and ensure increased safety of all CCU patients. Tele-ICU staff are visiting the Medical Center to evaluate and provide additional education for CCU Staff. Additional education will be provided to all CCU staff and providers with ongoing training as needed. New CCU employees/residents will also receive Tele-ICU training when joining the unit staff.

Recommendation 4

The Charlie Norwood VA Medical Center Director ensures that a review to evaluate the circumstances related to Patient 8's respiratory care is conducted and takes action as indicated.

Concur.

Target date for completion: June 2020

Director Comments

The Director has appointed a management review to investigate the circumstances related to Patient 8's respiratory care and take actions such as Protected Peer Review, Root Cause Analysis or Administrative Discipline based on these findings.

Recommendation 5

The Charlie Norwood VA Medical Center Director reviews current practices related to sitter availability when a physician orders a 1:1 sitter for Critical Care Unit patients and takes action as indicated.

Concur.

Target date for completion: December 2020

Director Comments

The Facility Director would like to thank the OIG for their recommendation.

The Director has tasked the acting ADPCS to conduct a review of the current sitter policy and make changes as needed to ensure the safety of our patients. Currently sitters are required by policy for SI/HI [suicidal ideation/homicidal ideation]. The new assignment structure for CCU RN allows better view of patients. And the ongoing hiring on Intermittent Care Techs allows for additional staff in the CCU to assist with patients.

Recommendation 6

The Charlie Norwood VA Medical Center Director reviews current practices related to Critical Care Unit nursing staff assignments and takes action as indicated to support safe patient care when intravenous medications that require frequent dose adjustments are prescribed.

Concur.

Target date for completion: March 15, 2020

Director Comments

The Facility Director would like to thank the OIG for their recommendation.

The Director has tasked the acting ADPCS to audit the staffing ratio in CCU and Step-down units since July 2019 to ensure proper nurse-to-patient ratios. At the unit level, ICU and Step-Down staffing is reviewed each day to include previous day final NHPPD [Nursing Hours Per Patient Day] and current day projected needs. Weekend staffing coverage in ICU is reviewed each Friday morning prior to the projected weekend. The Nurse Manager (NM) makes back-up contingencies for potential absences that are communicated to the Patient Care Coordinator (PCC). For balanced scheduling each week, ICU staffing is reviewed 4-weeks out. The staffing sheets are reviewed and signed daily by the CCU manager, Inpatient Chief Nurse and the ADPCS. Copies are provided to the MCD [Director] on a daily basis. CCU staffing has been no more than 1:2 and Step-down has been no more than 1:3. Average for CCU for the past 7 months is 1.44 patients per RN, and average for Step-Down for the past 7 months is 2.28 patients per registered nurse. Patient acuity is always considered when staffing assignments are made to ensure high quality care is provided.

OIG Comment

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

Glossary

angioedema. A type of swelling that affects deeper layers of skin, often the face and lips. Serious angioedema can be life-threatening if swelling causes the throat or tongue to block the airway.[73]

arrhythmia. A heart rhythm problem that occurs when the electrical impulses that coordinate the heartbeat do not work properly, causing the heart to beat too fast, too slow, or irregularly.[74]

Braden Scale. A tool utilized by health care professionals to score or predict a patient's level of risk for developing pressure injuries while hospitalized.[75]

cardiac arrest. The abrupt loss of heart function, breathing, and consciousness.[76]

cardiopulmonary resuscitation (CPR). A life-saving technique useful in emergencies when respiration has ceased, or the heart has stopped beating.[77]

chronic obstructive pulmonary disease (COPD). A chronic inflammatory lung disease that causes obstructed airflow from the lungs.[78]

continuous positive airway pressure (CPAP). A treatment that includes a mask or other device that fits over that nose and mouth. CPAP is used to treat sleep-related breathing disorders including sleep apnea.[79]

debridement. The surgical removal of lacerated, devitalized, or contaminated tissue.[80]

diabetes. A group of diseases that affect how the body uses blood sugar.[81]

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[73] Mayo Clinic, *Hives and Angioedema, Symptoms and Causes.* https://www.mayoclinic.org/diseases-conditions/hives-and-angioedema/symptoms-causes/syc-20354908. (The website was accessed on July 29, 2019.)

[74] Mayo Clinic, *Heart Arrhythmia, Symptoms and Causes.* https://www.mayoclinic.org/diseases-conditions/heart-arrhythmia/symptoms-causes/syc-20350668. (The website was accessed on September 26, 2019.)

[75] VHA Directive 1352, *Prevention and Management of Pressure Injuries*, March 21, 2019. https://www.va.gov/vhapublications/ViewPublication.asp?pub_ID=8274. (The website was accessed on August 5, 2019.)

[76] Mayo Clinic, *Sudden Cardiac Arrest, Symptoms and Causes.* https://www.mayoclinic.org/diseases-conditions/sudden-cardiac-arrest/symptoms-causes/syc-20350634. (The website was accessed on July 24, 2019.)

[77] Mayo Clinic, *Cardiopulmonary Resuscitation (CPR): First Aid*. https://www.mayoclinic.org/first-aid/first-aid-cpr/basics/art-20056600. (The website was accessed on August 14, 2019.)

[78] Mayo Clinic, *COPD, Symptoms and Causes.* https://www.mayoclinic.org/diseases-conditions/copd/symptoms-causes/syc-20353679. (The website was accessed on July 24, 2019.)

[79] National Heart, Lung, and Blood Institute, *CPAP.* https://www.nhlbi.nih.gov/health-topics/cpap. (The website was accessed on July 29, 2019.)

[80] Merriam-Webster, *Debridement.* https://www.merriam-webster.com/dictionary/debridement. (The website was accessed on August 5, 2019.)

[81] Mayo Clinic, *Diabetes, Symptoms and Causes.* https://www.mayoclinic.org/diseases-conditions/diabetes/symptoms-causes/syc-20371444. (The website was accessed on July 29, 2019.)

foley catheter. A thin flexible catheter used to drain urine from the bladder by way of the urethra.[82]

hypoglycemia. A condition caused by a very low level of blood sugar in the body's main energy source. Hypoglycemia is often related to the treatment of diabetes.[83]

hypoxic. Resulting from, causing, or experiencing inadequate levels of oxygen in the tissues and cells of the body.[84]

infiltration. The leakage of intravenous fluids or medications into the surrounding tissue caused by improper placement or dislodgment of the intravenous catheter.[85]

intravenous. Situated, performed, or occurring within or entering by way of a vein.[86]

intubation. The introduction of a tube into a hollow organ (as the trachea) to keep it open or restore its patency if obstructed.[87]

mechanical ventilation. The use of a machine that helps a patient breathe when the patient is unable to breathe spontaneously.[88]

nasal cannula. A tubing system that runs between the nostrils and the oxygen source to breathe in the oxygen. The tubing system consists of two small prongs that rest in the nostrils and connect to tubes that drop over the ears and merge under the chin.[89]

norepinephrine. An intravenous medicine used for blood pressure control in certain acute hypotensive states.[90]

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[82] Merriam-Webster, *Foley Catheter.* https://www.merriam-webster.com/dictionary/Foley%20catheter. (The website was accessed on September 29, 2019.)

[83] Mayo Clinic, *Hypoglycemia, Symptoms and Causes.* https://www.mayoclinic.org/diseases-conditions/hypoglycemia/symptoms-causes/syc-20373685. (The website was accessed on July 29, 2019.)

[84] Merriam-Webster, *Hypoxic.* https://www.merriam-webster.com/dictionary/hypoxic. (The website was accessed on October 2, 2019.)

[85] Lippincott Nursing Center, *Infiltration.* https://www.nursingcenter.com/ncblog/february-2015-(1)/complications-of-peripheral-i-v-therapy. (The website was accessed on October 10, 2019.)

[86] Merriam-Webster, *Intravenous.* https://www.merriam-webster.com/dictionary/intravenous. (The website was accessed on July 29, 2019.)

[87] Merriam-Webster, *Intubation.* https://www.merriam-webster.com/dictionary/intubation#medicalDictionary. (The website was accessed on August 5, 2019.)

[88] Cleveland Clinic, *Mechanical Ventilation.* https://my.clevelandclinic.org/health/articles/15368-mechanical-ventilation. (The website was accessed on September 24, 2019.)

[89] Newsnetwork. Mayo Clinic, *Mayo Clinic Health Letter.* https://newsnetwork.mayoclinic.org/discussion/mayo-clinic-health-letter-highlights-from-the-december-2014-issue/. (The website was accessed on August 12, 2019.)

[90] National Institutes of Health U.S. National Library of Medicine, *Levophed.* https://dailymed.nlm.nih.gov/dailymed/drugInfo.cfm?setid=2e0570e7-d28f-4936-cba8-81ee0c4c3547. (The website was accessed on September 9, 2019.)

oxygen saturation. The measurement of oxygen level in a blood sample taken from an artery. It can also be estimated by using a small device that clips to the finger (pulse oximeter). Normal pulse oximeter readings usually range from 95 to 100 percent. Values under 90 percent are considered low.[91]

pressure injury (decubitus ulcers, bed sores, pressure sores)**.** Localized damage to the skin and/or underlying soft tissue, usually over a bony prominence or related to a medical or other device.[92]

respiratory failure. A condition in which not enough oxygen passes from the lungs into the blood. Respiratory failure also can occur if the lungs cannot properly remove carbon dioxide from the blood.[93]

respiratory therapist. Respiratory therapists give patients oxygen, manage ventilators, and manage equipment and devices to help people that cannot breathe normally on their own.[94]

sepsis. A potentially life-threatening complication of an infection. Sepsis occurs when chemicals released into the bloodstream to fight the infection trigger inflammatory responses throughout the body. This inflammation can trigger a cascade of changes that can damage multiple organ systems.[95]

[91] Mayo Clinic, *Hypoxemia.* https://www.mayoclinic.org/symptoms/hypoxemia/basics/definition/sym-20050930. (The website was accessed on October 2, 2019.)

[92] Quick Safety, *Preventing Pressure Injuries*. https://www.jointcommission.org/assets/1/23/Quick_Safety_Issue_25_July_20161.PDF. (The website was accessed on August 6, 2019.)

[93] National Heart, Lung and Blood Institute, *Respiratory Failure.* https://www.nhlbi.nih.gov/health-topics/respiratory-failure. (The website was accessed on September 20, 2019.)

[94] Mayo Clinic, College of Medicine and Science, *Respiratory Therapist*. https://college.mayo.edu/academics/explore-health-care-careers/careers-a-z/respiratory-therapist/?_ga=2.102038785.1210232421.1569007371-140877192.1569007371. (The website was accessed on September 20, 2019.)

[95] Mayo Clinic, *Sepsis, Symptoms and Cause.* https://www.mayoclinic.org/diseases-conditions/sepsis/symptoms-causes/syc-20351214. (The website was accessed on July 29, 2019.)

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