Department of Veterans Affairs
Office of Inspector General

Office of Healthcare Inspections

Report No. 14-05173-92

Healthcare Inspection

Environment of Care and Safety Concerns in Operating Room Areas Edward Hines Jr. VA Hospital Hines, Illinois

January 19, 2016

Washington, DC 20420

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Executive Summary

The VA Office of Inspector General (OIG) Office of Healthcare Inspections conducted a review at the request of Senator Mark Kirk to assess allegations of environment of care and safety concerns at the Edward Hines Jr. VA Hospital (facility), Hines, IL.

We substantiated the allegation that prior to the new OR's first use for patient care on July 21, 2014, water had flooded the new surgical operating room (OR) areas and mold was present. However, during our tour of the new OR on October 28, 2014, surgical staff informed us that water had not infiltrated the area since surgical care had been initiated. The water infiltration problem was resolved and the mold was remediated prior to the new OR's first use for patient care. Our review of inpatient surgical wound culture data found no evidence of infections that related to fungal growth.

We substantiated the allegation of years of flooding and water damage in the old OR. We identified signs of water damage on the floor and wall tiles due to past flooding in the former surgical OR area, which was previously located in the basement. During our tour of the old OR on October 28, 2014, we observed that no patient care was being conducted in this area of the basement.

Surgical staff reported other patient and staff safety issues regarding the overhead paging and emergency system, temperature and humidity control adjustment, surgical booms, and operating room doors in the new surgical OR areas.

We substantiated the allegation that the overhead paging and emergency system was not audible throughout the entire surgical OR area. OR surgical staff informed us that the new surgical OR was constructed in two phases, Phase I and Phase II. When a code blue button was pressed (an indication that immediate medical attention was needed) in a surgical OR that was constructed during Phase I, the alarm did not sound in surgical areas that were constructed during Phase II, potentially delaying emergency response and compromising patient safety. We observed that code blue buttons were located at the central nurses' station outside of the post anesthesia care units. Therefore, if post anesthesia care staff were to need emergency assistance, the lack of code buttons could increase the likelihood of a delayed emergency response based on the need to leave the room to initiate a code.

In December 2014, surgical staff reported that two patients required resuscitation or immediate assistance since the opening of the new surgical OR. One code was called in the post anesthesia care unit, and the other code occurred during surgery. Review of the patients' electronic health records noted no delays in initiating the codes. We did not identify any additional codes from July 2014 through December 2014.

We substantiated the allegation that the adjustment of temperature and humidity in new surgical OR areas was difficult to control. The adjustment of temperature in an OR is important in order to prevent hyperthermia, surgical site infections, longer hospital stays, and other negative outcomes. The adjustment of humidity in an OR is important in order to reduce infections and prevent development of mold and mildew in anesthetizing locations. We reviewed facility surgical infection reports and did not identify evidence of

OR infections related to mold or mildew. We observed that the wall mounted thermostats located in the new OR lacked temperature gauges for surgical staff to make precise adjustments for a desired temperature. Surgical staff informed us that temperature adjustments could take up to an hour to reach desired temperatures.

We substantiated the allegation that surgical booms (ceiling mounted surgical equipment used to maximize OR space) located in the new surgical OR were difficult to manipulate and maneuver around. Representatives from the surgical boom manufacturer provided multiple training sessions informing surgical staff how to operate the surgical booms. However, several complaints were reported that the booms caused limitations to the surrounding physical space and were difficult to maneuver. In December 2014, the facility's Safety Officer and a manufacturer's representative conducted an additional in-service addressing equipment safety.

We did not substantiate the allegation that opening of the OR doors required staff to use their backs to push into the doors. We observed that OR doors are electric and are opened through the use of push plates. Push plates are adjacent to each OR door allowing staff to open each door without having to use their backs to push into the door. We reviewed accident prevention reports and did not identify documentation of staff accidents related to maneuvering of the OR doors.

We recommended that the Acting Facility Director: (1) implement an action plan to remediate water damage in the basement of Building 200; (2) initiate a safety analysis of the current overhead paging and emergency system for communication of a code throughout the entire surgical OR, including the post anesthesia care units and take action as necessary; (3) implement processes to maintain recommended ranges for temperature and humidity in OR areas; and (4) take actions to prevent staff injury from surgical booms in ORs. As of May 2015, a branch stemming from one of the two surgical booms was removed to prevent staff injury.

Comments

The Acting Veterans Integrated Service Network and Acting Facility Directors concurred with our recommendations and provided an acceptable action plan. (See Appendixes A and B, pages 8–11 for the Directors' comments.) We will follow up on the planned actions until they are completed.

JOHN D. DAIGH, JR., M.D.
Assistant Inspector General for
Healthcare Inspections

Purpose

The VA Office of Inspector General (OIG) Office of Healthcare Inspections conducted a review at the request of Senator Mark Kirk to assess allegations of environment of care and safety concerns at the Edward Hines, Jr. VA Hospital (facility), Hines, IL.

Background

The facility is a tertiary care facility with 496 inpatient beds and 9 surgical operating rooms that provides a broad range of medical, surgical, and psychiatric inpatient care, as well as primary and specialty care outpatient services. The facility is part of Veterans Integrated Service Network (VISN) 12 and serves a veteran population of over 56,000 unique patients.

Operating Room

The Surgical Operating Room (OR) was originally located in the facility's basement (directly above the gravel sub-basement area[1]) of Building 200 since it opened in 1970. During the summer of 2003, mold developed on walls in the surgical area of the basement, and surgery operations were shut down for several weeks while mold was removed. As a result of a feasibility study, the 2nd floor of Building 200 was chosen as the new location for the Surgical Department. Capital improvement plans[2] were submitted in 2004, and in July 2014 the new surgical OR was opened for patient care.

Allegations

In July 2014, the OIG received allegations regarding environment of care and safety concerns in surgical areas at the facility. Specifically, the areas of concern were:

- Flooding and presence of mold throughout the new surgical OR areas
- Years of flooding and water damage in the old operating room

Scope and Methodology

We conducted our review from September 2014 through March 2015. We visited the facility October 28–30, 2014, and December 16, 2014. We interviewed the complainants who contacted Senator Kirk regarding environment of care issues at the facility. We also interviewed senior managers and clinical and administrative staff with knowledge of the allegations, including staff from Surgery Service, Nursing Service, Facilities Management Service (FMS), Environmental Management Service, Infection Prevention Control, Patient Safety, and Quality Management.

[1] Sub-basement is a story below a basement.
[2] Capital Improvement Plan is a short range plan which identifies capital projects and equipment purchases, provides a planning schedule, and outlines options for financing the plan.

We reviewed relevant Veterans Health Administration (VHA), VISN, and local policies and procedures related to the OR, patient safety, quality management, infection control, and environmental and facilities management services. We reviewed fiscal year 2014 committee minutes and documents, training records, workplace accident prevention reports, facility surgical infection reports, and electronic health records for two patients who required resuscitation or immediate assistance in the new surgical OR. We also reviewed facility email correspondence submitted to FMS; The Joint Commission Official Accreditation Report dated September 9, 2014; Occupational Safety and Health Administration standards; Association periOperative Registered Nurses guidelines; and inspection results from two third-party laboratories that performed mold testing. Testing for mold presence was limited to a visual inspection.

We toured the new surgical OR located on the 2nd floor of Building 200 as well as the former surgical OR area.

We **substantiated** allegations when the facts and findings supported that the alleged events or actions took place. We **did not substantiate** allegations when the facts showed the allegations were unfounded. We **could not substantiate** allegations when there was no conclusive evidence to either sustain or refute the allegation.

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

Inspection Results

Issue 1: Flooding and the Presence of Mold in the New Surgical OR Areas

We substantiated the allegation that prior to the new OR's first use for patient care on July 21, 2014, water had flooded the new surgical OR and mold was present. However, during our tour of the new OR on October 28, 2014, surgical staff informed us that water had not infiltrated the area since surgical care had been initiated. The water infiltration problem was resolved, and the mold was remediated prior to the new OR's first use for patient care.

Prior to the opening of the new surgical OR on July 21, 2014, FMS staff reported numerous roof leaks. As a result, the facility managers hired a third party contractor to perform an inspection in April 2014 to inspect for mold growth in the new surgical OR areas in response to a concern about possible mold growth because of past water damage through the ceiling.[3] Air samples were collected to determine the background levels of airborne fungal spores[4] in various areas in comparison with outdoor air. The results showed mixed levels of fungal spores in five rooms located throughout the new surgical OR areas. FMS staff documented that the rooms that tested positive were remediated in accordance with the Occupational Safety and Health Administration.

On July 17, 2014, FMS staff reported that another leak was identified on a ceiling tile in a room where sterile supplies were stored. This leak was a result of plumbing and was remediated according to the facility's Mold Remediation Standard Operating Rooms Procedure[5] for small isolated areas. According to FMS staff, the leak was repaired by cutting out the ceiling tile and replacing the ceiling tile with a metal access door. Although there was no evidence of mold, to ensure ongoing air quality standards, FMS staff informed us that these rooms were retested by a third party laboratory in December 2014.[6] The results showed a decrease in total fungi count for each of the rooms tested. Currently, according to the Occupational Safety and Health Administration, there are no federal standards or recommendations for airborne concentrations of mold or mold spores.

We reviewed inpatient surgical wound culture data and found no documented evidence of infections that related to fungal growth.

Issue 2: Years of Flooding and Water Damage in Old Operating Room

We substantiated the allegation of years of flooding and water damage in the old operating room. During our tour of the facility on October 28, 2014, we identified signs of water damage on the floor and wall tiles due to past flooding in the former surgical

[3] MC Consulting, Inc., Limited Mold Inspection Report for Building 200, 2nd Floor Renovated Area, Edward Hines Jr. VA Hospital, Hines, IL, April 30, 2014.
[4] Fungal spores are microscopic biological particles that allow fungi to be reproduced.
[5] Hines VA Hospital, FMS Mold Remediation Standard Operating Procedure, p.1.
[6] EMSL Analytical, Inc., Expanded Fungal Report for Building 200 Surgery, December 19, 2014.

OR area, which was located in the basement. We also observed that no patient care was being conducted in this area of the basement.

FMS staff proposed an action plan in December 2014 to remediate this area in accordance with the facility's Mold Remediation Standard Operating Rooms Procedure[7] for mid-sized isolated areas by isolating the area where water damage had occurred to determine the precise point of water infiltration. A partition wall was constructed to remediate water damage and to ensure a safe environment in the basement of Building 200. This construction was completed on January 15, 2015.

Issue 3: Other Patient and Staff Safety Issues

Surgical staff informed us of other patient and staff safety concerns in the new surgical OR areas regarding the overhead paging and emergency system,[8] temperature and humidity control adjustment, surgical booms,[9] and operating room doors.

Overhead Paging and Emergency System

We substantiated the allegation that the overhead paging and emergency system was not audible throughout the entire surgical OR area. OR surgical staff informed us that the new surgical OR was constructed in two phases, Phase I and Phase II. When a code blue button[10] was pressed in a surgical OR that was constructed during Phase I, the alarm did not sound in surgical areas that were constructed during Phase II, potentially delaying emergency response and compromising patient safety. We observed that code blue buttons were located at the central nurses' station outside of the post anesthesia care units that are used for preparation and recovery. Therefore, if post anesthesia care staff were in need of emergency assistance, the lack of code buttons increases the likelihood of a delayed emergency response based on the need to leave the room to initiate a code. Bioengineering staff submitted an equipment request for fiscal year 2015 funding to add more code blue buttons and overhead code speakers.

In December 2014, surgical staff reported that two patients required resuscitation or immediate assistance since the opening of the new surgical OR. One code was called in the post anesthesia care unit, and the other code occurred during surgery. Review of the patients' electronic health records found no delays in initiating the codes. We did not identify any additional codes from July 2014 through December 2014.

[7] Hines VA Hospital, FMS Mold Remediation Standard Operating Procedure, p.2.
[8] Overhead paging and emergency system is used in hospitals to alert staff to various emergencies using codes to convey essential information quickly and with minimal misunderstanding to staff, while preventing stress and panic among visitors to the hospital.
[9] Surgical boom is a ceiling mounted equipment management system used to maximize operating room space, organize surgical equipment, and support service in one centralized location, providing equipment accessibility.
[10] Code blue button is a button that is pressed to indicate a patient requiring resuscitation or in need of immediate medical attention, most often as the result of a respiratory arrest or cardiac arrest.

Temperature and Humidity Adjustment

We substantiated the allegation that the adjustment of temperature and humidity in the new surgical OR areas was difficult to control. According to the Association of periOperative Registered Nurses guidelines, the recommended temperature range in an OR is between 68°F and 73°F[11] in order to prevent hyperthermia, surgical site infections, longer hospital stays, and other negative outcomes. The recommended humidity range in an OR is 20 percent to 60 percent[12] in order to reduce infections and prevent development of mold and mildew in anesthetizing locations. We reviewed facility surgical infection reports and did not identify evidence of OR infections related to mold or mildew.

During our tour of the facility on October 28, 2014, we observed that the wall mounted thermostats located in the new OR lacked temperature gauges for surgical staff to make precise adjustments for desired temperatures. Surgical staff informed us that temperature adjustments can take up to an hour to reach the desired temperatures. Temporary digital thermometers were provided to assist staff with monitoring temperature in each surgical OR.

Surgical Booms

We substantiated the allegation that surgical booms located in the new surgical OR 7 were difficult to manipulate and maneuver. According to facility policy, clinical staff who are responsible for using patient care monitoring, diagnostic, and treatment equipment must be trained on the proper use and potential hazards of each piece of equipment. This includes, at a minimum, training prior to initial use of the equipment.[13]

Representatives from the surgical boom manufacturer have provided multiple training sessions to surgical staff on how to operate the surgical booms. Although the facility stated that the surgical booms were installed by the manufacturer who used their own guidelines, several complainants reported that the booms caused limitations to the surrounding physical space and were difficult to maneuver. In December 2014, the facility's Safety Officer and a manufacturer's representative conducted an additional training addressing equipment safety.

Operating Room Doors

We did not substantiate the allegation that opening the OR doors required staff to use their backs to push into the doors. During our tour of the facility, we observed that OR

[11] Clinical Practice: Environment of Care, p.1. Association of periOperative Registered Nurses Website. http://www.aorn.org/clinicalfaqs/environmentofcare/ Accessed December 30, 2014.
[12] Clinical Practice: Environment of Care, p.2. Association of periOperative Registered Nurses Website. http://www.aorn.org/clinicalfaqs/environmentofcare/ Accessed December 30, 2014.
[13] Hines VA Hospital, Policy Memorandum No. 578-08-138A-047 (R-2), Equipment User Training Requirements, September 30, 2011, p.2.

doors are electric and are opened through the use of push plates.[14] Push plates are adjacent to each OR door allowing staff to open each door without having to use their backs to push into the door. We reviewed accident prevention reports and did not identify any documentation of staff accidents related to maneuvering of the OR doors.

Conclusions

We substantiated the allegation that prior to the OR's first use for patient care on July 21, 2014, water had flooded the new surgical OR and mold was present. However, during our tour of the new OR on October 28, 2014, surgical staff informed us that water had not infiltrated the area since surgical care had been initiated. The water infiltration problem was resolved, and the mold was remediated prior to the new OR's use for patient care.

We substantiated the allegation of years of flooding and water damage in the old operating room. We identified signs of water damage on the floor and wall tiles due to past flooding in the former surgical OR area previously located in the basement. During our tour of the old OR on October 28, 2014, we observed that no patient care was being conducted in this area of the basement.

We substantiated the allegation that the overhead paging and emergency system was not audible throughout the entire surgical OR area potentially delaying emergency code team response and compromising patient safety. We also observed that code blue buttons were located at the central nurses' station outside of the post anesthesia care units. Therefore, if post anesthesia care staff were in need of emergency assistance, the lack of code buttons increases the likelihood of a delayed emergency response based on the need to leave the room to initiate a code. We did not identify any additional codes from July 2014 through December 2014.

We substantiated the allegation that the adjustment of temperature and humidity in new surgical OR areas was difficult to control. We observed that the wall mounted thermostats located in the new OR lacked temperature gauges for surgical staff to make precise adjustments for a desired temperature.

We substantiated the allegation that surgical booms located in the new surgical OR were difficult to manipulate and maneuver. The facility's Safety Officer and a manufacturer's representative have conducted training on safe use of the booms.

We did not substantiate the allegation that opening of the OR doors required staff to use their backs to push into the doors.

[14] Push plates are wall mounted plates allowing for automatic door access where a person simply pushes the plate to open the door without having to use a knob or handle.

Recommendations

1. We recommended that the Acting Facility Director implement an action plan to remediate water damage in the basement of Building 200.

2. We recommended that the Acting Facility Director initiate a safety analysis of the current overhead paging and emergency system for communication of a code throughout the entire surgical operating room, including the post anesthesia care units and take action as necessary.

3. We recommended that the Acting Facility Director implement processes to maintain recommended ranges for temperature and humidity in operating room areas.

4. We recommended that the Acting Facility Director take actions to prevent staff injury as a result of surgical booms located in operating rooms.

Appendix A

Acting VISN Director Comments

Department of Veterans Affairs

Memorandum

Date: September 25, 2015

From: Acting Director, VA Great Lakes Health Care System (10N12)

Subj: **Healthcare Inspection—Environment of Care and Safety Concerns in Operating Room Areas, Edward Hines Jr. VA Hospital, Hines, Illinois**

To: Director, Chicago Office of Healthcare Inspections (54CH)

Director, Management Review Service (VHA 10AR MRS OIG Hotline)

1. I have reviewed the draft report for Hines VA Hospital and concur with the findings and recommendations.

2. I appreciate the Office of the Inspector General's effort to ensure high quality of care to our Veterans at the Hines VA Hospital.

(original signed by:)

James W. Rice

Appendix B

Acting Facility Director Comments

Department of Veterans Affairs

Memorandum

Date: September 25, 2015

From: Acting Director, Edward Hines, Jr. VA Hospital (578/00)

Subj: **Healthcare Inspection—Environment of Care and Safety Concerns in Operating Room Areas, Edward Hines Jr. VA Hospital, Hines, Illinois**

To: Acting Director, VA Great Lakes Health Care System (10N12)

1. I would like to thank the Office of the Inspector General for their thorough inspection of our Operating Rooms. The OIG staff members conducted themselves with the highest level of professionalism and exposed opportunities to improve the care we provide to our Veterans.

2. All recommendations made during the inspection have all been acted upon and are complete.

3. If you have any question or require additional information, please contact me directly at (708) 202-5639.

(original signed by:)

Daniel Zomchek, PhD, FACHE

Comments to OIG's Report

The following Director's comments are submitted in response to the recommendations in the OIG report:

OIG Recommendations

Recommendation 1. We recommended that the Acting Facility Director implement an action plan to remediate water damage in the basement of Building 200.

Concur

Target date for completion: Completed January 15, 2015

Facility response: A partition wall was constructed to remediate water damage and to ensure a safe environment in the basement of Building 200. The wall is a measure to prevent any water intrusion. This construction was completed on January 15, 2015. The old operating room once located in the basement of building 200 has been renovated for Ambulatory Surgery use. Ambulatory Surgery began receiving patients for procedures on July 6, 2015. Four of nine surgery suites were activated on July 6, 2015 and are operational. The inactive OR rooms are locked and only Engineering has key access to the area.

Recommendation 2. We recommended that the Acting Facility Director initiate a safety analysis of the current overhead paging and emergency system for communication of a code throughout the entire surgical operating room, including the post anesthesia care units and take action as necessary.

Concur

Completed: August 19, 2015

Facility response: A safety analysis was completed on July 29, 2014, to determine what additional devices such as code stations, annunciators, and overhead speakers would be required for safe communication to all areas. The procurement was awarded on May 4, 2015. All devices that were identified as being required from the safety analysis have been installed with the exception of two overhead speakers in Sterilization Processing Service logistics supply Room 2211 (non-critical location for code) and Anesthesia work room 2210 (critical location for code; however, speaker already installed in the anesthesia work room in close proximity to the non-compliant Room 2210, allowing safe communication with all adjoining work rooms left open). A contract modification to add conduit runs is required for these additional locations to be compliant and speaker installation finalized. Until speakers are installed, Anesthesia adjoining work rooms will leave doors open to assure that room 2210 will be able to hear code. Final speaker installation was completed on August 19, 2015.

Recommendation 3. We recommended that the Acting Facility Director implement processes to maintain recommended ranges for temperature and humidity in operating room areas.

Concur

Target date for completion: Completed December, 2014

Facility response: New temperature controllers with digital display were installed in OR rooms 1–9 to assure adjustments to desired temperature in October 2014. Temptrak devices to monitor both temperature and humidity remotely for OR rooms 1–9 were installed in June 2014. Humidification system was replaced for OR rooms 7–9 in December 2014. Ongoing monitoring has been established thru Temptrak system to assure guidelines for humidity and temperature are met.

Recommendation 4. We recommended that the Acting Facility Director take actions to prevent staff injury as a result of surgical booms located in operating rooms.

Concur

Target date for completion: Completed May 1, 2015

Facility response: An assessment was conducted and it was determined that a branch stemming from one of the two surgical booms in OR 7 was unsafe, given its awkward height. This branch was removed on May 1, 2015. The facility will continue to provide staff training on the proper use and potential hazards of this equipment prior to initial use of the equipment and as indicated. A mechanism is in place at the VAMC for employee accident reporting, tracking and reviewing all reported accidents and injuries to identify any improvements.

Appendix C

OIG Contact and Staff Acknowledgments

Contact	For more information about this report, please contact the OIG at (202) 461-4720.
Contributors	Alicia Castillo-Flores, MBA, MPH, Team Leader Sheila Cooley, GNP, MSN George Wesley, MD Thomas Wong, DO Judy Brown, Program Support Assistant

Appendix D

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