IN THE MATTER OF	*	**BEFORE THE**
HOLY CROSS HOSPITAL	*	**MARYLAND HEALTH**
Docket No.: 24-15-CP059	*	**CARE COMMISSION**

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STAFF REPORT AND RECOMMENDATION

CERTIFICATE OF ONGOING PERFORMANCE FOR PRIMARY PERCUTANEOUS CORONARY INTERVENTION SERVICES

May 15, 2025

I. INTRODUCTION

A. Background

Percutaneous coronary intervention (PCI), commonly known as coronary angioplasty, is a non-surgical procedure whereby a catheter is inserted in a blood vessel and guided to the site of the narrowing of a coronary artery to relieve coronary narrowing. Primary (or emergency) PCI programs provide emergency PCI intervention in the event of a heart attack shortly after it begins. Elective (or non-primary) PCI programs provide interventions that revascularize coronary arteries that are substantially blocked but have not yet resulted in an immediate cardiac event.

For many years, only Maryland hospitals with on-site cardiac surgery services could provide PCI. However, in the 1990s, Maryland began allowing some hospitals to perform primary PCI services without cardiac surgery on-site, first as part of research trials evaluating the safety of providing primary PCI at such hospitals and, later, as a regular clinical service, based on the research findings. The Maryland Health Care Commission (MHCC or Commission) issued waivers to hospitals to exempt them from the requirement for co-location of primary PCI services with cardiac surgery. In the following decade, similar research evaluated the safety of providing elective PCI services at hospitals without on-site cardiac surgery.

The nine Maryland hospitals that obtained waivers to provide elective PCI services participated in a multi-site clinical trial, C-PORT E, a study that was approved by the Commission upon the recommendation of its Research Proposal Review Committee. This non-inferiority study provided evidence that elective PCI could be performed safely and effectively at hospitals without on-site cardiac surgery. In 2012, the Maryland legislature passed a law directing the Commission to establish a process and minimum standards for a hospital to obtain and maintain Certificates of Ongoing Performance for the provision of cardiac surgery and PCI. The legislation required the Commission to establish a Clinical Advisory Group (CAG) to advise the agency on regulations to implement the new law.

After extensive discussion with the CAG, comprised of national and regional experts, and considering the CAG's and other stakeholders' recommendations, COMAR 10.24.17, the Cardiac Surgery and PCI Services chapter (Cardiac Services Chapter) of the State Health Plan for Facilities and Services was replaced, effective August 2014. The Cardiac Services Chapter was subsequently revised in November 2015 and again in January 2019.

The Cardiac Services Chapter contains standards for evaluating the performance of established cardiac surgery and PCI services in Maryland and for determining whether a hospital should be granted a Certificate of Ongoing Performance. A Certificate of Ongoing Performance for PCI services authorizes a hospital to continue to provide PCI services, either primary or both primary and elective PCI services, for a period of time that cannot exceed five years, unless an extension is granted by the Executive Director. At the end of the period, the hospital must demonstrate that it continues to meet the requirements in the Cardiac Services Chapter in order for the Commission to renew the hospital's authorization for a Certificate of Ongoing Performance.

In between renewals for a Certificate of Ongoing Performance, if a hospital is not in compliance with certain standards, a focused review must be conducted. Staff have the authority to conduct a focused review based on reported patient safety concerns, aberrations in data identified by Commission staff, or failure to meet quality standards established in State and federal regulations.[1] A hospital that is identified as failing to meet one or more of the requirements for a Certificate of Ongoing Performance must receive a detailed list of deficiencies from Commission staff and submit a plan of correction within 30 days of receipt of the list of deficiencies.[2] If a hospital does not submit a plan of correction that addresses deficiencies cited or does not successfully complete a plan of correction, the hospital shall upon notice of the Executive Director of the Commission, voluntarily relinquish its authority to perform cardiac surgery or emergency or elective PCI services, as applicable.[3]

B. Applicant

Holy Cross Hospital

Holy Cross Hospital (Holy Cross) is a 346-bed acute care general hospital located in Silver Spring, Maryland. The hospital has primary PCI services and does not have elective PCI services or a cardiac surgery program. Holy Cross filed a Certificate of Ongoing Performance application for primary PCI services on September 21, 2019, and was granted its initial Certificate of Ongoing Performance on March 18, 2021, for a period of four years. The Acting Executive Director of MHCC granted an extension in March 2025 for six months because staff needed more time to review the hospital's application. This is Holy Cross' first renewal of its Certificate of Ongoing Performance for primary PCI services.

Health Planning Region

Four health planning regions for adult cardiac services are defined in the Cardiac Services Chapter. The regions are defined by geographic areas. Holy Cross Hospital is located in the Metropolitan Washington health planning region. This region includes Calvert, Charles, Frederick, Montgomery, Prince George's, and St. Mary's counties, and the District of Columbia. Seven Maryland hospitals in this health planning region provide PCI services. Three of these hospitals provide both cardiac surgery and PCI services and four hospitals provide only PCI services.

C. Staff Recommendation

MHCC staff recommends that the Commission approve Holy Cross' application for a Certificate of Ongoing Performance to continue providing primary PCI services. A description of Holy Cross' documentation and MHCC staff's analysis follows.

[1] COMAR 10.24.17.07B(2)(a), .07C(2)(a), and .07D(2)(a).
[2] COMAR 10.24.17.07B(2)(c), .07C(2)(c), and .07D(2)(c).
[3] COMAR 10.24.17.07B(2)(e), .07C(2)(e), and .07D(2)(e).

II. PROCEDURAL HISTORY

Holy Cross applied for renewal of its Certificate of Ongoing Performance for PCI services on September 27, 2024. MHCC staff reviewed the application and requested additional information on February 21, 2025, April 11, 2025, and April 30, 2025. Staff received additional information on March 27, 2025, April 25, 2025, and May 5, 2025.

III. PROJECT CONSISTENCY WITH REVIEW CRITERIA

Data Collection

10.24.17.07D(3) Each PCI program shall participate in uniform data collection and reporting. This requirement is met through participation in the ACC-NCDR registry, with submission of duplicate information to the Maryland Health Care Commission. Each elective PCI program shall also cooperate with the data collection requirements deemed necessary by the Maryland Health Care Commission to assure a complete, accurate, and fair evaluation of Maryland's PCI programs.

Holy Cross stated that neither MHCC staff nor the hospital identified data collection or reporting deficiencies. The hospital submits data quarterly to the American College of Cardiology's National Cardiovascular Data Registry (ACC-NCDR) CathPCI and to MHCC.

Staff Analysis and Conclusion

Holy Cross has complied with the submission of ACC-NCDR CathPCI data to MHCC in accordance with the established schedule. MHCC staff concludes that Holy Cross complies with this standard.

Institutional Resources

10.24.17.07D(4)(a) The hospital shall demonstrate that primary PCI services will be available for all appropriate patients with acute myocardial infarction 24 hours per day, seven days per week.

Holy Cross provided the dates and downtime duration for the cardiac catheterization laboratory (CCL) for the period between July 2019 and September 2024. This information is available in Appendix A.

In addition to downtime related to preventative and corrective maintenance, Holy Cross informed MHCC of an incident in early January 2020 where the on-call interventionalist and other interventionalists with privileges to perform PCI at Holy Cross could not be reached between 2:40 a.m. and 3:10 a.m., resulting in the decision to transfer a patient to a different hospital. Holy Cross identified the on-call physician's cell phone as the source of the issue; it was in silent mode. To avoid a recurrence in the future, the physician agreed to provide a land-line backup number and utilize a Holy Cross system pager instead of relying on his cell phone. It was also agreed that there would be a backup physician assigned for on-call coverage, in the event the primary on-call physician was not available.

Staff Analysis and Conclusion

MHCC staff reviewed the information on CCL downtimes provided in Holy Cross' application and noted that the hospital reported that patient care was not affected by downtime due to maintenance, whether planned or unexpected. Holy Cross has three rooms in its CCL, and at least one room was always available for patient treatment. Staff also reviewed the information provided regarding the incident where a patient was transferred to a different hospital for PCI because no interventionalist could be reached. The hospital reported its plans for corrective action to MHCC staff, less than a week after the incident. Staff also reviewed information on the reasons for delays in achieving a door-to-balloon time of 90 minutes or less for emergency PCI patients. Considering the hospital's prompt response, corrective action, and no additional incidents for over four years, staff recommends the Commission find that Holy Cross complies with this standard.

10.24.17.07D(4)(b) The hospital shall commit to providing primary PCI services as soon as possible and not to exceed 90 minutes from patient arrival at the hospital, excluding transfer cases, for at least 75 percent of appropriate patients. The hospital shall also track the door-to-balloon times for transfer cases and evaluate areas for improvement.

Holy Cross provided a signed statement from its president and Chief Executive Officer (CEO), Andre A. Boyd, Sr., FACHE, dated March 13, 2025, affirming that Holy Cross commits to providing primary PCI services as soon as possible and not to exceed 90 minutes from patient arrival at the hospital for at least 75% of cases. Additionally, Holy Cross provided quarterly information on its door-to-balloon (DTB) times for the period July 2019 through June 2024, as shown in Table 1.

Table 1: Holy Cross' Reported DTB Times for Non-Transfer Primary PCI Cases by Quarter, July 2020 – June 2024

Quarter	Total Primary PCI Volume	Cases with DTB <= 90 minutes	Percent of Cases with DTB <=90 Minutes
CY 2019 Q3	19	15	78.9%
CY 2019 Q4	18	14	77.8%
CY 2020 Q1	20	17	85.0%
CY 2020 Q2	13	6	46.2%
CY 2020 Q3	13	12	92.3%
CY 2020 Q4	15	13	86.7%
CY 2021 Q1	19	13	68.4%
CY 2021 Q2	23	20	87.0%
CY 2021 Q3	9	8	88.9%
CY 2021 Q4	14	11	78.6%
CY 2022 Q1	22	17	77.3%
CY 2022 Q2	10	8	80.0%
CY 2022 Q3	23	12	52.2%
CY 2022 Q4	22	14	63.6%
CY 2023 Q1	19	12	63.2%
CY 2023 Q2	13	8	61.5%
CY 2023 Q3	18	13	72.2%
CY 2023 Q4	13	9	69.2%
CY 2024 Q1	8	6	75.0%
CY 2024 Q2	17	12	70.6%

Source: Holy Cross' Certificate of Ongoing Performance application (2024), page 5.

Holy Cross also stated that between July 1, 2019, and June 30, 2024, the hospital did not receive transfer patients who required primary PCI.

Holy Cross explained the steps that it has taken to improve DTB times and address staff and system errors that contributed to delays in primary PCI cases. The hospital also provided information on aspects of performance that would be expected to contribute to better DTB times, to demonstrate improvement in some aspects of patient care. Delays in door-to-electrocardiograms (EKGs) contributed to longer DTB times in some primary PCI cases. To address this issue, the hospital reported that between CY 2019 and CY 2024, it took several actions. These actions included establishing a dedicated EKG technician in the emergency department (ED), performing EKGs immediately after registration to expedite the process, using auditors to check door-to-EKG times for cases for patients who arrived in the ED with symptoms of chest pain to, and continuing to educate hospital staff on signs and symptoms of ST-elevation myocardial infarction (STEMI), including atypical presentation.

The hospital also identified communication issues as contributing to some primary PCI cases with a DTB time over 90 minutes. The hospital reported taking steps to improve communication with emergency medical service (EMS) colleagues to expedite patient transport to the CCL and using the One Call System in the ED for on-call interventional cardiologists. The hospital also reported that it has taken steps to improve communication between interventional cardiologists and the ED or STAT Team Provider.

Staff Analysis and Conclusion

MHCC staff analyzed the ACC-NCDR CathPCI data for non-transfer primary PCI cases and found that Holy Cross met the DTB standard in eight of the sixteen quarters between January 1, 2020, and December 31, 2023, as shown in Table 2. However, staff also notes that the DTB standard was waived during CY 2020 and most of CY 2021, due to the COVID-19 pandemic[4]. Therefore, the DTB standard does not apply for two of the eight quarters when the hospital did not meet the DTB benchmark, resulting in only six quarters where the hospital did not comply with the DTB standard. MHCC staff analysis may differ from the information provided by the hospital because the ACC-NCDR reports exclude certain cases from this performance metric, such as when there is a non-system reason for delay, and MHCC uses a DTB metric that includes all cases.

MHCC staff also considers a hospital's performance on the DTB standard over longer periods that include multiple quarters. Over rolling eight-quarter periods, Holy Cross complied with this standard, with between 75.6% and 81.6% of PCI cases meeting the DTB time standard in four instances, as shown below in Table 2. In five of the rolling eight-quarter periods, Holy Cross did not meet the DTB standard.

[4] https://mhcc.maryland.gov/mhcc/pages/hcfs/hcfs_cardiaccare/documents/MHCC%20bulletin_20210827.pdf

Table 2: Holy Cross' Non-Transfer Primary PCI Case Volume and Percentage of Cases With DTB Less Than or Equal to 90 Minutes, by Time Period

	Quarter			Rolling 8-Quarters		
Time Period	Total Primary PCI Volume	Cases With DTB<=90 Minutes	Percent of Cases with DTB <=90 Minutes	Total Primary PCI Volume	Cases With DTB<=90 Minutes	Percent of Cases with DTB <=90 Minutes
CY 2020 Q1	20	17	85.0%			
CY 2020 Q2	12	6	50.0%			
CY 2020 Q3	13	12	92.3%			
CY 2020 Q4	14	12	85.7%			
CY 2021 Q1	20	14	70.0%			
CY 2021 Q2	24	21	87.5%			
CY 2021 Q3	9	8	88.9%			
CY 2021 Q4	13	10	76.9%	125	100	80.0%
CY 2022 Q1	22	17	77.3%	127	100	78.7%
CY 2022 Q2	10	8	80.0%	125	102	81.6%
CY 2022 Q3	23	12	52.2%	135	102	75.6%
CY 2022 Q4	23	15	65.2%	144	105	72.9%
CY 2023 Q1	18	12	66.7%	142	103	72.5%
CY 2023 Q2	14	8	57.1%	132	90	68.2%
CY 2023 Q3	17	12	70.6%	140	94	67.1%
CY 2023 Q4	13	9	69.2%	140	93	66.4%

Source: MHCC staff analysis of ACC-NCDR CathPCI data, January 1, 2020 – Dec. 31, 2023.

For each case in those quarters where the DTB standard was not met, MHCC staff asked Holy Cross to explain the reason for the delay and address whether the hospital reviewed the case and identified any opportunities for improvement. Holy Cross explained that in CY 2020, and early CY 2021, many of the cases with DTB delays required following a protocol for COVID-19 precautions, which resulted in non-system delays in DTB times in some cases. Other non-system reasons for delays included difficulty crossing the culprit lesion, the need for cardiopulmonary resuscitation (CPR) or intubation prior to PCI, difficult vascular access, and delays in obtaining patient consent.

In the third and fourth quarters of CY 2022, based on MHCC staff's analysis of the ACC-NCDR CathPCI data and information reported by Holy Cross, there were 11 primary PCI cases with a non-system reason for delay. The reasons included high risk anatomy, difficulty crossing the culprit lesion, difficulty establishing vascular access, cardiac arrest and subsequent need for intubation prior to the PCI procedure, and a delay in obtaining patient consent in one case. In eight cases, the hospital's staff or processes contributed to the DTB time delay. Examples include delays providing EKGs for patients in the ED, delays in getting a patient from the ED to the CCL, and one delay was due to an interventional cardiologist's arrival because the wrong physician was contacted.

In CY 2023, based on MHCC staff's analysis of the ACC-NCDR CathPCI data and information reported by Holy Cross there were 14 cases with a non-system reason for delay in the provision of PCI services. The reasons included patient agitation, high risk anatomy, the need to intubate the patient or otherwise medically stabilize the patient prior to beginning the PCI, difficulty establishing vascular access, delayed patient consent, and difficulty crossing the culprit lesion. There were eight instances where Holy Cross staff or processes contributed to the delays.

These included delays in activating the STEMI status, a delay in interventional cardiologist arrival at the hospital, excess time in preparing the patient for PCI, a delay in providing the EKG in the ED and technical or equipment issues in the CCL.

Holy Cross stated that all cases in which the DTB standard was missed were reviewed at Holy Cross' regularly scheduled monthly Cardiology STEMI Process Meetings. The hospital also provided examples of the corrective actions that it has taken to improve compliance with the DTB time standard, as described previously on page 6 of this report.

Considering Holy Cross reviews all cases to identify opportunities for improvement and demonstrated efforts to reduce DTB times, MHCC staff recommends the Commission find that Holy Cross complies with this standard and include the following condition on the Certificate of Ongoing Performance:

> Holy Cross shall submit an action plan that describes changes that the hospital plans to implement or already has implemented to improve the hospital's compliance with the DTB time standard in COMAR 10.24.17.07D(4)(b) by July 1, 2025. Holy Cross shall also provide an explanation of the reason for delay for each primary PCI case with a DTB time over 90 minutes and any corrective action taken for each quarter of CY 2024 by June 30, 2025; for the first two quarters of CY 2025 by August 31, 2025; and for the second two quarters of CY 2025 by March 2, 2026

10.24.17.07D(4)(c) The hospital shall have adequate physician, nursing, and technical staff to provide cardiac catheterization laboratory and coronary care unit services to patients with acute myocardial infarction 24 hours per day, seven days per week.

Holy Cross provided the number of physicians and full-time-equivalent (FTEs) for nurses and technicians who provide cardiac catheterization services to acute myocardial infarction patients as of September 2024, as shown below in Table 3.

Table 3: Holy Cross' Reported CCL Physician, Nursing, and Technician Staff

Role	Number / FTEs	Cross Training (S/C/M)*
Physician	5	
Nurse and Nurse Supervisor	5 FTEs	C
Technician	6 FTEs 3 PRN	S/C/M

Source: Holy Cross' PCI Certificate of Ongoing Performance application (September 2024), p. 6.

* (S) scrub, (C) circulate, (M) monitor

Staff Analysis and Conclusion

MHCC staff compared the staffing levels described by Holy Cross to information reported by three other existing PCI programs. A comparison of volume and staffing levels for Holy Cross,

Johns Hopkins Bayview Medical Center (Bayview), University of Maryland Capital Regional Medical Center (UM CRMC), and Johns Hopkins Howard County Medical Center (JH HCMC) is shown below in Table 4. While these programs have lower volumes than many other PCI programs in Maryland, all of these programs still have significantly higher volumes than Holy Cross because these programs provide both elective and primary PCI services while Holy Cross performs only primary PCI.

Staff observed that Holy Cross has fewer physicians compared to the other hospitals. Holy Cross uses the same number of nurses as Bayview, five, and 62.5% of the nurses used by UM CRMC, which employs about eight nurses, even though UM CRMC's PCI volume is more than double that of Holy Cross. Holy Cross also utilizes more technicians than other hospitals with a relatively low volume of PCI cases.

Table 4: CCL Staffing for Holy Cross and Other Select PCI Programs

Facility	Total PCI Volume in 2023	Physicians	Nurse FTEs	Technician FTEs
Holy Cross	65	5	5.0	6.0
Bayview	129	9	5.0	6.0
UM CRMC	175	7	7.9	3.6
JH HCMC	177	9	8.6	6.0

Sources: Holy Cross' September 2024 PCI Certificate of Ongoing Performance application and PCI volume from ACC-NCDR CathPCI report for the period ending December 30, 2023; Bayview's 2024 PCI Certificate of Ongoing Performance application and PCI volume from ACC-NCDR CathPCI report for the period ending December 30, 2023; JH HCMC's PCI 2024 Certificate of Ongoing Performance application and PCI volume from ACC-NCDR CathPCI report for the period ending December 30, 2023; and UM CRMC's 2024 PCI Certificate of Ongoing Performance application and PCI volume from ACC-NCDR CathPCI report for the period ending December 30, 2023.

Note: Holy Cross performs only primary PCI and the other facilities perform both primary and elective PCI.

Based on MHCC staff's analysis of the number of staff at Holy Cross compared to other hospitals with relatively low PCI volumes, MHCC staff concludes that there are adequate nursing and technical staff to provide services 24 hours per day, seven days per week. MHCC staff concludes that Holy Cross complies with this standard.

10.24.17.07D(4)(d) The hospital president or Chief Executive Officer, as applicable, shall provide a written commitment stating the hospital administration will support the program.

Holy Cross provided a signed letter of commitment from its president and CEO, Andre A. Boyd, Sr., FACHE, dated March 13, 2025, stating that Holy Cross will continue to provide PCI services in accordance with the requirements established by the Commission.

Staff Analysis and Conclusion

MHCC staff concludes that Holy Cross meets this standard based on the letter of commitment provided.

10.24.17.07D(4)(e) The hospital shall maintain the dedicated staff necessary for data management, reporting, and coordination with institutional quality improvement efforts.

Holy Cross stated that five different staff, totaling 1.5 FTE positions, are responsible for the necessary data management, reporting, and coordination. These staff include 0.5 FTE of Holy Cross' Senior Coordinator for Performance Improvement, 0.25 FTE of each of two data abstractors, 0.15 FTE of Holy Cross' NCDR CathPCI Registry Abstractor, and 0.1 FTE of Holy Cross' NCDR ICD Registry Abstractor.

Staff Analysis and Conclusion

MHCC staff reviewed the information provided and notes that the hospital appears to have been submitting complete and timely information to the ACC-NCDR CathPCI and engaging in quality insurance activities to address DTB times for PCI patients, as described on page 6 of this report. MHCC staff concludes that Holy Cross complies with this standard.

10.24.17.07D(4)(f) The hospital shall identify a physician director of interventional cardiology services responsible for defining and implementing credentialing criteria for the catheterization laboratory and for overall primary PCI program management, including responsibility for equipment, personnel, physician call schedules, quality and error management, review conferences, and termination of primary PCI privileges.

Holy Cross stated that Rajeev Patel, M.D., was appointed as the Director of Holy Cross' CCL and Interventional Cardiology Services on July 27, 2016. The application listed the responsibilities of the Director of the CCL and Interventional Cardiology including ensuring efficient use of CCL equipment, developing the on-call schedule, quality improvement and assurance activities, leading STEMI process improvement meetings, and the credentialing and termination of PCI privileges.

Staff Analysis and Conclusion

MHCC staff reviewed the information provided in the application and concludes that Holy Cross complies with this standard.

10.24.17.07D(4)(g) The hospital shall design and implement a formal continuing medical education program for staff, particularly the cardiac catheterization laboratory and coronary care unit.

Holy Cross explained that its staff within the CCL, coronary care unit and ED are required to complete continuing education programs and activities related to cardiac care and primary PCI. The education requirements vary by role and department. Holy Cross' nursing directors and clinical educators track the education and training requirements for staff. Annual competencies, code simulation sheets, and Resuscitation Quality Improvement certifications are documented in staff files. For other educational offerings, there are sign-in sheets used to track participation. The completion of online modules in HealthStream is tracked by the software's learning management system. In addition to describing its ongoing medical educational program, Holy Cross also provided a list of education activities completed by cardiac staff between April 2022 and August 2024.

Staff Analysis and Conclusion

MHCC staff notes that the continuing medical education programming for staff includes appropriate topics. For example, the list of education activities provided by Holy Cross for the period from April 2022 to August 2024 included (without limitation) cardiac anatomy and physiology, mock STEMI drills, intra-aortic balloon pump (IABP) education, EKG competency, CCL protocol, and cardiac rhythm interpretation. The list of continuing medical education programming provided by Holy Cross also included dates, attendees, program type (internal or external), and whether the education activity was approved for CEUs (continuing education units). MHCC staff concludes that Holy Cross complies with this standard.

10.24.17.07D(4)(h) The hospital shall have a formal, written agreement with a tertiary care center that provides for the unconditional transfer of patients for any required additional care, including emergent or elective cardiac surgery or PCI, for hospitals performing primary PCI without on-site cardiac surgery.

Holy Cross submitted signed transfer agreements with Adventist HealthCare White Oak Medical Center and MedStar Washington Hospital Center. The agreement between Holy Cross and White Oak Medical Center was originally effective on February 1, 2008, and was subsequently amended and extended in August 2010, February 2012, November 2013, and April 2018; this agreement remains in effect. Holy Cross' agreement with MedStar Washington Hospital Center was initially executed on April 17, 2008, and was amended and extended in April 2010, February 2012, September 2015, and April 2018. This agreement also remains in effect.

Staff Analysis and Conclusion

MHCC staff reviewed the transfer agreements and amendments provided by Holy Cross and noted that both agreements provide for the unconditional transfer of patients, as required. MHCC staff concludes that the hospital complies with this standard.

10.24.17.07D(4)(i) A hospital shall maintain its agreement with a licensed specialty care ambulance service that, when clinically necessary, guarantees arrival of the air or ground ambulance within 30 minutes of a request for patient transport by hospitals performing primary PCI without on-site cardiac surgery.

Holy Cross provided an agreement between the hospital and Butler Medical Transport, LLC, executed in November 2019 by former Holy Cross CEO, Norvell Coots, M.D. and Butler Medical Transport's Chief Operating Officer.

Staff Analysis and Conclusion

MHCC staff reviewed the transfer agreement provided by Holy Cross, noting that for time-critical transports, Butler will arrive within thirty (30) minutes of receiving the request for patient transport. MHCC staff concludes that the hospital complies with this standard.

Quality

10.24.17.07D(5)(a) The hospital shall develop a formal, regularly scheduled (meetings at least every other month) interventional case review that requires attendance by interventionalists and other physicians, nurses, and technicians who care for primary PCI patients.

Holy Cross reported that its Cardiac Services Committee performs interventional case reviews that include evaluation of angiographic images, test results, and other aspects of patients' medical records. These case reviews are scheduled monthly. The Cardiac Services Committee includes interventionalists and other physicians, nurses, and technicians who care for primary PCI patients along with members of the performance improvement and quality management department. Holy Cross also provided a list of meeting dates and attendees for the period from July 1, 2019 through September 3, 2024, and minutes from the meetings of the Cardiac Services Committee between July 1, 2019 and December 31, 2024.

Staff Analysis and Conclusion

MHCC staff reviewed the lists of meeting dates, attendees, and copies of the meeting minutes. These records indicate that appropriate staff were regularly in attendance, including interventional cardiologists, nurses, and technicians. The meetings were usually held monthly between January 2020 and December 2024. In 2020, the hospital cancelled some meetings due to scheduling conflicts and information technology issues, but it still held nine Cardiac Services Committee meetings that year. The hospital held 10 meetings in 2021, 11 meetings in 2022, eleven meetings in 2023, and 11 meetings in 2024. MHCC staff concludes that Holy Cross complies with this standard.

10.24.17.07D(5)(b) A hospital shall create a multiple care area group (emergency department, coronary care unit, and cardiac catheterization laboratory) that includes, at a minimum, the physician and nursing leadership of each care area and meets monthly to review any and all issues related to the primary PCI system, identify problem areas, and develop solutions.

The hospital reported that its monthly Cardiac Services Committee meeting serves as the multiple care area group meeting. The hospital provided lists of meeting dates and attendees. Participants include staff in the ED, coronary care unit, and CCL including the physician and nursing leadership from each care area. Representatives from the hospital's performance improvement and quality management department also participate in this meeting. The purpose of these meetings is to review all issues related to the primary PCI system, identify problem areas, and develop solutions.

Staff Analysis and Conclusion

MHCC staff reviewed the dates and attendees of the monthly Cardiac Services Committee meetings and observed that physician and nurse leadership for the ED, CCL, and coronary care units regularly attended these meetings. MHCC staff concludes that Holy Cross complies with this standard.

10.24.17.07D(5)(c) The hospital shall evaluate the performance of each interventionalist

through an internal or external review, as follows:

(i) An annual review of at least 10 cases or 10 percent of randomly selected primary PCI cases, whichever is greater, performed by the interventionalist at the hospital, or all cases if the interventionalist performed fewer than 10 cases at the hospital, as provided for in Regulations .08 and .09; or

(ii) For a hospital with both primary and elective PCI programs, a semi-annual review of each interventionalist conducted as part of the required semi-annual external review of the hospital's randomly selected PCI cases, as provided in Paragraph .07C(4)(c), through random selection of five cases or 10 percent of PCI cases, whichever is greater, performed by the interventionalist at the hospital during the six-month period, or all cases if the interventionalist has performed fewer than five cases during the relevant period at the hospital, as provided for in Regulation .08*; *or

(iii) For a hospital with both primary and elective PCI programs, a quarterly or other review period conducted in a manner approved by Commission's Executive Director that assures that the external review of the cases performed by the interventionalist at the hospital will satisfy the annual requirement in Paragraphs .07C(4)(c) and .07D(5)(c).

10.24.17.07D(5)(d) The performance review of an interventionalist referenced in Paragraph .07D(5)(c) shall:

(i) Include a review of angiographic images, medical test results, and patients' medical records; and

(ii) Be conducted by a reviewer who meets all standards established by the Commission to ensure consistent rigor among reviewers.

Holy Cross explained that the hospital evaluates the performance of each interventionalist through an internal review process consistent with COMAR 10.24.17. Holy Cross Hospital's Cardiac Services Committee reviews all STEMI cases internally at scheduled monthly meetings. The hospital's application included a list indicating the number of cases reviewed each year, per interventionalist, to meet the requirements in COMAR 10.24.17.07D(5)(c) and (d).

Staff Analysis and Conclusion

MHCC staff reviewed the documentation provided by Holy Cross for the number of internal case reviews per physician per year and the minutes from the Cardiac Services Committee meetings. Staff analyzed the ACC-NCDR CathPCI data and verified that for the period from CY 2020 through CY 2023, at least ten cases, or ten percent of cases, whichever was greater, or all cases were reviewed, if the interventionalist performed fewer than ten cases. MHCC staff concludes that Holy Cross complies with this standard.

10.24.17.07D(5)(e) The chief executive officer of the hospital shall certify upon request by Commission staff that the hospital fully complies with each requirement for conducting and completing quality assurance activities specified in this chapter, including those regarding internal peer review of cases and external review of cases.

Holy Cross provided a signed statement from its president and CEO, Andre A. Boyd, Sr., FACHE, dated March 13, 2025, stating that Holy Cross complies with the case review requirement by evaluating the performance of individual interventionalists during scheduled monthly case reviews and that all primary PCI cases are reviewed.

Staff Analysis and Conclusion

MHCC staff reviewed the statement provided and concludes that Holy Cross complies with the standard.

10.24.17.07D(5)(f) The hospital's application for a Certificate of Ongoing Performance shall demonstrate that it has taken appropriate action in response to each concern identified through its quality assurance processes.

(i) All individually identifiable patient information submitted to the Commission for the purpose described in this subsection shall remain confidential.

(ii) Physician information collected through the peer review process that is submitted to the Commission for the purpose described in this subsection shall remain confidential.

Holy Cross stated that the hospital utilizes a multi-tiered process for quality improvement. All PCI cases performed at the hospital are initially reviewed within Holy Cross' monthly Cardiac Services Committee. If the Cardiac Services Committee identifies concerns about the care provided to a PCI patient, the case can be referred to the hospital-wide Peer Review Committee or Performance Improvement staff who can then prescribe a corrective action plan for a physician, or care team, if warranted. During the review period, no PCI cases were referred by the Cardiac Services Committee for further review and analysis.

Within its monthly Cardiac Services Committee, participants identified several opportunities for improvement. During the review period, the hospital took action to improve the following aspects of its PCI services: STEMI activation education, post-PCI care of patients, door-to-EKG times, DTB times, monitoring of patients during administration of procedural sedation, and communication between ED staff and PCI interventionalists.

Holy Cross provided data in a presentation that was prepared for a site visit, in June 2024, by the Maryland Institute for Emergency Medical Services Systems (MIEMSS) as documentation of the effectiveness of its quality improvement initiatives. The data indicated that Holy Cross was able to slightly reduce the average amount of time it took for an interventional cardiologist to arrive at the hospital for CY 2023 as compared to the first four months of CY 2024. In addition, the percentage of PCI patients that remain in Holy Cross' ED for less than 30 minutes also increased, from 77% to 80% from CY 2022 to CY 2023. Finally, in 2022, 68% of PCI patients at Holy Cross

received an EKG within ten minutes of arriving at the hospital, while in 2023 73% of PCI patients received an EKG within ten minutes of arriving at the hospital.

Staff Analysis and Conclusion

MHCC staff reviewed the information provided on Holy Cross' efforts to improve its PCI program that stemmed from its monthly Cardiac Services Committee meetings. Holy Cross is meeting monthly to review cases and identify opportunities for improvement and it has a multi-tiered process for quality improvement. The hospital has identified factors contributing to DTB delays, such as long door-to-EKG times, and it has taken steps to address those factors. These steps include establishing a dedicated EKG technician in the ED, performing EKGs immediately prior to registration upon at the hospital to expedite the process, using auditors to identify patients who arrived in the ED with symptoms of chest pain and check door-to-EKG times for them, and continuing to educate to staff on signs and symptoms of STEMI, including atypical presentation. Considering Holy Cross' description and documentation of its quality assurance processes and examples of actions the hospital has taken to address quality concerns, MHCC staff concludes that Holy Cross complies with the standard.

Patient Outcome Measures

10.24.17.07D(5)(a). A primary PCI program shall meet all performance standards established in statute or in State regulations.

(b) A hospital shall maintain a risk-adjusted mortality rate that is consistent with high quality patient care.

(c) A hospital with a risk-adjusted mortality rate for primary PCI cases that exceeds the statewide average beyond the acceptable margin of error calculated for the hospital by the Commission is subject to a focused review. The acceptable margin of error is the 95 percent confidence interval calculated for a hospital's all-cause 30-day risk-adjusted mortality rate for primary PCI cases.

Holy Cross' adjusted mortality rates, by rolling 12-month periods, for reporting periods ending between 2020 Q4 and 2024 Q3, are shown in Table 5.

Table 5: Holy Cross' Adjusted Mortality Rates (AMR) by Rolling 12-Month Reporting Period and Performance on MHCC Standards for PCI Programs

	STEMI			
Reporting Period	Hospital AMR	95% Confidence Interval	National Benchmark	Meets MHCC Standard
2023q4-2024q3	2.53	[0.06, 13.22]	0.75	Yes
2023q3-2024q2	2.43	[0.06, 12.79]	0.78	Yes
2023q2-2024q1	3.81	[0.00, 19.95]	0.79	Yes
2023q1-2023q4	2.68	[0.07, 14.23]	1.88	Yes
2022q4-2023q3	1.82	[0.05, 9.75]	1.91	Yes
2022q3-2023q2	1.46	[0.04, 7.85]	1.89	Yes
2022q2-2023q1	1.51	[0.04, 8.11]	1.89	Yes
2022q1-2022q4	1.26	[0.03, 6.76]	2.00	Yes
2021q4-2022q3	0.00	[0.00, 7.53]	2.11	Yes
2021q3-2022q2	2.45	[0.06,12.97]	2.18	Yes
2021q2-2022q1	1.93	[0.05,10.29]	2.19	Yes
2021q1-2021q4	1.76	[0.04, 9.37]	2.17	Yes
2020q4-2021q3	1.72	[0.04, 9.18]	2.18	Yes
2020q3-2021q2	6.46	[2.14, 14.26]	7.51	Yes
2020q2-2021q1	6.66	[2.21, 14.60]	7.55	Yes
2020q1-2020q4	7.61	[1.59, 21.11]	6.89	Yes

Source: MHCC Staff compilation of results from the hospital's quarterly reports from the ACC-NCDR CathPCI for PCI cases performed between January 2020 and June 2024.

Notes: A hospital's AMR meets the MHCC standard if the hospital's 95% confidence interval (CI) includes the national benchmark or indicates statistically significantly better performance than the national benchmark for STEMI cases. A hospital does not meet MHCC's standard when it performs statistically significantly worse than the national benchmark for STEMI cases. The national benchmark is the national median risk-adjusted in-hospital mortality rate for STEMI cases for each reporting period. Reporting on STEMI cases in the ACC-NCDR CathPCI reports changed beginning in the period ending 2021q3; for this period and later, the performance metric excludes cases with cardiogenic shock.

Staff Analysis and Conclusion

MHCC staff reviewed the adjusted mortality rate data by rolling 12-month periods and determined that the hospital's risk-adjusted mortality rate was not statistically significantly different than the national benchmark in any reporting period. The national benchmark fell within the 95 percent confidence interval for Holy Cross for all 12-month reporting periods between January 2020 and September 2024.

Based on the hospital's acceptable performance on the mortality metric for STEMI and non-STEMI cases during the review period, MHCC staff concludes that Holy Cross complies with this standard.

Physician Resources

10.24.17.07D(7)(a) Physicians who perform primary PCI at a hospital without on-site cardiac surgery shall perform a minimum of 50 PCI procedures annually averaged over a 24-month period. A hospital without on-site cardiac surgery shall track physicians' volume on a rolling

eight quarter basis and report the results to the Commission on a quarterly basis.

Holy Cross submitted information on the volume of primary PCI cases at Holy Cross and other hospitals, by physician and quarter, for the period from July 2022 through June 2024 for Drs. Patel, Chen, Finn, Ghosh, Reddy, Flyer, Marshall, and Trujillo. Each interventionalist signed and dated an affidavit affirming under penalty of perjury that the information provided is true and correct to the best of their knowledge. The signed affidavits indicate that each physician performed at least 50 PCI procedures over the 24-month period ending June 30, 2024.

Staff Analysis and Conclusion

MHCC staff reviewed the physician volumes reported by Holy Cross and analyzed data from the ACC-NCDR CathPCI. Staff confirmed that each interventionalist who performed primary PCI services at Holy Cross from 2020 through 2023 performed a minimum of 50 procedures annually, averaged over a 24-month period, except for one physician in 2020. However, staff notes that the requirement to perform at least 50 PCI procedures annually on average over a 24-month period was waived for 2020 and 2021, due to the COVID-19 pandemic.[5] All physicians met the standard during the time period when it applied. MHCC staff concludes that Holy Cross complies with this standard.

10.24.17. 07D(7)(b) Each physician who performs primary PCI at a hospital that provides primary PCI without on-site cardiac surgery who does not perform 50 PCI procedures annually averaged over a 24-month period, for reasons other than a leave of absence, will be subject to an external review of all cases in that 24-month period to evaluate the quality of care provided. The results of this evaluation shall be reported to the Commission. A hospital may be required to develop a plan of correction based on the results of the physician's evaluation.

Staff Analysis and Conclusion

MHCC staff's analysis showed that each interventionalist at Holy Cross performed greater than 50 PCI procedures annually, averaged over a 24-month period, when that requirement applied. This standard is not applicable to the hospital.

10.24.17.07D(7)(e) Each physician shall be board certified in interventional cardiology with an exception for those who performed interventional procedures before 1998 or completed their training before 1998 and did not seek board certification before 2003 [or physicians who completed a fellowship in interventional cardiology less than three years ago].

(f)Each physician shall obtain board certification within three years of completion of a fellowship in interventional cardiology.

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5 https://mhcc.maryland.gov/mhcc/pages/hcfs/hcfs_cardiaccare/documents/MHCC%20bulletin_cardiac_covid19_20200331.pdf

Holy Cross submitted a signed and dated statement from Dr. Rajeev Patel, M.D., Medical Director of the CCL, confirming that each physician performing PCI at the hospital is board-certified in interventional cardiology.

Staff Analysis and Conclusion

MHCC staff reviewed the information provided and concludes that Holy Cross meets this standard.

10.24.17.07D(7)(g) An interventionalist shall complete a minimum of 30 hours of continuing medical education credits in the area of interventional cardiology during every two years of practice.

Holy Cross submitted signed and dated attestations from Drs. Patel, Chen, Finn, Ghosh, Reddy, Flyer, and Marshall stating that each physician completed a minimum of 30 hours of continuing medical education credits in the area of interventional cardiology in the last two years.

Staff Analysis and Conclusion

Based on the signed attestations provided, MHCC staff concludes that Holy Cross complies with the standard.

10.24.17.07D (7)(h) Each physician who performs primary PCI agrees to participate in an on-call schedule.

Holy Cross submitted a signed statement from Dr. Rajeev Patel, M.D., Medical Director of the CCL, attesting that each physician who has performed primary PCI within the review period has participated in the on-call schedule. The on-call schedule for September 2024 was also provided by the hospital.

Staff Analysis and Conclusion

Based on the signed and dated statement from Holy Cross and MHCC staff's review of the on-call schedule, each physician who performs primary PCI at Holy Cross is participating in on-call coverage. MHCC staff concludes that Holy Cross is compliant with the standard.

Volume

10.24.17.07D(8)(a) For primary PCI cases, if a program falls below 36 cases for rural PCI providers and 49 cases for non-rural providers, a focused review will be triggered.

Staff Analysis and Conclusion

MHCC staff analyzed the ACC-NCDR CathPCI data to calculate the volume of primary PCI cases performed at Holy Cross from CY 2020 through CY 2023. As shown in Table 6, the primary PCI volume ranged from 61 to 78 cases each year.

Table 6: Holy Cross' Primary PCI Volume

Calendar Year	Primary PCI Volume
2020	61
2021	62
2022	78
2023	64

Source: MHCC staff analysis of ACC-NCDR CathPCI data, CY 2020 – CY 2023.

10.24.17.07D(8)(b) The target volume for each physician who performs primary PCI is 11 or more primary cases annually.

Holy Cross reported that all of the interventionalists at Holy Cross performed at least 11 primary PCI cases annually in Maryland hospitals, and therefore, it did not need to report signed statements attesting to the volume of primary PCI cases performed by location. However, the hospital provided the number of primary and elective PCI cases, by location and interventionalist, for each quarter from July 2022 through June 2024.

Staff Analysis and Conclusion

MHCC staff reviewed the primary PCI case volume submitted by Holy Cross and analyzed the ACC-NCDR CathPCI data to verify the number of primary PCI cases performed by each physician between CY 2020 and CY 2023. MHCC staff determined that each interventionalist performed at least 11 primary PCI cases annually during the review period, except for two interventionalists. MHCC staff's analysis of CY 2020 data shows that one physician only performed nine primary PCI cases that year, but the same physician did perform at least 11 primary PCI cases in the following years. In addition, MHCC staff notes that volume standards were waived in CY 2020, due to the COVID-19 pandemic. Another physician only performed nine primary PCI cases, based on MHCC staff's analysis of the ACC-NCDR CathPCI data for CY 2023. However, the hospital reported that the physician did perform over 11 primary PCI cases during that period, and the physician is meeting the standard for total PCI volume performed on average over 24-month periods. When a physician is performing an average of 50 PCI cases annually over 24-month periods, there should not be concern about the skill of an interventionalist who performs less than 11 primary PCI cases annually. Staff also notes that performing 11 primary PCI cases is a target, not an absolute requirement. MHCC staff recommends the Commission find that the hospital complies with this standard.

<u>Patient Selection</u>

10.24.17.07D(9) A hospital shall commit to providing primary PCI services only for suitable patients. Suitable patients are:

(a) Patients described as appropriate for primary PCI in the Guidelines of the American College of Cardiology Foundation/American Heart Association (ACCF / AHS) for Management of Patients with Acute Myocardial Infarction or the Guidelines of the American College of Cardiology Foundation/American Heart Association / Society for Cardiovascular Angiography and Interventions (ACCF / AHA / SCAI) for Percutaneous Coronary Intervention.

(b) Patients with acute myocardial infarction in cardiogenic shock that the treating physician (s) believes may be harmed if transferred to a tertiary institution, either because the patient is too unstable or because the temporal delay will result in worse outcomes.

(c) Patients for whom the primary PCI system was not initially available who received thrombolytic therapy that subsequently failed. These cases should constitute no more than 10 percent of cases.

(d) Patients who experienced a return of spontaneous circulation following cardiac arrest and present at a hospital without on-site cardiac surgery for treatment, when the treating physician(s) believes that transfer to a tertiary institution may be harmful to the patient.

Holy Cross reported that no patients received thrombolytic therapy between July 1, 2019, and June 30, 2024. Additionally, Holy Cross reported that based on internal review of primary PCI cases during the review period, none of the primary PCI patients at Holy Cross received primary PCI inappropriately.

Staff Analysis and Conclusion

MHCC staff analyzed the ACC-NCDR CathPCI data for the period from CY 2020 through CY 2023 and observed that zero patients received thrombolytic therapy at Holy Cross. Staff also notes that these ACC-NCDR CathPCI reports indicate that no PCI patients with acute coronary syndrome received PCI that was considered rarely appropriate. Based on MHCC's analysis of the ACC-NCDR CathPCI reports, MHCC staff concludes that Holy Cross complies with the standard.

RECOMMENDATION

Based on the hospital's compliance with the standards for institutional resources, quality, patient outcomes, physician resources, volume and patient selection, as described in the above analysis and the record in this review, MHCC staff recommends that the Commission find that Holy Cross meets the requirements for a Certificate of Ongoing Performance. Staff recommends that the Commission issue a Certificate of Ongoing Performance that permits Holy Cross to continue providing primary percutaneous coronary intervention services for three years subject to the following condition:

> Holy Cross shall submit an action plan that describes changes that the hospital plans to implement or already has implemented to improve the hospital's compliance with the DTB time standard in COMAR 10.24.17.07D(4)(b) by July 1, 2025. Holy Cross shall also provide an explanation of the reason for delay for each primary PCI case with a DTB time over 90 minutes and any corrective action taken for each quarter of CY 2024 by June 30, 2025; for the first two quarters of CY 2025 by August 31, 2025; and for the second two quarters of CY 2025 by March 2, 2026.

APPENDIX A

Room	Begin Date	End Date	Duration	Reason Unavailable
2	8/9/2019 8:00	8/9/2019 16:00	0:08:00	Preventive Maintenance Per Manufacturer
11	8/9/2019 8:00	8/9/2019 16:00	0:08:00	Preventive Maintenance Per Manufacturer
11	9/13/2019 11:33	9/13/2019 14:35	0:03:02	Corrective Maintenance - longitudinal potmeter
1	9/18/2019 8:00	9/18/2019 16:00	08:00.0	Preventive Maintenance Per Manufacturer
2	11/6/2019 16:07	11/7/2019 16:33	1:00:26	Corrective Maintenance - Replace Fire X board
11	1/8/2020 13:20	1/8/2020 15:20	0:02:00	Corrective Maintenance - Replace foot switch cable
2	2/6/2020 8:00	2/10/2020 7:48	3:23:48	Corrective Maintenance - Xray tube
2	2/28/2020 8:00	2/28/2020 16:00	0:08:00	Preventive Maintenance Per Manufacturer
11	2/28/2020 8:00	2/28/2020 16:00	0:08:00	Preventive Maintenance Per Manufacturer
1	3/10/2020 8:00	3/10/2020 16:00	0:08:00	Preventive Maintenance Per Manufacturer
2	3/11/2020 13:00	3/11/2020 16:33	0:03:33	Corrective Maintenance - Sticking panning mushroom pad
11	3/18/2020 10:54	3/18/2020 13:01	0:02:07	Corrective Maintenance - Geo module
2	3/18/2020 15:00	3/18/2020 15:40	0:00:40	Corrective Maintenance - C-arm
2	5/22/2020 1:38	5/22/2020 16:09	0:14:31	Corrective Maintenance - Video cable to slave monitor
11	7/15/2020 12:08	7/16/2020 13:45	1:01:37	Corrective Maintenance - Table motor
2	9/10/2020 9:12	9/10/2020 13:16	0:04:04	Corrective Maintenance - Troubleshoot table side module
1	9/14/2020 7:01	9/14/2020 13:39	0:06:38	Corrective Maintenance - Troubleshoot video matrix display
2	10/13/2020 8:00	10/13/2020 16:00	0:08:00	Preventive Maintenance Per Manufacturer
11	10/27/2020 8:00	10/27/2020 16:00	0:08:00	Preventive Maintenance Per Manufacturer
1	10/30/2020 8:00	10/30/2020 16:00	0:08:00	Preventive Maintenance Per Manufacturer
11	12/22/2020 14:50	12/22/2020 16:00	0:01:10	Corrective Maintenance - C-arm
2	2/16/2021 8:00	2/16/2021 16:00	0:08:00	Preventive Maintenance Per Manufacturer
2	2/26/2021 8:00	2/26/2021 16:00	0:08:00	Preventive Maintenance Per Manufacturer
1	3/2/2021 8:00	3/2/2021 16:00	0:08:00	Preventive Maintenance Per Manufacturer
11	3/11/2021 11:00	3/11/2021 12:47	0:01:47	Corrective Maintenance - Calibrated sensor
11	3/22/2021 8:00	3/22/2021 16:00	0:08:00	Preventive Maintenance Per Manufacturer
1	3/24/2021 13:37	3/24/2021 16:50	0:03:13	Corrective Maintenance - Keyboard and mouse
2	5/14/2021 8:15	5/14/2021 12:30	0:04:15	Corrective Maintenance - Troubleshoot fluro
1	6/24/2021 14:05	6/24/2021 15:35	0:01:30	Corrective Maintenance - Vitals screen
2	7/28/2021 8:00	7/28/2021 16:00	0:08:00	Preventive Maintenance Per Manufacturer
11	8/2/2021 8:00	8/2/2021 16:00	0:08:00	Preventive Maintenance Per Manufacturer
1	8/16/2021 8:00	8/16/2021 16:00	0:08:00	Preventive Maintenance Per Manufacturer
2	9/11/2021 8:00	9/11/2021 16:00	0:08:00	Preventive Maintenance Per Manufacturer
1	10/26/2021 9:15	10/26/2021 13:45	0:04:30	Corrective Maintenance - Geo module
2	11/8/2021 14:30	11/9/2021 15:59	1:01:29	Corrective Maintenance - Replace Geo computer
11	12/1/2021 13:10	12/1/2021 15:10	0:02:00	Corrective Maintenance - Emergency stop button
1	1/26/2022 8:00	1/26/2022 16:00	0:08:00	Preventive Maintenance Per Manufacturer
2	2/1/2022 8:00	2/1/2022 16:00	0:08:00	Preventive Maintenance Per Manufacturer

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Room	Begin Date	End Date	Duration	Reason Unavailable
11	2/1/2022 8:00	2/1/2022 16:00	0:08:00	Preventive Maintenance Per Manufacturer
1	2/17/2022 8:00	2/17/2022 16:00	0:08:00	Preventive Maintenance Per Manufacturer
1	2/23/2022 15:45	2/23/2022 20:18	0:04:33	Corrective Maintenance - Geo module
1	6/1/2022 10:29	6/1/2022 11:00	0:00:31	Corrective Maintenance - Power issue
1	7/12/2022 9:28	7/12/2022 10:58	0:01:30	Corrective Maintenance - Replace Power Supply
2	7/27/2022 8:00	7/27/2022 16:00	0:08:00	Preventive Maintenance Per Manufacturer
1	8/22/2022 8:00	8/22/2022 16:00	0:08:00	Preventive Maintenance Per Manufacturer
1	11/30/2022 7:48	11/30/2022 15:39	0:07:51	Corrective Maintenance - Troubleshoot defective cable
2	12/7/2022 11:38	12/7/2022 12:08	0:00:30	Corrective Maintenance - Dose not being recorded
1	12/26/2022 16:00	12/28/2022 16:17	2:00:17	Corrective Maintenance - Replace flashlight kit
1	1/10/2023 10:15	1/10/2023 11:48	0:01:33	Corrective Maintenance - Replace tube cover and sensor
1	2/16/2023 8:00	2/16/2023 16:00	0:08:00	Preventive Maintenance Per Manufacturer
2	2/16/2023 8:00	2/16/2023 16:00	0:08:00	Preventive Maintenance Per Manufacturer
2	2/20/2023 8:00	2/20/2023 16:00	0:08:00	Preventive Maintenance Per Manufacturer
11	2/23/2023 8:00	2/23/2023 16:00	0:08:00	Preventive Maintenance Per Manufacturer
11	3/1/2023 8:00	3/1/2023 16:00	0:08:00	Preventive Maintenance Per Manufacturer
11	5/9/2023 14:00	5/9/2023 15:50	0:01:50	Corrective Maintenance - Mushroom cap and PACS
1	6/6/2023 8:00	6/6/2023 16:00	0:08:00	Preventive Maintenance Per Manufacturer
2	6/8/2023 8:00	6/8/2023 16:00	0:08:00	Preventive Maintenance Per Manufacturer
11	7/7/2023 8:00	7/7/2023 16:00	0:08:00	Preventive Maintenance Per Manufacturer
1	7/25/2023 8:00	7/25/2023 16:00	0:08:00	Preventive Maintenance Per Manufacturer
1	8/21/2023 9:34	8/24/2023 15:41	3:06:07	Corrective Maintenance - Replace FlexVision PC and hard disk
2	9/28/2023 14:51	9/28/2023 16:51	0:02:00	Corrective Maintenance - Troubleshoot display
11	10/3/2023 8:11	10/3/2023 8:31	0:00:20	Corrective Maintenance - Foot Switch Pedal
1	10/4/2023 13:12	10/4/2023 13:42	0:00:30	Corrective Maintenance - Foot Switch Pedal
2	10/9/2023 12:42	10/9/2023 20:38	0:07:56	Corrective Maintenance - Troubleshoot software
11	10/13/2023 8:00	10/13/2023 16:00	0:08:00	Preventive Maintenance Per Manufacturer
11	10/14/2023 8:30	10/14/2023 12:54	0:04:24	Corrective Maintenance - Switch cable
2	10/30/2023 6:30	10/30/2023 10:32	0:04:02	Corrective Maintenance - Injector not coupling
2	11/5/2023 9:30	11/6/2023 7:36	0:22:06	Corrective Maintenance - Longitudinal motor
11	12/26/2023 7:19	12/26/2023 9:19	0:02:00	Corrective Maintenance - Software
1	1/25/2024 8:00	1/25/2024 16:00	0:08:00	Preventive Maintenance Per Manufacturer
11	2/9/2024 8:45	2/9/2024 10:16	0:01:31	Corrective Maintenance - Cooler fan
2	3/25/2024 8:00	3/25/2024 16:00	0:08:00	Preventive Maintenance Per Manufacturer
11	3/29/2024 7:13	3/29/2024 7:43	0:00:30	Corrective Maintenance - Mushroom cap
11	4/2/2024 10:18	4/2/2024 12:22	0:02:04	Corrective Maintenance - Tilt Module
11	4/22/2024 8:00	4/22/2024 16:00	0:08:00	Preventive Maintenance Per Manufacturer
1	5/1/2024 14:06	5/2/2024 16:00	1:01:54	Corrective Maintenance - Replace KVM Switch

APPENDIX A

Room	Begin Date	End Date	Duration	Reason Unavailable
11	5/21/2024 1:00	5/21/2024 16:00	0:15:00	Corrective Maintenance - Coronary tools
2	5/30/2024 6:33	5/30/2024 6:54	0:00:21	Corrective Maintenance - Moisture barrier
2	7/1/2024 1:29	7/2/2024 10:53	1:09:24	Corrective Maintenance - C-arm
1	8/5/2024 8:00	8/5/2024 16:00	0:08:00	Preventive Maintenance Per Manufacturer
11	9/12/2024 8:00	9/12/2024 16:00	0:08:00	Preventive Maintenance Per Manufacturer