

Research Article

Volume 15 Issue 2 - January 2026
DOI: 10.19080/JAICM.2026.15.555907

J Anest & Inten Care Med

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A Surgical Collaboration Between an Academic Medical Center and a Local, Private, Community-Based Hospital



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Submission: January 13, 2026; **Published:** January 30, 2026

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Abstract

Background: The complexity and increasing cost of health care creates challenges for hospitals to provide access to care [1-3]. Providing Mississippi with access to surgical care at the University of Mississippi Medical Center (UMMC) is vital. Due to the limited number of operating rooms (ORs), UMMC surgeons were unable to provide adequate access to surgical services for their patients. Due to the cost and time to build new ORs at UMMC, a surgical collaboration with a local, private community-based hospital, Merit Health Madison, offered a potentially viable option.

Methods: This mixed-methods study aimed to determine if the UMMC surgical collaboration with Merit Health Madison impacted the volume of surgical services at both locations. Surgeons' perceptions regarding the collaboration were also explored.

Results: The results indicated that UMMC surgeons were able to increase access to surgical services by performing 82 more monthly surgical cases and having access to 23,198 more monthly OR minutes through this surgical collaboration. The study provided the qualitative categories of convoluted access, collaborative felicity, and corroborated opportunities through the engaged participants' semi-structured interviews.

Conclusion: This study showed that a surgical collaboration with Merit Health Madison improved UMMC surgeons' ability to provide access to surgical services. The results of this study suggest a viable path forward to increase access to surgical services through a surgical collaboration. This study could serve as a guide for other academic medical centers considering potential surgical collaborations.

Keywords: Surgical Collaboration; Neurosurgery; Potential Solution; Surgeons' Perceptions

Abbreviations: UMMC: University of Mississippi Medical Center; ORs: Operating Rooms; CBOs: Community-Based Organizations

Background

The rising complexity and cost of health care pose significant challenges for hospitals in providing accessible care [1-3]. Globally, five billion people lack access to affordable and safe surgical services [4]. Hospitals face the challenge of ensuring safe, affordable care through patient care coordination and collaborations with community-based organizations (CBOs) [5]. CBOs, defined as private, public, or nonprofit entities meeting community health needs, enhance care access and support research [6]. CBOs bridge researchers and communities through disseminating findings to improve outcomes and reduce disparities [7,8]. Collaboration lacks a universal definition, often causing confusion [9]. It involves social entities engaging in joint activities for mutual goals [9]. Cross-sector collaborations between

public and private organizations address health determinants and disparities [10,11]. Effective collaboration requires coordinated knowledge sharing, especially in specialized fields, to achieve desired outcomes [12,13]. Collaborations with academic medical centers offer benefits like improved patient care coordination but face challenges [14].

The University of Mississippi Medical Center (UMMC), with 31 operating rooms (ORs) across its Jackson campus, faced surgical capacity constraints. The State of Mississippi Health Care Collaboration Act of 2017 allowed UMMC to form a collaboration with Merit Health Madison in 2019, which leveraged underutilized ORs at Merit Health [15]. Care coordination at this level can be complex [16]. This surgical collaboration would require robust

patient care coordination. UMMC's limited ORs restricted surgical case volume, hindering patient access. Collaboration with Merit Health Madison offered a potential solution. This mixed-methods study evaluated the UMMC-Merit Health Madison collaboration's impact on surgical volume and explored surgeons' perceptions. The study aimed to answer the following questions:

- a) Did the collaboration increase total surgical cases for UMMC at both locations 18 months post-collaboration?
- b) Did it increase total OR minutes for UMMC at both locations 18 months post-collaboration?
- c) What are UMMC surgeons' perceptions of the collaboration?

Methods

This mixed-methods study aimed to determine if the University of Mississippi Medical Center (UMMC) surgical collaboration with Merit Health Madison impacted the volume of surgical services at both locations. Surgeons' perceptions regarding the collaboration were also explored.

Research Design

This explanatory sequential mixed-methods study, from January 2018 to December 2020, examined surgical case volume and explored the perceptions of eligible UMMC surgeons. The explanatory sequential mixed-methods study was selected to first collect phase one quantitative data and then collect phase two qualitative data to help explain the quantitative results [17].

Setting

University of Mississippi Medical Center's main campus in Jackson, Mississippi, is the state's only academic medical center and level one trauma center. The hospital was founded in 1955 and comprises 722 beds. The University of Mississippi Medical Center's main campus consists of three different hospitals connected and located on the same campus. The three different hospitals and corresponding number of operating rooms (ORs) at UMMC are as follows:

- I. Adult Hospital - 15 complex operating rooms (ORs) and six ambulatory ORs
- II. Sanderson Children's Hospital - seven ORs
- III. Winfred L. Wiser Hospital for Women and Infants - three ORs

In 2019, UMMC performed 39,298 surgical procedures in all ORs. The adult hospital performed 29,905 surgical cases, Winfred L. Wiser Hospital for Women and Infants performed 1,646, and Children's Hospital performed 7,747. Merit Health Madison is part of the Merit Health Network, which contains 10 hospitals. Merit Health Madison is a local, private, community-based hospital

located in the suburb of Canton, Mississippi. Merit Health Madison is located 22 miles north of UMMC's main campus in Jackson, MS. The 113,000 square foot hospital began serving Madison County in 2011 and is the county's only hospital. Merit Health Madison has four ORs and one procedure room.

Participants and Sampling Methods

The target participants for this study were the UMMC surgeons who participated in the surgical collaboration with Merit Health Madison. University of Mississippi Medical Center surgeons who participated in the surgical collaboration include the specialties and sub-specialties of general, plastics, transplant, orthopedics, neurosurgery, and ear, nose, and throat. The researcher used a purposive sample, which included all UMMC surgeons who had performed surgical procedures at Merit Health Madison through the surgical collaboration. Targeted participants were invited to participate in the study utilizing a two-tier approach. Tier one participants were the UMMC surgeons who primarily performed surgeries at Merit Health Madison. Tier two participants were the UMMC surgeons who performed surgeries at Merit Health Madison, but less consistently.

Data Collection

Data collection took place in three phases:

- a. In phase one, the researcher emailed the Chief Perioperative Physician at UMMC requesting access to the quantitative data regarding total surgical cases and total operating room minutes.
- b. In phase two, data collection involved in-depth qualitative interviews to help explain phase one quantitative data results. The researcher emailed the Chief Perioperative Physician seeking permission to interview the eligible UMMC surgeons in a two-tiered system. Also, the researcher requested a list of those surgeons' names and email addresses. After receiving permission and the list of eligible surgeons, the researcher emailed the tier one eligible surgeons requesting their participation in the study.

In phase three, the researcher emailed the Ambulatory Operations Director (AOD) requesting participation in the study.

Instrument Development

The semi-structured interview guide was developed and adopted by the researcher, as shown in (Table 1). For clarity, the interview guide contained seven open-ended questions, and the interview guide was used in pilot interviews with a small group of non-eligible UMMC surgeons. After pilot interviews, the interview guide combined two questions into one question based on feedback. Therefore, the final interview guide contained six open-ended questions. Each primary open-ended question was followed by prompts, and the responses of the participants guided further questioning.

Table 1: The semi-structured interview guide utilized within the study.

Semi-Structured Interview Guide	
1.	How do you feel about access to surgical services in Mississippi in general?
2.	How do you perceive the surgical collaboration with Merit Health Madison?
3.	How would you describe any strengths, if any, of the surgical collaboration with Merit Health Madison?
4.	How would you describe any challenges, if any, of the surgical collaboration with Merit Health Madison? And how could UMMC address those?
5.	In an ideal world, what recommendations would you offer for future UMMC patient access to care collaborations?
6.	What other thoughts would you like to share?

Data Analysis

After completing phase one quantitative data collection, the researcher analyzed the data using IBM SPSS 26.0 statistics software. The researcher used an independent t-test to create a monthly comparison of the total surgical cases 18 months before and 18 months after the surgical collaboration. Also, the researcher used an independent t-test to create a monthly comparison of the total operating room minutes 18 months before and 18 months after the surgical collaboration. The level of significance was set at 0.05. P-value < 0.05 from the independent t-test indicated a significant difference between the total surgical cases and total operating room minutes before and after the collaboration. Within the independent t-test, Levene’s test was utilized. After completion of phase two qualitative data collection, the researcher used grounded theory to analyze the data. To analyze the qualitative data using grounded theory, an open coding process was conducted first to create concepts of the qualitative data set. Each participant interview transcript was reviewed line by line and coded by the researcher and a peer coder to represent the concept expressed by the participant. The codes were then organized into concept groups to allow the comparison process to become more manageable. The code concepts were then organized into categories. After open coding, the researcher utilized axial coding. Lastly, the researcher utilized selective coding. When the codes no longer produced any new categories, the data were considered saturated 17. After completion of phase three qualitative data collection, the interview with the AOD added depth since the AOD’s response was presented from an administrative standpoint. The findings of phase three were incorporated with established categories from phase two.

Ethical Considerations

The raw qualitative interviews and quantitative data collected remain confidential and will not be shared. Each participant’s interview transcripts were de-identified. Informed consent provided the study participants a thorough explanation of the study, the purpose of the study, potential risks and benefits, a

guarantee of anonymity, selection of participants, and the right to participate or withdraw at any time.

Results

Quantitative Findings

Regarding research question one, did the surgical collaboration between University of Mississippi Medical Center (UMMC) and Merit Health Madison increase total surgical cases and operating room minutes for UMMC at both locations 18 months post-collaboration? The result of Levene’s test on the first research question yielded a p-value of 0.111, so the equal variance was assumed. The mean total surgical cases pre-collaboration was 1,968, and post-collaboration was 2,050, a mean difference of 82 monthly cases. This increase provided UMMC surgeons with access to perform an additional 82 monthly surgical cases through the collaboration. With an independent t-test result of p=0.297 and this being more than 0.05, this mean difference between pre- and post-collaboration total surgical cases was not statistically significant.

Regarding research question two, did a surgical collaboration between UMMC and Merit Health Madison result in an increase in total operating room minutes for UMMC at both locations, 18 months after the collaboration? The result of Levene’s test for the second research question yielded a p-value of 0.663, so the equal variance was assumed. The mean total OR minutes before the collaboration was 238,149, and post collaboration was 261,347, a mean difference of 23,198 minutes. This increase provided UMMC surgeons with an additional 23,198 minutes of OR time to perform more surgical cases through the collaboration. With an independent t-test result of p=0.030 and this being less than 0.05, this mean difference between pre- and post-collaboration total OR minutes was statistically significant. As shown in (Table 2), the total surgical cases and total OR minutes performed by UMMC surgeons at UMMC and Merit Health Madison 18 months before and 18 months after the surgical collaboration. The surgical collaboration started in July 2019.

Table 2: Total Surgical Cases and OR minutes. This table illustrates the total Surgical Cases and total OR minutes performed by UMMC surgeons at UMMC and Merit Health Madison 18 months before and 18 months after the surgical collaboration. The surgical collaboration started in July 2019.

Total Surgical Cases and OR minutes Performed at UMMC and Merit Health Madison			
Date	Total Surgical Cases	Total OR Minutes	Collaboration
18-Jan	1959	243,595	no
18-Feb	1808	239,138	no
18-Mar	1920	233,525	no
18-Apr	1896	234,138	no
18-May	1969	249,441	no
18-Jun	1947	251,756	no
18-Jul	2025	260,573	no
18-Aug	2050	271,383	no
18-Sep	1785	225,746	no
18-Oct	2075	266,245	no
18-Nov	1951	244,193	no
18-Dec	1763	229,692	no
19-Jan	2035	248,610	no
19-Feb	1872	239,736	no
19-Mar	2080	263,372	no
19-Apr	2177	269,057	no
19-May	2196	272,699	no
19-Jun	1913	251,959	no
19-Jul	2201	266,760	yes
19-Aug	2335	291,232	yes
19-Sep	1972	257,990	yes
19-Oct	2309	292,774	yes
19-Nov	2089	261,604	yes
19-Dec	2096	263,093	yes
20-Jan	2082	255,431	yes
20-Feb	2096	261,512	yes
20-Mar	1645	207,842	yes
20-Apr	1011	152,289	yes
20-May	1854	243,896	yes
1-Jun	2154	275,852	yes
20-Jul	2114	270,805	yes
20-Aug	2093	270,594	yes
20-Sep	2153	279,550	yes
20-Oct	2264	292,310	yes
20-Nov	2205	282,784	yes
20-Dec	2231	277,928	yes

Qualitative Findings

Three categories emerged: convoluted access, collaborative felicity, and corroborated opportunities. Convoluted access referred to how the participants generally perceived the ability to access surgical services in Mississippi. Some participants noted that in certain regions of the state, there might be adequate access to surgical services. Some participants asserted that the vast majority of the state had limited access to surgical services. Collaborative Felicity referred to how the participants perceived the surgical collaboration between UMMC and Merit Health Madison. All participants shared a common perception that the surgical collaboration between UMMC and Merit Health Madison was helpful. Also, all participants noted the collaboration to be beneficial. Corroborated Opportunities referred to participant perceptions regarding circumstances they encountered while operating in the surgical collaboration. The participants believed these shared perceptions of common circumstances could maintain and bolster future surgical collaborations. Corroborated Opportunities was broken down into two sub-categories: favorable facility findings and executive emendations. Favorable facility findings were patients having more surgical access, increased training opportunities for residents, and flexibility for surgeons through the introduction of additional ORs. Executive emendations were proposals that the surgeons felt hospital administrations could utilize to improve future collaborations. The executive emendations were that surgeons should be involved in the pre-collaboration stage to determine which surgical services would be involved in the collaboration, ensure the appropriate surgical equipment was available, and ensure ancillary services were available for the surgeries performed.

Discussion

The literature regarding surgical collaborations among health care facilities was lacking. This study brought forth initial research to fill the gap in the field of surgical collaboration among health care facilities. While this study revealed the perceptions of the engaged participants 18 months after the collaboration, future research should investigate the engaged participants' perceptions at interval periods before the collaboration and throughout the collaboration. Future research should also investigate the financial perspective of increasing access to surgical services through a surgical collaboration.

Limitations of the Study

Limitations of this study were time constraints and access to data. First, the researcher was limited in the time frame in which the study was conducted. The researcher was limited in measuring change over a period of time of the UMMC surgeons' perceptions participating in the surgical collaboration with Merit Health Madison. While the intentions of the researcher were to explore the perceptions of participants engaging in the surgical

collaboration, the researcher cannot uphold that the participants' perspectives did not change from the start of the collaboration to the time in which the researcher conducted the semi-structured interviews. Next, the researcher was limited in access to data of the surgical collaboration. The financial data relating to the surgical collaboration between UMMC and Merit Health Madison were considered in the study, but financial data were not readily accessible during the study's time constraints.

Conclusion

This study investigated a surgical collaboration between an academic medical center and a local, private, community-based hospital. The study provided the quantitative results regarding total surgical cases and total OR minutes 18 months before and 18 months after a surgical collaboration. The study also provided the perceptions of UMMC surgeons participating in the surgical collaboration with Merit Health Madison. The results indicated that UMMC surgeons were able to increase access to surgical services through a surgical collaboration. The study provided a mean difference of 82 monthly surgical cases between pre-and post-collaboration. The study provided a mean difference of 23,198 total monthly OR minutes between pre-and post-collaboration. The study provided the qualitative categories of convoluted access, collaborative felicity, and corroborated opportunities through the engaged participants' semi-structured interviews. The results of this study suggest a viable path forward to increase access to surgical services through a surgical collaboration. Finally, this study could serve as a guide for other academic medical centers considering potential surgical collaborations.

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DOI: [10.19080/JAICM.2026.15.555907](https://doi.org/10.19080/JAICM.2026.15.555907)

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