

# Enhancing Patient-Centered Care for Metabolic Screening and Engagement for Clients in a Rural Integrated Clinic

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## Abstract

**Background:** Metabolic syndrome (MetS) affects approximately 34% to 40% of adults in the United States, leading to chronic diseases and an annual healthcare cost of \$2,000 per person.

**Local Problem:** Practice gaps in metabolic screening were identified at Early Healthcare. Among patients, only 30% underwent weight and blood pressure measurements, 18% received lipid panel lab work, and 2% had waist circumference measurements.

**Methods:** This quality improvement initiative used four 2-week Plan-Do-Study-Act cycles. The approach integrated various frameworks, such as the Institute of Medicine's patient-centered care domain, to enhance metabolic screening and patient engagement with shared decision-making (SDM). Data from process and outcome measures were analyzed every 2 weeks using summary tables and run charts to determine the next test of change.

**Interventions:** Core interventions included screening MetS risk factors and patient engagement.

**Results:** Effective care scores increased from 55% to 98% (8-week average: 78%). MetS screening rose from 64% to 97% (8-week average: 82%). SDM increased from 57% to 100% (8-week average: 76%). Team engagement improved from 1.3 to 4.7. Patient satisfaction scores increased from 3.3 to 4.4 (8-week average: 4). MetS detection rose from 3% to 24% (8-week average: 18%).

**Conclusions:** The project's success underscores the value of patient-centered care interventions in improving patient outcomes for MetS risk and fostering a patient-centric culture within the healthcare system.

**Keywords:** metabolic syndrome, patient-centered care, shared decision-making, healthcare quality improvement, patient engagement

Metabolic syndrome (MetS) affects 34% to 40% of American adults <sup>1</sup>. It contributes significantly to healthcare costs, totaling \$157 billion annually <sup>2</sup>. Despite guidelines, screening in primary care remains suboptimal <sup>3</sup>. Geographical disparities exist regarding the prevalence of obesity, MetS, and

diabetes <sup>4</sup>. Louisiana has high rates of obesity (36%), hypertension (39%), and diabetes (13%) <sup>5</sup>.

Baseline analysis at Earley HealthCare in Louisiana revealed metabolic screening and lifestyle intervention gaps. Providers only measured the: weight (30%; n = 15 of 50), blood pressure (18%; n = 9

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of 50), lipid panel levels (30%;  $n = 15$  of 50), and waist circumference (2%;  $n = 1$  of 50). At baseline, providers' surveys showed mean scores for incorporating lifestyle changes (2.3) and providing education to patients (3.6) on a 5-point Likert scale.

### Available Knowledge

MetS is a complex disorder characterized by interconnected factors such as elevated blood pressure, blood sugar, excess abdominal fat, and irregular cholesterol or triglyceride levels<sup>6</sup>. Researchers have studied regional disparities regarding MetS<sup>7</sup>, underlying mechanisms, its link with routine discrimination, and the impact of antipsychotic drugs on MetS<sup>8</sup>. According to the<sup>5</sup>, Louisiana has the third-highest predicted prevalence of MetS among adults. The American Diabetes Association's<sup>9</sup> "Standards of Care in Diabetes—2023" and the National Institute for Health and Care Excellence's<sup>10</sup> Clinical Guideline CG178 provide recommended practices for managing MetS. The ADA<sup>6</sup> and National Institute for Health and Care Excellence<sup>10</sup> recommend lifestyle interventions, such as weight loss and physical activity, to help manage MetS. Pharmacological interventions may be necessary for specific components of MetS, such as hypertension or dyslipidemia, if lifestyle interventions are ineffective. The risk of future complications may be minimized with consistent monitoring of metabolic parameters, allowing for early detection and treatment of MetS<sup>3,7,11</sup>.

### Rationale

Patient-centered care, an Institute of Medicine (IOM) domain, guided this project, emphasizing patients' needs and integration into healthcare decisions<sup>12, 13</sup>. The shared decision-making model fostered active patient participation<sup>14</sup>, and motivational interviewing influenced lifestyle choices<sup>13</sup>. These strategies aligned with the IOM's patient-centered domain, enhancing perceived control and engagement, and increasing adherence likelihood. The transtheoretical model—also called stages of change—was employed to promote healthier practices<sup>15</sup>. The project aimed to use a patient-centered approach to achieve 80% effective care within 8 weeks for patients at risk of MetS at Earley HealthCare.

### Methods

Earley HealthCare is a rural integrated clinic in Louisiana serving approximately 639 patients monthly. The clinic team comprises three nurse practitioners, an office manager, and an off-site virtual assistant. The clinic uses OsMind as its electronic medical record (EMR) system. The demographics of the clinic are predominantly the following: female (88%;  $n = 563$  of 639), self-pay (92%;  $n = 588$  of 639), White (81%;  $n = 518$  of 639), seekers of mental health services (56%;  $n = 358$  of 639), and seekers of weight loss services (64%;  $n = 408$  of 639). A considerable segment has received cosmetic injections (37%;  $n = 224$  of 639).

This quality improvement project used a Plan-Do-Study-Act (PDSA) process consisting of four 2-week cycles. After each cycle, a test of change (TOC) was developed based on data collection and analysis<sup>16</sup>. This doctoral project was excused from review by the institutional review board at Frontier Nursing University because it does not qualify as human subjects research and meets federal requirements for quality improvement. No external funding was acquired for this project.

### Interventions

Two core interventions were used in this project (Table 1). The first involved screening for metabolic risks using a metabolic screening tool (MST) based on guidelines from the American Diabetes Association<sup>6</sup>. The MST evaluated parameters such as body mass index, waist circumference, blood pressure, hemoglobin A1c, and HDL cholesterol levels and if the patient was on hypertension medication. The cumulative scores represented the overall metabolic risk status.

The second core intervention was patient engagement in shared decision-making. The shared decision-making tool (SDMT), adapted from the 9-item Shared Decision-Making Questionnaire<sup>17</sup>, assesses patient involvement in healthcare decision-making. It fosters patient engagement and autonomy in managing health, using a 6-point Likert scale (0 = completely disagree to 6 = completely agree) to gauge agreement with statements related to shared decision-making (Table 2). The effective care score was calculated by summing and then averaging

the SDMT items, providing an overall indicator of the degree of shared decision-making between the provider and patient regarding various mental health treatment options. These options included medications, lifestyle changes, exercise, diet, other mental health interventions, or even the choice of no treatment.

### Study of the Interventions

Qualitative and quantitative data collection enabled precise fine-tuning and optimization of interventions. Quantitative metrics from the MST and SDMT were extracted, and patient satisfaction responses were logged per PDSA cycle. The quantitative data was entered into Google Forms and transferred to Excel for analysis. Data points were organized by 3-day intervals, with biweekly mean and percentage calculations. Qualitative data, including field notes and feedback, were studied for themes. Run charts and graphical representations were used for data interpretation, as well as aggregate data tables. Data analysis every two weeks catalyzed the TOCs for subsequent PDSA cycles. The project included a Likert-scale survey to assess the providers' knowledge, attitudes, and practices concerning metabolic screening and patient engagement with antipsychotic medications.

### Measures

The project encompassed two process measures (Table 2), two outcome measures, one aim, and one balancing measure. The process measures focused on the frequency of utilization of the MST and the Shared SDMT. Outcome measures assessed the mean percentage of clients screened positive for MetS and SDMT scores, indicating the degree of shared decision-making between providers and patients (Table 2). The aim effect care mean percentage was obtained by summing the scores of each item, thus serving as a holistic indicator of the extent of shared decision-making between the provider and the patient concerning various mental health treatment options. The study aimed to operationalize a composite score calculated by the equally averaged score of four distinct components: the utilization rate of the MST, the utilization rate of the SDMT, the mean percentage of documentation of shared decision-making within the client's chart, and the mean percentage of scheduled

follow-up appointments. The balanced balancing measure employed a 5-point Likert scale (1 = *very dissatisfied* to 5 = *very satisfied*) in a patient satisfaction survey, with a baseline of 3 and the goal of a mean score of 3.2. The project team conducted continuous assessments of various contextual elements with regular reviews and updates throughout the study to ensure the completeness and accuracy of the data.

### Analysis

Quantitative data were collected biweekly and entered an Excel workbook. The project generated run charts from these data to monitor trends, shifts, and the number of runs, aiming to evaluate the performance of the core interventions and TOC. Identifying trends and shifts offered insights into process and outcome changes. Any special-cause signals detected on these charts indicated nonrandom variation, suggesting statistical significance. Observations, interviews, staff meetings, field notes, and patient feedback during engagement activities were sources for gathering qualitative data.

### Results

This project aimed to achieve 80% effective, patient-centered care within 8 weeks for patients at risk of MetS. The results showed that the mean percentage of patients receiving effective care increased from 55% in Cycle 1 to 78% (Figure 1) overall; the goal was surpassed in Cycles 3 (84%) and 4 (98%). The run chart indicated a special-cause signal of change with a shift in effective care marked from the start of Cycle 3. Cycle 4 exceeded the 3.2 goal for the balancing measure, reaching 4.0 from a baseline of 3.2. Patient demographics were the following: 42% ( $n = 57$  of 133) were aged 35 to 44 years, the majority were women 85% ( $n = 113$  of 133), 81% ( $n = 108$  of 133) identified as White, 95% ( $n = 127$  of 133) spoke English as their primary language, and 87% ( $n = 116$  of 133) were self-pay patients. The largest educational group had some college education but no degree, representing 29% ( $n = 39$  of 133) of the population.

### Metabolic Screening

Over the 8-week implementation, 82% ( $n = 133$  of 162) of clients used the MST (Table 2), improving patient care. In Cycle 1, the team introduced the MST to the clients. The Cycle 1 utilization rate was 64% ( $n$

=34 of 53). Among those who used the MST, 9% (*n* = 3 of 34) were at low risk, 15% (*n* = 5 of 34) were at risk, and 2.9% (*n* = 1 of 34) tested positive for MetS; risk was unknown for 82% (*n* = 28 of 34). In Cycle 2, visual aids were implemented into metabolic screening procedures to enhance patient understanding, and participation in healthcare management. The TOC resulted in a utilization rate of 82% (*n* = 28 of 34), with 46% (*n* = 13 of 28) at low risk, 36% (*n* = 10 of 28) at risk, and 18% (*n* = 5 of 28) testing positive for MetS. Implementing an electronic MST in Cycle 3 led to a 97% (*n* = 33 of 36) utilization rate, with 21% (*n* = 7 of 33) at low risk, 55% (*n* = 18 of 33) at risk, and 27% (*n* = 9 of 33) testing positive for MetS. Implementation of telehealth metabolic screening took place in Cycle 4, with 97% (*n* = 38 of 39) utilization rate, with 24% (*n* = 9 of 38) at low risk, 53% (*n* = 20 of 38) at risk, and 24% (*n* = 9 of 38) testing positive for MetS. The most impactful overall TOC was the implementation of the electronic MST in Cycle 3.

**Patient Engagement**

Over the 8-week implementation, 76% (*n* = 151 out of 199) of clients used the SDMT (Figure 2), and the mean score was 4 (1 = very dissatisfied to 5 = very satisfied; Table 3). During Cycle 1, the SDMT was

implemented, resulting in a 57% (*n* = 51 of 90) SDMT utilization rate and a mean score of 3.4. During Cycle 2, the introduction of healthcare provider communication training took place. SDMT utilization increased to 82% (*n* = 28 of 34), with a mean patient engagement score of 3.7. Cycle 3 showed further improvement with implementing patient education materials, with a utilization rate of 91.7% (*n* = 33 of 36) and a mean score of 4. Cycle 4 had the most impactful change; a social media patient education intervention led to the maximum utilization rate of 100% (*n* = 39 of 39) and the highest mean score of 4.5. The run chart indicated a special-cause signal of change with a shift in the SDMT utilization occurring in Cycle 3.

**Team Engagement**

To assess the team’s engagement, the project leader used a pre-implementation survey to evaluate the providers’ knowledge, attitudes, and practices regarding metabolic screening and patient engagement with antipsychotic medications. The survey employed a 5-point Likert scale (0 = very unconfident to 5 = very confident). The mean score prior to the PDSA implementation was a mere 1.3. The mean score was 4.7 postimplementation.

**Table 1: Core Interventions**

Core intervention	Plan-Do-Study-Act Cycle			
	1	2	3	4
Metabolic screening	Implement the MST	Implement visual aids	Implement electronic data collection	Implement telehealth metabolic screening
Patient engagement	Implement a SDMT	Implement healthcare provider communication training	Implement patient education materials	Implement social media education

Note. MST = metabolic screening tool; SDMT = shared decision-making tool.

**Table 2: Core Intervention Measures**

Core interventions			Baseline			PDSA 4			Project total		
Intervention	Tool	Operational definitions	N	n	% or M	N	n	% or M	N	n	% or M
Metabolic screening	MST	Process: no. of tools used / no. of patients eligible	53	34	63	39	38	97	162	133	82

Continue.....

		Outcome: no. of clients positive for metabolic syndrome) / no. of clients screened	53	1	4	38	9	14	133	24	18
Patient engagement	SDMT	Process: no. of tools used / no. of eligible clients	90	50	57	39	39	92	199	151	76
		Outcome: Mean score <sup>a</sup> on 6-point Likert scale			3			4.5			3.9

Note. MST = metabolic screening tool; SDMT = shared decision-making tool.

<sup>a</sup> A 6-point Likert scale was used, with 0 = *lowest* and 6 = *highest*.

**Table 3: Share Decision-Making Tool**

Likert scale <sup>a</sup>	PDSA 1 49			PDSA 2 28			PDSA 3 33			PDSA 4 38			Total 148		
	M	Mdn	Range	M	Mdn	Range	M	Mdn	Range	M	Mdn	Range	M	Mdn	Range
My provider made it clear that a decision must be made.	3.3	3	3	3.6	4	1	3.3	3	3	4.4	5	3	3.7	4	3
My provider wanted to know precisely in what ways I wanted to be involved in the decision-making.	2.5	3	3	3.1	3	2	3.5	3	3	4.6	5	2	3.4	3	4
My provider told me that there are various options for treating my medical condition.	3.2	3	2	3.4	4	2	3.8	4	2	4.6	5	2	3.8	4	3
My provider explicitly explained the advantages and disadvantages of each treatment	3.2	3	2	3.7	4	2	3.5	4	1	4.5	5	2	3.7	4	3
My provider helped me understand all the information.	4.1	4	2	4.3	4	5	4.3	4	0	4.6	5	1	4.3	4	3
My provider asked me which treatment option I preferred.	3.6	4	2	4	4	3	4.4	4	2	4.6	5	1	4.1	4	3

Continue.....

My provider and I thoroughly weighed the different treatment options	3.4	3	2	3.6	4	3	4	4	3	4.4	4	2	3.8	4	3
My provider and I selected a treatment option together.	3.6	4	2	3.9	4	3	4.6	5	1	4.3	4	1	4	4	3
My provider and I reached an agreement on how to proceed.	3.5	4	4	3.9	4	2	4.6	5	1	4.4	4	1	4	4	5
Mean score	3.3			3.7			4.1			4.4			4		

Note. PDSA = Plan-Do-Study-Act.

<sup>a</sup> A 6-point Likert scale was used, with 0 = lowest and 5 = highest

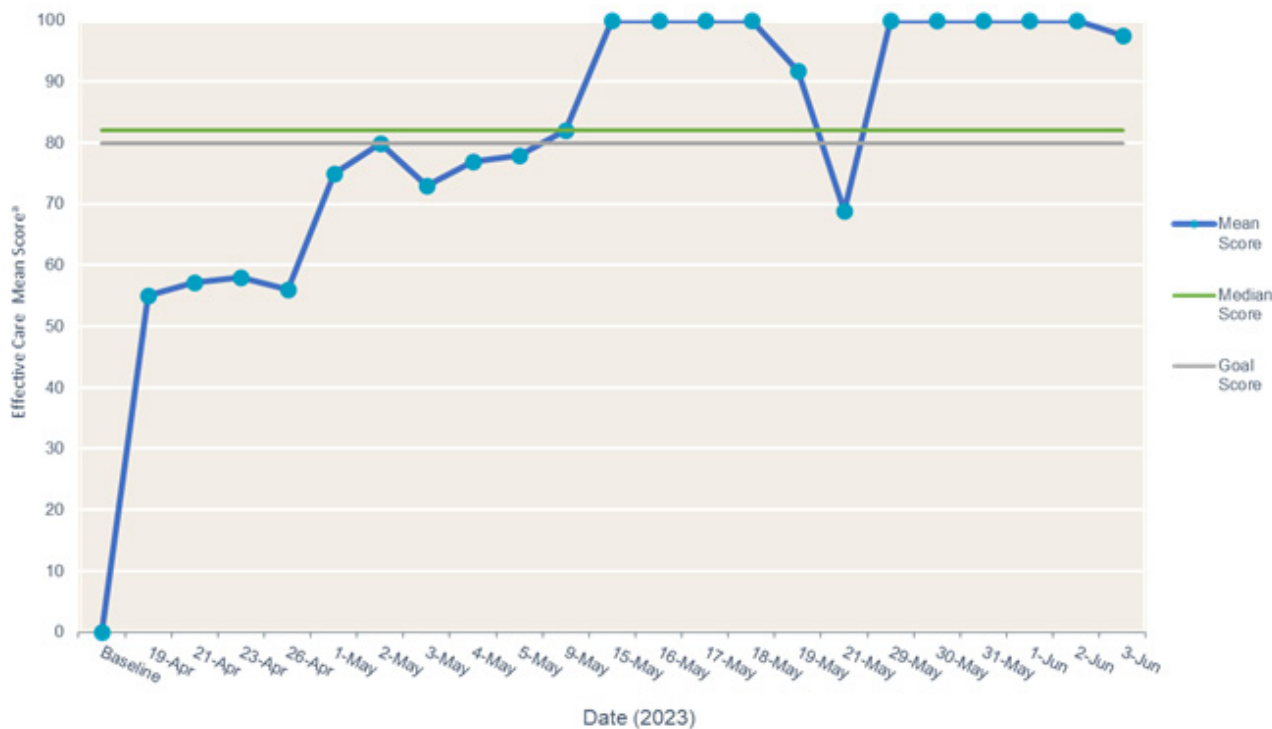
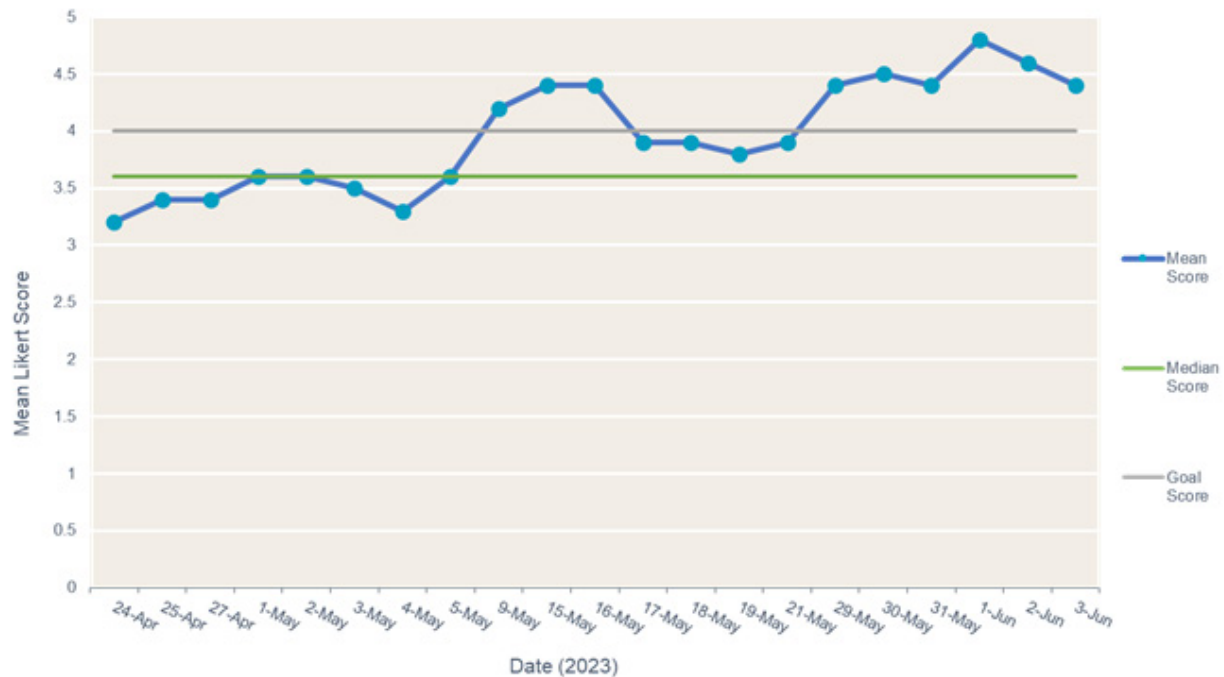


Figure 1: Aim Run Chart

a For the calculation of the effective care mean score, mean scores were added for metabolic screening tool use, shared decision-making tool use, shared decision documentation, and client follow-up scheduling and then divided by 4.



**Figure 2: Patient Engagementa**

a A 6-point Likert scale was used, with 0 = lowest and 6 = highest.

## Discussion

Within 8 weeks, the project achieved patient-centered care for individuals at risk of MetS. The project surpassed its goals through interventions such as metabolic screening, telehealth, and social media education. The project's successes, indicative of its adaptability and alignment with healthcare trends, suggest the potential for replication and use of the tools in other settings, amplifying its overall impact on healthcare.

## Interpretation

This quality improvement project implemented two interventions: metabolic screening and patient engagement. Metabolic screening used specific assessment tools endorsed in other research<sup>7</sup>, visual aids<sup>18</sup>, electronic data collection<sup>19</sup>, and telehealth<sup>19</sup>, resulting in an 82% utilization rate. MetS risks were identified in the screenings, positively impacting care. The patient engagement interventions were similar to successes in other research utilizing shared decision-making tools<sup>17</sup>, provider communication training<sup>17, 20</sup>, education materials<sup>21</sup>, and social media<sup>22</sup>. Introducing social media education yielded 100% utilization of shared decision-making

tools<sup>17</sup>. Collectively, these strategies improved patient satisfaction and enabled comprehensive MetS management<sup>23</sup>.

The project's success demonstrates the effectiveness of the interventions. The 82% utilization rate of metabolic screening shows that combining assessment tools and methods successfully identified MetS risks, aligning with the literature on regular metabolic monitoring<sup>3, 7</sup>. Additionally, introducing social media education for patient engagement yielded 100% utilization of shared decision-making tools, reflecting the growing emphasis on patient-centered approaches, where shared decision-making and participation are critical for improving satisfaction and outcomes<sup>17, 22</sup>.

Several contextual factors contributed to differences between anticipated and observed outcomes. Clinic relocation and EMR implementation influenced project progress. The relocation likely caused temporary disruptions, while EMR implementation necessitated staff training. Resistance to electronic data collection and patient unfamiliarity with telehealth explain outcome discrepancies and highlight the importance of considering contextual factors when implementing healthcare<sup>24</sup>.

## Limitations

The unique context of a rural Louisiana clinic may limit the generalizability of this project's findings. Clinic relocation and a new EMR system could have introduced variability, impacting validity. The project minimized these limitations through open communication, collaboration, and a flexible design. The translation of these findings to different settings necessitates careful consideration of the specific characteristics of the patient population and unique infrastructural factors, given that they may not be directly applicable to other healthcare environments.

## Conclusions

The project achieved its aim of increasing rates of metabolic screening and patient engagement, consequently enhancing the effectiveness of patient care. Its effectiveness underscores its potential utility in fostering patient-centered care. The flexible and adaptable design supports sustainability. While the results suggest the potential for application in other contexts, unique demographic and infrastructural factors must be considered. The project highlights the value of patient-centered interventions in healthcare practice and suggests further exploration in diverse settings. Future steps should focus on refining the intervention for broader implementation while emphasizing continuous improvement and patient-centered care. The project's success demonstrated the value of patient-centered care interventions in improving patient outcomes and fostering a patient-centric culture within the healthcare system.

## Ethical Clearance

This quality improvement project was not subjected to review by the institutional review board at Frontier Nursing University. The project was categorized as exempt, as it did not qualify as human subjects research, adhering to the federal standards for quality improvement initiatives. This exemption demonstrates our commitment to maintaining ethical integrity, considering the distinct character of this project."

**Source of Funding:** The financial aspects of this project were self-managed, indicating independence in terms of funding. No external funding was acquired, ensuring the absence of financial influences on the project's design, implementation, and outcomes.

**Conflict of Interest:** The authors declare that there are no conflicts of interest related to this project. This statement underscores our commitment to transparency and integrity in the research process, ensuring that the findings and conclusions presented are the result of unbiased, objective quality improvement practices.

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