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Economics of MRI Operations after Implementation of Interpersonal Skills Training

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Abstract

Purpose—Examine cost of MRI operations before and after implementation of interpersonal skills training to reduce unanticipated patient-related events in an academic medical center.

Methods—Teams at 4 MRI sites (2 hospital-based, 2 freestanding) were trained in evidence-based communication skills, February–April 2015. Training was designed to enable staff members to help patients mobilize their innate coping skills in response to any distress they experienced during their MRI visit. Data were collected prior to training and afterward from January–June 2016. Staff reported the incidence of disruptive motion, sedation use, MRI delays, incomplete exams, and no-shows. Cost and revenue associated with MRI operations and staff and physician costs were estimated using Medicare and private insurance rates and data from the U.S. Bureau of Labor Statistics.

Results—The study included 12,930 outpatient MRI visits. From baseline to follow-up, average monthly patient volume increased from 1,105 to 1,463 at hospital MRI sites and from 245 to 313 at freestanding MRI sites. Patient factors necessitating sedation and/or interfering with image progression/quality decreased from 9.0% to 5.5% at hospital sites and from 3.1 % to 1.2% at freestanding sites. These changes translated into a reduction in operational costs of \$4,600-per-1,000-scheduled-patients and an increase in profit of \$8,370-per-1,000-scheduled-patients in hospital MRI sites, and a corresponding increase in operational costs of \$1,570-per-1,000-

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scheduled-patients and an increase in profit of \$12,800-per-1,000-scheduled-patients in freestanding MRI sites.

Conclusions—We found significant improvements in MRI operational efficiency after interpersonal skills team training which were associated with reductions in costs and growth in revenue.

Keywords

Cost; economics; interpersonal skills; communication; MRI; equipment utilization

INTRODUCTION

Patient discomfort, claustrophobia, need for sedation, and inability to hold still have typically been considered to be “unanticipated” events in MRI and have not been broadly accounted for in the cost of MRI operations.[1] Only recently has there been more interest in how patient factors—such as ability to hold still—adversely affect an institution’s finances. [2] Increased national health policy focus on value-based payment, patient satisfaction, and price transparency will further drive the need for better quality at lower cost.[3–5] Moreover, 39 million MRI studies were performed in the U.S. in 2016 and the volume is growing.[6, 7] All of these factors contribute to the increasing cost and quality pressures that MRI centers face nationally.

The effects that (1) patient factors interfering with scan efficiency and (2) measures of how to address them have on overall costs and revenue are largely unknown. Team training in interpersonal skills for staff members of MRI centers has been shown to improve patient satisfaction and operational efficiency, including measures of scan rates, no-show rates, and study incompleteness rates,[8–11] thus affording an opportunity to assess such effects.

In this study, we estimated changes in the cost of MRI outpatient operations in an academic medical center before and after implementing team training in interpersonal skills. We also estimated changes in projected revenue attributable to changes in operational efficiency. Our hypothesis was that implementing MRI team training would improve operational efficiency and increase revenue.

METHODS

This study was reviewed by the Institutional Review Board and found to be exempt and is compliant with the Health Insurance Portability and Accountability Act (HIPAA). The work was supported by a Small Business Innovation in Research (SBIR) Phase II Grant awarded by NIH/NCCIH to BLINDED, who is the owner of a small business as required by the grant mechanism. All study data were controlled by the authors at the academic sites, and these sites had no relationships or conflicts of interest with the small business.

Study Design and Sites

The study was conducted at MRI sites of an urban, tertiary care academic medical center in the southeast U.S. The original protocol aimed to reproduce a randomized trial design that

had been successfully used in a Midwestern urban hospital center to assess the effect of interpersonal skill training on MRI outpatient operational efficiency.[8] We planned to randomize 6 non-overlapping MRI teams to receive training or serve as controls. Two teams worked in two freestanding outpatient sites; two teams worked at two separate MRI sites on the hospital campus during morning shifts, and two other teams worked at the same campus MRI sites during evening shifts.

Baseline data on outpatients were collected from February-April 2015 to facilitate randomization among the most similar pairs. However, concurrent with trial initiation, department review through an external consulting company resulted in considerable staff layoffs which then necessitated extensive staff rotations, particularly at the freestanding sites. Staff also began rotating between hospital sites but not shifts. For these reasons, the morning and evening hospital shifts were combined and used as a single randomization block. Eight staff of the evening shift were trained in advanced interpersonal skills in May and June 2015.

We anticipated that, in the ensuing months, MRI staffing would become more stable at sites, but this was not the case, and further randomization was impractical for this reason. Hence, 26 staff members from all sites that had not previously been trained were trained in January 2016 and the study was continued as a comparison between the baseline period (February to April 2015) and a post-training period (after all staff were trained in January 2016 to June 2016).

The outpatient sites each had one 54-cm bore 1 GE 1.5T HDX scanner (General Electric, Milwaukee, WI). The hospital sites operated five 70-cm bore scanners: two GE 1.5T 450W (General Electric, Milwaukee), 2 Siemens 3T Skyra and 1 Siemens 1.5T AERA (Siemens Healthineers, Erlangen, Germany). Only the hospital sites provided IV anxiolytics and anesthesia. Intravenous anxiolytic therapy was limited to a maximum of 10 mg diazepam IV and could be administered by a nurse with a radiologist on site. Higher doses of IV sedatives required supervision by an anesthesiologist and scheduling by the anesthesia department as general anesthesia cases with a fixed number of available slots per month. In case that these slots would not be filled in a month, patients from other facilities would be accepted until capacity was reached. Oral sedation was provided by the patient's treating physician; it was otherwise not available at the freestanding sites, but could, if needed, be prescribed at the hospital sites.

Central scheduling managed appointments for all sites and schedulers were unaware of the study. Patients with indication of claustrophobia or anxiety were typically scheduled at the hospital sites. The vast majority of studies performed at this medical center are scheduled for 45 minutes. The two outpatient sites in the study do not administer IV. When protocols required high spatial resolution, these studies were only scheduled at the hospital sites since only they had the requisite scanners. All other studies were randomly scheduled throughout the hospital system based on availability and patient preference due to location.

Team Training Intervention

The teams each received two 8-hour classroom sessions. Team training followed a protocol for communication and interpersonal skills training (Comfort Talk®, LLC, Brookline, MA). [11] The sessions included information about the scientific basis for the communication methods, group discussions, live and video demonstrations, practice in small groups, and role play. The classroom sessions were each followed by two days of on-site supervision. Trainees were provided with access to an online training support portal and an online course was also provided for trainees who were unable to attend all live sessions.

The first 8-hour session emphasized gaining rapid rapport through short, initial matching of the patient's verbal and nonverbal behaviors before leading to a more relaxed state, use of encouragement toward achieving patient cooperation, integration of room stimuli—particularly noise—into a patient's preferred scenario of choice, and basic pain and anxiety management techniques with integration of hypnoidal language. The second 8-hour session emphasized techniques in management of anxiety and resistance. The new skill sets were practiced in video-recorded interactions of role play in a microteaching approach.[12]

Emphasis was placed on building upon the skill sets the trainees already possessed and training them to build a behavioral and verbal vocabulary for challenging patient encounters that would reflect the specifics of their patient population and their own personal preferences. A post-training spaced-learning module in the form of a team and individual competition provided two weekly short snippets of teaching points through a mobile app or email for 13 weeks.

Data Collection

Staff members at each MRI site collected data on patient volume; no-shows; use of oral sedation, IV anxiolytics, or anesthesia; and imaging study outcomes (optimal, motion-degraded/requiring extra time, or cancelled/incomplete). Data were entered manually on uniform daily data collection forms by the site staff and were retrieved weekly by the site administrators and provided to the data analysis team for entry into spreadsheets. Because of further staff cuts, the outpatient sites were able to provide follow-up data only through May 2016 (inclusive).

Cost Analysis Framework

The cost analysis model compares the cost of MRI operations prior to training to the cost of MRI operations after training for the hospital sites and the freestanding sites. This model was informed by financial data provided by the MRI facilities and other sources (Figure and Table 1). The model captured no-show rates for patients scheduled for appointments; prevalence of claustrophobia or other difficulties with motion that interfered with MRI image quality; use of oral sedation, intravenous (IV) conscious sedation, and general anesthesia; study completion; and image quality outcomes. Image quality was assessed by the technologist performing the study. We conducted the analysis from the perspective of a hospital or health system which owns its imaging center and employs its staff and physicians.

Probability of Events

We estimated the probability of events from the data reported for the periods prior to (February-April 2015) and after training (January-June 2016). These estimates defined the probability of a patient not showing for their appointment, experiencing claustrophobia or difficulty remaining motionless, and receiving sedation. They also defined the probability that an MRI would be delayed/prolonged or canceled, along with the distribution of the MRI image quality (e.g., optimal study, defined as no or minimal motion artifact; suboptimal study, defined as moderate motion artifact; or incomplete study, defined as severe motion artifact). The probability of sedation was further stratified by the type of sedation a patient received (oral, IV conscious sedation, or general anesthesia).

Cost of Events in Cost Model

Prior research has used the Medicare fee schedule as a surrogate for economic costs because Medicare payments are thought to be a closer approximation to economic costs than other sources, such as commercial payment rates.[13] Similar to a prior study, we used a routine noncontrast MR examination of the brain (Current Procedural Terminology [CPT] code 70551) as a reference standard for estimating MRI costs.[2] Payment was based on Medicare's Hospital Outpatient Prospective Payment System (OPPS).[14–16] To estimate personnel costs, we used national estimates of median wages for an anesthesiologist, nurse, and MRI technologist from the United States Bureau of Labor Statistics.[17, 18] The costs of intravenous sedation setup, intravenous sedative medication, and general anesthesia were estimated from a prior study.[19] Radiologists were expected to be present during administration of IV conscious sedation.

Because we aimed to estimate cost from the perspective of hospital systems, we also performed a sensitivity analysis in which we accounted for changes in hospital revenue associated with team training. The primary sources of revenue changes we accounted for included payments for MRI examinations and payments for general anesthesia. As previously mentioned, we assumed that all staff (including anesthesiologists administering sedation) were employed by the hospital and that the hospital would therefore be the direct recipient of professional fees. Payments for MRI exams that were completed were estimated by adjusting Medicare OPPS payments by the proportion of national health insurance expenditures attributable to private insurance vs. Medicare vs. Medicaid[20] (47% vs. 29% vs 24%; this likely overestimates private insurance MRI volume because it assumes that expenditures and volume are proportionate) and the ratio of private insurance reimbursement for radiology relative to Medicare (1.75:1) and Medicaid (2.43:1).[21–23] Payments for general anesthesia were estimated using CMS's formula for anesthesia services, $(Time\ Units + Base\ Units) \times Conversion\ Factor = Allowance$, with 4 base units, a conversion factor of \$22.28 (national average), and a time period of 90 minutes (6 time units).[24] This estimate was then adjusted using the same method described for MRI.

Statistical Analysis

We performed univariate comparisons of no-show rates, sedation rates, and rates of incomplete or poor quality imaging studies in the period prior to implementation of team training to the period after implementation of team training using chi-square tests. All

reported p-values are 2-sided and a p-value of less than 0.05 was considered statistically significant. All costs were converted to 2016 US dollars using the consumer price index.[25] The model was programmed with TreeAge Pro 2014 (TreeAge Software Inc, Williamstown, Mass) and analyzed with Microsoft Excel (Microsoft Inc, Redmond, Wash).

RESULTS

Patient Flow

The study included a total of 12,930 outpatient MRI visits, with 10,631 at the hospital MRI sites and 2,299 at the freestanding MRI sites. From the baseline period immediately prior to training (February-April 2015) to the post-training period (January-June 2016), the average monthly patient volume increased from 1,105 to 1,463 at hospital MRI sites and from 245 to 313 at freestanding MRI sites.

Figure 2 summarizes the frequency of events associated with prolonging throughput once patients showed at the facility. Overall, such events reached 9.0% at the hospital sites, and 3.8% at the freestanding sites before training, with reductions post training to 5.5% at the hospital sites and 1.2% at the freestanding sites. Table 2 provides a breakdown of individual events: At the hospital MRI sites, the use of general anesthesia and IV anxiolytics did not change significantly, the use of oral sedation decreased significantly, and the frequency of disruptive motion and incompletions also decreased. At the freestanding MRI sites, there was a marginal decrease in no-shows, unchanged use of oral sedation, and a significant decrease in disruptive motion and incompletions.

Costs

Cost outcomes were calculated based on the frequency of events recorded on study forms from the hospital and freestanding MRI sites (Table 2), and from the cost inputs reported in Table 1. In hospital MRI sites, total MRI operational cost per 1,000 scheduled patients fell by \$4,600 and sedation costs fell by \$3,560. These changes were attributable to reductions in use of sedation and delays from disruptive motion and repeat scans. In a sensitivity analysis that accounted for revenue, payments to the hospital increased by \$3,770 per 1,000 scheduled patients, and profit (total revenue minus costs) increased by \$8,370.

In freestanding MRI sites, total MRI operational cost per 1,000 scheduled patients increased by \$1,570 (mainly since more patients showed up for their examinations) and sedation costs fell by \$410. However, because the frequency of no shows and incomplete studies fell and more diagnostic studies were completed, payments to the hospital increased by \$14,370 per 1,000 scheduled patients, and profit increased by \$12,800.

DISCUSSION

While the frequency of individual events that interfere with study completion—such as motion or need for sedation—may appear low, in aggregate, they can affect a large percentage of patients. The 9.0% rate we found prior to training is in-line with the 12.9% in a report of such events unrelated to contrast medium use, from a large southern urban university institution.[1] The same report also found considerably lower likelihood of such

events in scanner settings dedicated to outpatients only, similar to the freestanding sites in our study. The 1.1% rate of disruptive motion at hospital sites and 0.6% at freestanding sites prior to training is well below the rate of 5.5% and 7.5% reported by others[1, 2] and may be related to the technologists' mode of reporting as compared to electronic event capture or film review for motion artifact.

We found that providing team training in interpersonal skills to MRI staff members working at two sites within an academic medical center was associated with reductions in sedation use, disruptive motion/repeat scans, and incomplete scans. The changes in efficiency we observed after training may have been due to interpersonal skills training or other factors, which is difficult to ascertain in a pre-post, non-randomized design. These reductions translated into operational cost savings in hospital MRI sites and an increase in revenue and profit. Modest operational cost increases in outpatient MRI sites seem paradoxical in face of decreased on-site events. These were driven mainly by a decrease in no-shows, with an increased number of patients examined and an increase in the cost of equipment operation in this model. A decrease in no-shows after training has been shown in other trials [8, 11] and is intriguing in its context. Most importantly however, there were increases in revenue and profit.

Team training has been demonstrated to be effective for improving performance in other clinical scenarios. One study evaluated the effects of team training by using simulation to improve the response of radiologists, technologists, and nurses to contrast reactions.[26] This study found that simulation exercises improved participants' self-reported ability to manage contrast reactions and work in a team during an emergency. In another study of teams working in a neonatal intensive care unit, team training with cognitive bias modification reduced the adverse effects of exposure to rudeness on medical team performance and collaboration, including measures of information sharing, workload sharing, and communication.[27]

Cost savings attributable to team training in interpersonal skills are likely to be larger in systems with higher baseline rates of cancelled exams or sedation use. In a hospital system, however, such sites do not work independently of each other. In the current study, central scheduling already directed patients with concerns about anxiety or claustrophobia, studies needing contrast medium, or more complex imaging needs to the hospital site, which in its nature is more expensive to operate than a free-standing facility. Incompletions and disruptive motion with availability of all sedation options in the hospital setting (1.0 and 1.2%) were less frequent than in the free-standing facilities (2.6% and 0.6%), but they were not zero. This may be due in part to the tendency for hospital sites to see more anxious and more difficult to manage patients, thereby increasing the overall likelihood of scan failures even in the face of unchanged potency of drug per patient. The significant reduction in incompletions and disruptive motion after training, however, may point to more fundamental perceptual changes in the patient than drugs provide. It also raises the question of whether the overall institutional cost could be reduced by *a priori* sending more low- or moderately-anxious patients to freestanding outpatient facilities rather than expensive hospital-based settings.

In a prior randomized controlled trial, implementing team training improved patient satisfaction and reduced the incidence of delayed or cancelled MRI exams.[8] These studies were based on the experience of MRI outpatient sites at an urban Midwestern hospital system. The effects of team training we reported in that study were larger—in an absolute sense—than the effects we report in this study, and cost savings would likely be greater there. Other sites with similarly higher rates of baseline sedation use would likely also realize larger cost savings than the estimates we report in our current analysis.

The cost of implementing team training at an MRI center primarily depends on the number of staff members receiving training at any time. The cost of training one MRI technologist in terms of time away from service for two 8-hour days, for example, is approximately $\$44.61/\text{hr} \times 8 \text{ hrs/day} \times 2 \text{ days} = \713.76 plus curriculum/online support cost. In the current case the training would have amortized in 3.1 months if the curriculum/online support would not have been supported by the grant. These costs would be recovered at a rate proportional to the number of patients seen at the center, with more rapid recovery of upfront costs at centers with higher patient volumes. The return on investment would likely be favorable for most MRI centers training their staff in interpersonal skills.

Our study has limitations. The interpersonal skills team training we provided is a commercial product and application in other clinical settings may not be generalizable or may be similar to other available, noncommercial team training interventions. We did not collect detailed information about the types of MRI scans performed, and therefore could not account for how differences in types of scans may have affected outcomes associated with interpersonal skills team training. We performed the study at a single academic medical center and the results may therefore not be generalizable. In addition, our cost outcomes were derived by estimating the difference in costs between the period prior to training and the period after training. We used this before-and-after design for pragmatic reasons but our models did not account for temporal trends and our cost estimates may therefore be biased. For example, MRI volume increased in the post-training period compared to the pre-training period and these temporal changes may have also influenced the cost of MRI operations. In addition, changes in efficiency we observed after training may have been due to other factors. Also, revenue depends on case mix and payor reimbursement, so our results represent estimates, albeit conservative ones.

In conclusion, we found significant improvements in MRI operational efficiency after interpersonal skills team training, and these improvements were associated with reductions in costs and growth in revenue. Interpersonal skills team training is likely to have a larger impact at centers with higher rates of incomplete examinations and sedation use at baseline. Multisite studies with randomized designs may provide further insight into the cost implications of interpersonal skills team training to improve MRI operational efficiency.

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Summary

- We found significant improvements in MRI operational efficiency after interpersonal skills team training, and these improvements were associated with reductions in costs and growth in revenue.

Conclusion

- At hospital-based and freestanding MRI sites, use of oral sedation and the frequency of disruptive motion and incompletions fell after interpersonal skills team training
- At hospital-based MRI sites, team training translated into a reduction in operational costs of \$4,880 per-1,000-scheduled-patients and an increase in profit of \$7,710 per-1,000-scheduled-patients
- At freestanding MRI sites, team training translated into an increase in operational costs of \$1,730 per-1,000-scheduled-patients and an increase in profit of \$12,640 per-1,000-scheduled-patients
- Financial gains were achieved through increases in throughput and reductions in sedation and disruptive motion

(1), (2), and (3) are probability nodes; (+) represents replication of branches at node (n), where $n = 1, 2$, or 3

Figure 1.

Clinical decision tree for patients referred for MRI: Patients may keep or miss their appointments and face different likelihoods of MRI study completion and treatment with sedation. (1), (2), and (3) represent probability nodes and the (+) sign represents clones of these nodes

Figure 2.
Frequency of Events Affecting Throughput. H = hospital-based MRI, F = freestanding MRI facility. Pre = prior to interpersonal skill training, Post = after interpersonal skill training

Table 1

Probability of Events and Cost of Care among Patients Referred for MRI

Variable	Hospital MRI Sites		Freestanding MRI Sites		Source
	Before Team Training	After Team Training	Before Team Training	After Team Training	
Event probabilities					
Patient does not keep appointment	8.4%	8.0%	10.8%	8.3%	Study Data
Patient keeps appointment	91.6%	92.0%	89.2%	91.7%	
Patient does not receive sedative during visit	93.2%	94.9%	99.3%	99.7%	Study Data
Experiences claustrophobia/disruptive motion	2.0%	0.5%	4.7%	2.6%	Study Data
MRI completed, no delays	47.5%	61.8%	35.3%	70.0%	
MRI completed, with delays	26.2%	5.9%	8.8%	2.5%	
MRI canceled	26.2%	32.4%	55.9%	27.5%	
Does not experience claustrophobia/disruptive motion	98.0%	99.5%	95.3%	97.4%	Study Data
MRI completed, no delays	0.0%	0.0%	0.0%	0.0%	
MRI completed, with delays	0.0%	0.0%	0.0%	0.0%	
MRI canceled	0.0%	0.0%	0.0%	0.0%	
Patient receives sedative during visit	6.8%	5.1%	0.7%	0.3%	Study Data
Oral sedative	41.9%	32.9%	100.0%	100.0%	Study Data
MRI completed, no delays	86.3%	97.6%	80.0%	80.0%	
MRI completed, with delays	7.4%	1.6%	20.0%	0.0%	
MRI canceled	6.3%	0.8%	0.0%	20.0%	
Conscious sedation	28.8%	9.6%	0.0%	0.0%	Study Data
MRI completed, no delays	77.7%	95.4%	—	—	
MRI completed, with delays	14.6%	3.1%	—	—	
MRI canceled	7.8%	1.5%	—	—	
General anesthesia	12.8%	14.7%	0.0%	0.0%	Study Data
MRI completed, no delays	89.7%	100.0%	—	—	
MRI completed, with delays	0.0%	0.0%	—	—	
MRI canceled	10.3%	0.0%	—	—	
Event duration					
MRI time (min)					

Variable	Hospital MRI Sites			Freestanding MRI Sites			Source
	Before Team Training	After Team Training	Before Team Training	After Team Training	Before Team Training	After Team Training	
MRI completed, no repeat sequences	45	45	45	45	45	45	Andre et al 2015, Staff
MRI completed, repeat sequences	60	60	60	60	60	60	Andre et al 2015, Staff
MRI canceled	30	30	30	30	30	30	Andre et al 2015, Staff
Additional time if sedation administered (min)							
Oral sedation (lorazepam)*	15	15	15	15	15	15	Site Staff
Conscious sedation (IV anxiolytic)	30	30	30	30	30	30	Site Staff
General anesthesia	90	90	90	90	90	90	Site Staff
Event costs (in 2016 US\$)							
MRI use							
Cost per minute (\$)	6.08	6.08	6.08	6.08	6.08	6.08	Medicare Hospital OPPI
Staff cost (\$/hr)							
Anesthesiologist or Radiologist	173.69	173.69	173.69	173.69	173.69	173.69	Bureau of Labor Statistics
Nurse	46.50	46.50	46.50	46.50	46.50	46.50	Bureau of Labor Statistics
Technologist	44.61	44.61	44.61	44.61	44.61	44.61	Bureau of Labor Statistics
Medication/supplies cost (\$)							
Intravenous sedation setup	9.70	9.70	9.70	9.70	9.70	9.70	Lang et al 2002
Intravenous sedative	6.93	6.93	6.93	6.93	6.93	6.93	Lang et al 2002
General anesthesia supplies	49.88	49.88	49.88	49.88	49.88	49.88	Lang et al 2002
Facility revenue (\$)							
MRI reimbursement	352.27	352.27	352.27	352.27	352.27	352.27	CMS, THA
Anesthesiologist procedures							
General anesthesia	286.90	286.90	286.90	286.90	286.90	286.90	CMS, THA

Abbreviations: CMS, Centers for Medicare & Medicaid Services; MRI, magnetic resonance imaging; OPPI, Outpatient Prospective Payment System; hr, hour; THA, Truven Health Analytics

* Patient self-administers oral sedation prior to or during visit

Comparison of MRI Operational Measures and Use of Sedation among Patients Referred for MRI, Before and After Team Training. Except for no-shows, percentages refer to all showing patients.

MRI Outcomes and Use of Sedation	Hospital MRI Sites				Freestanding MRI Sites			
	Before Team Training	After Team Training	P value	Before Team Training	After Team Training	P value	Before Team Training	After Team Training
Patients showing per month	1,105	1,463		245	313			
No shows (% of all scheduled patients)	8.45%	8.01%	0.42	10.80%	8.32%	0.04		
General anesthesia	0.87%	0.75%	0.51	0.00%	0.00%	N/A		
Conscious sedation	3.10%	2.67%	0.22	0.00%	0.00%	N/A		
Oral sedation	2.86%	1.68%	<0.001	0.68%	0.32%	0.22		
Disruptive motion/repeat scans	1.15%	0.14%	<0.001	0.55%	0.07%	0.02		
Incompletions	0.99%	0.21%	<0.001	2.58%	0.76%	<0.001		

Table 3
Comparison of Cost of Imaging among Patients Referred for MRI, Before and After Team Training

	Hospital MRI Sites			Freestanding MRI Sites		
	Before Team Training	After Team Training	Difference	Before Team Training	After Team Training	Difference
Total cost	320,630	316,030	-4,600	299,030	300,600	1,570
Revenue	321,600	325,370	3,770	306,100	320,470	14,370
Profit (Total Revenue – Cost)	970	9,340	8,370	7,070	19,870	12,800
Staff and supply cost of sedation	20,380	16,820	-3,560	690	280	-410