Effect of Traumatologist Coverage of Emergency Room Orthopedic Call at a Community Hospital

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Objectives: To understand the effect of dedicated Emergency Room (ER) orthopedic call coverage by trauma-trained orthopedic surgeons (TTOS), rather than non-trauma-trained orthopedic surgeons (NTTOS), at a non-trauma-designated community hospital.

Design: Retrospective Comparative Cohort Study.

Setting: Non-trauma-designated hospital.

Patients/Participants: All ER patients admitted for operative orthopedic intervention during the 12 months prior to (baseline period) and after (study period) the implementation of dedicated ER coverage by TTOS.

Outcome Measures and Comparisons: ER-to-OR time, frequency of nighttime surgery (cases starting after 5pm), transfers for higher level of care, and several hip fracture outcomes (ER-to-OR time, case duration, implant costs, and length of stay [LOS] postoperatively).

Results: ER coverage by TTOS resulted in more call cases (464 vs 280), fewer transfers (4 vs 19), decreased nighttime surgery (4.84% vs 35.71%), decreased implant costs ($2573 vs $3129), and decreased OR supply costs ($391 vs $498). For hip fractures, there was a statistically-significant decrease in ER-to-OR time (23.7 vs 33.4 hours [$p<0.001$]), case duration (pinning 24.4 vs 33.3 minutes [$p=0.006$], nailing 33.4 vs 59.8 minutes [$p<0.001$], hemiarthroplasty 53.0 vs 72.9 minutes [$p<0.001$]), implant costs (pinning $608 vs $1,879 [$p<0.001$], nailing $1,704 vs $4,138 [$p<0.001$], hemiarthroplasty $3,273 vs $3,381 [$p=0.577$]), and LOS (5.47 vs 6.40 days). There was no significant difference in reoperation rates (NTTOS 3.56%, TTOS 4.53%).

Conclusions: Orthopedic emergency room call coverage at a non-trauma-designated hospital by trauma-trained orthopedic surgeons, rather than non-trauma-trained orthopedic surgeons, offered significant clinical and economic benefits.

Level of Evidence: Level III.

Key Words: Trauma fellowship, Orthopaedic call, Hip fracture outcomes, Community hospital, Clinical efficiency.

INTRODUCTION

Recognizing an opportunity to improve the quality of care, a community hospital without a trauma designation sought to secure traumatologist coverage. Non-trauma-trained orthopedic surgeons (NTTOS) had managed orthopedic emergency room (ER) calls for 20 years. In September 2023, trauma-trained orthopedic surgeons (TTOS) took over all calls for hospital and ER patients requiring orthopedic consultation. A special contract was established to incentivize surgeons and the hospital to collaborate on enhancing care and reducing costs by offering dedicated daytime call coverage, a reserved orthopedic operating room, adequate call stipends, and shared cost savings.

The contract between the hospital and the trauma physicians had several parts. The first included the group's commitment to cover all call for a 5-year period with trauma fellowship-trained surgeons. In exchange for this dedicated manpower, an increase in the call stipend was obtained. Additionally, a gainsharing agreement for implant cost savings was established to provide the group with 30% of the savings compared to the previous year, to be used for group overhead reduction. This would incentivize the use of value-based implants and collaboration with the hospital to move towards a dual vendor contract, featuring one conventional vendor and one high-value implant vendor. The third part of the contract was a co-management agreement, under which the group would receive one-third of the savings from reduced length of stay. A key fourth element was the provision of a dedicated fracture cleanup operating room (OR) from 12:00 to 17:00 daily, staffed by

Figure 1:
ER Coverage by Non-Trauma-Trained Orthopedic Surgeons (baseline period) vs. Trauma-Trained Orthopedic Surgeons (study period)

ALL ORTHO CASES FROM ER	Baseline Period	Study Period
Number of cases	281	464
ER-OR time, mean excluding outliers (>72 hours)	28.1 hours	26.0 hours
Implant costs, mean per case	$3,129	$2,573
Supply costs, mean per case	$498	$391
Nighttime surgery, proportion of all ortho cases starting after 5pm	35.71%	4.84%
ER transfers to higher level care	19	4
Reoperation Rate*	10/281 (3.56%) *	21/464 (4.53%) *
Dedicated trauma room utilization	N/A	40%

*All reoperations were planned or involved a non-orthopedic service

HIP FRACTURES	Baseline Period	Study Period	p-value
ER-OR time, mean	33.4 hours	23.7 hours	p<0.001
LOS postoperatively, mean	6.40 days	5.47 days	
Hip pinning, volume	23	30	
Hip pinning, mean implant cost	$1,879	$608	p<0.001
Hip pinning, mean case duration	33.3 mins	24.4 mins	p=0.006
Hip nailing, volume	86	114	
Hip nailing, mean implant costs	$4,138	$1,741	p<0.001
Hip nailing, mean case duration	59.8 mins	33.4 mins	p<0.001
Hip hemiarthroplasty, volume	45	68	
Hip hemiarthroplasty, mean implant costs	$3,381	$3,273	p=0.577
Hip hemiarthroplasty, mean case duration	72.9 mins	53.0 mins	p<0.001

ER = emergency room; ER-OR time = ER to OR time; LOS = length of stay

anesthesiologists experienced with orthopedic anesthesia, including regional techniques. It was also requested to have dedicated orthopedic OR technicians and X-ray technologists.

The aim of this study was to understand the impact of ER call coverage by traumatologists at a non-trauma-designated community hospital.

METHODS

After IRB approval, the study was initiated with cooperation from hospital administration, who shared an interest in assessing the success of the project. The goal was to compare the 12-month period from 9/1/2022 to 8/30/2023 with the 12-month period from 9/1/2023 to 9/1/2024. This enabled a direct comparison of ER coverage by NTTOS versus TTOS. All orthopedic surgical patients whose care was initiated via ER or in-hospital consultation were identified from hospital surgical logs. The most important metrics for the hospital, as well as key patient care endpoints, were selected. The total number of surgeries performed in each cohort was recorded. For each surgery, data on ER-to-OR time, implant costs, surgical supply costs, and length of stay (LOS) were collected. Hip fracture care was chosen as a key performance indicator (KPI), and several hip fracture outcomes—including ER-to-OR time, case duration (from skin incision to closure), implant costs, and LOS—

were analyzed. Additionally, the frequency of nighttime surgeries (cases starting after 5pm), transfers for higher levels of care, and trauma OR utilization rates were recorded. No patients were excluded.

Statistical comparisons between cohorts were conducted using Mann-Whitney U tests and Fisher's exact tests. The significance level was set at 0.05. The statistical software used was SPSS 25.0.

RESULTS

ER coverage by TTOS led to more call cases (464 vs 280), fewer transfers (4 vs 19), decreased nighttime surgeries (4.84% vs 35.71%), reduced mean implant costs ($2573 vs $3129), and lower OR supply costs ($391 vs $498). For hip fractures, there was a significant decrease in ER-to-OR time (23.7 vs 33.4 hours [p<0.001]), case duration (pinning 24.4 vs 33.3 minutes [p=0.006], nailing 33.4 vs 59.8 minutes [p<0.001], hemiarthroplasty 53.0 vs 72.9 minutes [p<0.001]), implant costs (pinning $608 vs $1,879 [p<0.001], nailing $1,704 vs $4,138 [p<0.001], hemiarthroplasty $3,273 vs $3,381 [p=0.577]), and length of stay (5.47 vs 6.40 days). The orthopedic trauma OR room utilization rate was 40%.

Reoperation rates for orthopedic ER patients were similar between groups (NTTOS 3.56%, TTOS 4.53%, p=0.58). All reoperations were either planned (such as external fixator removal or repeat debridement of infection) or involved a non-orthopedic surgical service (such as general surgery for ischemic intestinal volvulus or vascular surgery for peripheral arterial stent placement).

DISCUSSION

Non-trauma designated community ER call coverage by trauma-trained orthopedic surgeons led to an increased volume of orthopedic call cases, faster ER-to-OR times, shorter surgical durations, reduced length of stay (LOS), lower expenses on implants and OR supplies, fewer nighttime surgeries, and fewer transfers to higher levels of care. Specifically, for hip fractures, there was a significant decrease in ER-to-OR time, case duration, and implant costs during the study period.

The hospital observed a significant increase in the number of orthopedic fracture cases performed over a 12-month period by trauma-trained orthopedic surgeons. The reason for this was probably multifactorial. Transferring fewer orthopedic patients certainly contributed to this increase. Additionally, having a dedicated fracture OR likely played a role. Patients with ambulatory fractures such as distal radius, clavicle, or ankle fractures, who previously were sent out of the ER to private offices and often scheduled in physician-owned ASC settings, can now undergo same-day surgery. This led to faster care for patients and surgeons and also benefited the hospital. Furthermore, because of guaranteed operative time, more surgical transfers from nearby hospitals were accepted, and more elective surgical cases from satellite clinics were scheduled.

Having trauma-trained orthopedic surgeons cover call at a non-trauma facility helps reduce the number of patients transferred to higher levels of care for orthopedic issues. When appropriate implants and operating room time are available, patients receive the same level of care for their fractures as they would at a trauma center because the same traumatologists rotate between both locations. Patients are never put at risk. If a patient meets trauma criteria, such as having a pelvis or acetabular fracture or related vascular injury, they still need to be transferred. However, for most fractures, non-trauma hospitals can manage serious isolated orthopedic injuries like tibial plateau fractures, tibial pilon fractures, and open femur or tibia fractures without transfer. Community hospital call coverage by trauma-trained orthopedic surgeons enables patients to stay close to their family and friends, keeps healthcare dollars within the community, and reduces transfers and complaints of "patient dumping" by physicians at tertiary referral centers.

The decrease in ER-to-OR time was anticipated with the initiation of dedicated traumatology day call in coordination with the dedicated fracture OR. During the baseline period, ER and hospital consults were usually seen at the end of the day after elective non-trauma-trained orthopedic surgeons' clinics or cases were finished. Many of these call cases had to be scheduled for the next day or were completed overnight. Both practices increased the cost of care and the length of stay. One might think that NTTOS would be upset about being removed from the call panel. Although that was the initial reaction for some, after several months, surgeons observed that their elective practices improved; they saw more patients, performed more surgeries, and had less call and more vacation time. This is supported by a previous publication demonstrating the impact of trauma physicians on group practice[1].

Reducing night-time surgeries is a key metric for all hospital systems. Financially, it saves the hospital the extra costs associated with call teams, which are typically paid at time-and-a-half. Avoiding night surgeries also boosts daytime OR fracture room utilization and justifies the related expenses and opportunity costs for the facility. The primary benefit of decreasing night-time surgeries is improved patient care. Numerous studies have demonstrated that this reduces surgical time and complication rates. The risks of nighttime surgery have been well documented by multiple authors[2-5]. Increased morbidity and mortality are detrimental to patient care and costly for the hospital due to longer length of stay (LOS) and higher resource use.

It is not surprising that operating room times decreased with coverage by trauma-trained orthopedic surgeons. Previous papers published by the authors have shown that fellowship-trained trauma surgeons treat 16 of 18 common fractures in half the time at half the cost of general orthopedic surgeons[6]. Having a daytime fracture operating room with dedicated orthopedic scrub technicians, anesthesiologists, and x-ray technologists creates maximum efficiency. All trauma surgeons also agree on standardized surgical cards for implants, draping, positioning, and surgical prep, which eliminates confusion and reduces costs. This has also been demonstrated by previous authors[7]. Surgical times may seem short to academic practices, but with no residents and private practice anesthesia and orthopedic surgeons, a premium is placed on time and efficiency. Importantly, this decrease in surgical time must not be done to the detriment of patient care, as complications can lead to poor outcomes, increased morbidity and mortality, longer length of stay, potential return to the operating room, and overall higher costs. These are outcomes that surgeons and hospital administrators seek to avoid. In this study, there was no significant difference in reoperation rates between the baseline and study periods.

This study showed that conversion to trauma-trained orthopedic surgeons reduced LOS for hip fractures. Shorter length of stay is an important means of cost savings. Hip fractures have been linked to shorter LOS when operated on within 24 hours[8-10]. Additionally, hip fracture LOS and complications have been shown to decrease when hospitals follow standardized protocols that include standardized admission procedures, therapy, weight-bearing guidelines, antibiotic choices, anticoagulation, early discharge planning, and limiting narcotic use[11-12].

This study provides further evidence that the role of trauma-trained orthopedic surgeons has evolved. Traumatologists are now sought after not only for complex pelvis, acetabular, and periarticular fracture care but also to treat a wide range of common fracture patterns with expertise and efficiency that non-trauma-trained orthopedic surgeons (NTTOS) focused on elective outpatient orthopedics cannot match. Patients benefit from fracture specialists who perform procedures with less anesthesia time, reduced risk of nighttime surgeries,

faster access to surgery, and fewer transfers, allowing them to stay within their communities. Hospitals appreciate the shorter OR times, lower implant costs, and reduced length of stay. NTTOS benefit by being able to focus more on their elective clinics and surgeries, enabling them to see more patients and perform more procedures. When a practice hires skilled trauma-trained orthopedic surgeons who provide excellent patient care, the elective practice of NTTOS grow as word-of-mouth travels fast, especially in the digital age with online reviews.

The contract signed with the trauma surgeons and the hospital included several crucial covenants that contributed to the success of this transition. Without all these components, the success of this project would have been jeopardized. It has been understood for years that a fracture cleanup room is essential for efficiently caring for patients with infections and fractures from the emergency room[13-21]. The use of this operating room can only stay high if trauma physicians agree to have a doctor available during the day to use this room, rather than in elective clinics or performing elective surgeries as in the past system. Daytime trauma room use also helps eliminate nighttime surgeries and reduces the costs related to them. These conditions enable faster ER-to-OR times, lower length of stay (LOS), and cost savings. Each of these factors is vital for value-based care. The presence of a fracture cleanup room has been shown to improve operating room efficiency and enhance the quality of life for trauma surgeons, which is becoming increasingly important as modern medical demands grow[13].

Hospitals have experimented with many techniques over the past decade to incentivize physicians toward value-based care models. This has been particularly challenging with high-value implant adoption or when physicians switch from multiple vendors to a single vendor for implant choices. Despite data and publications that clearly show the clinical equivalency of high-value implants and the substantial cost savings[22-25], even hospital-employed physicians often resist change when millions of dollars are at stake. Gainsharing and co-management agreements have been highly effective in securing physician buy-in, as they allow physicians to retain a portion of the cost savings and benefit from improved outcomes[25]. This study clearly shows that this approach was successful and could be replicated at institutions nationwide to advance the value-based care initiative. The funds that trauma-trained orthopedic surgeons receive from gainsharing and co-management went directly to pay down overhead for the entire group so that all physicians can benefit and support the mission. This was important because ER patients sometimes require specialty care from fellowship-trained arthroplasty, hand, sports, or foot and ankle orthopedists, and partners are generally more willing to assist as a result of this model.

Because the total episode of care cost was included in the co-management portion of the agreement, physicians were also incentivized to collaborate in reducing overall OR costs and to establish formal protocols for pre- and postoperative care. All trauma surgeons agreed to use the same surgical cards, instruments, drapes, sutures, and so on. They also agreed on standardized protocols for hip fractures, preoperative antibiotics, and weight-bearing orders for the majority of fracture patterns and injury types, which helps reduce confusion among pre-op nurses, OR technicians, anesthesiologists, post-op nurses, physical therapists, and floor nurses.

The goal of any hospital operating room is often to increase the number of elective surgeries performed by each individual group. Providing call takers with dedicated operative time, anesthesia, and quality OR staff incentivizes physicians to bring elective cases to the hospital on days they are on call**.** This boosts hospital volume, improves patient access to care, and allows

physicians who typically work at multiple facilities to stay at a single hospital during the day, perform multiple operations, and care for multiple patients. An additional benefit for hospitals is that if trauma physicians are part of a large group practice and have a positive experience in the operating room, they may encourage their non-trauma colleagues to also bring well-paying elective cases to that hospital system.

CONCLUSION

Orthopedic emergency room call coverage by trauma-trained orthopedic surgeons results in increased orthopedic call case volume, faster transition from emergency room to operating room, shorter surgical times, reduced length of stay, lower spending on implants, fewer nighttime surgeries, and fewer transfers to higher levels of care. Providing orthopedic emergency room call coverage at a non-trauma-designated hospital by trauma-trained orthopedic surgeons, rather than non-trauma-trained surgeons, offers significant clinical and economic benefits to patients, surgeons, and hospitals. When surgeons are incentivized through gain-sharing and/or co-management agreements, along with designated fracture operating rooms and adequate call stipends, these arrangements can be highly successful.

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