

# Ambulatory Surgery Center Fracture Care: A Value-Based Opportunity

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**Objectives:** Due to improved regional anesthetic techniques, consistent patient outcomes, and economic incentives, fracture surgery is shifting from hospitals to ambulatory surgery centers (ASC). Orthopedic trauma surgeons now must compete for ASC block time against other orthopedic subspecialty cases such as Arthroplasty, Arthroscopy, and Spine. The purpose of this study was to identify which fracture cases are most suitable for the ASC setting, determine the key factors driving success in outpatient fracture surgery, and assess the value-based opportunity for the healthcare system.

**Design:** Retrospective comparative economic cohort study evaluating outpatient fracture surgery in an orthopaedic ambulatory surgery center compared with (1) hospital-based trauma surgery and (2) elective subspecialty cases performed in the same ASC.

**Setting:** Orthopaedic ambulatory surgery center compared with hospital-based outpatient surgical facilities.

**Patients/Participants:** 2,592 orthopedic trauma patients undergoing fracture surgery in the ASC and hospital setting, and 4,251 non-trauma orthopedic patients treated in an ASC from January 1 to December 31, 2023.

**Outcome Measures:** Fracture surgery CPT codes, location, volume, payments per case, cost margin per case, and cost savings.

**Results:** 319 fracture cases were performed in the ASC, and 569 outpatient fracture surgeries were conducted in a hospital-based setting. ASC-based fracture care showed an average savings of \$2,602 compared to hospital-based care for the 12 most common fracture surgeries. Overall, ASC fracture care generated \$315,810, while saving the healthcare system approximately \$830,000. If the additional 569 fracture cases were performed in the ASC, the center would benefit by an additional \$563,310, and the healthcare system would save an additional \$1,480,538.

**Conclusions:** ASC surgery has been shown to have lower costs while producing equivalent clinical outcomes to hospital settings. Orthopedic trauma fracture patients and surgeons should have access to care in these centers, but economic factors must be considered. Certain cases are financially beneficial for ASC treatment, but ASCs must prioritize clearance protocols, value-based implants, and efficient trauma fellowship-trained surgeons for successful implementation. The shift to ASC fracture care demonstrates clear benefits and offers significant savings to the healthcare system.

**Level of Evidence:** Level III – Retrospective comparative economic cohort study

**Key Words:** Ambulatory surgery center, value-based care, cost savings, orthopaedic trauma, outpatient fracture surgery.

## INTRODUCTION

Four fellowship-trained orthopedic trauma surgeons are part of a large private practice orthopedic group comprising 26 fellowship-trained orthopedic surgeons covering all subspecialties, including pediatrics and oncology. The group provides call services for the region's only Level II Trauma Center and five other hospital emergency rooms without trauma designations. Additionally, the practice operates three orthopedic urgent care locations. Each of these entities refers non-emergent fracture cases that may require surgery to our Orthopedic Trauma Service. Patients are seen for consultation in the office, and surgery is scheduled promptly if indicated. The group established a five-room ambulatory surgery center (ASC), which opened in 2000. Fracture cases that qualify are performed in the ASC depending on operating room (OR) availability.

**Table 1.** CPT code grouping used for data analysis based on fracture location.

Hardware removal	20680
Clavicle	23515
Proximal humerus	23615
Humeral shaft	24515, 24516
Olecranon	24685
Distal radius	25606, 25607, 25608, 25609
Unicondylar plateau	27535
Bicondylar plateau	27536
Patella	27524
Pilon	27827, 27828
Ankle	27814, 27822, 27823, 27792, 27766
Calcaneus	28415, 28406

In the United States, there has been a steady migration of orthopedic surgeries to the ASC setting due to lower infection rates<sup>1</sup>, decreased costs, and an equal or better safety profile compared to traditional hospital-based surgery.<sup>6-13</sup> Multiple factors have contributed to this shift, including the growth of physician-owned surgery centers<sup>14</sup>, improved regional anesthetic techniques<sup>15,16</sup>, availability of value-based implants<sup>17-19</sup>, and increased insurance approvals for outpatient surgical management of fractures. Orthopedic trauma surgeons and their patients now have the opportunity to benefit from ASC utilization. Changes in payor mix and reimbursement have also positively influenced ASC trauma case volumes.

Due to current reimbursement policies, hospital-based fracture care is more costly for patients and the healthcare system.<sup>4</sup> Moving outpatient or ambulatory fracture surgery from hospital-based operating rooms to the ASC setting offers a tremendous opportunity for cost savings and value-based care. It is our moral obligation as trauma surgeons to be responsible stewards of healthcare expenses while providing the highest standards of care.<sup>20</sup>

In addition to offering better value for patients and the healthcare system, the economic advantages of physician ownership are evident. Like any other business

venture, the goal is to maximize revenue while providing state-of-the-art medical care. Changes in outpatient status and reimbursement policies have led orthopedic ASCs to favor outpatient arthroplasty and spine surgery due to significant facility fees. This has resulted in a higher volume of patients and increased revenue for these centers. However, this creates competition for ASC OR space and can make it challenging for orthopedic traumatologists and their patients to benefit from the improved efficiency and more favorable patient experience.

The purpose of this study was to examine orthopedic fracture care provided by a large private practice orthopedic group in the ASC setting. This allowed for delineation of current ASC utilization and opportunities for expansion, determination of beneficial fracture cases suitable for ASC management, describing key success factors that enable fracture patients to be cared for in the ASC setting, calculating the financial incentive for physicians to move cases to the outpatient setting, and ultimately highlighting the value-based opportunity for the healthcare system.

**Table 2.** Case total for Orthopedic Trauma Service based on location.

ASC case total	319	12.3%
Hospital-based case total	2273	87.7%
Total cases	2592	

## METHODS

A retrospective analysis of all patients who underwent surgery by the four fellowship-trained orthopedic trauma surgeons in the practice was performed between January 1, 2023, and December 31, 2023. Institutional Review Board (IRB) approval was obtained. All trauma patients in the cohort had data collected, including surgical case location (hospital-based versus ASC), procedure Current Procedural Terminology (CPT) code, and payor type.

**Table 3.** Overall, 25% of hospital-based cases were treated on an ambulatory basis.

		<b>Cases</b>	<b>% of hospital case volume</b>
All hospital cases		2,276	100%
Inpatient cases		1,707	75%
Hospital ambulatory cases		569	25%
Hospital ambulatory cases subcategorized by anatomic location			
	<b>CPT</b>	<b>Cases</b>	<b>% of hospital case volume</b>
Distal radius	25606, 25607, 25608, 25609	107	4.7%
Ankle fx	27814, 27822, 27823, 27792, 27766	107	4.7%
Clavicle	23515	67	2.9%
HWR	20680	56	2.5%
Bicondylar plateau	27536	41	1.8%
Pilon	27827, 27828	37	1.6%
Unicondylar plateau	27535	33	1.5%
Humeral shaft	24515, 24516	31	1.4%
Proximal humerus	23615	29	1.2%
Patella	27524	25	1.1%
Olecranon	24685	21	0.9%
Calcaneus	28415, 28406	15	0.7%
<b>Total</b>		<b>569</b>	<b>25%</b>

To facilitate analysis, CPT codes were grouped according to fracture location (Table 1). For example, CPT 25606, 25607, 25608, and 25609 were combined and classified as distal radius fractures. This created 12 fracture types for analysis: clavicle, proximal humerus, humeral shaft, olecranon, distal radius, patella, unicondylar tibial plateau, bicondylar tibial plateau, tibial pilon, ankle, calcaneus fractures, and hardware removals.

For this analysis, the term “contribution margin” refers to the difference between total collections and direct implant-related expenses. This figure does not include other direct costs, such as disposable supplies. Nor does it account for indirect costs such as staffing, facility overhead, anesthesia, or administrative expenses. Contribution margin provides an estimate of per-case financial contribution toward the practice or ASC's fixed operating costs and potential distributions. This approach enables comparison of economic efficiency

across case types and subspecialties using a standardized margin above direct implant expenses.

Patients undergoing surgery for ambulatory fracture care were isolated by CPT code and analyzed by case location. This allowed for creation of an ASC and non-ASC cohort in order to calculate 2023 Orthopedic Trauma Service contribution margin for the practice and cost savings for the healthcare system generated by keeping patients out of hospital-based operating rooms.

Financial data, including payments made per CPT code, were accessed from the practice ASC database as well as available payment data points from the hospital. Payment data, including patient payments, Medicare payments, and the resulting total payments, were aggregated for available CPT codes. Similar diagnoses with multiple fixation CPT codes, such as ankle fracture fixation, distal radius fracture fixation, and humerus fracture fixation, were averaged when compiling total payment data.

**Table 4.** Payor mix for fracture cases.

Payor	ASC %	Hospital-based %
Managed Care Plans	53.4	21.0
State programs	18.7	28.8
Medicare	12.6	22.1
Medicare HMO	7.0	11.3
Commercial	4.3	1.9
Worker's Comp	2.7	2.1
Self-pay	1.3	1.6
Medicaid HMO	0.03	11.2

ASC contribution margin data was collected across subspecialties, including Trauma, Arthroplasty, Foot and Ankle, Spine, Hand, and Sports. No Pediatric or Oncology cases were performed in our ASC during the study period. Average contribution margin per minute and contribution margin per case were calculated. The contribution margin per case was aggregated from a comprehensive analysis of all cases performed at the ASC.

## RESULTS

From January 1, 2023, to December 31, 2023, a total of 6,843 orthopedic surgical cases were performed in the ASC by all orthopedic surgeons in the practice. The Orthopedic Trauma Service had a volume of 2592 total cases, with 319 (12.3%) completed in the ASC (Table 2). When evaluating potential opportunities for ASC surgical management, 569 patients with ambulatory-type fractures that could have been performed in the ASC but were instead taken to hospital-based operating rooms (Table 3). This represents 25% of the Orthopedic Trauma Service operative volume.

The patient payor mix for ASC fracture cases had several differences compared to the payor mix for hospital-based fracture cases. Hospital-based fracture cases had a higher proportion of government-assisted health plans, including Medicare, Medicaid, and other state-specific programs (Table 4). In contrast, the payor

mix for ASC fracture cases had a much higher proportion of private health plans, including commercial plans and Managed Care plans.

Payment data was available and analyzed for the top 12 most common ambulatory fracture surgeries. This enabled comparison of cost differences between ASC and hospital-based procedures for the same fracture type (Table 5). In all cases, hospital-based fracture care was significantly more expensive for the healthcare system. Humeral shaft fixation (CPT 24515, 24516) resulted in the largest cost/payment difference (\$4,041) between the hospital-based setting and the ASC. Hardware removal (CPT 20680) had the lowest payment difference (\$1,240), however still substantial. Including all CPTs, the average payment difference was \$2,602 per case, favoring the ASC setting.

ASC contribution margin data across all subspecialties was analyzed, and our four trauma-trained surgeons had an average contribution margin per case of \$990 (Table 6). The Orthopedic Trauma Service's average contribution margin per case was significantly less than Arthroplasty or Spine, only slightly less than Sports (\$1039), but more than Hand partners (\$774). Average contribution margin per minute of OR time per specialty was also examined, with the Trauma service averaging \$18.73 per minute (Table 7). There was a wide variation among trauma surgeons, with an average contribution margin of \$24.20/min for surgeon 1, \$22.29/min for surgeon 2, \$5.46/min for surgeon 3, and \$3.47/min for surgeon 4 (Table 8). The top trauma physicians had shorter OR times and higher use of value-based implants instead of conventional ones. These two surgeons had a contribution margin per minute greater than four-fifths of sports surgeons, two-thirds of hand surgeons, and one-third of foot and ankle surgeons.

Overall, ASC fracture care generated \$315,810 while saving the healthcare system \$830,038. If the 569

**Table 5.** Average payment per CPT grouping, comparing hospital-based payments to ASC payments.

CPT	Average Payment (\$)		
	Hospital-based	ASC	Difference
Humerus fixation (24515, 24516)	12,498	8,457	<b>4,041</b>
Pilon fixation (27827, 27828)	13,749	9,912	<b>3,837</b>
Proximal humerus fixation (23615)	13,415	9,738	<b>3,677</b>
Patella fixation (27524)	7,564	4,140	<b>3,424</b>
Olecranon fixation (24685)	7,469	4,971	<b>2,498</b>
Calcaneus fixation (28406, 28415)	7,924	5,584	<b>2,340</b>
Ankle fixation (27766, 27792, 27814, 27822, 27823)	6,366	4,160	<b>2,206</b>
Distal radius fixation (25606, 25607, 25608, 25609)	6,703	4,637	<b>2,066</b>
Bicondylar plateau fixation (27536)	13, 521	11,479	<b>2,042</b>
Unicondylar plateau fixation (27535)	7,589	5,618	<b>1,971</b>
Clavicle fixation (23515)	6,027	4,142	<b>1,885</b>
Hardware Removal (20680)	2,497	1,257	<b>1,240</b>
<b>Average payment difference</b>			<b>2,602</b>

fracture cases done in a hospital setting had been performed in the ASC, the ASC would have benefited an additional \$563,310, and the healthcare system would have saved an additional \$1,480,538.

**DISCUSSION**

Value-based healthcare should serve as a guiding principle in the modern healthcare algorithm given the unsustainability of rising healthcare costs. Orthopedic trauma surgeons must be conscious of the cost of care given the vulnerability of their patient population. Although one may think that private practice physicians with a physician-owned center would increase the cost of care, this is not accurate. In 2022, the ASC under study was ranked among the best ambulatory surgery centers in the U.S. by Money and The Leapfrog Group.<sup>21</sup> The Leapfrog Group is a nonprofit organization that helps consumers access safe, high-value care. They have compiled and published data on patient safety and quality of care for over 20 years. Based on their criteria, this surgery center provides quality, value-based care for patients with fractures and hopefully will provide a model for success for other aspiring ASCs by outlining potential opportunities for trauma patients. The center has implemented several successful strategies that enable it to be a highly efficient and profitable center.

The guiding principles of any physician-owned ASC center should be to never compromise patient care or regulatory compliance. Operating rooms should run under the premise of maximum utilization and efficiency. This means placing patient care first and reducing costs through a variety of initiatives, from patient clearance to improved regional anesthesia to the standardization of case cards and utilization of high-value implants. With turnover times under 15 minutes, dedicated orthopedic surgical technicians, dedicated orthopedic nurses, and anesthesiologists efficient at regional blocks, the ASC is an extremely attractive workplace for all surgeons in the practice. Much of the OR time is reserved for Arthroplasty, Spine, and Sports services.

**Table 6.** ASC contribution margin (reimbursement less implant expenses) per case by sub-specialty team

Sub-specialty	Contribution Margin
Joints	\$4707
Spine	\$4144
Foot & Ankle	\$2326
Sports	\$1039
<b>Trauma</b>	<b>\$990</b>
Hand	\$774

**Table 7.** Average contribution margin (reimbursement less implant expenses) per minute of OR time by sub-specialty team.

Sub-specialty	Contribution Margin
Joints	\$68.23
Spine	\$56.34
Foot and Ankle	\$33.30
Hand	\$24.76
<b>Trauma</b>	<b>\$18.73</b>
Sports	\$15.92

The aim of this study is for fracture patients and orthopedic trauma surgeons alike to benefit from data demonstrating the financial viability and cost savings of fracture care in the ASC setting.

Our data demonstrates a significant opportunity for improvement of ASC utilization by trauma surgeons and patients. Currently, trauma physicians perform about 12% of their total cases annually at the ASC (Table 2), with a clear opportunity for growth. Many cases, such as pelvis fractures, open fractures, and hip and femur fractures, must always be treated in the hospital for patient safety reasons.

**Table 8.** Trauma surgeon's contribution margin (reimbursement less implant expenses) per minute of OR time at the ASC.

Traumatologist	Contribution Margin
Surgeon #1	\$24.20
Surgeon #2	\$22.29
Surgeon #3	\$5.46
Surgeon #4	\$3.47

Additionally, all infection-related cases remain hospital-based to preserve the benefit of low ASC infection rates for elective spine and arthroplasty cases. This data suggests that, with current volumes, roughly 25% more patients each year could benefit from the efficiency, low infection rates, and improved patient experience of fracture surgery in the ASC setting. Most ASCs have limited capacity due to the high volume of elective orthopedic surgery being performed. Due to

intense competition for availability at the ASC, data was needed to evaluate the value and profitability of outpatient fracture surgery compared to more traditional outpatient orthopedic procedures like arthroscopy, arthroplasty, and hand surgery.

Analyzing available payment data demonstrated clear and significant cost reduction for fracture surgery performed at an ASC compared to hospital-based surgery (Table 5). The biggest difference arises because the government and other payors reimburse hospitals significantly more for the same procedure to reward their inefficiency and higher costs. Combining the concept of increased utilization of the ASC for ambulatory fracture surgery with significant cost reduction per case has the ability to make a substantial financial impact for both patients and the healthcare system. One could argue that cost containment in fracture surgery from an implant standpoint is easier to standardize compared to other subspecialties. At our center, a large proportion of the savings was due to the use of high-value implants (Orthopedic Implant Company) rather than traditional vendors (Stryker, Smith and Nephew, TriMed). Conventional and high-value implants are used at both the trauma center and the ASC under similar pricing contracts. No increase in complication rates was observed between vendors, and this reflects prior published data on this topic.<sup>18,19,22</sup> In hospitals, physicians often have little to no financial incentive for cost containment due to lack of widespread adoption of gainsharing or co-management agreements<sup>23,24</sup>, but physician-owned ASCs promote greater cost awareness. This extends beyond implants. We have standardized surgical case cards, implemented cost savings through draping techniques, eliminating popoff sutures, and opting for ¾ drapes instead of C-Armor, etc. Many of these changes were described in previous publications by our authors.<sup>17</sup>

Physician-owned ASCs also benefit from this data as it demonstrates the potential increased volume that fracture surgery and trauma partners within the group can provide. Fracture surgery completed by trauma-trained surgeons has proven to be more efficient and cost-effective compared to non-trauma-trained partners.<sup>25</sup> The contribution margin per case data of the different subspecialties also demonstrates that trauma cases generate a greater or near-equivalent contribution margin per case compared to Sports and Hand partners (Table 6), which are two major service lines occupying much of the elective block time. This data suggests that trauma surgeons and fracture patients warrant the same consideration for block time from a financial standpoint.

The difference in profitability among our trauma surgeons is striking (Table 8). It emphasizes the point that patient selection, physician selection and value-based implant selection are of vital importance to ASC-based fracture surgery. Extremely difficult cases, less efficient surgeons, or cases not amenable to value-based implants should remain in the hospital setting. This is not “cherry picking” or “lemon dropping,” as some non-business-trained orthopedic surgeons might suggest. It is simply about getting the right patient to the right place at the right time for the benefit of physicians, patients, and the healthcare system. The definition of value is outcome divided by cost, and this distribution accomplishes that goal.

ASC surgery is far more efficient than hospital-based surgery, with shorter turnover times and dedicated orthopedic circulating nurses and scrub technicians.<sup>26</sup> Orthopedic trauma surgeons, accustomed to the delays in hospitals, can finally enjoy the benefits that their elective partners take for granted. Dedicated orthopedic nurses and scrub technicians, high first-start percentages, low PACU dwell times, and quick turnover times all boost trauma surgeon efficiency. It is also likely that surgical

time decreases, but with 26 physicians in the practice, that data is difficult to accurately obtain.

Orthopedic trauma patients are known to present preoperative clearance difficulties compared to other elective orthopedic outpatient surgical patients. Initially, the ASC was difficult for orthopedic traumatologists and their patients because of these hurdles. The development of a Pre-Admission Surgical Screening (PASS) Clinic has proven to be an effective way to overcome this barrier to entry. Prior to institution of the PASS clinic, only American Society of Anesthesiologists (ASA) I and II patients were done at our ASC. Now, most ASA III patients can be safely cleared for outpatient surgery. This practice has been done with success at hospitals, and its utilization has been vital to the success of our traumatologists getting cases approved at our ASC and to provide safe outpatient care for fracture patients.

Improvements in anesthesia and post-operative care have been critical to fracture patient care in the ASC setting. Hiring anesthesiologists trained in peripheral nerve blocks has allowed surgeons to perform cases that previously required in hospital care, such as tibial plateau, tibial pilon, and calcaneus fractures. These are high-reimbursement cases for the ASC, and effective pain control is the key factor for discharge home. Immediate on-site postoperative physical therapy is another factor for success, as it allows patients to be cleared for safe discharge home. While dedicating a therapist to the ASC does cost money but allows the practice to benefit from the facility fee in the surgery center, providing DME such as walkers or crutches, and enhances patient satisfaction. These benefits clearly outweigh the costs of a dedicated therapist for the ASC.

Although moving surgery from hospital-based facilities to ASCs may impact hospital systems financially, this is good for patient care. It frees up hospital orthopedic trauma ORs for trauma patients that require inpatient surgery. It also allows patients with

nonemergent fractures take advantage of the improved experience and lower costs of ASC. This improves overall access to orthopedic trauma specialty care both at the ASC and hospital, and saves money for the entire healthcare system. Access to care is a key performance indicator of the American healthcare system, and increased ASC use for fracture patients helps ensure they receive the right care, in the right place, at the right time.

This study has recognized limitations. Being retrospective in nature, there are inherent biases that could be introduced due to its' design. Additionally, polytrauma patients or those with open fractures, who also have other ambulatory fractures treated in the same setting as their injuries requiring a hospital setting. These patients had clavicle, distal radius, and ankle fractures fixed during their hospitalization. They were not excluded to maintain consistent hospital-based versus ASC cohorts when analyzing cost and payment data. Finally, due to the heterogeneity of each patient's situation—such as medical comorbidities, injury severity, and concomitant injuries—a direct link between insurance type and surgical location could not be established, and only general observations could be made.

### CONCLUSION

ASC surgery has been shown to have lower costs and equivocal clinical outcomes compared to hospital settings. Orthopedic trauma fracture patients and surgeons should have access to care at these centers, but economic factors must be considered. Certain cases are financially advantageous for ASC treatment, but ASCs must focus on using PASS clinic protocols, value-based implants, and trauma fellowship-trained surgeons for successful implementation. The shift from hospital-based to ASC surgical fracture care demonstrates clear financial benefits to physicians while offering significant savings to the healthcare system.

### Potential Conflicts of Interest

One author (PA), has stock ownership of Zeda Holdings, Inc.

For the remaining authors, none were declared.

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