



## Original research

## Access to Total Knee Arthroplasty for Military Insured Patients

Payton Yerke Hansen, BS <sup>a</sup>, Brandon Macknofsky, BS <sup>a</sup>, Cara E. Busheme, BS, MS <sup>a</sup>,  
 Clyde K. Fomunung, BS, MBA <sup>b, c</sup>, Alessia C. Lavin, MD <sup>b, c</sup>, Carlos A. Fernandez, MD <sup>b, c</sup>,  
 Vani Sabesan, MD <sup>b, c, \*</sup>

<sup>a</sup> Charles E. Schmidt College of Medicine Florida Atlantic University, Boca Raton, FL, USA

<sup>b</sup> Department of Orthopaedics, JFK/University of Miami, Palm Beach, FL, USA

<sup>c</sup> Palm Beach Shoulder Service at Atlantis Orthopaedics, Lake Worth, FL, USA

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## ABSTRACT

**Background:** Rigorous training may lead to increased rates of knee osteoarthritis and arthroplasties in military service members. Given the large numbers of arthritis and the increasing need for total joint replacements, access to appropriate care can be difficult for this population based on insurance restrictions. The aim of this study was to evaluate access to total knee arthroplasty for TRICARE patients in contracted civilian medical facilities.

**Methods:** Orthopedic surgeons contracted to perform total knee replacements in the state of Florida were identified via TRICARE's website. Investigators used a secret shopper methodology with a standardized script to request an appointment for their family member for a total knee arthroplasty using either TRICARE Select or BlueCross preferred provider organization. The appointment acceptance rates, wait times, call duration, and accuracy of the physician listing were collected.

**Results:** A total of 228 offices that perform total knee arthroplasties in Florida were successfully contacted. Overall, 43.1% of the clinics had an inaccurate online listing, and 207 (91%) were able to schedule an appointment with TRICARE, compared to 93% for BlueCross Blue Shield ( $P = .06$ ). The average wait for TRICARE patients was 24 days and 18 days for BlueCross ( $P < .01$ ). Call times for TRICARE patients averaged 7.2 minutes, compared to 5.2 minutes for BlueCross ( $P < .01$ ).

**Conclusions:** TRICARE patients encountered longer waiting periods and inaccurate provider listings when accessing orthopedic care. Our results suggest a disparity in healthcare access for patients using TRICARE, which may result in negative health outcomes from receiving delayed care.

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## Introduction

Military personnel have unique healthcare needs that differ from the civilian population. Due to the rigorous military training and daily activities, service members have 50% increased rates of osteoarthritis compared to age-matched civilians and a higher incidence compared to civilian populations [1–4]. Primary and secondary osteoarthritis commonly affects the knees in military personnel and is among the leading diagnoses found in active-duty service members that have been medically separated from active duty [5–7]. This increased rate of osteoarthritis necessitates a

higher rate of joint arthroplasty, and a majority of arthroplasty procedures are performed by TRICARE contracted civilian orthopedic surgeons rather than military treatment facility (MTF) surgeons [3,8–10].

TRICARE is the military health insurance program that provides health coverage to service members and their families. It allows members' access to both MTF and contracted civilian medical facilities [11]. TRICARE provides near-universal healthcare coverage; however, the military lifestyle provides unique challenges that impact access to healthcare, such as frequent relocations, on average every 2–3 years, and a lack of accessibility to specialty health services [12]. After each relocation, these families are required to establish new relationships with healthcare providers. Additionally, because most military service members join between the ages of 18 and 22, many retire from the military long before

\* Corresponding author. Palm Beach Shoulder Service at Atlantis Orthopaedics, 4560 Lantana Rd Suite 100, Lake Worth, FL 33463, USA. Tel.: +1 561 453 2939.

E-mail address: [sabes001@gmail.com](mailto:sabes001@gmail.com)

they are eligible for Medicare, and these retired veterans also utilize the TRICARE insurance. After retirement, access to healthcare is dependent on location [13]. While retirees still receive the amenities offered through the Veterans Affairs, they are largely limited by contracted civilian medical facilities due to low acceptance rates [2]. Anand et al. (2020) found that 74% of primary care physicians self-reported that they accept new TRICARE patients, which is a much lower rate compared to self-reported new patient acceptance rates for Medicare and private insurance (83% and 87%, respectively) [2,14]. Furthermore, studies have shown that physicians tend to overestimate their practice acceptance rates for new patients based on insurance type [14,15]. The difficulty in finding available providers and the lack of providers accepting this particular insurance creates a barrier in maintaining continuous care for this population [12,15,16].

Interestingly, MTF primary care physicians refer patients to specialists more often than civilian physicians [2]. Furthermore, it is projected to be more difficult to secure an appointment when seeking elective procedures performed by a specialist, such as total knee arthroplasty [17]. Patients undergoing total knee arthroplasties wait approximately 12 weeks longer than what is clinically recommended (23.8 weeks vs 12 weeks) to secure an appointment [17]. Delays in orthopedic care can result in prolonged preoperative pain and function as well as an increased risk for postoperative complications [18]. Therefore, it is important to identify if patients enrolled in TRICARE Select experience similar barriers to access specialized care in the civilian sector.

The aim of this study was to analyze the access and potential barriers to obtaining total knee arthroplasty procedures for TRICARE patients in contracted civilian medical facilities compared to privately insured patients.

## Material and methods

An online search was conducted using the “Find a Surgeon” tool on the publicly available TRICARE website to identify TRICARE-contracted orthopedic surgeons within the state of Florida who perform total knee arthroplasties. Concierge medicine clinics, emergency departments, and urgent care centers were excluded from the call list. Additionally, inaccurate or disconnected phone numbers were recorded. The phone numbers, addresses, and number of listings per physician contacted were documented and verified for accuracy.

Each physician was assigned a number through a random number generator, and each physician was contacted in ascending order. Trained investigators contacted each office to make an appointment for a fictitious family member using a blocked phone number. The investigator used a standardized script and validated secret shopper protocol [19] to limit interpersonal variation (Appendix). The investigator specifically asked if each physician could provide a second opinion for their family member who was recently evaluated and told they needed a complex knee arthroplasty by a different orthopedic surgeon. In this scenario, the family member had TRICARE Select insurance. TRICARE Select was used because it is a preferred provider organization (PPO) plan that would provide the closest comparison to BlueCross PPO plans. This scenario was then duplicated with the family member having BlueCross PPO insurance. Overall, the scenario involved 2 separate phone calls to each orthopedic office, and each phone call was 1 week apart to avoid caller recognition. The date of each phone call and given appointment was recorded, as well as the time spent on the phone call.

The office locations, appointment acceptance rates, wait times to appointment, length of call, and accuracy of the physician listing were collected as outcome variables. Listing accuracy was

determined by conducting a Google search of the physician's name and state of practice. The results of the Google search were then compared to the information listed on the Tricare website. County demographics were obtained from the 2020 Decennial Census. The waiting period for an appointment was calculated as the number of days from the date of the call to the date of the soonest appointment. Statistical analyses were performed to compare acceptance rates using a chi-squared test, and independent sample t-tests were used to compare waiting periods. A logistic regression analysis was performed to detect whether the number of veterans and median household income in the county were significant predictors of successfully securing an appointment for patients or increased wait times. Statistical significance was considered with a  $P$  value  $< .05$ .

## Results

A total of 260 orthopedic offices were identified in the state of Florida from the TRICARE website, with 228 orthopedic surgeons that performed knee arthroplasties. The overall success rate of being offered an appointment with TRICARE Select was 91%, and the success rate for BlueCross PPO was 93% ( $P = .06$ ). Additionally, 10 offices only accepted TRICARE Select as a secondary insurance, and this stipulation was never encountered with BlueCross PPO. Twenty-one offices did not accept TRICARE, and of those, only 8 were able to recommend another surgeon who would accept TRICARE. The observed acceptance rates were independent of the county median income ( $P = .46$ ) and the number of veterans in the area ( $P = .42$ ) (Table 1).

There was a significantly higher average wait time for patients with TRICARE Select (24 days) compared to an average wait time for BlueCross PPO patients of 18 days ( $P < .01$ ). The wait times also varied by county, and TRICARE patients had longer wait times in 83% of counties (Table 2). The observed waiting periods were independent of the county median income ( $P = .14$ ) and the number of veterans in the area ( $P = .47$ ) (Table 2).

Call times for TRICARE patients were significantly longer compared to BlueCross patients, with an average call time for TRICARE of 7.2 minutes and 5.2 minutes for BlueCross ( $P < .01$ ). The TRICARE “Find a Physician” website had numerous inaccurate listings. Of the 260 clinics contacted, 112 (43.1%) had either an inaccurate phone number or an inaccurate address listed. Many of the physicians contacted were listed multiple times with different phone numbers and addresses. The number of listings per physician ranged from 1 to 8.

## Discussion

TRICARE insurance provides care to military service members and their dependents, allowing its recipients access to both military and civilian medical facilities. Additionally, while on active duty, healthcare costs are completely covered by TRICARE, but when a military service member retires, they do have enrollment fees, copayments, and prescription costs, typically at a lower cost compared to private insurance plans. TRICARE also has the added benefit of providing healthcare coverage overseas in Europe, Africa, Latin America, Canada, and the Pacific Islands. To address the costs for retirees, TRICARE can be paired with a supplemental insurance program to minimize the costs for veterans while still receiving healthcare coverage [20]. These benefits need to be considered when discussing the tradeoffs with access and provision of total joint care in our study.

Most military-related arthroplasty procedures are performed by TRICARE network civilian orthopedic surgeons rather than at military facilities. This pattern is likely due to military retirees and their families integrating into the civilian population system after

**Table 1**

The acceptance rates for TRICARE and BlueCross insurances for orthopedic offices contacted in the state of Florida. Acceptance rates are organized by county and compared to the percent of veterans and mean household income in each county.

County	TRICARE accepted (%)	BlueCross accepted (%)	Percent veteran (%)	Median household income
Alachua	89	100	5.6	\$49,689
Bay	80	100	12.1	\$54,316
Brevard	100	100	10.9	\$56,775
Broward	100	100	3.8	\$59,547
Charlotte	100	100	12.0	\$51,499
Citrus	100	100	12.8	\$44,237
Clay	86	100	12.0	\$65,740
Collier	100	100	7.1	\$69,653
Duval	100	100	8.6	\$55,807
Escambia	100	100	10.6	\$50,915
Flagler	80	100	9.4	\$54,514
Gulf	100	100	11.2	\$47,712
Hernando	100	100	9.8	\$48,812
Highlands	100	100	10.0	\$40,942
Hillsborough	86	95	6.3	\$58,884
Indian River	100	100	9.6	\$54,740
Jackson	75	75	8.5	\$39,872
Lake	75	100	8.9	\$54,513
Lee	86	100	7.4	\$57,832
Leon	83	100	5.1	\$53,106
Manatee	100	100	8.0	\$59,009
Marion	67	100	9.9	\$45,371
Miami-Dade	100	83	1.8	\$51,347
Monroe	100	100	8.8	\$70,033
Nassau	100	100	9.8	\$69,943
Okaloosa	100	100	15.5	\$63,412
Okeechobee	100	100	7.5	\$41,760
Orange	71	71	4.5	\$58,254
Osceola	100	100	4.6	\$52,279
Palm Beach	78	94	5.4	\$63,299
Pasco	100	100	8.4	\$52,828
Pinellas	100	100	8.6	\$54,090
Polk	100	100	6.7	\$50,584
Putnam	50	100	9.4	\$37,670
Santa Rosa	100	100	13.2	\$67,949
Sarasota	100	100	9.6	\$62,236
Seminole	75	100	5.8	\$66,768
St. Johns	100	100	7.7	\$82,252
St. Lucie	100	100	7.5	\$52,322
Sumter	100	100	14.7	\$57,226
Taylor	100	100	6.5	\$40,306
Volusia	100	100	9.1	\$49,494
Walton	100	100	9.0	\$58,093

**Table 2**

The wait times for scheduled evaluation by an Orthopaedic Surgeon for a total knee replacement based on TRICARE and BlueCross insurances for orthopedic offices contacted in the state of Florida. Wait times are organized by county.

County	TRICARE wait time (d)	BlueCross wait time (d)
Alachua	21.3	12.0
Bay	19.7	11.8
Brevard	28.2	24.5
Broward	22.4	17.5
Charlotte	25.0	21.8
Citrus	30.7	19.3
Clay	29.5	19.7
Collier	25.8	19.2
Duval	22.8	15.3
Escambia	24.8	24.4
Flagler	41.8	24.0
Gulf	13.0	13.0
Hernando	25.0	18.0
Highlands	29.0	19.0
Hillsborough	24.5	18.6
Indian River	21.0	15.5
Jackson	28.3	23.3
Lake	23.0	19.7
Lee	16.5	16.8
Leon	14.0	17.2
Manatee	15.5	17.8
Marion	20.0	13.5
Miami-Dade	30.0	19.8
Monroe	36.0	20.0
Nassau	34.5	24.0
Okaloosa	26.4	19.0
Okeechobee	9.5	11.0
Orange	26.8	13.3
Osceola	22.0	22.0
Palm Beach	25.9	15.1
Pasco	23.6	20.2
Pinellas	15.7	16.6
Polk	24.8	15.8
Putnam	28.0	21.0
Santa Rosa	21.3	19.0
Sarasota	23.2	12.8
Seminole	31.7	20.0
St. Johns	25.0	22.5
St. Lucie	25.0	17.5
Sumter	32.0	24.0
Taylor	21.4	18.8
Volusia	18.5	10.5
Walton	51.0	14.0

their time served in the military [8]. An estimated 7.2 million people in the United States are living with hip and knee replacements, which are projected to increase by 85% in both the military and civilian sectors as the American population continues to age [21–23].

Even with more arthroplasties being performed by TRICARE network civilian orthopedic surgeons, our results demonstrated significantly longer wait times and difficulty accessing appropriate providers in their network when compared to BlueCross insured patients. This lack of access and longer wait times can lead to a lack of treatment or delays in treatment. These results are compounded by the fact that TRICARE patients encountered more barriers to care from appropriate orthopedic specialists, such as mandatory primary care referrals and incorrect listings on the TRICARE website. Delayed access to healthcare has been found to have negative health outcomes as well as decreased patient satisfaction [24]. Specifically, evidence suggests patients undergoing total knee arthroplasty who had severe functional impairment at the time of surgery had worse 3-year outcomes when compared to patients who underwent a total knee arthroplasty at a higher level of function [25]. Additionally, Fortin et al. (2002) identified that

patients with lower functionality scores prior to total knee arthroplasty had poorer functional status up to 2 years post-operatively, which makes delays in care concerning [26]. Furthermore, patients with delayed surgeries performed functional activities at a lower level (with greater pain and difficulty) than patients with shorter waiting times [27]. Other metrics, such as the role of the preoperative health-related quality of life score, can serve as a predictor of postoperative outcomes. In a study by Garbuz et al., it was found that there was a negative impact on functionality and health-related quality of life scores when total hip replacement was delayed by more than 6 months [28]. A delay in total knee arthroplasty can lead to significant progression and deterioration of a patient's osteoarthritis condition and negatively impact postoperative outcomes for total joint replacements, leading to muscle deconditioning, loss of mobility, and a lack of ability to exercise and rehabilitate after surgery [27,28].

Additionally, it is important to note that with a delay in total knee arthroplasty, there is a potential for increased pain and use of opioids, as opioids are commonly prescribed to alleviate pain in cases of severe osteoarthritis. According to the 2011 U.S. Army Posture Statement, pain is the leading cause of both short- and long-term disability in the military, and previous studies have

shown a substantial increase in opioid misuse in the military sector [29–31]. Research suggests preoperative opioid usage is highest for total joint arthroplasty patients [30]. A study by Berger et al. found that patients who underwent total hip or total knee replacements had relatively high levels of pain and opioid usage (58% reported opioid usage) and a significant increase in total healthcare-related costs in the 2-year period preceding surgery [31]. With such a large number of patients utilizing opioids to control their pain prior to total knee arthroplasty, any delay in surgery could potentially result in an even greater number of patients requiring opioids to manage their pain.

Military personnel also have access to the US Department of Veterans Affairs (VA), albeit with reported issues. Miller et al. found that veterans reported challenges in accessing and coordinating care in VA facilities. These complaints stemmed from decreased access to care in rural locations, low staff recruitment and retention, as well as the unavailability of specialty services [32]. Furthermore, the wait times varied across the types of specialty services. Specifically, orthopedics and optometry had a longer wait time than other specialty services for veterans living in rural and urban areas [33,34]. In 2018, 37% of rural veterans waited over 30 days for orthopedic services in the VA. Furthermore, black and Hispanic veterans were more likely to have longer wait times in comparison to their white counterparts [33,35]. As a result of such issues with the VA, veterans often opt to use healthcare facilities in the civilian sector, and there are still delays in their care, which is evidenced by our study. This only further highlights the disparity in healthcare that military members are encountering and the delays impacting orthopedic care specifically.

Our study also found that orthopedic surgeons were less likely to accept patients who were insured under TRICARE. Anand et al. found that the most common reasons physicians don't accept TRICARE patients are insufficient reimbursement rates, difficulty in navigating reimbursement and referrals in the TRICARE system, lack of coverage for their medical specialty, and lack of familiarity with the program [2]. Therefore, increasing reimbursement, clear navigation coordinators, and specialty coverage may increase acceptance rates. Furthermore, these findings underscore the need for better information dissemination to physicians.

While this study provides some important insights into the access of total knee arthroplasties using TRICARE insurance, it is not without limitations. Specifically, our calls were made during the summer months, which are commonly used for vacation time. This could increase our waiting time for appointments. Furthermore, there is a wide variation in the number of orthopedic surgeons listed on the TRICARE website. We encountered many counties within the state of Florida that do not have any orthopedic surgeons who perform knee arthroplasties listed on the TRICARE website. Some offices also required insurance information that was beyond the scope of the script, so we were unable to establish an appointment date. Finally, our study did not take into account cancellations by other patients, which would influence the wait times. However, our goal was to focus on the patient experiences in scheduling an appointment.

## Conclusions

TRICARE patients encountered more barriers to accessing care, including longer waiting periods, a lack of accurate listings, and a lack of recommendations for other appropriate TRICARE providers. Our results suggest a disparity in healthcare access for military members and their families, with increased difficulty in securing an appointment. This results in a delay of care, which has potential negative health outcomes and decreased patient satisfaction.

## Conflicts of interest

V. J. Sabesan receives research support from Arthrex, Inc., Orthofix, Inc., Wright Medical Technology, Inc. V. J. Sabesan also serves as a consultant to Zimmer Biomet and Restor3D. V. J. Sabesan serves as a board or committee member for the following organizations: Florida Orthopaedic Society, ISTA, and the Journal of Shoulder and Elbow Surgery. The other authors, their immediate families, and any research foundation with which they are affiliated have not received any financial payments or other benefits from any commercial entity related to the subject of this article.

For full disclosure statements refer to <https://doi.org/10.1016/j.artd.2023.101143>.

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