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Title: **Risk of 30-day Readmission after Knee or Hip Replacement in Rheumatoid Arthritis and Osteoarthritis by non-Medicare and Medicare Payer Status**
Running Title: **Readmission Risk after Arthroplasty**

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Abstract

Objective

To determine the indication and risk of 30-day rehospitalization after hip or knee replacement among rheumatoid arthritis (RA) and osteoarthritis (OA) by Medicare and non-Medicare status.

Methods

Using the Nationwide Readmission Database (2010-2014), we defined an Index hospitalization as an elective hospitalization with a principal procedure of total hip or knee replacement among adults aged ≥18 years. Primary payer was categorized as Medicare or non-Medicare. Survey logistic regression provided the odds of 30-day rehospitalization in RA relative to OA. We calculated the rates for principal diagnoses leading to rehospitalization.

Results

Overall, 3.53% of 2,190,745 index hospitalization had a 30-day rehospitalization. Patients with RA had a higher adjusted risk of rehospitalization after TKR (Odds Ratio [OR], 1.11; 95% Confidence Interval [CI], 1.02 to 1.21) and THR (OR, 1.39; 95% CI, 1.19 to 1.62). Persons with RA and OA did not differ with respect to rates of infections, cardiac events, or postoperative complications leading to the rehospitalization. After TKR, RA patients with Medicare had a lower VTE risk (OR, 0.58;95% CI, 0.58 to 0.88) while post-THR those with RA had a greater VTE risk (OR, 2.41;95% CI, 1.04 to 5.57).

Conclusion

RA patients had a higher 30-day rehospitalization than OA after TKR and THR regardless of payer type. While infections, postoperative complications, cardiac did not differ, there was a significant difference in venous thromboembolism as the rehospitalization's principal diagnosis.

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Introduction

Joint Replacement is cost-effective and associated with improvements in quality of life, function, and patient satisfaction.[1–4] It serves as an alternative when medical interventions are no longer alleviating symptoms. Such is the case for patients with severe joint damage resulting from end stage osteoarthritis (OA) or rheumatoid arthritis (RA) with poor response to medications resulting chronic synovitis and progressive erosive arthritis.

Several adverse events potentially requiring rehospitalization after total joint replacement surgery include infections[5–8], cardiovascular events[9,10], venous thromboembolism[11–14], and mortality[15–17]. Current literature on readmission rates after major joint replacement shows high variability with respect to the post-operative follow-up time, age and specific underlying joint disease of study populations, and methods for accounting for and the number of potential confounders considered.[18–29] A number of studies have assessed risk after joint replacement among patient with RA.[20,22,29–32] To date, the majority of studies have either evaluated a 90-day follow-up period, were limited to a single institution or to a specific aged population such as Medicare beneficiaries.

Using a large population-based sample representative database of U.S. hospitalizations including both non-Medicare and Medicare patients, we describe the risk of 30-day rehospitalization along with the principal diagnosis for the rehospitalization among persons with RA and OA after primary total hip or knee replacement while accounting for comorbid conditions.

Methods

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We conducted a cross sectional analysis using the 2010 thru 2014 Nationwide Readmissions Database (NRD), Healthcare Cost and Utilization Project (HCUP), Agency for Healthcare Research and Quality. NRD databases have been described elsewhere.[28,29] Briefly, NRD is a publicly available database which includes approximately 28 million annual hospital discharges along with linkage variables to allow patient tracking for readmission within the same calendar year. As a complex survey design database, it requires the incorporation of discharge-level weights to generate national estimates. Additionally, in the calculation of standard errors it requires the data elements of stratification and clusters. The NRD, a limited dataset, is not subject to HIPAA review by an Institutional Review Board (IRB).[30]

We defined an index admission as an elective hospitalization among persons aged ≥ 18 years, including a principal procedure of primary total hip replacement or primary total knee replacement, and alive at discharge. Excluded were hospitalizations in the month of December in order to ensure a 30-day post-discharge follow-up period since linkage across calendar years is not possible. The *International Classification of Diseases*, *Ninth revision*, Clinical Modification (ICD-9) codes were used to extract the principal procedure and diagnoses in the index hospitalization along with the principal diagnosis for the rehospitalization. Principal procedures of primary total hip replacement (81.51), total knee replacement (81.54), along with diagnoses of RA(714), OA(715), and comorbid conditions were extracted using their ICD-9 codes. Patients were categorized as RA if both RA and OA diagnoses were present. The primary payer for the index hospitalization was categorized as either Medicare or non-Medicare where non-Medicare included Medicaid, private insurances, self-pay, no charge, or other payer.

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The main outcome of interest was a 30-day rehospitalization defined as the first rehospitalization within 30-day time period after discharge from the index hospitalization. We considered the reason for the 30-day rehospitalization to be represented by the principal diagnosis listed. The principal diagnoses of primary interest included cardiac events, strokes, venous thromboembolism, infections, acute renal failure, and post-procedural complication principal diagnoses (see Supplemental Table 1). Briefly, cardiac diagnoses included acute coronary syndrome, acute myocardial infarction, acute congestive heart failure, and dysrhythmias. Venous thromboembolic events included diagnoses of deep venous thromboembolism or pulmonary embolism. Infections were categorized as either localized or distant to the surgical site. Infections localized to the surgical site consisted of ICD-9 diagnoses including an infection and inflammatory reaction due to internal joint prosthesis (ICD-9: 996.66) or other postoperative infection (ICD-9: 998.59). Infections not localized to the surgical site included sepsis, pneumonia, superficial infections of the skin and abscesses, or infections involving the upper or lower genitourinary tract were referred to as distant infections. Post-procedural complications were extracted using ICD-9 codes 998 and 996 (See Supplemental Table 1). For example, a dislocation of prosthetic joint was identified by using ICD-9 996.42 and a hematoma complicating a procedure by using ICD-9 998.12. We defined a composite event as the occurrence of a cardiac event, stroke, venous thromboembolism, infection, acute renal failure, or a post-procedural complication.

Statistical Analysis

Categorical variables were expressed as weighted frequencies (±standard error (SE)) and percentages (%). Continuous variables were expressed as means (±SE). The Rao-Scott Chi-

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Square test was used to test the association between the categorical variables. Survey logistic regression provided the odds of outcomes among persons with RA relative to OA. The regression models included an unadjusted model (Model 1), Model 2 represents Model 1 plus age and gender; Model 3 represents Model 2 plus comorbid conditions including coronary artery disease, hypertension, diabetes mellitus, chronic kidney disease, chronic pulmonary disease, chronic heart failure, cancer. All statistical tests were based on a two-sided test with a significance level of 0.05 and accounted for the survey design features of NRD in order to provide population-based estimates. All statistical analyses were conducted using SAS statistical software (SAS Institute Inc., Carey, NC).

Results

There were 2,190,745 index hospitalizations for TKR or THR of which 67,059 were persons with RA and 2,123,686 with OA (see Supplemental Table 2). Persons with RA were younger (64.38±0.10 vs. 65.79±0.06 years (y); p< 0.001), more likely to be female (75.59% vs. 59.62%; p< 0.001), and to have coexisting conditions of chronic heart failure (CHF) (2.57% vs. 1.93%; p< 0.001), and chronic obstructive pulmonary disease (COPD) (19.17% vs. 14.13%; P< 0.001), while less likely to have hypertension (HTN) (64.27% vs. 65.36%; p=0.003).

A total of 2,184,477 (99.7%) of the 2,190,745 index hospitalizations had non-missing payer information including 1,207,899 (55.29%) with Medicare and 976,578 (44.71%) with non-Medicare (Table 1). Among the non-Medicare hospitalization, persons with RA were less likely to have coronary artery disease (CAD) (4.20% vs 4.71%; p=0.04), diabetes mellitus (DM) (15.99% vs 16.92%; p=0.04), but more likely to have CHF (1.41% vs 0.91%; p=0.0001), and COPD (16.81% vs 13.04%; p<0.0001). Among the Medicare hospitalizations, persons with RA were

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less likely to have hypertension (HTN) (69.3% vs 71.6%; p<0.0001), CAD (9.45% vs 10.19%; p=0.01), DM (20.48% vs 21.95%; p=0.0002), but more likely to have CHF (3.37% vs 2.75%; p=0.0003), and COPD (20.77% vs 15.02%; p<0.001). A significantly greater proportion of patients with RA were younger than 65 years of age as compared to those with OA in the Medicare group (22.03% vs 10.10%; <0.001).

The principal procedure was THR in 513,848 (23.46%) and TKR in 1,676,897 (76.54%) hospitalizations. Tables 2 and 3 display patient characteristics by joint replacement type among persons with non-Medicare and Medicare, respectively. In both types of joint replacement surgeries and payer types, there was a higher prevalence of CHF and COPD and lower prevalence of HTN among patients with RA. In both non-Medicare and Medicare patients who underwent TKR, there was a lower prevalence of CAD, HTN, and DM in persons with RA.

Study Outcomes

The overall 30-day readmission rate was 77,196 (3.53%). The readmission rate was higher when comparing persons with RA to OA (4.02% vs 3.52%; p=0.0003) and those with Medicare versus non-Medicare as payer (4.13% vs 2.80%; p <0.0001). The 30-day readmission rate after TKR was 3.55% which did not significantly differ between persons with RA and OA among those with non-Medicare (3.12% vs 2.83%; p=0.16) or Medicare (4.26% vs 4.10%; p=0.47). The readmission rate after THR was 3.47%. Persons with RA had a higher readmission rate after THR among both non-Medicare (3.85% vs 2.63%; p=0.005) and Medicare (5.51% vs 4.16%; p=0.002) payers.

As shown in Table 4, the adjusted odds of 30-day rehospitalization after TKR was significantly higher (OR, 1.11; 95% CI, 1.02 to 1.21) in persons with RA as compared to OA. In analysis by

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payer type, the increased risk was limited to those with non-Medicare (OR, 1.15; 95% CI, 1.001 to 1.32) but not Medicare (OR, 1.04; 95% CI, 0.93 to 1.16). After THR, the risk of 30-day readmission was higher among patients with RA, a finding which was consistent overall (OR, 1.39; 95% CI, 1.19 to 1.62) and by non-Medicare (OR, 1.45; 95% CI, 1.10 to 1.91) and Medicare (OR, 1.27; 95% CI, 1.05 to 1.54) as payer.

The study composite event, which included cardiac events, strokes, venous thromboembolism, infections, acute renal failure, and post-procedural complication principal diagnoses accounted for 36,665 (47.49%) of the 77,196 30-day rehospitalizations with the remaining hospitalizations due to alternate principal diagnoses. Patients with RA and OA did not differ in the proportion of rehospitalizations due to the composite event (49.7% vs 48.93%; p=0.66).

The principal diagnosis for the rehospitalization was an infection in 14,425 (18.69%), a postoperative complication in 11,815 (17.74%), a venous thromboembolic event in 5,349 (6.93%), and a cardiac diagnosis in 3,174 (4.11%). Rehospitalizations with an infection, including both local and distant to surgical site, as the principal diagnosis did not significantly differ between RA and OA (20.97% vs 18.60%; p=0.09). Infections distant to the surgical site occurred in 1,579 (4.96%) and those localized to the surgical site accounted for 10,598 (13.73%) of the rehospitalizations with no significant difference between RA and OA in local (14.51% vs 13.70%; p=0.50) or distant infections (6.47% vs 4.90%; p=0.06). Figure 1 displays the rates of infections listed as primary indicators for 30-day rehospitalization. Regardless of payer type, persons with RA and OA did not differ significantly in the rate of local, distant, or overall infections.

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Figure 2 displays the rates of cardiac, venous thromboembolic, and postoperative complications as the indication for the 30-day rehospitalization. There was no significant difference between RA and OA in either cardiac events or postoperative complications after TKR or THR. After TKR, RA patients with Medicare had a significantly lower rate of VTE as compared to OA (4.2% vs 7.1%; p=0.01) while the difference in VTE events among non-Medicare patients did not reach statistical significance (5.5% vs 8.7%; p=0.06). After THR, in contrast to non-Medicare patients, Medicare patients with RA had a significantly higher rate of VTE as the principal diagnosis for the rehospitalization (9.0% vs 3.9%; p=0.03). RA patients with Medicare had a lower risk of VTE (OR, 0.58;95% CI, 0.58 to 0.88) after TKR while post-THR those with RA had a greater VTE risk (OR, 2.41;95% CI, 1.04 to 5.57).

Discussion

In this large population-based sample representing U.S. hospitalization with a primary total hip and knee replacement, both non-Medicare and Medicare patients with RA were at a greater risk for 30-day rehospitalization after THR, and non-Medicare patients with RA after TKR, as compared with those with OA. Nearly half of the rehospitalizations were due to infections, postoperative wound complications, cardiac events, or venous thromboembolic events. Infections accounted for approximately one in five rehospitalizations. While both non-Medicare and Medicare patients with RA had a slightly higher rate of rehospitalization with an infection as a principal diagnosis after TKR and THR, the differences with patients with OA was not of statistically significance. The proportion of 30-day rehospitalizations with postoperative wound complications or cardiac reasons as the etiology for 30-day rehospitalization after TKR and THR

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did not differ between patients with RA and OA in either the non-Medicare or Medicare populations. While Medicare patients with RA had a significantly higher risk of venous thromboembolic events post-THR, patients with OA had a higher proportion of readmissions due to venous thromboembolic event after TKR. Overall, patients with RA had a higher risk for 30-day rehospitalization than those OA. The increased rehospitalization among patients with RA was not due to differences in infections, cardiac events, or postoperative complications.

Rehospitalizations represent a major concern after major joint surgery. The need for a rehospitalization within a 30-day time period is of both clinical and economic significance.[33–35] Among Medicare beneficiaries, the 30-day readmission rate after major joint replacement has been reported to range from 5.9% to 8.5% for the time periods 1991-1992 to 2007-2008 and 6.2% for 2006 through 2015.[18,19] Single center studies which were not limited to Medicare beneficiaries reported a 30-day readmission rate of 6.2% and 4.4% after primary knee and hip replacement, respectively.[20,21] Studies with a focus on patients with inflammatory arthritis have also reported on the risk for readmission after replacement.[22,28,31] Singh et al. reported arthritis-specific 90-day readmission rate after knee or hip replacement to be 8.5% and 6.7% in persons with RA and OA, respectively.[22] Based on an age- and gender-matched study population of 768 persons with RA and 3,940 with OA included in the Taiwan National Health Insurance Research Database, Kang et al. reported that 90-day readmission rates were higher in patients with RA (14.2%) versus OA (11.3%).[31] Our study provides the 30-day readmission risk among persons with RA versus OA after primary joint replacement among a nationally representative U.S. study population. In our cohort, the crude 30-day readmission rate was 3.5% which was significantly higher among RA than OA (4.0% vs 3.5%; p=0.0003). Patients with

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RA who underwent primary TKR and THR had a 11% and 39% increase in the odds of 30-day rehospitalization than patients with OA.

Infections, including prosthetic joint infections, represent a major post-operative concern after joint replacement surgery. Factors such as immunosuppressant medications, increased operating time, hematoma, surgical site infection along with several comorbid conditions including obesity, malignancy, RA have been associated with increased risk for prosthetic joint infections.[36] The association between RA and infections may be due to factors such as disease-related altered immune state, co-exiting comorbid conditions, and the immunosuppressive treatment regimens including corticosteroids, conventional Disease Modifying Anti-Rheumatic Drugs (DMARDs), and biologic DMARDs. George et al. reported the rate of post-operative hospitalized infections occurring within 30 days among Medicare participants with RA who underwent elective hip or knee replacement as 9.0%.[19] In a matched case-control study patients with RA had two-fold higher risk of serious infections.[37] Among patients receiving knee replacement, Stundner et al. reported a significantly higher rate of infections among persons with RA versus OA (4.5% vs. 3.8%; P<0.01).[38] As for post-hip replacement, a higher incidence of sepsis (0.40% vs. 0.14%; P<0.01), pneumonia (1.21% vs. 0.80%; P=0.0036), and all other infections (6.32% vs. 4.38%; P<0.01) was reported by Stundner et al. in persons with RA versus OA.[39] In contrast, a study by Michaud et al. using data from the Veterans Affairs Surgical Quality Improvement Program to compare the 30-day post-operative hip and knee replacement rate of infections found no significant difference in the rates of infection rates (4.17% vs. 4.15%; P=0.97) or in the relative risk between the RA and OA groups (OR, 1.02; 95% CI: 0.72 to 1.47).[40] Our study assessed the risk of both local and distant

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infections at 30-days after primary TKR and THR. Our findings did not find a significant difference between patients with RA and OA with respect to the risk of infections a finding that was consistent among non-Medicare and Medicare patients.

In addition to infections, other postoperative complications, such as wound dehiscence, hematoma, and seroma could complicate patient recovery. Dislocation, for example, can be a potential early complication after hip replacement. The rates and contributing factors to post-operative hip dislocation after hip replacement have been previously published.[32,41–43] Dislocation rates as high as 11% have been reported after hip replacement[32], and is reportedly more common in patients with RA. Ravi et al. reported that the rate of hip dislocations after hip replacement was 2.6% and 1.2% among patients with RA versus OA, respectively.[30] Zwartele et al. reported on dislocation more than a three-fold greater risk among those with relative to without inflammatory arthritis.[32] The results of our study did not reveal any significant difference between RA and OA with respect to post-operative complications including dislocation of internal joint prothesis, wound disruption, postoperative seroma or hematoma.

Studies reporting on the risk of venous thromboembolic disease among patients with RA have been mixed with some reporting a higher risk while others decreased or similar risk as compared with patients with OA.[12,44–46] We found the rate of venous thromboembolic events at 30-days post-TKR and also among non-Medicare patients who underwent THR to be lower among patients with RA as compared with OA. In contrast, Medicare patients with RA had a higher rate of venous thromboembolic events as compared with those with OA after THR. Several possibilities may account for our finding. First, given our need to rely on ICD codes

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provided in the NRD to capture diagnoses there may have been missed patient characteristics or diagnoses that could have led to differential outcomes. Alternatively, patients with RA may have had greater limitations in their mobility either before and/or after THR leading to a greater risk of venous thromboembolic events. There may also have been a differential detection bias in the post-THR phase. Lastly, we could not account for either the duration nor the severity of inflammation, either in acute or chronic phases, in the patients with RA which could have impacted hypercoagulability.

It is important to highlight several of the strengths and limitations of our study. The main strength of our study is the use of a nationally representative U.S. study population which included patients with and without Medicare. Several limitations of our study include lack of information on medication use including immunosuppressive used to treat RA, functional status, duration and severity of rheumatoid arthritis, as well as specific details regarding the operation such as duration of operative, type of prosthetic implant. Since NRD lacks patient identifiers the possibility of multiple index hospitalization for the same patient undergoing primary THR and TKR cannot be excluded.

In summary, patients with RA are at a significantly higher risk for a 30-day rehospitalization after both primary total knee and hip replacement surgery in both non-Medicare and Medicare payer population. There was no significant difference between patient with RA and OA with respect to infections, postoperative complications, or cardiac events at a 30-day follow-up period. However, there was a statistically higher rate of venous thromboembolism as the indication for readmission in patients with RA and Medicare.

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Table 1. Characteristics by Rheumatoid Arthritis and Osteoarthritis Status by Insurance Type Status

Characteristic	Non-Medicare (n=976,578)			Medicare (n=1,207,899)		P Value
	Arthritis Type			Arthritis Type		
	RA	OA	P Value	RA	OA	
	n(%)	n(%)		n(%)	n(%)	
Age			<0.001			<0.001
18 to 64	23,437(86.99)	808,699(85.16)		8,796(22.03)	117,911(10.10)	
65 and older	1,549(13.01)	140,939(14.84)		31,123(77.97)	1,050,069(89.90)	
Female	19,926(73.96)	531,668(55.99)	<0.001	30,644(76.77)	731,009(62.59)	<0.001
Surgery			<0.001			0.0001
Hip	5,590(20.75)	237,871(25.05)		8,270(20.72)	261,290(22.37)	
Knee	21,350(79.25)	711,767(74.95)		31,649(79.28)	906,690(77.63)	
CAD	1,131(4.20)	44,707(4.71)	0.04	3,774(9.45)	119,011(10.19)	0.01
CHF	380(1.41)	8,712(0.91)	0.0001	1,343(3.37)	32,074(2.75)	0.0003
DM	4,310(15.99)	160,713(16.92)	0.04	8,177(20.48)	256,330(21.95)	0.0002
Cancer	56(0.21)	2,583(0.27)	0.27	186(0.47)	7,105(0.61)	0.06
HTN	15,287(56.74)	547,796(57.68)	0.12	27,677(69.33)	836,297(71.60)	<0.0001
CKD	561(2.08)	18,316(1.93)	0.31	1,973(4.94)	26,222(5.26)	0.17
COPD	4,528(16.81)	123,830(13.04)	<0.0001	8,290 (20.77)	175,442(15.02)	<0.001
VHD	642(2.38)	18,245(1.92)	0.01	1,598(4.00)	47,610(4.08)	0.70

Abbreviations: CAD represents coronary artery disease; CHF, Congestive Heart Failure; DM, Diabetes Mellitus; HTN, Hypertension; CKD, Chronic Kidney Disease; PVD, Peripheral Vascular Disease; COPD, Chronic Obstructive Pulmonary Disease; VHD, Valvular Heart Disease.

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Table 2. Characteristics among Non-Medicare Insured by Type of Arthritis and Joint Replacement

Characteristic	Knee Replacement (n=733,116) Arthritis Type RA (n=21,350) n(%)	Knee Replacement (n=733,116) Arthritis Type OA (n=711,767) n(%)	P Value	Hip Replacement (n=243,462) Arthritis Type RA (n=5,590) n(%)	Hip Replacement (n=243,462) Arthritis Type OA (n=237,871) n(%)	P Value
Age			<0.001			0.83
18 to 64	18,521(86.75)	599,961(84.29)		4,916(87.94)	208,738(87.75)	
65 and older	2,829(13.25)	111,806(15.71)		674(12.06)	29,133(12.25)	
Female	3,258(73.95)	82,860(55.30)	<0.001	30,644(76.77)	731,009(62.59)	<0.001
CAD	915(4.29)	34,627(4.87)	0.04	215(3.85)	10,080(4.24)	0.47
CHF	306(1.43)	6,849(0.96)	0.002	74(1.33)	1,863(0.78)	0.03
DM	3,609(16.90)	133,817(18.80)	0.0002	702(12.55)	26,896(11.31)	0.13
Cancer	35(0.16)	1,869(0.26)	0.13	22(0.39)	52(0.30)	0.50
HTN	12,517(58.63)	429,211(60.30)	0.02	2,770(49.54)	118,585(49.85)	0.82
CKD	460(2.15)	14,712(2.07)	0.62	101(1.81)	3,604(1.52)	0.30
COPD	3,707(17.36)	97,191(13.65)	<0.0001	821 (14.69)	26,639(11.20)	<0.001
VHD	516(2.42)	13,954(1.96)	0.02	126(2.25)	4,291(1.80)	0.16

Abbreviations: CAD represents coronary artery disease; CHF, Congestive Heart Failure; DM, Diabetes Mellitus; HTN, Hypertension; CKD, Chronic Kidney Disease; PVD, Peripheral Vascular Disease; COPD, Chronic Obstructive Pulmonary Disease; VHD, Valvular Heart Disease.

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Table 3. Characteristics among Medicare Insured by Type of Arthritis and Joint Replacement

Characteristic	Knee Replacement (n=733,116) Arthritis Type RA (n=31,649) n(%)	OA (n=906,690) n(%)	P Value	Hip Replacement (n=243,462) Arthritis Type RA (n=8,270) n(%)	OA (n=261,290) n(%)	P Value
Age			<0.001			<0.001
18 to 64	6,965(22.01)	91,267(10.07)		1,830(22.13)	26,643(10.20)	
65 and older	24,684(77.99)	815,423(89.93)		6,440(77.87)	234646(89.80)	
Female	16,403(76.83)	418,614(58.81)	<0.001	3,523(63.02)	113,054(47.53)	<0.001
CAD	3,003(9.49)	92,131(10.16)	0.04	771(9.32)	26,879(10.29)	0.16
CHF	1,020(3.22)	25,034(2.76)	0.01	323(3.91)	7,040(2.69)	0.01
DM	6,706(21.19)	210,721(23.24)	<0.001	1,472(17.80)	45,609(17.46)	0.68
Cancer	133(0.42)	5,315(0.59)	0.05	53(0.64)	1,790(0.69)	0.78
HTN	22,218(70.20)	658,387(72.61)	<0.001	5,459(66.01)	177,910(68.09)	0.03
CKD	1,558(4.92)	48,405(5.34)	0.11	415(5.02)	13,046(4.99)	0.96
COPD	6,496(20.52)	136,797(15.09)	<0.0001	1,794 (21.69)	38,645(14.79)	<0.001
VHD	1,226(3.87)	36,198(3.99)	0.56	372(4.50)	11,784(4.37)	0.79

Abbreviations: CAD represents coronary artery disease; CHF, Congestive Heart Failure; DM, Diabetes Mellitus; HTN, Hypertension; CKD, Chronic Kidney Disease; PVD, Peripheral Vascular Disease; COPD, Chronic Obstructive Pulmonary Disease; VHD, Valvular Heart Disease.

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Table 4. Risk of 30-Day Readmission and Composite Adverse Events after Index Hospitalization for Primary Joint Replacement

	Model 1 OR [95%CI]	Model 2 OR [95%CI]	Model 3 OR [95%CI]
Total Knee Replacement			
30-Day Readmission			
Overall	1.08[0.99,1.17]	**1.14[1.04,1.24]**	**1.11[1.02,1.21]**
By Payor Type			
Non-Medicare	1.10[0.96,1.26]	**1.16[1.01,1.33]**	**1.15[1.001,1.32]**
Medicare	1.04[0.94,1.16]	1.05[0.94,1.17]	1.04[0.93,1.16]
Composite Event			
Overall	1.03[0.87,1.23]	1.07[0.90,1.27]	1.05[0.89,1.25]
By Payor Type			
Non-Medicare	1.23[0.95,1.59]	**1.32[1.02,1.71]**	**1.31[1.01,1.70]**
Medicare	0.96[0.78,1.19]	0.96[0.78,1.19]	0.95[0.77,1.17]
Total Hip Replacement			
30-Day Readmission			
Overall	**1.43[1.23,1.67]**	**1.45[1.24,1.70]**	**1.39[1.19,1.62]**
By Payor Type			
Non-Medicare	**1.48[1.12,1.96]**	**1.50[1.13,1.98]**	**1.45[1.10,1.91]**
Medicare	**1.34[1.11,1.62]**	**1.31[1.09,1.59]**	**1.27[1.05,1.54]**
Composite Event			
Overall	1.01[0.76,1.35]	0.99[0.74,1.32]	1.00[0.74,1.33]
By Payor Type			
Non-Medicare	0.91[0.54,1.55]	0.86[0.51,1.46]	0.84[0.50,1.42]
Medicare	1.07[0.74,1.55]	1.05[0.73,1.51]	1.07[0.74,1.54]

Abbreviations: OR represents Odds Ratio; CI, Confidence Interval.
Model 1 represents unadjusted model; Model 2 represents Model plus age and gender; Model 3 represents Model 2 plus comorbidities (coronary artery disease, hypertension, diabetes mellitus, chronic kidney disease, chronic pulmonary disease, chronic heart failure, cancer).

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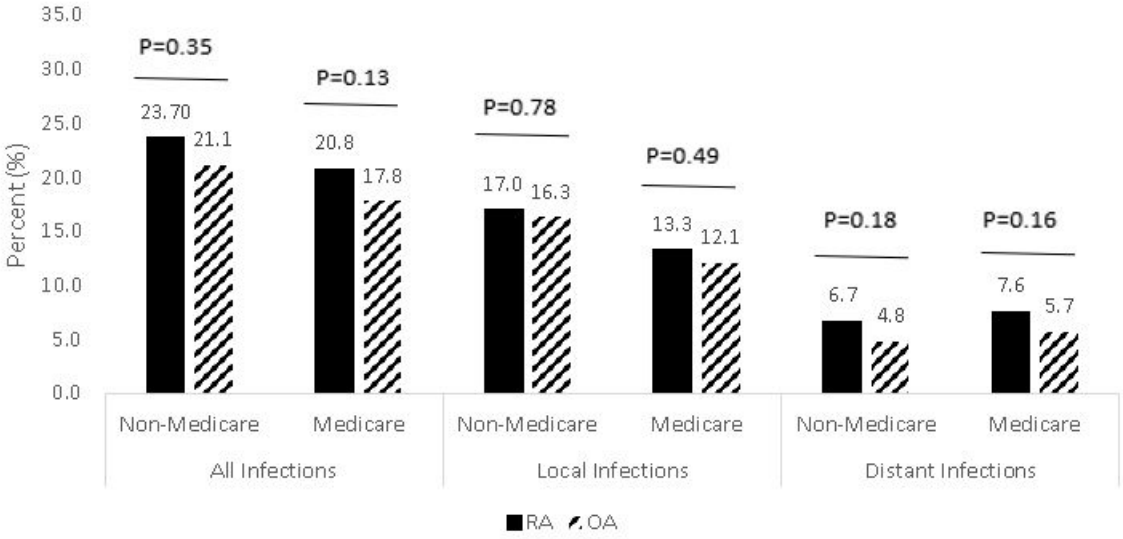
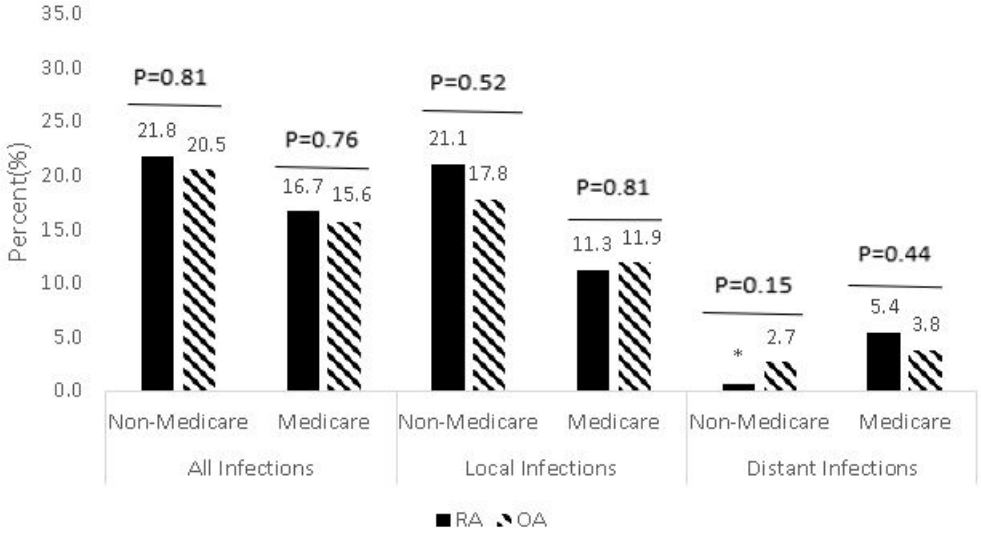
Figure 1. Infectious Indication for 30-day Readmission rates

A. Total Knee Replacement



B. Total Hip Replacement



* Cell sizes n <10 not reported as per HCUP reporting recommendations

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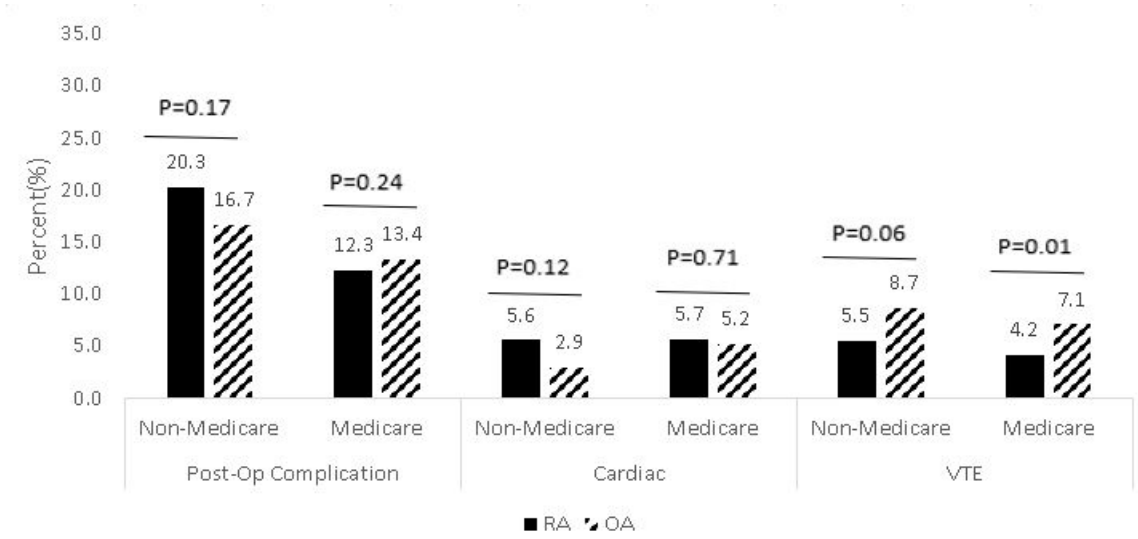
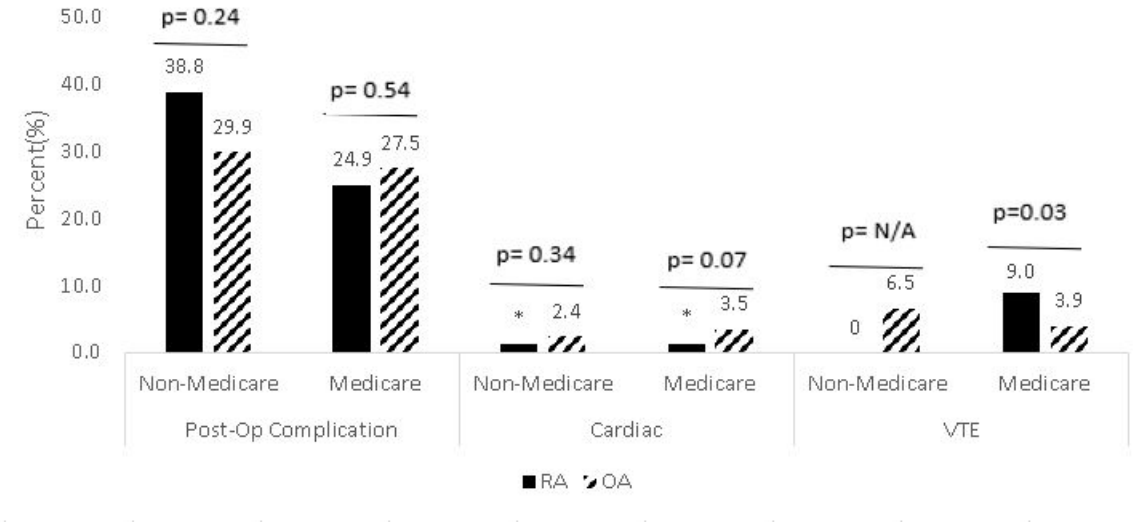
Figure 2. Cardiac, Venous Thromboembolic, and Other Post-Operative Complication Indication for 30-day Rehospitalization

A. Total Knee Replacement



B. Total Hip Replacement



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Correction

Risk of 30-day Readmission After Knee or Hip Replacement in Rheumatoid Arthritis and Osteoarthritis by Non-Medicare and Medicare Payer Status

Ali Yazdanyar, Anthony Donato, Mary Chester Wasko, and Michael M. Ward

J Rheumatol 2022; doi:10.3899/jrheum.201370

Figure 2 was printed incorrectly and is a duplicate of Figure 1. The figure legends are correct.

This correction applies to the print edition and the First Release published online on December 15, 2021. The correct Figure 2 appears online. We apologize for this error.

doi:10.3899/jrheum.201370.C1