Health care disparities in surgical treatment of rotator cuff disease

Dane H. Salazar, MD, MBA, Ryan Moossighi, BS, Isabel Reedy, BS, Andrew Kim, BS, Hassan Farooq, MD, Nickolas G. Garbis, MD

Loyola University Health System, Department of Orthopedic Surgery and Rehabilitation, Maywood, IL, USA

Stritch School of Medicine, Loyola University, Maywood, IL, USA

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**Background:** Health care disparities have been well-documented in literature to affect care and recovery after surgery. Insurance type is regularly cited by orthopedic surgeons to play a role in the incongruences faced by patients in the perioperative period. Recent trends highlight an increased reluctance by some insurance companies to approve indicated surgery. Our primary objective was to assess insurance type and how it affects approval rates for rotator cuff debridement and rotator cuff repair.

**Methods:** A retrospective review of 999 patients who underwent arthroscopic rotator cuff debridement or repair was conducted. Data abstraction included demographics, prior surgical or nonsurgical interventions, radiologic imaging, insurance type, and denial of insurance coverage. Patients were grouped by insurance type—Medicaid, Medicare, workers’ compensation, and private insurance. Univariable and multivariable logistic regression models were developed to estimate odds ratios (ORs) for insurance type associated with the denial of insurance coverage.

**Results:** Nine hundred ninety-seven patients were included in our final analysis. Those with private insurance were more likely to be non-Hispanic white (71%), whereas the proportion of Hispanics was highest among those with workers’ compensation (27%) and Medicaid (20%). There were no significant differences by insurance type for prior nonsurgical interventions and radiologic imaging. For previous surgical interventions (13%), however, rates were higher for Medicaid (18%) and workers’ compensation (17%) than those for Medicare (12%) and private insurance (9%) (\(P = .003\)). Compared with private insurance, the odds of insurance denial were significantly higher for those with Medicaid at 54% (OR: 7.91, 95% confidence interval: 5.27-11.88, \(P < .001\)) and workers’ compensation at 19% (OR: 1.71, 95% confidence interval: 1.04-2.81, \(P = .04\)).

**Discussion:** One in 2 patients with Medicaid coverage faces insurance denial compared with any other insurance type. Workers’ compensation follows with the second highest rates. Almost half the Hispanic population are insured by either Medicaid or workers’ compensation and may face barriers to care that can negatively impact outcomes and complication rates.

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All patients arthroscopically treated with débridement or total rotator cuff repair were included, and those <18 years old, pregnant, or immunocompromised were excluded. The demographic data collected for analysis included age, gender, race and ethnic background, zip code of residence, history of medical comorbidities, and tobacco usage. Nonoperative interventions before surgery were recorded and included injections (both corticosteroid and visco-supplementation), oral steroid medications, oral nonsteroidal anti-inflammatory or cyclooxygenase-2 inhibitor (n = 710, 71.3%). The most common comorbidities included hypertension (n = 364, 36.5%), diabetes (n = 181, 18.2%), and hyperlipidemia (n = 98, 9.8%), with nearly one-quarter past or current smokers (n = 237, 23.8%). Patients with Medicare were older than all other payer categories (66 ± 8 years). Those with workers’ compensation were predominantly male (70.3%, n = 121). Those with private insurance were more likely to be non-Hispanic white (71.3%), whereas the proportion Hispanic was higher among those with workers’ compensation (27.3%) and Medicaid (20.3%). Comorbidities were generally more prevalent in those with Medicare (Table I).

Nearly all patients received prior magnetic resonance imaging (n = 962, 96.7%) and an x-ray (n = 940, 94.3%). Over two-thirds received treatments including corticosteroid injection (n = 666, 66.9%), physical therapy (n = 697, 70.0%), and an oral nonsteroidal anti-inflammatory or cyclooxygenase-2 inhibitor (n = 710, 71.3%). There were no significant differences by the payer among these prior treatment characteristics except for receipt of a previous surgical intervention (n = 132, 13.3%), where rates were higher for Medicaid (n = 42, 18.2%) and workers’ compensation (n = 30, 17.4%) than those for Medicare (n = 23, 12.4%) and private (n = 37, 9.1%) insurance (P < 0.003) (Table II).

The rates of denials were similar for those who previously received corticosteroid injections (22.1%, 147/666) compared with those who did not (23.9%, 79/330) (P = 0.50). Furthermore, the addition of previous corticosteroid injections to the multivariable models did not substantially modify the association between the insurance type and the odds of denial.

Discussion

When do differences in orthopedic surgery access become disparities in care? Whitehead et al defined a disparity as a difference
parities as COX2 of a difference is required.5 The Institute of Medicine de
et al added that a detailed understanding of the nature and etiology
is decided. consensus de
pro
believed to have collected hundreds of millions of dollars in extra
finances during the COVID-19 pandemic, in large part for services
for not accepting Medicaid included low reimbursement rates,
20%, and Washington DC
45%, Houston
¼
50%, Los Angeles
¼
45%, New York
¼
15%, Denver
¼
20%, and Chicago
¼
70.9%.
Insurance denials require substantial time, energy, effort, and
resources from both providers and health care organizations to
appeal and overturn. The reality is that some providers and orga-
nizations do not have the time, incentive, or resources to advocate
for and overturn treatment denials on behalf of their patients.
These appeal processes and “peer reviews” are disruptive to the
health care providers’ practices and patient care activities. In
addition, they often require substantial administrative support and
resources.

Despite varied practice models, this issue affects all of us indi-
vidually, and the societal responsibility should be borne by us
collectively. The American Academy of Orthopaedic Surgeons
Principles of Medical Ethics and Professionalism in Orthopaedic
Surgery state that “an orthopedic surgeon has a responsibility not
only to the individual patient, to colleagues, and orthopedic
surgeons in training, but also to society as a whole. Activities that
have the purpose of improving the health and well-being of the patient
and or the community in a cost-effective way deserve the interest,
support, and participation of the orthopedic surgeon.”

In spite of this guidance, patients with state-funded insurance
plans encounter substantial disparities in their access to musculo-
skeletal care.16 As per the most recent report from the Centers
for Medicare and Medicaid Services, Medicare or Medicaid insures
more than 70.5 million Americans.1 A 2017 survey found that less
than 50% of orthopedic surgery practices surveyed accepted
Medicaid insurance, and in 9 major US cities, acceptance rates were
below 50% (Atlanta = 25%, Dallas = 20%, Denver = 35%, Detroit =
45%, Houston = 45%, Los Angeles = 15%, Miami = 15%, New York =
20%, and Washington DC = 30%).10 Reasons among surgeons given
for not accepting Medicaid included low reimbursement rates,
administrative burdens, patients’ nonmedical needs, challenges
keeping appointments, and compliance with treatment plans.

In a nationwide orthopedic survey, Labrum et al found that adult
patients with Medicaid insurance had limited access to care in 32% of
orthopedic practices: 37% of private and 13% of academic prac-
tices.13 In addition, patients with Medicaid were less likely to be
offered an appointment within 2 weeks (36% vs. 89%).13

that is inequitable, unjust, or unacceptable.12,19 In 2003, Braveman
et al added that a detailed understanding of the nature and etiology
of a difference is required.5 The Institute of Medicine de
parities as “racial or ethnic differences in the quality of health care
that are not due to access-related factors or clinical needs, prefer-
ences, and appropriateness of intervention.”16 However, there is no
consensus definition of health care disparity because it relies
heavily on “who is deciding what is avoidable and unjust and how it
is decided.”

Our study highlights the fact that simply possessing health care
insurance does not eliminate hurdles to timely, quality, and
accessible orthopedic care when it comes to a common diagnosis
such as rotator cuff pathology. Patients with state-backed Medicaid
insurance plans were most likely to have denial of surgical treatment
of their rotator cuff disease (n = 125, 54.3%), followed by
workers’ compensation (n = 33, 19.2%), private insurance (n = 51,
12.5%), and Medicare (n = 17, 9.2%). Compared with private insurance
and adjusting for age, sex, race, number of comorbidities, and
prior treatments, the odds of insurance denial were significantly
higher for those with Medicaid (OR: 7.91, 95% CI: 5.27-11.88) and
workers’ compensation (OR: 1.71, 95% CI: 1.04-2.81) (Table III).
Thus, in spite of exhaustive nonoperative treatment and docu-
mentation of on-going debilitating pain, patients had a statistically
significant difference in denial rates for surgical intervention for
their rotator cuff disease depending solely on the insurance type.

Several recent reports have documented substantial revenue
increases for the five for-profit insurance companies that run the
Medicaid programs in our state.11 Those insurance carriers are
believed to have collected hundreds of millions of dollars in extra
profits during the COVID-19 pandemic, in large part for services
never provided to patients.11 An analysis of the quarterly and yearly
financial reporting of the five Medicaid insurance carriers in our
state demonstrated unprecedented surge in recent profits. Three of
the Medicaid companies (Meridian, IlliniCare, and Molina) reported
a combined increase of nearly 300 million dollars during the nine-
month stretch of the height of the pandemic compared with the
same time period of the prior year.11

| Treatment | Overall (N = 997) | Medicaid (N = 232) | Medicare (N = 185) | Workers’ compensation (N = 172) | Private (N = 408) | P value |
|-----------|------------------|-------------------|-------------------|-------------------------------|------------------|---------|
| Previous corticosteroid injection, n (%) | 666 (66.9) | 147 (63.6) | 130 (70.3) | 110 (64.0) | 279 (68.4) | .37 |
| Previous formal physical therapy, n (%) | 697 (70.0) | 158 (68.4) | 128 (69.2) | 129 (75.0) | 282 (69.1) | .47 |
| Received oral NSAID or COX2 inhibitor, n (%) | 710 (71.3) | 168 (72.4) | 120 (64.9) | 118 (68.6) | 304 (74.7) | .08 |
| MRI performed, n (%) | 962 (96.7) | 226 (97.8) | 176 (95.1) | 168 (97.7) | 392 (96.3) | .39 |
| X-ray performed, n (%) | 940 (94.3) | 218 (94.0) | 173 (93.5) | 160 (93.0) | 389 (95.3) | .66 |
| Previous surgical intervention, n (%) | 132 (13.3) | 42 (18.2) | 23 (12.4) | 30 (17.4) | 37 (9.1) | .003 |

COX2, cyclooxygenase-2; MRI, magnetic resonance imaging; NSAID, nonsteroidal anti-inflammatory drugs.

### Table III

Odds ratios for private, Medicaid, Medicare, and workers’ compensation associated with denial of coverage.

| Payer                  | N (%) initially denied | P value | Odds ratio (95% CI) | P value | Odds ratio (95% CI) | P value |
|------------------------|------------------------|---------|---------------------|---------|---------------------|---------|
| Primary payer          |                        |         |                     |         |                     |         |
| Private                | 51 (12.5)               | <.001   | 1 (reference)       |         | 1 (reference)       | <.001   |
| Medicaid               | 126 (54.3)              | <.001   | 3.92 (5.63-12.30)   | <.001   | 7.96 (5.33-11.88)   | <.001   |
| Medicare               | 17 (9.2)                | .24     | 0.61 (0.33-1.15)    | .12     | 0.62 (0.33-1.15)    | .13     |
| Workers’ compensation  | 33 (19.2)               | .04     | 1.70 (1.04-2.79)    | .03     | 1.71 (1.04-2.81)    | .04     |

Model 1 adjusts for: age, sex, race, and number of comorbidities.
Model 2 adjusts for model 1 variables plus previous corticosteroid injection, previous formal physical therapy, receipt of oral NSAID or COX2 inhibitors, MRI performed, x-ray performed, and previous surgical intervention.
et al had similar findings in a regional study where they found that a patient with Medicaid insurance was offered an appointment within two weeks 59% of the time compared with the same patient with private insurance 79% of the time.

In a recent study investigating outcomes after rotator cuff surgery, Fu et al demonstrated that patients who experienced a delay in arthroscopic rotator cuff repair had an increased risk of a revision cuff surgery. On the basis of time from diagnosis to repair, patients were stratified into an early repair group (<6 weeks), a routine repair group (between 6 weeks and 12 months), or a delayed repair group (>12 months). A total of 2759 patients were included, with 1510 (54.7%) undergoing early repair, 1104 (40.0%) undergoing routine repair, and 145 (5.3%) having delayed repair. The overall revision rate at 5-year follow-up was 9.6%. The revision rate was higher in the delayed group (15.2%) relative to the early (9.9%) and routine (8.3%) groups. Delayed rotator cuff repair was associated with an increased risk of undergoing subsequent revision rotator cuff repair while controlling for age and medical comorbidities.

In our study, we found that Hispanic patients represented only 17.5% of the overall cohort, but made up 47.3% of the patients with either Medicaid or workers’ compensation insurance. In addition, 94 of the 999 (9.4%) patients required an interpreter for language translation or reported nonfluent proficiency with the English language. In the patients with a substantial language barrier, 63% had either Medicaid or workers’ compensation insurance. In our population, under-represented ethnic minority patients may represent a subgroup that is especially vulnerable to insurance denials. The increased denial rates by insurance carriers, in spite of appropriate nonoperative treatment failures, increase the fiscal or administrative burden on health care providers and health care systems but more importantly may negatively impact patient outcomes and quality of life.

Our study has several limitations and drawbacks. First, because Medicaid and workers’ compensation insurance programs vary from state to state, our findings may be specific to the state in which we practice and, thus, not adaptable to all state models. In addition, our practice model is an academic tertiary referral practice, which may bias both the type of insurance and the type of patients seen in our practice compared with different practice models. Furthermore, the patient population treated at our institution does not unequivocally translate, especially when assessing differences in urban vs. rural communities. Finally, our cohort includes only patients who ultimately underwent surgical treatment of their rotator cuff disease and, thus, patients whose insurance denials were ultimately appealed and overturned. Consequently, this cohort does not capture patients who were lost to follow-up after initial insurance denial or patients who ultimately decided against surgical intervention for their rotator cuff disease. These limitations necessitate future work to highlight potential differences and help improve our overall understanding.

Conclusion

Our study found that the type of health care insurance was a statistically significant independent risk factor for insurance denial for arthroscopic rotator cuff surgery. Ethnic minorities were disproportionately represented among the insurance carriers most likely to deny services and, thus, may face barriers to care that can negatively impact patient outcomes and complication rates. The main goal of the United States’ health care system should be to provide quality and timely care to patients who are in need, regardless of their insurance type. Orthopedic surgeons should actively confront barriers to more equitable musculoskeletal care. Through advocacy, policy changes, workforce diversification, and practice changes, we can develop solutions that improve access, quality, and cost-effectiveness for our respective communities.

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