INTRODUCTION: Knee arthroscopy (KA) has been a popular therapeutic intervention for osteoarthritis (OA) that is resistant to medical treatment, but not yet severe enough to warrant total knee arthroplasty (TKA) or unicompartmental arthroplasty (UKA). The effectiveness of KA was questioned following the 2002 publication of a randomized controlled trial which showed no difference between KA and placebo treatment (1). Based on this report the Centers for Medicare and Medicaid Services (CMS) reviewed its decision to cover KA for OA (2). Largely through the efforts of the AAOS the coverage of this procedure was continued. The purpose of this study was to document the epidemiology of KA in its temporal relationship with TKA and UKA over a 10 year period using Medicare claims data.

METHODS: Medicare claims data from a 5% nationwide sample between 1997-2006 was employed to identify knee arthroscopy patients, by using relevant CPT-4 (Current Procedural Terminology) procedure codes. Patients younger than 65 years old, not enrolled in both Parts A and B, or enrolled in an HMO were excluded. The overall prevalence and epidemiology of knee arthroscopy were evaluated for the Medicare population, as well as a function of diagnosis category (arthropathy vs. injury). The diagnoses were based on the recorded ICD-9-CM (International Classification of Diseases, 9th rev., Clinical Modification) diagnosis codes (Arthropathy: 710, 712, 713, 714, 715, 716, 717, 718, 719, 727, 732, and 733; Injury: 836 and 844).

The outcomes of arthroscopy were tracked longitudinally with arthroplasty (total or unicompartmental) as the outcome, using the Kaplan-Meier method. Patients who died without undergoing TKA were considered censored, and the longevity of their respective arthroscopy was calculated up to the date of death. Each beneficiary’s enrollment status and date of death were identified in the annual Medicare denominator files. Cox regression was also used to determine the relative risk of subsequent knee arthroplasty for arthroscopy patients diagnosed with injury compared to those diagnosed with arthropathy. Total and unicompartmental knee arthroplasties were identified using CPT-4 codes 27447 and 27446, respectively. Cox regression analyses were adjusted for age, gender, comorbidity, census region, and year of the arthroscopy surgery.

RESULTS: Our sample of 78,137 knee arthroscopy patients (40,804 arthropathy and 37,333 injury patients) between 1997-2006 was equivalent to an extrapolated national Medicare population of 1,562,740 patients over the study period. The Medicare knee arthroscopy patient sample grew by 56.1% from 6,268 (125,360 extrapolated) in 1997 to 9,782 (195,640 extrapolated) in 2006, while the prevalence grew by 44.6% from 362.2 to 523.7 per 100,000 elderly Medicare beneficiaries during the same time period. In general, the demographics for arthroplasty and injury patients were comparable. Approximately 63% of the patients were female, while the vast majority were white (93%) and aged 65 to 74 years (75%). In 2006, the prevalence of arthroscopy was greatest in the 65-69 years age group, compared to the ≥85 years age group (748.4 vs. 82.4 per 100k persons). The prevalence was also greater for females (566.0 vs. 466.4 (males) per 100k persons) and white patients (570.8 vs. 220.0 (blacks) per 100k persons). The greatest proportion of arthroscopies was performed in the South region (41%), compared to the Midwest (24%), West (20%), and Northeast (15%) regions. Only 9% of arthroscopic procedures were performed on patients who receive public assistance for their Medicare premiums and deductibles.

By the end of 2006, a total of 20.4% and 17.9% of the patients diagnosed with arthropathy and injury at the index arthroscopy subsequently underwent arthroplasty, respectively. From the Kaplan-Meier analysis, 32.5% of arthropathy patients and 29.5% of injury patients underwent arthroplasty at 9 years from the index arthroscopy (Fig. 1). After adjusting for other covariates, patients who underwent arthroscopy associated with injury had a significantly lower risk of requiring subsequent arthroplasty than those diagnosed with arthropathy (adjusted hazard ratio of 0.86; p<0.0001).

DISCUSSION: This study has demonstrated a continuous increase in the performance of KA for OA of the knee. No decrease in the procedure resulted from the threatened discontinuation of Medicare coverage. Roughly one third of patients receiving KA for OA receive knee arthroplasty within a 10 year period, with arthroplasty associated with knee injury codes at a significantly lower risk of TKA or UKA than arthropathy codes. Four important questions emerge from this study: 1) Does diagnostic code selection vary based on the fellowship training or subspecialty focus of the surgeon (eg, sports vs. total joints)? 2) What factors are driving the regional variation of KA? 3) What factors account for the racial disparity in KA? 4) Given this pattern for arthroplasty following KA, is there enough individual surgeon variation to justify the creation of performance measures relating to a surgeon’s annual rate of arthroplasty following KA?

REFERENCES: