INTRODUCTION
In 2010 there were 18.6 million physician visits in the U.S. for knee symptoms and complaints – more than any other localized orthopaedic complaint. Patient reported outcomes (PROs) are frequently used pre- and post-operatively to evaluate characteristics of orthopaedic complaints. Existing normative data has been limited to comparing narrow age ranges; has only included patients who have a history of high athletic demands, such as those in the military; or has described a large age range but failed to account for history of knee-related injury - a confounding factor for normative scores. Therefore, normative KOOS scores in a population of patients in the U.S. accounting for as many relevant demographic variables as possible would be helpful to researchers employing the KOOS in a broad population of patients.

The authors conducted a descriptive study without controls to document KOOS normative reference values in a general U.S. population presenting to an outpatient orthopaedic referral clinic in a suburban metropolitan city for an orthopaedic issue unrelated to knee pain.

METHODS
The KOOS was administered to 1000 patients or accompanying family members who presented to an outpatient orthopaedic clinic in a suburban metropolitan city for an orthopaedic issue unrelated to their knee in July 2014. Participants were eligible if they self-reported a medical history negative for ankle, knee, or hip surgery. KOOS scale means, standard deviations, medians, ranges, interquartile ranges, and percentiles were calculated by sex, age range, laterality, and history of knee injury in the past year. Non-parametric statistical analysis was used to evaluate differences in KOOS scale scores between five age ranges and between those having a past knee injury but not within the last 12 months.

RESULTS
There were 402 males and 598 females in the final study cohort. Laterality was equal with 500 right knees and 500 left knees sampled. No statistically significant differences were noted when comparing outcomes by laterality.

KOOS outcomes for each age cohort are summarized in Table 1 by scale and stratified by sex. Males scored lower on the Symptoms scale compared to other scales (median score = 96.4 for Symptoms; median score = 100 for all other scales) in all age cohorts except ages 56-64. Females also reported lower scores in the Symptoms scale. Median Symptoms score for females in each of the age groups from 18-55 years old was 96.4, and median score for the 56-64 year old cohort was 92.9. Median scores for Pain and Knee-related Quality of Life scales were lower in the 56-64 year old female cohort (97.2 and 93.8 respectively).

Three percent of all participants reported a history of knee injury in the last year (12 male, 3%; 19 female, 3%). All KOOS scale scores were significantly lower (P<0.05) for men and women who reported a history of knee injury. No statistically significant differences in KOOS scores were observed between men and women with a similar history of knee injury in the past year.

DISCUSSION
Normative values for KOOS scale scores at all age ranges suggest a high level of functioning among participants with no history of knee injury in the past year (Table 1). Symptoms, Pain, and Knee-related Quality of Life scales showed the greatest variability in KOOS scores for patients, particularly in the youngest and oldest cohorts. A significant decline in KOOS outcomes was observed for females in older cohorts (Table 2). Significantly lower normative scores were observed in all scales for men and women with a history of knee injury in the past year (Table 3). Although no statistically significant differences between sexes were observed (Table 4), the observation that women experience a significant decline in scores with age confirms the necessity of age- and sex-specific normative data when evaluating patients with the KOOS. This study can aid surgeons in counseling patients and in developing expectations after treatment of injuries. The results may serve as a benchmark for future comparison as the demographic composition and activity demands of the population change.