

## Projections for Total Ankle Arthroplasty based upon the National Inpatient Sample

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**Introduction/Purpose:** The utilization of total ankle arthroplasty (TAA) has increased significantly over the past decade. While projections for hip and knee arthroplasty show an exponential increase in demand, there remains a paucity of literature on the projected demand for TAA. Outcomes for TAA show promising results at 10 year follow up and, as a result, the demand for TAA will likely see a significant increase over the next few decades. The purpose of this study is to assess the current trends and future demand of TAA utilization.

**Methods:** National Inpatient Sample (NIS) data from 1997-2014 was used to identify trends in the utilization of TAA. United States Census Bureau data from 1997-2014 was used to identify historical population data and future population estimates. A linear regression model was created using Mathematica v11.3 to project future demand for total ankle arthroplasty. The data was stratified to show past and future trends based on gender and age.

**Results:** The overall utilization rate of TAA increased from 232 procedures in 1997 to 4435 procedures in 2014. Based on our model, the overall demand for TAA is expected to increase by 174 percent to 12,161 procedures by 2045. Stratified by age groups, the number of procedures is predicted to increase by 69% in ages 18-44, 177% in ages 45-64, and 287% in ages 65-84 by 2045. Stratified by gender, males are projected to undergo 7,070 procedures and females are projected to undergo 6,114 procedures in 2045.

**Conclusion:** Improvements in TAA techniques and implants are leading to better long term clinical outcomes following TAA. Based on our projection model, there is going to be a significant increase in demand for TAA by 2045.

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