



# Disparities and Healthcare Costs of Undergoing Clipping versus Coiling for Ruptured Intracranial Aneurysms

Ranjith Babu MD, MS; S. Harrison Farber; Akshita Iyer BS; Frank William Petraglia III BS; Rupen Desai BS; John Gallis; Beth Parente; Ali R. Zomorodi MD; Fernando Gonzalez MD; Tony P. Smith MD; Shivanand P. Lad MD, PhD  
Department of Neurosurgery, Duke University Medical Center, Durham, NC

## Introduction

The treatment of ruptured intracranial aneurysms (RIAs) involves endovascular coiling or surgical clipping. While many landmark studies have compared these treatment modalities with respect to various outcomes, very few studies have investigated the associated healthcare costs. Additionally, the effect of insurance status on treatment choice has not yet been investigated.

## Methods

We utilized the Truven MarketScan database to examine patients who underwent clipping or coiling for RIAs from 2000-2009. Various patient characteristics and associated healthcare costs were examined.

## Results

A total of 5,266 patients (2,517 coiled; 2,749 clipped) were analyzed. Patients in the coiling and clipping groups had a similar mean age (54.9 vs. 54.2 years), with both groups having a similar gender distribution. Patients who underwent surgical clipping were seen to have significantly less medical comorbidities. Examination of insurance status revealed significant differences between clipped and coiled patients ( $p < 0.001$ ), with patients who underwent coiling to more likely have Commercial (67.1% vs. 65.8%) and less likely to have Medicaid (18.0% vs. 21.5%) insurance compared to clipped patients. Evaluation of costs revealed clipped patients to accumulate more costs compared to coiled patients at 90-day follow-up (\$244,000 vs. \$223,100,  $p = 0.15$ ). However with longer follow-up, coiling patients were seen to incur healthcare costs more rapidly. At 2-year follow-up, clipped patients were seen to accumulate non-significantly less healthcare costs compared to coiled patients (\$970,900 vs. \$1,020,800,  $p = 0.33$ ). Multivariate regression demonstrated coiling to have significantly less costs at 90 days ( $p = 0.021$ ) though at 2 years clipped patients were seen to have slightly less costs ( $p = 0.34$ ).

## Conclusions

Patients undergoing coiling or clipping for the treatment of RIAs have similar characteristics though insurance disparities are present. Also, while clipping results in more upfront costs, this treatment modality may be associated with lower healthcare costs compared to endovascular coiling at long-term follow-up.

## Learning Objectives

By the conclusion of this session, participants should be able to: 1) Describe the importance of evaluating treatments not only based on efficacy but also their long-term cost-effectiveness, 2) Discuss, in small groups, potential reasons why endovascular coiling of RIAs may lead to higher long-term healthcare costs when compared to surgical clipping, 3) Identify reasons why insurance disparities may exist in the treatment of RIAs.