



# A Re-evaluation of the ISUIA Criteria and the PHASES Score for Predicting Intracranial Aneurysmal Rupture

Arsalaan Salehani; D. Jay McCracken MD; Courtney E. McCracken Ph.D.; Sameer H. Halani BA MS; Jason H Boulter BS; Lucas R Philipp BS; Brendan P. Lovasik BA; Faiz U. Ahmad MD MCh; Raul G. Nogueira MD; Gustavo Pradilla MD  
Emory University School of Medicine



## Learning Objectives

- By the conclusion of this session, participants should be able to:
- 1) Discuss the aneurysm rupture risk reported by the ISUIA.
  - 2) Calculate the aneurysm rupture risk using the PHASES score.
  - 3) Evaluate the applicability of using the ISUIA criteria and PHASES score to counsel patients on their aneurysmal rupture risk.

## Introduction

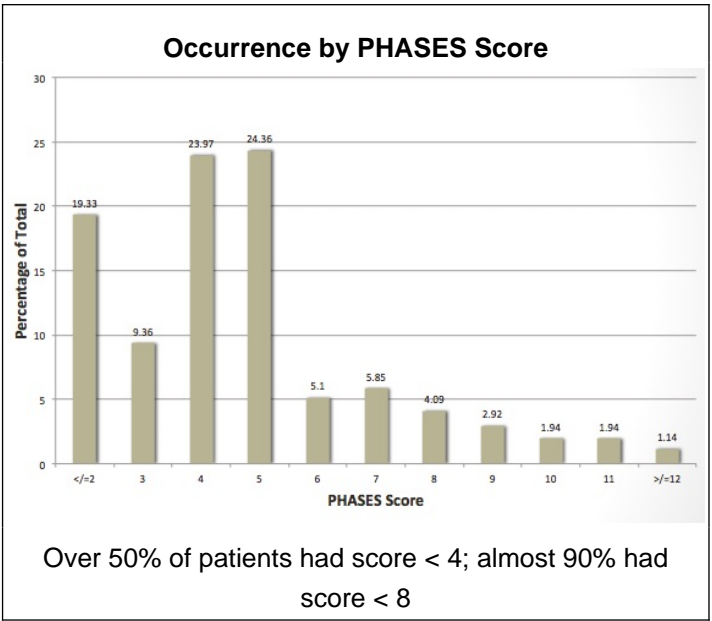
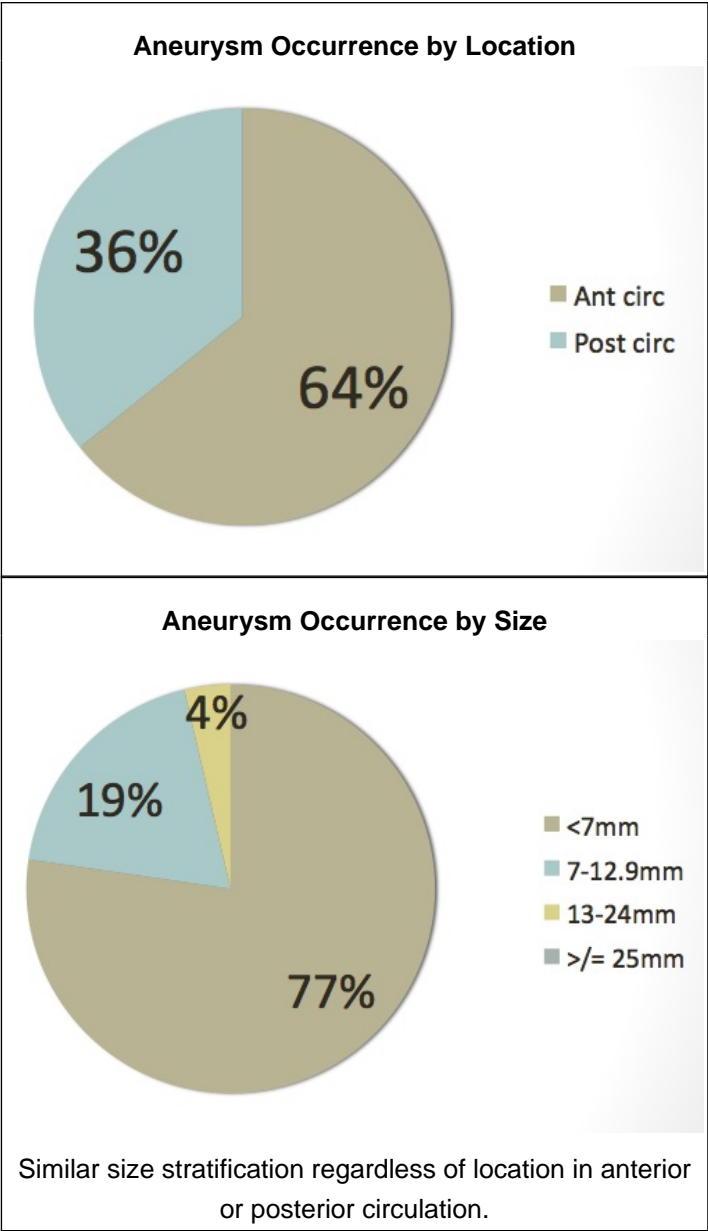
The International Study of Unruptured Intracranial Aneurysms (ISUIA) criteria and the PHASES score are widely used to weigh the risk of intervention for unruptured aneurysms. The ISUIA found anterior circulation aneurysms <7mm in diameter to have the lowest risk of rupture. The PHASES study evaluated a myriad of factors that could predict intracranial aneurysmal rupture risk, namely patient population, history of hypertension, age, size and site of aneurysm, and history of earlier subarachnoid hemorrhage (SAH) from a previous aneurysm. Patients were assigned points for each of these categories, with the total number of points predicting the risk of aneurysmal rupture. The present study was designed to investigate the characteristics of ruptured aneurysms at a tertiary referral center and to compare these to the data published in both the ISUIA and PHASES studies.

## Methods

A large single-center SAH database was retrospectively reviewed and patients were stratified by ethnicity, aneurysm size and location, history of hypertension, history of SAH, age and smoking status.

## Results

A total of 520 ruptured aneurysms were identified. Upon calculating PHASES scores, 7 patients were excluded due to insufficient data for score calculation. Smoking was prevalent in approximately 20% of patients across most PHASES score groups.



## Conclusions

Approximately 77% of ruptured aneurysms in this study were < 7mm in largest diameter, regardless of location in the anterior or posterior circulation. More than half the patients had PHASES scores < 4, with almost 90% having a score < 8. A score of 8 is reported as having a 5-year rupture risk of 3.2%, a similar percentage to the risk of 5-year mortality from surgical or endovascular intervention. Strict adherence to the ISUIA criteria and PHASES score does not appear to prevent the majority of morbidity-mortality from ruptured intracranial aneurysms. Therefore, further studies are needed to re-evaluate these tools.

## References

1. da Costa, L. B., et al. (2004). "Unruptured intracranial aneurysms: natural history and management decisions." Neurosurg Focus 17(5): E6.
2. Greving, J. P., et al. (2014). "Development of the PHASES score for prediction of risk of rupture of intracranial aneurysms: a pooled analysis of six prospective cohort studies." The Lancet Neurology 13(1): 59-66.
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