# A three-dimensional interactive atlas of cerebral arterial variants

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## Features

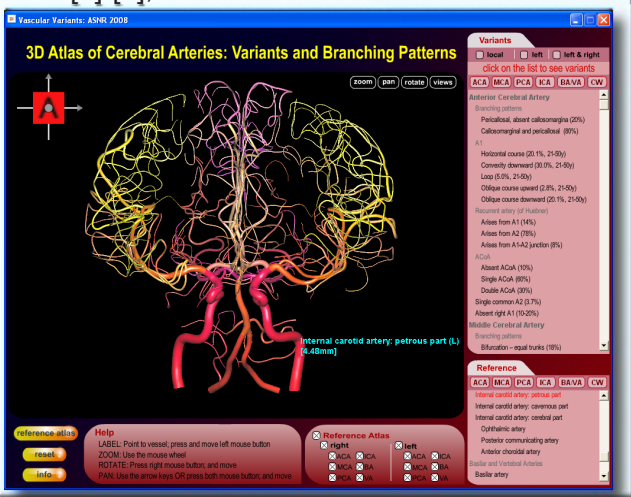
- 60 cerebral arterial variants and branching patterns in 3D
- reference atlas of cerebral vasculature, fully labeled with names and diameters
- real-time interactive manipulation of variants and reference atlas (rotate, zoom, pan, view)
- variants presented in correlation to surrounding anatomy (local, hemisphere, whole brain)
- incident rates for variants

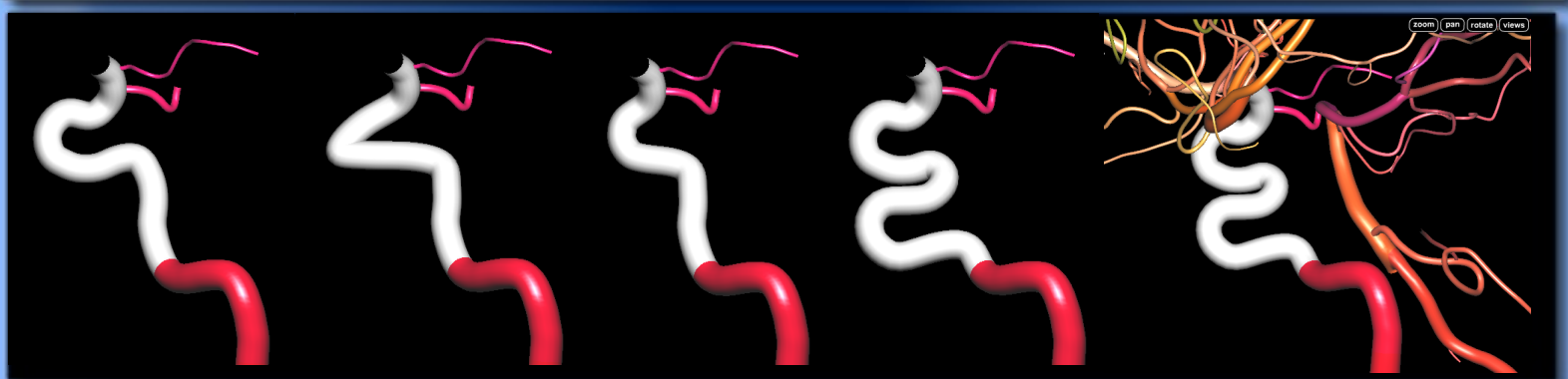
## Objective

The knowledge of cerebrovascular variants is critical in diagnosis and treatment. Numerous textbooks and articles describe these variants and present them in form of drawings or autopsy photographs. However, there is no computerized interactive atlas providing three-dimensional (3D) vascular models and exploration tools allowing the user for a better and faster understanding of vascular variants and their spatial relationships. The objective of this exhibit is to present a 3D interactive atlas of cerebral arterial variants and branching patterns.

## Materials & methods

A 3D, detailed, highly parcellated, fully segmented, and completely labeled reference atlas of cerebrovasculature was constructed from 3T scans earlier [1]. Based on existing literature [2]-[9], 3D models of vascular variants and variations for the ACA, MCA, PCA, ICA, BA, VA, and circle of Willis are constructed. The vascular variants are modeled in 3D and embedded into the reference cerebrovascular atlas. User friendly tools are developed for variant selection, display, manipulation, and labeling.




## Conclusion

This atlas facilitates the user to easily get familiarized with cerebral arterial variants. It also aids in presentation of vascular variants and understanding of their spatial relationships either individually or embedded into the surrounding reference cerebrovasculature. It is useful for medical students, educators to prepare teaching materials, and clinicians. It is easily extendable with new variants and branching patterns.

## References

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