Rules for Measurement of Percent Stenosis of Intracranial Arteries

1. Diameter measurements must be done using electronic cursors provided by the imaging software
2. The image showing the most severe diameter stenosis should be chosen for measuring the stenotic diameter (Ds)

Location for measuring the reference normal artery (Dn) for the M1, M2, A1, PI, vertebral and basilar artery:

1st choice: Non-diseased, proximal part of the artery at its widest, non-tortuous segment that has parallel margins
2nd choice: Non-diseased, distal part of the artery at its widest, parallel, non-tortuous segment. Use this choice if the proximal part of the artery cannot be measured (e.g., MCA origin stenosis)
3rd choice: Non-diseased, most distal, parallel, non-tortuous segment of the feeding artery. Use this choice if the entire artery is diseased.
   - If the entire **MCA** is diseased, D proximal will be measured at the most distal, parallel segment of the supraclinoid carotid artery
   - If the entire **M2** is diseased, D proximal will be measured at the most distal, parallel segment of the M1
   - If the entire **A1** is diseased, D proximal will be measured at the most distal, parallel segment of the supraclinoid carotid artery
   - If the entire **P1** is diseased, D proximal will be measured at the most distal, parallel segment of the basilar artery
   - If the entire **vertebral** artery is diseased, D proximal will be measured at the most distal, parallel non-tortuous segment of the extracranial vertebral artery
   - If the entire **basilar** artery is diseased, D proximal will be measured at the most distal, parallel segment of the dominant vertebral artery
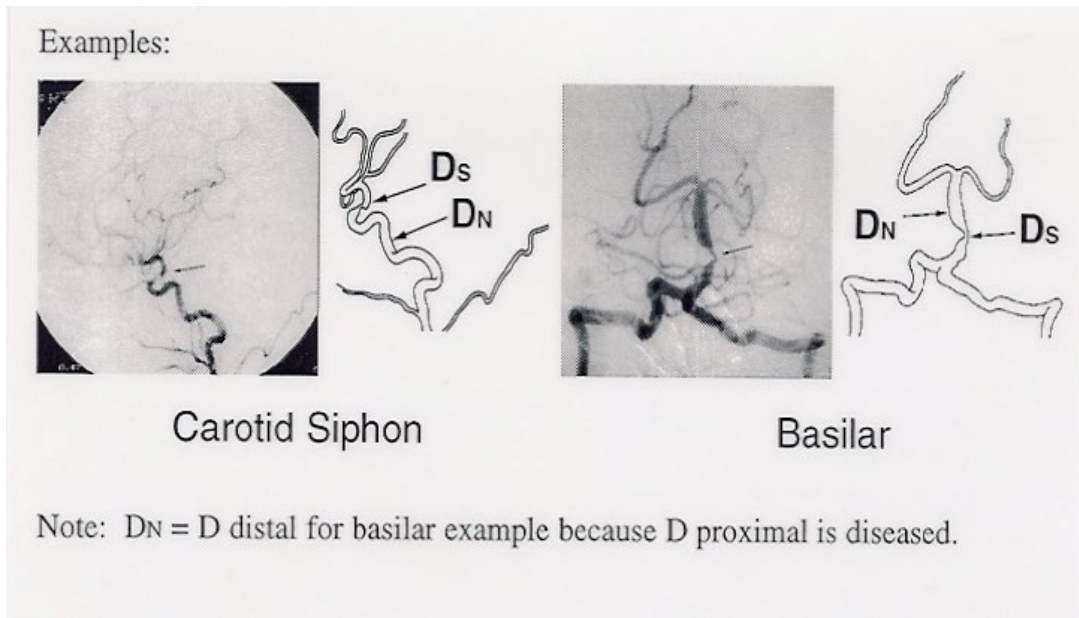
Location for measuring the reference normal vessel (Dn) for the intracranial carotid artery

1st choice: Non-diseased, widest, parallel, non-tortuous portion of the petrous carotid artery
2nd choice: Most distal, parallel part of the extracranial internal carotid artery. Use 2nd choice if the entire petrous carotid is diseased

Use the formula (1 – [Ds / Dn]) x 100), to calculate the % diameter stenosis of the target lesion

See figure below for where to measure Dn for examples of carotid and basilar stenoses.

Examples:

Carotid Siphon

Basilar

Note: D$_N$ = D distal for basilar example because D proximal is diseased.

For carotid siphon lesion, Dn = diameter of petrous carotid artery at widest, parallel, non-tortuous segment