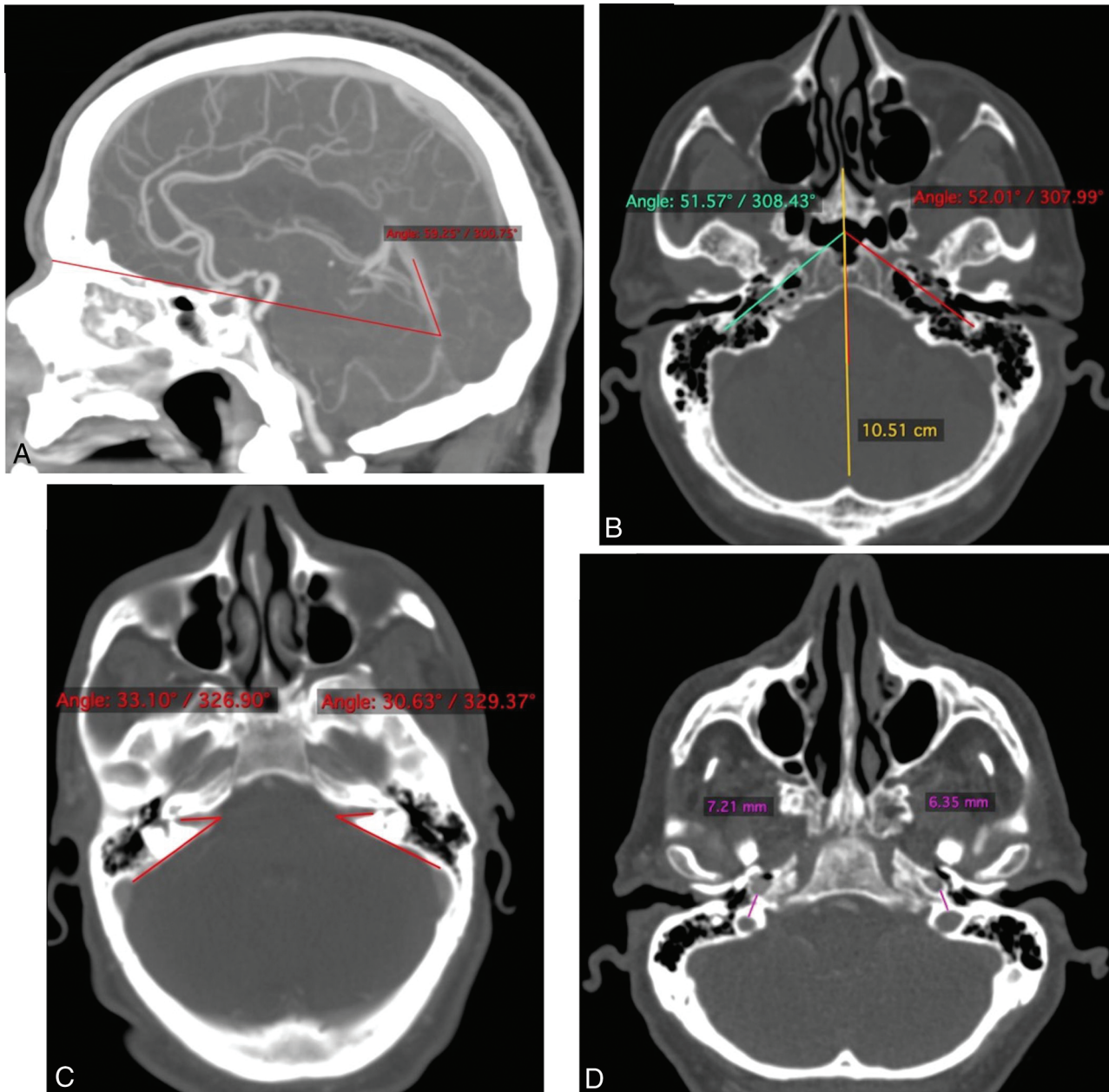
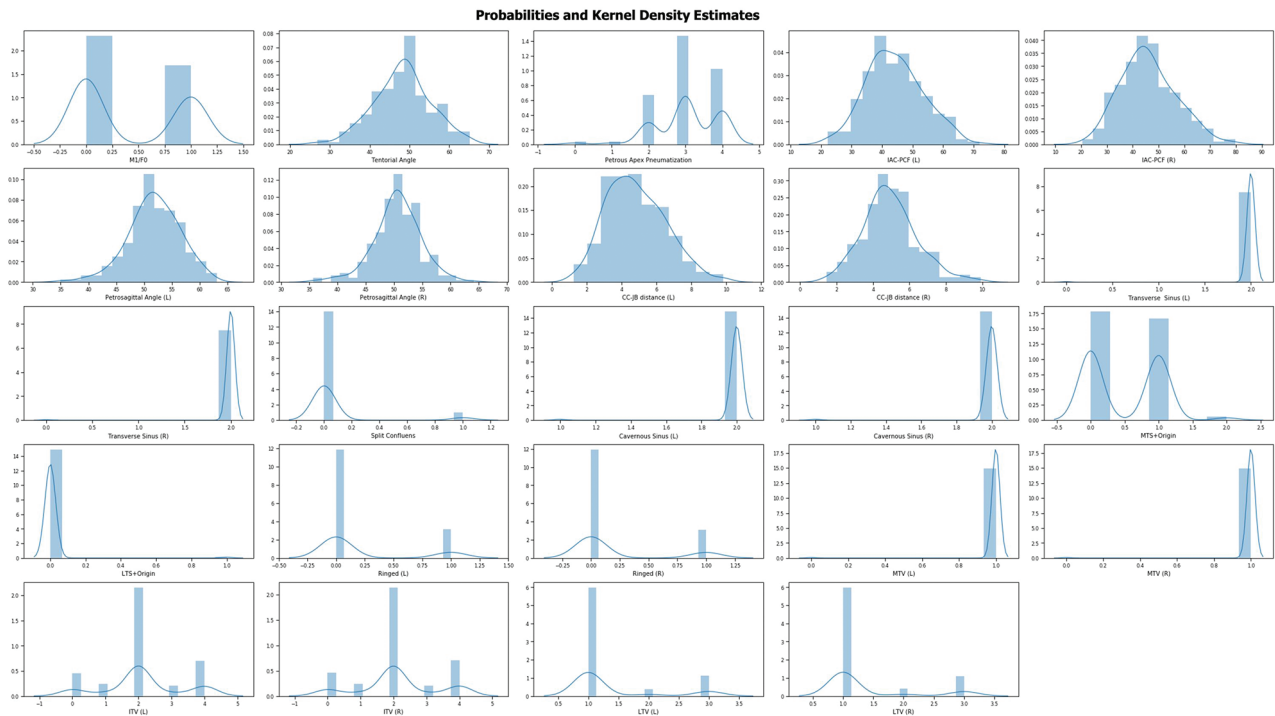
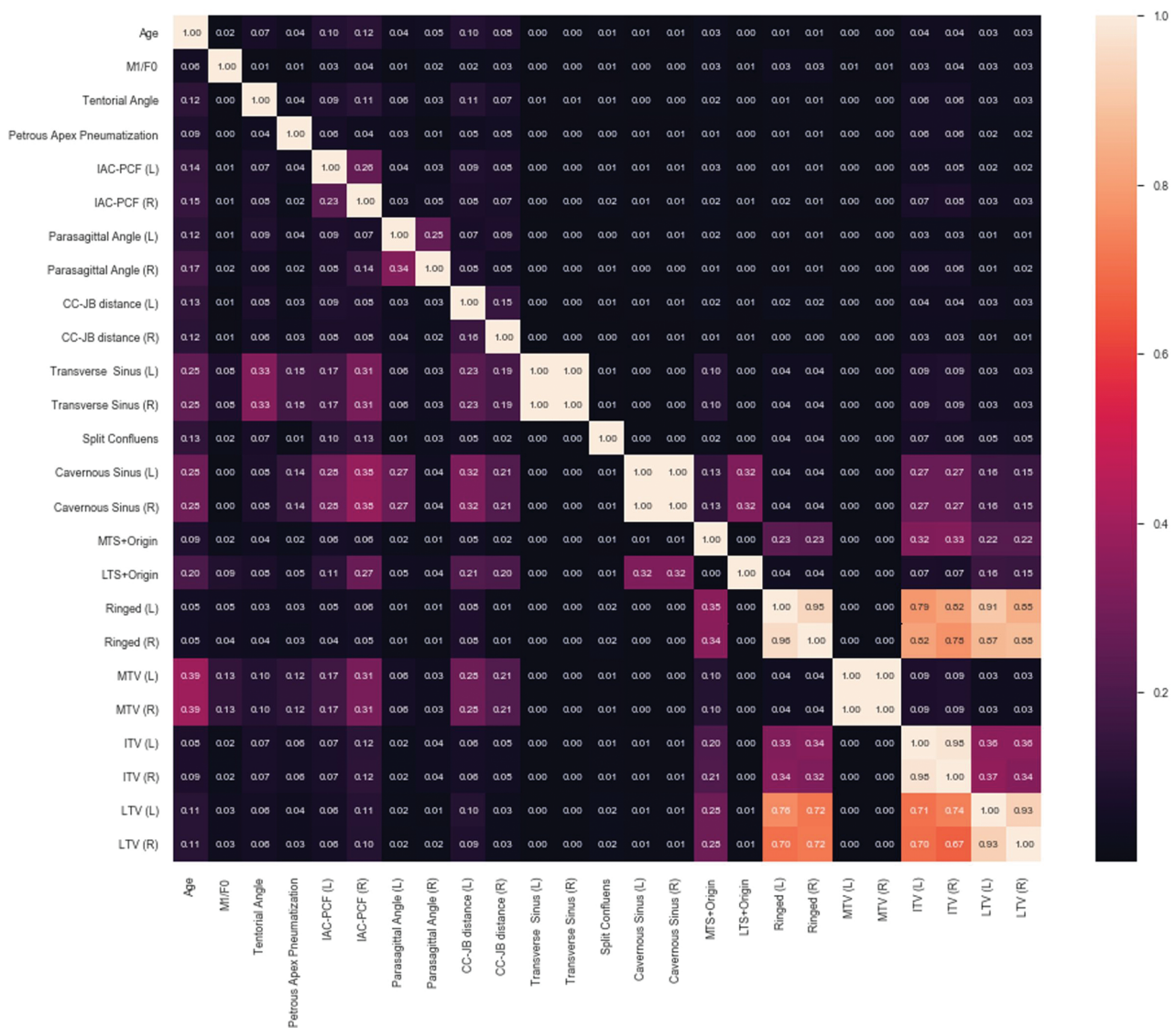




**ON-LINE FIG 1.** Measurements of the skull base and tentorium. Representative patient measurements are shown. A, Tentorial angle, measured as the angle between 2 lines: 1) a line from the nasion through the tuberculum sella, and 2) a line through the straight sinus intersecting line 1. B, Petrosagittal angle; the angle has 2 lines: 1) a line drawn from the stylomastoid foramen through the spheno-occipital synchondrosis, and 2) a midsagittal line defined by the nasal septum and torcula herophili. C, The IAC-PCF angle is measured as the angle between 2 lines: 1) a line drawn through the center of the internal auditory canal, and 2) a line along the petrous ridge intersecting line 1. D, CC-JB distance is the measured distance between the anterior bony margin of the jugular bulb and posterior bony margin of the carotid canal at the level before the carotid canal turns anteriorly.



**ON-LINE FIG 2.** Probability density functions and kernel density estimates for bony measurements, dural sinus categories, and tentorial vein categories. Y-axes in all charts are patient numbers. Patient population had a sex mode of female, with the age having a central tendency around 60 years of age, with normal distribution. Angular measurements and distances of the skull base taken to assess completed development showed symmetry across the left-right axis. Several variables show uniformity across all patients. These included transverse sinus patency, confluens configuration, cavernous sinus patency, origin of the LTS, MTV configuration. Age (year), tentorial angle (degree); IAC-PCF (*left*) and (*right*) (degrees); petrosagittal angle (*left*) and (*right*) (degrees); CC-JB distance (*left*) and (*right*) (millimeters). The remaining variables are categoric. The MTV was either present or absent (0 or 1). The ITV was categorized as 0 through 4 per the results of preliminary categorization. The LTV was categorized as 1 through 3 per the results of preliminary categorization.



**ON-LINE FIG 3.** Uncertainty coefficient (Thiel's U) heat map for bony measurements, dural sinus categories, and tentorial vein categories. The Thiel's U association heat map, an asymmetric measure of association among categoric variables, confirmed the 2 intercorrelated variable groupings. The uncertainty coefficient at a given row and column indicates what fraction of the column variable can be predicted given the row variable. It verifies the strong relationships among the first grouping (MTS origin, RC, ITV, and LTV), as well as among the second grouping (cavernous sinus, LTS origin, transverse sinus, and MTV).

# On-line Supplementary Data: Data for all patients used in the study

| Study No. | Indications                      | Findings                                                                                                                                         | Age | M/<br>F | Tentorial Angle | Petrous Apex Pneumatization | IAC- PCF (L) | IAC- PCF (R) | Petrosagittal Angle (L) | Petrosagittal Angle (R) | CCJB Distance (L) | CCJB Distance (R) | Transverse Sine (L) | Transverse Sine (R) | Split Confluents | Cavernous Sinus (L) | Cavernous Sinus (R) | MTS+ Origin | LTS+ Origin | Raged (L) | Raged (R) | MTV (L) | MTV (R) | ITV (L) | ITV (R) | LTV (L) | LTV (R) |
|-----------|----------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------|-----|---------|-----------------|-----------------------------|--------------|--------------|-------------------------|-------------------------|-------------------|-------------------|---------------------|---------------------|------------------|---------------------|---------------------|-------------|-------------|-----------|-----------|---------|---------|---------|---------|---------|---------|
| 1         | ICA saccular aneurysm follow-up  | Stable left ICA saccular aneurysm; dominant right PcomA; global volume loss                                                                      | 84  | 1       | 45.66           | 3                           | 47.88        | 49.04        | 46.13                   | 46.3                    | 2.02              | 5.64              | 2                   | 2                   | 0                | 2                   | 2                   | 1           | 0           | 0         | 0         | 1       | 1       | 2       | 2       | 1       | 1       |
| 2         | Research protocol                | Stable anterior communicating artery aneurysm (2 mm); anterior cerebral artery trifurcation; bovine aortic arch; global volume loss              | 77  | 0       | 58.49           | 3                           | 46.96        | 48.11        | 37.57                   | 38.9                    | 7.47              | 4.87              | 2                   | 2                   | 0                | 2                   | 2                   | 1           | 0           | 0         | 0         | 1       | 1       | 2       | 2       | 1       | 1       |
| 3         | Treatment follow-up              | Stable stent-coiled left ophthalmic artery aneurysm                                                                                              | 72  | 0       | 45.51           | 2                           | 36.34        | 36.52        | 34.92                   | 39.6                    | 4.3               | 4.84              | 2                   | 2                   | 0                | 2                   | 2                   | 1           | 0           | 0         | 0         | 1       | 1       | 2       | 2       | 1       | 1       |
| 4         | TIA                              | Cerebellar tonsillar ectopia (2 mm)                                                                                                              | 66  | 1       | 27.7            | 1                           | 53.1         | 54.69        | 61.53                   | 59.05                   | 6.35              | 7.21              | 2                   | 2                   | 0                | 2                   | 2                   | 1           | 0           | 0         | 0         | 1       | 1       | 3       | 3       | 1       | 1       |
| 5         | Cavernous ICA aneurysm follow-up | Stable 2-mm aneurysm arising from the left cavernous ICA                                                                                         | 41  | 0       | 37              | 2                           | 51.8         | 67.99        | 51.47                   | 49.99                   | 2.36              | 2.31              | 2                   | 2                   | 0                | 2                   | 2                   | 1           | 0           | 1         | 1         | 1       | 1       | 4       | 4       | 3       | 3       |
| 6         | Aneurysm follow-up               | Stable anterior communicating artery aneurysm (11 cm); stable posterior communicating artery origin aneurysm (2 mm); basilar tip aneurysm (1 mm) | 82  | 0       | 47.34           | 2                           | 58.64        | 61.93        | 55.33                   | 53.9                    | 2.41              | 2.83              | 2                   | 2                   | 0                | 2                   | 2                   | 0           | 0           | 0         | 0         | 1       | 1       | 2       | 2       | 1       | 1       |
| 7         | Rule out venous sinus thrombosis | Normal                                                                                                                                           | 31  | 0       | 61.78           | 3                           | 35.6         | 34.49        | 48.33                   | 46.03                   | 2.76              | 2.71              | 2                   | 2                   | 0                | 2                   | 2                   | 1           | 0           | 1         | 1         | 1       | 1       | 4       | 4       | 3       | 3       |
| 8         | Altered mental status            | Normal                                                                                                                                           | 84  | 0       | 53.72           | 3                           | 42.58        | 49.41        | 53.74                   | 48.47                   | 5.14              | 5.9               | 2                   | 2                   | 0                | 2                   | 2                   | 0           | 0           | 0         | 0         | 1       | 1       | 2       | 2       | 1       | 1       |
| 9         | Research protocol                | Normal                                                                                                                                           | 63  | 0       | 38.63           | 2                           | 46.59        | 48.67        | 57.23                   | 49.07                   | 3.5               | 4.23              | 2                   | 2                   | 0                | 2                   | 2                   | 1           | 0           | 1         | 1         | 1       | 1       | 4       | 4       | 3       | 3       |
| 10        | Research protocol                | Normal                                                                                                                                           | 69  | 1       | 34.87           | 4                           | 40.44        | 32           | 61.26                   | 54.67                   | 2.68              | 2.58              | 2                   | 2                   | 0                | 2                   | 2                   | 1           | 0           | 1         | 1         | 1       | 1       | 4       | 4       | 3       | 3       |
| 11        | Research protocol                | Normal                                                                                                                                           | 67  | 0       | 46.26           | 4                           | 45.03        | 57.6         | 51.68                   | 53.89                   | 3.02              | 2.56              | 2                   | 2                   | 0                | 2                   | 2                   | 0           | 1           | 0         | 0         | 1       | 1       | 2       | 2       | 1       | 1       |
| 12        | Rule out stroke                  | Normal                                                                                                                                           | 74  | 1       | 36.6            | 3                           | 43.58        | 36.99        | 43.68                   | 49.57                   | 3.36              | 3.89              | 2                   | 2                   | 0                | 2                   | 2                   | 1           | 0           | 0         | 0         | 1       | 1       | 2       | 2       | 1       | 1       |

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# On-line Supplementary Data: Continued

| Study No. | Indications                                             | Findings                                                                | Age | M/ F | Tentorial Angle | Petrous Apex Pneumatization | IAC- PCF (R) | IAC- PCF (L) | Petrosagittal Angle (R) | Petrosagittal Angle (L) | CCJB Distance (R) | CCJB Distance (L) | Transverse Sinus (L) | Transverse Sinus (R) | Split Confluent | Cavernous Sinus (L) | Cavernous Sinus (R) | MTS+ Origin | LTS+ Origin | Ringed (L) | Ringed (R) | MTV (L) | MTV (R) | ITV (L) | ITV (R) | LTV (L) | LTV (R) |
|-----------|---------------------------------------------------------|-------------------------------------------------------------------------|-----|------|-----------------|-----------------------------|--------------|--------------|-------------------------|-------------------------|-------------------|-------------------|----------------------|----------------------|-----------------|---------------------|---------------------|-------------|-------------|------------|------------|---------|---------|---------|---------|---------|---------|
| 13        | Research protocol                                       | Normal                                                                  | 71  | 1    | 49.75           | 3                           | 32.28        | 29.21        | 50.31                   | 48.19                   | 4.09              | 5.05              | 2                    | 2                    | 0               | 2                   | 2                   | 0           | 0           | 0          | 0          | 1       | 1       | 3       | 3       | 1       | 1       |
| 14        | Research protocol                                       | Normal                                                                  | 67  | 0    | 42.27           | 2                           | 46.32        | 44.68        | 58.54                   | 58.34                   | 4.84              | 5.75              | 2                    | 2                    | 0               | 2                   | 2                   | 0           | 0           | 0          | 0          | 1       | 1       | 0       | 0       | 1       | 1       |
| 15        | Research protocol                                       | Normal                                                                  | 93  | 0    | 31.2            | 3                           | 41.52        | 36.76        | 60.36                   | 57.16                   | 7.38              | 7.56              | 2                    | 2                    | 0               | 2                   | 2                   | 0           | 0           | 0          | 0          | 1       | 1       | 3       | 3       | 1       | 1       |
| 16        | Research protocol                                       | Normal                                                                  | 38  | 0    | 34.47           | 3                           | 24.29        | 20.4         | 48.49                   | 52.17                   | 3.91              | 5.64              | 2                    | 2                    | 1               | 2                   | 2                   | 1           | 0           | 1          | 1          | 1       | 1       | 4       | 4       | 2       | 2       |
| 17        | Research protocol                                       | Pituitary microadenoma (2 mm)                                           | 63  | 1    | 44.17           | 3                           | 39.2         | 45.22        | 50.52                   | 51.73                   | 3.32              | 7.33              | 2                    | 2                    | 0               | 2                   | 2                   | 0           | 0           | 0          | 0          | 1       | 1       | 2       | 2       | 1       | 1       |
| 18        | Research protocol                                       | Mild chronic ischemic changes                                           | 67  | 1    | 57.65           | 2                           | 57.02        | 65.32        | 54.76                   | 50.39                   | 4.64              | 4.06              | 2                    | 2                    | 0               | 2                   | 2                   | 1           | 0           | 1          | 1          | 1       | 1       | 4       | 4       | 3       | 3       |
| 19        | Transient blurred vision                                | Cerebellar tonsillar ectopia (4 mm)                                     | 42  | 0    | 45.4            | 3                           | 61.15        | 62.58        | 51.78                   | 47.79                   | 2.07              | 5.65              | 2                    | 2                    | 0               | 2                   | 2                   | 1           | 0           | 0          | 0          | 1       | 1       | 3       | 3       | 1       | 1       |
| 20        | TIA and rheumatoid arthritis                            | Normal                                                                  | 57  | 0    | 54.87           | 4                           | 40.53        | 43.19        | 52.25                   | 46.04                   | 6.92              | 5.92              | 2                    | 2                    | 0               | 2                   | 2                   | 1           | 0           | 0          | 0          | 1       | 1       | 0       | 0       | 1       | 1       |
| 21        | Rule out stroke                                         | Multiple small subacute/ chronic infarcts in the cerebellar hemispheres | 60  | 1    | 50.7            | 4                           | 37.21        | 32.62        | 59.6                    | 49.67                   | 4.43              | 5.66              | 2                    | 2                    | 0               | 2                   | 2                   | 0           | 0           | 0          | 0          | 1       | 1       | 2       | 2       | 1       | 1       |
| 22        | Anisocoria                                              | Global volume loss with hydrocephalus ex vacuo                          | 69  | 0    | 58.55           | 3                           | 37.45        | 31.8         | 46.82                   | 44.33                   | 3.63              | 4.31              | 2                    | 2                    | 0               | 2                   | 2                   | 0           | 0           | 0          | 0          | 1       | 1       | 2       | 2       | 1       | 1       |
| 23        | Aneurysm follow-up                                      | Stable lobulated anterior communicating artery aneurysm (1.2 cm)        | 86  | 0    | 48.83           | 4                           | 37.22        | 32.24        | 49.37                   | 49.63                   | 3.45              | 4.33              | 2                    | 2                    | 0               | 2                   | 2                   | 1           | 0           | 1          | 0          | 1       | 1       | 2       | 4       | 3       | 1       |
| 24        | Prolactinoma                                            | Stable microadenoma (3 mm)                                              | 40  | 0    | 46.91           | 3                           | 41.63        | 45.42        | 56.12                   | 58.6                    | 5.8               | 4.96              | 2                    | 2                    | 0               | 2                   | 2                   | 1           | 0           | 0          | 0          | 1       | 1       | 2       | 2       | 1       | 2       |
| 25        | Trauma, rule out vertebral artery dissection            | Normal                                                                  | 57  | 1    | 39.22           | 3                           | 40.29        | 34.49        | 53.06                   | 49.64                   | 3.14              | 5.65              | 2                    | 2                    | 0               | 2                   | 2                   | 0           | 0           | 0          | 0          | 1       | 1       | 2       | 2       | 1       | 1       |
| 26        | Rule out Guillain-Barré syndrome, Miller-Fisher variant | Normal                                                                  | 51  | 1    | 49.36           | 3                           | 34.28        | 43.79        | 56.34                   | 57.52                   | 4.93              | 6.54              | 2                    | 2                    | 0               | 2                   | 2                   | 1           | 0           | 0          | 0          | 1       | 1       | 0       | 0       | 1       | 1       |
| 27        | Acute vision loss                                       | Mild atherosclerotic disease                                            | 85  | 1    | 52.49           | 3                           | 35.77        | 34.53        | 57.37                   | 57.46                   | 3.21              | 4.94              | 2                    | 2                    | 0               | 2                   | 2                   | 1           | 0           | 0          | 0          | 1       | 1       | 0       | 0       | 1       | 1       |
| 28        | Hallucination                                           | Normal                                                                  | 77  | 0    | 37.88           | 4                           | 43.78        | 44.5         | 50.85                   | 48.21                   | 5.53              | 2.56              | 2                    | 2                    | 0               | 2                   | 2                   | 0           | 0           | 0          | 0          | 1       | 1       | 2       | 2       | 1       | 1       |
| 29        | Neck pain                                               | Normal                                                                  | 25  | 1    | 53.18           | 3                           | 53.72        | 49.4         | 51.78                   | 54.68                   | 1.5               | 5.94              | 2                    | 2                    | 0               | 2                   | 2                   | 1           | 0           | 1          | 1          | 1       | 1       | 0       | 0       | 2       | 2       |
| 30        | Follow-up, pituitary microadenoma (5 mm)                | Microadenoma                                                            | 38  | 1    | 49.36           | 2                           | 38.61        | 45.87        | 45.29                   | 46.79                   | 4.45              | 6.52              | 2                    | 2                    | 0               | 2                   | 2                   | 0           | 0           | 0          | 0          | 1       | 1       | 2       | 2       | 1       | 1       |

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| Study No. | Indications                               | Findings                                                                       | Age | M/ F | Tentorial Angle | Petrous Apex Pneumatization | IAC- PCF (L) | IAC- PCF (R) | Petrosagittal Angle (L) | Petrosagittal Angle (R) | CC-JB Distance (L) | CC-JB Distance (R) | Transverse Sinus (L) | Transverse Sinus (R) | Split Confluents | Cavernous Sinus (L) | Cavernous Sinus (R) | MTS+ Origin | LTS+ Origin | Ringed (L) | Ringed (R) | MTV (L) | MTV (R) | ITV (L) | ITV (R) | LTV (L) | LTV (R) |
|-----------|-------------------------------------------|--------------------------------------------------------------------------------|-----|------|-----------------|-----------------------------|--------------|--------------|-------------------------|-------------------------|--------------------|--------------------|----------------------|----------------------|------------------|---------------------|---------------------|-------------|-------------|------------|------------|---------|---------|---------|---------|---------|---------|
| 31        | Right-arm numbness                        | Normal; hypoplastic distal left vertebral artery                               | 23  | 1    | 50.86           | 3                           | 44.99        | 39.63        | 47.29                   | 49.14                   | 2.62               | 5.47               | 2                    | 2                    | 0                | 2                   | 2                   | 1           | 0           | 0          | 0          | 1       | 1       | 2       | 2       | 1       | 1       |
| 32        | Slurred speech                            | Normal                                                                         | 85  | 0    | 57.09           | 1                           | 22.14        | 35.58        | 52.64                   | 52.19                   | 2.88               | 4.45               | 2                    | 2                    | 0                | 2                   | 2                   | 1           | 0           | 1          | 1          | 1       | 1       | 4       | 4       | 3       | 3       |
| 33        | Headache; rule out pseudotumor cerebri    | Arachnoid granulation of left transverse-sigmoid junction                      | 36  | 0    | 54.85           | 2                           | 61.81        | 62.28        | 57.79                   | 54.48                   | 7.18               | 7.05               | 2                    | 2                    | 0                | 2                   | 2                   | 1           | 0           | 0          | 0          | 1       | 1       | 3       | 3       | 1       | 1       |
| 34        | Neuropathy                                | Colloid cyst (5 mm)                                                            | 53  | 1    | 46.56           | 2                           | 26.81        | 31.73        | 46.71                   | 46.64                   | 7.4                | 2.07               | 2                    | 2                    | 0                | 2                   | 2                   | 1           | 0           | 0          | 0          | 1       | 1       | 0       | 0       | 1       | 1       |
| 35        | Papilledema, headache                     | Moderate right and severe left transverse sinus focal stenoses                 | 52  | 0    | 55.85           | 4                           | 53.38        | 38.79        | 49.22                   | 51.53                   | 4.67               | 4.32               | 0                    | 0                    | 0                | 2                   | 2                   | 0           | 0           | 0          | 0          | 1       | 1       | 2       | 2       | 1       | 1       |
| 36        | Transient blurred vision                  | Normal                                                                         | 72  | 0    | 48.74           | 4                           | 47.93        | 45.45        | 48.63                   | 50.78                   | 5.12               | 5.45               | 2                    | 2                    | 1                | 2                   | 2                   | 1           | 0           | 1          | 1          | 1       | 1       | 4       | 4       | 3       | 3       |
| 37        | Stroke evaluation                         | Normal                                                                         | 81  | 1    | 42.08           | 4                           | 45.79        | 31.15        | 43.56                   | 40.42                   | 5                  | 4.83               | 2                    | 2                    | 0                | 2                   | 2                   | 0           | 0           | 0          | 0          | 1       | 1       | 2       | 2       | 1       | 1       |
| 38        | Pounding headache                         | Normal                                                                         | 52  | 1    | 58.21           | 4                           | 51.34        | 43.92        | 49.78                   | 48.76                   | 4.82               | 4.22               | 2                    | 2                    | 0                | 2                   | 2                   | 0           | 0           | 0          | 0          | 1       | 1       | 2       | 2       | 1       | 1       |
| 39        | Headache; family history of aneurysm      | Right anterior cerebral artery aneurysm (3 mm)                                 | 45  | 0    | 49.85           | 2                           | 38.18        | 48.51        | 49.5                    | 51.81                   | 3.44               | 4.42               | 2                    | 2                    | 0                | 2                   | 2                   | 1           | 0           | 0          | 0          | 1       | 1       | 0       | 0       | 1       | 1       |
| 40        | Stroke evaluation                         | Normal                                                                         | 54  | 0    | 38.18           | 4                           | 37.52        | 37.36        | 51.93                   | 49.96                   | 4.34               | 5.31               | 2                    | 2                    | 0                | 2                   | 2                   | 1           | 0           | 0          | 0          | 1       | 1       | 2       | 2       | 1       | 1       |
| 41        | Hemiplegia                                | Left anterior communicating artery aneurysm (4 × 6 mm)                         | 66  | 1    | 45.9            | 4                           | 47.69        | 50.63        | 39.65                   | 41.49                   | 5                  | 5.82               | 2                    | 2                    | 0                | 2                   | 2                   | 1           | 0           | 0          | 0          | 1       | 1       | 2       | 2       | 1       | 1       |
| 42        | Headache                                  | Atherosclerosis distal basilar artery                                          | 55  | 1    | 45.94           | 2                           | 26.68        | 30           | 45.79                   | 49.87                   | 7.52               | 7.58               | 2                    | 2                    | 0                | 2                   | 2                   | 1           | 0           | 0          | 0          | 1       | 1       | 2       | 2       | 1       | 1       |
| 43        | Right visual loss                         | Dislocated right ocular lens                                                   | 62  | 1    | 46.57           | 2                           | 22.74        | 27.59        | 41.42                   | 41.3                    | 6.55               | 5.33               | 2                    | 2                    | 0                | 2                   | 2                   | 1           | 0           | 1          | 1          | 1       | 1       | 4       | 4       | 2       | 2       |
| 44        | Headache; rule out stroke                 | Normal                                                                         | 46  | 1    | 47.09           | 3                           | 25.32        | 31.16        | 43.25                   | 44.39                   | 2.35               | 3.68               | 2                    | 2                    | 0                | 2                   | 2                   | 0           | 0           | 0          | 0          | 1       | 1       | 2       | 2       | 1       | 1       |
| 45        | Acute vision loss                         | Chronic microvascular ischemic changes                                         | 77  | 1    | 49.43           | 2                           | 37.19        | 38.2         | 48.06                   | 45.86                   | 4.29               | 2.83               | 2                    | 2                    | 0                | 2                   | 2                   | 1           | 0           | 0          | 0          | 1       | 1       | 0       | 0       | 1       | 1       |
| 46        | Dizziness                                 | Normal                                                                         | 45  | 0    | 57.86           | 2                           | 56.92        | 62.97        | 49.56                   | 50.83                   | 5.96               | 4.49               | 2                    | 2                    | 0                | 2                   | 2                   | 1           | 0           | 0          | 0          | 1       | 1       | 2       | 2       | 1       | 1       |
| 47        | Reported loss of balance and coordination | Normal                                                                         | 51  | 0    | 37.34           | 4                           | 34.22        | 31.55        | 39.49                   | 41.74                   | 4.13               | 4.55               | 2                    | 2                    | 0                | 2                   | 2                   | 1           | 0           | 0          | 0          | 1       | 1       | 0       | 0       | 1       | 1       |
| 48        | Headache                                  | Suspected area of ischemia on MRI is not visualized on CTA; normal vasculature | 52  | 0    | 53.66           | 4                           | 38.89        | 48.37        | 47.02                   | 47.21                   | 6.32               | 7.46               | 2                    | 2                    | 0                | 2                   | 2                   | 1           | 0           | 0          | 0          | 1       | 1       | 2       | 2       | 1       | 1       |

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# On-line Supplementary Data: Continued

| Study No. | Indications                    | Findings                                                                               | Age | M/ F | Tentorial Angle | Petrous Apex Pneumatization | IAC- PCF (°) | IAC- PCF (°) | Petrosagittal Angle (°) | CCJB Distance (°) | CCJB Distance (°) | Transverse Sinus (L) | Transverse Sinus (R) | Split Confluents | Cavernous Sinus (L) | Cavernous Sinus (R) | MTS+ Origin | LTS+ Origin | Ringed (L) | Ringed (R) | MTV (L) | MTV (R) | ITV (L) | ITV (R) | LTV (L) | LTV (R) |
|-----------|--------------------------------|----------------------------------------------------------------------------------------|-----|------|-----------------|-----------------------------|--------------|--------------|-------------------------|-------------------|-------------------|----------------------|----------------------|------------------|---------------------|---------------------|-------------|-------------|------------|------------|---------|---------|---------|---------|---------|---------|
| 49        | Stroke evaluation              | Normal                                                                                 | 59  | 0    | 50.89           | 2                           | 37.11        | 39.16        | 49.77                   | 46                | 4.18              | 4.6                  | 2                    | 2                | 0                   | 2                   | 2           | 0           | 0          | 0          | 1       | 1       | 0       | 0       | 1       | 1       |
| 50        | Dizziness                      | Hypoplastic anterior inferior cerebellar arteries; Stable cerebellar tonsillar ectopia | 40  | 0    | 53              | 4                           | 45.01        | 24.83        | 55.89                   | 48.85             | 5.85              | 4.5                  | 2                    | 2                | 0                   | 2                   | 2           | 2           | 0          | 0          | 1       | 1       | 2       | 2       | 1       | 1       |
| 51        | Rule out aneurysm              | Left carotid terminus aneurysm (1 mm)                                                  | 91  | 1    | 45.68           | 3                           | 30           | 43.77        | 51.11                   | 46.37             | 7.27              | 7.52                 | 2                    | 2                | 0                   | 2                   | 2           | 0           | 0          | 0          | 1       | 1       | 2       | 2       | 1       | 1       |
| 52        | Right-arm weakness, SCD        | Normal                                                                                 | 38  | 0    | 58.76           | 2                           | 38.76        | 36.13        | 53.02                   | 50.94             | 6.29              | 4.44                 | 2                    | 2                | 0                   | 2                   | 2           | 1           | 0          | 1          | 1       | 1       | 3       | 3       | 3       | 3       |
| 53        | Prolactinoma surgical planning | Normal                                                                                 | 27  | 0    | 53.31           | 4                           | 35.46        | 45.92        | 50.45                   | 48.24             | 3.81              | 3.85                 | 2                    | 2                | 0                   | 2                   | 2           | 1           | 0          | 1          | 1       | 1       | 4       | 4       | 3       | 3       |
| 54        | Stroke evaluation              | Normal                                                                                 | 52  | 1    | 44.69           | 3                           | 36.04        | 40.14        | 49.58                   | 47.79             | 3.4               | 4.63                 | 2                    | 2                | 0                   | 2                   | 2           | 1           | 0          | 0          | 1       | 1       | 3       | 3       | 1       | 1       |
| 55        | Diplopia                       | Normal                                                                                 | 46  | 0    | 48.35           | 3                           | 35.79        | 34.86        | 46.01                   | 49.83             | 6.54              | 3.17                 | 2                    | 2                | 0                   | 2                   | 2           | 1           | 0          | 1          | 1       | 1       | 4       | 4       | 3       | 3       |
| 56        | Diplopia                       | Normal                                                                                 | 45  | 0    | 41.17           | 2                           | 22.94        | 30.84        | 49.82                   | 50.91             | 6.5               | 5.85                 | 2                    | 2                | 0                   | 2                   | 2           | 2           | 0          | 0          | 1       | 1       | 3       | 3       | 1       | 1       |
| 57        | TIA                            | Normal                                                                                 | 88  | 0    | 44.83           | 2                           | 50.62        | 42.83        | 56.93                   | 51.76             | 4.37              | 6.08                 | 2                    | 2                | 0                   | 2                   | 2           | 0           | 0          | 0          | 1       | 1       | 2       | 2       | 1       | 1       |
| 58        | Right amaurosis fugax          | Normal                                                                                 | 53  | 1    | 46.44           | 4                           | 41.48        | 48.4         | 59.59                   | 53.63             | 4.63              | 4.46                 | 2                    | 2                | 0                   | 2                   | 2           | 0           | 0          | 0          | 1       | 1       | 2       | 2       | 1       | 1       |
| 59        | Left-sided pulsatile tinnitus  | Normal                                                                                 | 40  | 1    | 53.7            | 3                           | 39.42        | 30.58        | 49.48                   | 50.1              | 6.03              | 4.99                 | 2                    | 2                | 0                   | 2                   | 2           | 1           | 0          | 0          | 1       | 1       | 0       | 0       | 1       | 1       |
| 60        | Right pulsatile tinnitus       | Normal                                                                                 | 49  | 1    | 53.61           | 3                           | 39.94        | 37.14        | 53.49                   | 53.26             | 5.47              | 6.77                 | 2                    | 2                | 0                   | 2                   | 2           | 1           | 0          | 1          | 1       | 1       | 4       | 4       | 3       | 3       |
| 61        | Dizziness                      | Normal                                                                                 | 47  | 0    | 45.42           | 3                           | 45.44        | 40.61        | 48.86                   | 43.82             | 5.29              | 5.21                 | 2                    | 2                | 0                   | 2                   | 2           | 0           | 0          | 0          | 1       | 1       | 0       | 0       | 1       | 1       |
| 62        | Unilateral chronic pain        | Normal                                                                                 | 46  | 0    | 51.17           | 3                           | 45.96        | 42.23        | 57.67                   | 51.15             | 5.3               | 6.33                 | 2                    | 2                | 0                   | 2                   | 2           | 1           | 0          | 0          | 1       | 1       | 2       | 2       | 1       | 1       |
| 63        | Anisocoria                     | Global volume loss                                                                     | 85  | 1    | 48.77           | 2                           | 39.43        | 48.14        | 54.81                   | 54.25             | 4.47              | 3.76                 | 2                    | 2                | 0                   | 2                   | 2           | 0           | 0          | 0          | 1       | 1       | 2       | 2       | 1       | 1       |
| 64        | Stroke evaluation              | Normal                                                                                 | 73  | 1    | 64.65           | 3                           | 31.69        | 39.91        | 51.6                    | 50.45             | 5.64              | 4.56                 | 2                    | 2                | 0                   | 2                   | 2           | 1           | 0          | 0          | 1       | 1       | 2       | 2       | 1       | 1       |
| 65        | Loss of vision                 | Normal                                                                                 | 44  | 1    | 45.43           | 4                           | 34.52        | 31.65        | 54.54                   | 53.92             | 4.48              | 3.64                 | 2                    | 2                | 0                   | 2                   | 2           | 1           | 0          | 1          | 1       | 1       | 4       | 4       | 3       | 3       |
| 66        | AMS                            | Normal                                                                                 | 68  | 0    | 51.71           | 2                           | 43.21        | 49.89        | 53.61                   | 47.4              | 9.85              | 8.79                 | 2                    | 2                | 0                   | 2                   | 2           | 0           | 0          | 0          | 1       | 1       | 2       | 2       | 1       | 1       |
| 67        | Headache                       | Normal                                                                                 | 30  | 0    | 50.08           | 4                           | 38.42        | 44.68        | 50.03                   | 50.48             | 3.35              | 3.23                 | 2                    | 2                | 0                   | 2                   | 2           | 1           | 0          | 0          | 1       | 1       | 0       | 0       | 1       | 1       |
| 68        | Family history of aneurysms    | Normal                                                                                 | 84  | 0    | 47.59           | 3                           | 41.34        | 42.03        | 56.67                   | 50.89             | 6.04              | 7.59                 | 2                    | 2                | 0                   | 2                   | 2           | 1           | 0          | 0          | 1       | 1       | 2       | 2       | 1       | 1       |
| 69        | Headache                       | Normal                                                                                 | 47  | 0    | 51.94           | 2                           | 41.64        | 51.7         | 45.25                   | 46.67             | 7.44              | 6.82                 | 2                    | 2                | 0                   | 2                   | 2           | 1           | 0          | 0          | 1       | 1       | 0       | 0       | 1       | 1       |
| 70        | Ataxia, slurred speech         | Moderate atherosclerosis                                                               | 93  | 1    | 57.63           | 4                           | 39.47        | 52.19        | 54.81                   | 57.13             | 4.9               | 5.57                 | 2                    | 2                | 0                   | 2                   | 2           | 0           | 0          | 0          | 1       | 1       | 2       | 2       | 1       | 1       |
| 71        | MVC                            | Normal                                                                                 | 63  | 1    | 47.94           | 2                           | 39.23        | 44.75        | 44.54                   | 43.07             | 4.45              | 6.89                 | 2                    | 2                | 0                   | 2                   | 2           | 1           | 0          | 0          | 1       | 1       | 2       | 2       | 1       | 1       |
| 72        | Headache                       | Normal                                                                                 | 59  | 0    | 48.87           | 4                           | 34.52        | 42.07        | 55.62                   | 45.94             | 7.9               | 5.39                 | 2                    | 2                | 0                   | 2                   | 2           | 1           | 0          | 0          | 1       | 1       | 2       | 2       | 1       | 1       |

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# On-line Supplementary Data: Continued

| On-line Supplementary Data. Continued |                                            |                                          |     |      |                 |                             |              |              |                         |                         |                   |                   |                      |                      |                  |                     |                     |             |             |            |            |         |         |         |         |         |         |
|---------------------------------------|--------------------------------------------|------------------------------------------|-----|------|-----------------|-----------------------------|--------------|--------------|-------------------------|-------------------------|-------------------|-------------------|----------------------|----------------------|------------------|---------------------|---------------------|-------------|-------------|------------|------------|---------|---------|---------|---------|---------|---------|
| Study No.                             | Indications                                | Findings                                 | Age | M/ F | Tentorial Angle | Petrous Apex Pneumatization | IAC- PCF (L) | IAC- PCF (R) | Petrosagittal Angle (L) | Petrosagittal Angle (R) | CCJB Distance (L) | CCJB Distance (R) | Transverse Sinus (L) | Transverse Sinus (R) | Split Confluents | Cavernous Sinus (L) | Cavernous Sinus (R) | MTS+ Origin | LTS+ Origin | Ringed (L) | Ringed (R) | MTV (L) | MTV (R) | ITV (L) | ITV (R) | LTV (L) | LTV (R) |
| 73                                    | Tinnitus                                   | Normal                                   | 51  | 0    | 45.39           | 3                           | 43.12        | 40.4         | 54.92                   | 49.3                    | 5.68              | 5.95              | 2                    | 2                    | 0                | 2                   | 2                   | 0           | 0           | 0          | 0          | 1       | 1       | 2       | 2       | 1       | 1       |
| 74                                    | Status post cochlear implant               | Normal                                   | 67  | 0    | 47.02           | 4                           | 48.79        | 57.48        | 55.71                   | 53.68                   | 5.85              | 4.28              | 2                    | 2                    | 0                | 2                   | 2                   | 0           | 0           | 0          | 0          | 1       | 1       | 2       | 2       | 1       | 1       |
| 75                                    | Headache                                   | Normal                                   | 93  | 0    | 58.38           | 4                           | 45.14        | 45.3         | 55.15                   | 55.15                   | 6.18              | 8.91              | 2                    | 2                    | 0                | 2                   | 2                   | 1           | 0           | 1          | 1          | 1       | 1       | 2       | 2       | 3       | 3       |
| 76                                    | Tinnitus                                   | Normal                                   | 29  | 0    | 48.91           | 4                           | 63.19        | 61.42        | 48.61                   | 47.22                   | 3.75              | 4.58              | 2                    | 2                    | 0                | 2                   | 2                   | 1           | 0           | 0          | 0          | 1       | 1       | 2       | 2       | 1       | 1       |
| 77                                    | Painless R vision loss                     | Normal                                   | 46  | 1    | 41.53           | 4                           | 41.67        | 36.36        | 5.6                     | 54.44                   | 5.35              | 4.33              | 2                    | 2                    | 0                | 2                   | 2                   | 1           | 0           | 0          | 0          | 1       | 1       | 2       | 2       | 1       | 1       |
| 78                                    | Headache                                   | Normal                                   | 45  | 1    | 47.96           | 2                           | 49.16        | 49.27        | 54.68                   | 51.63                   | 6.61              | 5.45              | 2                    | 2                    | 0                | 2                   | 2                   | 1           | 0           | 0          | 0          | 1       | 1       | 2       | 2       | 1       | 1       |
| 79                                    | R/o stroke                                 | Normal                                   | 77  | 0    | 49.1            | 3                           | 38.74        | 54.49        | 54.28                   | 53.73                   | 8.52              | 6.18              | 2                    | 2                    | 0                | 2                   | 2                   | 0           | 0           | 0          | 0          | 1       | 1       | 2       | 2       | 1       | 1       |
| 80                                    | Follow-up old lacunar infarcts             | Old lacunar infarct                      | 56  | 0    | 60.32           | 4                           | 46.16        | 49.03        | 53.61                   | 52.12                   | 4                 | 4.02              | 2                    | 2                    | 0                | 2                   | 2                   | 0           | 0           | 0          | 0          | 1       | 1       | 2       | 2       | 1       | 1       |
| 81                                    | TIA                                        | Normal                                   | 52  | 1    | 54.35           | 3                           | 45.56        | 53.2         | 54.86                   | 54.61                   | 3.03              | 4.59              | 2                    | 2                    | 0                | 2                   | 2                   | 1           | 0           | 0          | 0          | 1       | 1       | 2       | 2       | 1       | 1       |
| 82                                    | Stroke evaluation                          | Normal                                   | 65  | 0    | 33.86           | 2                           | 31.02        | 31.4         | 50.39                   | 51.31                   | 3.12              | 4.19              | 2                    | 2                    | 0                | 2                   | 2                   | 1           | 0           | 1          | 1          | 1       | 1       | 4       | 4       | 2       | 2       |
| 83                                    | Headache                                   | Mild atherosclerosis left paracaloid ICA | 47  | 0    | 62.99           | 2                           | 38.49        | 39.5         | 53.54                   | 52.72                   | 4.56              | 5.33              | 2                    | 2                    | 0                | 2                   | 2                   | 0           | 0           | 0          | 0          | 1       | 1       | 2       | 2       | 1       | 1       |
| 84                                    | Acute right vision loss                    | Moderate atherosclerosis                 | 68  | 1    | 48.61           | 3                           | 41.15        | 42.98        | 45.8                    | 43.57                   | 4.73              | 3.64              | 2                    | 2                    | 0                | 2                   | 2                   | 1           | 0           | 0          | 0          | 1       | 1       | 0       | 0       | 1       | 1       |
| 85                                    | Throbbing R headache millimeter in ureter? | Normal                                   | 34  | 1    | 57.49           | 4                           | 38.6         | 41.23        | 54.1                    | 48.02                   | 2.94              | 4.74              | 2                    | 2                    | 0                | 2                   | 2                   | 0           | 0           | 0          | 0          | 1       | 1       | 2       | 2       | 1       | 1       |
| 86                                    | Retroorbital headache                      | Normal                                   | 86  | 0    | 39.85           | 4                           | 34.81        | 42.03        | 42.04                   | 44.92                   | 3.17              | 3.88              | 2                    | 2                    | 0                | 2                   | 2                   | 0           | 0           | 0          | 0          | 1       | 1       | 2       | 2       | 1       | 1       |
| 87                                    | Pituitary adenoma                          | Stable pituitary adenoma                 | 51  | 0    | 62.24           | 2                           | 46.16        | 48.1         | 47.44                   | 45.47                   | 3.38              | 6.92              | 2                    | 2                    | 0                | 2                   | 2                   | 0           | 0           | 0          | 0          | 1       | 1       | 2       | 2       | 1       | 1       |
| 88                                    | Rule out subarachnoid hemorrhage           | Normal                                   | 71  | 1    | 39.56           | 3                           | 40.2         | 47.78        | 58.01                   | 52.03                   | 4.34              | 7.03              | 2                    | 2                    | 0                | 2                   | 2                   | 0           | 0           | 0          | 0          | 1       | 1       | 2       | 2       | 1       | 1       |
| 89                                    | Evaluate aneurysm                          | Normal                                   | 19  | 0    | 47.02           | 3                           | 50           | 45.26        | 45.26                   | 50                      | 5.51              | 5.1               | 2                    | 2                    | 0                | 2                   | 2                   | 0           | 0           | 0          | 0          | 1       | 1       | 2       | 2       | 1       | 1       |
| 90                                    | Evaluate aneurysm                          | Normal                                   | 34  | 1    | 35.63           | 3                           | 54.63        | 66.97        | 51.18                   | 48.77                   | 3.39              | 3.5               | 2                    | 2                    | 0                | 2                   | 2                   | 1           | 0           | 0          | 0          | 1       | 1       | 3       | 3       | 1       | 1       |
| 91                                    | Headache                                   | Normal                                   | 53  | 0    | 55.71           | 4                           | 42.76        | 42.92        | 63.05                   | 61.04                   | 3.3               | 1.67              | 2                    | 2                    | 0                | 2                   | 2                   | 0           | 0           | 0          | 0          | 1       | 1       | 2       | 2       | 1       | 1       |
| 92                                    | Evaluate central venous thrombosis         | Normal                                   | 26  | 0    | 45.89           | 3                           | 60.56        | 61.74        | 57.68                   | 49.84                   | 6.84              | 7.8               | 2                    | 2                    | 0                | 2                   | 2                   | 0           | 0           | 0          | 0          | 1       | 1       | 2       | 2       | 1       | 1       |
| 93                                    | Pituitary adenoma                          | Stable pituitary adenoma, no mass effect | 52  | 1    | 60.8            | 4                           | 49.69        | 39.48        | 52.16                   | 51.52                   | 3.71              | 3.04              | 2                    | 2                    | 0                | 2                   | 2                   | 0           | 0           | 0          | 0          | 1       | 1       | 2       | 2       | 1       | 1       |
| 94                                    | Headache, stroke evaluation                | Normal                                   | 37  | 0    | 49.24           | 0                           | 31.26        | 30.78        | 56.2                    | 53.5                    | 4.91              | 4.27              | 2                    | 2                    | 0                | 2                   | 2                   | 1           | 0           | 0          | 0          | 1       | 1       | 2       | 2       | 1       | 1       |
| 95                                    | Proptosis                                  | Normal                                   | 45  | 1    | 41.94           | 0                           | 38.76        | 40.14        | 48.61                   | 48.17                   | 6.15              | 6.04              | 2                    | 2                    | 0                | 2                   | 2                   | 1           | 0           | 0          | 0          | 1       | 1       | 2       | 2       | 1       | 1       |

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# On-line Supplementary Data: Continued

| Study No. | Indications                           | Findings                                                  | Age | M/ F | Tentorial Angle | Petrous Apex Pneumatization | IAC- PCF (L) | IAC- PCF (R) | Petrosagittal Angle (L) | Petrosagittal Angle (R) | CCJB Distance (L) | CCJB Distance (R) | Transverse Sinus (L) | Transverse Sinus (R) | Split Confluents | Cavernous Sinus (L) | Cavernous Sinus (R) | MTS+ Origin | LTS+ Origin | Ringed (L) | Ringed (R) | MTV (L) | MTV (R) | ITV (L) | ITV (R) | LTV (L) | LTV (R) |
|-----------|---------------------------------------|-----------------------------------------------------------|-----|------|-----------------|-----------------------------|--------------|--------------|-------------------------|-------------------------|-------------------|-------------------|----------------------|----------------------|------------------|---------------------|---------------------|-------------|-------------|------------|------------|---------|---------|---------|---------|---------|---------|
| 96        | Worsening memory loss                 | Normal                                                    | 69  | 0    | 41.43           | 2                           | 49.1         | 46.39        | 43.61                   | 44.46                   | 3.69              | 4.98              | 2                    | 2                    | 0                | 2                   | 2                   | 1           | 0           | 1          | 1          | 1       | 1       | 4       | 4       | 3       | 3       |
| 97        | Left central retinal artery occlusion | Normal intracranial vessels                               | 92  | 0    | 49.04           | 4                           | 55.98        | 55.17        | 55.98                   | 39.41                   | 4.91              | 4.43              | 2                    | 2                    | 0                | 2                   | 2                   | 0           | 0           | 0          | 0          | 1       | 1       | 2       | 2       | 1       | 1       |
| 98        | Seizure                               | Normal                                                    | 35  | 1    | 48.66           | 4                           | 37.47        | 45.96        | 58.68                   | 50.6                    | 2.5               | 2.68              | 2                    | 2                    | 0                | 2                   | 2                   | 0           | 0           | 0          | 0          | 1       | 1       | 2       | 2       | 1       | 1       |
| 99        | Sellar mass                           | Stable sellar mass, abutting optic chiasm                 | 64  | 1    | 46.93           | 3                           | 50.91        | 52.85        | 41.66                   | 47.15                   | 4.15              | 4                 | 2                    | 2                    | 0                | 2                   | 2                   | 0           | 0           | 0          | 0          | 1       | 1       | 2       | 2       | 1       | 1       |
| 100       | Left-sided weakness                   | Normal                                                    | 65  | 1    | 40.61           | 4                           | 39.96        | 37.52        | 53.7                    | 48.69                   | 2.97              | 2.84              | 2                    | 2                    | 0                | 2                   | 2                   | 1           | 0           | 0          | 0          | 1       | 1       | 2       | 2       | 1       | 1       |
| 101       | Seizure                               | Normal                                                    | 42  | 1    | 41.07           | 3                           | 55.59        | 50.95        | 54.3                    | 54.08                   | 3.84              | 4.29              | 2                    | 2                    | 0                | 2                   | 2                   | 1           | 0           | 0          | 0          | 1       | 1       | 2       | 2       | 1       | 1       |
| 102       | Pseudotumor cerebri                   | Narrowing of superior sagittal sinus and transverse sinus | 26  | 0    | 40.16           | 2                           | 56.51        | 55.92        | 52.68                   | 47.67                   | 4.13              | 5.3               | 2                    | 2                    | 0                | 2                   | 2                   | 1           | 0           | 0          | 0          | 1       | 1       | 1       | 1       | 1       | 1       |
| 103       | Headache                              | Possible normal pressure hydrocephalus                    | 77  | 0    | 36.21           | 3                           | 44.55        | 53.56        | 48.19                   | 46.78                   | 4.61              | 4.2               | 2                    | 2                    | 0                | 2                   | 2                   | 0           | 0           | 0          | 0          | 1       | 1       | 2       | 2       | 1       | 1       |
| 104       | Headache, worsening left eye vision   | Left V4 vertebral artery segment moderate atherosclerosis | 91  | 0    | 43.06           | 2                           | 53.41        | 58.04        | 54.11                   | 53.43                   | 4.87              | 6.07              | 2                    | 2                    | 0                | 2                   | 2                   | 0           | 0           | 0          | 0          | 1       | 1       | 0       | 0       | 1       | 1       |
| 105       | Stroke evaluation                     | Normal                                                    | 70  | 0    | 46.6            | 4                           | 33.96        | 29.12        | 50.17                   | 49.44                   | 5.28              | 4.48              | 2                    | 2                    | 0                | 2                   | 2                   | 1           | 0           | 0          | 0          | 1       | 1       | 1       | 1       | 1       | 1       |
| 106       | Evaluate aneurysm                     | Normal                                                    | 63  | 0    | 50.21           | 4                           | 35.06        | 33.35        | 48.75                   | 50.72                   | 3.63              | 2.5               | 2                    | 2                    | 0                | 2                   | 2                   | 0           | 0           | 0          | 0          | 1       | 1       | 0       | 0       | 1       | 1       |
| 107       | Stroke evaluation                     | Normal                                                    | 83  | 1    | 40.42           | 3                           | 44.42        | 44.88        | 55.67                   | 54.83                   | 6.47              | 6.71              | 2                    | 2                    | 0                | 2                   | 2                   | 1           | 0           | 0          | 0          | 1       | 1       | 2       | 2       | 1       | 1       |
| 108       | Headache                              | Normal                                                    | 43  | 1    | 51.49           | 3                           | 45.04        | 38.68        | 48.09                   | 45.7                    | 5.06              | 5.39              | 2                    | 2                    | 0                | 2                   | 2                   | 0           | 0           | 0          | 0          | 0       | 0       | 2       | 2       | 1       | 1       |
| 109       | Headache                              | Normal                                                    | 36  | 0    | 54.53           | 3                           | 60.92        | 37.65        | 47.18                   | 49.36                   | 6.74              | 5.03              | 2                    | 2                    | 0                | 2                   | 2                   | 1           | 0           | 1          | 1          | 1       | 1       | 2       | 2       | 1       | 1       |
| 110       | Stroke evaluation                     | Normal                                                    | 58  | 1    | 43.99           | 3                           | 30.98        | 34.53        | 45.78                   | 48.29                   | 6.15              | 4.6               | 2                    | 2                    | 0                | 2                   | 2                   | 1           | 0           | 0          | 0          | 1       | 1       | 3       | 3       | 1       | 1       |
| 111       | Headache                              | Normal                                                    | 69  | 0    | 49.23           | 2                           | 53.79        | 50.67        | 56.1                    | 53.73                   | 4.31              | 4.4               | 2                    | 2                    | 0                | 2                   | 2                   | 0           | 0           | 0          | 0          | 1       | 1       | 2       | 2       | 1       | 1       |
| 112       | Transient blurred vision              | Normal                                                    | 42  | 0    | 48.88           | 4                           | 33.62        | 39.21        | 51.42                   | 49.14                   | 8.25              | 5.01              | 2                    | 2                    | 0                | 2                   | 2                   | 1           | 0           | 0          | 0          | 1       | 1       | 2       | 2       | 1       | 1       |
| 113       | Stroke evaluation                     | Normal                                                    | 76  | 1    | 62.27           | 2                           | 42.41        | 46.41        | 52.28                   | 48.42                   | 3.96              | 6.05              | 2                    | 2                    | 0                | 2                   | 2                   | 1           | 0           | 0          | 0          | 1       | 1       | 2       | 2       | 1       | 1       |
| 114       | Headache                              | Normal                                                    | 52  | 0    | 34.05           | 3                           | 58.32        | 49.08        | 48.48                   | 43.83                   | 2.63              | 2.33              | 2                    | 2                    | 1                | 2                   | 2                   | 1           | 0           | 0          | 0          | 1       | 1       | 0       | 0       | 1       | 1       |
| 115       | Headache                              | Normal                                                    | 65  | 1    | 44.61           | 2                           | 52.16        | 58.66        | 49.04                   | 46.97                   | 3.94              | 7.02              | 2                    | 2                    | 0                | 2                   | 2                   | 0           | 0           | 0          | 0          | 1       | 1       | 2       | 2       | 1       | 1       |
| 116       | Headache, facial palsy                | Normal                                                    | 73  | 0    | 51.69           | 3                           | 47.92        | 48.8         | 53.29                   | 50.55                   | 5.04              | 4.03              | 2                    | 2                    | 0                | 2                   | 2                   | 0           | 0           | 0          | 0          | 1       | 1       | 2       | 2       | 1       | 1       |
| 117       | Tinnitus                              | Normal                                                    | 36  | 0    | 55.09           | 2                           | 34.43        | 52.43        | 46.84                   | 49.18                   | 7.13              | 3.06              | 2                    | 2                    | 0                | 2                   | 2                   | 1           | 0           | 0          | 0          | 1       | 1       | 1       | 1       | 1       | 1       |
| 118       | Dysarthria                            | Normal                                                    | 95  | 0    | 43.03           | 4                           | 59.3         | 59.06        | 46.98                   | 47.62                   | 1.25              | 1.45              | 2                    | 2                    | 0                | 2                   | 2                   | 1           | 0           | 1          | 1          | 1       | 1       | 4       | 4       | 3       | 3       |
| 119       | Headache                              | Mild atherosclerotic disease                              | 84  | 0    | 42.16           | 4                           | 34.69        | 34.78        | 51.44                   | 49.52                   | 9.54              | 2.94              | 2                    | 2                    | 0                | 2                   | 2                   | 0           | 0           | 0          | 0          | 1       | 1       | 0       | 0       | 1       | 1       |
| 120       | Headache                              | Normal                                                    | 45  | 1    | 50.43           | 4                           | 51.85        | 53.51        | 50.03                   | 50.36                   | 6.69              | 4.78              | 2                    | 2                    | 0                | 2                   | 2                   | 0           | 0           | 0          | 0          | 1       | 1       | 2       | 2       | 1       | 1       |
| 121       | Headache                              | Normal                                                    | 71  | 0    | 48.17           | 2                           | 57.27        | 56.42        | 57.77                   | 56.42                   | 2.91              | 2.49              | 2                    | 2                    | 0                | 2                   | 2                   | 1           | 0           | 0          | 0          | 1       | 1       | 1       | 1       | 1       | 1       |

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| Study No. | Indications                                           | Findings                           | Age | M/<br>F | Tentorial<br>Angle | Petrous Apex<br>Pneumatization | IAC-<br>PCF (°) | IAC-<br>PCF (°) | Petrosigittal<br>Angle (°) | CC-JB<br>Distance (°) | CC-JB<br>Distance (°) | Transverse<br>Sinus (L) | Transverse<br>Sinus (R) | Split<br>Confluent | Cavernous<br>Sinus (L) | Cavernous<br>Sinus (R) | MTS+<br>Origin | LTS+<br>Origin | Ringed<br>(L) | Ringed<br>(R) | MTV<br>(L) | MTV<br>(R) | ITV<br>(L) | ITV<br>(R) | LTV<br>(L) | LTV<br>(R) |
|-----------|-------------------------------------------------------|------------------------------------|-----|---------|--------------------|--------------------------------|-----------------|-----------------|----------------------------|-----------------------|-----------------------|-------------------------|-------------------------|--------------------|------------------------|------------------------|----------------|----------------|---------------|---------------|------------|------------|------------|------------|------------|------------|
| 122       | Surgical planning                                     | Normal                             | 68  | 1       | 43.21              | 4                              | 36.8            | 53.68           | 60.74                      | 50.77                 | 6.22                  | 5.85                    | 2                       | 2                  | 0                      | 2                      | 2              | 0              | 0             | 0             | 1          | 1          | 2          | 2          | 1          | 1          |
| 123       | Headache                                              | Normal                             | 41  | 0       | 56.83              | 2                              | 40.36           | 41.36           | 53.91                      | 53.9                  | 3.45                  | 5.88                    | 2                       | 2                  | 0                      | 2                      | 2              | 1              | 0             | 0             | 1          | 1          | 1          | 1          | 1          | 1          |
| 124       | Dizziness                                             | Normal                             | 53  | 0       | 49.14              | 3                              | 37.08           | 30.9            | 44.17                      | 47.28                 | 6.12                  | 5.43                    | 2                       | 2                  | 0                      | 2                      | 2              | 1              | 0             | 1             | 1          | 1          | 4          | 4          | 2          | 2          |
| 125       | Rule out giant cell<br>arteritis                      | Normal                             | 63  | 1       | 44.96              | 4                              | 36.73           | 44.22           | 47.81                      | 52.4                  | 6.52                  | 4.35                    | 2                       | 2                  | 0                      | 2                      | 2              | 0              | 0             | 0             | 1          | 1          | 2          | 2          | 1          | 1          |
| 126       | Ataxia s/p trauma                                     | Normal                             | 51  | 0       | 44.18              | 4                              | 42.48           | 52.78           | 58.56                      | 54.58                 | 1.87                  | 4.39                    | 2                       | 2                  | 0                      | 2                      | 2              | 1              | 0             | 1             | 1          | 1          | 4          | 4          | 3          | 3          |
| 127       | Intractable<br>headache                               | Mild atherosclerosis               | 81  | 0       | 43.38              | 3                              | 32.83           | 40.8            | 51.02                      | 53.39                 | 8.04                  | 9.64                    | 2                       | 2                  | 0                      | 2                      | 2              | 1              | 0             | 1             | 1          | 1          | 2          | 2          | 1          | 1          |
| 128       | Transient right-arm<br>weakness                       | Normal                             | 48  | 1       | 47.86              | 3                              | 39.13           | 25.91           | 57.73                      | 52.37                 | 7.17                  | 4.29                    | 2                       | 2                  | 0                      | 1                      | 1              | 1              | 0             | 0             | 1          | 1          | 1          | 1          | 1          | 1          |
| 129       | Migraine with<br>seizure                              | Normal                             | 48  | 0       | 43.16              | 3                              | 39.51           | 32.68           | 56.9                       | 49.19                 | 2.65                  | 4.73                    | 2                       | 2                  | 0                      | 1                      | 1              | 1              | 1             | 1             | 1          | 1          | 4          | 4          | 2          | 2          |
| 130       | Abducens palsy,<br>headache                           | Normal                             | 52  | 1       | 42.44              | 3                              | 39.7            | 26.83           | 49.4                       | 49.27                 | 6.06                  | 3.72                    | 2                       | 2                  | 0                      | 2                      | 2              | 0              | 0             | 0             | 1          | 1          | 2          | 2          | 1          | 1          |
| 131       | Rule out optic<br>neuropathy                          | Normal                             | 74  | 1       | 49.21              | 4                              | 50.62           | 56.59           | 54.18                      | 48.16                 | 7.54                  | 7.47                    | 2                       | 2                  | 1                      | 2                      | 2              | 0              | 0             | 0             | 1          | 1          | 2          | 2          | 1          | 1          |
| 132       | Headache post-<br>procedure                           | Normal                             | 55  | 0       | 37.29              | 3                              | 38.05           | 43.61           | 50.9                       | 49.21                 | 5.13                  | 4.92                    | 2                       | 2                  | 0                      | 2                      | 2              | 2              | 0             | 0             | 1          | 1          | 2          | 2          | 1          | 1          |
| 133       | Pulsatile tinnitus                                    | Normal                             | 70  | 0       | 54.13              | 4                              | 49.48           | 45.92           | 55.81                      | 54.43                 | 1.77                  | 3.66                    | 2                       | 2                  | 0                      | 2                      | 2              | 1              | 0             | 1             | 1          | 1          | 4          | 4          | 2          | 2          |
| 134       | Headache                                              | Normal                             | 40  | 1       | 42.93              | 3                              | 28.03           | 33.18           | 50.19                      | 50.75                 | 1.6                   | 1.49                    | 2                       | 2                  | 0                      | 2                      | 2              | 0              | 0             | 0             | 1          | 1          | 2          | 2          | 1          | 1          |
| 135       | Rule out aneurysm                                     | Normal                             | 33  | 0       | 43.03              | 3                              | 38.31           | 39.86           | 52.88                      | 49.08                 | 3.09                  | 2.8                     | 2                       | 2                  | 0                      | 2                      | 2              | 0              | 0             | 0             | 1          | 1          | 2          | 2          | 1          | 1          |
| 136       | Blurry vision                                         | Normal                             | 72  | 1       | 58.11              | 4                              | 55.76           | 52.15           | 56.12                      | 51.42                 | 4.6                   | 3.52                    | 2                       | 2                  | 0                      | 2                      | 2              | 0              | 0             | 0             | 1          | 1          | 2          | 2          | 1          | 1          |
| 137       | Headache                                              | Normal                             | 59  | 0       | 42.1               | 4                              | 52.94           | 56.47           | 54.4                       | 45.74                 | 2.29                  | 3.82                    | 2                       | 2                  | 0                      | 2                      | 2              | 1              | 0             | 1             | 1          | 1          | 4          | 4          | 2          | 2          |
| 138       | Headache, history<br>of DVT                           | Normal                             | 45  | 0       | 43.02              | 4                              | 71.93           | 79.63           | 50.01                      | 51.32                 | 8.17                  | 5.94                    | 2                       | 2                  | 0                      | 2                      | 2              | 0              | 0             | 0             | 1          | 1          | 2          | 2          | 1          | 1          |
| 139       | Weakness                                              | hypoplastic bv,<br>atherosclerosis | 73  | 1       | 42.95              | 3                              | 54.02           | 58.03           | 51.53                      | 51.03                 | 6.6                   | 5.14                    | 2                       | 2                  | 0                      | 2                      | 2              | 0              | 0             | 0             | 1          | 1          | 2          | 2          | 1          | 1          |
| 140       | Skull base<br>abnormality                             | Normal                             | 21  | 0       | 37.71              | 3                              | 62.71           | 62.26           | 51.66                      | 52.3                  | 4.65                  | 4.88                    | 2                       | 2                  | 1                      | 2                      | 2              | 0              | 0             | 0             | 1          | 1          | 2          | 2          | 1          | 1          |
| 141       | Anaurosis fugax                                       | Moderate<br>atherosclerosis        | 64  | 0       | 34.27              | 3                              | 46.33           | 55.99           | 51.39                      | 52.44                 | 6.06                  | 5.05                    | 2                       | 2                  | 0                      | 2                      | 2              | 1              | 0             | 0             | 1          | 1          | 1          | 1          | 1          | 1          |
| 142       | Dysarthria                                            | Normal                             | 78  | 1       | 50.04              | 2                              | 43.85           | 45.32           | 59.41                      | 51.28                 | 3.46                  | 3.97                    | 2                       | 2                  | 0                      | 2                      | 2              | 0              | 0             | 0             | 1          | 1          | 2          | 2          | 1          | 1          |
| 143       | Transient loss of<br>vision                           | Normal                             | 70  | 0       | 43.65              | 3                              | 51.59           | 64.11           | 53.23                      | 51.82                 | 4.81                  | 4.18                    | 2                       | 2                  | 1                      | 2                      | 2              | 1              | 0             | 1             | 1          | 1          | 4          | 4          | 2          | 2          |
| 144       | Rule out aneurysm                                     | Normal                             | 31  | 0       | 46.6               | 3                              | 52.84           | 58.55           | 57.93                      | 53.62                 | 2.7                   | 4.21                    | 2                       | 2                  | 1                      | 2                      | 2              | 1              | 0             | 1             | 1          | 1          | 4          | 4          | 3          | 3          |
| 145       | Difficulty speaking                                   | Normal                             | 55  | 1       | 53.5               | 3                              | 54.47           | 58.49           | 58.04                      | 50.31                 | 8.55                  | 8.43                    | 2                       | 2                  | 0                      | 2                      | 2              | 1              | 0             | 0             | 1          | 1          | 1          | 1          | 1          | 1          |
| 146       | Rule out anterior<br>communicating<br>artery aneurysm | Normal                             | 67  | 0       | 57.74              | 3                              | 36.11           | 42.36           | 51.35                      | 45.55                 | 6.86                  | 5.55                    | 2                       | 2                  | 0                      | 2                      | 2              | 0              | 0             | 0             | 1          | 1          | 2          | 2          | 1          | 1          |
| 147       | Rule out<br>thrombosis                                | Normal                             | 21  | 0       | 44.67              | 3                              | 29.13           | 63.68           | 43.46                      | 37.2                  | 5.65                  | 5.26                    | 2                       | 2                  | 0                      | 2                      | 2              | 1              | 0             | 1             | 1          | 1          | 4          | 4          | 3          | 3          |

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# On-line Supplementary Data: Continued

| On-line Supplementary Data. Continued |                                                                    |                                    |     |      |                 |                             |              |              |                         |                         |                   |                   |                      |                      |                 |                     |                     |             |             |            |            |         |         |         |         |         |         |   |
|---------------------------------------|--------------------------------------------------------------------|------------------------------------|-----|------|-----------------|-----------------------------|--------------|--------------|-------------------------|-------------------------|-------------------|-------------------|----------------------|----------------------|-----------------|---------------------|---------------------|-------------|-------------|------------|------------|---------|---------|---------|---------|---------|---------|---|
| Study No.                             | Indications                                                        | Findings                           | Age | M/ F | Tentorial Angle | Petrous Apex Pneumatization | IAC- PCF (L) | IAC- PCF (R) | Petrosagittal Angle (L) | Petrosagittal Angle (R) | CCJB Distance (L) | CCJB Distance (R) | Transverse Sinus (L) | Transverse Sinus (R) | Split Confluent | Cavernous Sinus (L) | Cavernous Sinus (R) | MTS+ Origin | LTS+ Origin | Ringed (L) | Ringed (R) | MTV (L) | MTV (R) | ITV (L) | ITV (R) | LTV (L) | LTV (R) |   |
| 148                                   | Rule out thrombosis                                                | Normal                             | 42  | 0    | 53.1            | 4                           | 51.95        | 50.4         | 53.8                    | 56.17                   | 6.74              | 5.03              | 2                    | 2                    | 1               | 2                   | 2                   | 1           | 0           | 1          | 1          | 1       | 1       | 1       | 4       | 4       | 2       | 2 |
| 149                                   | Headache                                                           | Normal                             | 44  | 0    | 37.82           | 3                           | 44.84        | 35.97        | 59.85                   | 53.85                   | 5.67              | 7.28              | 2                    | 2                    | 0               | 2                   | 2                   | 2           | 0           | 1          | 1          | 1       | 1       | 1       | 4       | 4       | 3       | 3 |
| 150                                   | Pulsatile tinnitus                                                 | Normal                             | 31  | 0    | 49.53           | 4                           | 33.09        | 36.94        | 55.03                   | 51.11                   | 8.22              | 6.23              | 2                    | 2                    | 0               | 2                   | 2                   | 1           | 0           | 1          | 1          | 1       | 1       | 1       | 4       | 4       | 3       | 3 |
| 151                                   | Left-sided weakness                                                | Normal                             | 67  | 1    | 49.1            | 3                           | 38.23        | 46.64        | 49.19                   | 48.1                    | 6.14              | 5.73              | 2                    | 2                    | 0               | 2                   | 2                   | 0           | 0           | 0          | 0          | 0       | 1       | 1       | 2       | 2       | 1       | 1 |
| 152                                   | Microadenoma                                                       | Normal                             | 28  | 0    | 40.09           | 2                           | 48.81        | 51.73        | 51.75                   | 49.84                   | 8.38              | 8.6               | 2                    | 2                    | 0               | 2                   | 2                   | 0           | 0           | 0          | 0          | 0       | 1       | 1       | 2       | 2       | 1       | 1 |
| 153                                   | Unresponsive                                                       | Normal                             | 32  | 1    | 50.15           | 2                           | 49.07        | 60.4         | 51.04                   | 56.58                   | 5.03              | 4.6               | 2                    | 2                    | 0               | 2                   | 2                   | 0           | 0           | 0          | 0          | 0       | 1       | 1       | 2       | 2       | 1       | 1 |
| 154                                   | Transient blurred vision                                           | Normal                             | 69  | 1    | 51.5            | 2                           | 50.55        | 40.05        | 53.1                    | 54.12                   | 5.83              | 6.29              | 2                    | 2                    | 0               | 2                   | 2                   | 1           | 0           | 0          | 0          | 0       | 1       | 1       | 1       | 1       | 1       | 1 |
| 155                                   | Headache, vision loss                                              | Global volume loss                 | 35  | 0    | 51.84           | 3                           | 30.7         | 37.3         | 49.43                   | 53.61                   | 4.39              | 5.11              | 2                    | 2                    | 0               | 2                   | 2                   | 0           | 0           | 0          | 0          | 0       | 1       | 1       | 2       | 2       | 1       | 1 |
| 156                                   | Right eye                                                          | Normal                             | 76  | 0    | 51.19           | 1                           | 30.2         | 23.8         | 53.95                   | 50.97                   | 4.14              | 3.44              | 2                    | 2                    | 0               | 2                   | 2                   | 1           | 0           | 1          | 1          | 1       | 1       | 1       | 4       | 4       | 3       | 3 |
| 157                                   | Migraine, right-arm weakness                                       | Normal                             | 28  | 0    | 49.91           | 4                           | 38.6         | 39.43        | 51.16                   | 45.13                   | 3.28              | 2.92              | 2                    | 2                    | 0               | 2                   | 2                   | 1           | 0           | 0          | 0          | 0       | 1       | 1       | 1       | 1       | 1       | 1 |
| 158                                   | Evaluate aneurysm                                                  | Left cavernous ICA aneurysm (2 mm) | 48  | 0    | 57.74           | 4                           | 64.58        | 69.06        | 50.2                    | 49.41                   | 3.3               | 3.72              | 2                    | 2                    | 0               | 2                   | 2                   | 1           | 0           | 1          | 1          | 1       | 1       | 1       | 4       | 4       | 3       | 3 |
| 159                                   | Right-eye pain                                                     | Normal                             | 66  | 0    | 49.94           | 2                           | 44.3         | 27.24        | 53.72                   | 51.5                    | 5.68              | 2.49              | 2                    | 2                    | 0               | 2                   | 2                   | 0           | 0           | 0          | 0          | 0       | 1       | 1       | 2       | 2       | 1       | 1 |
| 160                                   | Headache, vision change                                            | Normal                             | 64  | 0    | 41.37           | 2                           | 52.13        | 52.59        | 56.13                   | 56.32                   | 3.25              | 3.54              | 2                    | 2                    | 1               | 2                   | 2                   | 1           | 0           | 0          | 0          | 0       | 1       | 1       | 2       | 2       | 1       | 1 |
| 161                                   | Left-sided numbness, evaluate infarct, severe left-sided neck pain | Normal                             | 49  | 1    | 48.39           | 3                           | 62.38        | 76.99        | 47.35                   | 49.32                   | 6.39              | 5.65              | 2                    | 2                    | 0               | 2                   | 2                   | 0           | 0           | 0          | 0          | 0       | 1       | 1       | 2       | 2       | 1       | 1 |
| 162                                   | Headache                                                           | Normal                             | 55  | 0    | 64.04           | 4                           | 50.76        | 41.84        | 47.63                   | 48.16                   | 4.76              | 5.64              | 2                    | 2                    | 0               | 2                   | 2                   | 0           | 0           | 0          | 0          | 0       | 1       | 1       | 2       | 2       | 1       | 1 |
| 163                                   | Rule out fibromuscular dysplasia                                   | Normal                             | 53  | 0    | 51.53           | 3                           | 63.44        | 51.38        | 50.75                   | 50.68                   | 3.25              | 4.15              | 2                    | 2                    | 0               | 2                   | 2                   | 1           | 0           | 0          | 0          | 0       | 1       | 1       | 2       | 2       | 1       | 1 |
| 164                                   | Stroke evaluation                                                  | Normal                             | 64  | 1    | 63.02           | 2                           | 32.61        | 38.72        | 51.1                    | 50.43                   | 2.64              | 4.53              | 2                    | 2                    | 0               | 2                   | 2                   | 0           | 0           | 0          | 0          | 0       | 1       | 1       | 2       | 2       | 1       | 1 |
| 165                                   | Syncope, rule out aneurysm, dissection                             | Normal                             | 19  | 1    | 40.11           | 4                           | 35.83        | 32.93        | 52.9                    | 54.02                   | 3.32              | 7.4               | 2                    | 2                    | 0               | 2                   | 2                   | 1           | 0           | 1          | 1          | 1       | 1       | 1       | 4       | 4       | 2       | 2 |
| 166                                   | Evaluate jugular stenosis                                          | Normal                             | 30  | 0    | 48.59           | 3                           | 51.53        | 45.11        | 49.71                   | 52.01                   | 5.68              | 4.32              | 2                    | 2                    | 0               | 2                   | 2                   | 0           | 0           | 0          | 0          | 0       | 1       | 1       | 0       | 0       | 1       | 1 |
| 167                                   | Rule out aneurysm                                                  | Normal                             | 53  | 0    | 44.87           | 4                           | 42.06        | 70.27        | 54.17                   | 56.15                   | 2.9               | 2.98              | 2                    | 2                    | 0               | 2                   | 2                   | 1           | 0           | 1          | 1          | 1       | 1       | 1       | 4       | 4       | 2       | 2 |
| 168                                   | Headache                                                           | Normal                             | 50  | 1    | 47.46           | 3                           | 46.64        | 46.88        | 52.46                   | 51.75                   | 2.91              | 3.87              | 2                    | 2                    | 0               | 2                   | 2                   | 0           | 0           | 0          | 0          | 0       | 1       | 1       | 2       | 2       | 1       | 1 |
| 169                                   | Numbness                                                           | Mild atherosclerosis               | 65  | 0    | 51.2            | 3                           | 45.48        | 45.15        | 45.15                   | 50.55                   | 4.22              | 5.06              | 2                    | 2                    | 0               | 2                   | 2                   | 0           | 0           | 0          | 0          | 0       | 1       | 1       | 2       | 2       | 1       | 1 |
| 170                                   | Stroke evaluation                                                  | Normal                             | 78  | 0    | 65.11           | 4                           | 66.18        | 56.06        | 56.12                   | 54.26                   | 8                 | 6.55              | 2                    | 2                    | 0               | 2                   | 2                   | 0           | 0           | 0          | 0          | 0       | 1       | 1       | 0       | 0       | 1       | 1 |
| 171                                   | Stroke evaluation                                                  | Normal                             | 76  | 1    | 47.34           | 3                           | 45.2         | 56.64        | 52.81                   | 49.25                   | 5.26              | 4.78              | 2                    | 2                    | 0               | 2                   | 2                   | 0           | 0           | 0          | 0          | 0       | 1       | 1       | 2       | 2       | 1       | 1 |
| 172                                   | Slurred speech                                                     | Normal                             | 46  | 1    | 33.42           | 4                           | 49.28        | 39.39        | 51.71                   | 51.23                   | 5.63              | 4.91              | 2                    | 2                    | 0               | 2                   | 2                   | 0           | 0           | 0          | 0          | 0       | 1       | 1       | 2       | 2       | 1       | 1 |
| 173                                   | Slurred speech                                                     | Normal                             | 56  | 0    | 39.12           | 3                           | 49.35        | 46.63        | 59.03                   | 54.43                   | 4.3               | 6.19              | 2                    | 2                    | 0               | 2                   | 2                   | 0           | 0           | 0          | 0          | 0       | 1       | 1       | 2       | 2       | 1       | 1 |

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# On-line Supplementary Data: Continued

| Study No. | Indications                                           | Findings                      | Age | M/ F | Tentorial Angle | Petrous Apex Pneumatization | IAC- PCF (L) | IAC- PCF (R) | Petrosagittal Angle (L) | Petrosagittal Angle (R) | CCJB Distance (L) | CCJB Distance (R) | Transverse Sinus (L) | Transverse Sinus (R) | Split Confluents | Cavernous Sinus (L) | Cavernous Sinus (R) | MTS+ Origin | LTS+ Origin | Ringed (L) | Ringed (R) | MTV (L) | MTV (R) | ITV (L) | ITV (R) | LTV (L) | LTV (R) |
|-----------|-------------------------------------------------------|-------------------------------|-----|------|-----------------|-----------------------------|--------------|--------------|-------------------------|-------------------------|-------------------|-------------------|----------------------|----------------------|------------------|---------------------|---------------------|-------------|-------------|------------|------------|---------|---------|---------|---------|---------|---------|
| 174       | Known suprasellar mass                                | Stable suprasellar mass       | 33  | 1    | 59.31           | 3                           | 46.46        | 52.03        | 44.09                   | 51.01                   | 4.68              | 5.62              | 2                    | 2                    | 0                | 2                   | 2                   | 0           | 0           | 0          | 0          | 1       | 1       | 2       | 2       | 1       | 1       |
| 175       | Numbness                                              | Normal                        | 31  | 0    | 49.06           | 4                           | 43.54        | 39.85        | 47.51                   | 45.81                   | 4.81              | 5.14              | 2                    | 2                    | 0                | 2                   | 2                   | 1           | 0           | 1          | 1          | 1       | 4       | 4       | 3       | 3       |         |
| 176       | Numbness                                              | Normal                        | 59  | 0    | 49.57           | 3                           | 30.15        | 35.31        | 50.3                    | 52.43                   | 3.71              | 4.59              | 2                    | 2                    | 0                | 2                   | 2                   | 0           | 0           | 0          | 0          | 1       | 1       | 2       | 2       | 1       | 1       |
| 177       | Fibrous nasal tumor                                   | Normal intracranial vessels   | 72  | 1    | 48.51           | 3                           | 40.17        | 37.41        | 52.58                   | 50.43                   | 3.21              | 2.8               | 2                    | 2                    | 0                | 2                   | 2                   | 0           | 0           | 0          | 0          | 1       | 1       | 2       | 2       | 1       | 1       |
| 178       | Dizziness                                             | Normal                        | 57  | 1    | 51.41           | 3                           | 33.33        | 39.03        | 55.07                   | 55.57                   | 5.79              | 3.25              | 2                    | 2                    | 0                | 2                   | 2                   | 0           | 0           | 0          | 0          | 1       | 1       | 2       | 2       | 1       | 1       |
| 179       | Rule out AVM in hereditary hemorrhagic telangiectasia | Normal                        | 65  | 1    | 46.29           | 3                           | 37.74        | 57.95        | 52.5                    | 50.76                   | 5.41              | 5.05              | 2                    | 2                    | 0                | 2                   | 2                   | 0           | 0           | 0          | 0          | 1       | 1       | 2       | 2       | 1       | 1       |
| 180       | Dizziness, evaluate carotid arteries                  | Normal                        | 81  | 0    | 43.49           | 4                           | 59.77        | 70.7         | 50.39                   | 53.52                   | 5.15              | 4.44              | 2                    | 2                    | 0                | 2                   | 2                   | 0           | 0           | 0          | 0          | 1       | 1       | 0       | 0       | 1       | 1       |
| 181       | Stroke evaluation                                     | Normal                        | 60  | 1    | 46.55           | 3                           | 46.19        | 56.05        | 56.44                   | 57.56                   | 7.16              | 5.87              | 2                    | 2                    | 0                | 2                   | 2                   | 0           | 0           | 0          | 0          | 1       | 1       | 2       | 2       | 1       | 1       |
| 182       | Status post Chiari decompression, follow-up           | Normal                        | 37  | 0    | 40.49           | 4                           | 29.38        | 34.91        | 52.5                    | 50.69                   | 5.73              | 4.03              | 2                    | 2                    | 0                | 2                   | 2                   | 1           | 0           | 1          | 1          | 1       | 4       | 4       | 3       | 3       |         |
| 183       | Headache                                              | Normal                        | 51  | 1    | 48.18           | 3                           | 62.41        | 55.32        | 52.51                   | 53.42                   | 5.47              | 6.43              | 2                    | 2                    | 1                | 2                   | 2                   | 1           | 0           | 1          | 1          | 1       | 4       | 4       | 3       | 3       |         |
| 184       | Headache                                              | Normal                        | 51  | 1    | 50.34           | 4                           | 38.21        | 46.13        | 48.43                   | 46.14                   | 3.64              | 5.89              | 2                    | 2                    | 0                | 2                   | 2                   | 0           | 0           | 0          | 0          | 1       | 1       | 2       | 2       | 1       | 1       |
| 185       | Left-arm weakness                                     | Normal                        | 21  | 0    | 47.8            | 3                           | 45.61        | 47.8         | 56.34                   | 57.45                   | 7.44              | 6.89              | 2                    | 2                    | 0                | 2                   | 2                   | 0           | 0           | 0          | 0          | 1       | 1       | 2       | 2       | 1       | 1       |
| 186       | Preoperative planning for microadenoma                | Normal                        | 30  | 0    | 54.63           | 3                           | 36.44        | 42.83        | 50.58                   | 53.96                   | 7.2               | 5.4               | 2                    | 2                    | 0                | 2                   | 2                   | 0           | 0           | 0          | 0          | 1       | 1       | 2       | 2       | 1       | 1       |
| 187       | Weakness                                              | Normal                        | 37  | 0    | 64.53           | 3                           | 40.26        | 42.24        | 48.73                   | 50.97                   | 4.26              | 4.55              | 2                    | 2                    | 0                | 2                   | 2                   | 0           | 0           | 0          | 0          | 1       | 1       | 2       | 2       | 1       | 1       |
| 188       | Stroke evaluation                                     | Normal                        | 81  | 1    | 47.97           | 3                           | 33.11        | 39.3         | 48.96                   | 51.74                   | 4.4               | 5.48              | 2                    | 2                    | 0                | 2                   | 2                   | 1           | 0           | 1          | 1          | 1       | 4       | 4       | 3       | 3       |         |
| 189       | Weakness                                              | Normal                        | 91  | 1    | 56.78           | 3                           | 41.82        | 37.38        | 56.49                   | 53.83                   | 3.53              | 3.7               | 2                    | 2                    | 0                | 2                   | 2                   | 0           | 0           | 0          | 0          | 1       | 1       | 2       | 2       | 1       | 1       |
| 190       | Altered mental status                                 | Normal                        | 81  | 0    | 51.42           | 2                           | 58.07        | 58.42        | 54.45                   | 50.66                   | 4.6               | 5.67              | 2                    | 2                    | 0                | 2                   | 2                   | 0           | 0           | 0          | 0          | 1       | 1       | 2       | 2       | 1       | 1       |
| 191       | Tinnitus                                              | Normal                        | 43  | 0    | 49.57           | 3                           | 40.59        | 34.31        | 53.59                   | 55.91                   | 4.65              | 5.11              | 2                    | 2                    | 0                | 2                   | 2                   | 1           | 0           | 0          | 0          | 1       | 1       | 1       | 1       | 1       | 1       |
| 192       | Headache                                              | Normal                        | 84  | 0    | 26.84           | 4                           | 41.09        | 46.11        | 51.17                   | 52.95                   | 4.34              | 5.47              | 2                    | 2                    | 0                | 2                   | 2                   | 0           | 0           | 0          | 0          | 1       | 1       | 2       | 2       | 1       | 1       |
| 193       | Stroke evaluation                                     | Normal                        | 70  | 0    | 51.87           | 4                           | 54.53        | 53.34        | 55.07                   | 53.53                   | 5.8               | 4.97              | 2                    | 2                    | 1                | 2                   | 2                   | 0           | 0           | 0          | 0          | 1       | 1       | 2       | 2       | 1       | 1       |
| 194       | Slurred speech                                        | Chronic small-vessel ischemia | 90  | 1    | 52.18           | 4                           | 48.18        | 43.03        | 48.33                   | 53.02                   | 6.41              | 7.35              | 2                    | 2                    | 0                | 2                   | 2                   | 0           | 0           | 0          | 0          | 1       | 1       | 0       | 0       | 1       | 1       |
| 195       | Headache, papilledema                                 | Normal                        | 49  | 1    | 55.51           | 2                           | 41.03        | 41.6         | 50.18                   | 49                      | 3.42              | 4.75              | 2                    | 2                    | 0                | 2                   | 2                   | 0           | 0           | 0          | 0          | 1       | 1       | 3       | 3       | 1       | 1       |
| 196       | Dizziness                                             | Normal                        | 73  | 0    | 61.16           | 4                           | 54.72        | 67.35        | 51.21                   | 48.96                   | 4.09              | 5.84              | 2                    | 2                    | 1                | 2                   | 2                   | 0           | 0           | 0          | 0          | 1       | 1       | 2       | 2       | 1       | 1       |
| 197       | Headache                                              | Normal                        | 40  | 0    | 42.45           | 2                           | 41.02        | 49.83        | 49.79                   | 50.26                   | 3.75              | 3.91              | 2                    | 2                    | 0                | 2                   | 2                   | 1           | 0           | 0          | 0          | 1       | 1       | 1       | 1       | 1       | 1       |
| 198       | Headache                                              | Normal                        | 56  | 1    | 39.84           | 3                           | 63.72        | 63.17        | 59.73                   | 60.96                   | 4.3               | 3.63              | 2                    | 2                    | 1                | 2                   | 2                   | 0           | 0           | 0          | 0          | 1       | 1       | 3       | 3       | 1       | 1       |
| 199       | Neck pain                                             | Normal                        | 48  | 0    | 50.09           | 4                           | 47.27        | 48.72        | 51.38                   | 51.53                   | 3.57              | 4.22              | 2                    | 2                    | 0                | 2                   | 2                   | 1           | 0           | 1          | 1          | 1       | 4       | 4       | 3       | 3       |         |
| 200       | Headache                                              | Normal                        | 68  | 0    | 57.88           | 3                           | 41           | 43           | 52.34                   | 43.61                   | 2.36              | 4.12              | 2                    | 2                    | 0                | 2                   | 2                   | 0           | 0           | 0          | 0          | 1       | 1       | 2       | 2       | 1       | 1       |
| 201       | Stroke evaluation                                     | Normal                        | 71  | 1    | 42.02           | 4                           | 36.89        | 41.4         | 52.07                   | 51.16                   | 9.78              | 4.42              | 2                    | 2                    | 1                | 2                   | 2                   | 1           | 0           | 1          | 1          | 1       | 4       | 4       | 3       | 3       |         |

Continued on next page

# On-line Supplementary Data: Continued

| Study No. | Indications                                       | Findings                                 | Age | M/ F | Tentorial Angle | Petrous Apex Pneumatization | IAC- PCF (R) | IAC- PCF (L) | Petrosagittal Angle (R) | Petrosagittal Angle (L) | CCJB Distance (R) | CCJB Distance (L) | Transverse Sinus (L) | Transverse Sinus (R) | Split Confluent | Cavernous Sinus (L) | Cavernous Sinus (R) | MTS+ Origin | LTS+ Origin | Ringed (L) | Ringed (R) | MTV (L) | MTV (R) | ITV (L) | ITV (R) | LTV (L) | LTV (R) |
|-----------|---------------------------------------------------|------------------------------------------|-----|------|-----------------|-----------------------------|--------------|--------------|-------------------------|-------------------------|-------------------|-------------------|----------------------|----------------------|-----------------|---------------------|---------------------|-------------|-------------|------------|------------|---------|---------|---------|---------|---------|---------|
| 202       | Migraine and left-sided sensory loss              | Normal                                   | 79  | 1    | 51.25           | 4                           | 37.53        | 42.72        | 51.56                   | 56.38                   | 5.38              | 5.8               | 2                    | 2                    | 0               | 2                   | 2                   | 1           | 0           | 1          | 1          | 1       | 1       | 4       | 4       | 3       | 3       |
| 203       | Fall                                              | Normal                                   | 76  | 1    | 40.57           | 4                           | 46.5         | 41.52        | 51.48                   | 48.88                   | 6.41              | 8.96              | 2                    | 2                    | 0               | 2                   | 2                   | 0           | 0           | 0          | 0          | 1       | 1       | 2       | 2       | 1       | 1       |
| 204       | Sudden severe neck pain                           | Normal                                   | 60  | 0    | 44.88           | 3                           | 43.43        | 48.88        | 47.14                   | 48.87                   | 4.56              | 3.99              | 2                    | 2                    | 0               | 2                   | 2                   | 0           | 0           | 0          | 0          | 1       | 1       | 0       | 0       | 1       | 1       |
| 205       | Vertigo                                           | Possible fibromuscular dysplasia variant | 67  | 0    | 53.09           | 3                           | 44.19        | 53.81        | 49.2                    | 51.34                   | 5.71              | 5.72              | 2                    | 2                    | 1               | 2                   | 2                   | 0           | 0           | 0          | 0          | 1       | 1       | 2       | 2       | 1       | 1       |
| 206       | History of aortic root aneurysm, tremor, headache | Normal                                   | 65  | 0    | 46.3            | 3                           | 48.6         | 48.59        | 51.15                   | 48.4                    | 8.43              | 7.97              | 2                    | 2                    | 0               | 2                   | 2                   | 0           | 0           | 0          | 0          | 1       | 1       | 2       | 2       | 1       | 1       |
| 207       | Evaluate aneurysm                                 | Normal                                   | 55  | 0    | 45.49           | 3                           | 45.74        | 54.04        | 60.88                   | 59.93                   | 5.72              | 4.62              | 2                    | 2                    | 0               | 2                   | 2                   | 1           | 0           | 0          | 0          | 1       | 1       | 1       | 1       | 1       | 1       |
| 208       | Stroke evaluation                                 | Normal                                   | 86  | 0    | 37.73           | 3                           | 48.78        | 42.89        | 51.28                   | 49.43                   | 3.93              | 4.24              | 2                    | 2                    | 0               | 2                   | 2                   | 1           | 0           | 1          | 1          | 1       | 1       | 4       | 4       | 3       | 3       |
| 209       | Rule out giant cell arteritis                     | Normal                                   | 63  | 1    | 45.35           | 3                           | 46.14        | 44.5         | 55.08                   | 54.49                   | 6.33              | 5.05              | 2                    | 2                    | 0               | 2                   | 2                   | 0           | 0           | 0          | 0          | 1       | 1       | 0       | 0       | 1       | 1       |
| 210       | Speech changes                                    | Normal                                   | 53  | 1    | 54.92           | 3                           | 54.92        | 51.46        | 54.91                   | 52.83                   | 4.28              | 4.43              | 2                    | 2                    | 0               | 2                   | 2                   | 0           | 0           | 0          | 0          | 1       | 1       | 2       | 2       | 1       | 1       |
| 211       | Rule out thrombosis                               | Normal                                   | 62  | 1    | 35.87           | 3                           | 41.93        | 44.3         | 57.38                   | 51.07                   | 3.3               | 2.87              | 2                    | 2                    | 0               | 2                   | 2                   | 0           | 0           | 0          | 0          | 1       | 1       | 2       | 2       | 1       | 1       |
| 212       | Headache                                          | Normal                                   | 51  | 1    | 36.56           | 4                           | 44.77        | 59.89        | 51.24                   | 50.47                   | 4.16              | 3.94              | 2                    | 2                    | 0               | 2                   | 2                   | 1           | 0           | 0          | 0          | 1       | 1       | 1       | 1       | 1       | 1       |
| 213       | Stroke evaluation                                 | Normal                                   | 57  | 0    | 48.05           | 3                           | 43.29        | 46.81        | 52.76                   | 50.14                   | 3.02              | 3.22              | 2                    | 2                    | 0               | 2                   | 2                   | 0           | 0           | 0          | 0          | 1       | 1       | 2       | 2       | 1       | 1       |
| 214       | Research protocol                                 | Normal                                   | 69  | 0    | 48.73           | 4                           | 46.89        | 46.04        | 53.6                    | 53.3                    | 4.78              | 9.9               | 2                    | 2                    | 0               | 2                   | 2                   | 0           | 0           | 0          | 0          | 1       | 1       | 2       | 2       | 1       | 1       |
| 215       | Evaluate aneurysm                                 | Normal                                   | 59  | 1    | 50.44           | 3                           | 45.32        | 46.67        | 59.73                   | 55.49                   | 3.89              | 3.67              | 2                    | 2                    | 0               | 2                   | 2                   | 0           | 0           | 0          | 0          | 1       | 1       | 2       | 2       | 1       | 1       |
| 216       | Research protocol                                 | Normal                                   | 78  | 1    | 51.19           | 4                           | 34.13        | 42.42        | 61.38                   | 64.17                   | 7.31              | 4.84              | 2                    | 2                    | 0               | 2                   | 2                   | 0           | 0           | 0          | 0          | 1       | 1       | 2       | 2       | 1       | 1       |
| 217       | Rule out vasculitis                               | Normal                                   | 58  | 1    | 49.34           | 3                           | 31.26        | 35.47        | 51.02                   | 46.98                   | 5.22              | 3.93              | 2                    | 2                    | 0               | 2                   | 2                   | 0           | 0           | 0          | 0          | 1       | 1       | 0       | 0       | 1       | 1       |
| 218       | Headache                                          | Normal                                   | 67  | 0    | 49.4            | 3                           | 50.07        | 55.91        | 46.93                   | 50.4                    | 3.05              | 6.3               | 2                    | 2                    | 0               | 2                   | 2                   | 0           | 0           | 0          | 0          | 1       | 1       | 2       | 2       | 1       | 1       |
| 219       | Stroke evaluation                                 | Mild atherosclerosis                     | 56  | 1    | 44.29           | 4                           | 62.88        | 64.27        | 47.29                   | 52.89                   | 4.28              | 3.94              | 2                    | 2                    | 0               | 2                   | 2                   | 0           | 0           | 0          | 0          | 1       | 1       | 2       | 2       | 1       | 1       |
| 220       | S/p MCV                                           | Normal                                   | 53  | 1    | 48.84           | 2                           | 49.01        | 46.75        | 53.99                   | 52.73                   | 3.85              | 3.09              | 2                    | 2                    | 0               | 2                   | 2                   | 0           | 0           | 0          | 0          | 1       | 1       | 2       | 2       | 1       | 1       |
| 221       | Tinnitus                                          | Normal                                   | 67  | 0    | 41.76           | 3                           | 49.38        | 43.13        | 53.97                   | 52.35                   | 4.62              | 4.53              | 2                    | 2                    | 0               | 2                   | 2                   | 1           | 0           | 1          | 1          | 1       | 1       | 4       | 4       | 3       | 3       |
| 222       | Stroke evaluation                                 | Normal                                   | 40  | 1    | 53.17           | 3                           | 49.25        | 73.71        | 57.63                   | 54.48                   | 5.7               | 1.91              | 2                    | 2                    | 0               | 2                   | 2                   | 0           | 0           | 0          | 0          | 1       | 1       | 0       | 0       | 1       | 1       |
| 223       | Trauma                                            | Nondisplaced occipital fracture          | 28  | 1    | 48.76           | 3                           | 48.75        | 46.67        | 55.23                   | 49.75                   | 4                 | 4.79              | 2                    | 2                    | 0               | 2                   | 2                   | 0           | 0           | 0          | 0          | 1       | 1       | 2       | 2       | 1       | 1       |
| 224       | Rule out aneurysm                                 | Normal                                   | 32  | 1    | 46.3            | 2                           | 40.64        | 42.18        | 56.04                   | 60.18                   | 3.61              | 5.27              | 2                    | 2                    | 0               | 2                   | 2                   | 1           | 0           | 0          | 0          | 1       | 1       | 1       | 1       | 1       | 1       |
| 225       | Head pain                                         | Normal                                   | 69  | 0    | 56.02           | 3                           | 45.85        | 60.84        | 51.9                    | 50.45                   | 1.48              | 6.45              | 2                    | 2                    | 0               | 2                   | 2                   | 0           | 0           | 0          | 0          | 1       | 1       | 2       | 2       | 1       | 1       |
| 226       | Headache, rule out pseudotumor cerebri            | Normal                                   | 35  | 0    | 57.37           | 3                           | 60.24        | 65.87        | 48.8                    | 52.05                   | 2.93              | 3.89              | 2                    | 2                    | 0               | 2                   | 2                   | 1           | 0           | 1          | 1          | 1       | 1       | 4       | 4       | 3       | 3       |
| 227       | Stroke evaluation                                 | Atherosclerosis                          | 100 | 0    | 49.76           | 3                           | 39.11        | 49.69        | 56.3                    | 57.35                   | 5.15              | 4.56              | 2                    | 2                    | 0               | 2                   | 2                   | 1           | 0           | 1          | 1          | 1       | 1       | 4       | 4       | 3       | 3       |
| 228       | Evaluate carotid stenosis                         | Normal                                   | 72  | 0    | 55.29           | 3                           | 56.78        | 65.06        | 48.91                   | 50.61                   | 3.35              | 6.09              | 2                    | 2                    | 0               | 2                   | 2                   | 0           | 0           | 0          | 0          | 1       | 1       | 2       | 2       | 1       | 1       |

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# On-line Supplementary Data: Continued

| Study No. | Indications                    | Findings        | Age | M/ F | Tentorial Angle | Petrous Apex Pneumatization | IAC- PCF (L) | IAC- PCF (R) | Petrosagittal Angle (L) | Petrosagittal Angle (R) | CCJB Distance (L) | CCJB Distance (R) | Transverse Sinus (L) | Transverse Sinus (R) | Split Confluens | Cavernous Sinus (L) | Cavernous Sinus (R) | MTS+ Origin | LTS+ Origin | Ringed (L) | MTV (L) | ITV (L) | ITV (R) | LTV (L) | LTV (R) |   |
|-----------|--------------------------------|-----------------|-----|------|-----------------|-----------------------------|--------------|--------------|-------------------------|-------------------------|-------------------|-------------------|----------------------|----------------------|-----------------|---------------------|---------------------|-------------|-------------|------------|---------|---------|---------|---------|---------|---|
| 229       | Right-sided pulsatile tinnitus | Normal          | 54  | 0    | 50.2            | 4                           | 56.9         | 62.3         | 53.45                   | 54.44                   | 5.35              | 5.71              | 2                    | 2                    | 0               | 2                   | 2                   | 1           | 0           | 1          | 1       | 1       | 4       | 4       | 3       | 3 |
| 230       | Unresponsive                   | Atherosclerosis | 89  | 0    | 51.19           | 2                           | 44.34        | 42.58        | 59.29                   | 57.24                   | 6.02              | 6.59              | 2                    | 2                    | 0               | 2                   | 2                   | 0           | 0           | 0          | 1       | 1       | 0       | 0       | 1       | 1 |
| 231       | Neck pain                      | Normal          | 44  | 0    | 48.79           | 3                           | 46.74        | 43.9         | 47.92                   | 45.54                   | 6.35              | 4.86              | 2                    | 2                    | 0               | 2                   | 2                   | 0           | 0           | 0          | 1       | 1       | 2       | 2       | 1       | 1 |
| 232       | History of stroke              | Normal          | 66  | 1    | 59.25           | 0                           | 55.56        | 47.93        | 51.47                   | 51.96                   | 3.1               | 3.78              | 2                    | 2                    | 0               | 2                   | 2                   | 0           | 0           | 0          | 0       | 1       | 2       | 2       | 1       | 1 |
| 233       | Dizziness                      | Normal          | 77  | 1    | 55.81           | 4                           | 54.47        | 57.63        | 52.01                   | 51.57                   | 6.64              | 5.08              | 2                    | 2                    | 0               | 2                   | 2                   | 0           | 0           | 0          | 0       | 1       | 2       | 2       | 1       | 1 |
| 234       | Stroke evaluation              | Normal          | 73  | 0    | 41.85           | 3                           | 36.54        | 41.45        | 51.76                   | 50.48                   | 3.19              | 5.5               | 2                    | 2                    | 0               | 2                   | 2                   | 1           | 0           | 1          | 1       | 1       | 4       | 4       | 3       | 3 |
| 235       | Stroke evaluation              | Normal          | 69  | 0    | 57.58           | 3                           | 30.29        | 24.95        | 40.13                   | 35.67                   | 2.69              | 3.7               | 2                    | 2                    | 0               | 2                   | 2                   | 0           | 0           | 0          | 0       | 1       | 3       | 3       | 1       | 1 |
| 236       | Hemisensory deficit            | Normal          | 48  | 1    | 48.22           | 3                           | 46.43        | 33.79        | 52.3                    | 48.93                   | 6.85              | 7.26              | 2                    | 2                    | 0               | 2                   | 2                   | 0           | 0           | 0          | 1       | 1       | 2       | 2       | 1       | 1 |
| 237       | Headache                       | Normal          | 61  | 0    | 57.58           | 4                           | 57.45        | 65           | 47.19                   | 46.39                   | 4.55              | 3.48              | 2                    | 2                    | 0               | 2                   | 2                   | 1           | 0           | 0          | 1       | 1       | 2       | 2       | 1       | 1 |
| 238       | Stroke evaluation              | Normal          | 42  | 0    | 53.09           | 2                           | 30.24        | 32.21        | 45                      | 44.57                   | 3.9               | 5.1               | 2                    | 2                    | 1               | 2                   | 2                   | 1           | 0           | 0          | 1       | 1       | 0       | 0       | 1       | 1 |

**Note:**—PcomA indicates posterior communicating artery; AMS, altered mental status; MVC, motor vehicle crash; R/o, rule out; DVT, deep vein thrombosis; S/p, status post; L, left; R, right; bv, right posterior communicating artery.

**On-line Summary Statistics: count, mean, SD, quartile ranges, and sex distribution for each variable in the study are provided**

|         | Study No. |      | Age (yr) | MI/F0 | Tentorial Angle |      | Petrus Apex Pneumatization |      | IAC-PCF (L) |      | IAC-PCF (R) | Petrosagittal Angle (L) |      | Petrosagittal Angle (R) |      | CC-JB Distance (L) |     | CC-JB Distance (R) |     |
|---------|-----------|------|----------|-------|-----------------|------|----------------------------|------|-------------|------|-------------|-------------------------|------|-------------------------|------|--------------------|-----|--------------------|-----|
|         | 238       | 238  | 238      | 238   | 238             | 238  | 238                        | 238  | 238         | 238  | 238         | 238                     | 238  | 238                     | 238  | 238                | 238 | 238                | 238 |
| Count   | 238       | 238  | 238      | 238   | 238             | 238  | 238                        | 238  | 238         | 238  | 238         | 238                     | 238  | 238                     | 238  | 238                | 238 | 238                | 238 |
| Mean    | —         | —    | 58       | —     | 48              | 3    | 35.7                       | 1.3  | 44          | 46   | 52          | 51                      | 51   | 51                      | 51   | 5                  | 5   | 5                  | 5   |
| SD      | —         | —    | 18       | —     | 7               | 1    | 35.7                       | 1.3  | 9           | 11   | 5           | 4                       | 4    | 4                       | 4    | 2                  | 2   | 1                  | 1   |
| Min     | —         | 19   | —        | 26.8  | 0               | 22.1 | 20.4                       | 20.4 | 22.1        | 0    | 0           | 1                       | 1    | 0                       | 0    | 0                  | 0   | 0                  | 0   |
| 25%     | —         | —    | 45       | —     | 43.5            | 3    | 34.9                       | 35.7 | 37.6        | 38.9 | 49.0        | 48.4                    | 48.4 | 48.4                    | 48.4 | 3.5                | 3.5 | 4.0                | 4.0 |
| 50%     | —         | —    | 57       | —     | 48.7            | 3    | 54.9                       | 53.4 | 43.7        | 45.2 | 51.7        | 50.7                    | 50.7 | 50.7                    | 4.6  | 4.6                | 4.8 | 4.8                | 4.8 |
| 75%     | —         | 70.8 | —        | 52.4  | 4               | 49.9 | 52.8                       | 6.0  | 5.8         | 2    | 0           | 2                       | 1    | 0                       | 0    | 1                  | 1   | 1                  | 2   |
| Max     | —         | —    | 100      | —     | 65.1            | 4    | 54.9                       | 53.4 | 71.9        | 79.6 | 63.1        | 64.2                    | 64.2 | 64.2                    | 9.9  | 9.9                | 9.9 | 9.9                | 9.9 |
| Total M | —         | —    | —        | 100   | —               | —    | —                          | —    | —           | —    | —           | —                       | —    | —                       | —    | —                  | —   | —                  | —   |
| Total F | —         | —    | —        | 138   | —               | —    | —                          | —    | —           | —    | —           | —                       | —    | —                       | —    | —                  | —   | —                  | —   |

|         | Transverse Sinus (L) |     | Transverse Sinus (R) |     | Split Confluens | Cavernous Sinus (L) |     | Cavernous Sinus (R) |     | MTS + Origin |     | LTS + Origin |     | Ring (L) |     | Ring (R) |     | MTV (L) |     | MTV (R) |     | ITV (L) |     | ITV (R) |     | LTV (L) |     | LTV (R) |     |
|---------|----------------------|-----|----------------------|-----|-----------------|---------------------|-----|---------------------|-----|--------------|-----|--------------|-----|----------|-----|----------|-----|---------|-----|---------|-----|---------|-----|---------|-----|---------|-----|---------|-----|
|         | 238                  | 238 | 238                  | 238 | 238             | 238                 | 238 | 238                 | 238 | 238          | 238 | 238          | 238 | 238      | 238 | 238      | 238 | 238     | 238 | 238     | 238 | 238     | 238 | 238     | 238 | 238     | 238 | 238     | 238 |
| Count   | 238                  | 238 | 238                  | 238 | 238             | 238                 | 238 | 238                 | 238 | 238          | 238 | 238          | 238 | 238      | 238 | 238      | 238 | 238     | 238 | 238     | 238 | 238     | 238 | 238     | 238 | 238     | 238 | 238     | 238 |
| Mean    | 2                    | 2   | 2                    | 2   | 0               | 2                   | 2   | 2                   | 2   | 1            | 1   | 0            | 0   | 0        | 0   | 0        | 0   | 1       | 1   | 1       | 1   | 2       | 2   | 2       | 1   | 1       | 1   | 1       | 1   |
| SD      | 0                    | 0   | 0                    | 0   | 0               | 0                   | 0   | 0                   | 0   | 1            | 1   | 0            | 0   | 0        | 0   | 0        | 0   | 0       | 0   | 0       | 0   | 1       | 1   | 1       | 1   | 1       | 1   | 1       | 1   |
| Min     | 0                    | 1   | 1                    | 1   | 0               | 0                   | 0   | 0                   | 0   | 0            | 0   | 0            | 0   | 0        | 0   | 0        | 0   | 1       | 1   | 1       | 1   | 2       | 2   | 2       | 1   | 1       | 1   | 1       | 1   |
| 25%     | 2                    | 2   | 2                    | 2   | 0               | 2                   | 2   | 2                   | 2   | 0            | 0   | 0            | 0   | 0        | 0   | 0        | 0   | 1       | 1   | 1       | 1   | 2       | 2   | 2       | 1   | 1       | 1   | 1       | 1   |
| 50%     | 2                    | 2   | 2                    | 2   | 0               | 2                   | 2   | 2                   | 2   | 0            | 0   | 0            | 0   | 0        | 0   | 0        | 0   | 1       | 1   | 1       | 1   | 2       | 2   | 2       | 1   | 1       | 1   | 1       | 1   |
| 75%     | 2                    | 1   | 1                    | 1   | 0               | 2                   | 2   | 2                   | 2   | 0            | 0   | 0            | 0   | 0        | 0   | 0        | 0   | 1       | 1   | 1       | 1   | 2       | 2   | 2       | 1   | 1       | 1   | 1       | 1   |
| Max     | 2                    | 2   | 2                    | 2   | 1               | 2                   | 2   | 2                   | 2   | 2            | 2   | 1            | 1   | 1        | 1   | 1        | 1   | 1       | 1   | 1       | 1   | 4       | 4   | 4       | 3   | 3       | 3   | 3       | 3   |
| Total M | —                    | —   | —                    | —   | —               | —                   | —   | —                   | —   | —            | —   | —            | —   | —        | —   | —        | —   | —       | —   | —       | —   | —       | —   | —       | —   | —       | —   | —       | —   |
| Total F | —                    | —   | —                    | —   | —               | —                   | —   | —                   | —   | —            | —   | —            | —   | —        | —   | —        | —   | —       | —   | —       | —   | —       | —   | —       | —   | —       | —   | —       | —   |

**Note:** — Indicates does not apply; Min, minimum; Max, maximum; M, male; F, female; SCD, Sickle Cell Disease; L, left; R, right.

On-line Table 1: Preliminary categories for statistical analysis<sup>a</sup>

| Variable                                 | Tentorial Angle<br>(degree) | Petrous Apex<br>Pneumatization | Internal Acoustic Canal–<br>Petroclival Fissure Angle<br>(degrees)                                                                                                                                                     | Petrosigittal Angle<br>(degrees) | Carotid Canal–Jugular<br>Bulb Distance (mm) | Transverse<br>Sinus     | Split Confluens<br>Sinuum                | Cavernous Sinus                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|------------------------------------------|-----------------------------|--------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|---------------------------------------------|-------------------------|------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Variable Type                            | Numeric                     | Categorical                    | Numeric                                                                                                                                                                                                                | Numeric                          | Numeric                                     | Categorical             | Categorical                              | Categorical                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|                                          |                             | –                              | 1 = Absent air cells at the petrous apex only in base, 2 = air cells near carotid canal, 3 = air cells at the petrous area lateral to the carotid canal, 4 = air cells at the petrous area medial to the carotid canal | –                                | –                                           | –                       | 0 = Stenosis, 1 = diminutive, 2 = patent | 0 = Absent, 1 = present                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Variable                                 | MTS                         | Location of MTS<br>Origin      | LTS                                                                                                                                                                                                                    | Location of<br>LTS Origin        | Ring<br>Configuration                       | MTV                     | ITV                                      | LTV                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Variable Type                            | Categorical                 | Categorical                    | Categorical                                                                                                                                                                                                            | Categorical                      | Categorical                                 | Categorical             | Categorical                              | Categorical                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| 0 = Stenosis, 1 = diminutive, 2 = patent |                             | 0 = Absent, 1 = present        | 0 = SS, 1 = TS                                                                                                                                                                                                         | Left 0 = Absent, 1 = present     | 0 = TS, 1 = TS-S junction                   | 0 = Absent, 1 = Present | 0 = Absent, 1 = Present                  | 0 = Uninterrupted, connecting superior petrosal sinus to transverse sinus, 1 = interrupted by LTS, 1 segment from transverse sinus to LTS, 1 segment from LTS to superior petrosal sinus, 2 = interrupted medialized by RC, 1 segment LTV from transverse sinus to RC, 3 = interrupted lateralized, 1 LTV from LTS to superior petrosal sinus, when MTS and RC at confluence–transverse sinus junction, 4 = 1 LTV, from straight sinus to LTS at transverse sinus–sigmoid sinus junction, then LTS gives superior petrosal sinus |

**Note:**—SS indicates straight sinus; TS, transverse sinus; TS-S, transverse sinus–sigmoid sinus junction; –, does not apply.

On-line Table 2: P value matrix from Pearson correlation<sup>a</sup>

|                               | Age    | M I/FO | Tentorial Angle | IAC-PCF (L) | IAC-PCF (R) | Petro-Sagittal Angle (L) | Petro-Sagittal Angle (R) | CC-JB Dist (L) | CC-JB Dist (R) | Petrous Apex Pneumatization_0 | Petrous Apex Pneumatization_1 | Petrous Apex Pneumatization_2 | Petrous Apex Pneumatization_3 | Petrous Apex Pneumatization_4 | Trans Sinus (L)_0 |
|-------------------------------|--------|--------|-----------------|-------------|-------------|--------------------------|--------------------------|----------------|----------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|-------------------|
| Age                           | 0.0000 | 0.4283 | 0.5969          | 0.7787      | 0.9499      | 0.2330                   | 0.7183                   | 0.3521         | 0.3276         | 0.4136                        | 0.0852                        | 0.9898                        | 0.1941                        | 0.2445                        | 0.7472            |
| M/FO                          | 0.4283 | 0.0000 | 0.6249          | 0.1476      | 0.2149      | 0.3569                   | 0.1803                   | 0.7691         | 0.8905         | 0.3862                        | 0.7603                        | 0.4027                        | 0.2245                        | 0.4796                        | 0.3958            |
| Tentorial angle               | 0.5969 | 0.6249 | 0.0000          | 0.4730      | 0.6198      | 0.3191                   | 0.5180                   | 0.7691         | 0.8553         | 0.6410                        | 0.4978                        | 0.3372                        | 0.2512                        | 0.6567                        | 0.3074            |
| IAC-PCF (L)                   | 0.7787 | 0.1476 | 0.4730          | 0.0000      | 0.0000      | 0.0319                   | 0.0774                   | 0.4424         | 0.5258         | 0.6633                        | 0.1033                        | 0.8905                        | 0.6910                        | 0.2775                        | 0.3123            |
| IAC-PCF (R)                   | 0.9499 | 0.2149 | 0.6198          | 0.0000      | 0.0000      | 0.0518                   | 0.0775                   | 0.8244         | 0.6228         | 0.2933                        | 0.1867                        | 0.7711                        | 0.5862                        | 0.4025                        | 0.4862            |
| Petrosagittal angle (L)       | 0.2330 | 0.3569 | 0.3191          | 0.0319      | 0.0775      | 0.0000                   | 0.0000                   | 0.6015         | 0.4199         | 0.9008                        | 0.1352                        | 0.5541                        | 0.5069                        | 0.4018                        | 0.6175            |
| Petrosagittal angle (R)       | 0.7183 | 0.1803 | 0.5180          | 0.0775      | 0.0775      | 0.0000                   | 0.0000                   | 0.4341         | 0.4188         | 0.8217                        | 0.1442                        | 0.9339                        | 0.9339                        | 0.9430                        | 0.8350            |
| CC-JB distance (L)            | 0.3521 | 0.9331 | 0.7691          | 0.4424      | 0.8244      | 0.6015                   | 0.4341                   | 0.0000         | 0.0000         | 0.9671                        | 0.7045                        | 0.7565                        | 0.6288                        | 0.7842                        | 0.9163            |
| CC-JB distance (R)            | 0.3276 | 0.8905 | 0.8553          | 0.5258      | 0.6228      | 0.4199                   | 0.4188                   | 0.0000         | 0.0000         | 0.9246                        | 0.7741                        | 0.4857                        | 0.3012                        | 0.7874                        | 0.8742            |
| Petrous apex pneumatization_0 | 0.4136 | 0.3862 | 0.6410          | 0.6633      | 0.2933      | 0.9008                   | 0.8217                   | 0.9671         | 0.9246         | 0.0000                        | 0.8447                        | 0.3769                        | 0.1131                        | 0.2388                        | 0.9103            |
| Petrous apex pneumatization_1 | 0.0852 | 0.7603 | 0.4978          | 0.1033      | 0.1867      | 0.1352                   | 0.1442                   | 0.7045         | 0.7741         | 0.8447                        | 0.0000                        | 0.3769                        | 0.1131                        | 0.2388                        | 0.9103            |
| Petrous apex pneumatization_2 | 0.9898 | 0.4027 | 0.3372          | 0.8505      | 0.7711      | 0.5541                   | 0.6568                   | 0.7565         | 0.4857         | 0.3769                        | 0.3769                        | 0.0000                        | 0.0000                        | 0.0000                        | 0.6117            |
| Petrous apex pneumatization_3 | 0.1941 | 0.2245 | 0.2512          | 0.6910      | 0.5862      | 0.5069                   | 0.9339                   | 0.9163         | 0.3012         | 0.1131                        | 0.1131                        | 0.0000                        | 0.0000                        | 0.0000                        | 0.3632            |
| Petrous apex pneumatization_4 | 0.2445 | 0.4796 | 0.6567          | 0.2775      | 0.4025      | 0.4018                   | 0.9430                   | 0.6288         | 0.0775         | 0.2388                        | 0.2388                        | 0.0000                        | 0.0000                        | 0.0000                        | 0.1408            |
| Transverse sinus (L)_0        | 0.7472 | 0.3958 | 0.3074          | 0.3123      | 0.4862      | 0.6175                   | 0.8350                   | 0.8274         | 0.7842         | 0.9103                        | 0.9103                        | 0.6117                        | 0.3632                        | 0.1408                        | 0.0000            |
| Transverse sinus (L)_2        | 0.7472 | 0.3958 | 0.3074          | 0.3123      | 0.4862      | 0.6175                   | 0.8350                   | 0.8274         | 0.7842         | 0.9103                        | 0.9103                        | 0.6117                        | 0.3632                        | 0.1408                        | 0.0000            |
| Transverse sinus (R)_0        | 0.7472 | 0.3958 | 0.3074          | 0.3123      | 0.4862      | 0.6175                   | 0.8350                   | 0.8274         | 0.7842         | 0.9103                        | 0.9103                        | 0.6117                        | 0.3632                        | 0.1408                        | 0.0000            |
| Transverse sinus (R)_2        | 0.7472 | 0.3958 | 0.3074          | 0.3123      | 0.4862      | 0.6175                   | 0.8350                   | 0.8274         | 0.7842         | 0.9103                        | 0.9103                        | 0.6117                        | 0.3632                        | 0.1408                        | 0.0000            |
| Split confluens_0             | 0.6553 | 0.1546 | 0.2400          | 0.0101      | 0.0276      | 0.5919                   | 0.2431                   | 0.8783         | 0.9533         | 0.6415                        | 0.6415                        | 0.4095                        | 0.7021                        | 0.7890                        | 0.7890            |
| Split confluens_1             | 0.6553 | 0.1546 | 0.2400          | 0.0101      | 0.0276      | 0.5919                   | 0.2431                   | 0.8783         | 0.9533         | 0.6415                        | 0.6415                        | 0.4095                        | 0.7021                        | 0.7890                        | 0.7890            |
| Cavernous sinus (L)_1         | 0.4409 | 0.8193 | 0.5808          | 0.4764      | 0.0248      | 0.1159                   | 0.8982                   | 0.9170         | 0.6979         | 0.8732                        | 0.8732                        | 0.4717                        | 0.3375                        | 0.9269                        | 0.9269            |
| Cavernous sinus (L)_2         | 0.4409 | 0.8193 | 0.5808          | 0.4764      | 0.0248      | 0.1159                   | 0.8982                   | 0.9170         | 0.6979         | 0.8732                        | 0.8732                        | 0.4717                        | 0.3375                        | 0.9269                        | 0.9269            |
| Cavernous sinus (R)_1         | 0.4409 | 0.8193 | 0.5808          | 0.4764      | 0.0248      | 0.1159                   | 0.8982                   | 0.9170         | 0.6979         | 0.8732                        | 0.8732                        | 0.4717                        | 0.3375                        | 0.9269                        | 0.9269            |
| Cavernous sinus (R)_2         | 0.4409 | 0.8193 | 0.5808          | 0.4764      | 0.0248      | 0.1159                   | 0.8982                   | 0.9170         | 0.6979         | 0.8732                        | 0.8732                        | 0.4717                        | 0.3375                        | 0.9269                        | 0.9269            |
| MTS+origin_0                  | 0.0046 | 0.0321 | 0.0394          | 0.0492      | 0.0626      | 0.1501                   | 0.5459                   | 0.3356         | 0.5436         | 0.5436                        | 0.0769                        | 0.2114                        | 0.1135                        | 0.9712                        | 0.3265            |
| MTS+origin_1                  | 0.0127 | 0.0891 | 0.1017          | 0.1081      | 0.2080      | 0.0979                   | 0.5551                   | 0.2188         | 0.6086         | 0.5051                        | 0.0672                        | 0.2322                        | 0.1025                        | 0.9135                        | 0.3428            |
| MTS+origin_2                  | 0.1872 | 0.0867 | 0.1011          | 0.1634      | 0.0190      | 0.4081                   | 0.9554                   | 0.3034         | 0.4388         | 0.8207                        | 0.8207                        | 0.8267                        | 0.8522                        | 0.7785                        | 0.8963            |
| MTS+origin_3                  | 0.9795 | 0.2284 | 0.5142          | 0.8005      | 0.8935      | 0.5104                   | 0.7678                   | 0.1206         | 0.1857         | 0.8732                        | 0.8732                        | 0.4717                        | 0.8957                        | 0.5739                        | 0.9269            |
| LTS+origin_1                  | 0.9795 | 0.2284 | 0.5142          | 0.8005      | 0.8935      | 0.5104                   | 0.7678                   | 0.1206         | 0.1857         | 0.8732                        | 0.8732                        | 0.4717                        | 0.8957                        | 0.5739                        | 0.9269            |
| Ring (L)_0                    | 0.4800 | 0.0012 | 0.2799          | 0.2532      | 0.3313      | 0.9349                   | 0.4068                   | 0.0274         | 0.5443         | 0.3708                        | 0.0510                        | 0.1964                        | 0.3922                        | 0.0730                        | 0.6071            |
| Ring (L)_1                    | 0.4800 | 0.0012 | 0.2799          | 0.2532      | 0.3313      | 0.9349                   | 0.4068                   | 0.0274         | 0.5443         | 0.3708                        | 0.0510                        | 0.1964                        | 0.3922                        | 0.0730                        | 0.6071            |
| Ring (L)_2                    | 0.3364 | 0.0017 | 0.2740          | 0.3002      | 0.4365      | 0.8712                   | 0.3799                   | 0.0365         | 0.5707         | 0.3769                        | 0.0472                        | 0.2225                        | 0.4738                        | 0.1167                        | 0.6117            |
| Ring (R)_1                    | 0.3364 | 0.0017 | 0.2740          | 0.3002      | 0.4365      | 0.8712                   | 0.3799                   | 0.0365         | 0.5707         | 0.3769                        | 0.0472                        | 0.2225                        | 0.4738                        | 0.1167                        | 0.6117            |
| Ring (R)_2                    | 0.4119 | 0.2409 | 0.6484          | 0.8842      | 0.4862      | 0.4754                   | 0.2263                   | 0.7151         | 0.7006         | 0.9103                        | 0.9103                        | 0.6117                        | 0.2735                        | 0.4987                        | 0.9484            |
| MTV (L)_1                     | 0.4119 | 0.2409 | 0.6484          | 0.8842      | 0.4862      | 0.4754                   | 0.2263                   | 0.7151         | 0.7006         | 0.9103                        | 0.9103                        | 0.6117                        | 0.2735                        | 0.4987                        | 0.9484            |
| MTV (R)_1                     | 0.4119 | 0.2409 | 0.6484          | 0.8842      | 0.4862      | 0.4754                   | 0.2263                   | 0.7151         | 0.7006         | 0.9103                        | 0.9103                        | 0.6117                        | 0.2735                        | 0.4987                        | 0.9484            |
| ITV (L)_0                     | 0.6419 | 0.6360 | 0.6795          | 0.4561      | 0.3492      | 0.2248                   | 0.6269                   | 0.2906         | 0.1894         | 0.5182                        | 0.5182                        | 0.1388                        | 0.6461                        | 0.6289                        | 0.7104            |
| ITV (L)_1                     | 0.4047 | 0.4836 | 0.4650          | 0.9489      | 0.8984      | 0.1226                   | 0.0653                   | 0.5986         | 0.6947         | 0.6529                        | 0.6529                        | 0.0097                        | 0.3351                        | 0.7960                        | 0.7960            |
| ITV (L)_2                     | 0.0985 | 0.0120 | 0.0223          | 0.1269      | 0.2614      | 0.7691                   | 0.3206                   | 0.3294         | 0.0465         | 0.1356                        | 0.0425                        | 0.0920                        | 0.3351                        | 0.7960                        | 0.7960            |
| ITV (L)_3                     | 0.5007 | 0.3763 | 0.0840          | 0.8666      | 0.6971      | 0.6394                   | 0.9748                   | 0.7226         | 0.5007         | 0.6768                        | 0.0326                        | 0.2082                        | 0.2305                        | 0.6071                        | 0.3917            |
| ITV (L)_4                     | 0.3941 | 0.0040 | 0.0747          | 0.2094      | 0.6225      | 0.8754                   | 0.6139                   | 0.0072         | 0.1588         | 0.4086                        | 0.0306                        | 0.1388                        | 0.3218                        | 0.0118                        | 0.8106            |
| ITV (R)_0                     | 0.6419 | 0.6360 | 0.6795          | 0.4561      | 0.3492      | 0.2248                   | 0.6269                   | 0.2906         | 0.1894         | 0.5182                        | 0.5182                        | 0.1388                        | 0.6461                        | 0.6289                        | 0.7104            |
| ITV (R)_1                     | 0.4047 | 0.4836 | 0.4650          | 0.9489      | 0.8984      | 0.1226                   | 0.0653                   | 0.5986         | 0.6947         | 0.6529                        | 0.6529                        | 0.0097                        | 0.3351                        | 0.7960                        | 0.7960            |
| ITV (R)_2                     | 0.0985 | 0.0120 | 0.0223          | 0.1269      | 0.2614      | 0.7691                   | 0.3206                   | 0.3294         | 0.0465         | 0.1356                        | 0.0425                        | 0.0920                        | 0.3351                        | 0.7960                        | 0.7960            |
| ITV (R)_3                     | 0.5007 | 0.3763 | 0.0840          | 0.8666      | 0.6971      | 0.6394                   | 0.9748                   | 0.7226         | 0.5007         | 0.6768                        | 0.0326                        | 0.2082                        | 0.2305                        | 0.6071                        | 0.3917            |
| ITV (R)_4                     | 0.3941 | 0.0040 | 0.0747          | 0.2094      | 0.6225      | 0.8754                   | 0.6139                   | 0.0072         | 0.1588         | 0.4086                        | 0.0306                        | 0.1388                        | 0.3218                        | 0.0118                        | 0.8106            |
| LTV (L)_1                     | 0.4845 | 0.0088 | 0.0227          | 0.1054      | 0.1984      | 0.8197                   | 0.3384                   | 0.2805         | 0.0429         | 0.1323                        | 0.0444                        | 0.1062                        | 0.2614                        | 0.3765                        | 0.8716            |
| LTV (R)_1                     | 0.5007 | 0.3763 | 0.0840          | 0.8666      | 0.6971      | 0.6394                   | 0.9748                   | 0.7226         | 0.5007         | 0.6768                        | 0.0326                        | 0.2082                        | 0.2305                        | 0.6071                        | 0.3917            |
| LTV (R)_2                     | 0.5007 | 0.3763 | 0.0840          | 0.8666      | 0.6971      | 0.6394                   | 0.9748                   | 0.7226         | 0.5007         | 0.6768                        | 0.0326                        | 0.2082                        | 0.2305                        | 0.6071                        | 0.3917            |
| LTV (R)_3                     | 0.5007 | 0.3763 | 0.0840          | 0.8666      | 0.6971      | 0.6394                   | 0.9748                   | 0.7226         | 0.5007         | 0.6768                        | 0.0326                        | 0.2082                        | 0.2305                        | 0.6071                        | 0.3917            |
| LTV (R)_4                     | 0.5007 | 0.3763 | 0.0840          | 0.8666      | 0.6971      | 0.6394                   | 0.9748                   | 0.7226         | 0.5007         | 0.6768                        | 0.0326                        | 0.2082                        | 0.2305                        | 0.6071                        | 0.3917            |
| LTV (L)_2                     | 0.4660 | 0.0026 | 0.2582          | 0.1241      | 0.4576      | 0.8073                   | 0.4384                   | 0.0661         | 0.2439         | 0.3831                        | 0.0436                        | 0.2513                        | 0.2275                        | 0.663                         | 0.663             |
| LTV (L)_3                     | 0.406  | 0.0089 | 0.1017          | 0.2268      | 0.2702      | 0.7524                   | 0.5488                   | 0.194          | 0.8470         | 0.6894                        | 0.6894                        | 0.7316                        | 0.7921                        | 0.0704                        | 0.678             |
| LTV (L)_4                     | 0.9347 | 0.0089 | 0.1017          | 0.2268      | 0.2702      | 0.7524                   | 0.5488                   | 0.194          | 0.8470         | 0.6894                        | 0.6894                        | 0.7316                        | 0.7921                        | 0.0704                        | 0.678             |
| LTV (R)_2                     | 0.2542 | 0.0026 | 0.2395          | 0.1543      | 0.8443      | 0.6413                   | 0.6161                   | 0.1027         | 0.2352         | 0.4639                        | 0.1020                        | 0.2825                        | 0.3531                        | 0.0908                        | 0.663             |
| LTV (R)_3                     | 0.0888 | 0.0161 | 0.0996          | 0.2129      | 0.2822      | 0.2678                   | 0.2678                   | 0.0320         | 0.7920         | 0.6768                        | 0.6768                        | 0.6349                        | 0.9542                        | 0.5810                        | 0.8106            |
| LTV (R)_4                     | 0.8401 | 0.0128 | 0.7817          | 0.5972      | 0.9762      | 0.5737                   | 0.5785                   | 0.1326         | 0.2498         | 0.4713                        | 0.0104                        | 0.3201                        | 0.2913                        | 0.1187                        | 0.6789            |

Continued on next page

On-line Table 2: Continued

|                         | Trans Sinus (L)_2 | Trans Sinus (R)_0 | Trans Sinus (R)_2 | Split Confluents_0 | Split Confluents_1 | Cav Sinus (L)_1 | Cav Sinus (L)_2 | Cav Sinus (R)_1 | Cav Sinus (R)_2 |
|-------------------------|-------------------|-------------------|-------------------|--------------------|--------------------|-----------------|-----------------|-----------------|-----------------|
| Age                     | 0.7472            | 0.7472            | 0.7472            | 0.6553             | 0.6553             | 0.4409          | 0.4409          | 0.4409          | 0.4409          |
| M/FO                    | 0.3958            | 0.3958            | 0.3958            | 0.1546             | 0.1546             | 0.8193          | 0.8193          | 0.8193          | 0.8193          |
| Tentorial angle         | 0.3074            | 0.3074            | 0.3074            | 0.3074             | 0.3074             | 0.5808          | 0.5808          | 0.5808          | 0.5808          |
| IAC-PCF (L)             | 0.3123            | 0.3123            | 0.3123            | 0.0101             | 0.0101             | 0.4764          | 0.4764          | 0.4764          | 0.4764          |
| IAC-PCF (R)             | 0.4862            | 0.4862            | 0.4862            | 0.0276             | 0.0276             | 0.0248          | 0.0248          | 0.0248          | 0.0248          |
| Petrosagittal angle (L) | 0.6175            | 0.6175            | 0.6175            | 0.5919             | 0.5919             | 0.1159          | 0.1159          | 0.1159          | 0.1159          |
| Petrosagittal angle (R) | 0.8350            | 0.8350            | 0.8350            | 0.2431             | 0.2431             | 0.8982          | 0.8982          | 0.8982          | 0.8982          |
| CC-JB distance (L)      | 0.8274            | 0.8274            | 0.8274            | 0.8783             | 0.8783             | 0.9170          | 0.9170          | 0.9170          | 0.9170          |
| CC-JB distance (R)      | 0.7842            | 0.7842            | 0.7842            | 0.9533             | 0.9533             | 0.6979          | 0.6979          | 0.6979          | 0.6979          |
| Petrous apex            | 0.9103            | 0.9103            | 0.9103            | 0.6415             | 0.6415             | 0.8732          | 0.8732          | 0.8732          | 0.8732          |
| pneumatization_0        |                   |                   |                   |                    |                    |                 |                 |                 |                 |
| pneumatization_1        | 0.9103            | 0.9103            | 0.9103            | 0.6415             | 0.6415             | 0.8732          | 0.8732          | 0.8732          | 0.8732          |
| pneumatization_2        | 0.6117            | 0.6117            | 0.6117            | 0.4095             | 0.4095             | 0.4777          | 0.4777          | 0.4777          | 0.4777          |
| pneumatization_3        | 0.3632            | 0.3632            | 0.3632            | 0.7021             | 0.7021             | 0.1202          | 0.1202          | 0.1202          | 0.1202          |
| pneumatization_4        | 0.1408            | 0.1408            | 0.1408            | 0.5953             | 0.5953             | 0.3375          | 0.3375          | 0.3375          | 0.3375          |
| Transverse sinus (L)_0  | 0.0000            | 0.0000            | 0.0000            | 0.7890             | 0.7890             | 0.9269          | 0.9269          | 0.9269          | 0.9269          |
| Transverse sinus (L)_2  | 0.0000            | 0.0000            | 0.0000            | 0.7890             | 0.7890             | 0.9269          | 0.9269          | 0.9269          | 0.9269          |
| Transverse sinus (R)_0  | 0.0000            | 0.0000            | 0.0000            | 0.7890             | 0.7890             | 0.9269          | 0.9269          | 0.9269          | 0.9269          |
| Transverse sinus (R)_2  | 0.0000            | 0.0000            | 0.0000            | 0.7890             | 0.7890             | 0.9269          | 0.9269          | 0.9269          | 0.9269          |
| Split confluents_0      | 0.7890            | 0.7890            | 0.7890            | 0.0000             | 0.0000             | 0.7045          | 0.7045          | 0.7045          | 0.7045          |
| Split confluents_1      | 0.7890            | 0.7890            | 0.7890            | 0.0000             | 0.0000             | 0.7045          | 0.7045          | 0.7045          | 0.7045          |
| Cavernous sinus (L)_1   | 0.9269            | 0.9269            | 0.9269            | 0.7045             | 0.7045             | 0.0000          | 0.0000          | 0.0000          | 0.0000          |
| Cavernous sinus (L)_2   | 0.9269            | 0.9269            | 0.9269            | 0.7045             | 0.7045             | 0.0000          | 0.0000          | 0.0000          | 0.0000          |
| Cavernous sinus (R)_1   | 0.9269            | 0.9269            | 0.9269            | 0.7045             | 0.7045             | 0.0000          | 0.0000          | 0.0000          | 0.0000          |
| Cavernous sinus (R)_2   | 0.9269            | 0.9269            | 0.9269            | 0.7045             | 0.7045             | 0.0000          | 0.0000          | 0.0000          | 0.0000          |
| MTS+origin_0            | 0.3265            | 0.3265            | 0.3265            | 0.2710             | 0.2710             | 0.4999          | 0.4999          | 0.4999          | 0.4999          |
| MTS+origin_1            | 0.3428            | 0.3428            | 0.3428            | 0.2145             | 0.2145             | 0.1364          | 0.1364          | 0.1364          | 0.1364          |
| MTS+origin_2            | 0.8963            | 0.8963            | 0.8963            | 0.5900             | 0.5900             | 0.8535          | 0.8535          | 0.8535          | 0.8535          |
| LTS+origin_0            | 0.9269            | 0.9269            | 0.9269            | 0.7045             | 0.7045             | 0.0000          | 0.0000          | 0.0000          | 0.0000          |
| LTS+origin_1            | 0.9269            | 0.9269            | 0.9269            | 0.7045             | 0.7045             | 0.0000          | 0.0000          | 0.0000          | 0.0000          |
| Ring (L)_0              | 0.6071            | 0.6071            | 0.6071            | 0.0207             | 0.0207             | 0.3142          | 0.3142          | 0.3142          | 0.3142          |
| Ring (L)_1              | 0.6071            | 0.6071            | 0.6071            | 0.0207             | 0.0207             | 0.3142          | 0.3142          | 0.3142          | 0.3142          |
| Ring (R)_0              | 0.6117            | 0.6117            | 0.6117            | 0.0176             | 0.0176             | 0.3036          | 0.3036          | 0.3036          | 0.3036          |
| Ring (R)_1              | 0.6117            | 0.6117            | 0.6117            | 0.0176             | 0.0176             | 0.3036          | 0.3036          | 0.3036          | 0.3036          |
| MTV (L)_0               | 0.9484            | 0.9484            | 0.9484            | 0.7890             | 0.7890             | 0.9269          | 0.9269          | 0.9269          | 0.9269          |
| MTV (R)_0               | 0.9484            | 0.9484            | 0.9484            | 0.7890             | 0.7890             | 0.9269          | 0.9269          | 0.9269          | 0.9269          |
| MTV (R)_1               | 0.9484            | 0.9484            | 0.9484            | 0.7890             | 0.7890             | 0.9269          | 0.9269          | 0.9269          | 0.9269          |
| ITV (L)_0               | 0.7104            | 0.7104            | 0.7104            | 0.9683             | 0.9683             | 0.5986          | 0.5986          | 0.5986          | 0.5986          |
| ITV (L)_1               | 0.7960            | 0.7960            | 0.7960            | 0.2847             | 0.2847             | 0.0105          | 0.0105          | 0.0105          | 0.0105          |
| ITV (L)_2               | 0.3917            | 0.3917            | 0.3917            | 0.0935             | 0.0935             | 0.0989          | 0.0989          | 0.0989          | 0.0989          |
| ITV (L)_3               | 0.8106            | 0.8106            | 0.8106            | 0.8864             | 0.8864             | 0.7341          | 0.7341          | 0.7341          | 0.7341          |
| ITV (L)_4               | 0.6349            | 0.6349            | 0.6349            | 0.0069             | 0.0069             | 0.2508          | 0.2508          | 0.2508          | 0.2508          |
| ITV (R)_0               | 0.7104            | 0.7104            | 0.7104            | 0.9683             | 0.9683             | 0.5986          | 0.5986          | 0.5986          | 0.5986          |
| ITV (R)_1               | 0.7960            | 0.7960            | 0.7960            | 0.2847             | 0.2847             | 0.0105          | 0.0105          | 0.0105          | 0.0105          |
| ITV (R)_2               | 0.3876            | 0.3876            | 0.3876            | 0.1010             | 0.1010             | 0.1019          | 0.1019          | 0.1019          | 0.1019          |
| ITV (R)_3               | 0.8106            | 0.8106            | 0.8106            | 0.8864             | 0.8864             | 0.7341          | 0.7341          | 0.7341          | 0.7341          |
| ITV (R)_4               | 0.6302            | 0.6302            | 0.6302            | 0.0085             | 0.0085             | 0.2613          | 0.2613          | 0.2613          | 0.2613          |
| LTV (L)_1               | 0.6163            | 0.6163            | 0.6163            | 0.0148             | 0.0148             | 0.2930          | 0.2930          | 0.2930          | 0.2930          |
| LTV (L)_2               | 0.8183            | 0.8183            | 0.8183            | 0.0093             | 0.0093             | 0.0034          | 0.0034          | 0.0034          | 0.0034          |
| LTV (L)_3               | 0.6738            | 0.6738            | 0.6738            | 0.2556             | 0.2556             | 0.5508          | 0.5508          | 0.5508          | 0.5508          |
| LTV (R)_1               | 0.6163            | 0.6163            | 0.6163            | 0.0148             | 0.0148             | 0.2930          | 0.2930          | 0.2930          | 0.2930          |
| LTV (R)_2               | 0.8106            | 0.8106            | 0.8106            | 0.0153             | 0.0153             | 0.0052          | 0.0052          | 0.0052          | 0.0052          |
| LTV (R)_3               | 0.6789            | 0.6789            | 0.6789            | 0.2304             | 0.2304             | 0.5573          | 0.5573          | 0.5573          | 0.5573          |

**Note:**—Trans indicates Transverse; Cav, cavernous; Dist, distance; R, right; L, left.  
<sup>a</sup> P value matrix output from the Pearson correlation for all variables to assess directionality of the correlated variables are shown.

**On-line Table 3: P value matrix from Pearson correlation<sup>a</sup>**

| MTS+<br>Origin_2 | LTS+<br>Origin_0 | LTS+<br>Origin_1 | Ring (L)_0 | Ring (L)_1 | Ring (R)_0 | Ring (R)_1 | MTV (L)_0 | MTV (L)_1 | MTV (R)_0 | MTV (R)_1 | ITV (L)_0 | ITV (L)_1 | ITV (L)_2 | ITV (L)_3 | ITV (L)_4 |
|------------------|------------------|------------------|------------|------------|------------|------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| 0.1872           | 0.9795           | 0.9795           | 0.4800     | 0.4800     | 0.3364     | 0.3364     | 0.4119    | 0.4119    | 0.4119    | 0.4119    | 0.6149    | 0.0407    | 0.0985    | 0.5007    | 0.3941    |
| 0.0867           | 0.2284           | 0.2284           | 0.0012     | 0.0012     | 0.0017     | 0.0017     | 0.2409    | 0.2409    | 0.2409    | 0.2409    | 0.6360    | 0.4836    | 0.0120    | 0.3763    | 0.0040    |
| 0.1011           | 0.5142           | 0.5142           | 0.2799     | 0.2799     | 0.3002     | 0.3002     | 0.6484    | 0.6484    | 0.6484    | 0.6484    | 0.6795    | 0.4650    | 0.0223    | 0.0840    | 0.0747    |
| 0.1634           | 0.8005           | 0.8005           | 0.2532     | 0.2532     | 0.2740     | 0.2740     | 0.8842    | 0.8842    | 0.8842    | 0.8842    | 0.5617    | 0.4989    | 0.0169    | 0.8666    | 0.2094    |
| 0.0190           | 0.8935           | 0.8935           | 0.3313     | 0.3313     | 0.4365     | 0.4365     | 0.4862    | 0.4862    | 0.4862    | 0.4862    | 0.3492    | 0.8984    | 0.2614    | 0.6971    | 0.6225    |
| 0.4081           | 0.5104           | 0.5104           | 0.9349     | 0.9349     | 0.8712     | 0.8712     | 0.4754    | 0.4754    | 0.4754    | 0.4754    | 0.2748    | 0.1726    | 0.7691    | 0.6394    | 0.8754    |
| 0.9554           | 0.7678           | 0.7678           | 0.4068     | 0.4068     | 0.3799     | 0.3799     | 0.2263    | 0.2263    | 0.2263    | 0.2263    | 0.6269    | 0.0653    | 0.3206    | 0.9748    | 0.6139    |
| 0.3034           | 0.1206           | 0.1206           | 0.0274     | 0.0274     | 0.0365     | 0.0365     | 0.7151    | 0.7151    | 0.7151    | 0.7151    | 0.3906    | 0.5986    | 0.3294    | 0.7226    | 0.0072    |
| 0.4388           | 0.1857           | 0.1857           | 0.5443     | 0.5443     | 0.5707     | 0.5707     | 0.7006    | 0.7006    | 0.7006    | 0.7006    | 0.1894    | 0.6947    | 0.0465    | 0.5007    | 0.1158    |
| 0.8207           | 0.8732           | 0.8732           | 0.3708     | 0.3708     | 0.3769     | 0.3769     | 0.9103    | 0.9103    | 0.9103    | 0.9103    | 0.5182    | 0.6529    | 0.1356    | 0.6768    | 0.4086    |
| 0.8207           | 0.8732           | 0.8732           | 0.0510     | 0.0510     | 0.0472     | 0.0472     | 0.9103    | 0.9103    | 0.9103    | 0.9103    | 0.0425    | 0.5182    | 0.0326    | 0.0306    | 0.0000    |
| 0.8267           | 0.4717           | 0.4717           | 0.1964     | 0.1964     | 0.2225     | 0.2225     | 0.6117    | 0.6117    | 0.6117    | 0.6117    | 0.1388    | 0.0097    | 0.0920    | 0.3526    | 0.0000    |
| 0.8522           | 0.8957           | 0.8957           | 0.3922     | 0.3922     | 0.4738     | 0.4738     | 0.2735    | 0.2735    | 0.2735    | 0.2735    | 0.6461    | 0.3351    | 0.3148    | 0.2305    | 0.3218    |
| 0.7785           | 0.5739           | 0.5739           | 0.0730     | 0.0730     | 0.1167     | 0.1167     | 0.4987    | 0.4987    | 0.4987    | 0.4987    | 0.6389    | 0.3335    | 0.6077    | 0.0118    | 0.0654    |
| 0.8963           | 0.9269           | 0.9269           | 0.6071     | 0.6071     | 0.6117     | 0.6117     | 0.9484    | 0.9484    | 0.9484    | 0.9484    | 0.7104    | 0.7960    | 0.3917    | 0.8106    | 0.6349    |
| 0.8963           | 0.9269           | 0.9269           | 0.8963     | 0.8963     | 0.6117     | 0.6117     | 0.9484    | 0.9484    | 0.9484    | 0.9484    | 0.7104    | 0.7960    | 0.3917    | 0.8106    | 0.6349    |
| 0.8963           | 0.9269           | 0.9269           | 0.6071     | 0.6071     | 0.6117     | 0.6117     | 0.9484    | 0.9484    | 0.9484    | 0.9484    | 0.7104    | 0.7960    | 0.3917    | 0.8106    | 0.6349    |
| 0.5900           | 0.7045           | 0.7045           | 0.0207     | 0.0207     | 0.0176     | 0.0176     | 0.7890    | 0.7890    | 0.7890    | 0.7890    | 0.9683    | 0.2847    | 0.0935    | 0.0864    | 0.0069    |
| 0.5900           | 0.7045           | 0.7045           | 0.0207     | 0.0207     | 0.0176     | 0.0176     | 0.7890    | 0.7890    | 0.7890    | 0.7890    | 0.9683    | 0.2847    | 0.0935    | 0.8864    | 0.0069    |
| 0.5900           | 0.7045           | 0.7045           | 0.0207     | 0.0207     | 0.0176     | 0.0176     | 0.7890    | 0.7890    | 0.7890    | 0.7890    | 0.9683    | 0.2847    | 0.0935    | 0.8864    | 0.0069    |
| 0.8535           | 0.0000           | 0.0000           | 0.3142     | 0.3142     | 0.3036     | 0.3036     | 0.9269    | 0.9269    | 0.9269    | 0.9269    | 0.5986    | 0.0105    | 0.0989    | 0.7341    | 0.2508    |
| 0.8535           | 0.0000           | 0.0000           | 0.3142     | 0.3142     | 0.3036     | 0.3036     | 0.9269    | 0.9269    | 0.9269    | 0.9269    | 0.5986    | 0.0105    | 0.0989    | 0.7341    | 0.2508    |
| 0.8535           | 0.0000           | 0.0000           | 0.3142     | 0.3142     | 0.3036     | 0.3036     | 0.9269    | 0.9269    | 0.9269    | 0.9269    | 0.5986    | 0.0105    | 0.0989    | 0.7341    | 0.2508    |
| 0.8535           | 0.0000           | 0.0000           | 0.3142     | 0.3142     | 0.3036     | 0.3036     | 0.9269    | 0.9269    | 0.9269    | 0.9269    | 0.5986    | 0.0105    | 0.0989    | 0.7341    | 0.2508    |
| 0.8535           | 0.0000           | 0.0000           | 0.3142     | 0.3142     | 0.3036     | 0.3036     | 0.9269    | 0.9269    | 0.9269    | 0.9269    | 0.5986    | 0.0105    | 0.0989    | 0.7341    | 0.2508    |
| 0.8535           | 0.0000           | 0.0000           | 0.3142     | 0.3142     | 0.3036     | 0.3036     | 0.9269    | 0.9269    | 0.9269    | 0.9269    | 0.5986    | 0.0105    | 0.0989    | 0.7341    | 0.2508    |
| 0.8535           | 0.0000           | 0.0000           | 0.3142     | 0.3142     | 0.3036     | 0.3036     | 0.9269    | 0.9269    | 0.9269    | 0.9269    | 0.5986    | 0.0105    | 0.0989    | 0.7341    | 0.2508    |
| 0.8535           | 0.0000           | 0.0000           | 0.3142     | 0.3142     | 0.3036     | 0.3036     | 0.9269    | 0.9269    | 0.9269    | 0.9269    | 0.5986    | 0.0105    | 0.0989    | 0.7341    | 0.2508    |
| 0.8535           | 0.0000           | 0.0000           | 0.3142     | 0.3142     | 0.3036     | 0.3036     | 0.9269    | 0.9269    | 0.9269    | 0.9269    | 0.5986    | 0.0105    | 0.0989    | 0.7341    | 0.2508    |
| 0.8535           | 0.0000           | 0.0000           | 0.3142     | 0.3142     | 0.3036     | 0.3036     | 0.9269    | 0.9269    | 0.9269    | 0.9269    | 0.5986    | 0.0105    | 0.0989    | 0.7341    | 0.2508    |
| 0.8535           | 0.0000           | 0.0000           | 0.3142     | 0.3142     | 0.3036     | 0.3036     | 0.9269    | 0.9269    | 0.9269    | 0.9269    | 0.5986    | 0.0105    | 0.0989    | 0.7341    | 0.2508    |
| 0.8535           | 0.0000           | 0.0000           | 0.3142     | 0.3142     | 0.3036     | 0.3036     | 0.9269    | 0.9269    | 0.9269    | 0.9269    | 0.5986    | 0.0105    | 0.0989    | 0.7341    | 0.2508    |
| 0.8535           | 0.0000           | 0.0000           | 0.3142     | 0.3142     | 0.3036     | 0.3036     | 0.9269    | 0.9269    | 0.9269    | 0.9269    | 0.5986    | 0.0105    | 0.0989    | 0.7341    | 0.2508    |
| 0.8535           | 0.0000           | 0.0000           | 0.3142     | 0.3142     | 0.3036     | 0.3036     | 0.9269    | 0.9269    | 0.9269    | 0.9269    | 0.5986    | 0.0105    | 0.0989    | 0.7341    | 0.2508    |
| 0.8535           | 0.0000           | 0.0000           | 0.3142     | 0.3142     | 0.3036     | 0.3036     | 0.9269    | 0.9269    | 0.9269    | 0.9269    | 0.5986    | 0.0105    | 0.0989    | 0.7341    | 0.2508    |
| 0.8535           | 0.0000           | 0.0000           | 0.3142     | 0.3142     | 0.3036     | 0.3036     | 0.9269    | 0.9269    | 0.9269    | 0.9269    | 0.5986    | 0.0105    | 0.0989    | 0.7341    | 0.2508    |
| 0.8535           | 0.0000           | 0.0000           | 0.3142     | 0.3142     | 0.3036     | 0.3036     | 0.9269    | 0.9269    | 0.9269    | 0.9269    | 0.5986    | 0.0105    | 0.0989    | 0.7341    | 0.2508    |
| 0.8535           | 0.0000           | 0.0000           | 0.3142     | 0.3142     | 0.3036     | 0.3036     | 0.9269    | 0.9269    | 0.9269    | 0.9269    | 0.5986    | 0.0105    | 0.0989    | 0.7341    | 0.2508    |
| 0.8535           | 0.0000           | 0.0000           | 0.3142     | 0.3142     | 0.3036     | 0.3036     | 0.9269    | 0.9269    | 0.9269    | 0.9269    | 0.5986    | 0.0105    | 0.0989    | 0.7341    | 0.2508    |
| 0.8535           | 0.0000           | 0.0000           | 0.3142     | 0.3142     | 0.3036     | 0.3036     | 0.9269    | 0.9269    | 0.9269    | 0.9269    | 0.5986    | 0.0105    | 0.0989    | 0.7341    | 0.2508    |
| 0.8535           | 0.0000           | 0.0000           | 0.3142     | 0.3142     | 0.3036     | 0.3036     | 0.9269    | 0.9269    | 0.9269    | 0.9269    | 0.5986    | 0.0105    | 0.0989    | 0.7341    | 0.2508    |
| 0.8535           | 0.0000           | 0.0000           | 0.3142     | 0.3142     | 0.3036     | 0.3036     | 0.9269    | 0.9269    | 0.9269    | 0.9269    | 0.5986    | 0.0105    | 0.0989    | 0.7341    | 0.2508    |
| 0.8535           | 0.0000           | 0.0000           | 0.3142     | 0.3142     | 0.3036     | 0.3036     | 0.9269    | 0.9269    | 0.9269    | 0.9269    | 0.5986    | 0.0105    | 0.0989    | 0.7341    | 0.2508    |
| 0.8535           | 0.0000           | 0.0000           | 0.3142     | 0.3142     | 0.3036     | 0.3036     | 0.9269    | 0.9269    | 0.9269    | 0.9269    | 0.5986    | 0.0105    | 0.0989    | 0.7341    | 0.2508    |
| 0.8535           | 0.0000           | 0.0000           | 0.3142     | 0.3142     | 0.3036     | 0.3036     | 0.9269    | 0.9269    | 0.9269    | 0.9269    | 0.5986    | 0.0105    | 0.0989    | 0.7341    | 0.2508    |
| 0.8535           | 0.0000           | 0.0000           | 0.3142     | 0.3142     | 0.3036     | 0.3036     | 0.9269    | 0.9269    | 0.9269    | 0.9269    | 0.5986    | 0.0105    | 0.0989    | 0.7341    | 0.2508    |
| 0.8535           | 0.0000           | 0.0000           | 0.3142     | 0.3142     | 0.3036     | 0.3036     | 0.9269    | 0.9269    | 0.9269    | 0.9269    | 0.5986    | 0.0105    | 0.0989    | 0.7341    | 0.2508    |
| 0.8535           | 0.0000           | 0.0000           | 0.3142     | 0.3142     | 0.3036     | 0.3036     | 0.9269    | 0.9269    | 0.9269    | 0.9269    | 0.5986    | 0.0105    | 0.0989    | 0.7341    | 0.2508    |
| 0.8535           | 0.0000           | 0.0000           | 0.3142     | 0.3142     | 0.3036     | 0          |           |           |           |           |           |           |           |           |           |

Continued on next page

On-line Table 3: Continued

| MTS+<br>Origin_2 | ITV (R)_0 | ITV (R)_1 | ITV (R)_2 | ITV (R)_3 | ITV (R)_4 | LTV (L)_1 | LTV (L)_2 | LTV (L)_3 | LTV (R)_1 | LTV (R)_2 | LTV (R)_3 |
|------------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| 0.1872           | 0.6149    | 0.0407    | 0.1485    | 0.5007    | 0.5571    | 0.4560    | 0.1406    | 0.9347    | 0.2542    | 0.0888    | 0.8401    |
| 0.0867           | 0.6360    | 0.4836    | 0.0088    | 0.3763    | 0.0027    | 0.0026    | 0.2221    | 0.0089    | 0.0026    | 0.1561    | 0.0128    |
| 0.1001           | 0.6795    | 0.4650    | 0.0227    | 0.0840    | 0.0782    | 0.2582    | 0.1017    | 0.7888    | 0.2395    | 0.0996    | 0.7817    |
| 0.1634           | 0.4561    | 0.8666    | 0.1054    | 0.8666    | 0.1727    | 0.2411    | 0.2268    | 0.5143    | 0.2411    | 0.2129    | 0.5972    |
| 0.0190           | 0.3492    | 0.8984    | 0.1984    | 0.6971    | 0.4870    | 0.4376    | 0.2702    | 0.8443    | 0.5605    | 0.2822    | 0.9762    |
| 0.4081           | 0.2248    | 0.1126    | 0.8197    | 0.6394    | 0.9418    | 0.8073    | 0.7524    | 0.6413    | 0.6272    | 0.9847    | 0.5737    |
| 0.9554           | 0.6269    | 0.0653    | 0.3384    | 0.9748    | 0.6480    | 0.4384    | 0.5488    | 0.6161    | 0.2634    | 0.2678    | 0.5785    |
| 0.3034           | 0.2906    | 0.5986    | 0.2805    | 0.7226    | 0.0051    | 0.0061    | 0.0194    | 0.1027    | 0.0108    | 0.0320    | 0.1326    |
| 0.4388           | 0.1894    | 0.6947    | 0.0429    | 0.5007    | 0.1085    | 0.2439    | 0.8470    | 0.2352    | 0.2439    | 0.7920    | 0.2498    |
| 0.8207           | 0.5182    | 0.6768    | 0.1523    | 0.6894    | 0.4021    | 0.3831    | 0.6894    | 0.4659    | 0.3831    | 0.6768    | 0.4713    |
| 0.8207           | 0.1882    | 0.6529    | 0.0444    | 0.0326    | 0.0336    | 0.0436    | 0.6894    | 0.0120    | 0.0436    | 0.6768    | 0.0104    |
| 0.8267           | 0.1388    | 0.0097    | 0.1062    | 0.3526    | 0.1828    | 0.2513    | 0.7316    | 0.2825    | 0.2513    | 0.6349    | 0.3201    |
| 0.8522           | 0.6461    | 0.3351    | 0.2614    | 0.2305    | 0.2573    | 0.2215    | 0.7921    | 0.2271    | 0.3689    | 0.9542    | 0.2913    |
| 0.7785           | 0.6289    | 0.3235    | 0.7485    | 0.0118    | 0.0383    | 0.0413    | 0.4393    | 0.0704    | 0.0908    | 0.5810    | 0.1187    |
| 0.8963           | 0.7104    | 0.7960    | 0.3876    | 0.8106    | 0.6302    | 0.6163    | 0.8183    | 0.6738    | 0.6163    | 0.8106    | 0.6789    |
| 0.8963           | 0.7104    | 0.7960    | 0.3876    | 0.8106    | 0.6302    | 0.6163    | 0.8183    | 0.6738    | 0.6163    | 0.8106    | 0.6789    |
| 0.8963           | 0.7104    | 0.7960    | 0.3876    | 0.8106    | 0.6302    | 0.6163    | 0.8183    | 0.6738    | 0.6163    | 0.8106    | 0.6789    |
| 0.8963           | 0.7104    | 0.7960    | 0.3876    | 0.8106    | 0.6302    | 0.6163    | 0.8183    | 0.6738    | 0.6163    | 0.8106    | 0.6789    |
| 0.5900           | 0.9683    | 0.2847    | 0.1010    | 0.8864    | 0.0085    | 0.0048    | 0.0093    | 0.2556    | 0.0148    | 0.0153    | 0.2304    |
| 0.5900           | 0.9683    | 0.2847    | 0.1010    | 0.8864    | 0.0085    | 0.0048    | 0.0093    | 0.2556    | 0.0148    | 0.0153    | 0.2304    |
| 0.8535           | 0.5986    | 0.1005    | 0.1019    | 0.7341    | 0.2613    | 0.2930    | 0.0034    | 0.5508    | 0.2930    | 0.0052    | 0.5573    |
| 0.8535           | 0.5986    | 0.1005    | 0.1019    | 0.7341    | 0.2613    | 0.2930    | 0.0034    | 0.5508    | 0.2930    | 0.0052    | 0.5573    |
| 0.8535           | 0.5986    | 0.1005    | 0.1019    | 0.7341    | 0.2613    | 0.2930    | 0.0034    | 0.5508    | 0.2930    | 0.0052    | 0.5573    |
| 0.8535           | 0.5986    | 0.1005    | 0.1019    | 0.7341    | 0.2613    | 0.2930    | 0.0034    | 0.5508    | 0.2930    | 0.0052    | 0.5573    |
| 0.4040           | 0.9195    | 0.0000    | 0.0000    | 0.3606    | 0.0000    | 0.0000    | 0.0003    | 0.5508    | 0.0000    | 0.0001    | 0.5573    |
| 0.0555           | 0.9273    | 0.0000    | 0.0000    | 0.6380    | 0.0000    | 0.0000    | 0.0000    | 0.0000    | 0.0000    | 0.0000    | 0.0000    |
| 0.0000           | 0.4546    | 0.6027    | 0.7721    | 0.0835    | 0.7549    | 0.8091    | 0.6438    | 0.5802    | 0.8091    | 0.6295    | 0.5596    |
| 0.8535           | 0.5986    | 0.1005    | 0.1019    | 0.7341    | 0.2613    | 0.2930    | 0.0034    | 0.5508    | 0.2930    | 0.0052    | 0.5573    |
| 0.8535           | 0.5986    | 0.1005    | 0.1019    | 0.7341    | 0.2613    | 0.2930    | 0.0034    | 0.5508    | 0.2930    | 0.0052    | 0.5573    |
| 0.8441           | 0.8441    | 0.0392    | 0.0000    | 0.2272    | 0.0000    | 0.0000    | 0.0000    | 0.0000    | 0.0000    | 0.0000    | 0.0000    |
| 0.8441           | 0.8441    | 0.0392    | 0.0000    | 0.2272    | 0.0000    | 0.0000    | 0.0000    | 0.0000    | 0.0000    | 0.0000    | 0.0000    |
| 0.8267           | 0.0147    | 0.0418    | 0.0000    | 0.2387    | 0.0000    | 0.0000    | 0.0000    | 0.0000    | 0.0000    | 0.0000    | 0.0000    |
| 0.8267           | 0.0147    | 0.0418    | 0.0000    | 0.2387    | 0.0000    | 0.0000    | 0.0000    | 0.0000    | 0.0000    | 0.0000    | 0.0000    |
| 0.8267           | 0.0147    | 0.0418    | 0.0000    | 0.2387    | 0.0000    | 0.0000    | 0.0000    | 0.0000    | 0.0000    | 0.0000    | 0.0000    |
| 0.8963           | 0.7104    | 0.7960    | 0.3876    | 0.8106    | 0.6302    | 0.6163    | 0.8183    | 0.6738    | 0.6163    | 0.8106    | 0.6789    |
| 0.8963           | 0.7104    | 0.7960    | 0.3876    | 0.8106    | 0.6302    | 0.6163    | 0.8183    | 0.6738    | 0.6163    | 0.8106    | 0.6789    |
| 0.8963           | 0.7104    | 0.7960    | 0.3876    | 0.8106    | 0.6302    | 0.6163    | 0.8183    | 0.6738    | 0.6163    | 0.8106    | 0.6789    |
| 0.4546           | 0.0000    | 0.1373    | 0.0000    | 0.1686    | 0.0054    | 0.0166    | 0.6771    | 0.0152    | 0.0166    | 0.6123    | 0.0169    |
| 0.6027           | 0.1373    | 0.0000    | 0.0000    | 0.3383    | 0.0537    | 0.0445    | 0.3587    | 0.0919    | 0.0445    | 0.3383    | 0.0974    |
| 0.7588           | 0.0000    | 0.0000    | 0.0000    | 0.0000    | 0.0000    | 0.0000    | 0.0000    | 0.0000    | 0.0000    | 0.0002    | 0.0000    |
| 0.0835           | 0.1686    | 0.3383    | 0.0000    | 0.0000    | 0.0739    | 0.2508    | 0.3950    | 0.4438    | 0.2508    | 0.3749    | 0.4648    |
| 0.7364           | 0.0061    | 0.0571    | 0.0000    | 0.0780    | 0.0000    | 0.0000    | 0.0000    | 0.0000    | 0.0000    | 0.0000    | 0.0000    |
| 0.4546           | 0.0000    | 0.1373    | 0.0000    | 0.1686    | 0.0054    | 0.0166    | 0.6771    | 0.0152    | 0.0166    | 0.6123    | 0.0169    |
| 0.6027           | 0.1373    | 0.0000    | 0.0000    | 0.3383    | 0.0537    | 0.0445    | 0.3587    | 0.0919    | 0.0445    | 0.3383    | 0.0974    |
| 0.7721           | 0.1686    | 0.0000    | 0.0000    | 0.0000    | 0.0739    | 0.2508    | 0.3950    | 0.4438    | 0.2508    | 0.3749    | 0.4648    |
| 0.0835           | 0.1686    | 0.3383    | 0.0000    | 0.0000    | 0.0739    | 0.2508    | 0.3950    | 0.4438    | 0.2508    | 0.3749    | 0.4648    |
| 0.7549           | 0.0034    | 0.0537    | 0.0000    | 0.0739    | 0.0000    | 0.0000    | 0.0000    | 0.0000    | 0.0000    | 0.0000    | 0.0000    |
| 0.8091           | 0.0166    | 0.0445    | 0.0000    | 0.2508    | 0.0000    | 0.0000    | 0.0000    | 0.0000    | 0.0000    | 0.0000    | 0.0000    |
| 0.6438           | 0.6771    | 0.3587    | 0.0000    | 0.3950    | 0.0000    | 0.0000    | 0.0000    | 0.1346    | 0.0000    | 0.0000    | 0.1411    |
| 0.5802           | 0.0152    | 0.0919    | 0.0000    | 0.4438    | 0.0000    | 0.0000    | 0.1346    | 0.0000    | 0.0000    | 0.1185    | 0.0000    |
| 0.8091           | 0.0166    | 0.0445    | 0.0000    | 0.2508    | 0.0000    | 0.0000    | 0.0000    | 0.0000    | 0.0000    | 0.0000    | 0.0000    |
| 0.6295           | 0.6123    | 0.3383    | 0.0002    | 0.3749    | 0.0000    | 0.0000    | 0.0000    | 0.1185    | 0.0000    | 0.0000    | 0.1247    |
| 0.5596           | 0.0169    | 0.0574    | 0.0000    | 0.4648    | 0.0000    | 0.0000    | 0.1411    | 0.0000    | 0.0000    | 0.1247    | 0.0000    |

Note:—L indicates left; R, right.

<sup>a</sup> P value matrix output from the Pearson correlation for all variables to assess directionality of the correlated variables are shown.