**Supplemental Materials**

**Residual Decline in Cognition after Adjustment for Common Neuropathologic Conditions**

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Table S1

*Estimates of Change in Cognition from the Mixture Model (Stratified Analysis)*

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| --- | --- | --- | --- |
| **ROS (N=471)** | Group 1 (N=223) Estimate (SE, *p*) | Group 2 (N=185)Estimate (SE, *p*) | Group 3 (N=63)Estimate (SE, *p*) |
| Intercept () | .103 (.039, .009) | -.098 (.048, .042) | -.117 (.083, .159) |
|  Variance () | .102 (.015, <.001) | .127 (.021, <.001) | .219 (.063, .001) |
| Linear () | .027 (.011, .011) | .031 (.023, .186) | -.098 (.047, .036) |
|  Variance () | .001 (.0002, <.001) | .007 (.001, <.001) | .032 (.011, .002) |
|  Covariance () | .002 (.001, .097) | -.003 (.003, .318) | -.008 (.015, .568) |
| Quadratic () | -.003 (.001, .009) | -.013 (.002, <.001) | -.016 (.005, <.001) |
| Residuals Variance | .030 (.002, <.001) | .070 (.007, <.001) | .337 (.045, <.001) |

|  |  |  |  |
| --- | --- | --- | --- |
| **MAP (N=405)** | Group 1 (N=267) Estimate (SE, *p*) | Group 2 (N=72)Estimate (SE, *p*) | Group 3 (N=66)Estimate (SE, *p*) |
| Intercept () | .289 (.042, <.001) | .155 (.082, .059) | .206 (.083, .013) |
|  Variance () | .137 (.017, <.001) | .226 (.048, <.001) | .215 (.059, <.001) |
| Linear () | .023 (.012, .071) | .056 (.030, <.056) | -.132 (.054, .015) |
|  Variance () | .002 (.0004, <.001) | .016 (.004, <.001) | .023 (.011, <.041) |
|  Covariance () | .004 (.002, .119) | .034 (.008, <.001) | .025 (.013, .053) |
| Quadratic () | -.002 (.002, .188) | -.029 (.004, <.001) | -.007 (.008, .407) |
| Residuals Variance | .037 (.002, <.001) | .046 (.006, <.001) | .193 (.029, <.001) |

Table S2

*Demographic, Clinical, and Pathologic Characteristics by Studies*

|  |  |  |  |
| --- | --- | --- | --- |
| Mean (SD) or N (%) | ROS (N=471) | MAP (N=405) | *p*-value |
| # Follow-up years | 8.3 (4.1) | 5.4 (3.0) | <.0013 |
| Age at baseline (in years) | 77.9 (6.7) | 83.0 (6.0) | <.0011 |
| Age at death (in years) | 87.3 (6.9) | 89.4 (6.0) | <.0011 |
| Male sex | 168 (35.7%) | 129 (31.9%) | .2342 |
| Education (in years) | 18.2 (3.5) | 14.5 (2.7) | <.0011 |
| Baseline cognition | 0.03 (0.5) | -0.10 (0.5) | <.0011 |
| Pathologic AD  | 285 (60.5%) | 252 (62.2%) | .6042 |
| Macroscopic infarcts | 160 (34.0%) | 143 (35.3%) | .6782 |
| Neocortical Lewy bodies | 53 (11.3%) | 49 (12.1%) | .6972 |
| Hippocampal sclerosis  | 32 (6.8%) | 38 (9.4%) | .1592 |

Demographic and clinical measures are taken at study baseline except for age at death, and pathology measures are taken at autopsy.

SD: Standard deviation.

1 ANOVA (df=1); 2 Chi Square (df=1); 3 Kruskal–Wallis Test (df=1).

Table S3

*Estimates of Change in Cognition from the Mixture Model (the Subset of Participants with at Least 5 Follow-Ups)*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **N=662** | Group 1 (N=279) Estimate (SE, *p*) | Group 2 (N=199)Estimate (SE, *p*) | Group 3 (N=112)Estimate (SE, *p*) | Group 4 (N=72)Estimate (SE, *p*) |
| Intercept () | .090 (.030, .002) | .051 (.036, .155) | -.004 (.048, .941) | -.078 (.064, .222) |
|  Variance () | .044 (.013, .001) | .019 (.012, .101) | .031 (.017, .077) | .083 (.042, .048) |
| Linear () | .008 (.008, .280) | .038 (.021, .076) | .038 (.034, .254) | -.091 (.045, .042) |
|  Variance () | .001 (.0003, <.001) | .005 (.002, .009) | .018 (.006, .002) | .016 (.008, .039) |
|  Covariance () | .002 (.002, .306) | .003 (.003, .247) | -.007 (.005, .194) | .012 (.010, .229) |
| Quadratic () | -.001 (.001, .143) | -.011 (.002, <.001) | -.036 (.006, <.001) | -.010 (.004, .020) |
| Residuals Variance | .029 (.003, <.001) | .053 (.007, <.001) | .080 (.045, <.001) | .334 (.060, <.001) |

*Figure S1.* Decline in global cognition by common neuropathologies.

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