

**Supplementary Table 1.** Between-group comparison of cognitive assessment at baseline and 6-month follow-up.

|                                       | Baseline                     |                                    |                          | 6-month follow-up           |                            |                               |
|---------------------------------------|------------------------------|------------------------------------|--------------------------|-----------------------------|----------------------------|-------------------------------|
|                                       | C+ group (n=19)              | HC group (n=19)                    | p-value                  | C+ group (n=19)             | HC group (n=19)            | p-value                       |
| <b>Neuropsychological tests</b>       | median (IQR) or mean [95%CI] |                                    |                          |                             |                            |                               |
| TMT-A , sec                           | 43 (33-74)                   | 51 (34-59)                         | 0.759 <sup>b</sup>       | 42 (38-63)                  | 42 (29-56)                 | 0.381 <sup>b</sup>            |
| <b>TMT-A, z-score<sup>†</sup></b>     | <b>-1.26 [-2.49, 0.03]</b>   | <b>-0.61 [-1.43, 0.20]</b>         | <b>0.363<sup>a</sup></b> | <b>-0.88 [-1.80, 0.04]</b>  | <b>-0.18 [-0.97, 0.61]</b> | <b>0.232<sup>a</sup></b>      |
| TMT part B, sec                       | 78 (59-119)                  | 75 (67-98)                         | 0.781 <sup>b</sup>       | 93 (62-135)                 | 89 (59-117)                | 0.381 <sup>b</sup>            |
| <b>TMT-B, z-score<sup>†</sup></b>     | <b>-0.99 [-2.12, 0.14]</b>   | <b>-0.18 [-0.80, 0.43]</b>         | <b>0.197<sup>a</sup></b> | <b>-1.91 [-3.39, -0.44]</b> | <b>-0.56 [-1.37, 0.24]</b> | <b>0.102<sup>a</sup></b>      |
| AVLT-sum, words                       | 37.11 [32.07, 42.14]         | 40.74 [35.93, 45.55]               | 0.281 <sup>a</sup>       | 36.58 [32.34, 40.82]        | 43.84 [38.68, 49.00]       | 0.029 <sup>a*</sup>           |
| <b>AVLT-sum, z-score</b>              | <b>-1.00 [-1.42, -0.59]</b>  | <b>-0.58 [-1.10, -0.07]</b>        | <b>0.190<sup>a</sup></b> | <b>-1.12 [-1.60, -0.65]</b> | <b>-0.24 [-0.77, 0.30]</b> | <b>0.014<sup>a*</sup></b>     |
| AVLT-DR, words                        | 7.32 [5.65, 8.99]            | 7.84 [6.36, 9.33]                  | 0.624 <sup>a</sup>       | 5.74 [4.19, 7.28]           | 9.53 [7.92, 11.14]         | 0.001 <sup>a**</sup>          |
| <b>AVLT-DR, z-score</b>               | <b>-0.78 [-1.33, -0.23]</b>  | <b>-0.54 (0.23) [-1.01, -0.06]</b> | <b>0.482<sup>a</sup></b> | <b>-1.41 [-1.97, -0.84]</b> | <b>0.06 [-0.54, 0.65]</b>  | <b>&lt;.001<sup>a**</sup></b> |
| VFT-sum, words                        | 32.89 [27.83, 37.96]         | 32.79 [26.74, 38.84]               | 0.978 <sup>a</sup>       | 32.89 [26.63, 39.16]        | 32.42 [27.10, 37.74]       | 0.904 <sup>a</sup>            |
| <b>VFT-sum, z-score</b>               | <b>1.62 [0.97, 2.26]</b>     | <b>1.26 [0.68, 1.85]</b>           | <b>0.389<sup>a</sup></b> | <b>1.62 [0.81, 2.43]</b>    | <b>1.24 [0.63, 1.85]</b>   | <b>0.427<sup>a</sup></b>      |
| VFT-error, words                      | 2.42 [1.59, 2.42]            | 1.52 [0.34, 2.71]                  | 0.202 <sup>a</sup>       | 3.16 [1.87, 4.45]           | 1.47 [0.75, 2.20]          | 0.024 <sup>a*</sup>           |
| <b>VFT-error, z-score<sup>†</sup></b> | <b>-1.32 [-1.98, -0.65]</b>  | <b>-0.53 [-1.59, 0.53]</b>         | <b>0.198<sup>a</sup></b> | <b>-1.95 [-3.04, -0.87]</b> | <b>-0.49 [-1.15, 0.17]</b> | <b>0.022<sup>a*</sup></b>     |
| <b>Patient-reported outcomes</b>      | median (IQR)                 |                                    |                          |                             |                            |                               |
| <b>FACT-Cog</b>                       |                              |                                    |                          |                             |                            |                               |
| <b>Cog PCI, score</b>                 | 66 (59, 70)                  | 65 (61, 68)                        | 0.568 <sup>b</sup>       | 68 (63-70)                  | 65 (59-70)                 | 0.223 <sup>b</sup>            |
| <b>Cog PCA, score</b>                 | 24 (22, 26)                  | 23 (22, 25]                        | 0.385 <sup>b</sup>       | 24 (16-27)                  | 23 (21-23)                 | 0.411 <sup>b</sup>            |

**AVLT-DR**, (Rey) Auditory Verbal Learning Test - delayed recall (Trial 7); **AVLT-sum**, (Rey) Auditory Verbal Learning Test - sum (Trial 1-5); **C+ group**, Cancer survivor group with chemotherapy; **CI**, confidence interval; **Cog-PCA**, cognitive function – perceived cognitive ability; **Cog-PCI**, cognitive function – perceived cognitive impairment; **FACT-Cog**, Functional Assessment of Cancer Therapy - Cognitive Function; **HC group**, healthy control group; **IQR**, Interquartile range; **TMT-A**, Trail Making Test- part A; **TMT-B**, Trail Making Test - part B; **VFT-sum**, Verbal (Phenomic) Fluency Test - total cumulative number for three mora, **VFT-error**, Verbal (Phenomic) Fluency Test - number of repeated errors for the three mora

<sup>†</sup> The reversed values of the normalized score (Z-score) was used so that the positive direction of cognitive performance is better. a, two sample t-test; b, Wilcoxon rank sum test , \*p<0.05 \*\*p<0.01

**Supplementary Table 2.** Comparison of change in difference (  $\Delta$  ) for cognitive functional assessment between group

|                                                         | <b>C+ group (n=19)</b>       | <b>HC group (n=19)</b>    | <b>p-value</b>            |
|---------------------------------------------------------|------------------------------|---------------------------|---------------------------|
| <b>Neuropsychological tests</b>                         | median (IQR) or mean [95%CI] |                           |                           |
| $\Delta$ TMT-A , sec                                    | -3 [-22, 15]                 | 0 [-16, 5]                | 0.849 <sup>b</sup>        |
| <b><math>\Delta</math> TMT-A, score<sup>†</sup></b>     | 0.38 [-0.84, 1.61]           | 0.43 [-0.52, 1.38]        | <b>0.944<sup>a</sup></b>  |
| $\Delta$ TMT part B, sec                                | 12 [-12, 30]                 | 4 [-6, 10]                | 0.448 <sup>b</sup>        |
| <b><math>\Delta</math> TMT-B, score<sup>†</sup></b>     | -0.92 [-1.88, 0.04]          | -0.38 [-0.99, 0.23]       | <b>0.326<sup>a</sup></b>  |
| $\Delta$ AVLT-sum, words                                | -0.53 [-4.89, 3.83]          | 3.11 [-0.92, 7.13]        | 0.207 <sup>a</sup>        |
| <b><math>\Delta</math> AVLT-sum, score</b>              | -0.12 [-0.61, 0.37]          | 0.35 [-0.10, 0.79]        | <b>0.149<sup>a</sup></b>  |
| $\Delta$ AVLT-DR (Trial 7), words                       | -1.58 [-3.15, -0.01]         | 1.68 [0.44, 2.93]         | <b>0.002<sup>a*</sup></b> |
| <b><math>\Delta</math> AVLT-DR (Trial 7), score</b>     | -0.62 [-1.23, -0.02]         | 0.59 [0.13, 1.05]         | <b>0.002<sup>a*</sup></b> |
| $\Delta$ VFT-sum, words                                 | 0 [-2.83, 2.83]              | -0.37 [-3.30, 2.56]       | 0.850 <sup>a</sup>        |
| <b><math>\Delta</math> VFT-sum, score</b>               | 0.01 [-0.35, 0.37]           | -0.01 [-0.36, 0.33]       | <b>0.909<sup>a</sup></b>  |
| $\Delta$ VFT-error, words                               | 0.74 [-0.92, 2.39]           | -0.05 [-1.35, 1.25]       | 0.436 <sup>a</sup>        |
| <b><math>\Delta</math> VFT-error, score<sup>†</sup></b> | -0.64 [-1.98, 0.70]          | 0.04 (0.56) [-1.14, 1.22] | <b>0.431<sup>a</sup></b>  |
| <b>Patient-reported outcomes</b>                        | median [IQR]                 |                           |                           |
| <b><math>\Delta</math> FACT-Cog</b>                     |                              |                           |                           |
| <b><math>\Delta</math> Cog PCI, score</b>               | 0 [-3, 6]                    | 0 [-6, 2]                 | 0.356 <sup>b</sup>        |
| <b><math>\Delta</math> Cog PCA, score</b>               | -1 [-3, 3]                   | 0 [-2, 2]                 | 0.770 <sup>b</sup>        |

**AVLT-DR**, (Rey) Auditory Verbal Learning Test - delayed recall (Trial 7); **AVLT-sum**, (Rey) Auditory Verbal Learning Test - sum (Trial 1-5); **C+ group**, Cancer survivor group with chemotherapy; **CI**, confidence interval; **Cog-PCA**, cognitive function – perceived cognitive ability; **Cog-PCI**, cognitive function – perceived cognitive impairment; **FACT-Cog**, Functional Assessment of Cancer Therapy - Cognitive Function; **HC group**, healthy control group; **IQR**, Interquartile range; **SE**, standard error; **TMT-A**, Trail Making Test- part A; **TMT-B**, Trail Making Test - part B; **VFT-sum**, Verbal (Phenomic) Fluency Test - total cumulative number for three mora, **VFT-error**, Verbal (Phenomic) Fluency Test - number of repeated errors for the three mora

<sup>†</sup> The reversed values of the normalized score (Z-score) was used so that the positive direction of cognitive performance is better. a, two sample t-test; b, Wilcoxon rank sum test , \*p<0.05

**Supplementary Table 3.** Within-group comparison of cognitive assessment in the C+ group and HC group

|                                       | C+ group                     |                             |                           | HC group                           |                            |                           |
|---------------------------------------|------------------------------|-----------------------------|---------------------------|------------------------------------|----------------------------|---------------------------|
|                                       | Baseline                     | 6-month follow-up           | p-value                   | Baseline                           | 6-month follow-up          | p-value                   |
| <b>Neuropsychological tests</b>       | median (IQR) or mean [95%CI] |                             |                           |                                    |                            |                           |
| TMT-A , sec                           | 43 (33-74)                   | 42 (38-63)                  | 0.459 <sup>e</sup>        | 51 (34-59)                         | 42 (29-56)                 | 0.487 <sup>e</sup>        |
| <b>TMT-A, z-score<sup>†</sup></b>     | <b>-1.26 [-2.49, 0.03]</b>   | <b>-0.88 [-1.80, 0.04]</b>  | <b>0.523<sup>d</sup></b>  | <b>-0.61 [-1.43, 0.20]</b>         | <b>-0.18 [-0.97, 0.61]</b> | <b>0.353<sup>d</sup></b>  |
| TMT part B, sec                       | 78 (59-119)                  | 93 (62-135)                 | 0.085 <sup>e</sup>        | 75 (67-98)                         | 89 (59-117)                | 0.378 <sup>e</sup>        |
| <b>TMT-B, z-score<sup>†</sup></b>     | <b>-0.99 [-2.12, 0.14]</b>   | <b>-1.91 [-3.39, -0.44]</b> | <b>0.058<sup>d</sup></b>  | <b>-0.18 [-0.80, 0.43]</b>         | <b>-0.56 [-1.37, 0.24]</b> | <b>0.204<sup>d</sup></b>  |
| AVLT-sum, words                       | 37.11 [32.07, 42.14]         | 36.58 [32.34, 40.82]        | 0.803 <sup>d</sup>        | 40.74 [35.93, 45.55]               | 43.84 [38.68, 49.00]       | 0.122 <sup>d</sup>        |
| <b>AVLT-sum, z-score</b>              | <b>-1.00 [-1.42, -0.59]</b>  | <b>-1.12 [-1.60, -0.65]</b> | <b>0.611<sup>d</sup></b>  | <b>-0.58 [-1.10, -0.07]</b>        | <b>-0.24 [-0.77, 0.30]</b> | <b>0.123<sup>d*</sup></b> |
| AVLT-DR, words                        | 7.32 [5.65, 8.99]            | 5.74 [4.19, 7.28]           | 0.049 <sup>d*</sup>       | 7.84 [6.36, 9.33]                  | 9.53 [7.92, 11.14]         | 0.011 <sup>d*</sup>       |
| <b>AVLT-DR, z-score</b>               | <b>-0.78 [-1.33, -0.23]</b>  | <b>-1.41 [-1.97, -0.84]</b> | <b>0.044<sup>d*</sup></b> | <b>-0.54 (0.23) [-1.01, -0.06]</b> | <b>0.06 [-0.54, 0.65]</b>  | <b>0.014<sup>d*</sup></b> |
| VFT-sum, words                        | 32.89 [27.83, 37.96]         | 32.89 [26.63, 39.16]        | 1.000 <sup>d</sup>        | 32.79 [26.74, 38.84]               | 32.42 [27.10, 37.74]       | 0.794 <sup>d</sup>        |
| <b>VFT-sum, z-score</b>               | <b>1.62 [0.97, 2.26]</b>     | <b>1.62 [0.81, 2.43]</b>    | <b>0.981<sup>d</sup></b>  | <b>1.26 [0.68, 1.85]</b>           | <b>0.90 [0.31, 1.49]</b>   | <b>0.933<sup>d</sup></b>  |
| VFT-error, words                      | 2.42 [1.59, 2.42]            | 3.16 [1.87, 4.45]           | 0.361 <sup>d</sup>        | 1.52 [0.34, 2.71]                  | 1.47 [0.75, 2.20]          | 0.933 <sup>d*</sup>       |
| <b>VFT-error, z-score<sup>†</sup></b> | <b>-1.32 [-1.98, -0.65]</b>  | <b>-1.95 [-3.04, -0.87]</b> | <b>0.331<sup>d</sup></b>  | <b>-0.53 [-1.59, 0.53]</b>         | <b>-0.49 [-1.15, 0.17]</b> | <b>0.942<sup>d*</sup></b> |
| <b>Patient-reported outcomes</b>      | median (IQR)                 |                             |                           |                                    |                            |                           |
| <b>FACT-Cog</b>                       |                              |                             |                           |                                    |                            |                           |
| <b>Cog PCI, score</b>                 | 66 (59, 70)                  | 68 (63-70)                  | 0.605 <sup>e</sup>        | 65 (61, 68)                        | 65 (59-70)                 | 0.364 <sup>e</sup>        |
| <b>Cog PCA, score</b>                 | 24 (22, 26)                  | 24 (16-27)                  | 0.641 <sup>e</sup>        | 23 (22, 25]                        | 23 (21-23)                 | 0.921 <sup>e</sup>        |

**AVLT-DR**, (Rey) Auditory Verbal Learning Test - delayed recall (Trial 7); **AVLT-sum**, (Rey) Auditory Verbal Learning Test - sum (Trial 1-5); **C+ group**, Cancer survivor group with chemotherapy; **CI**, confidence interval; **Cog-PCA**, cognitive function – perceived cognitive ability; **Cog-PCI**, cognitive function – perceived cognitive impairment; **FACT-Cog**, Functional Assessment of Cancer Therapy - Cognitive Function; **HC group**, healthy control group; **IQR**, Interquartile range; **TMT-A**, Trail Making Test- part A; **TMT-B**, Trail Making Test - part B; **VFT-sum**, Verbal (Phenomic) Fluency Test - total cumulative number for three mora, **VFT-error**, Verbal (Phenomic) Fluency Test - number of repeated errors for the three mora

<sup>†</sup> The reversed values of the normalized score (Z-score) was used so that the positive direction of cognitive performance is better. d, paired t-test; e, Wilcoxon sign rank test , \*p<0.05 \*\*p<0.01

**Supplementally Table 4 : Comparison of mean changes in THb concentration between group**

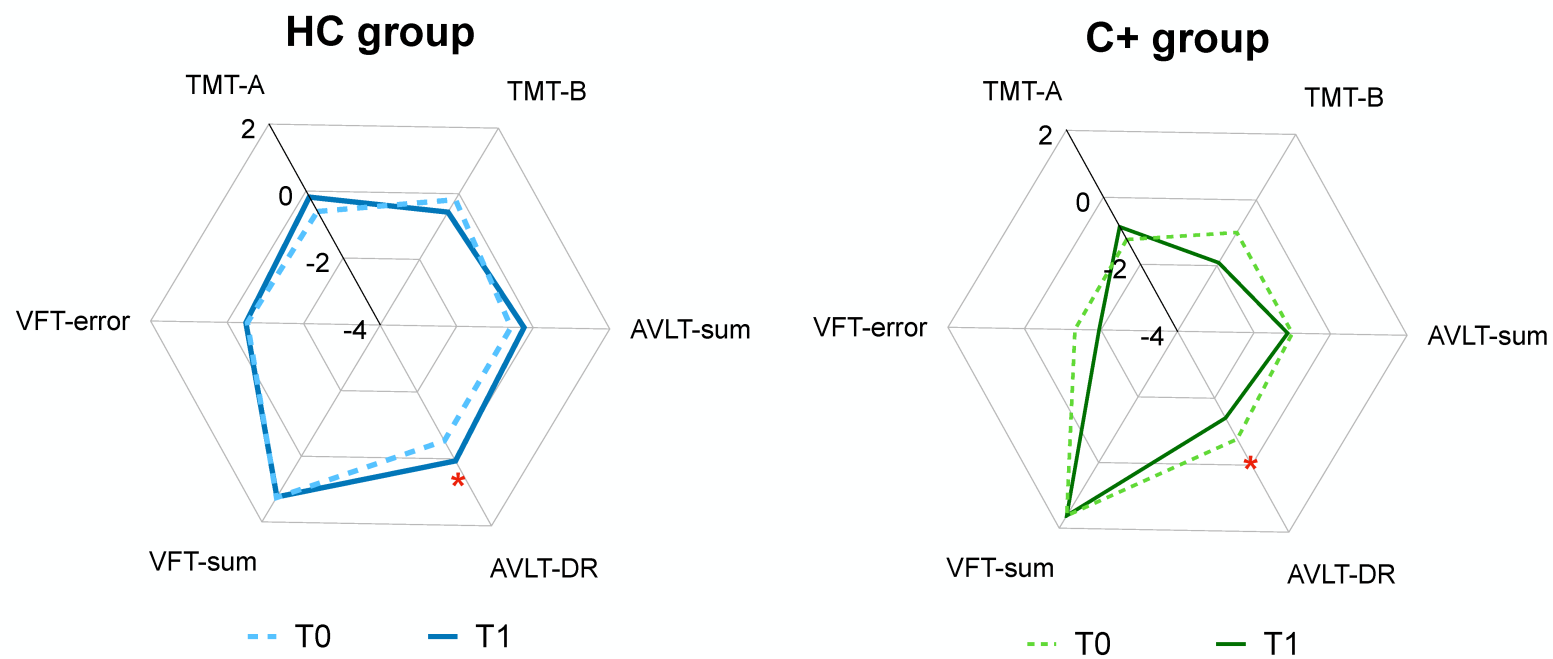
|           | Channel           | Cancer with chemotherapy group |                                |                                  | Healthy control group         |                               |                                  | t-value | p-value |
|-----------|-------------------|--------------------------------|--------------------------------|----------------------------------|-------------------------------|-------------------------------|----------------------------------|---------|---------|
|           |                   | On control task<br>(95% CI)    | On VFT task<br>(95% CI)        | Change<br>(95% CI)               | On control task<br>(95% CI)   | On VFT task<br>(95% CI)       | Change<br>(95% CI)               |         |         |
| <b>T0</b> | <b>Left LPFC</b>  | 1.009<br>(0.1839 to 1.8336)    | 1.1987<br>(0.5956 to 1.8017)   | 0.1899<br>(0.3782 to 0.9844)     | 0.8167<br>(-0.0947 to 1.7280) | 1.5513<br>(0.3616 to 2.7410)  | 0.7347<br>(-0.7215 to 2.1908)    | -0.69   | 0.4947  |
|           | <b>Left FP</b>    | -0.0561<br>(-1.2689 to 1.1567) | 0.7095<br>(-0.1607 to 1.5797)  | 0.7657<br>(-0.4619 to 1.9932)    | 0.6791<br>(-0.4433 to 1.8016) | 0.1812<br>(-0.6424 to 1.0048) | -0.4979<br>(-1.6291 to 0.6333)   | 1.59    | 0.1205  |
|           | <b>Right FP</b>   | -0.1777<br>(-0.8198 to 0.4644) | 0.70055<br>(-0.6084 to 2.0095) | 0.8783<br>(-0.2300 to 1.9865)    | 0.3667<br>(-0.3202 to 1.0536) | 0.6103<br>(-1.1078 to 2.3283) | 0.2435<br>(-1.5136 to 2.0059)    | 0.64    | 0.5250  |
|           | <b>Right LPFC</b> | 0.7326<br>(0.2098 to 1.2553)   | 1.3130<br>(0.1432 to 2.4827)   | 0.5804<br>(-0.5451 to 1.7059)    | 0.4647<br>(-0.1234 to 1.0528) | 2.8827<br>(0.3669 to 5.3985)  | 2.4180*<br>(-0.2497 to 5.0857)   | -1.33   | 0.1908  |
| <b>T1</b> | <b>Left LPFC</b>  | -0.4252<br>(-1.2596 to 0.4091) | 1.0187<br>(-0.7817 to 2.8190)  | 1.4439<br>(-0.2342 to 3.1220)    | 0.1734<br>(-0.6237 to 0.9705) | 2.4616<br>(0.6962 to 4.2271)  | 2.2882*<br>(0.2235 to 4.3529)    | -0.67   | 0.5092  |
|           | <b>Left FP</b>    | 0.8049<br>(-0.2774 to 1.8873)  | -0.1186<br>(-0.7883 to 0.5511) | -0.9235*<br>(-1.7287 to -0.1184) | 1.1348<br>(-0.0165 to 2.2862) | 0.1492<br>(-0.4381 to 0.7364) | -0.9857*<br>(-0.1831 to -0.1404) | 0.11    | 0.9118  |
|           | <b>Right FP</b>   | -0.207<br>(-0.9780 to 0.5641)  | -0.0235<br>(-1.2121 to 1.1651) | 0.1835<br>(-0.6412 to 1.0082)    | 0.0984<br>(-0.4957 to 0.6924) | 0.8431<br>(-0.2202 to 1.9065) | 0.7448<br>(-0.1366 to 1.6262)    | -0.97   | 0.3371  |
|           | <b>Right LPFC</b> | -0.4671<br>(-1.3109 to 0.3767) | 1.0586<br>(-0.6102 to 2.7274)  | 1.5257<br>(-0.1052 to 3.1566)    | 0.2076<br>(-0.5011 to 0.9163) | 1.7924<br>(-1.2426 to 4.8274) | 1.5848<br>(-1.52325 to 4.6928)   | -0.04   | 0.9720  |

Values are mean (95% confidence interval), T0: pre-chemotherapy or baseline assessments, T1: six-months follow-up assessments, FP: Frontal pole, LPFC: Lateral prefrontal cortex, VFT: verbal fluency test

**Supplemental Table 5: Comparison of mean changes in THb concentration within groups**

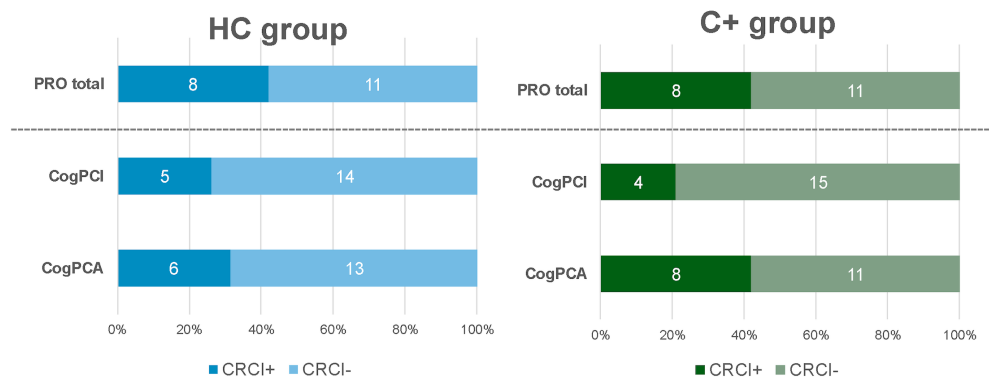
|    | Ch         | T0: pre-chemotherapy                |                                |                                | T1: 6-month follow-up          |                                |                                     | Difference in change<br>(95% CI) | P-value |
|----|------------|-------------------------------------|--------------------------------|--------------------------------|--------------------------------|--------------------------------|-------------------------------------|----------------------------------|---------|
|    |            | Baseline (control task)<br>(95% CI) | On task<br>(95% CI)            | Change<br>(95% CI)             | Baseline<br>(95% CI)           | On task<br>(95% CI)            | Change<br>(95% CI)                  |                                  |         |
| C+ | Left LPFC  | 1.009<br>(0.1839 to 1.8336)         | 1.1987<br>(0.5956 to 1.8017)   | 0.1899<br>(0.3782 to 0.9844)   | -0.4252<br>(-1.2596 to 0.4091) | 1.0187<br>(-0.7817 to 2.8190)  | 1.4439<br>(-0.2342 to 3.1220)       | 1.2540<br>(-0.7115 to 3.2196)    | 0.2063  |
|    | Left FP    | -0.0561<br>(-1.2689 to 1.1567)      | 0.7095<br>(-0.1607 to 1.5797)  | 0.7657<br>(-0.4619 to 1.9932)  | 0.8049<br>(-0.2774 to 1.8873)  | -0.1186<br>(-0.7883 to 0.5511) | -0.9235*<br>(-1.7287 to -0.1184)    | -1.6892<br>(-3.0813 to -0.2971)  | 0.0184* |
|    | Right FP   | -0.1777<br>(-0.8198 to 0.4644)      | 0.70055<br>(-0.6084 to 2.0095) | 0.8783<br>(-0.2300 to 1.9865)  | -0.207<br>(-0.9780 to 0.5641)  | -0.0235<br>(-1.2121 to 1.1651) | 0.1835<br>(-0.6412 to 1.0082)       | -0.6948<br>(-2.2113 to -0.8217)  | 0.3619  |
|    | Right LPFC | 0.7326<br>(0.2098 to 1.2553)        | 1.3130<br>(0.1432 to 2.4827)   | 0.5804<br>(-0.5451 to 1.7059)  | -0.4671<br>(-1.3109 to 0.3767) | 1.0586<br>(-0.6102 to 2.7274)  | 1.5257<br>(-0.1052 to 3.1566)       | 0.9453<br>(-1.0643 to 2.9549)    | 0.3498  |
|    |            | T0: baseline                        |                                |                                | T0: 6-month follow-up          |                                |                                     |                                  |         |
| HC | Left LPFC  | 0.8167<br>(-0.0947 to 1.7280)       | 1.5513<br>(0.3616 to 2.7410)   | 0.7347<br>(-0.7215 to 2.1908)  | 0.1734<br>(-0.6237 to 0.9705)  | 2.4616<br>(0.6962 to 4.2271)   | 2.2882*<br>(0.2235 to 4.3529)       | 1.5535<br>(-0.5674 to 3.6745)    | 0.1478  |
|    | Left FP    | 0.6791<br>(-0.4433 to 1.8016)       | 0.1812<br>(-0.6424 to 1.0048)  | -0.4979<br>(-1.6291 to 0.6333) | 1.1348<br>(-0.0165 to 2.2862)  | 0.1492<br>(-0.4381 to 0.7364)  | -0.9857*<br>(-0.1831 to -0.1404)    | -0.4878<br>(-1.8637 to 0.8882)   | 0.4803  |
|    | Right FP   | 0.3667<br>(-0.3202 to 1.0536)       | 0.6103<br>(-1.1078 to 2.3283)  | 0.2435<br>(-1.5136 to 2.0059)  | 0.0984<br>(-0.4957 to 0.6924)  | 0.8431<br>(-0.2202 to 1.9065)  | 0.7448<br>0.9844(-0.1366 to 1.6262) | 0.5013<br>(-1.3138 to 2.3163)    | 0.5821  |
|    | Right LPFC | 0.4647<br>(-0.1234 to 1.0528)       | 2.8827<br>(0.3669 to 5.3985)   | 2.4180*<br>(-0.2497 to 5.0857) | 0.2076<br>(-0.5011 to 0.9163)  | 1.7924<br>(-1.2426 to 4.8274)  | 1.5848<br>(-1.52325 to 4.6928)      | -0.8332<br>(-4.4224 to 2.7560)   | 0.6435  |

Values are mean (95% confidence interval), T0: pre-chemotherapy or baseline assessments, T1: six-months follow-up assessments, FP: Frontal pole, LPFC: Lateral prefrontal cortex, VFT: verbal fluency test

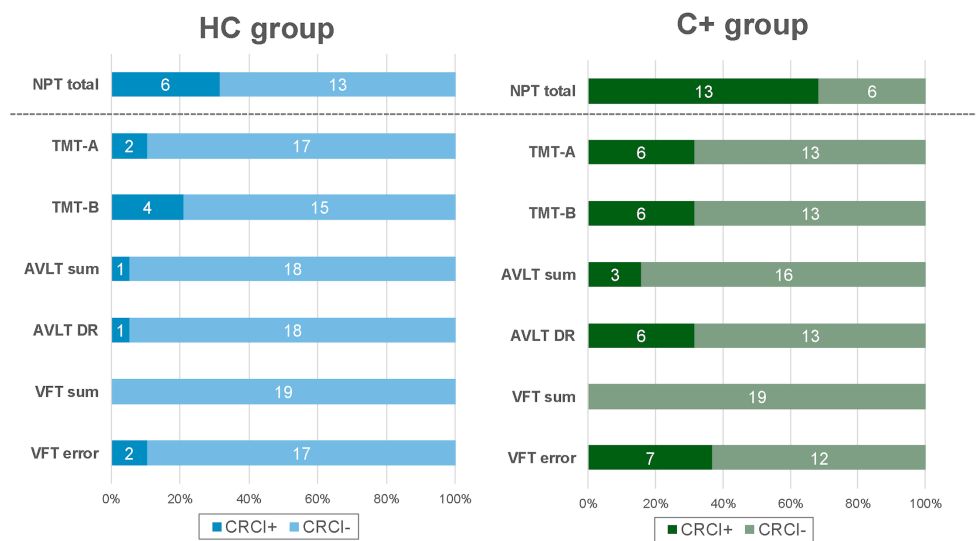


**Supplementary Figure 1. Comparisons of neuropsychological tests in within-group**

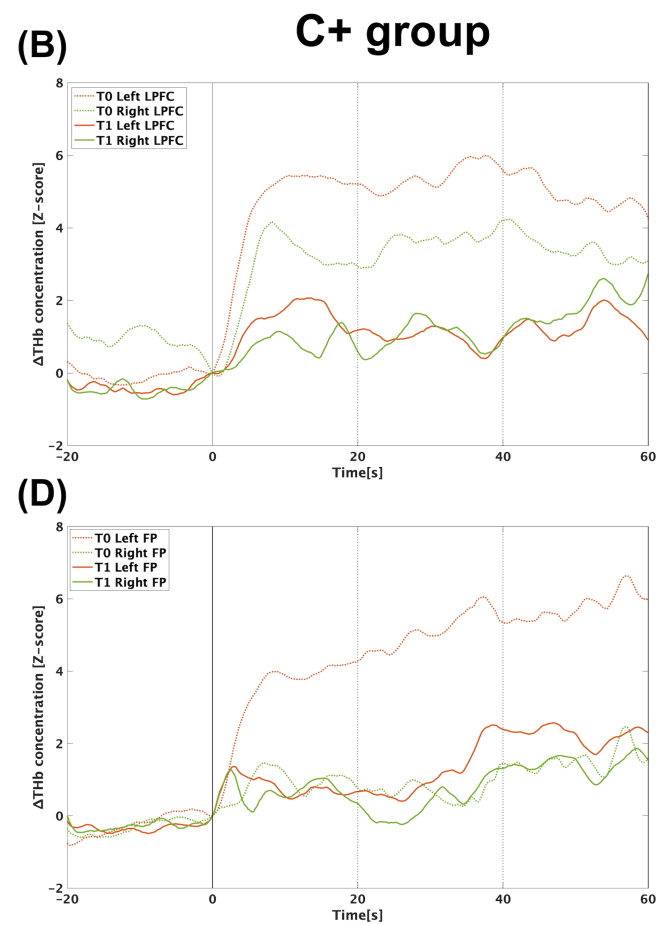
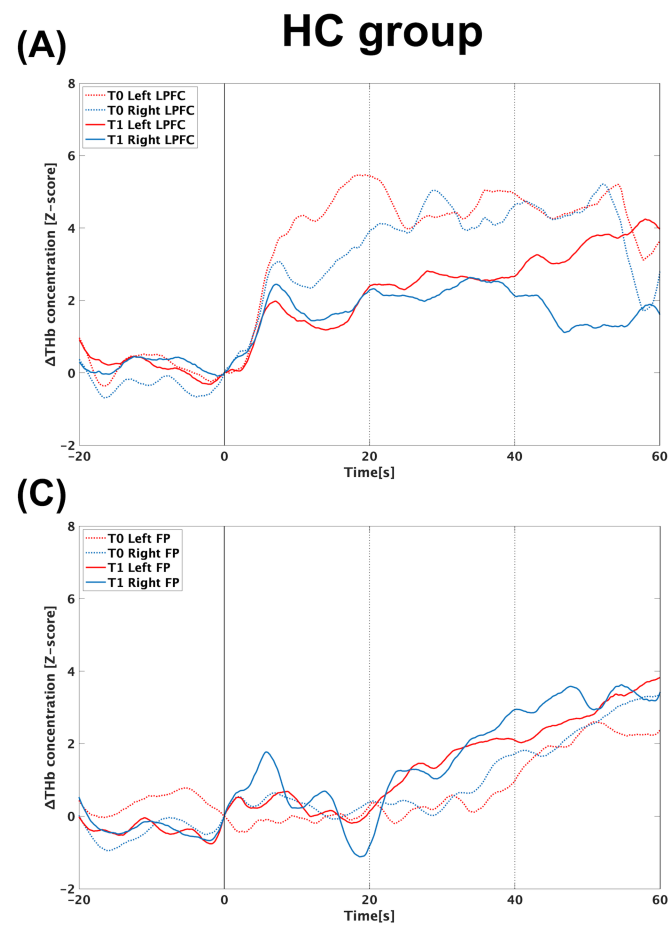
The normalized Z-scores for all assessment tools were positive for higher cognitive performance (\* $p < 0.05$ ).



**Supplementary Figure 2. CRCI incidence in C+ group and HC group using FACT-Cog subscales**



**Supplementary Figure 3. CRCI incidence in C+ group and HC group using NPT subscales**



**Supplementary Figure 4. The waveforms of total Hb concentration changes in both lateral prefrontal cortex (LPFC) and frontal pole (FP) regions during cognitive tasks in baseline (T0) and follow-up (T1) assessments. A) Right LPFC, B) Left LPFC, C) Right FP, D) Left FP.**