**SUPPLEMENTAL FIGURE 1.** Translational and rotational parameters when the reference non-AC emission frame is co-registered to other frames in the dynamic image. This is shown for a control subject with negligible head movement (upper panel A-B) and for an AD patient with large head movement (lower panel C-D). A positive translation parameter here indicates that the *voxel at the center of the reference frame* (located at 64, 64, 32) has been shifted along the x, y, or z-axis by so many millimeters in the *positive* direction (shown by the direction of the left-handed coordinate system arrows at the top of the figure) as the reference frame is co-registered to another frame within the dynamic image. Similarly, a positive rotation parameter indicates that the *voxel at the center of the reference frame* has been rotated around the axis of interest by so many degrees in a *clockwise* direction as the reference frame is co-registered to another frame within the dynamic image. A negative rotation parameter indicates a *counterclockwise* rotation.
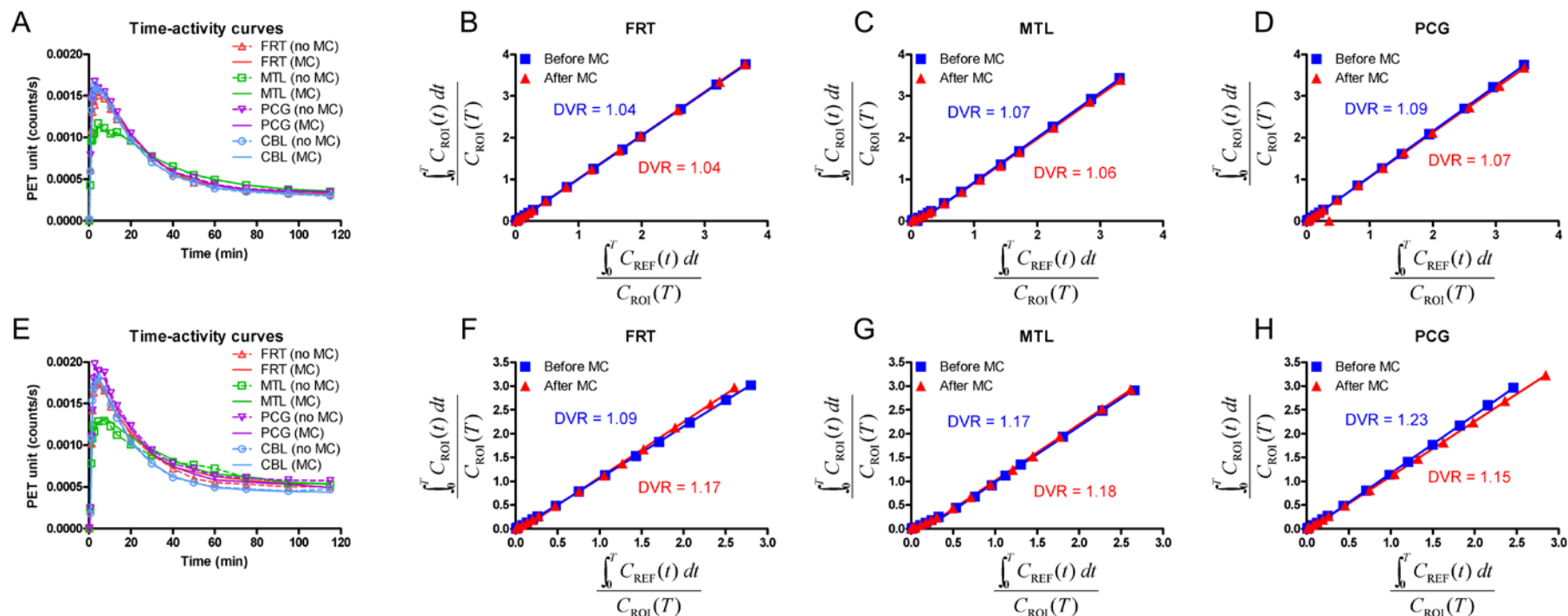
SUPPLEMENTAL FIGURE 2. Regional time-activity curves (TACs) and Logan plots for a control subject with negligible head movement (upper panel A-D) and for an AD patient with large head movement (lower panel E-H). The slope of the linear portion of the Logan plot is the distribution volume ratio (DVR), which is equal to the distribution volume of the tracer in the region of interest divided by the distribution volume of the tracer in the reference region. The control subject showed no noticeable changes in regional TACs and DVR values before and after movement correction. However, note the changes in the TACs and DVR values for the AD patient before and after movement correction. The x and y-axes of the Logan plot are given in units of time [minutes]. By dimensional analysis, the DVR is thus a unitless physiological parameter.
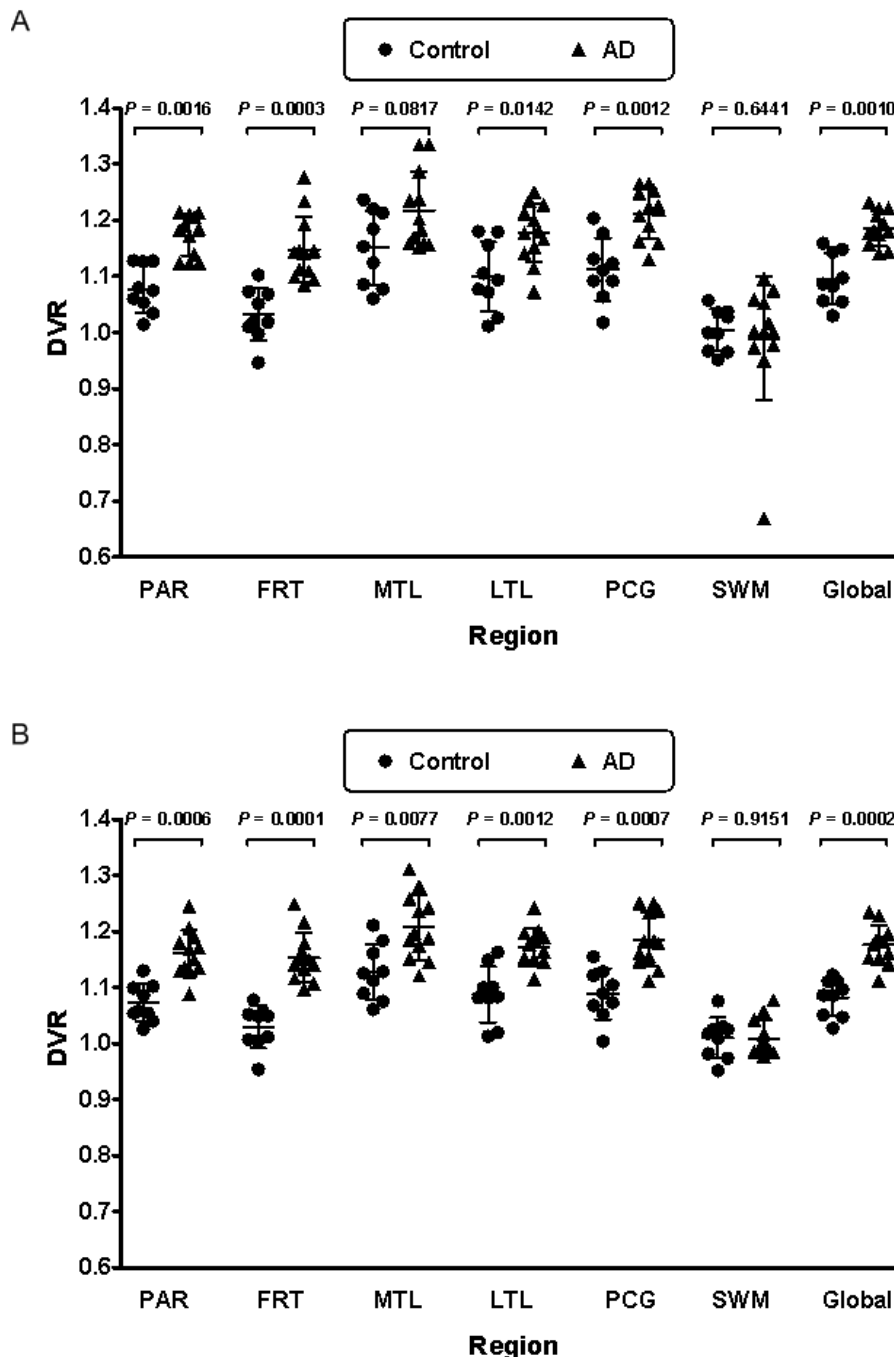
SUPPLEMENTAL FIGURE 3. Group comparisons in regional [^{18}F]-FDDNP distribution volume ratios before (A) and after (B) movement correction. Regions included are parietal, frontal, medial temporal (MTL), lateral temporal (LTL), posterior cingulate (PCG), subcortical white matter (SWM) and global. *P*-values from the two-tailed Mann-Whitney test are shown. Note that MTL and SWM before movement correction were not shown to be statistically significant between control subjects and AD patients. Note also that parietal, frontal, MTL, LTL, PCG, and global regions had their *P*-values reduced after movement correction. This was especially apparent in the MTL region (a decrease of over 90% in *P*-value). All regions after movement correction were shown to be significant between control subjects and AD patients ($P < 0.05$), except for SWM.
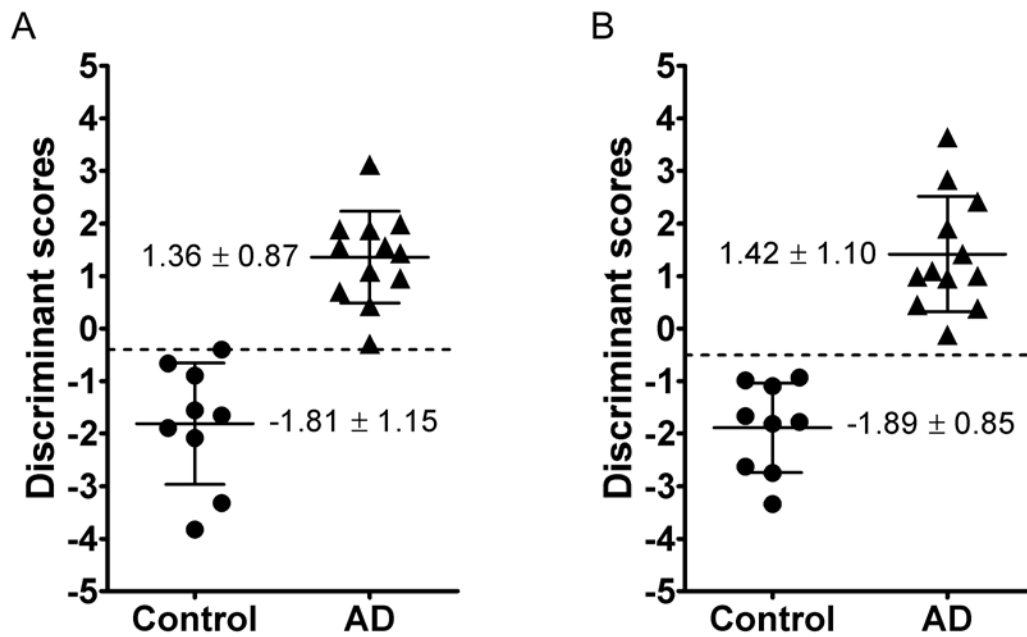
SUPPLEMENTAL FIGURE 4. Sample scatter plots of discriminant scores for the control and AD groups using frontal, parietal, posterior cingulate, medial temporal and lateral temporal collectively as predictor regions in the discriminant function before (A) and after (B) movement correction. Note the complete separation between the two groups after movement correction.