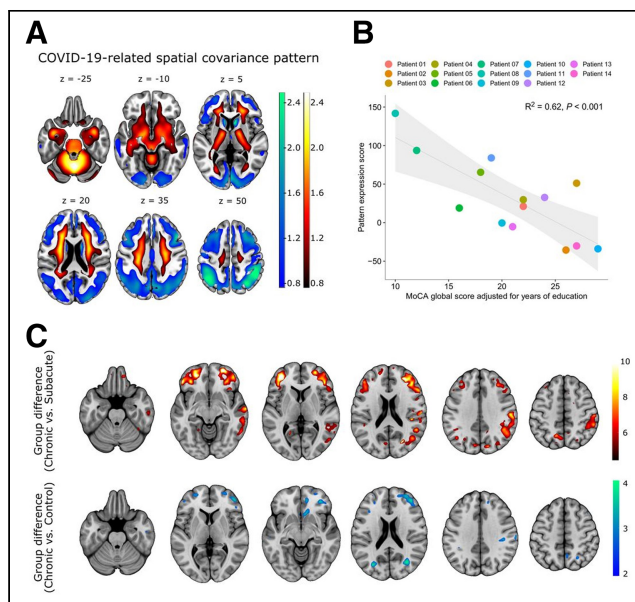


2021 SNMMI Image of the Year

On June 15, as part of the SNMMI Annual Meeting, a multipart figure showing the persistence of patterns of neocortical dysfunction and cognitive impairment in patients after COVID-19 was named as the 2021 SNMMI Image of the Year. The study, “Altered regional cerebral function and its association with cognitive impairment in COVID-19: A prospective FDG PET study” was presented by Blazhenets et al. from the University of Freiburg (Germany) and reflected the central role molecular imaging is likely to play in assessing the long-term impacts of the pandemic.

The authors prospectively examined the impact of COVID-19 on the central nervous system in hospitalized patients at the subacute (no longer infectious) and chronic (6 months later) stages using ^{18}F -FDG PET and neurologic assessments. The 2021 Image of the Year shows imaging patterns of recovery and dysfunction from a group of patients with at least 1 new neurologic symptom at the subacute stage, as well as neurologic and neuropsychological results and images from conventional group analysis using statistical parametric mapping (SPM). ^{18}F -FDG PET indicated pathologic results (mainly frontoparietal hypometabolism) in 10 of 15 individuals at the subacute stage. A highly significant COVID-19-related spatial covariance pattern was characterized by positive weights in brain stem, cerebellum, white matter, and mesiotemporal structures and by negative weights in wide-spread neocortical areas (with frontoparietal predominance). Individual imaging patterns corresponded significantly to the neurologic/neuropsychological assessments. Conventional SPM analysis also showed widespread frontoparietal-dominant neocortical hypometabolism. At 6-month follow-up, both imaging findings and neurocognitive assessments showed improvement, but deficits remained in comparison with a control group, including remaining neocortical hypometabolism. Neocortical dysfunction accompanied by cognitive impairment was detected in two-thirds of inpatients with subacute COVID-19. The authors concluded that, although a significant recovery of regional neuronal function and cognition was evident, “residuals are still



A. COVID-19-related spatial covariance pattern of cerebral glucose metabolism overlaid onto an MRI template. Voxels with negative region weights are color-coded in cool colors, and regions with positive region weights in warm colors. **B.** Association between expression of COVID-19-related covariance pattern and the Montreal Cognitive Assessment score adjusted for years of education. Each dot represents an individual patient's data (shaded gray area = 95% CI). **C.** Results of a statistical parametric mapping (SPM) analysis. Upper row compared to the subacute stage (paired t test, $P < 0.01$, false discovery rate-corrected). Bottom row depicts regions that still show significant decreases of normalized ^{18}F -FDG uptake in COVID-19 patients at the chronic stage compared to the age-matched control cohort at an exploratory statistical threshold (2-sample t test, $P < 0.005$). Images are presented in neurologic orientation (i.e., left image side corresponds to patients' left body side; numbers denote axial [Z] position in mm).

measurable in some patients 6 months after manifestation of COVID-19.” They recommended that post-COVID-19 patients with persistent cognitive complaints be referred to a neurologist and possibly to cognitive rehabilitation programs.