**Introduction**

- Temporal lobe epilepsy (TLE) patients display neurocognitive deficits unrelated to temporal functions & broadly abnormal functional connectivity (FC) abnormalities. 1,2
- TLE patients exhibit perturbed properties within intrinsic connectivity networks (ICNs). 3
- Others have shown that FC within ICNs may generally be related to neurocognition, but none examined if abnormal FC between subcortical arousal structures & ICNs may relate to neurocognition in TLE. 4
- We hypothesize that FC between subcortical arousal structures exhibit FC perturbations in TLE. 1,2
- It is also known that pedunculopontine nucleus (PPN) & nucleus basalis of Meynert (NBm) anatomically connect to key nodes in ICNs. 6
- We hypothesize that FC between subcortical arousal structures & ICNs may relate to neurocognitive problems in TLE.

**Methods**

- We evaluated 50 unilateral TLE patients & 50 matched healthy controls with resting-state functional MRI (fMRI). 7
- We calculated non-directed FC (Fisher-z Pearson correlation) and directed FC (Granger causality laterality index) between subcortical arousal structures & ICNs.
- We examined connectivity differences between TLE patients & healthy controls.
- We related FC to neurocognitive measures.
- We used a novel fMRI-based alertness index to compare alertness in patients vs. controls & examine how this influenced FC. 7

**Results**

- Patients with TLE have decreased non-directed FC between arousal structures & the salience network (SN).
- Patients with TLE exhibit altered directed & non-directed connectivity between subcortical arousal structures & resting-state networks.
- Abnormal connectivity between subcortical structures & ICNs may be related to neurocognitive deficits in TLE. 8
- Despite short-term changes in alertness index in TLE patients long-term FC abnormalities of arousal structures may not change with alertness.

**Discussion**

- Are connectivity abnormalities between subcortical arousal structures & ICNs related to neurocognitive deficits in TLE? 9

**Conclusions**

- Patients with TLE exhibit altered directed & non-directed functional connectivity between subcortical arousal structures & resting-state networks.
- Abnormal connectivity between subcortical structures & ICNs may be related to neurocognitive deficits in TLE.
- Despite short-term changes in alertness index in TLE patients long-term FC abnormalities of arousal structures may not change with alertness.

**References**

2 González et al. JNNP. 2019; 90:1109-1116.  