

Supplemental Table 1: Summary of the concordance of the localization investigations with the final comprehensive epilepsy program (CEP) localization in 176 patients who underwent pre-surgical evaluation for medically refractory focal epilepsy.

Concordance with CEP localization	FDG-PET (n=176)	MRI (n=176)	Video-EEG monitoring (n=172)	Intracranial EEG (n=16)	Ictal-Interictal SPECT (n=15)
Concordant localization	109 (61.9%)	59 (33.5%)	100 (58.1%)	15 (93.8%)	8 (53.3%)
Non-concordant localization	4 (2.3%)	2 (1.1%)	3 (1.7%)	-	1 (6.7%)
Test localizing, CEP unlocalizing	18 (2.2%)	2 (1.1%)	4 (2.3%)	-	-
Test unlocalizing, CEP localizing	43 (24.4%)	71 (40.3%)	29 (16.9%)	-	4 (26.7%)
Neither localizing	2 (1.1%)	42 (23.9%)	36 (20.9%)	1 (6.3%)	2 (13.3%)

Supplemental Table 2: The health impact of having a localizing MRI and/or VEM with regard to post-surgical outcome.

	Class I/II outcomes	Class III/IV outcomes	Not operated	Total
Both localizing and concordant	21 (53.8%)	6 (15.4%)	12 (30.8%)	39
One localizing or non-concordant*	25 (27.8%)	9 (10%)	56 (62.2%)	90
Neither localizing or concordant	0 (0%)	2 (4.7%)	41 (95.3%)	43
Total	46 (26.7%)	17 (9.9%)	109 (63.4%)	172

Key: \*non-concordant localization with the comprehensive epilepsy program (CEP) localization

Supplemental Table 3: The diagnostic performance of PET and health impact with regard to surgical outcome when either VEM or MRI were non-localizing or gave non-concordant localization\*.

	Class I/II outcomes	Class III/IV outcomes	Not operated	Total
PET localizing	24 (32.9%)	6 (8.2%)	43 (58.9%)	73
PET non-localizing	1 (5.9%)	3 (17.6%)	13 (76.5%)	17
Total	25 (27.8%)	9 (10%)	56 (62.2%)	90

Key: \*non-concordant localization with the comprehensive epilepsy program (CEP) localization

## **LEGENDS FOR FIGURES**

### **Supplemental Figure 1:**

Coronal, axial and sagittal FDG-PET images from a patient with **A.** temporal lobe epilepsy and **B.** extratemporal lobe epilepsy (occipital) showing the images views and colour table used for routine reporting of the PET studies. Both patients had normal MRI, but focal hypometabolism detected on the FDG-PET, which was critical in the patients being able to proceed to having epilepsy surgery.

### **Supplemental Figure 2:**

Decision tree analysis as represented by Extend Software using blocks from the Crump Institute. A baseline strategy of medical treatment for all patients was compared to three imaging strategies a) patients are investigated with VEM and MRI only, b) ictal SPECT for patients with an indeterminate VEM/MRI result, and c) inter-ictal PET for patients with an indeterminate VEM/MRI result.