

Supplementary Table 1 Correlation of Functional Connectivity measures: Invasive vs. Noninvasive data

		Data with IEDs (data without IEDs)									
		Betweenness		Closeness		Degree		Eigenvector			
		rho	P-value	rho	P-value	rho	P-value	rho	P-value		
RESECTED AREAS	iEEG vs. ESI	AEC	D					(0.5)	(0.002)		
			A					(0.4)	(0.010)		
			BB	0.5 (0.5)	0.001 (0.001)			0.5 (0.6)	0.001 (***)	0.4 (0.5)	0.007 (0.003)
		PLV	D								
			A								
			BB	(0.5)	(0.002)	(0.4)	(0.008)	(0.5)	(***)	0.6	***
	iEEG vs. MSI	AEC	D	(0.5)	(0.002)			(0.4)	(0.008)	0.5 (0.5)	0.002 (0.002)
			A					(0.6)	(***)	(0.5)	(0.003)
			BB			(0.4)	(0.008)	(0.5)	(***)	0.5	***
		PLV	D							0.6 (0.4)	*** (0.007)
			A							0.5	0.002
			BB	0.4	0.004					0.4	0.006
NON-RESECTED AREAS	iEEG vs. ESI	AEC	D								
			A								
			BB	0.4	0.008			(0.6)	(***)	(0.6)	(***)
		PLV	D								
			A			(0.4)	(0.006)				
			BB			(0.5)	(0.006)				
	iEEG vs. MSI	AEC	D	(0.4)	(0.011)			(0.4)	(0.006)	(0.6)	(***)
			A	(0.4)	(0.010)			(0.6)	(***)	(0.6)	(***)
			BB	0.4	0.003			(0.4)	(0.009)	(0.5)	(***)
		PLV	D			(0.4)	(0.009)				
			A							(0.5)	(0.003)
			BB							(0.4)	(0.008)
		Resected Areas (% Patients)		Non-Resected Areas (% Patients)							
Correlation Coefficient	Interpretation	iEEG vs. ESI	iEEG vs. MSI	iEEG vs. ESI	iEEG vs. MSI						
0.40 ≤ rho ≤ 0.69	Moderate	92	89	86	89						
0.70 ≤ rho ≤ 0.89	Strong	16	13	19	22						
0.90 ≤ rho ≤ 1.00	Very strong	3	0	0	0						

A = alpha band; B = beta band; BB = broadband; D = delta band; G = gamma band; rho = Spearman's rho correlation coefficient (greater and equal to 0.4); T = theta band; empty cells represent the non-statistical significance of the measure of interest for that specific surgical outcome. ***P < 0.001.

Supplementary Table 2 Prognostic value of Invasive Functional Connectivity: Leave-One-Out Cross-Validation

iEEG	Thr. (%)	Fisher's Exact test	Performance	PPV	NPV	Accuracy
AEC gamma ^a	100	0.002	33 (31-37%)	73 (71-76%)	61 (59-62%)	61 (60-62%)
PLV broadband ^d	100	0.028	24 (22-28%)	64 (62-67%)	60 (59-62%)	60 (59-62%)
PLV delta ^a	100	0.028	24 (22-28%)	64 (62-67%)	60 (59-62%)	60 (59-62%)
AEC theta ^b	100	0.016	29 (27-34%)	68 (67-72%)	60 (59-62%)	60 (59-62%)
AEC gamma ^b	100	0.016	29 (27-34%)	68 (67-72%)	60 (59-62%)	60 (59-62%)
AEC betweenness theta ^a	75	***	31 (28-34%)	70 (67-74%)	61 (60-62%)	61 (60-63%)
AEC degree theta ^a	65	***	26 (20-28%)	64 (59-67%)	61 (60-63%)	61 (60-63%)
AEC eigenvector theta ^a AEC	90	0.001	31 (27-34%)	70 (67-73%)	61 (59-62%)	61 (60-62%)
betweenness alpha ^a AEC	100	0.028	24 (22-28%)	64 (62-67%)	60 (59-62%)	60 (59-62%)
degree alpha ^a	85	0.004	25 (22-31%)	65 (61-71%)	61 (59-62%)	61 (60-62%)
AEC betweenness beta ^a AEC	85	0.029	18 (14-23%)	58 (54-63%)	60 (59-62%)	60 (59-62%)
degree beta ^a	90	0.017	23 (19-27%)	63 (58-65%)	60 (59-62%)	60 (59-62%)
AEC eigenvector beta ^a	85	0.042	19 (16-23%)	58 (54-59%)	60 (59-62%)	60 (59-62%)
AEC betweenness gamma ^a	45	***	25 (22-30%)	63 (61-69%)	62 (61-63%)	62 (61-63%)
AEC degree gamma ^a	85	***	32 (30-36%)	71 (68-75%)	61 (60-62%)	61 (60-62%)
AEC eigenvector gamma ^a	80	0.016	22 (19-26%)	61 (59-65%)	60 (59-62%)	60 (59-62%)
PLV betweenness broadband ^d	90	0.015	18 (15-21%)	57 (54-60%)	61 (59-62%)	60 (59-62%)
PLV degree broadband ^a PLV	75	***	17 (15-19%)	55 (52-58%)	61 (60-63%)	61 (60-62%)
betweenness delta ^a PLV	90	0.005	24 (22-28%)	64 (62-67%)	61 (59-62%)	61 (60-62%)
degree delta ^a	75	***	16 (12-20%)	55 (50-59%)	61 (60-62%)	61 (60-62%)
PLV betweenness theta ^a PLV	100	0.002	33 (31-38%)	73 (71-76%)	61 (59-62%)	61 (60-62%)
betweenness alpha ^a PLV	85	***	31 (28-36%)	70 (66-75%)	61 (60-62%)	61 (60-63%)
betweenness beta ^a	100	0.002	33 (31-37%)	73 (71-76%)	61 (59-62%)	61 (60-62%)
PLV eigenvector beta ^a	60	0.002	23 (19-27%)	62 (59-66%)	61 (60-62%)	61 (60-62%)
PLV betweenness gamma ^a	80	0.002	21 (17-28%)	60 (59-67%)	61 (60-63%)	61 (60-62%)
PLV degree gamma ^a	90	0.003	26 (23-30%)	66 (63-70%)	61 (59-62%)	61 (59-62%)
PLV eigenvector gamma ^a	95	0.003	31 (29-35%)	71 (68-74%)	61 (59-62%)	61 (59-62%)
AEC degree broadband ^b	80	0.038	16 (13-19%)	55 (52-59%)	61 (59-62%)	60 (59-62%)
AEC eigenvector broadband ^b	80	0.038	20 (17-25%)	60 (56-65%)	60 (59-62%)	60 (59-62%)
AEC betweenness theta ^b	90	***	38 (35-43%)	77 (75-83%)	61 (59-62%)	61 (60-62%)
AEC closeness theta ^b	100	0.004	34 (32-39%)	74 (72-78%)	60 (59-62%)	61 (59-62%)
AEC degree theta ^b	85	0.002	28 (24-34%)	68 (64-72%)	61 (59-62%)	61 (60-62%)
AEC eigenvector theta ^b AEC	95	***	39 (38-45%)	79 (78-83%)	61 (59-62%)	61 (60-62%)
betweenness alpha ^b AEC	95	0.036	25 (21-30%)	65 (61-68%)	60 (59-62%)	60 (59-62%)
degree beta ^b	95	0.028	20 (11-24%)	59 (50-63%)	60 (59-62%)	60 (59-62%)
AEC eigenvector beta ^b	80	0.019	21 (18-25%)	61 (57-64%)	61 (59-62%)	60 (59-62%)
AEC betweenness gamma ^b	90	0.022	24 (20-28%)	64 (59-68%)	60 (59-62%)	60 (59-62%)
PLV betweenness	95	***	30 (16-34%)	69 (56-73%)	61 (59-62%)	61 (60-62%)
broadband ^b PLV closeness	100	0.044	22 (18-26%)	62 (58-65%)	60 (59-62%)	60 (59-62%)
broadband ^b PLV	90	0.022	21 (17-24%)	60 (56-64%)	61 (59-62%)	60 (59-62%)
betweenness delta ^b PLV	95	0.014	27 (24-32%)	67 (63-70%)	60 (59-62%)	60 (59-62%)
eigenvector theta ^b	95	0.022	24 (22-28%)	64 (62-67%)	60 (59-62%)	60 (59-62%)
PLV betweenness alpha ^b PLV	100	0.005	30 (26-34%)	70 (67-73%)	60 (59-62%)	61 (59-62%)
closeness alpha ^b	70	0.004	23 (19-26%)	62 (58-65%)	61 (59-62%)	61 (59-62%)
PLV eigenvector alpha ^b	80	***	25 (21-29%)	63 (58-69%)	61 (60-63%)	62 (60-62%)
PLV betweenness beta ^b	100	0.022	24 (21-30%)	64 (61-70%)	60 (59-62%)	60 (59-62%)
PLV closeness beta ^b	50	0.024	17 (14-25%)	55 (51-64%)	62 (60-63%)	61 (60-62%)
PLV betweenness gamma ^b						

^aComputed on data with interictal epileptiform discharges. ^bComputed on data without interictal epileptiform discharges. Thr. = threshold. *** P-value < 0.001.

Supplementary Table 3 Prognostic value of Noninvasive Functional Connectivity: Leave-One-Out Cross-Validation

ESI	Thr. (%)	Fisher's Exact test	Performance	PPV	NPV	Accuracy
AEC beta ^a	90	***	23 (19-29%)	62 (58-67%)	62 (60-63%)	62 (61-63%)
PLV broadband ^d	100	0.036	25 (22-30%)	65 (63-68%)	60 (59-62%)	60 (59-62%)
PLV delta ^a	100	0.036	25 (23-29%)	65 (63-68%)	60 (59-62%)	60 (59-62%)
PLV theta ^a	100	0.010	30 (28-35%)	70 (68-74%)	60 (59-62%)	61 (59-62%)
PLV alpha ^a	100	0.010	30 (28-35%)	70 (68-74%)	60 (59-62%)	61 (59-62%)
PLV beta ^a	100	0.036	25 (23-29%)	65 (63-68%)	60 (59-62%)	60 (59-62%)
AEC alpha ^b	100	0.014	27 (25-31%)	67 (65-70%)	60 (59-62%)	60 (59-62%)
PLV broadband ^b	100	0.014	27 (24-32%)	67 (65-70%)	60 (59-62%)	60 (59-62%)
PLV delta ^b	100	0.014	27 (24-32%)	67 (65-70%)	60 (59-62%)	60 (59-62%)
PLV theta ^b	100	0.044	22 (20-27%)	62 (60-65%)	60 (59-62%)	60 (59-62%)
PLV alpha ^b	100	0.014	27 (24-32%)	67 (65-70%)	60 (59-62%)	60 (59-62%)
PLV beta ^b	100	0.014	27 (24-32%)	67 (65-70%)	60 (59-62%)	60 (59-62%)
PLV gamma ^b	100	0.044	22 (19-27%)	62 (60-65%)	60 (59-62%)	60 (59-62%)
AEC betweenness broadband ^a	90	***	38 (35-43%)	78 (74-84%)	61 (59-62%)	61 (60-62%)
AEC closeness broadband ^a	100	0.002	35 (34-39%)	75 (74-79%)	60 (59-62%)	61 (60-62%)
AEC degree broadband ^a AEC	95	0.044	22 (20-26%)	62 (60-65%)	60 (59-62%)	60 (59-62%)
eigenvector broadband ^a AEC	90	0.028	24 (22-27%)	64 (60-67%)	60 (59-62%)	60 (59-62%)
betweenness beta ^a AEC	40	***	22 (19-25%)	60 (57-63%)	61 (60-63%)	61 (60-62%)
closeness beta ^a	80	***	20 (16-23%)	58 (54-61%)	62 (61-63%)	61 (61-63%)
AEC degree beta ^a	65	0.002	23 (19-27%)	62 (58-66%)	61 (60-62%)	61 (60-62%)
AEC betweenness gamma ^a	80	0.001	23 (21-29%)	62 (58-68%)	61 (60-62%)	61 (60-62%)
AEC closeness gamma ^a	90	0.002	19 (17-23%)	59 (56-61%)	61 (60-62%)	61 (60-62%)
PLV degree broadband ^a	80	***	17 (15-20%)	61 (53-60%)	61 (60-62%)	61 (60-62%)
PLV eigenvector delta ^a	85	***	28 (25-32%)	67 (65-71%)	61 (60-62%)	61 (60-62%)
PLV betweenness theta ^a	100	0.036	25 (23-29%)	65 (63-68%)	60 (59-62%)	60 (59-62%)
PLV closeness theta ^a	100	0.028	24 (21-30%)	64 (60-70%)	60 (59-62%)	60 (59-62%)
PLV degree theta ^a	85	***	22 (17-24%)	61 (55-64%)	61 (60-62%)	61 (60-62%)
PLV eigenvector theta ^a	95	***	36 (33-39%)	75 (71-78%)	61 (59-62%)	61 (60-62%)
PLV betweenness beta ^a	100	0.036	25 (23-29%)	65 (63-68%)	60 (59-62%)	60 (59-62%)
PLV closeness beta ^a	95	***	16 (14-21%)	55 (52-60%)	61 (60-63%)	61 (60-62%)
PLV eigenvector beta ^a	90	0.016	22 (15-27%)	61 (56-65%)	60 (59-62%)	60 (59-62%)
PLV betweenness gamma ^a	90	0.036	25 (23-29%)	65 (63-68%)	60 (59-62%)	60 (59-62%)
PLV eigenvector gamma ^a AEC	100	0.002	35 (34-40%)	75 (74-79%)	60 (59-62%)	61 (60-62%)
betweenness broadband ^b	100	0.001	37 (34-41%)	76 (75-80%)	61 (59-62%)	61 (59-62%)
AEC closeness broadband ^b	100	0.002	33 (31-37%)	73 (71-76%)	61 (59-62%)	61 (59-62%)
AEC eigenvector gamma ^b PLV	85	0.020	23 (19-26%)	62 (59-67%)	60 (59-62%)	60 (59-62%)
betweenness broadband ^b PLV	100	0.044	22 (19-26%)	62 (60-65%)	60 (59-62%)	60 (59-62%)
eigenvector broadband ^b PLV	90	0.006	26 (22-28%)	65 (60-68%)	61 (59-62%)	61 (59-62%)
betweenness delta ^b	100	0.006	32 (29-36%)	71 (70-75%)	60 (59-62%)	61 (59-62%)
PLV eigenvector theta ^b	75	0.009	18 (13-20%)	57 (51-60%)	61 (59-62%)	61 (59-62%)
PLV betweenness alpha ^b	90	***	32 (29-36%)	71 (68-76%)	61 (60-62%)	61 (60-62%)
PLV closeness alpha ^b	100	0.034	23 (19-28%)	62 (59-68%)	60 (59-62%)	60 (59-62%)
PLV eigenvector alpha ^b	65	0.003	21 (18-24%)	60 (57-63%)	61 (60-62%)	61 (60-62%)
PLV eigenvector beta ^b	50	***	29 (26-31%)	67 (64-70%)	62 (61-63%)	62 (61-63%)
PLV betweenness gamma ^b	100	0.006	32 (29-36%)	71 (70-75%)	60 (59-62%)	61 (59-62%)
PLV eigenvector gamma ^b	90	***	36 (33-40%)	75 (73-80%)	61 (59-62%)	61 (60-62%)

^aComputed on data with interictal epileptiform discharges. ^bComputed on data without interictal epileptiform discharges. Thr. = threshold. *** P-value < 0.001.

Supplementary Table 4 Prognostic value of Noninvasive Functional Connectivity: Leave-One-Out Cross-Validation

MSI	Thr. (%)	Fisher's Exact test	Performance	PPV	NPV	Accuracy
PLV alpha ^a	100	0.002	33 (31-37%)	73 (71-76%)	61 (59-62%)	61 (59-62%)
PLV beta ^a	100	0.002	33 (31-37%)	73 (71-76%)	61 (59-62%)	61 (60-62%)
PLV gamma ^a	80	***	25 (22-30%)	58 (56-63%)	67 (65-68%)	64 (63-66%)
PLV broadband ^b	100	0.008	29 (26-32%)	68 (67-71%)	60 (59-62%)	61 (59-62%)
PLV delta ^b	100	0.008	29 (26-32%)	68 (67-71%)	60 (59-62%)	61 (59-62%)
PLV theta ^b	100	0.008	38 (36-42%)	77 (76-81%)	61 (59-62%)	61 (60-62%)
PLV beta ^b	100	0.008	24 (21-27%)	64 (62-67%)	60 (59-62%)	60 (59-62%)
PLV gamma ^b	100	0.008	33 (31-37%)	73 (71-76%)	61 (59-62%)	61 (60-62%)
AEC eigenvector beta ^a	30	***	18 (17-22%)	57 (55-61%)	61 (60-63%)	61 (60-62%)
AEC betweenness	100	0.008	29 (26-34%)	68 (67-71%)	60 (59-62%)	61 (59-62%)
gamma ^a AEC degree	85	0.006	20 (17-25%)	60 (56-64%)	61 (59-62%)	61 (59-62%)
gamma ^a AEC eigenvector	90	0.005	27 (25-31%)	67 (65-69%)	61 (59-62%)	61 (59-62%)
gamma ^a PLV betweenness	95	0.010	23 (20-27%)	62 (59-67%)	61 (59-62%)	61 (59-62%)
theta ^a PLV betweenness	90	0.009	18 (13-23%)	58 (52-63%)	61 (59-62%)	61 (60-62%)
gamma ^a AEC closeness	90	0.009	19 (17-22%)	58 (56-61%)	61 (60-62%)	61 (60-62%)
beta ^b AEC degree beta ^b	85	0.002	25 (20-29%)	65 (59-69%)	61 (59-62%)	61 (60-62%)
AEC eigenvector beta ^b	50	0.001	21 (17-24%)	60 (56-64%)	61 (60-62%)	61 (60-62%)
PLV betweenness delta ^b	75	***	16 (14-20%)	55 (52-59%)	61 (60-63%)	61 (60-62%)
PLV betweenness theta ^b	55	***	18 (16-22%)	55 (53-60%)	63 (62-64%)	62 (61-63%)
PLV closeness theta ^b PLV	80	***	22 (19-24%)	56 (54-60%)	66 (65-67%)	63 (62-64%)
eigenvector theta ^b PLV	100	0.028	24 (21-28%)	64 (62-67%)	60 (59-62%)	60 (59-62%)
eigenvector alpha ^b PLV	60	***	21 (17-24%)	60 (55-63%)	61 (60-63%)	61 (60-62%)
eigenvector beta ^b PLV	60	0.001	17 (14-20%)	56 (52-59%)	61 (60-62%)	61 (60-62%)
betweenness gamma ^b PLV	65	***	21 (19-24%)	58 (56-62%)	62 (61-64%)	62 (61-63%)
eigenvector gamma ^b	95	***	20 (16-25%)	59 (56-64%)	60 (59-62%)	60 (59-62%)

^aComputed on data with interictal epileptiform discharges. ^bComputed on data without interictal epileptiform discharges. Thr. = threshold. *** P-value < 0.001.