

# Epilepsy and Co-Morbidities in Adults

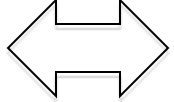
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# Common Comorbidities in Epilepsy

- Somatic Disorders
- Psychiatric Disorders
  - Depression
  - Anxiety
  - Suicide
- Cognitive Dysfunction

# Considerations for Surveillance

- Pharmaco-Resistance (Refractory):
  - ~30-40% of the epilepsy population
  - Failing initial drug predicts long-term recurrence
- Inaccuracy of self-reported seizure rate
  - 80% of patients “miss” seizures
  - 60% of all seizures unreported
  - Lowest reported rate  greater inaccuracy
  - ❖ Consider Diabetes and rapid glucose measurement

Blum et al. *Neurology* 47:260-264, 1996

Hoppe et al. *Arch Neurol*: 64:1595-1599, 2007

Akman et al *Epilepsy Behav*:86-98, 2009

## UK National Health Service

- General Practice Research Database
- 211 Practices,
- 1.3 million people
- 4 years

Gaitatzis et al.

*Epilepsia*. 5:1613-22, 2004

All individuals	Rate ratio (95% CI)
<b>Mental health disorders</b>	
Neuroses	1.90 (1.79–2.02)
Obsessive-compulsive disorder	2.57 (1.61–4.10)
Anxiety	1.99 (1.85–2.14)
Hysteria	3.92 (2.55–6.04)
Depression	1.98 (1.87–2.09)
Schizophrenia	4.13 (3.05–5.61)
Organic psychoses	6.05 (5.13–7.14)
Other psychoses	3.98 (3.62–4.38)
Alcohol dependence	5.70 (4.84–6.71)
Dementia	6.34 (5.47–7.35)
<b>Somatic disorders</b>	
Cerebrovascular accident (CVA)	6.96 (6.38–7.60)
Hemorrhagic CVA	10.62 (6.52–17.32)
Occlusive CVA	7.49 (5.69–9.86)
Transient ischemic attack	4.94 (4.44–5.50)
Neoplasia	1.05 (0.89–1.25)
Brain neoplasms	55.05 (38.00–79.75)
Meningiomas	31.44 (9.16–107.91)
Cerebral degeneration	6.80 (5.96–7.76)
Alzheimer's disease	8.05 (5.89–11.00)
Parkinson's disease	3.19 (2.44–4.18)
Migraine	1.60 (1.43–1.80)
Ischemic heart disease	1.34 (1.19–1.50)
Heart failure	1.68 (1.45–1.95)
Congenital cardiac abnormalities	7.34 (4.58–11.75)
Diabetes mellitus	1.57 (1.39–1.78)
Pneumonias	3.19 (2.72–3.74)
Asthma	1.30 (1.19–1.41)
Chronic bronchitis	1.67 (1.26–2.21)
Emphysema	1.25 (0.67–2.34)
Peptic ulcers	1.92 (1.55–2.37)
Gastrointestinal (GI) bleed	3.37 (2.78–4.08)
Upper GI bleed	4.31 (3.41–5.46)
Lower GI bleed	2.16 (1.43–3.25)
Unspecified GI bleed	2.85 (1.77–4.59)
Rheumatoid arthritis	0.99 (0.67–1.47)
Osteoarthritis	1.02 (0.91–1.15)
Fractures	2.17 (2.00–2.35)
Eczema	0.90 (0.47–1.74)

# Canadian Health Studies

Disease	CHS prevalence ratio (95% CI)	NPHS prevalence ratio (95% CI)
Stomach/intestinal ulcers*	2.5 (2.0–3.2)	2.7 (2.1–3.4)
Stroke*	3.9 (2.7–5.3)	4.7 (3.4–6.2)
Urinary incontinence*	3.2 (2.4–4.1)	4.4 (3.5–5.5)
Bowel disorders (Crohn's/colitis)*	2.0 (1.4–2.7)	3.3 (2.4–4.3)
Cataracts	1.2 (0.9–1.6)	2.4 (1.9–2.9)
Thyroid condition	1.6 (1.3–2.1)	1.3 (0.9–1.7)
Cancer	1.4 (0.9–2.1)	1.2 (0.7–2.1)
Glaucoma	1.2 (0.7–1.9)	1.1 (0.6–1.9)
Chronic fatigue	4.1 (2.8–5.7)	NE
Allergies*	1.2 (1.0–1.3)	1.6 (1.4–1.8)
Asthma	1.4 (1.1–1.7)	1.1 (0.8–1.3)
Arthritis/rheumatism*	1.4 (1.2–1.6)	1.5 (1.3–1.7)
Back problems*	1.4 (1.2–1.6)	1.2 (1.0–1.4)
High blood pressure	1.1 (0.9–1.3)	1.9 (1.7–2.2)
Migraine*	2.0 (1.7–2.3)	2.6 (2.2–3.0)
Chronic bronchitis/emphysema*	2.9 (2.0–4.0)	1.9 (1.3–2.5)
Diabetes	1.2 (0.9–1.6)	1.6 (1.2–2.0)
Heart disease*	2.3 (1.9–2.7)	1.8 (1.4–2.3)
Fibromyalgia	1.5 (0.9–2.4)	NE
Alzheimer's disease & other dementia	NE	4.3 (2.7–7.4)

# Epilepsy, Affective Disorder, and Suicide

	<u>Rate Ratio</u>	<u>P value</u>
No Epilepsy	1	
Epilepsy	2.4 (2.0-2.8)	<0.0001
<b><u>Epilepsy +</u></b>		<0.0001
Affective Disorder	32.0 (20.8-49.4)	<0.0001
Anxiety Disorder	11.4 (4.16-31.4)	<0.0001
Schizophrenia	12.5 (8.05-22.7)	<0.0001



# Psychiatric Comorbidity in Epilepsy

- Canadian Community Health Survey
- World Mental Health Diagnostic Interview
- 36,984 Subjects; 253 with epilepsy

Psychiatric disorder	No epilepsy (N = 36,727) (95% CI)	Epilepsy (N = 253) (95% CI)
Major depressive disorder (Lifetime)	10.7 (10.2–11.2)	17.4 (10.0–24.9)
Mood disorder (Lifetime)	13.2 (12.7–13.7)	24.4 (16.0–32.8)
Mood disorder (12 month)	5.2 (4.9–5.5)	14.1 (7.0–21.1)
Anxiety disorder (Lifetime)	11.2 (10.8–11.7)	22.8 (14.8–30.9)
Anxiety disorder (12 month)	4.6 (4.3–4.9)	12.8 (6.0–19.7)
Mood/anxiety disorder (12 month)	8.0 (7.6–8.5)	19.9 (12.3–27.4)
Mood disorder/anxiety disorder/dysthymia (lifetime)	19.6 (19.0–20.2)	34.2 (25.0–43.3)
Panic disorder/agoraphobia (Lifetime)	3.6 (3.3–3.9)	6.6 (2.9–10.3)
Panic disorder/agoraphobia (12 month)	2.0 (1.8–2.2)	5.6 (1.9–9.2)
Suicidal ideation (lifetime)	13.3 (12.8–13.8)	25.0 (17.4–32.5)
Any mental health disorder (12 month)	10.9 (10.4–11.3)	23.5 (15.8–31.2)
Any mental health disorder (lifetime)	20.7 (19.5–20.7)	35.5 (25.9–44.0)

# Rating Depression

Doctors are beginning to use a simple questionnaire to measure if an adult is suffering from depression. The test is not meant to be a formal diagnosis, but a high score would lead a doctor to recommend more screening.

Over the past two weeks, how often have you been bothered by any of the following problems?

Circle the number under your answer.

	Not at all	Several days	More than half the days	Nearly every day
1. Little interest or pleasure in doing things	0	1	2	3
2. Feeling down, depressed or hopeless	0	1	2	3
3. Trouble falling or staying asleep, or sleeping too much	0	1	2	3
4. Feeling tired or having little energy	0	1	2	3
5. Poor appetite or overeating	0	1	2	3
6. Feeling bad about yourself, or that you are a failure or have let yourself or your family down	0	1	2	3
7. Trouble concentrating on things, such as reading the newspaper or watching TV	0	1	2	3
8. Moving or speaking so slowly that other people could have noticed. Or the opposite, being so fidgety or restless that you have been moving around a lot more than usual	0	1	2	3
9. Thoughts that you would be better off dead, or hurting yourself in some way	0	1	2	3

Add columns  +  +

Total score =

## RESULTS

<b>1-4</b> Minimal depression	<b>5-9</b> Mild depression	<b>10-14</b> Moderate depression	<b>15-19</b> Moderately severe depression	<b>20-27</b> Severe depression
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## Depressed? New York City Screens for People at Risk

By [MARC SANTORA](#) and [BENEDICT CAREY](#)

Published: April 13, 2005



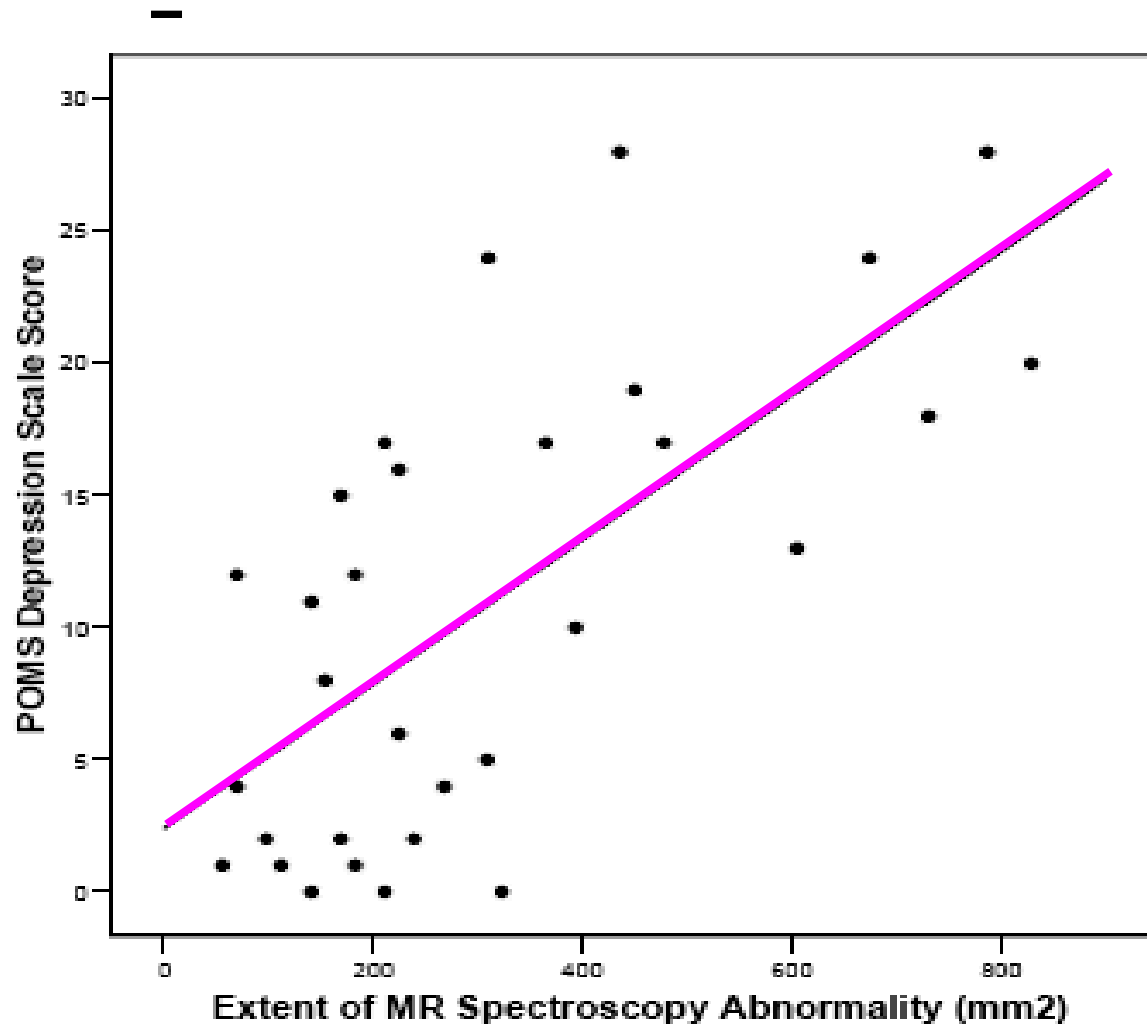
# Neurological Disorders Depression Inventory for Epilepsy (NDDI-E)

Please circle the number that best describes your mood over the past 2 weeks

	Always or often	Sometimes	Rarely	Never
Everything is a struggle	4	3	2	1
Nothing I do is right	4	3	2	1
Feel guilty	4	3	2	1
I'd be better off dead	4	3	2	1
Frustrated	4	3	2	1
Difficulty finding pleasure	4	3	2	1

- Validated in >400 epilepsy patients
- Cronbach's alpha 0.85; test-retest reliability 0.78
- Score of 15 has a specificity of 90% at sensitivity of 81%
- Positive Predictive Value of 0.62

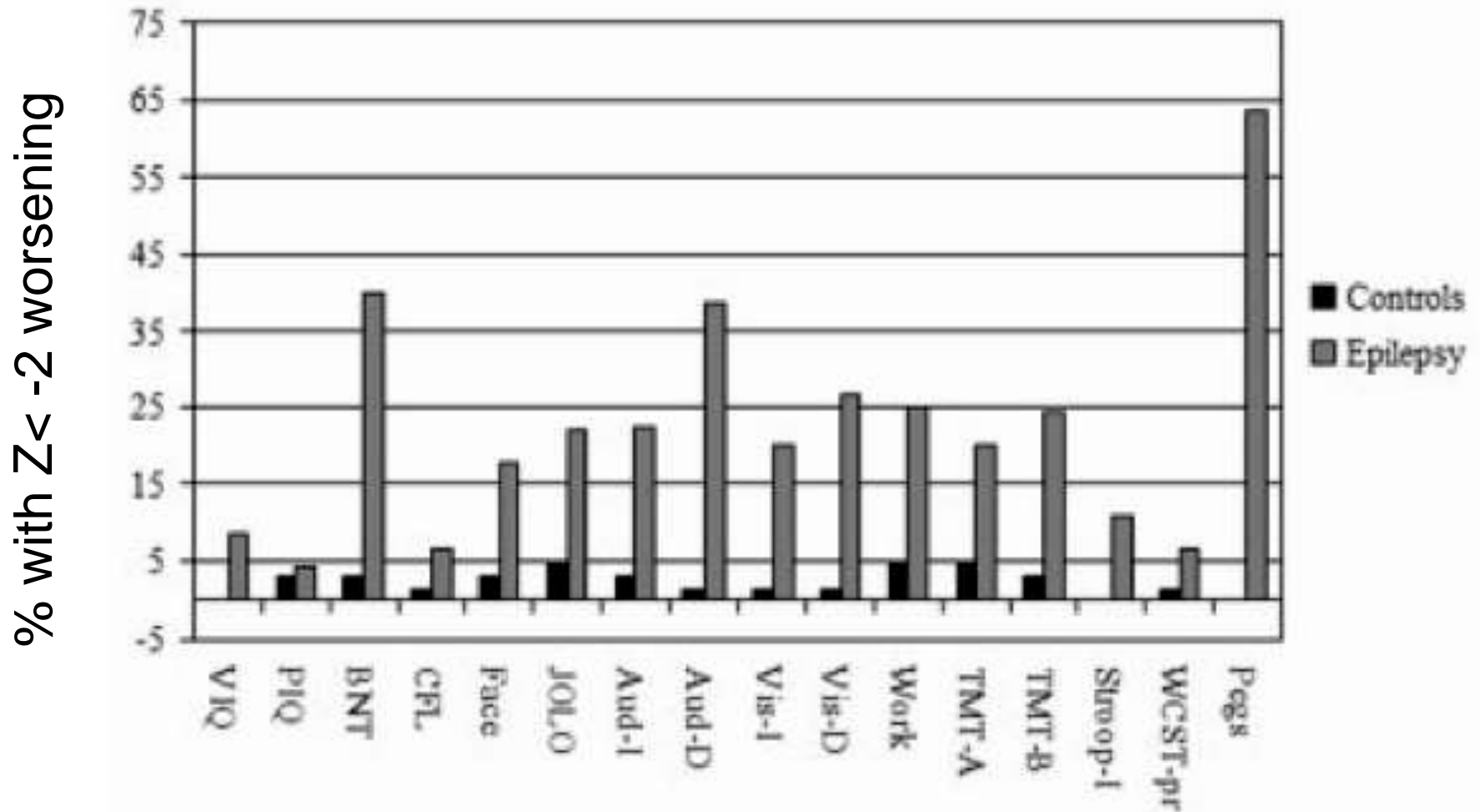
# $^1\text{H}$ -MR Spectroscopy and Depression in TLE



Spearman rho = 0.65,  $p < 0.001$

Gilliam et al. *Neurology* 68:364-368, 2007

# Temporal Lobe Epilepsy and Cognition



# Surveillance of Comorbidities

Data should support understanding of:

- **Causality**

- Brain dysfunction vs Disability and Psychiatric Illness
- Fitness vs Drugs and Heart Disease
- Genes vs Drugs vs Behavior and GI Disorders

- **Consequences**

- Psychiatric illness and disability
- Cognition and employment/income
- Somatic or Psychiatric comorbidity and mortality

**Goal:** longitudinal studies with deep databases  
(EHR + Neuroimaging + Biomarkers-Genes)