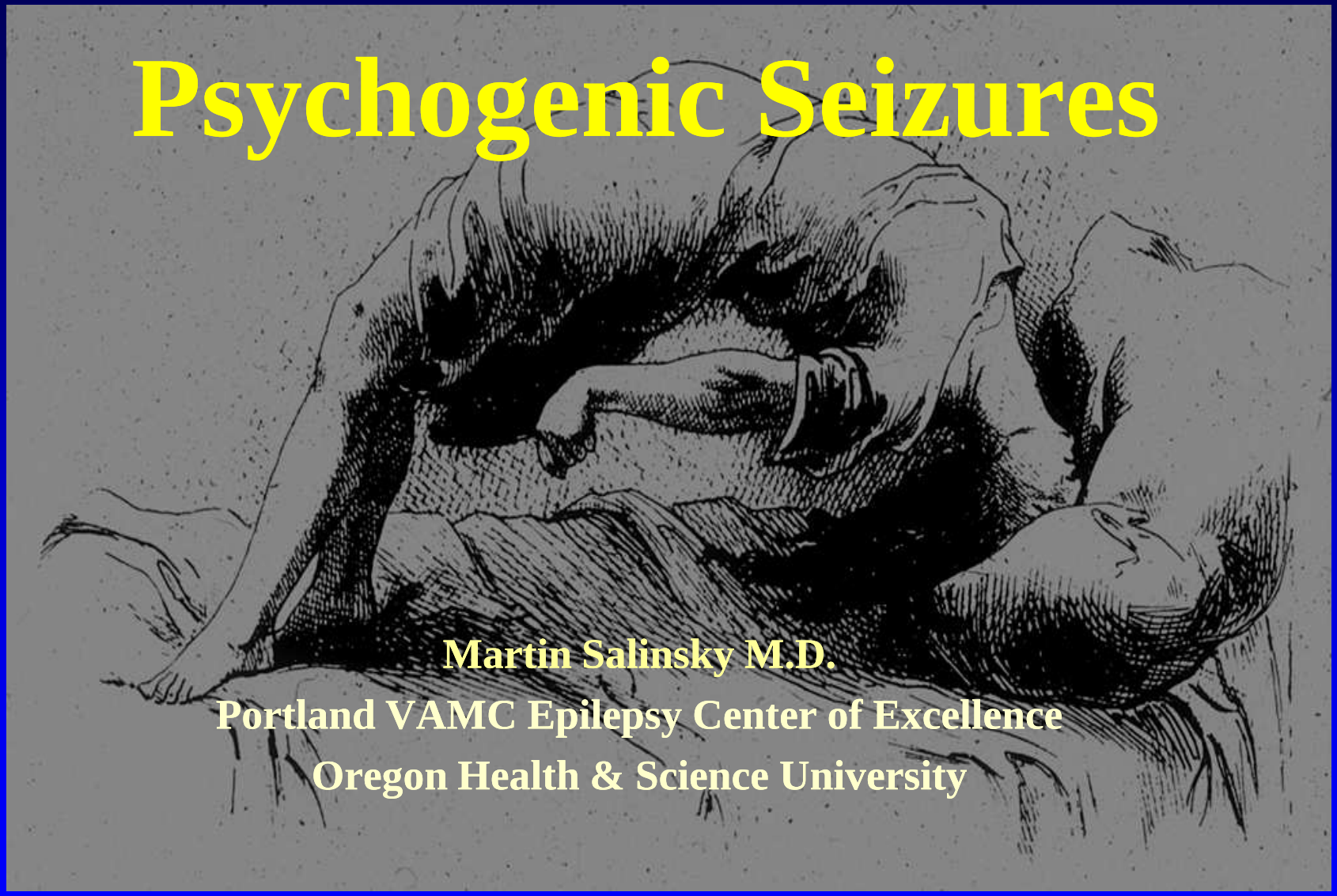
# Psychogenic Seizures



**Martin Salinsky M.D.**
**Portland VAMC Epilepsy Center of Excellence**
**Oregon Health & Science University**

*…You'd better ask the doctors here about my illness, sir. Ask them whether my fit was real or not.*

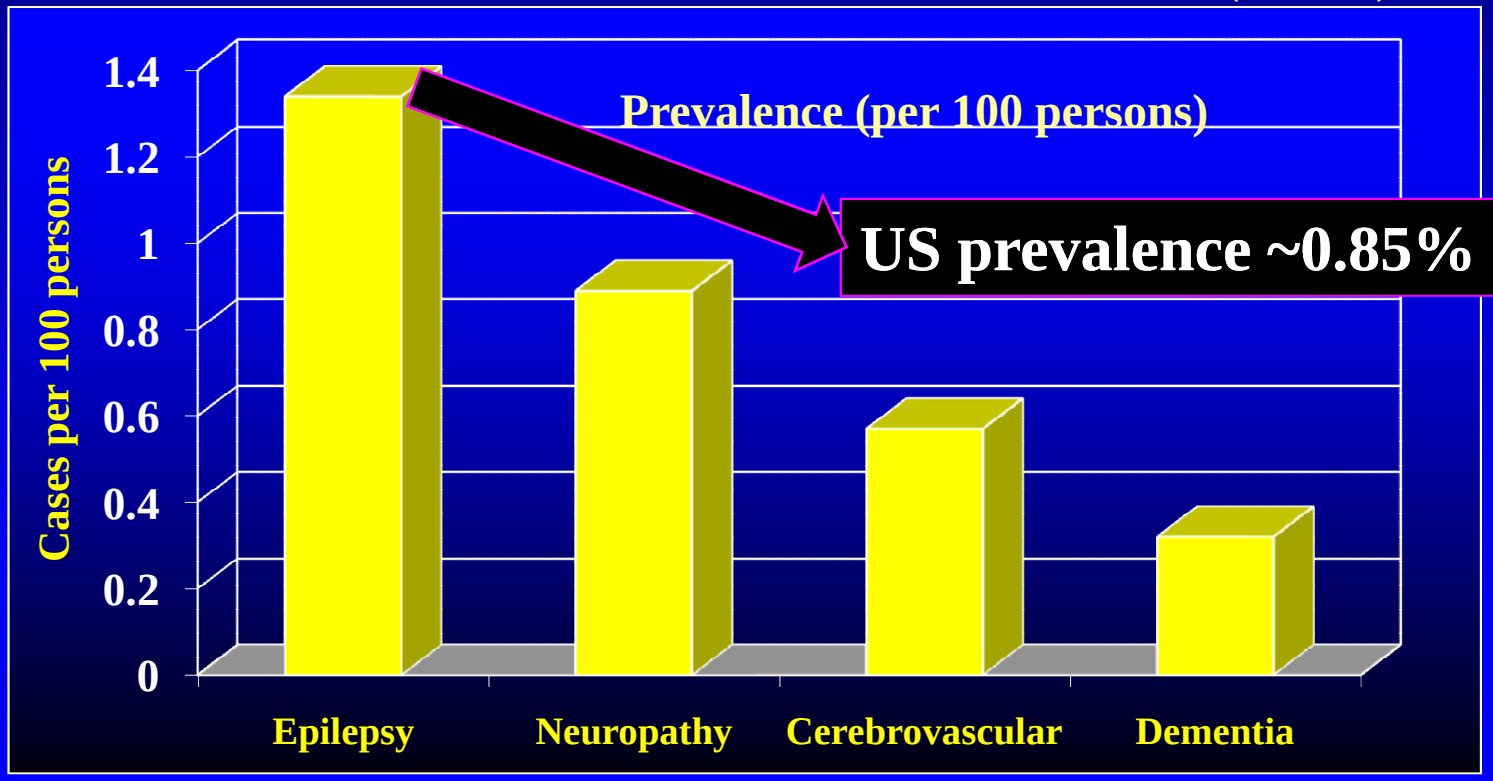
**The Brothers Karamazov; F. Dostoevsky, 1881**

# Psychogenic Seizures

- Psychogenic seizures (PNES)
- PNES in Veterans
- Treatment and Prognosis

# Epilepsy

- The most common problem faced by neurologists worldwide*
  - ~1% of the world burden of disease (WHO)




*excluding headache, back pain

Singhai; Arch Neurol 1998
Murray et al; WHO, 1994
Medina; J Neurol Sci 2007
Kobau; MMR, August 2008

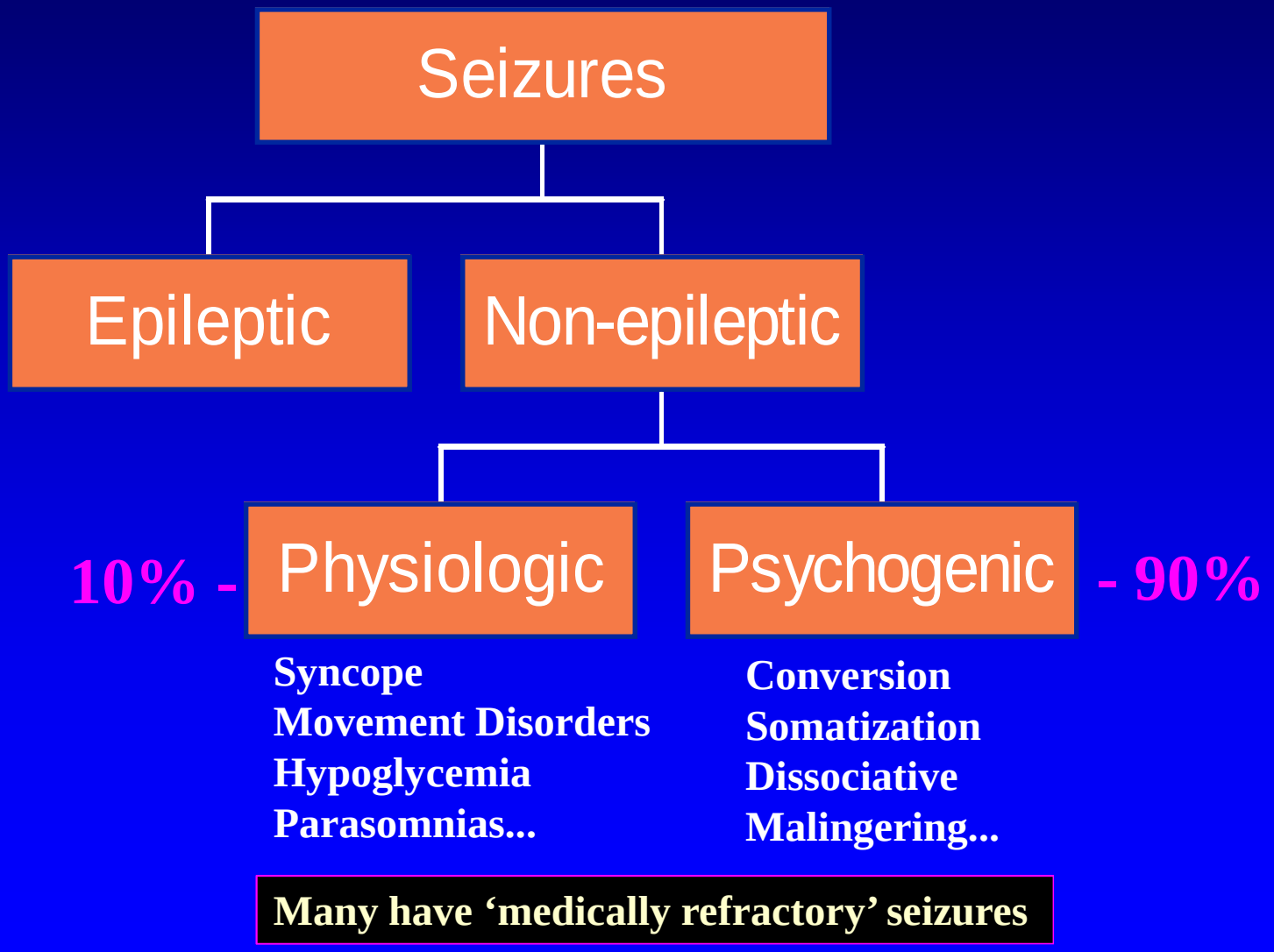
# Disorders that may mimic epilepsy (adults)

- Cardiovascular events (syncope)
  - » Vasovagal attacks (vasodepressor syncope)
  - » Arrhythmias (Stokes-Adams attacks)
- Movement disorders
  - » Paroxysmal choreoathetosis
  - » Myoclonus, tics, habit spasms
- Migraine - confusional, basilar
- Sleep disorders (parasomnias)
- Metabolic disorders (hypoglycemia)
- Psychological disorders
  - » Psychogenic seizures

# Non-Epileptic Seizures (NES)

- A transient alteration in behavior resembling an epileptic seizure but *not due to paroxysmal neuronal discharges*;
  - **Psychogenic Seizures (PNES)**
    - without other physiologic abnormalities
    - with probable psychological origin

# Non-Epileptic Seizures (NES)



# Psychogenic Seizures: Frequency

**from inpatient video-EEG**

| Author | | Year | % with PNES |
|---|---|---|---|
| Ramani et al | | 1980 | 20 |
| King et al | | 1982 | 20 |
| Pierelli et al | | 1989 | 50 |
| OHSU/PVAMC | | 1995 | 40 |
| Bowman et al | | 1996 | 33 |
| Martin et al | | 2003 | 32 |
| Benbadis et al | | 2004 | 30 |

# Psychogenic Seizures: Frequency

**from inpatient video-EEG**

| Author | Year | % with PNES |
|---|---|---|
| Ramani et al | 1980 | 20 |
| King et al | 1982 | 20 |
| Pierelli et al | 1989 | 50 |
| OHSU/PVAMC | 1993 | 40 |
| Bowman et al | | |
| Martin et al | | |
| Benbadis et al | | |

**outpatient prevalence estimates**

| Author | Year | % with PNES |
|---|---|---|
| Scott et al | 1982 | 5% |
| Sigudadottir | 1998 | ~4% |
| Benbadis, Hauser | 2000 | <4% |

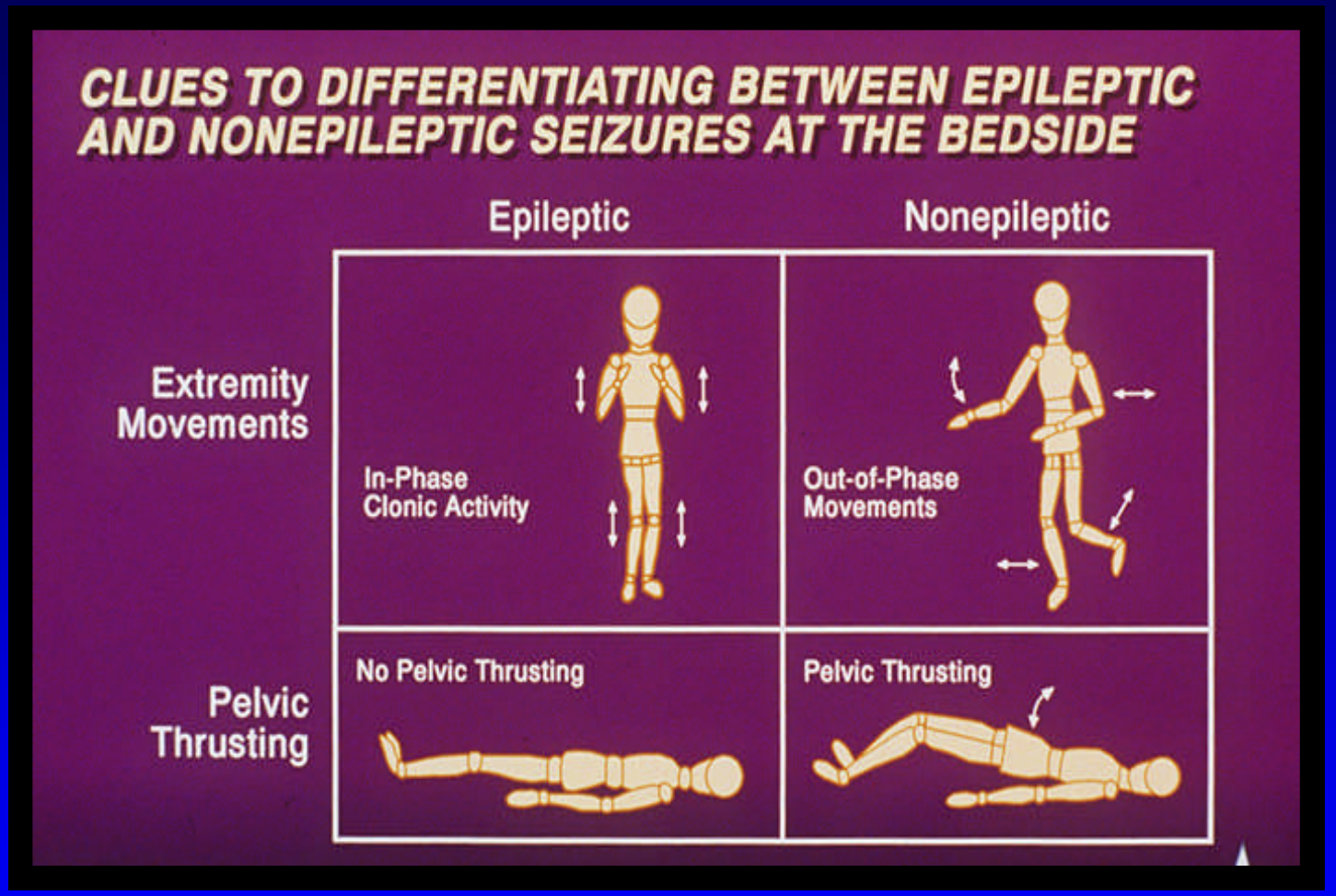
**10-20% of pts. with medically refractory seizures**

**NES treatment workshop; 2006**

# Psychogenic seizures - Observations that may be helpful

- Body movements - origin, migration, pattern
- Responsiveness - verbal, pain, threat
- Duration of attack
- Self injury - tongue biting, lacerations (?)
- Incontinence - urine, stool (?)

# CLUES TO DIFFERENTIATING BETWEEN EPILEPTIC AND NONEPILEPTIC SEIZURES AT THE BEDSIDE



## ‘Arc de cercle’ in patient with ‘*hystero-epilepsy*’

**From Iconographie Photographique de la Salpetriere; Bourneville and Regnard, 1876 (patients of Charcot)**

**Charcot**

***Hystero-epilepsy***

# AN ACCOUNT

OF A

# DEMONSTRATION ON THE PHENOMENA OF HYSTERO-EPILEPSY:

## AND ON THE MODIFICATION WHICH THEY UNDERGO UNDER THE INFLUENCE OF MAGNETS AND SOLENOIDS;

*Given by* PROFESSOR CHARCOT *at the Salpêtrière.*

BY ARTHUR GAMGEE, M.D., F.R.S.,
Brackenbury Professor of Physiology in Owens College, Manchester.

ON the mornings of Friday and Saturday, August 23rd and 24th, several physicians and scientific men, amongst whom were Professors Virchow, Grainger Stewart, Turner, Oscar Liebreich, Ray Lankester, Dr. Broadbent, Mr. Ernest Hart, etc., who happened to be in Paris, met in Professor Charcot's wards in the great hospital of La Salpêtrière, and had the privilege of being present at a demonstration in which this distinguished physician brought under their notice all the remarkable features of hystero-epilepsy — that remarkable disease almost all our knowledge of which is due to the labours of M. Charcot. In these demonstrations, the remarkable influence of solenoids and of magnets upon the diseased organism was exhibited, no less than ovarian region. (By perusing the account afterwards given of the convulsive attacks of hystero-epilepsy, the reader will understand the grounds for the diagnosis of the ovarian irritation in these cases.) Professor Charcot brought this patient before us to demonstrate that usually it is possible in patients affected with hystero-epilepsy to induce the mesmeric condition. The patient being seated opposite to him, at the distance of about two feet, he steadily maintained the index finger of his right hand at a short distance from the centre of her forehead; she was directed to look steadily at the finger, and did so. Several minutes elapsed (the time was not actually noted), and the patient did not seem sensibly affected. She declared that "to day she had no desire to sleep".—At 10.4 A.M., the previous attempts, which may have lasted ten minutes, having failed, Professor Charcot, placing his head on a level with that of the patient, commenced to stare fixedly into both her eyes.—At 10.6, the eyelids drooped, and, at the same time, began to wink in a rapid tremulous manner; this phenomenon continuing throughout the whole duration of the induced sleep, and being, Professor Charcot remarked, constant; at the same time, a tonic contraction of the flexors of both forearms occurred, the fists becoming temporarily clenched.—At 10.7, the patient being asleep, Professor Charcot told her to rise and take a chair. She did so, her eyes being closed and her eyelids tremulous. Having seated herself, he told her to write her name. Pen, ink, and paper being furnished her, she sleepily wrote her own name, and afterwards, when ordered, Professor Charcot's, her eyes remaining closed the whole time. Whilst writing, the skin over the right wrist was transfixed by a thick needle, but the patient appeared quite unconscious of the operation, continuing to write with the needle *in situ*. It is to be remarked that, during the mesmeric state, the patient is anæsthetic on both sides of the body;

***"Hystero-epilepsy is a nervous disease of women of great rarity, affecting them especially during the child bearing period of life… associated with hyperesthesia of one or both ovarian regions…."***

# Joseph Babinski

**AKA** Joseph Jules François Félix Babinski

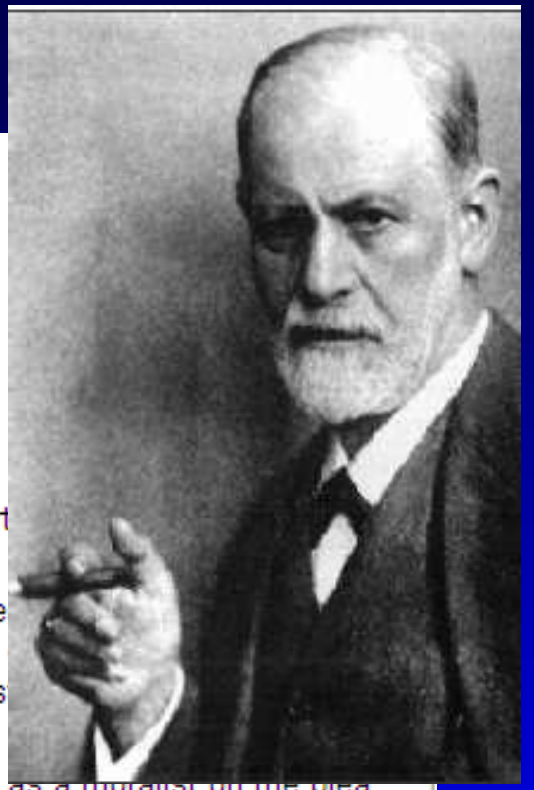
**Born:** 17-Nov-1857
**Birthplace:** Paris, France
**Died:** 29-Oct-1932
**Location of death:** Paris, France
**Cause of death:** Illness
**Remains:** Buried, Cimetière des Champeaux, Montmorency, France

**Gender:** Male
**Religion:** Christian
**Race or Ethnicity:** White
**Occupation:** Doctor, Scientist

**Nationality:** France
**Executive summary:** The Babinski sign

**Military service:** French Military Health Service (1916-20)

Neurologist Joseph Babinski is best known for his 1896 discovery of what is now called the Babinski sign, a reflexive extension of the big toe and fanning of the other toes when the foot is stroked in a particular manner,



The International Journal of Psychoanalysis

(1945). International Journal of Psycho-Analysis, 26:1-8

## Dostoevsky and Parricide (1928)

*Sigmund Freud*

Four facets may be distinguished in the rich personality of Dostoevsky: the creative art moralist and the sinner. How is one to find one's way in this bewildering complexity?

The creative artist is the least doubtful: Dostoevsky's place is not far behind Shakespe *Karamazov* is the most magnificent novel ever written; the episode of the Grand Inquisitor, literature of the world, can hardly be overestimated. Before the problem of the creative artis down its arms.

The moralist in Dostoevsky is the most readily assailable. If we seek to rank him high as a moralist on the plea that only a man who has gone through the depths of sin can reach the highest summit of morality, we are neglecting a doubt that arises. A moral man is one who reacts to temptation as soon as he feels it in his heart, without yielding to it. A man who alternately sins and then in his remorse erects high moral standards la

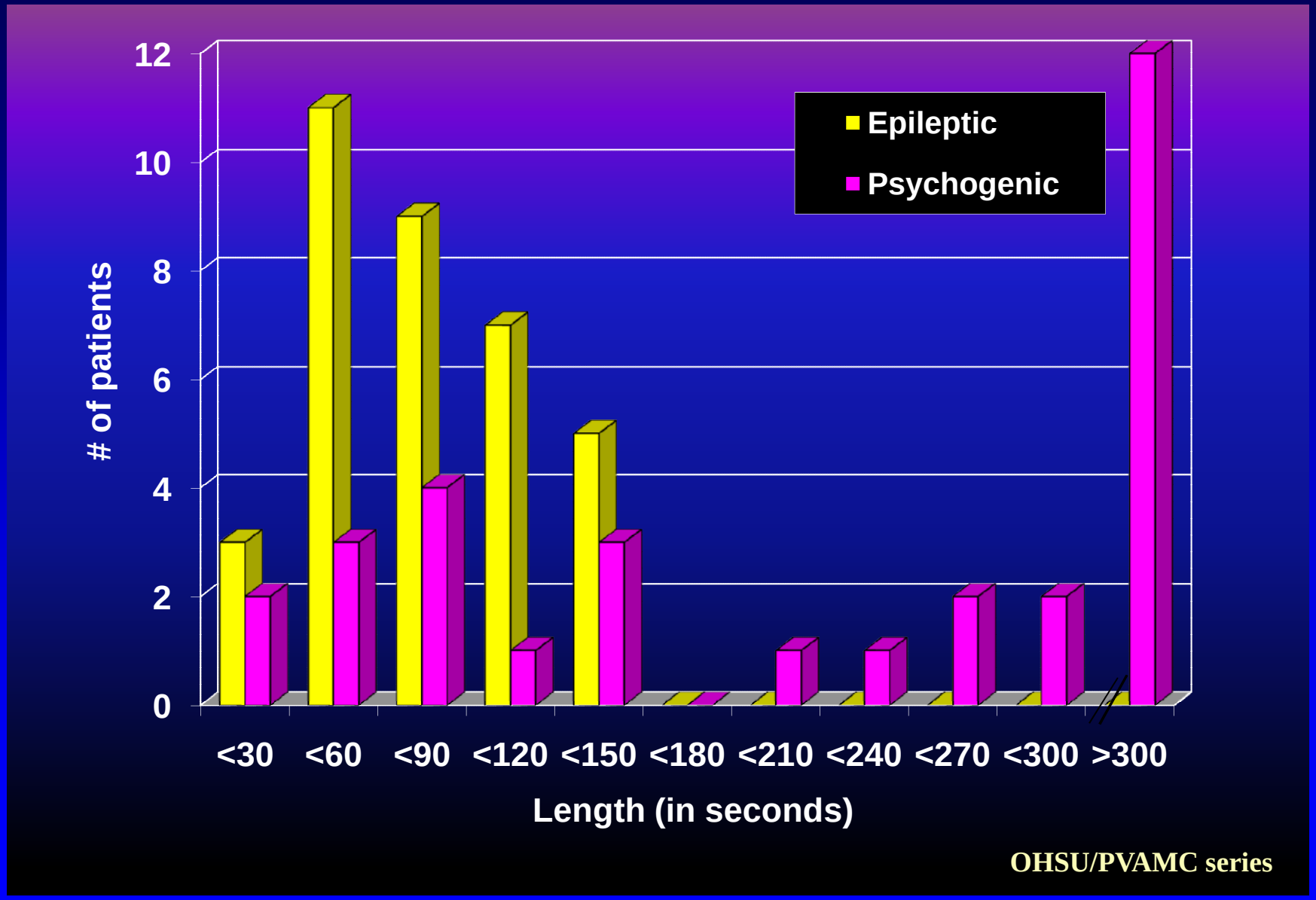
***…You'd better ask the doctors here about my illness, sir. Ask them whether my fit was real or not.***

**The Brothers Karamazov; F. Dostoevsky, 1881**

# Psychogenic seizures - Observations that may be helpful

- Body movements - origin, migration, pattern
- Responsiveness - verbal, pain, threat
- Duration of attack
- Self injury - tongue biting, lacerations (?)
- Incontinence - urine, stool (?)

# Seizure Duration



# Psychogenic seizures - Observations that may be helpful

- Body movements - origin, migration, pattern
- Responsiveness - verbal, pain, threat
- Duration of attack
- Self injury - tongue biting, lacerations
- Incontinence - urine, stool

**Laboratory**

- **Electroencephalography (EEG)**

# Psychogenic Seizures
# Importance of Ictal Recordings

- **A normal *interictal* EEG does not rule out epilepsy**
  - **~30% of epileptic patients will have no *interictal* discharges; even with multiple EEGs[1]**
- **An epileptiform *interictal* EEG does not diagnose epilepsy (or rule out non-epileptic seizures)**
  - **Population survey – most persons with *interictal* epileptiform discharges do not have epilepsy (background rate ~1%)[2]**

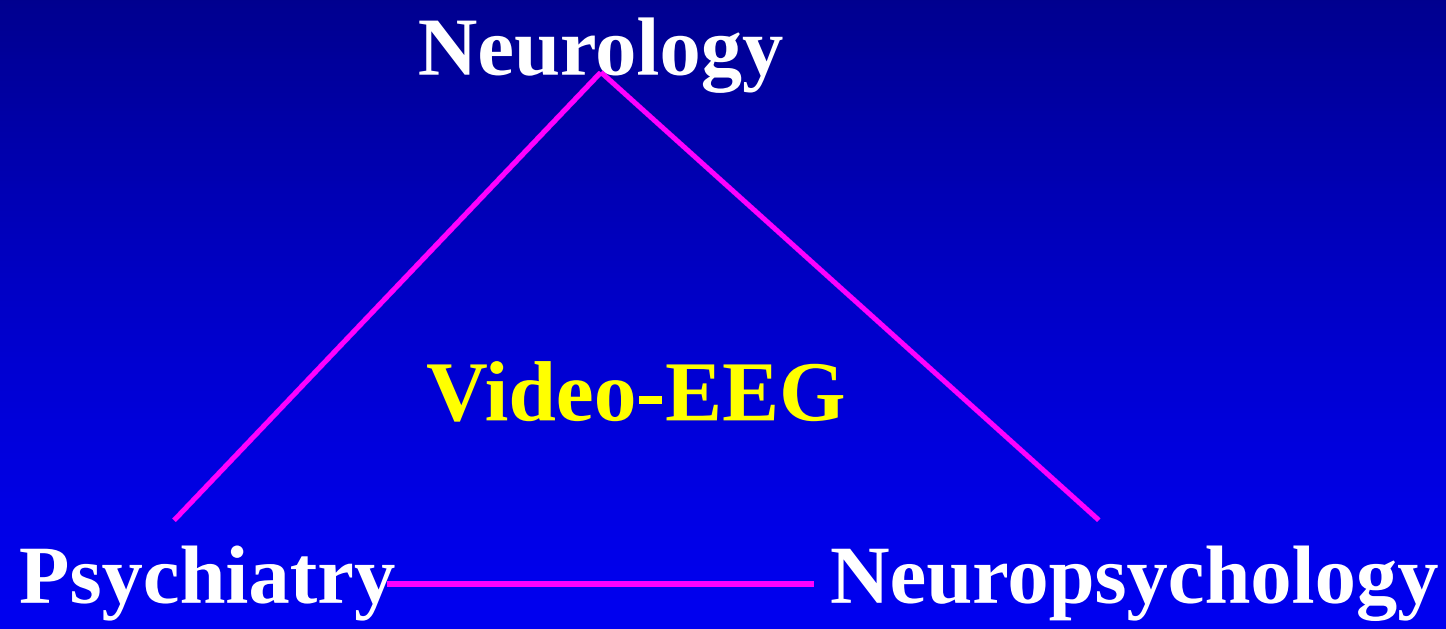
[1]Salinsky et al, 1986
[2]Zivin, Ajmone-Marsan, 1968

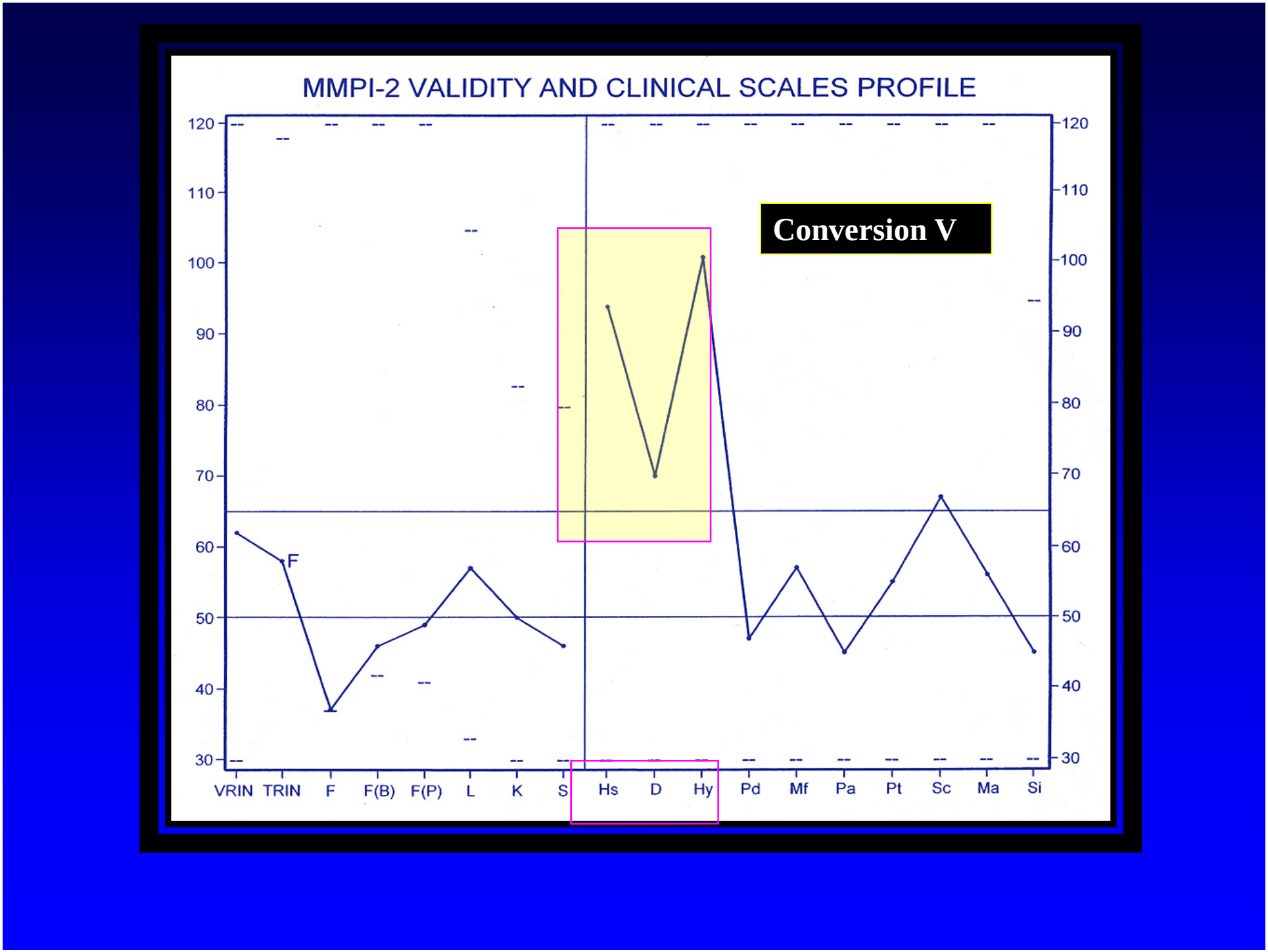
# Psychogenic Seizures + Epilepsy

| Author | Year | N | %PNES+ES |
|---|---|---|---|
| Lesser et al | 1983 | 210 | 10 |
| PVAMC/OHSU | 1994 | 64 | 10 |
| Walczac et al | 1995 | 55 | 31 |
| Martin et al | 2003 | 514 | 5 |
| Reuber et al | 2003 | 329 | 31 |
| Jones et al | 2010 | 221 | 13.5 |

**Studies differed in criteria: Some accepted interictal discharges as evidence for epilepsy, others did not**

**Inpatient video-EEG monitoring is the gold standard for the diagnosis of psychogenic non-epileptic seizures (PNES)**

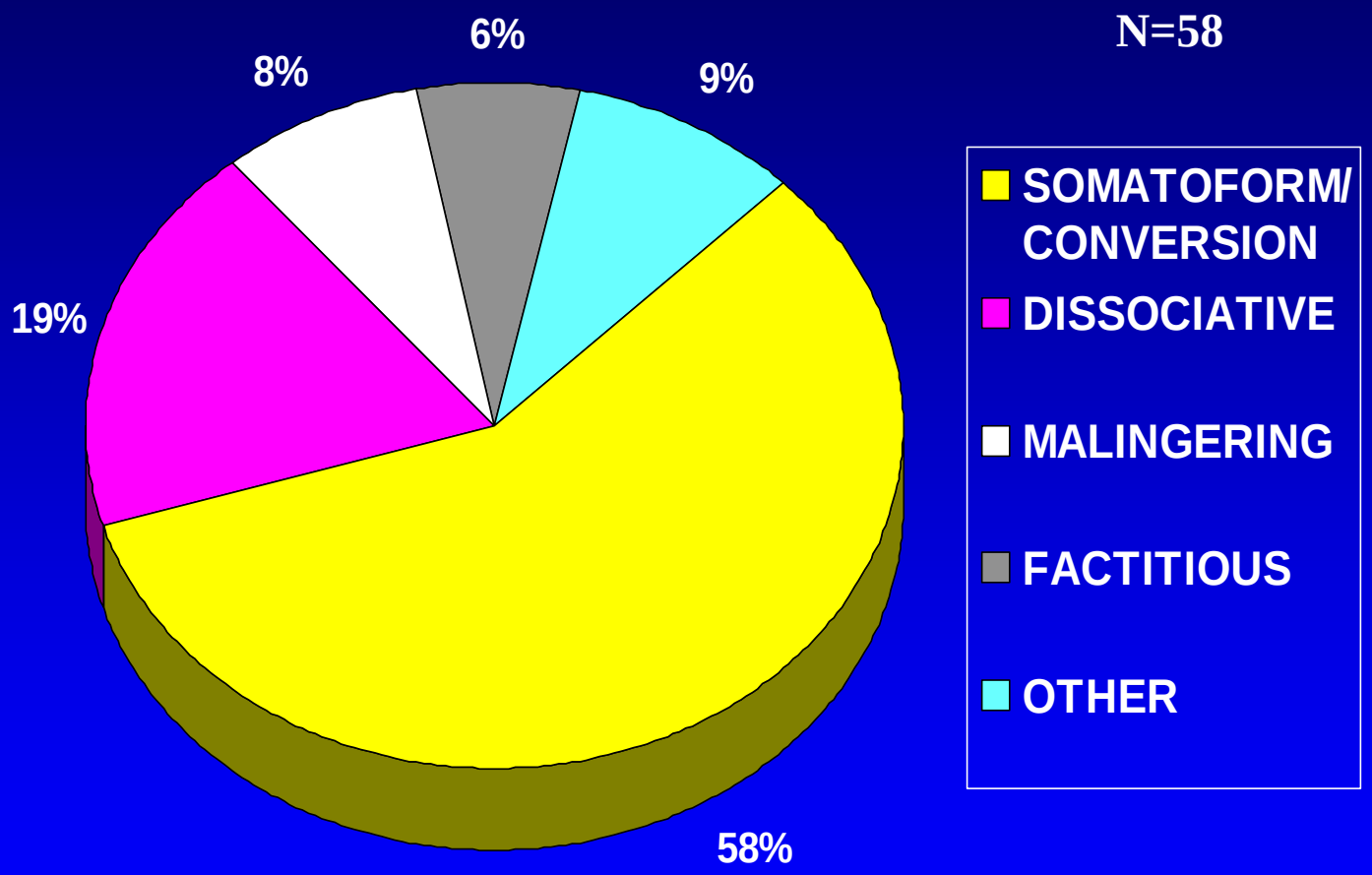



MMPI-2 VALIDITY AND CLINICAL SCALES PROFILE
Conversion V
120
110
100
90
80
70
60
50
40
30
F
VRIN TRIN F F(B) F(P) L K S Hs D Hy Pd Mf Pa Pt Sc Ma Si

| VARIABLE | N | % CORRECT CLASSIFICATION |
|---|---|---|
| EEG (routine) | 121 | 74% |
| MMPI-2 HS scale | 144 | 77% |
| EEG + MMPI-2 | 115 | 82% |
| EEG + MMP1-2 + # of years | 111 | 86% |

OHSU/PVAMC series
Storzbach et al, 2000

# Primary Psychiatric Diagnoses; Psychogenic Seizure Patients (pure)




OHSU/PVAMC series (S. Smith)

# Psychiatric diagnoses

- 45 patients (35 women, 10 men)
  - Inpatient Video-EEG confirmed diagnosis (retrospective)
- Instruments
  - Structured clinical interview for DSM III R (SCID)
  - Dissociative experiences scale
  - Personality diagnostic questionnaire – revised
- Hx sexual abuse
  - 80% of women (69% pre-adult); 20% of men
- Hx physical abuse
  - 77% of women (63% pre-adult); 30% of men
- Substance abuse (lifetime) 42%

Bowman et al 1996

# Psychiatric diagnosis (n=45)

- Somatoform disorders – 89%
  - Conversion disorder 82%
  - Other conversion symptoms 42%
- Dissociative disorders – 91%
- Affective disorders – 64%
  - Major depression 47%
- PTSD – 49%
- Other anxiety disorders – 47%
  - Phobic 33%; panic 20%
- Personality disorders – 62%
  - Paranoid, borderline, histrionic, avoidant (most common)

Axis I

Axis II

**Mean number of current axis I diagnoses – 4.4 (1-10)**

Bowman et al 1996

# Psychiatric diagnosis (n=45)

- Som
- Diss
- Affe
- PTSD – 49%
- Other anxiety disorders – 47%
  - Phobic 33%; panic 20%
- Personality disorders – 62%
  - Paranoid, borderline, histrionic, avoidant (most common)

*"It is to be noted that nearly all, if not all, cases of hystero-epilepsy have been connected to fright or anguish."*

*Gamgee, BMJ 1878*

xis I

Axis II

**Mean number of current axis I diagnoses – 4.4 (1-10)**

Bowman et al 1996

# Psychogenic seizures - Impact of the epilepsy diagnosis

- Restrictions on driving
- Restrictions on work
- Restrictions on activities
- Social stigma
- Locus of control issues
- Cost of assessment and treatment

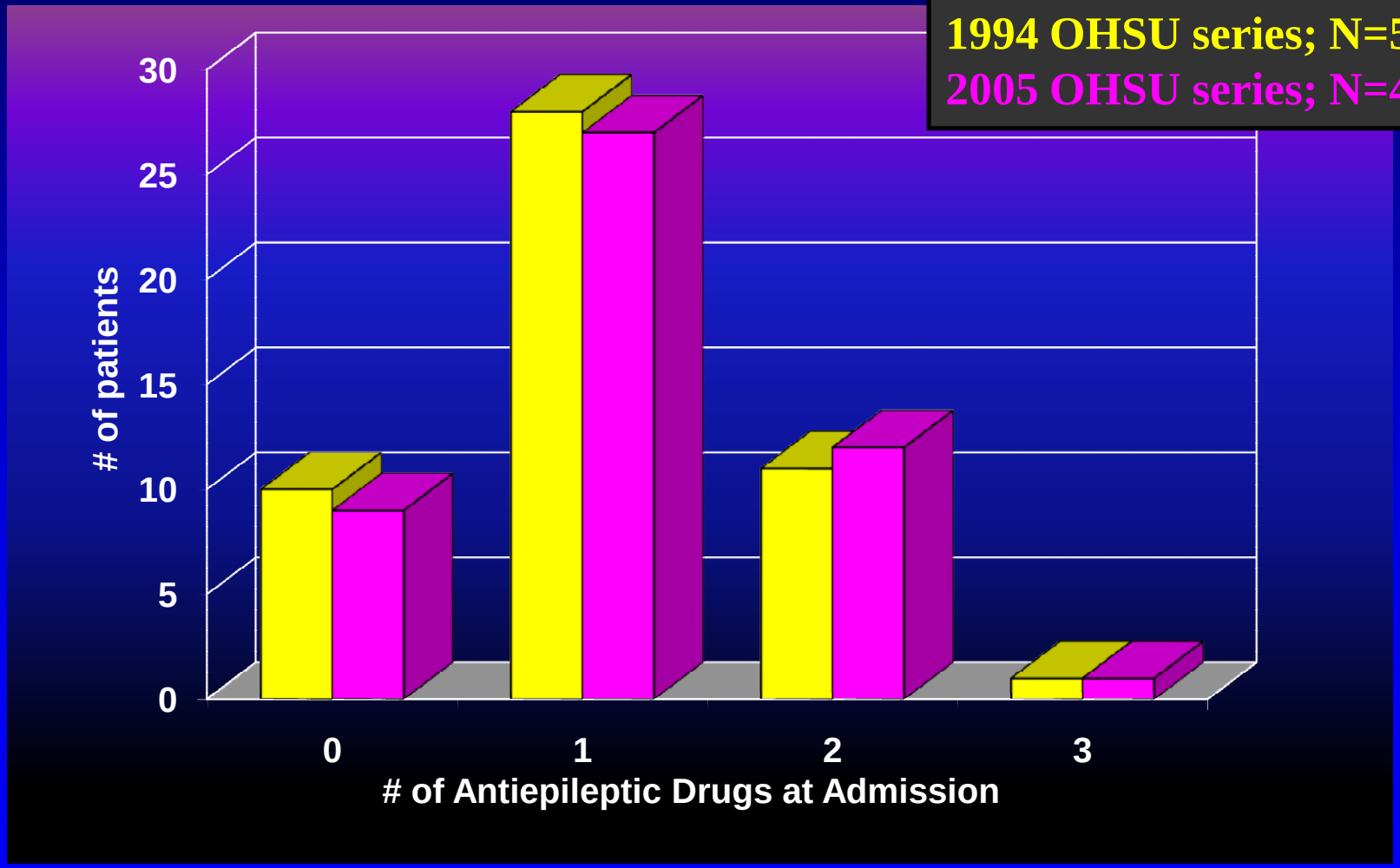
# Psychogenic seizures -
## Impact of the epilepsy diagnosis

- Restrictions on driving
- Restrictions on work
- Restrictions on activities
- Social stigma
- Locus of control issues
- Cost of assessment and treatment
- **(U.S.) 2.3-4.8 Billion dollars per year (including indirect costs; loss of productivity)**

# Psychogenic seizures - Impact of the epilepsy diagnosis

- Restrictions on driving
- Restrictions on work
- Restrictions on activities
- Social stigma
- Locus of control issues
- Cost of assessment and treatment
- Medical complications of therapy

# Psychogenic Seizures



# Psychogenic Seizures

- Psychogenic seizures (PNES)
- **PNES in Veterans**
- Treatment and Prognosis

# Epilepsy and TBI

- The most common cause of new onset epilepsy in young adults
  - 30,000 cases/yr in U.S.
- Higher risk of epilepsy with military combat TBI
  - 45% in Vietnam Head Injury Study[1];
  - Related to high rates of penetrating head injuries

[1]Raymont et al, Neurology 2010

# Psychogenic Seizures and TBI

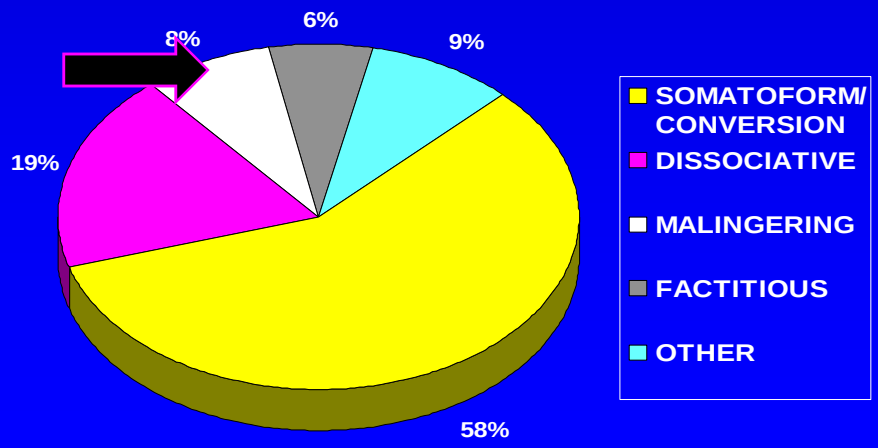
- 157 patients with PNES
  - » 24% had seizures attributed to TBI[1]
    - 78% had ‘mild’ TBI (Annegers classification)
- 102 patients with PNES
  - » 32% had seizures attributed to TBI[2]
    - 91% had ‘minor’ head injury

**Permissive event**

[1]Barry et al 1998
[2]Westbrook et al 1998
Annegars, Coan 2000

# Psychogenic Seizures
# Increased Risk in Veterans

- Relatively high rates of TBI
  - 19% of OEF/OIF
  - Increased seizure risk
  - Most common putative cause for PNES
- Relatively high rates of PTSD
  - Estimates of 20%
  - Established risk factor for PNES
- Compensation

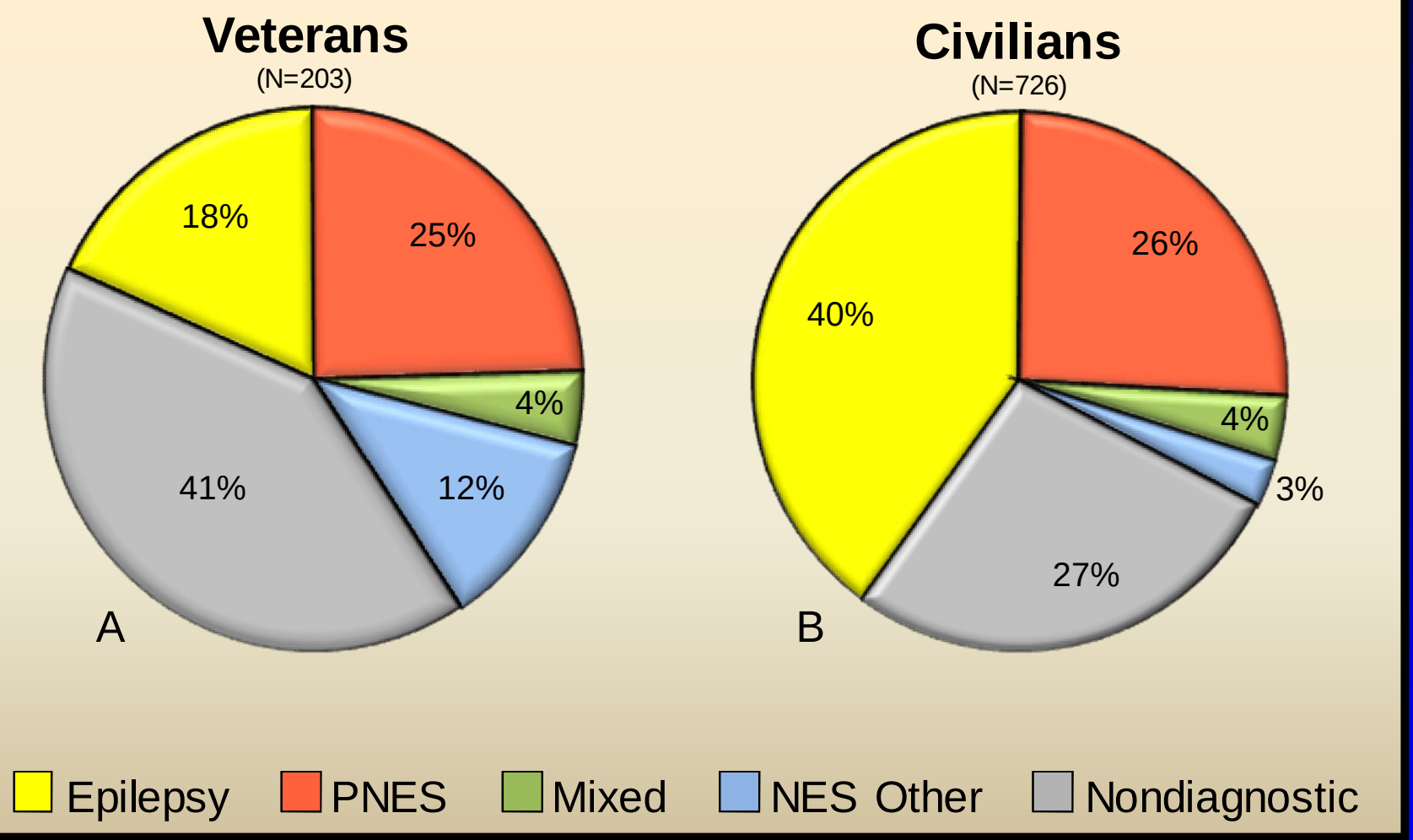


# Psychogenic Seizures (PNES) U.S. Veterans (questions)

- Are PNES more common in veterans than civilians?
  - Referred for video-EEG monitoring
- Is there a longer delay to diagnosis of PNES in veterans as compared to civilians?
- Do veterans with PNES have greater exposure to antiepileptic drugs (AEDs) as compared to civilians?

# Psychogenic Seizures in Veterans Subjects

- **Portland VAMC Epilepsy Monitoring Unit 2000-2010**
  - **Shared by patients from VA and civilians (from Oregon Health & Science University)**
  - **All patients evaluated by same care team, with same equipment and protocols**

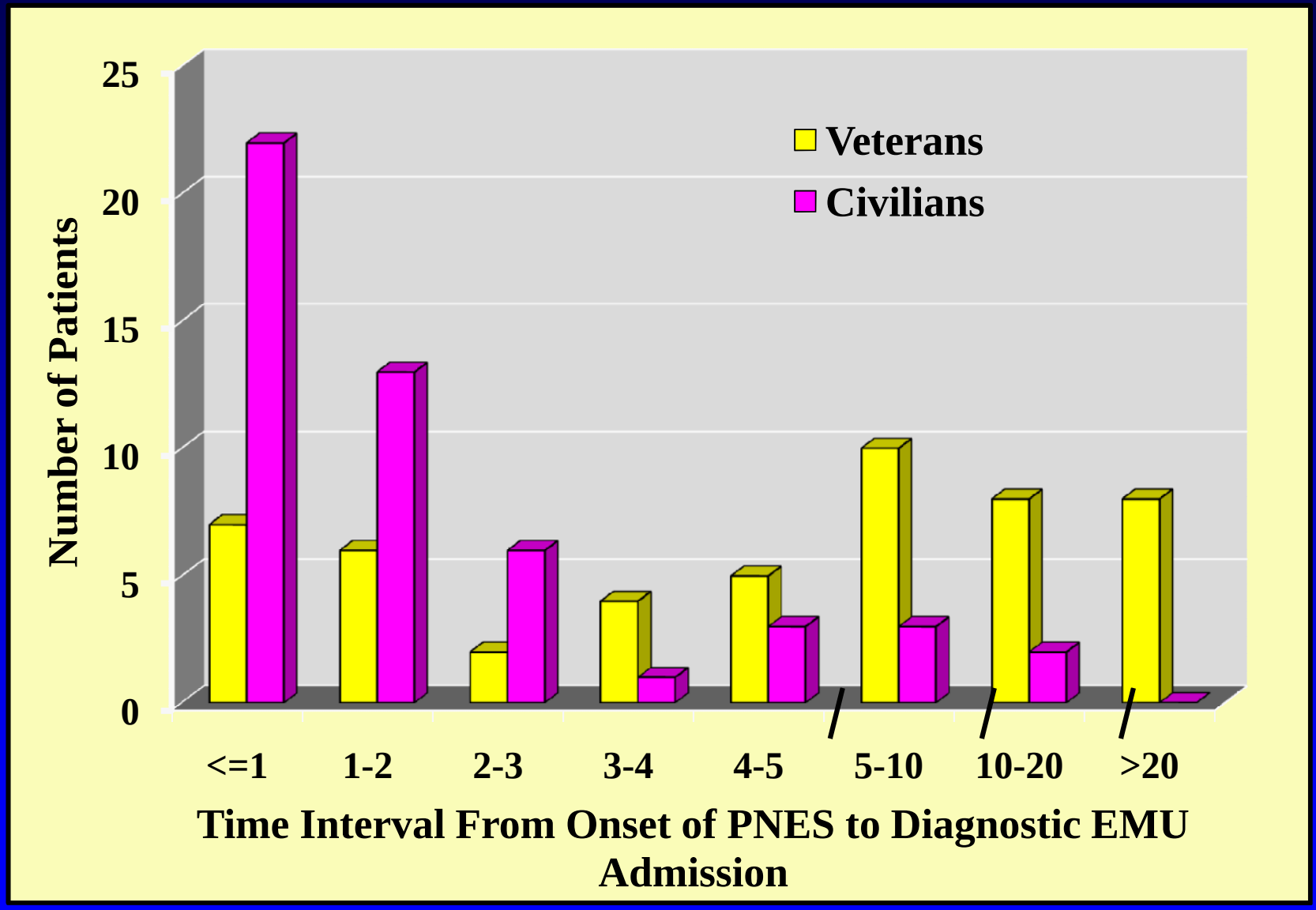



**PNES – Psychogenic non-epileptic seizures**
**ES – Epileptic seizures**
**NES other – Syncope, parasomnia, other**
**Mixed – PNES + ES**

# Psychogenic seizures
# Veterans Compared to Civilians

| | Veterans | Civilians | p |
|---|---|---|---|
| Number of PNES patients | 50 | 50 | |
| Age at EMU admission (median) | 49.0 (24-66) | 34.5 (19-74) | <0.001 (W) |
| Sex (% male) | 80 | 26 | <0.001 (F) |
| % using AEDs at admission | 72% | 80% | ns |
| # AEDs at admission (median) | 1 (0-3) | 1 (0-3) | ns |
| Cumulative AED-years (median) | 4.0 (0-50) | 1.0 (0-30) | <0.01 (W) |
| Interval from onset of spells to diagnostic EMU admission in months (median) | 60.5 (3-408) | 12.5 (2-144) | <0.001 (W) |

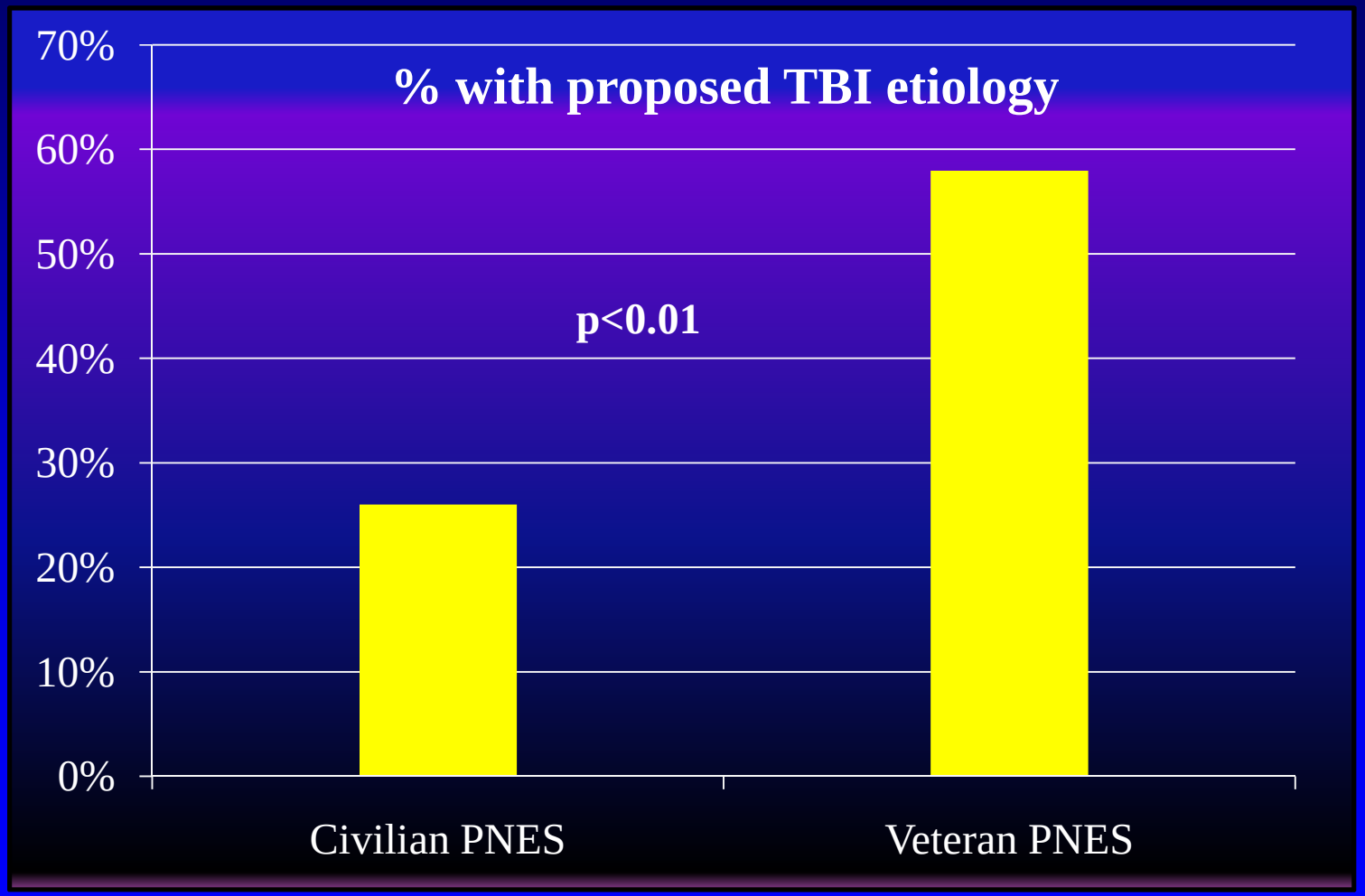
F – Fishers Exact test  W – Wilcoxon test


Number of Patients
25
20
15
10
5
0
Veterans
Civilians
<=1
1-2
2-3
3-4
4-5
5-10
10-20
>20
Time Interval From Onset of PNES to Diagnostic EMU Admission

# PNES in Veterans

- Why the delay in diagnosis?
  - » Availability of EMUs within VAMC?
    - – 50% of patients from states with no VA EMUs
    - – Recent creation of the VA Epilepsy Centers of Excellence
  - » Acceptance of seizures related to TBI?
    - – Primary provider index of suspicion?

# Proposed Etiology of PNES
# Veterans




**For veterans with PNES >50% of TBIs were military**

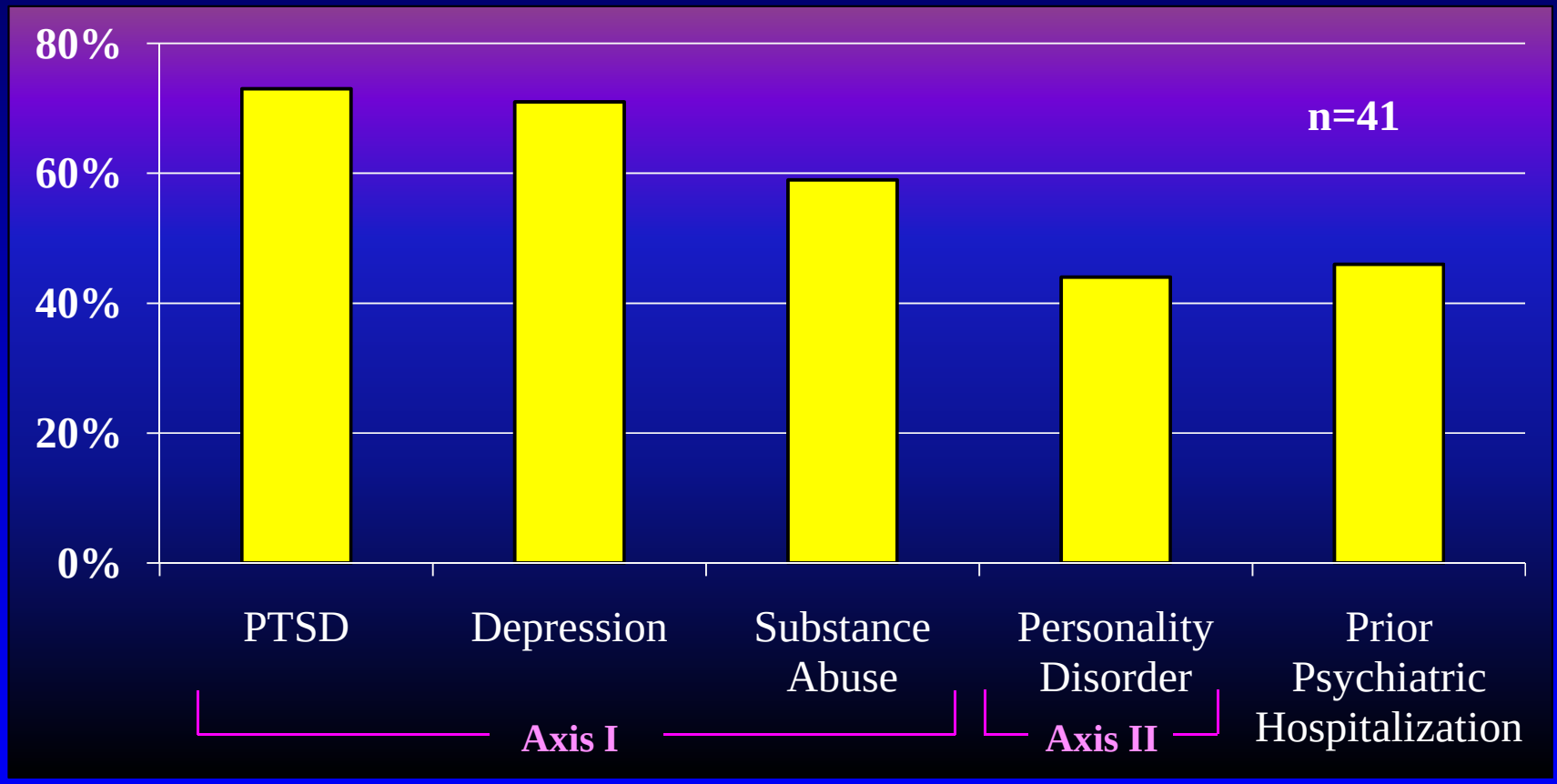
# PNES in Veterans: Questions

- What are the psychiatric disorders leading to PNES?
  - » The relationship to TBI?
  - » To PTSD?
- What therapeutic approaches can be used?

# Psychogenic Seizures in Veterans
## Psychiatric Diagnoses (prior to diagnosis)

- Median of 72 months of records available for review
  - » Prior to diagnosis of PNES
- 41/50 veterans with PNES had prior mental health evaluations available
  - » Median of 3 axis I diagnoses/patient

# Psychogenic Seizures in Veterans
## Psychiatric Diagnoses (prior to diagnosis)



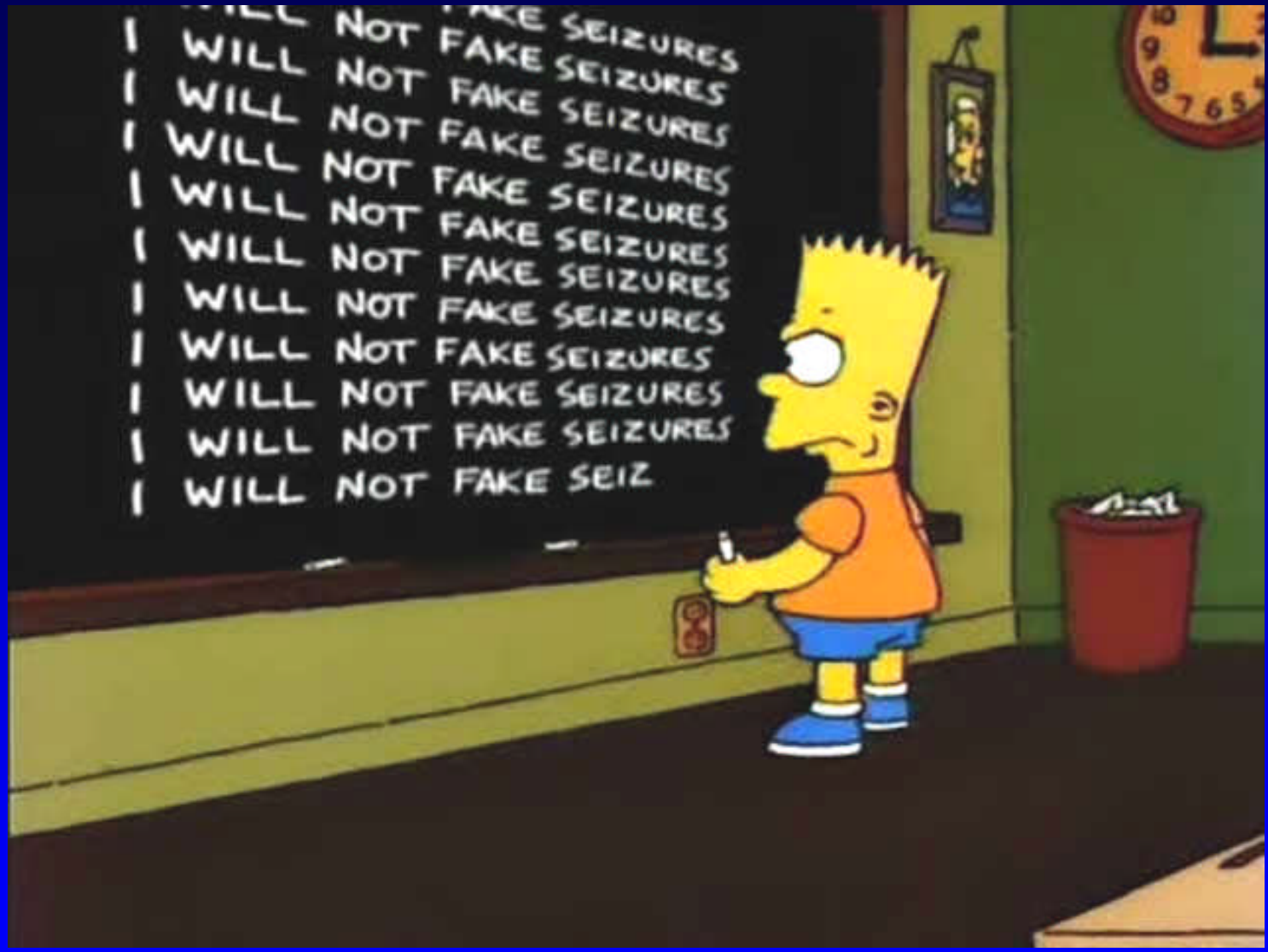

- 15 other axis I diagnoses were represented.
- PTSD attributed to civilian trauma in 13 patients, combat trauma in 10, and military sexual trauma in 4.
- Axis II; primarily borderline or NOS

# Psychogenic Seizures

- Psychogenic seizures (PNES)
- PNES in Veterans
- Treatment and Prognosis

# Psychogenic Seizures - Treatment (conventional)

- Honest, supportive, conclusive presentation of the diagnosis
- Explain the nature of PNES
- Discontinue antiepileptic drugs if not needed
- Mental health referral
  - » Supportive counseling


I WILL NOT FAKE SEIZURES
I WILL NOT FAKE SEIZURES
I WILL NOT FAKE SEIZURES
I WILL NOT FAKE SEIZURES
I WILL NOT FAKE SEIZURES
I WILL NOT FAKE SEIZURES
I WILL NOT FAKE SEIZURES
I WILL NOT FAKE SEIZURES
I WILL NOT FAKE SEIZURES
I WILL NOT FAKE SEIZ

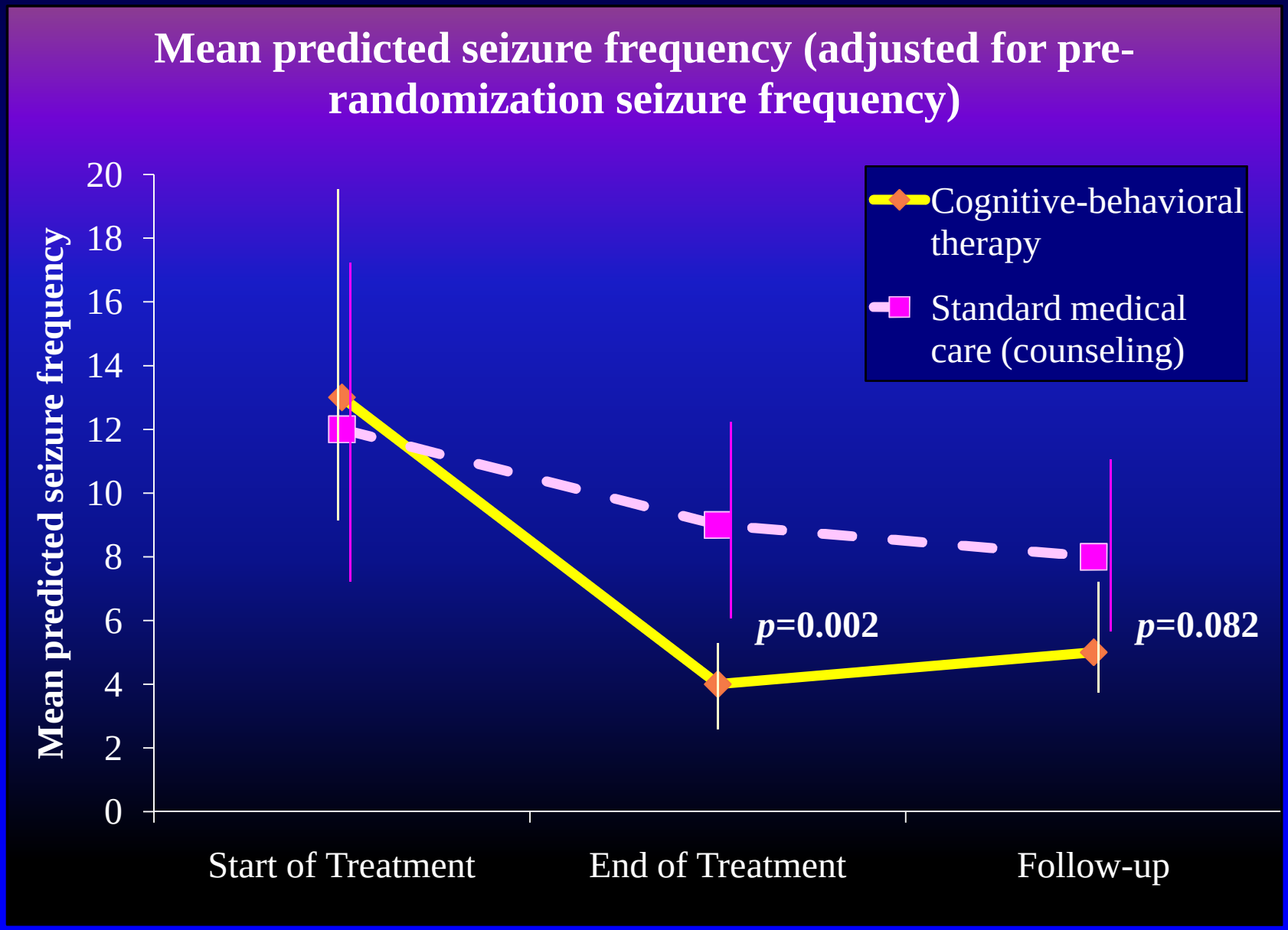
# Psychogenic Seizures - Treatment

- Psychotherapy
- Cognitive-Behavioral
- Medication
- Meditation
- Biofeedback
- EMDR
- Relaxation therapy

**No validated treatments or controlled trials**

-Cochrane Review 2005
-NES Treatment Workshop 2006

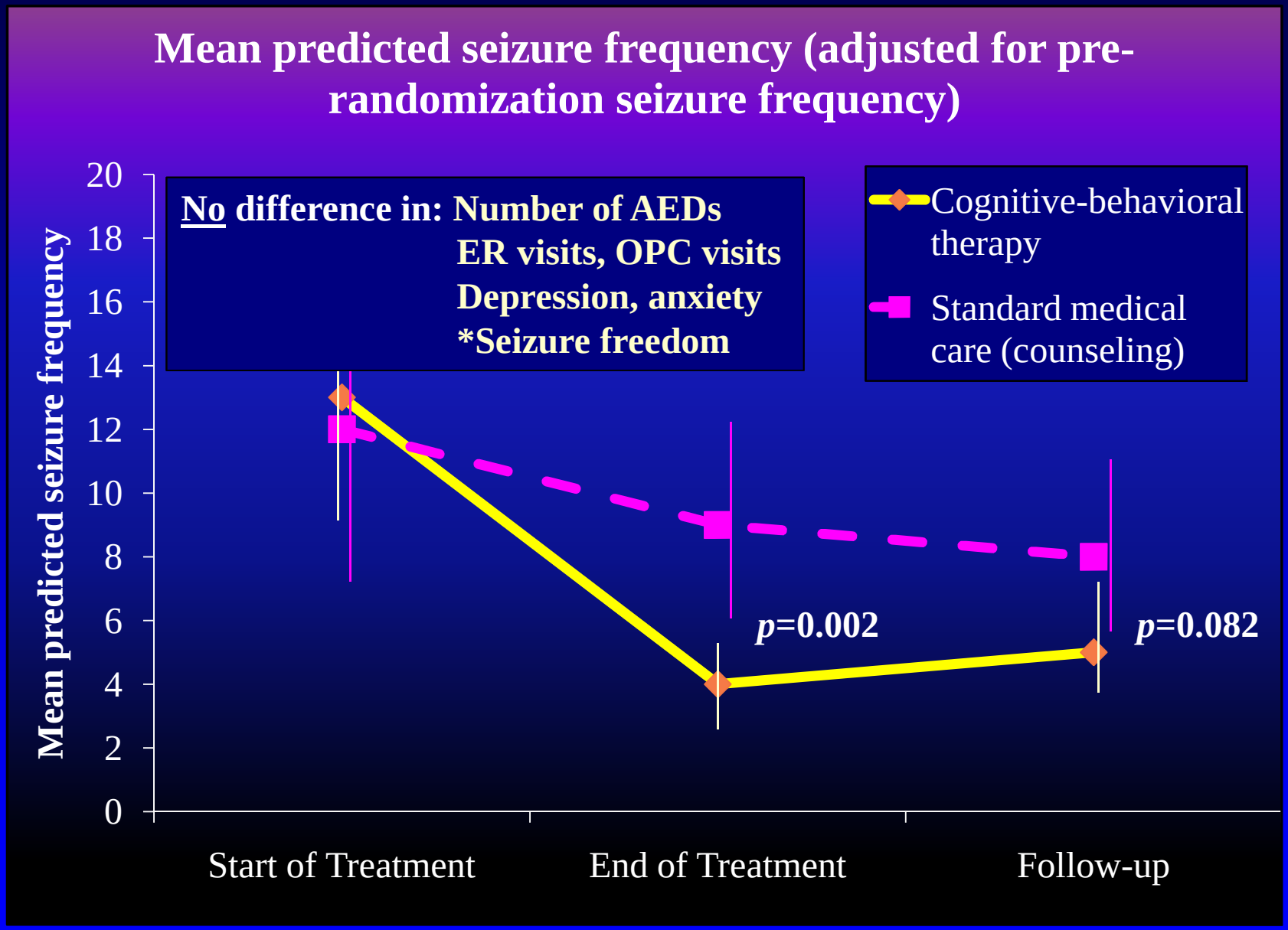
## Mean predicted seizure frequency (adjusted for pre-randomization seizure frequency)




**3 month treatment; 6 month follow-up**

**Goldstein et al, Neurology, 2010**

## Mean predicted seizure frequency (adjusted for pre-randomization seizure frequency)




**3 month treatment; 6 month follow-up**

Goldstein et al, Neurology, 2010

# Psychogenic Seizures
## Outcome (diagnosis matters)

| Author | N/ % f/u | f/u interval; months (SD) | Seizure free (interval) | AED free |
|---|---|---|---|---|
| Selwa, 2000 | 85/67 | 19-48 | 40% (?)# | 68% |
| Kanner, 1999 | 45/100 | 6-26 | 29% (6 months) | ? |
| Walczak, 1995 | 72/71 | 12-27 | 35% (6 months)# | 53% |
| Ettinger, 1999 | 76/74 | 18 (10) | 52% (?) | 59% |
| Reuber, 2003 | 210/47 | 49 (3) | 56% (?)*# | 48% |
| McKenzie, 2010 | 260/72 | 6-12 | 38% (2 mo.) | 75% |

**#Shorter duration of illness at diagnosis correlated with better outcome**
***Younger age at diagnosis correlated with better outcome**

# Psychogenic Seizures
## Outcome (diagnosis matters)

| | Baseline | 6-12 mo. f/u | p |
|---|---|---|---|
| % spell free > 2 mo. | | 38 | <0.001 |
| % >50% reduction in spells | | 61 | |
| % with ER visits / hosp. admissions | 49.7 | 15.5 | <0.001 |
| % employed | 10.2 | 23.5 | <0.001 |
| % using AEDs | 52.3 | 13.2 | <0.001 |
| % drawing social security | 62.6 | 61.5 | ns |

**No specific treatment given; most patients had little or no treatment (c/w results of previous studies)**

**Factors associated with seizure-free outcome included :**

**Not drawing social security (2.3x)**

**Male (2.5x)**

**No prior dx of anxiety or depression (2.3x)**

**McKenzie et al; Neurology, 2010**

# Psychogenic Seizures –
## Outcome predictors at 6 Months

- 29% were free of all seizures
- Poorer outcome associated with history:
  - Recurrent major depression
  - Personality disorders
  - Dissociative disorders
  - New somatic symptoms after diagnosis

Kanner et al 1999

# Whack-A-Mole Syndrome

# Epileptic Seizures Mistaken for Psychogenic Seizures

(also called pseudo-pseudoseizures)

# ‘Pseudo-pseudoseizures’

- Frontal lobe epilepsies
  - Complex automatisms
- Unusual seizure semiology
  - Gelastic seizures
- ‘Panic attack’ like symptoms
  - Temporal lobe seizures

# Ictal EEG can be Misleading

- **Simple Partial Seizures**
  - » 21% of 87 episodes revealed an ictal EEG pattern
- **Complex Partial Seizures**
  - » Rarely, no surface EEG correlate

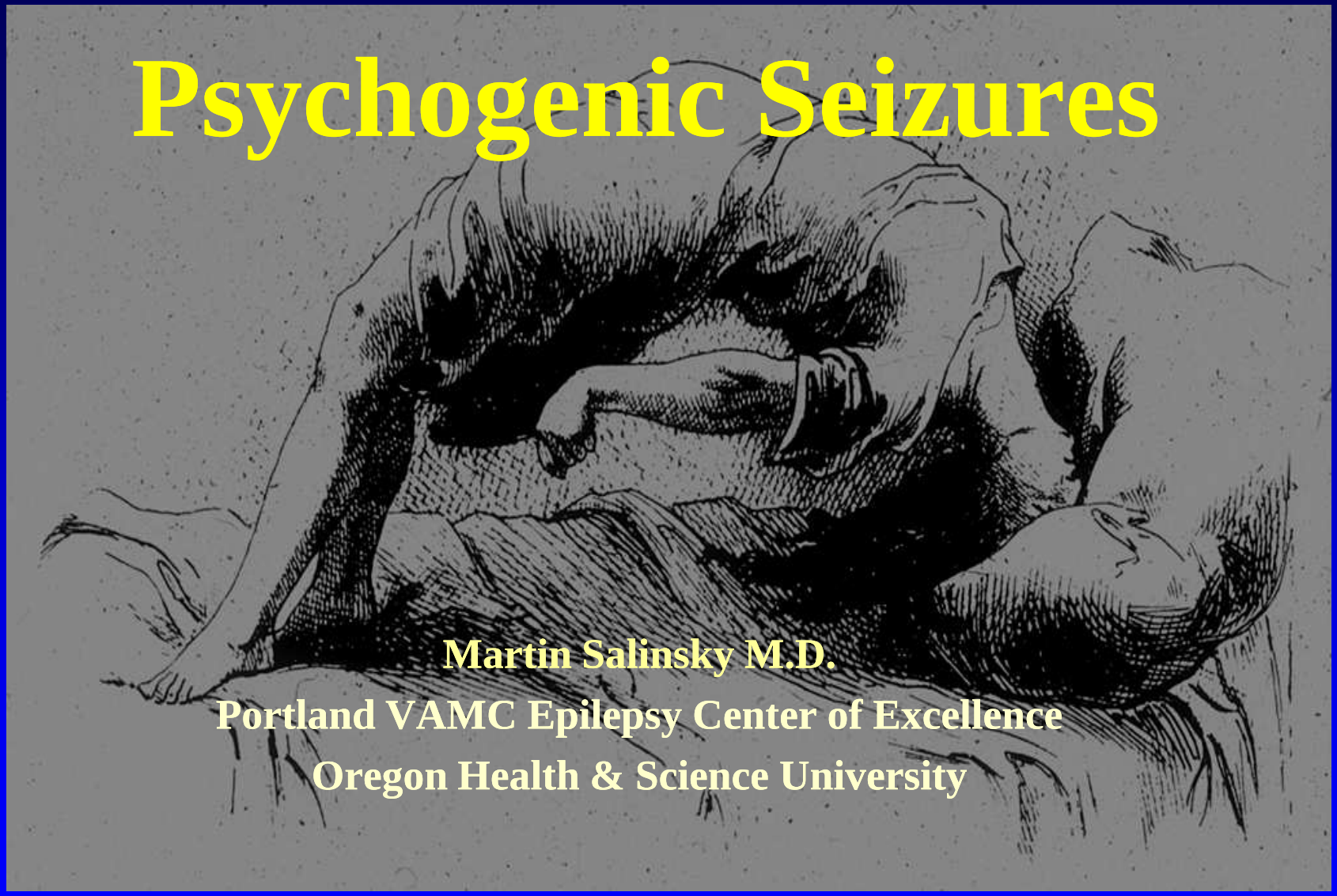
**Beware ‘Frontal lobe epilepsy’**

Devinsky, 1988

# Summary: Psychogenic Seizures

- Common
  - » 10-20% of patients with medically refractory seizures
    - ? More within the VA system
- Symptoms of psychiatric disorders
  - » Clue to early recognition
  - » Opportunity for intervention
- Treatment remains problematic
  - » Diagnosis alone often leads to improvement
  - » Early diagnosis can decrease disability and may improve long-term outcome

# Psychogenic Seizures



**Martin Salinsky M.D.**
**Portland VAMC Epilepsy Center of Excellence**
**Oregon Health & Science University**