

Suicide and ECT

- Suicide is a major, preventable health problem
- Suicide in 2004
 - 32,439 deaths
 - 11th leading cause of death
 - Overall rate is 10.9 per 100,000
 - 14.3 per 100,000 age 65 and over
 - Estimated 8 to 25 attempts per completed suicide
- ECT reduces suicide risk and suicidal drive

Efficacy of ECT in Major Depression

Findings from the
Consortium for Research in
ECT (CORE) Study

The CORE Study



TRIAL DESIGN

Acute Phase (Phase I): *Thrice Weekly ECT*

Remitters

HAM-D ≤ 10 & HAM-D Reduction $\geq 60\%$

Interim Week

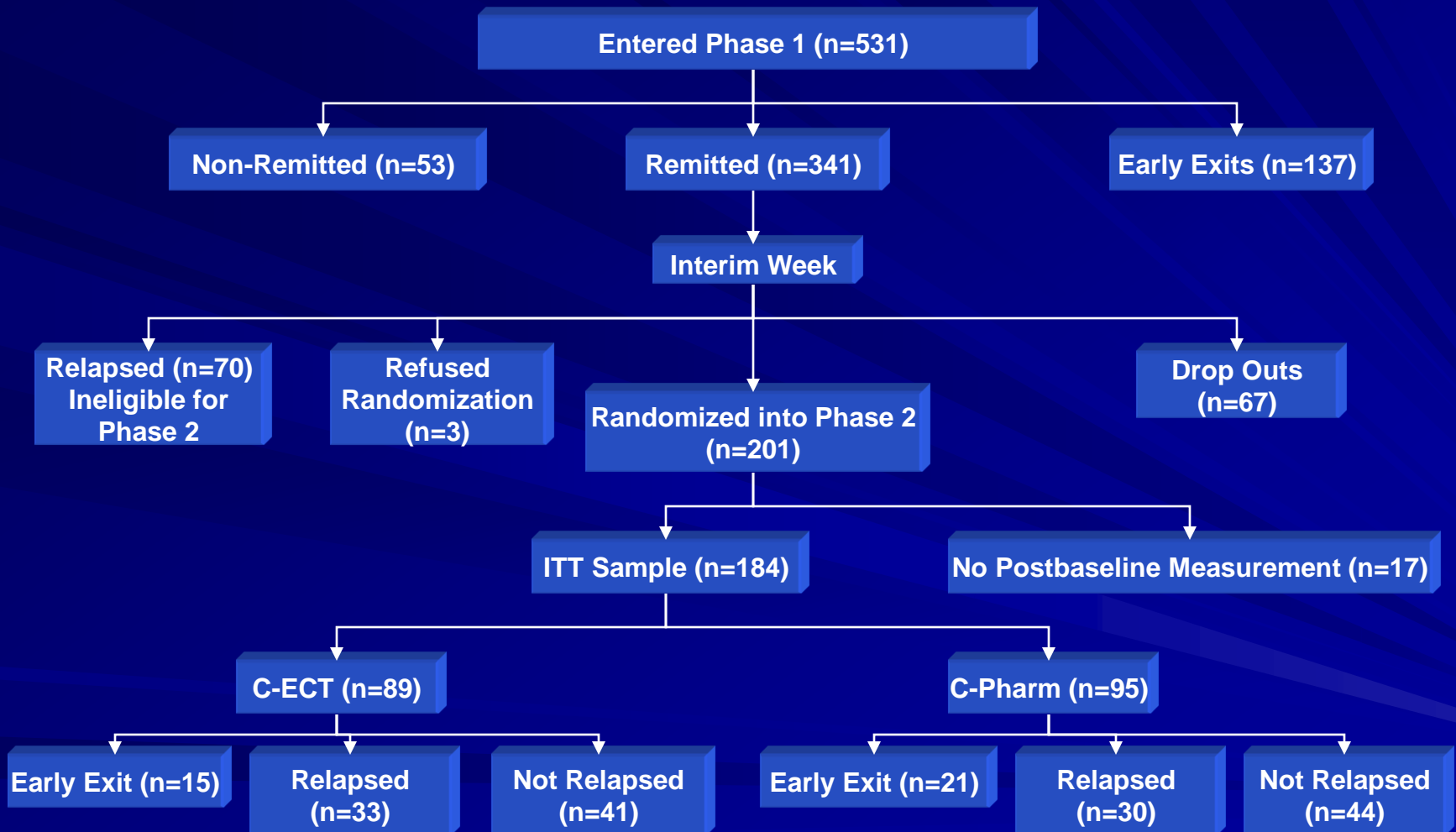
Remain Remitted for 1 Week

Randomized Phase (Phase II): *Randomized to:*

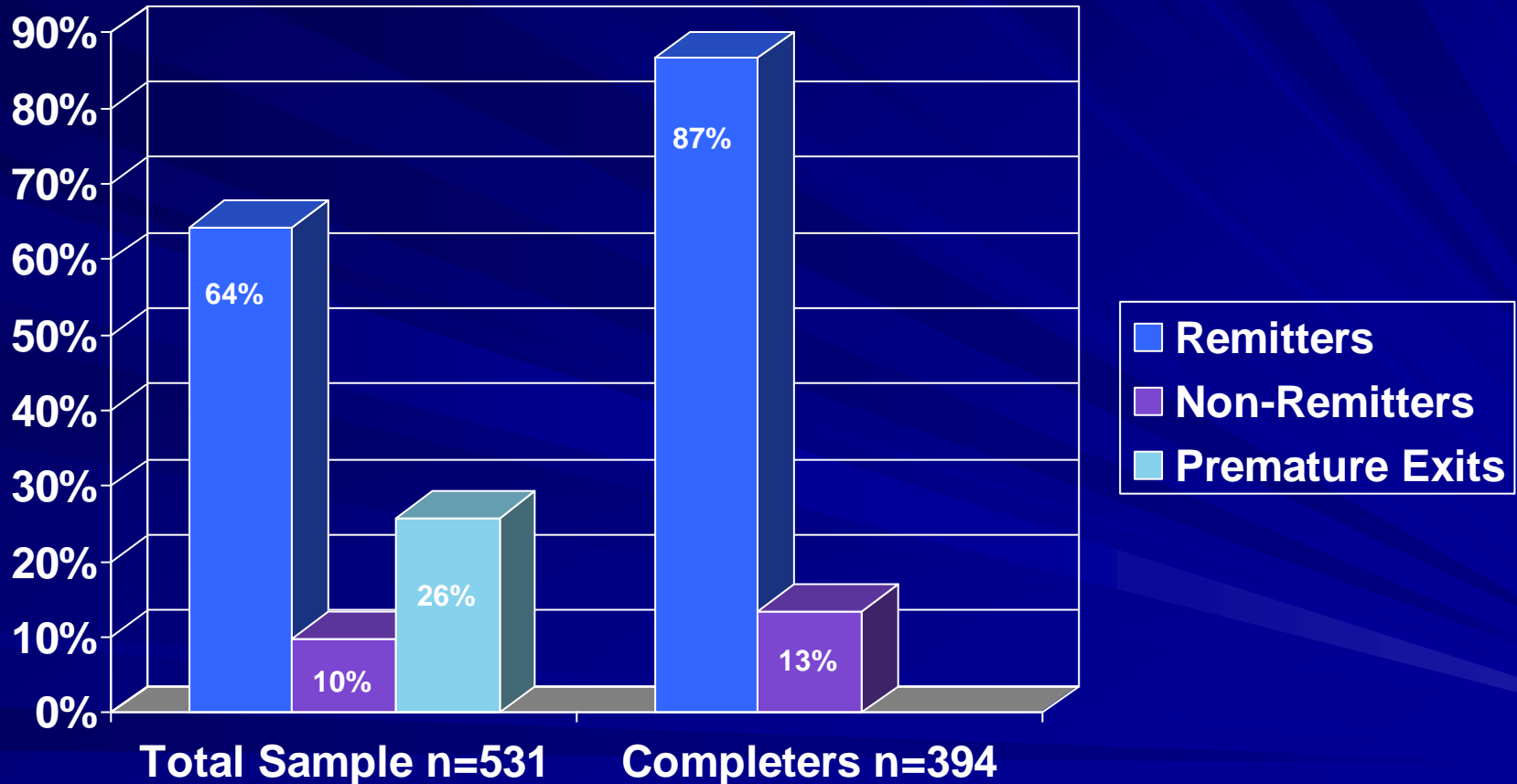
Continuation
ECT

Continuation Pharmacotherapy
(*lithium + nortriptyline*)

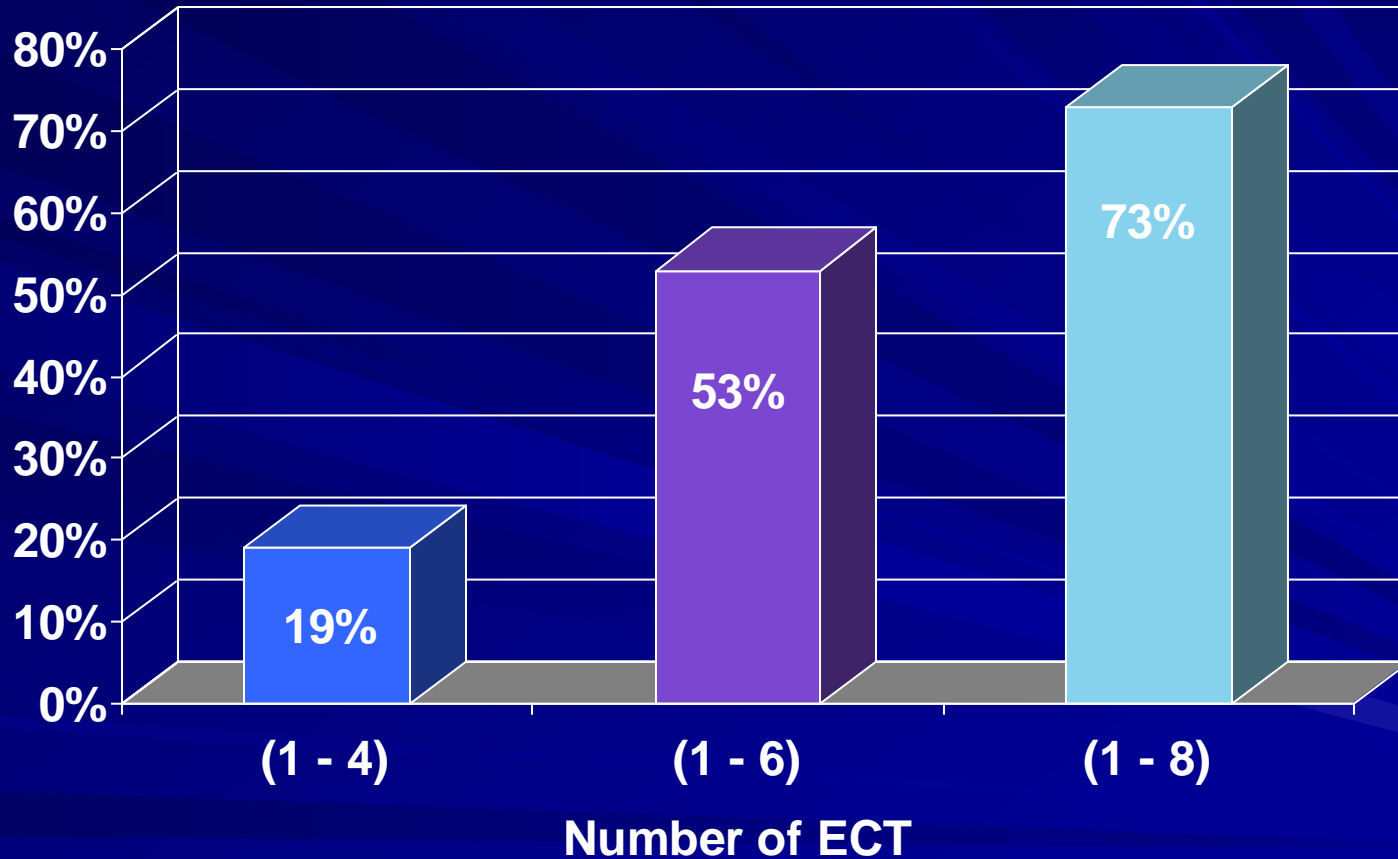
CORE C-ECT vs. C-Pharm Results



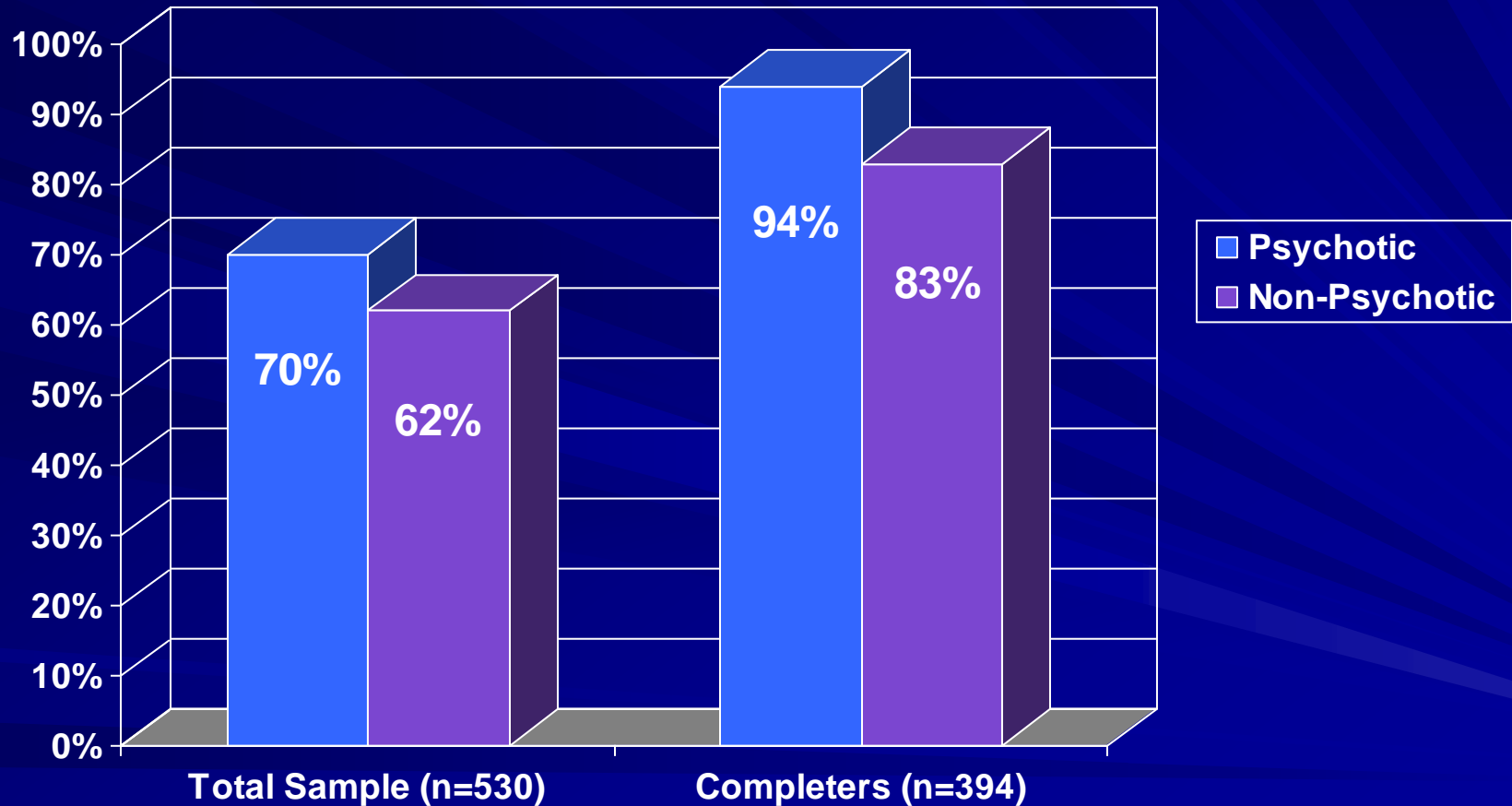
Response Status for Patients Entering and Completing Acute Phase



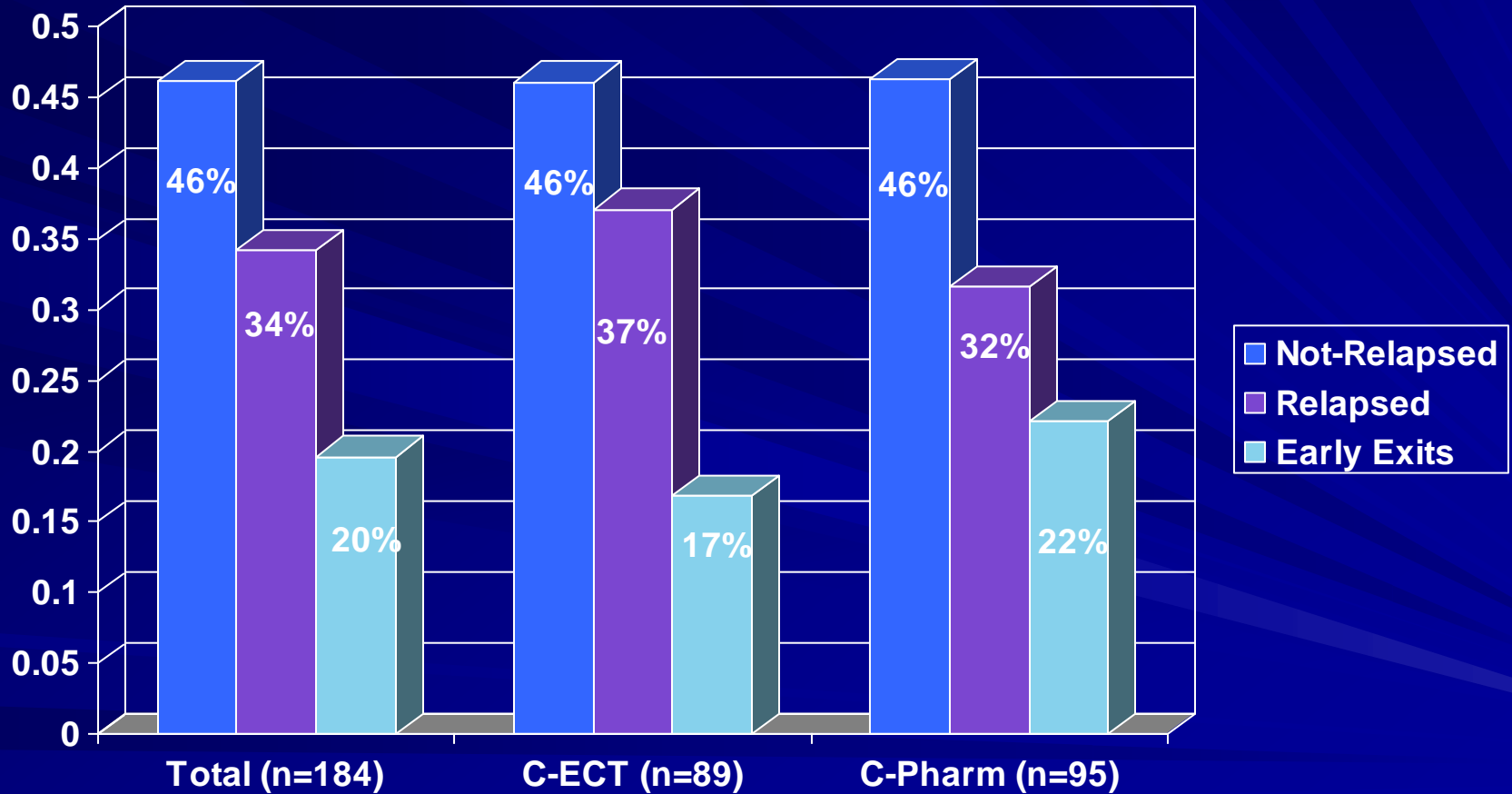
Proportion of Patients Remitting by ECT Number



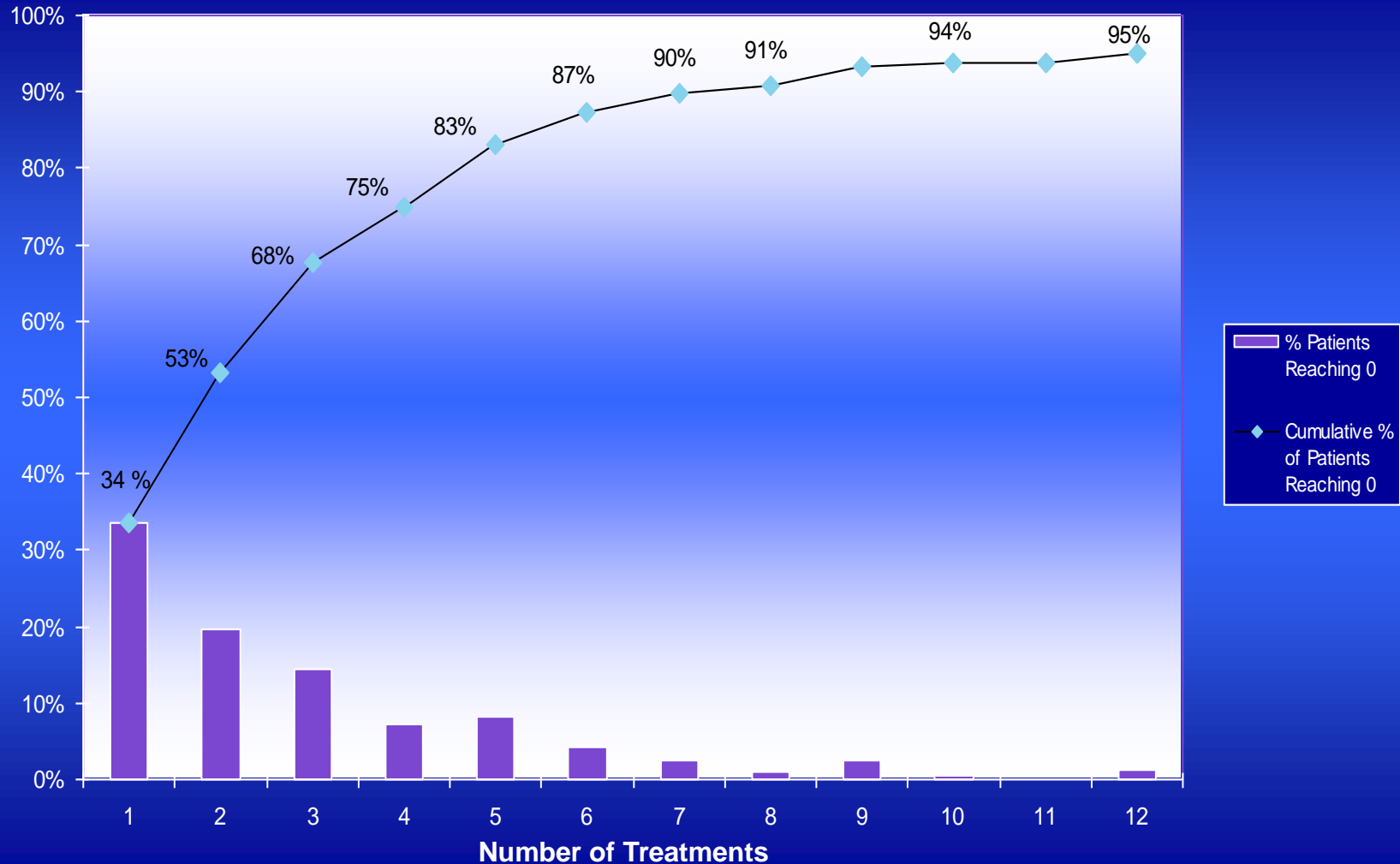
Remission Rates for Psychotic and Non-Psychotic Patients



Relapse Status at 6 Months



Number of ECT Needed to Resolve Suicide Risk Among All Patients with Baseline Self-Rating ≥ 2



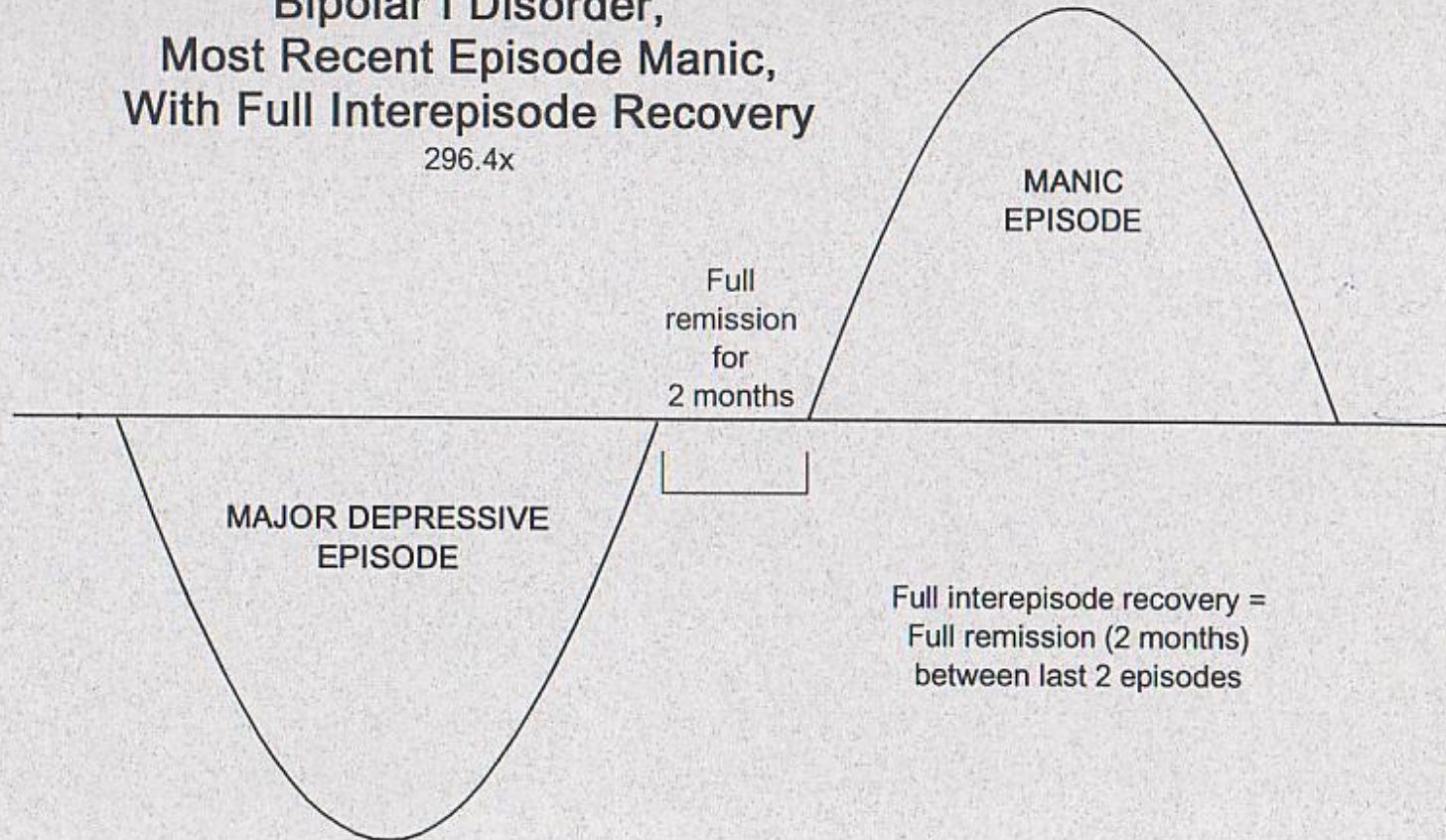
Conclusions

- Bilateral ECT results in high remission rates
- Psychotic depression responds particularly well to ECT
- Continuation ECT is an effective alternative to pharmacotherapy for relapse prevention

Mania

Bipolar I Disorder,
Most Recent Episode Manic,
With Full Interepisode Recovery

296.4x



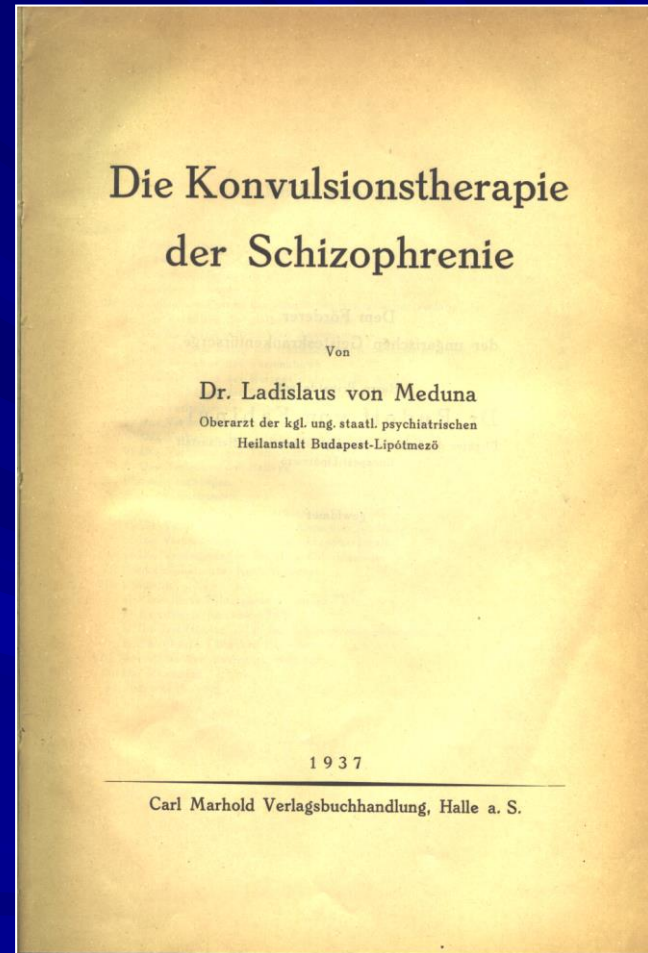
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Mania

- ECT effective in acute mania
 - 70-80% of patient achieve remission or marked improvement
 - Clinical trials with anti-manic agents report non-response rates over 30%
 - Substantial number of medication-resistant patients benefit from ECT
- ECT generally reserved for those who do not respond to medications
 - American and Canadian Psychiatric Associations consider ECT 2nd-line treatment
 - Except when rapid-onset of action is needed
 - There is still a paucity of evidence about the comparative efficacy of ECT and treatment options for mania

Schizophrenia

- Currently, usually reserved for patients with treatment-resistant schizophrenia
 - There is evidence that combination of ECT and antipsychotic medications is more efficacious than either alone
 - Main benefit seems to be an acceleration of treatment response



Schizophrenia

- Patients with psychotic exacerbations and short episode duration are more likely to benefit
- Features predictive of good outcomes
 - Prominent delusions and hallucinations
 - Fewer premorbid schizoid personality traits
 - Presence of catatonic symptoms

Catatonia



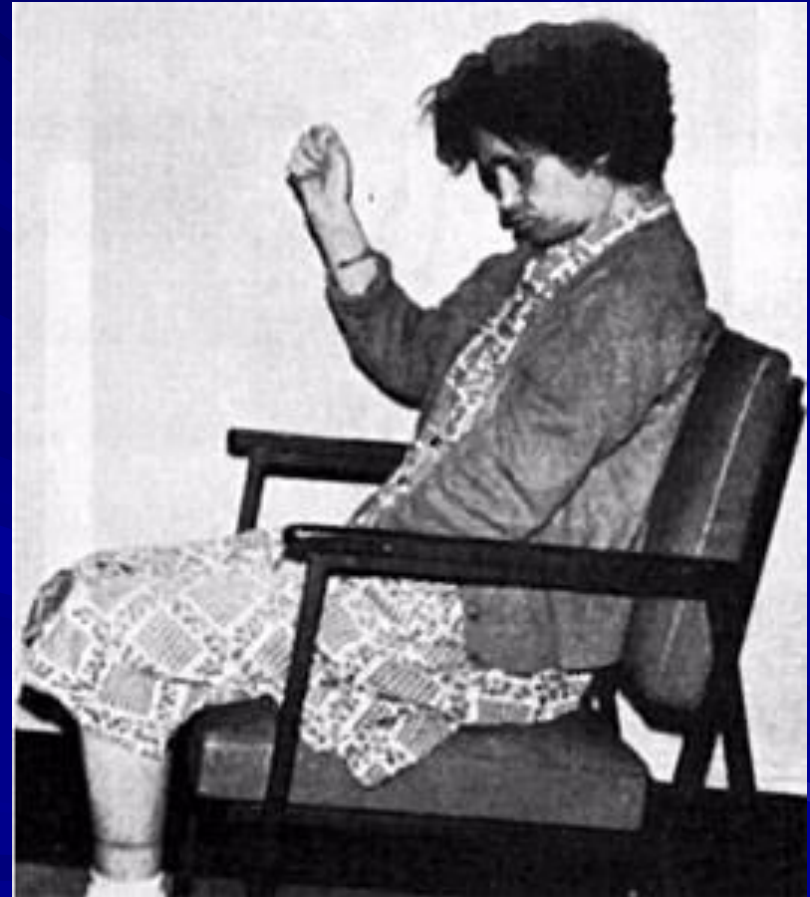
- A motor syndrome in psychiatric patients
- Found in:
 - Mania
 - Depression
 - Systemic diseases
 - Toxic syndromes
 - Schizophrenia
 - Neurologic disorders

“The patient remains entirely motionless, without speaking, and with a rigid, masklike facies, the eyes focused at a distance; he seems devoid of any will to move or react to any stimuli; there may be fully developed ‘waxen’ flexibility, as in cataleptic states. The general impression conveyed by such patients is one of profound mental anguish.”

Kahlbaum 1874

Catatonia

- Prevalence of catatonia among psychiatric patients ranges from 7.6% to 38%
- Most catatonic patients have a mood disorder
 - Particularly mania
- 20% of patients with mania exhibit catatonic features
- Syndrome has an excellent short-term prognosis



Catatonia

Primary Signs

- Mutism
- Immobility/ Stupor
- Staring
- Posturing
- Negativism
- Grimacing

Associated Signs

- Rigidity
- Mannerisms
- Stereotypy
- Echophenomena
- Waxy flexibility
- Perseveration

Treatment

- Benzodiazepines: Lorazepam
 - IV or PO
 - Give until relief of symptoms or sleep
- ECT is the definitive treatment
- Antipsychotics
 - May exacerbate syndrome
 - Even the atypical antipsychotics may induce neuroleptic malignant syndrome in catatonic patients

Adverse Effects

- ECT is the safest procedure performed under general anesthesia
 - Mortality rate $\leq 0.002\%$
- Medical morbidity results from the anesthetic administration or the physiological consequences of the induced seizure
 - Transient blood pressure and heart rate changes
 - Arrhythmias
- Common, non-serious side effects include headache, nausea, and muscle aches

Adverse Effects

- The cognitive effects of ECT remain an issue of concern and controversy in the field
 - For the vast majority of patients, these effects are mild and acceptable
 - For a small minority they may be considerably more extensive
- The extent of cognitive impairment (*primarily retrograde amnesia*) is proportional to the intensity of the ECT administered

ECT May Cause Three Types of Memory Disturbance

■ Acute Confusional State

- Lasting up to an hour after each treatment and varies with age
- Consequence of both the seizure and the anesthetic agents

■ Retrograde Amnesia

- Affects memories of events from the period of illness and treatment
- Greater for public events than for personal information
- A small subset of patients will complain of more severe symptoms not matched by objective cognitive testing

■ Anterograde Amnesia

- Anterograde amnesia refers to the impairment in retaining new memories after ECT
- This deficit typically resolves within 1 to 3 weeks after a course of ECT

*1,250 Electroconvulsive Treatments without
Evidence of Brain Injury*

Technique

- Bilateral ECT remains the “gold standard”
 - Associated with more short-term and long-term cognitive side effects than right-unilateral ECT
- Historical debate as to the relative effectiveness of unilateral vs. bilateral ECT
 - Literature confounded by less-than-optimal electrode placement or dosing strategies for unilateral ECT

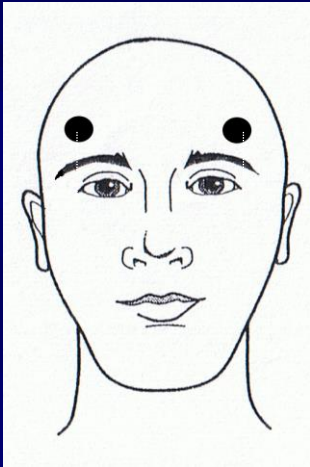


Thymatron

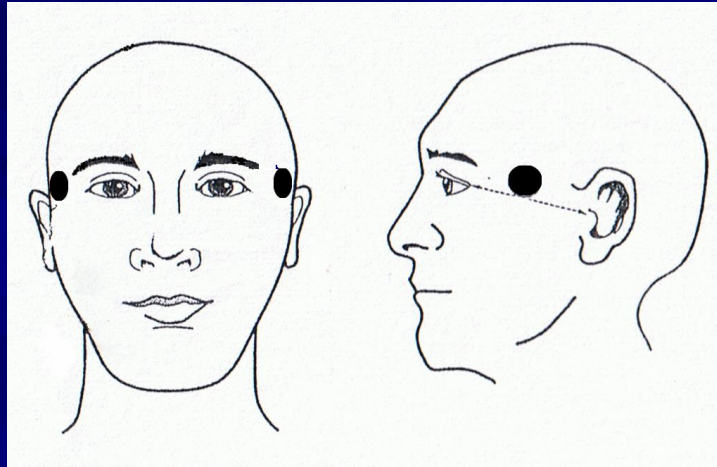


Mecta Spectra 5000

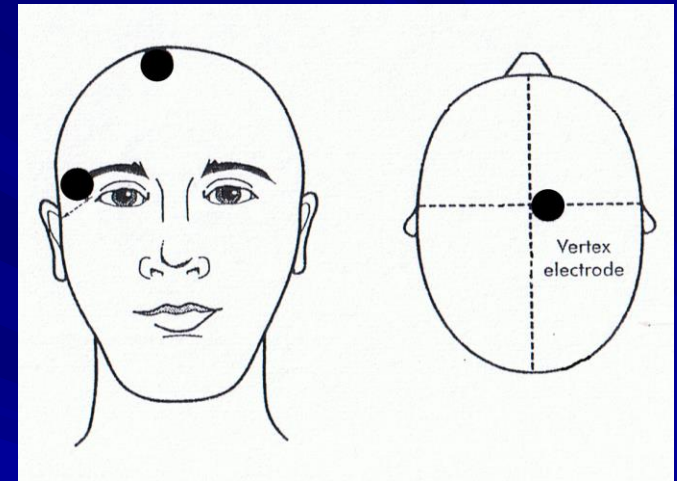
Electrode Placement



Bi-Frontal



Bi-Temporal



Right Unilateral

Drugs for Anesthesia

■ Anesthetic Agents

- Rapid onset of action and short duration preferable
- Methohexital ($0.75 - 1 \text{ mg/kg}$)
 - Short-acting barbiturate
 - Most commonly used
 - Low anticonvulsant effect
 - Low cost
- Thiopental ($2 - 5 \text{ mg/kg}$)
 - Greater risk of cardiac side effects
- Ketamine ($0.5 - 1 \text{ mg/kg}$)
 - Proconvulsant
 - Tends to worsen ECT induced HR and BP changes
- Propofol ($2 - 3 \text{ mg/kg}$)
 - Anticonvulsant effects
- Etomidate ($0.2 - 0.3 \text{ mg/kg}$)
 - Few cardiac effects

■ Muscle Relaxants

- Succinylcholine ($0.5 - 1.5 \text{ mg/kg}$)
 - Depolarizing agent - leads to visible fasciculations
 - Rapid onset (1- 2 minutes)
 - Duration of action less than 10 minutes
 - Easy to use and low cost
 - Agent of choice

■ Anticholinergics

- Used to blunt asystole associated with electrical shock and to control excessive salivation
- Atropine ($0.4 - 1 \text{ mg}$)
 - Centrally acting leading to CNS effects
- Glycopyrrolate ($0.1 - 0.4 \text{ mg}$)
 - Peripherally acting

Technique

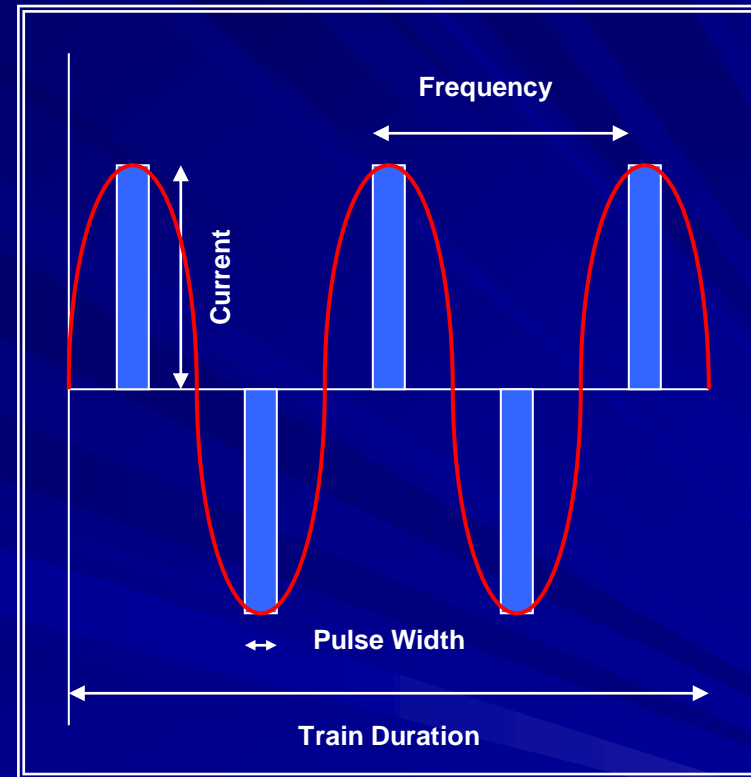
- For many years, it was assumed that all seizures were equally efficacious
- Stimulus dose affects efficacy
 - Especially in RUL ECT
 - The degree to which stimulus intensity exceeds seizure threshold, and not the absolute stimulus dose administered, is critical in determining outcome

Technique

- Changes in seizure threshold occur in less than 20% of patients during the treatment course
- Seizure should be monitored during every treatment
 - Motor and EEG
- Stimulus dosing must be adjusted when an inadequate seizure is induced

Stimulus and Dosing Recommendations

- Constant Current
- Waveform
 - Brief-pulse
 - Sine-wave considered obsolete
- Dose
 - Maximum Outputs in USA limited to 504-576 mC
 - Higher in rest of the world
 - Bitemporal/Bifrontal
 - Minimally Dose Sensitive
 - Unilateral
 - Strong dose-response relationship



*Parameters in a bidirectional brief pulse stimulation
(overlapping sine-wave)*

Treatment

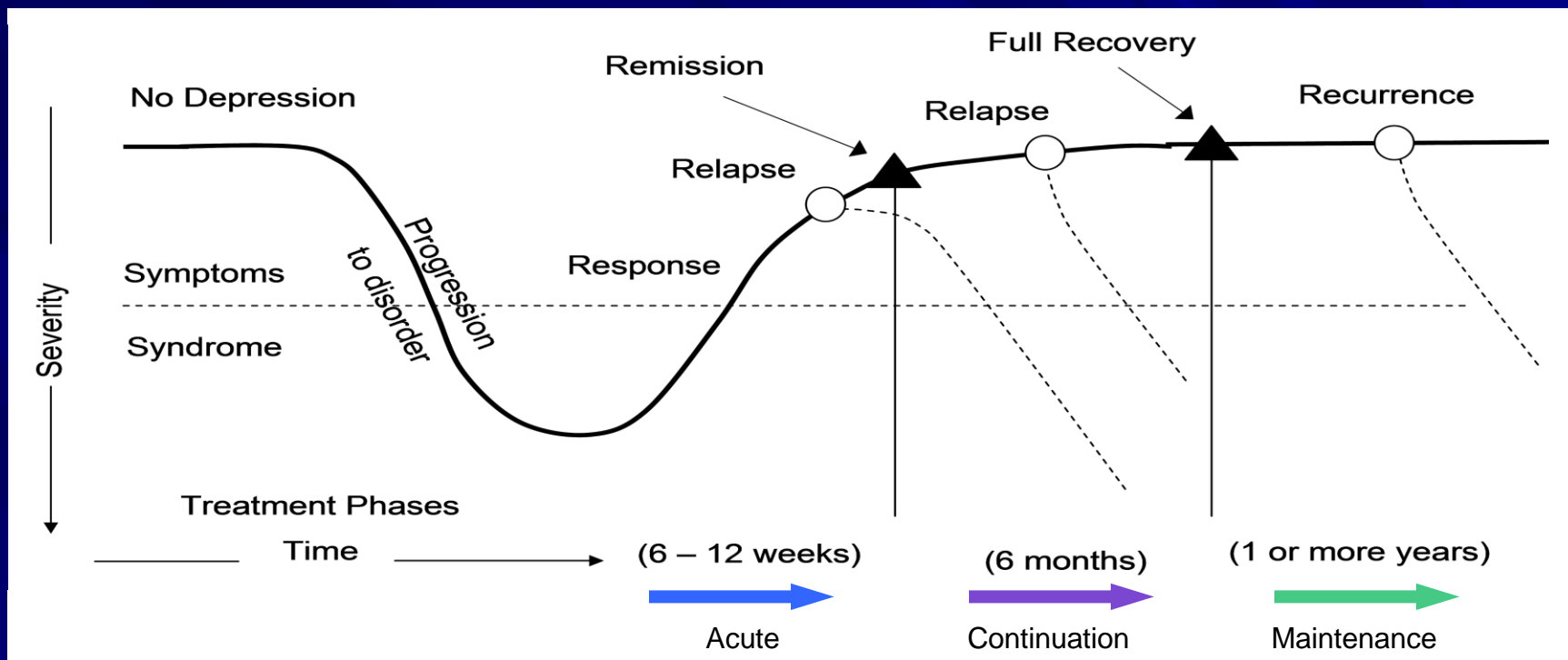
Number of Treatments

- No fixed number of treatments in a “Course”
- 6-12 treatments are *usually* needed for a response to occur
- Treat until the patient is well
 - Or no further improvement over two treatments
- Continuation treatment is necessary

Twice a week ECT

- An effective schedule
- Therapeutic outcome not different from three times a week ECT
- Slower onset of action
- Less cognitive effects
- ECT three times a week specifically indicated when early onset of clinical effect is of primary importance

Three Phases of Treatment



- Continuation treatment is necessary to sustain remission
- Relapse rates after ECT
 - Placebo: 84%
 - Nortriptyline: 60%; Nortriptyline and Lithium: 32 – 39%
 - Continuation ECT: 32%