Electroconvulsive Therapy

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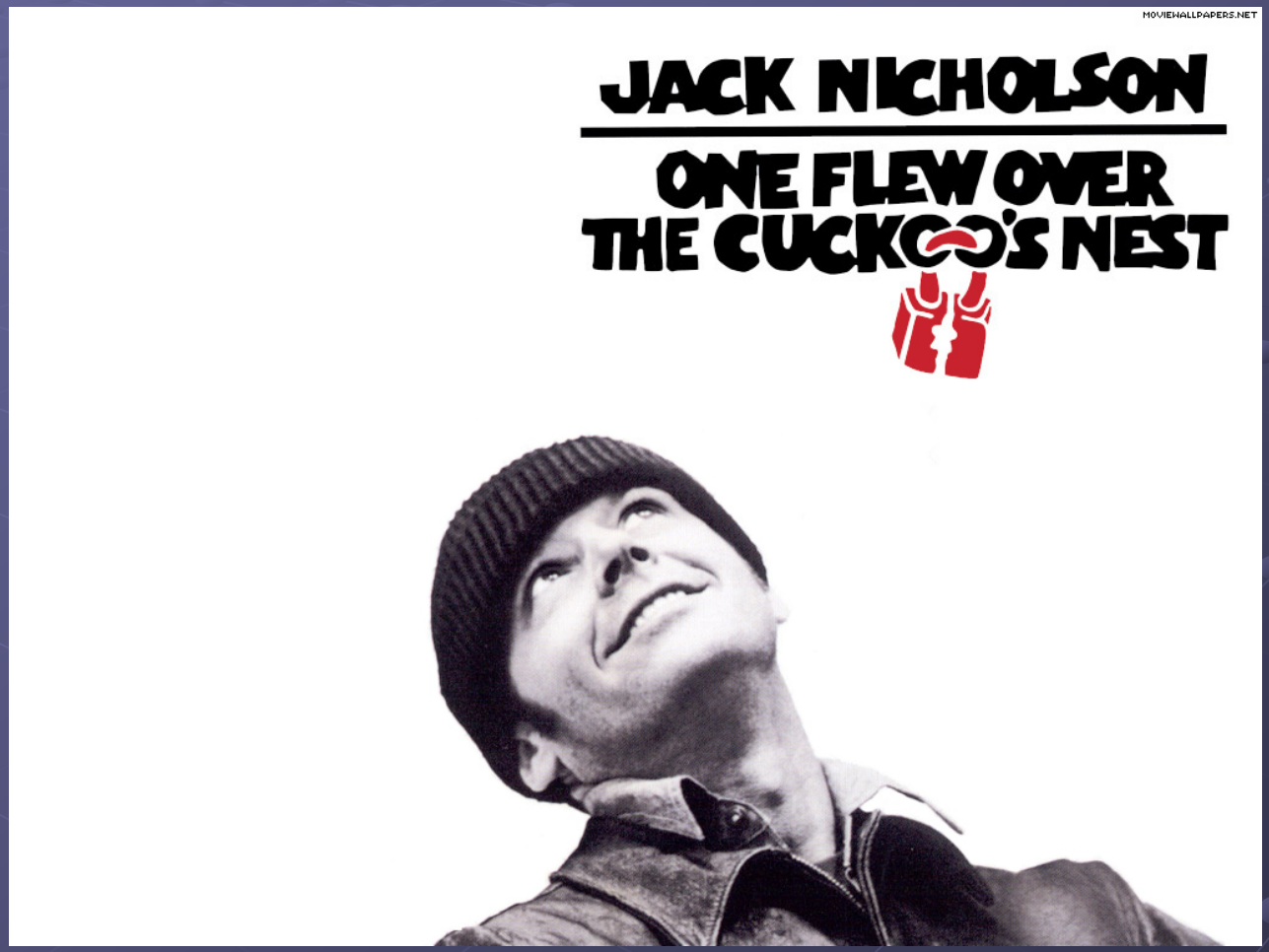
Overview

1. History of convulsive therapies
2. Indications for ECT and reasons for referral
3. The technique of the procedure
4. Adverse effects

What is ECT?

One Flew Over the Cuckoo's Nest



One Flew Over the Cuckoo's Nest

- A book by Ken Kesey (1962), made into a film by Milos Forman (1975)
- 5 major Academy Awards
- National Film Registry of the Library of Congress

One Flew Over the Cuckoo's Nest

Vintery, mintery, cutery, corn,
Apple seed and apple thorn;
Wire, briar, limber lock,
Three geese in a flock.
One flew east,
And one flew west,
And one flew over the
cuckoo's nest.

One Flew Over the Cuckoo's Nest

- Ken Kesey (1935-2001)
- Worked at a VA mental health facility in Menlo Park, California
- He was exposed to ECT and volunteered for drug trials

One Flew Over the Cuckoo's Nest

Louise Fletcher as Nurse Ratched

Jack Nicholson's character receiving ECT

One Flew Over the Cuckoo's Nest

Jack Nicholson and Will Sampson

One Flew Over the Cuckoo's Nest

- Film and book also depict psychosurgery (lobotomy), psychopharmacology, institutionalization

What is ECT?

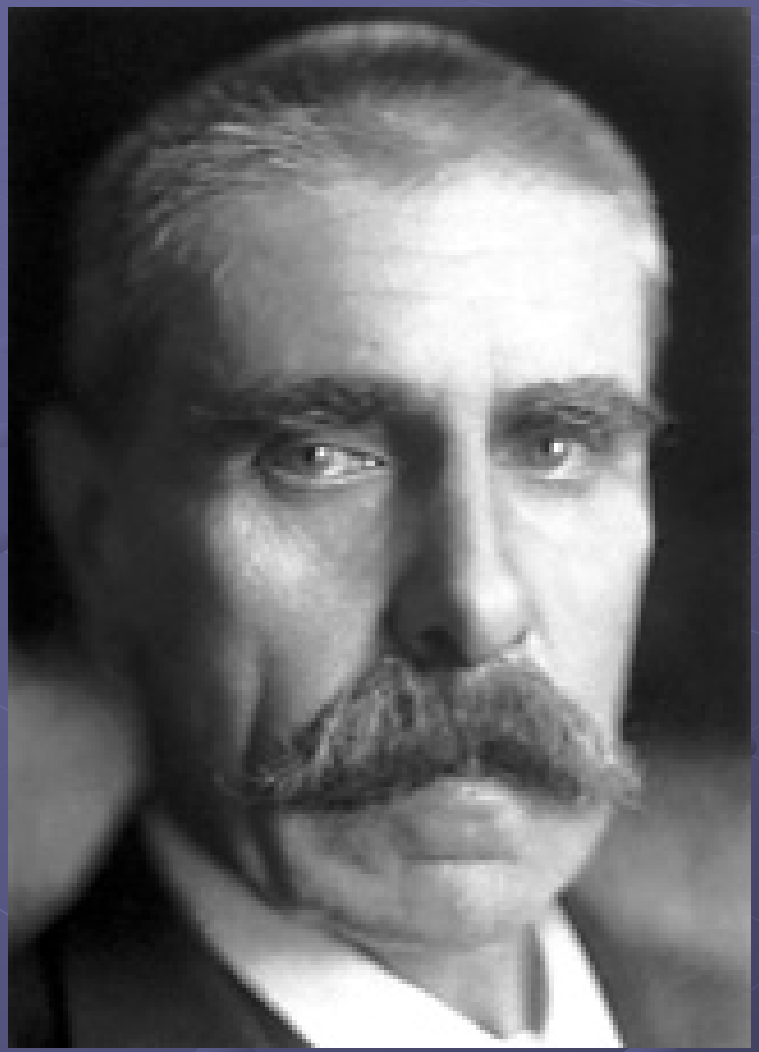
- Biological therapy with psychiatric and medical indications.
- Controlled induction of a seizure with electrical current
- Medically managed

ECT practice

History of ECT

- Until the 1930's, no effective biological therapies for psychiatric illness existed

History of ECT



- Julius Wagner-von Jauregg (Vienna)
- Malaria therapy for general paresis from syphilis (1918)
- Nobel Prize in Medicine (1927)

History of ECT

- Manfred Sakel (Vienna)
- Insulin coma therapy for schizophrenia (1933)
- Hypoglycemic coma and convulsions

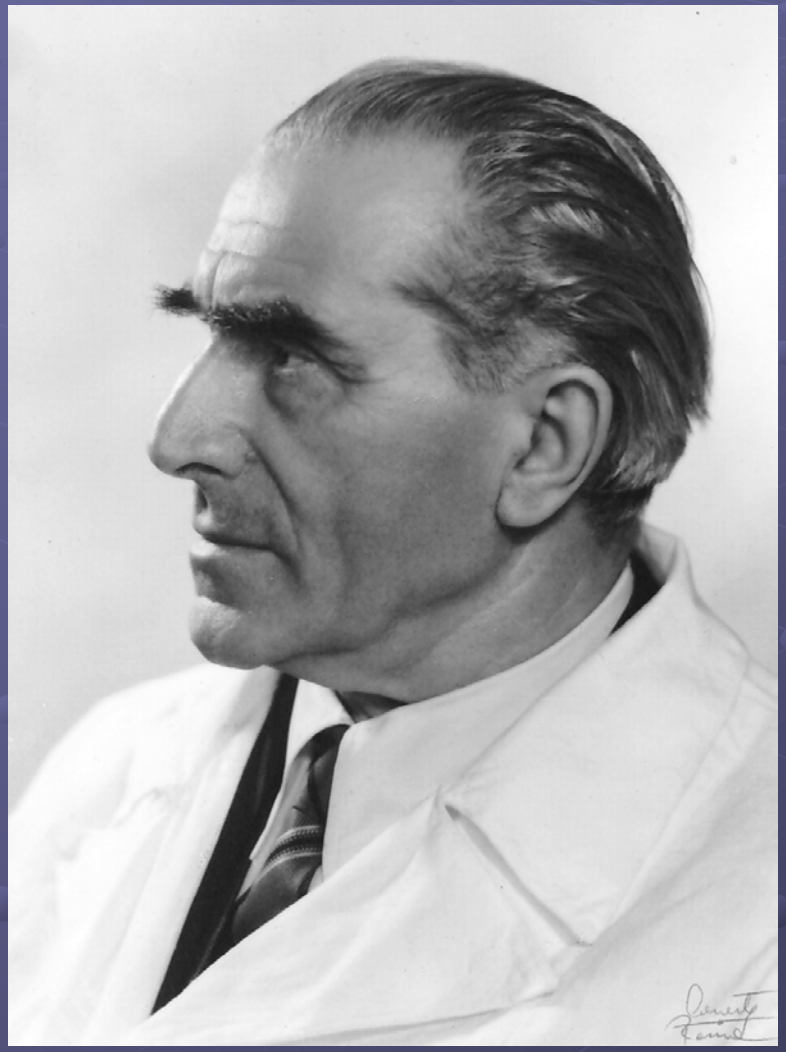
History of ECT

- Ladislas von Meduna (Budapest)
- Medicine-induced convulsive therapy (1934)
- Camphor-in-oil, then pentylenetetrazol (Cardiazol, Metrazol)

History of ECT

- Egas Moniz (Lisbon)
- Prefrontal leukotomy, later renamed lobotomy (1936)
- Nobel Prize in Medicine (1949)

History of ECT



Ugo Cerletti

History of ECT

- Ugo Cerletti and Lucio Bini (Rome)
- Electroconvulsive Therapy (1938)
- 8 years of research with animal models

History of ECT

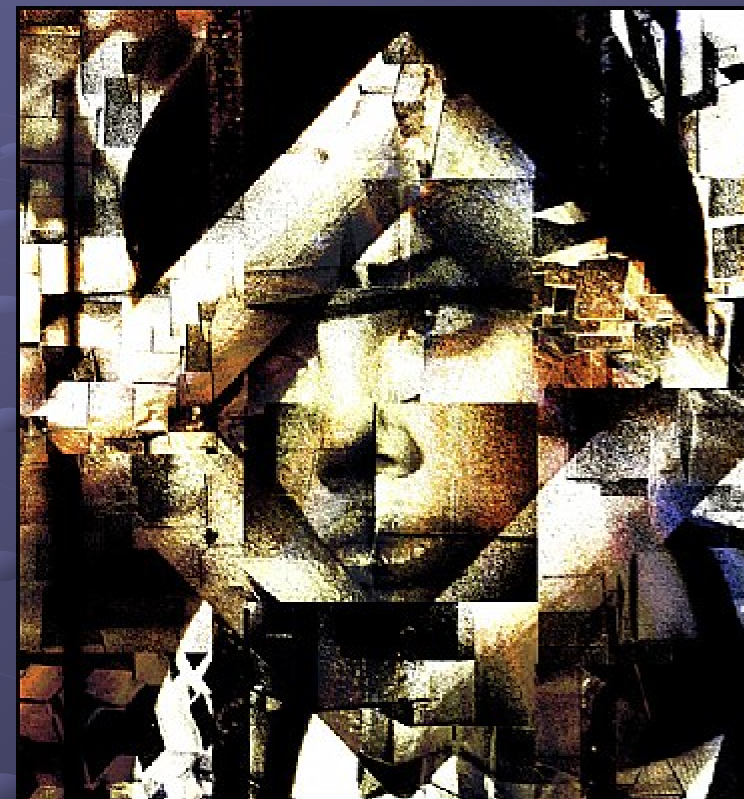
- April 1938, first treatment performed at the Clinic in Rome
- First patient: S.E., 39 year old male found wandering in a train station without a ticket
- Symptoms included passive behavior, incoherence, hallucinations, disorientation.
- “Gesticulating”, periods of mutism and striking, incomprehensible neologisms
- Loose associations

History of ECT

- The diagnosis was schizophrenia
- The first treatment produced a seizure
- The patient did not die
- The second treatment:

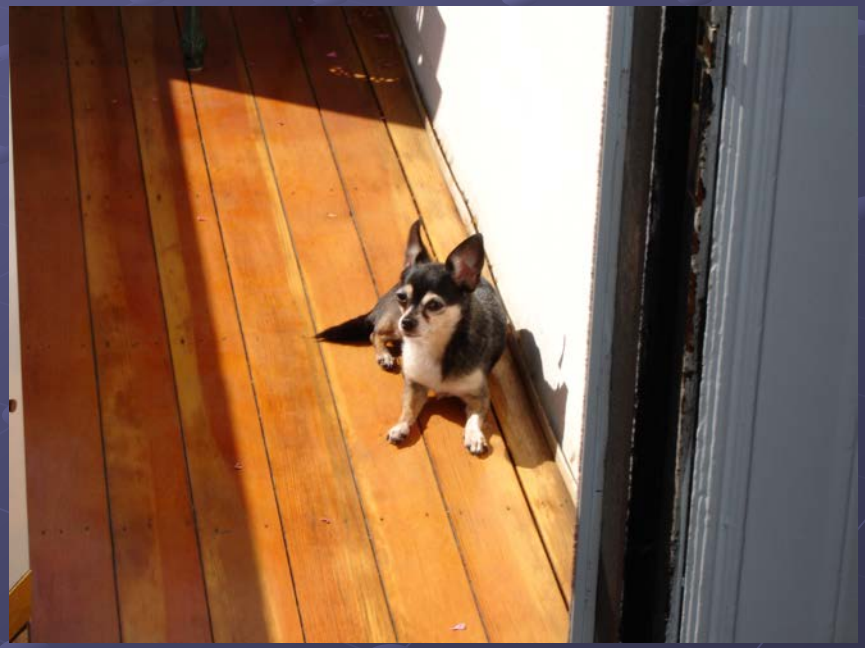
After awakening, the patient sat up of his own accord, looked about him calmly with a vague smile, as though asking what was expected of him. I asked him 'What has been happening to you?'. He answered, with no more gibberish: 'I don't know; perhaps I have been asleep.

-Cerletti

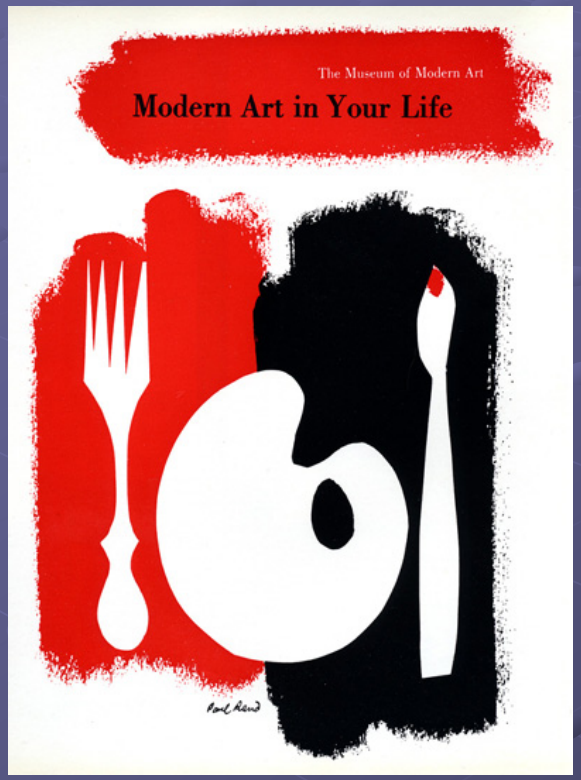


History of ECT

- 11 treatments
- Full recovery
- Discharged in June, 1938



Modernization of ECT



- Anesthesia Induction
- Muscle Relaxants
- Oxygen
- Vital Sign Monitoring
- EEG Monitoring
- Pulsed Square Waveform stimulus
- Evidence-based Research

Indications for ECT

Primary Use of ECT

1. A need for rapid, definitive response because of the severity of a psychiatric or medical condition
2. When the risks of other treatments outweigh the risks of ECT
3. A history of poor medication response or good ECT response
4. The patient's preference

Rembrandt, The Anatomy Lesson of Dr. Nicolaes Tulp (1632)

Indications for ECT

Secondary Use of ECT

1. Treatment resistance
2. Intolerance to, or adverse effects with pharmacotherapy that are deemed less likely or less severe with ECT
3. Deterioration of the patient's psychiatric or medical condition creating a need for a rapid, definitive response

Indications for ECT

Major Depressive Disorder

- Particularly with psychotic or catatonic features
- Response rates are generally reported to be 80-90% (Prudic et al. 1990, 1996)
- In treatment resistant depression, rates reported to be 50-60% (Prudic et al, 1996, Sackheim et al. 1990b, 2000)
- Older patients are more likely than younger to show marked benefit

Indications for ECT

- ECT and other somatic therapies tend to be less effective for secondary depression (Bibb and Guze 1972, Black et al. 1988, 1993, Coryell et al. 1985, Zorumski et al. 1986)

- MDD and a comorbid personality disorder may have a reduced probability of response (Black et al. 1988, Zimmerman et al. 1986a)

Indications for ECT

Mania

- Remission or marked clinical improvement in 80% of patients with ECT (Mukherjee et al. 1994)
- Significant activation may occur

Indications for ECT

Schizophrenia

- Rarely as a first line agent
- Better with acute onset and shorter episode duration
- Better with catatonic or affective features

Indications for ECT

Other medical indications include

- Neuroleptic Malignant Syndrome
- Catatonia due to a General Medical Condition
- Refractory Parkinson's Disease
- Epilepsy
- Endocrinopathies

Indications for ECT

ECT tends to be ineffective for

- Dysthymia
- Anxiety
- Substance Abuse
- Eating Disorders
- Personality Disorders

Self-Portrait: The Night Wanderer, Edvard Munch, 1923-4, Oil on Canvas

Think ECT when you see…

- Refractory Major Depressive Disorder with catatonic or psychotic features
- Severe Bipolar Disorder
- Early Schizophrenia with affective or catatonic features
- Catatonia

Think ECT when you see…

- Any condition which requires a rapid response (e.g. elderly depressed patients with failure to thrive due to depression)
- Any treatment refractory affective disorder– the less comorbidities the better
- If a patient asks for the treatment

Do NOT think of ECT…

- As a last resort treatment
- As an effective treatment for anxiety or personality disorders
- When patients are actively using substances

Do remember…

- People with personality disorders, dysthymia, anxiety, and eating disorders can also suffer from a life-threatening depressive episode.
- Consultation can be helpful

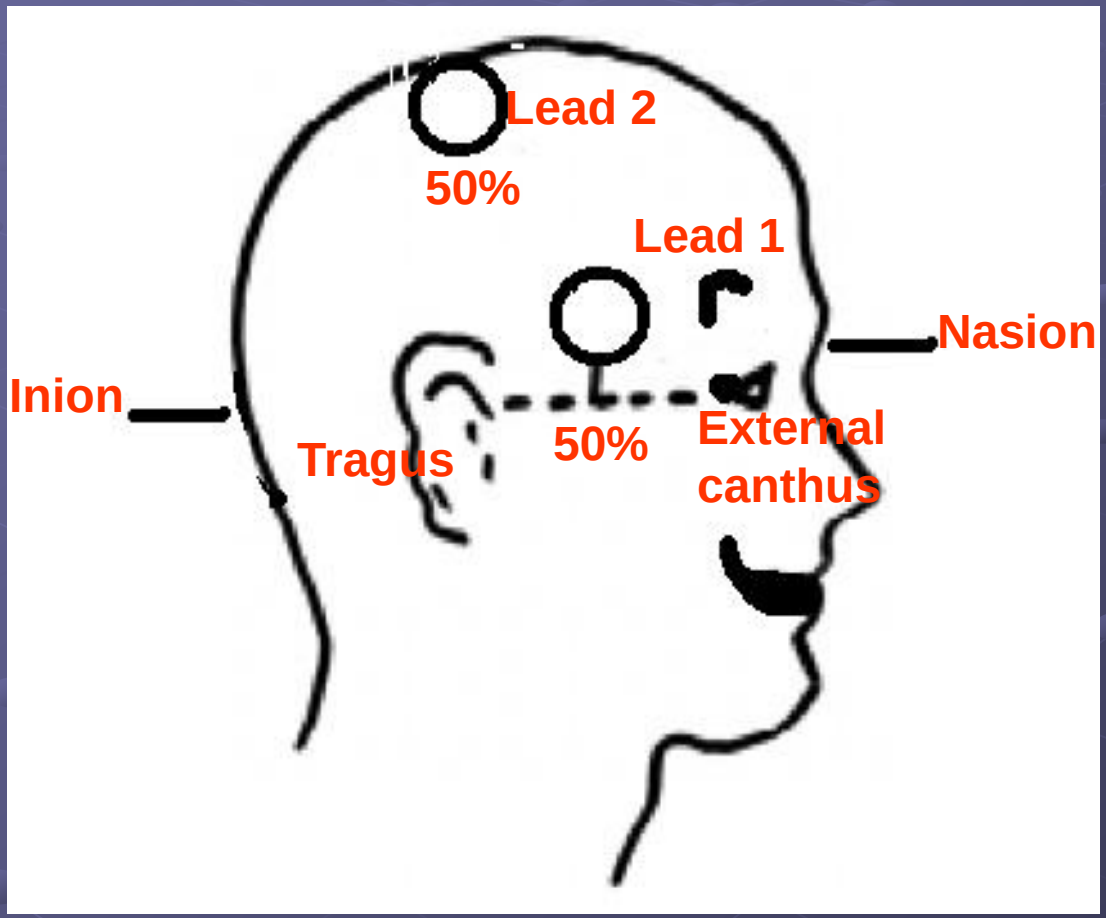
The Machine and Mode of Delivery

Thymatron System IV

The Machine and Mode of Delivery

Mecta Spectrum 5000Q

Unilateral v. Bilateral Treatment



Unilateral v. Bilateral Treatment

Unilateral

- Lower charge to elicit seizure
- Less side effects
- Likely requires higher dosing for effect
- 4-6x seizure threshold

Unilateral v. Bilateral Treatment

Bilateral

- Higher charge to produce seizure
- More side effects
- 2.5x seizure threshold

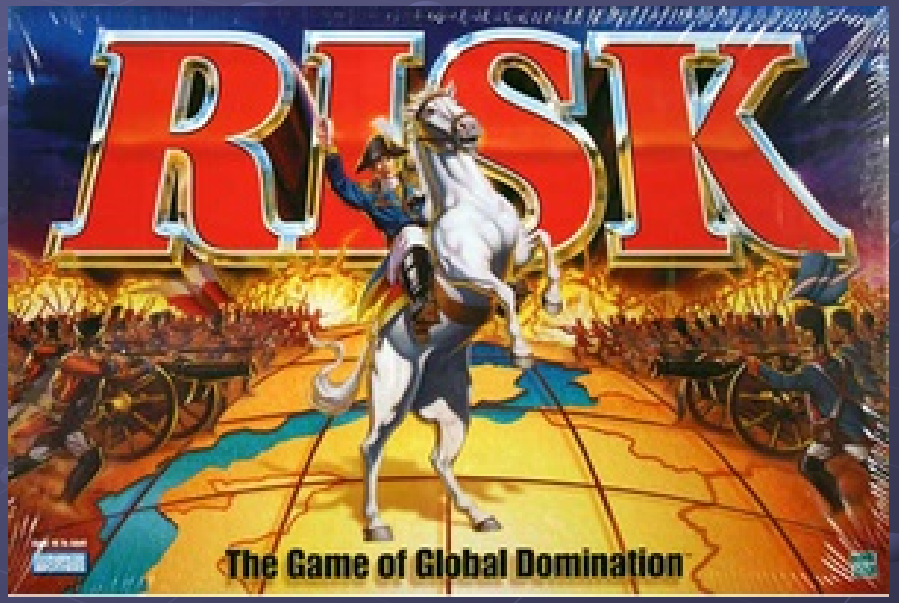
Unilateral v. Bilateral Treatment

How to choose?

- Goal is to achieve 80-90% remission rates
- Start with unilateral, then switch?
- Start with bilateral?

Adverse Effects

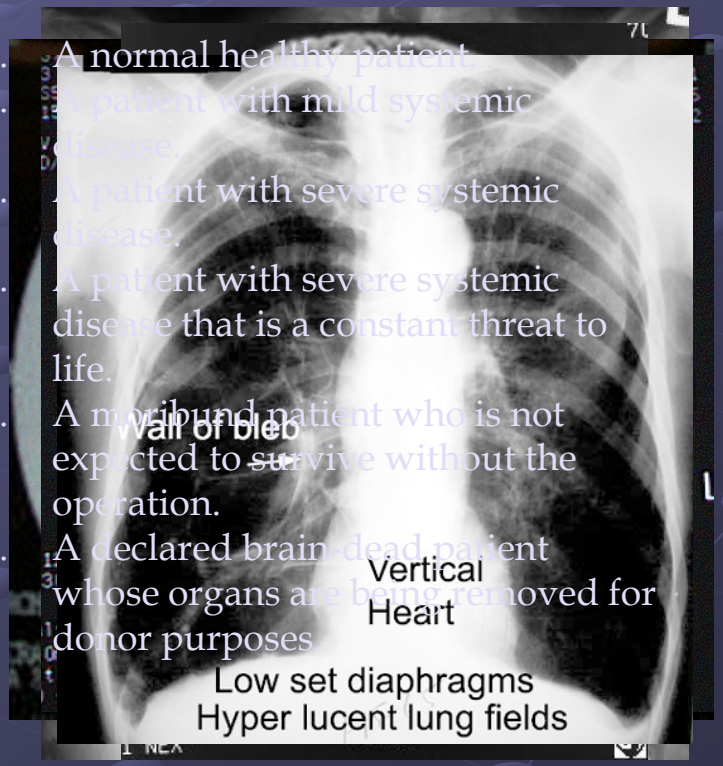
- All treatments have risks
- What are the absolute contraindications for ECT?
- (This is a trick question) There are none.
- What are conditions that pose an elevated risk with ECT?



Conditions Associated with Substantially Increased Risk

- Unstable or severe ***Cardiovascular*** conditions– recent myocardial infarction, unstable angina, poorly compensated CHF, severe valvular disease
- ***Aneurysm or Vascular Malformation*** that might be susceptible to rupture with increased blood pressure
- Increased intracranial pressure– ***Brain Tumors*** or other space occupying lesions
- Recent ***Cerebral Infarction***
- ***Pulmonary Conditions*** such as severe COPD, asthma, or pneumonia
- ***High Anesthetic Risk*** (American Society of Anesthesiologists level 4 or 5)

1. A normal healthy patient.
2. A patient with mild systemic disease.
3. A patient with severe systemic disease.
4. A patient with severe systemic disease that is a constant threat to life.
5. A moribund patient who is not expected to survive without the operation.
6. A declared brain-dead patient whose organs are being removed for donor purposes



Adverse Effects

- What is the mortality rate of ECT?
- Approximately 1 per 10,000 patients
  or 1 per 80,000 treatments

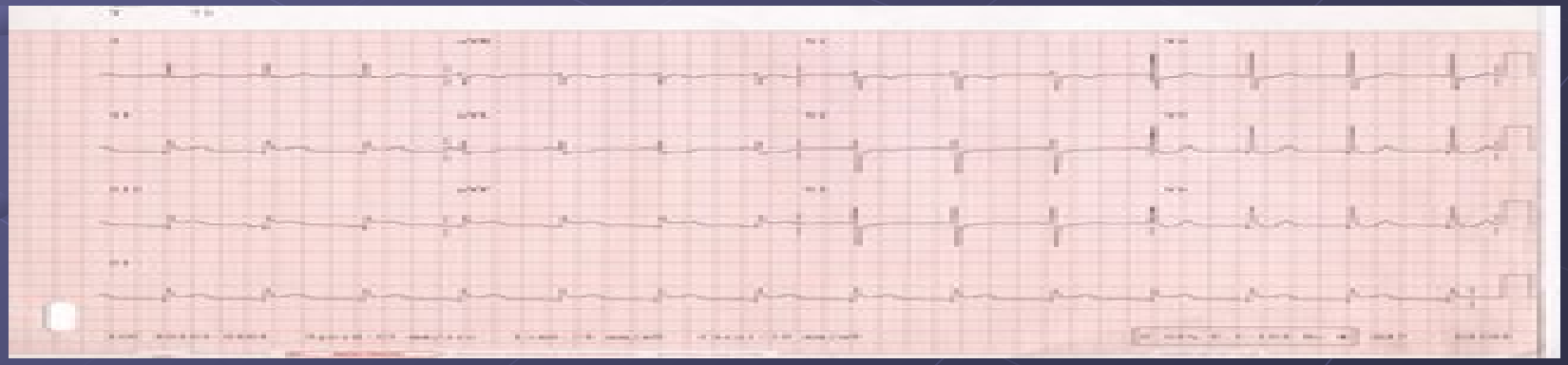
- Elevated risk factors are associated with increased mortality

Adverse Effects

- Always seek consultation when there are questions about a patient's ability to tolerate the treatment
- Evaluate and treat any conditions prior to starting treatment to modify medical risk
- Always obtain informed consent specifically tailored to the patient and any existing medical conditions

Adverse Effects

- Cardiovascular complications are the main cause of mortality and morbidity
- Arrhythmias including bradycardia and asystole
- Hypertension or hypotension
- Ischemia



Neurological Complications

- Prolonged seizures (>3 minutes)
- Status epilepticus (>30 minutes or multiple seizures without return to consciousness between them)
- Post-ictal delirium
- Confusion (post- and interictal)
- Memory disturbance

Memory Disturbance

- Retrograde amnesia
- Anterograde amnesia
- These will tend to resolve
- No evidence of long-term cognitive deficits or permanent brain damage

Adverse Effects

- Prolonged postictal apnea
- Occurs almost exclusively in patients who have slow metabolism of succinylcholine
- Pseudocholinesterase deficiency

Adverse Effects

- Minor side effects may also occur
- Headache
- Muscle soreness
- Nausea
- Dental complications

Medication and ECT

- Theophylline
- Lithium
- Benzodiazepines
- Anticonvulsants
- MAOI

Consultation and Evaluation

- Obtain psychiatric history and exam
- Assess if there is an indication for ECT
- Medical history and physical exam

Consultation and Evaluation

- Assess for modifiable risk factors (cardiovascular, pulmonary, neurological, etc)
- Examine the mouth, head, and obtain family history of response to anesthesia

- Obtain laboratory and radiological studies where indicated (i.e. Chem 7, CBC w/ diff, coags, LFT's, TSH, chest x-ray, EKG)
- Consultation where appropriate

Consultation and Evaluation

- Anesthesia should pre-op patient
- Assess airway, review risks and benefits of medications, assess ASA risk
- Informed consent should be obtained