

ELECTROCONVULSIVE THERAPY

ASCP Slide Collection 2006

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Fink M. *ELECTROSHOCK: Restoring the
Mind* (Oxford U Press, 1999)

References

Fink M. *ELECTROSHOCK: Restoring the Mind* (Oxford U Press, 1999)

Ottosson J.-O., Fink M. *Ethics in Electroconvulsive Therapy*. NY: Routledge, 2004

Fink M, Taylor MA. *CATATONIA*. Cambridge University Press, 2003.

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CLINICAL INDICATIONS

Reference:

**Fink M. *ELECTROSHOCK: Restoring the Mind* (Oxford U Press, 1999)
(Reissued 2002 in Paperback)**

ECT is Effective: DSM-IV Diagnostic Classes

Major Depression

- **Single episode** [296.2x]
- **Recurrent** [296.3x]

Bipolar Major Depression

- **Depressed** [286.5x]
- **Mixed** [296.6x]
- **Not otherwise specified** [296.70]

Mania (Bipolar Disorder)

- **Mania** [296.4x]
- **Mixed type** [296.6x]
- **Not otherwise specified** [296.70]

ECT is Effective: Additional DSM-IV Classes

Atypical Psychosis [298.90]

Schizophrenia

- **Schizophreniform [295.40]**
- **Schizo-affective [295.70]**

Catatonia [295.2x]

- **Schizophrenia, catatonia subtype [293.89]**
- **Secondary to medical condition [293.89]**
- **Malignant catatonia [293.89]**
- **Neuroleptic malignant syndrome [333.92]**
- **Secondary to MD or mania**

ECT vs Impramine In Depression

DeCarolis Study - 1964

Treatment	Response Rate
Impramine 200-350 mg/day x 25 + days n=437	56%
ECT (8-10 bilateral Rx) n=190	72%

Efficacy of Antidepressants Alone in Psychotic and Non-Psychotic Depressed Patients DeCarolis Study - 1964

No. Improved/Total

	<u>Psychotic Patients</u>		<u>Non-Psychotic Patients</u>	
Simpson <i>et al</i>*	8/15	(53%)	31/36	(86%)
Hordern <i>et al</i>*	4/27	(15%)	89/110	(81%)
DeCarolis <i>et al</i>**	72/181	(40%)	174/256	(68%)
Glassman <i>et al</i>***	3/13	(29%)	14/21	(67%)

*p<0.01, **p<0.001, ***p<0.05

Psychotic Depression Response Rates

Antidepressants	36%
Antipsychotics	47%
Antidepressants + antipsychotics	77%
ECT	70-85%
(Bilateral ECT in CORE Study	95%)

Relative Efficacy Antidepressants and ECT

	<u>Number</u>		<u>% Marked Improvement</u>		<u>P Value</u>
	<u>ECT</u>	<u>AD</u>	<u>ECT</u>	<u>AD</u>	
Total	140	93	42	22	0.0005
Insomnia	129	78	44	24	0.01
Anorexia	111	84	44	23	0.005
Agitation	70	40	51	24	0.01
Guilt	72	43	44	23	0.025
Weight gain	65	41	43	32	NS
Retardation	63	37	35	24	NS
Tearing	80	42	45	26	NS

From Avery D & Winokur G. *Biol Psychiatry* 1977; 12:507-23

Mortality in Depressed Patients

	<u>N</u>	<u>1 Yr</u>	<u>Non-cancer</u>	<u>3 Yr</u>	<u>Non-cancer</u>
ECT	135	0.7%	0.0%	2.25	0.75
Adequate AD	71	1.4%	1.4%	2.8%	1.4%
ECT+AD	122	2.2%	2.5%	6.6%	6.6%
Inadequate AD	121	5.8%	5.0%	9.1%*	8.3%
Neither ECT nor AD	70	10.0%**	7.0%	11.4%**	8.3%

* $p \leq 0.05$ ** $p \leq 0.025$

From Avery D & Winokur G. ArchGenPsychiatry 1976 33:1029-37

Indications for ECT in Therapy Resistant Depression

- Failure*: Two medication trials of 4 weeks minimum duration at clinically adequate dosages
- Severity: Warrants hospital care
and/or
- Intolerance: Inability to tolerate medication side effects
- Prognosis: At least two favorable predictors of outcome

*Follows the standard used to administer clozapine in therapy-resistant psychosis

Therapy Resistant Depression

Predictors of Good Outcome With ECT

- Acute onset
- Age over 50 years
- Psychosis (delusions) prominent
- Vegetative signs severe
- Severe starvation and >10% weight loss
- Suicidality requiring 24-hour observation
- Catatonia
- Stupor
- Delirium
- Previous good response to ECT

Therapy Resistent Depression

Predictors of Poor Outcome With ECT

- Character pathology prominent (Axis II DSM)
- Indefinite onset; prolonged illness
- “Neurotic signs” prominent
 - Anxiety
 - Somatizations
- Comorbid alcoholism, substance abuse
- Lack of response to tricyclic antidepressants

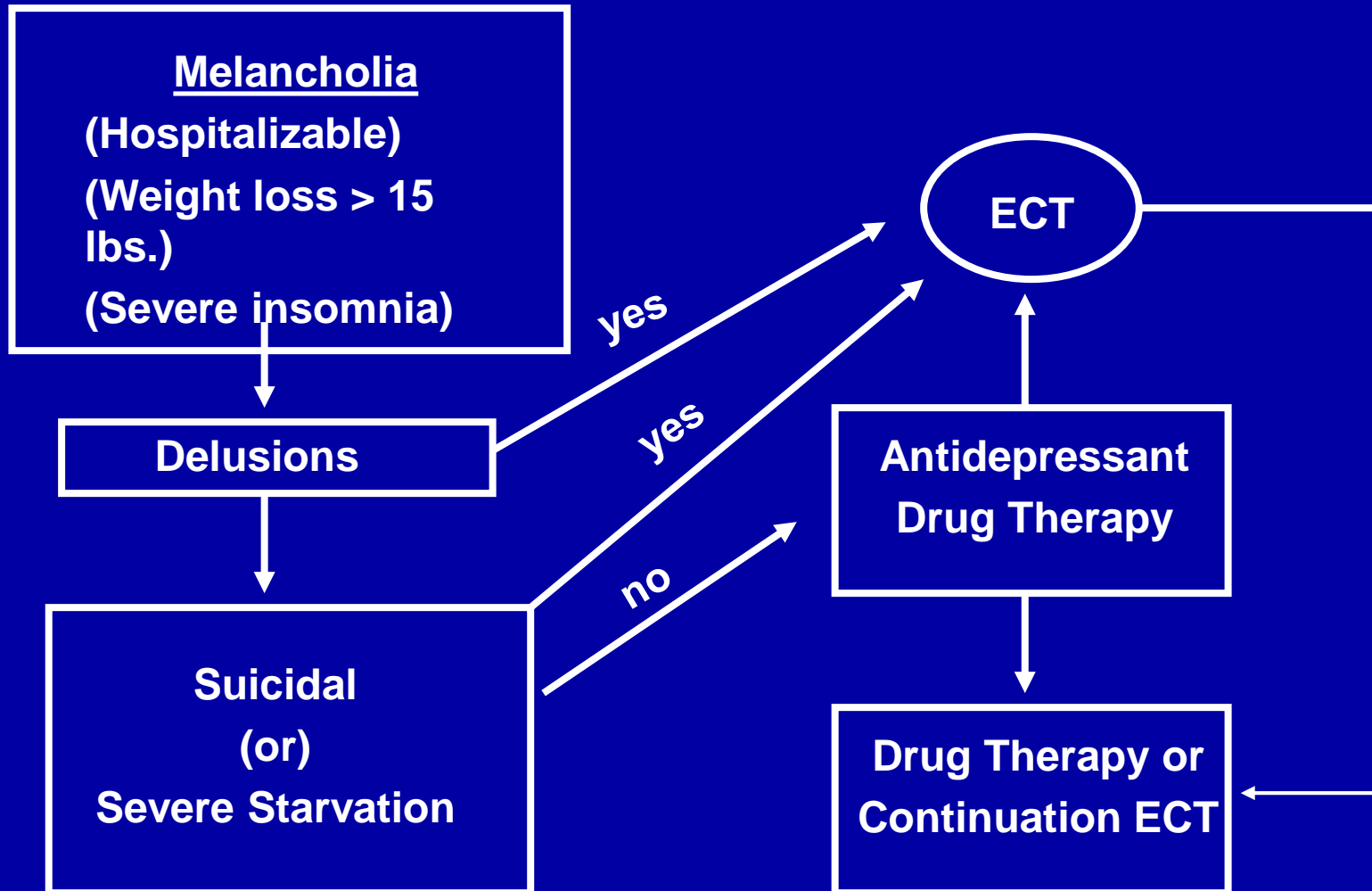
Primary Indications for ECT in the Elderly

- Depression with psychosis
 - Delusions of guilt
 - Delusions of infidelity
 - Delusions of hopeless disease
 - Delusions of poverty
- Melancholia with agitation
- Depression with dementia
 - “Pseudodementia”

Additional Indications for ECT in the Elderly

- Antidepressant resistant depression
- Antidepressant toxicity
 - Delirium
 - Hypotension
- Secondary depression
 - Antihypertensive drugs
- “Secondary Mania”

Treatment Algorithm for Severe Depression in the Elderly



SUICIDE AND ECT

- ECT is our principal effective treatment that is proven to reduce suicide risk and suicide drive.

SUICIDE AND ECT

- No TCA trials demonstrate efficacy against suicide (see Avery & Winokur, 1978)
- No SSRI trials (Malone, 1997)
- ? SSRI induce suicide (Teicher *et al.*, 1990)

- Salzman C. Treatment of suicidal patient. In: DG Jacobs (Ed): *Harvard Medical School Guide to Suicide Assessment and Intervention*. San Francisco: Jossey-Bass, 1999. Chap 21: 372-382.

SUICIDE and ECT

Rates of Suicide

- 11th leading cause of death
- Age-adjusted rate is 10.7 per 100,000
- For schizophrenia, 90 to 100 per 100,000
 - 1.3% deaths from suicide
 - Estimated 8 to 25 attempts per completed suicide

NIMH: Suicide Facts. <http://www.nimh.gov/research/suifact.htm>

SUICIDE and ECT

Standardized Mortality Rates

- Major depression 18-23
- Bipolar disorder 12-18
- Schizophrenia 8-9
- Personality disorders 5-10

- Harris EC, Barraclough B. *Br J Psychiatry* 1997; 178;205-228

SUICIDE AND ECT

- No TCA trials demonstrate efficacy against suicide (see Avery & Winokur, 1978)
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MORTALITY IN DEPRESSED PATIENTS

<u>TREATMENT:</u>	<u>ADEQUATE</u> <i>N=328</i>	<u>INADEQUATE</u> <i>N=191</i>	<u>p</u>
<u>MORTALITY, TOTAL</u>			
1 Yr.	1.8	7.3	.005
3 Yr.	4.0	9.0	.01
<u>NON-SUICIDE</u>			
1 Yr.	1.8	5.8	.05
3 Yr.	2.4	8.4	.005
<u>SUICIDE</u>			
1 Yr.	0	1.6	ns
3 Yr.	1.5	1.6	ns

From Avery, D. and Winokur, G. Arch gen. Psychiat. 133: 1029-1037, 1976.

MORTALITY IN DEPRESSED PATIENTS

	N	1 Yr.		3 Yr.	
			(NC)		(NC)
ECT	135	0.7%	[0.0]	2.2%	[0.7]
ADEQUATE AD	71	1.4	[1.4]	2.8	[1.4]
ECT + AD	122	2.2	[2.5]	6.6	[6.6]
INADEQUATE AD	121	5.8	[5.0]	9.1*	[8.3]
NEITHER ECT NOR AD	70	10.0**	[7.0]	11.4**	[8.5]

* $p \leq .05$

** $p \leq .025$

From Avery, D. and Winokur, G. *Arch. gen. Psychiat.* 33: 1029-1037, 1976.

NC = Non-cancer

CORE Study of ECT (405 Patients)

Sites	4 academic centers MUSC, Mayo, UT-Texas, LIJ Hillside
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Treatment	Bilateral electrode placement 3x/week
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Evaluation	HAMD-24, 3x/week
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Suicide evaluation	HAMD Item 3
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0- absent

1- life is empty, not worth living

2- recurrent thoughts, wishes of death

3. active suicidal thoughts, threats, gestures

4- serious suicide attempt

Demographic Characteristics of Patients Receiving Acute Phase ECT (405 Patients)

Age	mean \pm sd = 55.2 \pm 17.1	
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Gender	Male	33.4%
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Female	66.6%
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Race	Caucasian	91%
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Other	9%
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Psychosis status	Psychotic	32%
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Non-psychotic	68%
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Baseline HAM-D	mean \pm sd = 35.1 \pm 7.1	
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Percent Exhibiting Suicidality (HAM-D Item 3 \geq 2)

	% \geq 2 at Baseline	% Reaching Rating = 0
Total Sample	58.7% (237/404)	93.2% (221/237)
Gender		
Male	67.4% (91/135)	97.8% (89/91)
Female	54.3% (146/269)	97.3% (142/146)
Psychosis		
Psychotic	53.9% (70/130)	90.0% (63/70)
Non-psychotic	59.9% (160/267)	94.3% (151/160)

Average Number of ECT Required to Resolve Suicidality

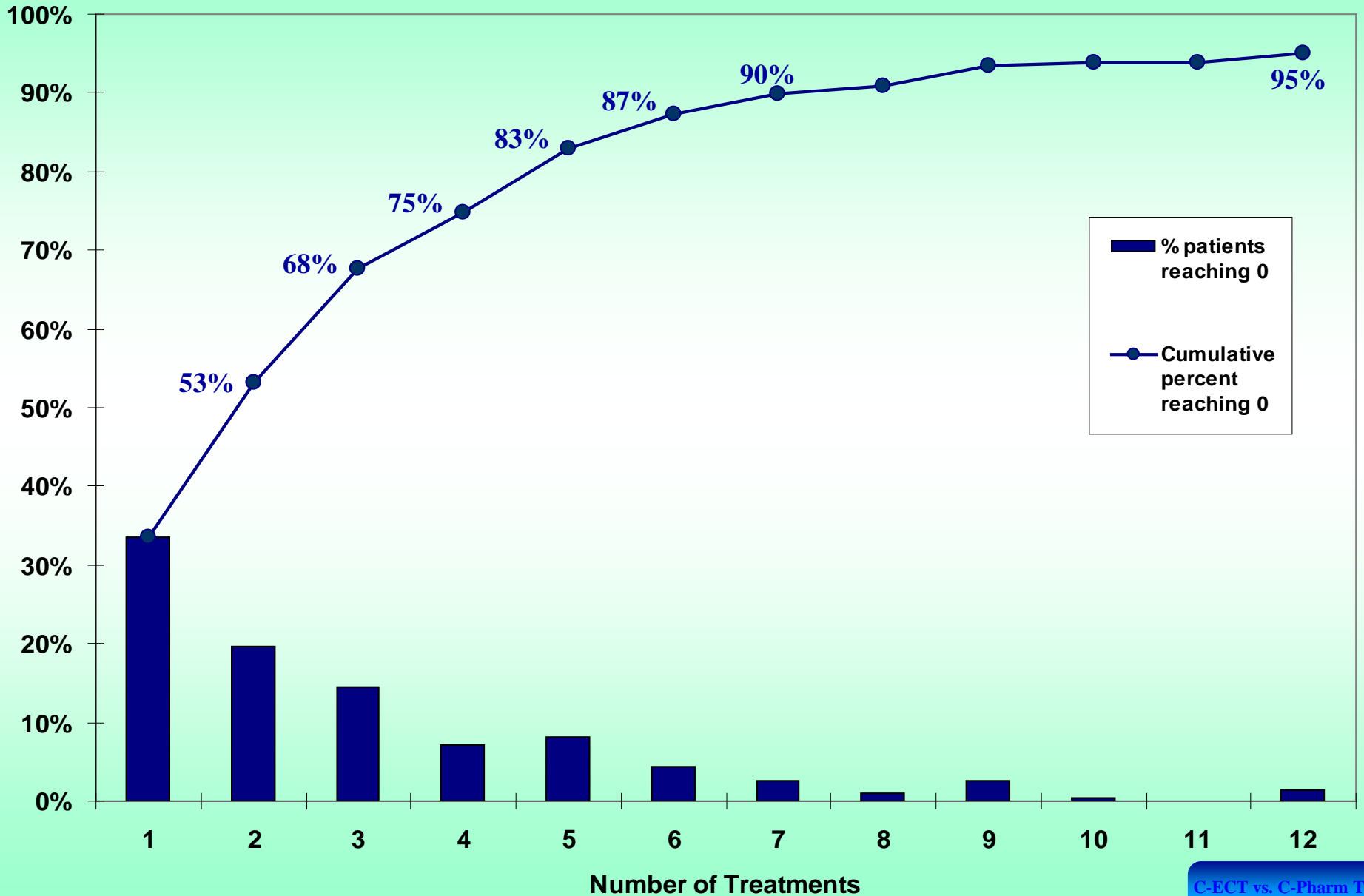
Item 3 Change	% Exhibiting Change	Number of ECT Required to Reach Endpoint*
≥ 2 to 0	94.9% (223/235)	2.9 \pm 2.3
≥ 2 to ≤ 1	98.3% (231/235)	1.9 \pm 1.5
4 to 0	91.7% (11/12)	2.7 \pm 2.4

* mean \pm std

Suicide Rating and ECT Number

Treatment Number	Percent Patients Reaching 0	Cumulative Percent Reaching 0
1	33.6% (79/235)	33.6%
2	19.6% (46/235)	53.2%
3	14.5% (34/235)	67.7%
4	7.2% (17/235)	74.9%
5	8.1% (19/235)	83.0%
6	4.3% (10/235)	87.3%
7	2.6% (6/235)	89.9%
8	0.9% (2/235)	90.8%
9	2.6% (6/235)	93.4%
10	0.4% (1/235)	93.8%
11	0	93.8%
12	1.3% (3/235)	95.1%
Never	(12/235)	

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



Non-Conventional Uses of Electroconvulsive Therapy

- In Adolescents
- Bipolar Disorder
- Catatonia
- Delirium
- Psychosis
 - Schizophrenia
 - Manic Psychosis
 - Delirious mania
- Neurology

ECT in Adolescents

- **Inhibitors to its use**
 - **Fear of 'brain damage'**
 - **Psychological etiology of disorders**
 - **Legislative proscription**
 - **Lack of training**

ECT in Adolescents

- **Indications and Efficacy**
 - **Identical to Adults**
- **Technical Features of ECT**
 - **Identical to Adults**
 - **Consent procedures defined by state laws**
 - **Prolonged seizures possible; use diazepam**

ECT in Bipolar Disorder

- **Indications**
 - **Therapy-resistant mania**
 - **Rapid cycling mania**
 - **Manic excitement (delirious mania)**

Reference: Mukherjee *et al.* ECT of acute manic episodes: A review of 50 years' experience.
Am J Psychiatry 1994; 151:169-76.

ECT in Bipolar Disorder

- **Special Considerations**
 - **Consent- difficult to obtain**
 - **Anesthesia- use of ketamine**
 - **Bitemporal electrode placement**
 - **Treatment en bloc**
 - **Concurrent lithium- risks**
 - **Concurrent anticonvulsants- risks**

CATATONIA

- Max Fink, M.D.

Fink M. Taylor MA: *CATATONIA: A Clinician's Guide to Diagnosis & Treatment*. Cambridge UK: Cambridge U Press, 2003

Catatonia

“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. K. Die Katatonie oder das Spannungs-Irresein, 1874.

Catatonia

A motor syndrome in psychiatric patients

Akin to delusions, delirium, hallucinations

Catatonia

Primary Signs

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

Catatonia

Associated Signs

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

Catatonia

- 1874: Kahlbaum defines catatonia
- 1919: Kraepelin includes catatonia in dementia praecox
- 1921: August Hoch describes Benign Stupors
- 1952: DSM-II: Schizophrenic reaction, catatonic type (22.2)

Catatonia

- 1980: DSM-III : Schizophrenia, catatonic type (295.20)
 - 1994: DSM-IV
 - 295.20 Schizophrenia, catatonic type
 - 293.89 Catatonic disorder due to [general medical condition]
- Modifier in Affective disorders

Catatonia

- Found in
 - Mania (Bipolar disorder)
 - Depression
 - Systemic diseases
 - Toxic syndromes
 - Schizophrenia
 - Neurologic disorders

Catatonia

Varieties

- Catatonia, a syndrome
- Malignant Catatonia
- Excited catatonia
- Delirious mania (manic delirium)
- Benign Stupor
- Neuroleptic malignant syndrome
- ? Toxic Serotonin Syndrome

Catatonia

Symptomatic Treatment

- Barbiturates: Amobarbital iv, 500mg/10ml;
 - 1 ml/40 seconds to relief or sleep
- Benzodiazepines: Lorazepam
 - iv, 1mg/2 min to relief or sleep
 - oral, 4-16 mg/day

Catatonia

Electroconvulsive Therapy

- ECT is the definitive treatment
- Bilateral electrode placement most effective
- Initial daily treatment x 3 (“*en bloc*”)
- Sustained by standard ECT regimen
- Catatonia relieved within 2-4 ECT
- May need ketamine anesthesia initially

Catatonia

Treatment

- Neuroleptics riskful- May precipitate NMS
- Alternate treatment: Carbamazepine

DELIRIUM

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Fink M. Interaction of delirium and seizures. *Sem Clin Neuropsychiatry*. 2000; 5:31-35.

Delirium

- **Definition**
 - **Acute onset**
 - **Altered, fluctuating consciousness**
 - **Excitement, overactivity, aggressivity**
 - **Disorientation, confusion**
 - **Rambling, incoherent speech**
 - **Altered sleep-wake cycle**

Delirium

- **Causes**
 - **Brain dysfunction**
 - Trauma, infection, stroke
 - **Systemic disease (metabolic, infectious)**
 - **Drug toxicity**
 - Anticholinergics, lithium
 - Alcoholism
 - **Mania**

Delirium

- **Laboratory Findings**
 - **Fever, hypertension, tachycardia . . .**
 - **Hypoglycemia, uremia . . .**
 - **Elevated drug serum and urine levels**
 - **EEG**
 - **Increased slowing, varying frequencies**
 - **Slow wave burst activity**
 - **Increased beta activity**

Delirium

- **Treatment**
 - Prevent self injury
 - Determine and treat systemic cause
 - Withdraw psychotropic medications
 - Establish metabolic integrity
 - Alter brain dysfunction
 - Stimulants
 - ECT

Delirium

- **Role of ECT**
 - Rapidly changes brain function
 - Sedates
 - Controls agitation, excitement
- **Procedures**
 - Bitemporal electrode placement
 - Daily treatments (en bloc)
 - Monitor adequacy of seizures

ECT in Psychosis: History

- 1917 Fever Therapy for neurosyphilis
- 1930 Barbiturate for catatonia
- 1933 Insulin coma for dementia praecox
- 1934 Pharmaco-convulsive Therapy for DP
- 1935 Lobotomy for obsessions
- 1938 Pharmaco-Convulsive becomes ECT
- 1953 Chlorpromazine for psychosis
- 1960's CPZ replaces ICT, ECT, Lobotomy
- 1975 ECT for psychotic depression
- 1987 ECT in clozapine-resistant psychosis

ECT in Psychosis

Medications are defined as "antipsychotic" when their actions reduce thought disorders.

ECT modifies thought disorders with the same facility as drugs.

ECT is an antipsychotic treatment.

ECT and antipsychotic drugs act synergistically.

ECT in Psychosis: Known Augmentations

- Chlorpromazine
- Thiothixene
- Fluphenazine
- Clozapine

ECT in Psychosis: Many Faces

- **Psychotic Depression**
- **Psychotic mania**
- **Delirious mania**
- **Toxic and delirious psychosis**
- **Schizophrenia**
- **Schizo-affective disorder**
- **Catatonic subtype**
- **Paranoid subtype**
- **Delusional Disorder**

ECT in Psychosis: Technical

Continue antipsychotic medication

Bitemporal electrodes

Half-age dosing

Three times per week

Minimum 20 ECT

Continuation ECT

ECT in Schizophrenia

Indications

Positive-symptom psychosis
Less than 2 years duration

Subtypes in which ECT is effective

catatonic subtype (295.2)
paranoid type (295.3)
schizo-affective disorder (295.7)

ECT in Schizophrenia

Action

Augments antipsychotic agents

Known effective agents

chlorpromazine

thiothixene

fluphenazine

clozapine

Ref:

Fink M, Sackeim HA: ECT for schizophrenia? Schiz Bull 1996; 22:27-39.

ECT in Manic Psychosis

Indications

Therapy resistant mania

Rapid cycling mania

Delirious mania (Manic excitement)

Ref:

Mukherjee et al. ECT of acute manic episodes: A review of 50 years experience. Am J Psychiatry 1994; 151:169-176

ECT in Manic Psychosis

Special Considerations

Consent: Difficult to obtain

Anesthesia: Use of ketamine

Bitemporal electrode placement

Treatment en bloc

Concurrent medications:

lithium

anticonvulsants

antipsychotics

Delirious Mania

History of the Concept

1849 Bell 40/1700 patients/13 years

*1973 Taylor & Abrams 19% manic patients
"confused"*

1980 Bond 3 patients (Li and haloperidol)

1981 Klerman "excited mania"

1981 Kramp and Bolwig 3 patients (ECT)

1997 Strömngren 8 patients (ECT)

1999 Fink 5 patients (ECT)

Delirious Mania

Definition

A syndrome of:

excitement,

delirium,

psychosis,

of acute onset,

high mortality if untreated.

Ref:

Fink M. Delirious mania. *Bipolar Disorders* 1999;1:54-60.

Delirious Mania

Signs and Symptoms

Excited, restless

Delusions: fearful, paranoid

Incoherent, rambling speech

Disoriented, poor recall

Insomnia

Fever, tachycardia, hypertension

Mutism, negativism, stereotypy, posturing

Delirious Mania

Treatment

Sedation

Benzodiazepines, barbiturates

High doses of BZD (~8-16 mg lorazepam)

Avoid antipsychotic agents

Especially high potency neuroleptic agents

(e.g., haloperidol)

ECT (en bloc)