The Electroencephalogram: Pre- and Post-Evaluations in Variable Somatic Therapies

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Computer analysis of the Index Medi-cus indicates that, since 1964, 84 investigative studies have been published. An in-depth investigation of these publications reveals the following:

1. Not all of the papers mention the Electroencephalogram.
2. Many of the investigations involve psychological studies and tests, with or without mention of the EEG.
3. Some of the investigations dwell on the confusion factor, with or without correlation of brain waves. The element of confusion is generally not qualitatively defined. One extreme could mean several days or weeks of confusion which is expected to develop when regressive treatment is given, and at the other extreme, a few minutes or an hour of confusion following a single ECT when the waking interval is shortened.
4. Methodology is frequently ill-defined, and the type of electronic instrumentation may not be mentioned at all.
5. Some of the reports indicate that after convulsive therapy, whether unilateral or bilateral, considerable brain wave alteration is present in some and not in others.
6. Brain waves in dominant or non-dominant hemisphere may show slowing or blunting or alpha beta or theta and/or generalized grade 1-2-3 dysrhythmia. Generally there is less alteration in unilateral than in bilateral ECT.
7. Some investigators believe that if electric treatment is to be therapeutically beneficial the brain waves must undergo change.

Over an 18-month interval from July, 1972, to December, 1973, 83 patients were given variable types of somatic treatment, and each patient was pre- and post-encephalographically evaluated. A

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qualified Electroencephalographer evaluated all graphs.

Methods and techniques of treatment were determined, and eight different modalities were employed in 15 different combinations. There were four types of "pure culture" therapy, mainly unilateral ECT, deep sedac, a regular sedac, and S.M.E. (sedac molac elimination). The remainder of the modalities, T.P.S. (tri power sedac), indoklon, metrazol, and molac as shown in Table 1 were administered in variable combinations.

In unilateral convulsive therapy, scalp electrode placement was either left or right and without regard for dominant or non-dominant cerebral hemisphere. The first electrode was parietally placed immediately superior to the auricle, the second immediately above and toward the vertex. In low-threshold patients the electrode placement is more proximal, whereas in high threshold, the vertex electrode is more distantly located.

In sedac treatment the Roman helmet is cephalically placed; the bilateral horseshoe electrodes are placed on each forearm and hooked in parallel. The cephalic is tied into the negative circuit and the forearm to the positive. In deep sedac the patient is given a pentothal or brevital anesthesia, and regular sedac is administered within the range of comfort. The sedac molac elimination modality (S.M.E.) was originated by Dr. William Philpott and consists of about an hour, of pre- and post-sedac therapy. In the middle are given short bursts of molac sine current with bitemporal electrode placement. The S.M.E. modality has proven to be invaluable in breaking up severe obsessive compulsive phenomena.

The usual indoklon method is that of introducing 1/4 to 2 cubic centimeters of the drug into the breathing bag containing oxygen. T.P.S. (tri-power sedac) is administered with anesthesia and utilizes from 10,000 to 100,000 units of sedac current to bring about only the tonic phase of the "convulsion." Molac (sine current) treatment may be given unilaterally or bilaterally. On occasion we use metrazol in recalcitrant hard-core situations: with a nineteen-gauge needle, 30 milligrams of brevital is intravenously given very quickly and followed by 10 cc of metrazol.

The following tables and graphs are self explanatory:

Tables 1a, 1b, 1c, 1d, and 1e constitute the basic work sheets for the project. Table 2 defines the "pure culture" treatments vertically, the number of treatments given, and horizontally are tabulated the number of patients in each single modality.

Tables 3a, 3b, and 3c project variable combinations of therapy and the number of patients receiving them.

Table 4 portrays the number of treatments given in variable age groups.

SUMMARY

Eighty-three patients were given 1,969 variable modalities of somatic treatment within an interval of 18 months. Eight different modalities were used in 15 different combinations—only four in "pure culture." The authors wish to emphasize that the great majority of convulsive therapy was given unilaterally without regard for dominant or non-dominant hemisphere.

The instrument used was the Reiter S.O.S. electro-stimulator which provides both direct and sedac current. In contrast to sine current which provides a heavy and excessive amount of electricity given within several tenths of one second, the unidirectional or direct current is administered with infinitely less dosage and over an interval of 45 seconds. Unidirectional current is smoother, less traumatic to the neurones and to the musculoskeletal system. It is also more readily controlled and may be manipulated to eliminate the clonic phase of the convulsive seizure. The sedac currents having a velocity of one to possibly 30 million cycles per second are of symphonic quality and appear not to diffuse or change the brain wave pattern.

In all of the patients treated (it may be noted in Table 1a, b, c, d, e) there

appeared to be neither confusion nor any appreciable alteration of the encephalogram.

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TABLE 1a Types and Amounts of

Therapies given

Case No	Age & Sex	Diagnosis	Days in Hospital	ECT	Deep Sedac	Reg Sedac	Other or Indoklon Metrazol	Pre-EEG	Post-EEG	Clinical Status Discharge	*Any Readmis-sions	Post R Confusion
0718	60 M»	Psychotic Disorder Involutional	42	19				Normal	Normal	Improved	None	None
1731	40 F	Psychotic Disorder	29		11	4		Normal	Normal	Improved	None	None
4379	75 F	Psychoneurotic Reaction Conversion Type	41	12	4		TPS-5	Normal	Normal	Improved	None	None
7077	29 M	Psychotic Disorder Schizophrenic	42	10	7		SME-3	Normal	Normal	Improved	None	None
1459	32 M	Personality Disorder	42		19	5		Normal	Normal	Improved	None	None
5372	42 M	Personality Disorder Mixed Type	35		21			Normal	Normal	Improved	* One	None
8763	42 F	Psychotic Disorder Type Undetermined	50	17	5		SME--2	S1. Abnormal	Normal-Somewhat Slow	Improved	None	None
0741	53 F	Psychoneurotic Reaction	41	6	16			Normal	Normal	Improved	None	None
6476	35 M	Personality Disorder Mixed	38		18			Normal	S1. abnormal-degree of cortical instability non-specific	Improved	None	None
5887	22 F	Psychoneurotic Reaction Mixed	33	10	4			Normal	Normal	Improved	None	None
7094	20 F	Psychotic Disorder Schizophrenic	39	22	2		4 SME-1 TPS-1	Normal	Normal	Improved	I 'One	None

* **Due to cost involved pt. that were readmitted did not have a pre- & post-EEG done.**

Somatic Therapies and the Electroencephalogram Cases

TABLE 1b

Types and Amount of Therapies given.

Case No	Age & Sex	Diagnosis	Days in Hospital	ECT	Clinical Sedac	*Any Sedac	Post-Deep Indoklon	Reg Metrazol	Pre-EEG	Other or Post-EEG	Discharge	Status on Readmissions	Confusion	R
8511	21 F	Psychotic Disorder Schizophrenic Reaction	**39**	**10**	11				Normal	Slightly Abnormal	Improved	"One	None	
6886	38 M	Psychoneurotic Reaction	**33**			20					Improved	None	None	
2336	57 F	Psychotic Disorder Undiff.	**41**		22				Normal	Normal	Improved	* One	None	
5496	21 M	Psychotic Disorder. Psychoneurotic Reaction	**51**		30				Normal	Normal	Improved	None	None	
8525	49 F	Psychoneurotic Reaction			31 Abnormal				S1.	S1. Abnormal	Improved	None	None	
6836	32 M	Psychoneurotic Reaction	**51**		29	2			Normal	Normal	Improved	None	None	
8229	46 F	Psychotic Disorder Schizophrenic Reaction	**11**	**6**						Normal Normal	Improved	None	None	
9812	31 M	Personality Disorder	**45**		26				Normal	Normal	Improved	" One	None	
7203	23 F	Psychoneurotic Reaction	28	**14**	1				Normal	Normal	Improved	None	None	
5848	57 F	Psychotic Disorder Schizophrenic	**30**	**1**	9	1	7		Normal	Normal	Improved	" One	None	
7448	68 F	Psychotic Disorder Involutional	**42**	**16**	1	1			Normal	Normal	Improved	None	None	
9212	22 F	Psychotic Disorder Schizophrenic	28	**13**	2 Due to Drugs.			SME-2	Normal	SI. Abnormal-Prob.	Improved	None	None	

"Due to cost involved pt. that were readmitted did not have a pre- & post- EEG done.

TABLE 1c Types and Amounts of Therapies given.

Case No	Age & Sex	Diagnosis	Days in Hospital	ECT	Deep Sedac	Reg Sedac	Other or Indoklon Metrazol	Pre-EEG	Clinical Post-EEG	*Any Discharge	Post Status on sions	Readmis- Confusion	R
5652	58 F	Psychoneurotic Reaction Mixed	45	3	19	1	7	Normal	Normal	Improved	None	None	
6584	42 M	Psychotic Disorder Schizophrenic	37	12	6		SME-3	Normal	Normal	Improved	None	None	
7638	47 F	Personality Disorder	35		22			Normal	Normal	Improved	None	None	
8739	41 F	Psychotic Disorder Schizophrenic	29	12			Metrazol-2	Normal	Normal	Improved	None	None	
4156	40 F	Psychotic Disorder		18	22	17	Molac3	Normal	Normal	Improved	None	None	
1195	66 M	Psychotic Disorder Involutional Reaction	54	13	3		TPS-4	Normal	Normal	Improved	None	None	
8954	23 M	Personality Disorder	43	7	10	11		Normal	Normal	Improved	None	None	
8848	43 F	Psychotic Disorder Schizophrenic Reaction Acute Brain Syndrome Ex. Poisons	42 33 35	22 8	2 11	2	7 SME--8 4	Normal	Normal	Improved	None	None	Normal
8525	34 F	Psychoneurotic Reaction Obsessive-Compulsive	48 48 48	9 8	9 22			Normal	Recovered	None	None	Normal	Improved
6877	20 M	Psychotic Disorder Schizophrenic		19	3			Normal	None	None			
6894	24 M	Psychoneurotic Reaction Psychotic Disorder Involutional Reaction						Normal	Normal	Improved	None	None	
8788	27 F	55						Normal	31. Abnormal potent- Epileptogenic.	Improved	None	None	ially
7117	F							Normal	Normal	Improved	None	None	

*** Due to cost involved pt. that were readmitted did not have a pre- & post-EEG done.**

TABLE 1d Types and

Amounts of Therapies given

Case No	Age & Sex	Diagnosis	Days in Hospital	ECT	Deep Sedac	Reg Sedac	Other or Indoklon Metrazol	Pre-EEG	on Readmis- Confusion	Clinical R Post-EEG	* Any Discharge	Post Status sions
2022	29 F	Psychotic Disorder Schizophrenic	**34**	**15**				Normal	Normal	Improved	None	None
3749	29 F	Psychotic Disorder Schizophrenic	**66**	**9**	**10**		6 4 Metrazol SME--8	Normal	Normal	Improved	" One	None
1243	45 M	Personality Disorder Mixed	**13**		**7**			Normal	Normal	Improved	None	None
8750	14M	Behavior Disorder	**45**		**25**			Normal	Normal	Improved	None	None
0998	22 M	Personality Disorder Mixed	**26**		**13**			Normal	Normal	Improved	None	None
0794	55 M	Psychoneurotic Reaction Anxiety	**34**					Normal	Normal	Improved	None	None
4992	58 F	Psychoneurotic Reaction Mixed	**34**		**6**	**16**		Normal	Normal	Improved	" One	None
1586	25 M	Psychoneurotic Reaction Mixed	**30**	**6**	**9**			Normal	Normal	Improved	None	None
8748	20 F	Psychotic Disorder Undiff.	**31**	**3**	**15**			Normal	Normal	Improved	None	None
8447	35 M	Psychotic Disorder Schizophrenic	**38**		**24**			Normal	Normal	Improved	* One	None
8727	18 F	Personality Disorder Mixed	**35**		**21**			Normal	Normal	Improved	None	None
6300	56 M	Psychotic Disorder Involutional	**33**	**13**				Normal	Normal	Improved	* One	None

Due to cost involved pt. that were readmitted did not have a pre- Et post- EEG done.

TABLE 1e Types and Amounts of Therapies given.

Case No	Age & Sex	Diagnosis	Days in Hospital	ECT	Reg Metrazol	Other or Pre-EEG	Post-EEG	Discharge	Status on Readmissions	Confusion	Clinical R	"Any Sedac	Post Deep Sedac	Indoklon
5613	43 M	Psychotic Disorder Undetermined	**12**	**2**		20			Normal	Normai	Improved	None	None	
6130	35 F	Psychotic Disorder Depressive Reaction	**44**	**16**		4			Normal	Normal	Improved	None	None	
2621	26 M	Personality Disorder Type- Mixed	**25**			16			Normal	Normal	Improved	None	None	
1731	41 F	Psychotic Disorder	**28**			11	4		Normal	Normal	Improved	None	None	
9837	33 F	Psychotic Disorder Schizophrenic Personality Disorder Depressive Reaction	**40**	**9** **14**		8		Metrazol-7	Normal	Normal	Improved	None	None	
6850	34 M	Psychoneurotic Reaction Personality Disorder Type- Undetermined	**32**	**16 2**		20			Normal	Normal	Improved	None	None	
1983	51 F	Psychotic Disorder Type- Undetermined	**50**	**18**		14			Normal	Normal	Improved	None	None	
2761	43 M	Psychotic Disorder Schizophrenic Psychotic Disorder	**41**				4		Normal	Normal	Improved	None	None	
5207	53 F 51	Involutional Psychoneurotic Reaction Anxiety Typi	**14**				10		Normal	Normal	Improved	None	None	
8889	F 49 F		**55**			1	19		Normal	Normal	Improved	None	None	
8875	49 F		**40**			1	3		Normal	Normal	Improved	None	None	
0117			**28**		14			Normal	Normal	Normal	Improved	None	None	

*Due to cost involved pt. that were readmitted did not have a pre- & post-EEG done.

TABLE 1f Types and Amounts of

Therapies given

Case No	Age & Sex	Diagnosis	Days in Hospital	Clinical ECT	*Any Sedac	Post Deep Sedac	Reg Indoklon	Metrazol	Other or Pre-EEG	Post-EEG	Discharge	Status on Readmissions	Confusion	R
3018	48 F	Psychoneurotic Reaction Mixed	**36**	18					Normal	Normal	Improved	None	None	
0342	51 **M**	Psychotic Disorder Involutional	**38**	17					Normal	Normal	Improved	None	None	
6694	56 F	Psychotic Disorder Involutional	**31**	15	2			SME-2	Normal	Normal	Improved	None	None	
8683	57 F	Psychotic Disorder Involutional	**59**	14 SME-2	10 Abnormal		6	4Metrazol	S1.	Normal	Improved	'One	None	
8665	15F	Personality Disorder	**37**	6	17				Normal	Normal	Improved	None	None	
8590	44F 61 F	Psychoneurotic Reaction Personality Disorder	**45**	22				Normal	Normal	Improved	None	None 11	29	
8550			**70**	SME-"	Normal		Normal	Improved	None	None				
8516	15 F	Personality Disorder	**44**		28			TPS-3	Normal	Normal	Improved	None	None	
8847	28 F	Psychotic Disorder	**34**	11	4			SME-2	Normal	Normal	Improved	None	None	
2456	35 F	Psychoneurotic Reaction	**30**		10	3		SME-7	Normal	Normal	Improved	None	None	
1110	74 M	Psychoneurotic Reaction Mixed	**30**			21			Normal	Normal	Improved	None	None	
2834	29 F	Personality Disorder	**41**		12	3		SME-6	Normal	Normal	Improved	None	None	
1903	39 **M**	Psychotic Disorder Schizophrenic Reactior	**54** i	10 Abnormal	21	1		SME-2 proved	SI.	Normal	Unim-	None	None	
8748	20 F	Psychotic Disorder Schizophrenic	**32**	3	15				Normal	Normal	Improved	None	None	

***Due to cost involved pt. that were readmitted did not have a pre- & post-EEG done.**

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TABLE 1g Types and Amounts of

Therapies given

Case No	Age & Sex	Diagnosis	Days in Hospital	ECT	Clinical Readmis- Confusion	*Any R Sedac	Post Deep Sedac	Reg Indoklon	Other or Metrazol	Pre-EEG	Post-EEG	Status on Discharge	sions
8802	36 F	Psychotic Disorder Schizophrenic	**28**	**1**	6 Non- Specific		4			Normal	SI. Abnormal	Improved	None None
8759	54F	Psychotic Disorder Involutional Reaction	**45**	**9**					Metrazol-5	Normal	Normal	Improved	None None TPS-5
8750	14 **M**	Behavior Disorder	**45**		25					Normal	Normal	Improved	None None
6288	44F	Psychoneurotic Reaction Mixed	**41**		28					Normal	Normal	Improved	None None
7443	57 F	Psychotic Disorder Involutional Reaction	**22**	**9**						Normal	Normal	Improved	None None
8441	28 M	Psychoneurotic Reaction Mixed	**39**		21					Normal	Normal	Improved	None None
6625	27 M	Personality Disorder Mixed	**29**		18					Normal	Normal	Improved	None None
	31 F	Psychoneurotic Reaction Obessive-Compulsive	O.P.D.					SME-20 Grade2Bitemp	Grade 1	Grade 1 Dysrhy	Improved		None Dys

*** Due to cost involved pt. that were readmitted did not have a pre- & Post EEG done.**

TABLE 2

Pure Culture Treatments

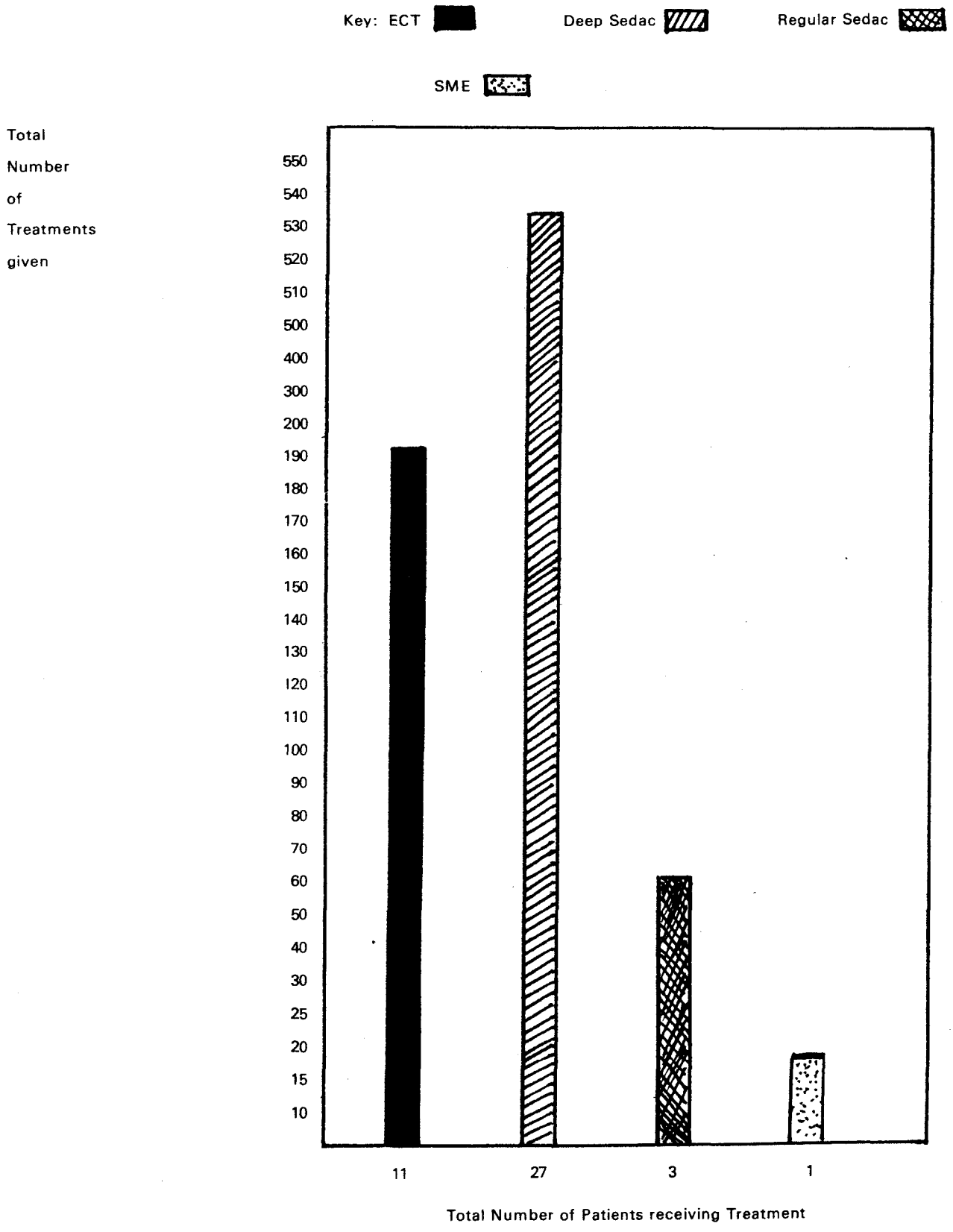

TABLE 3a

Patients who received variable treatments

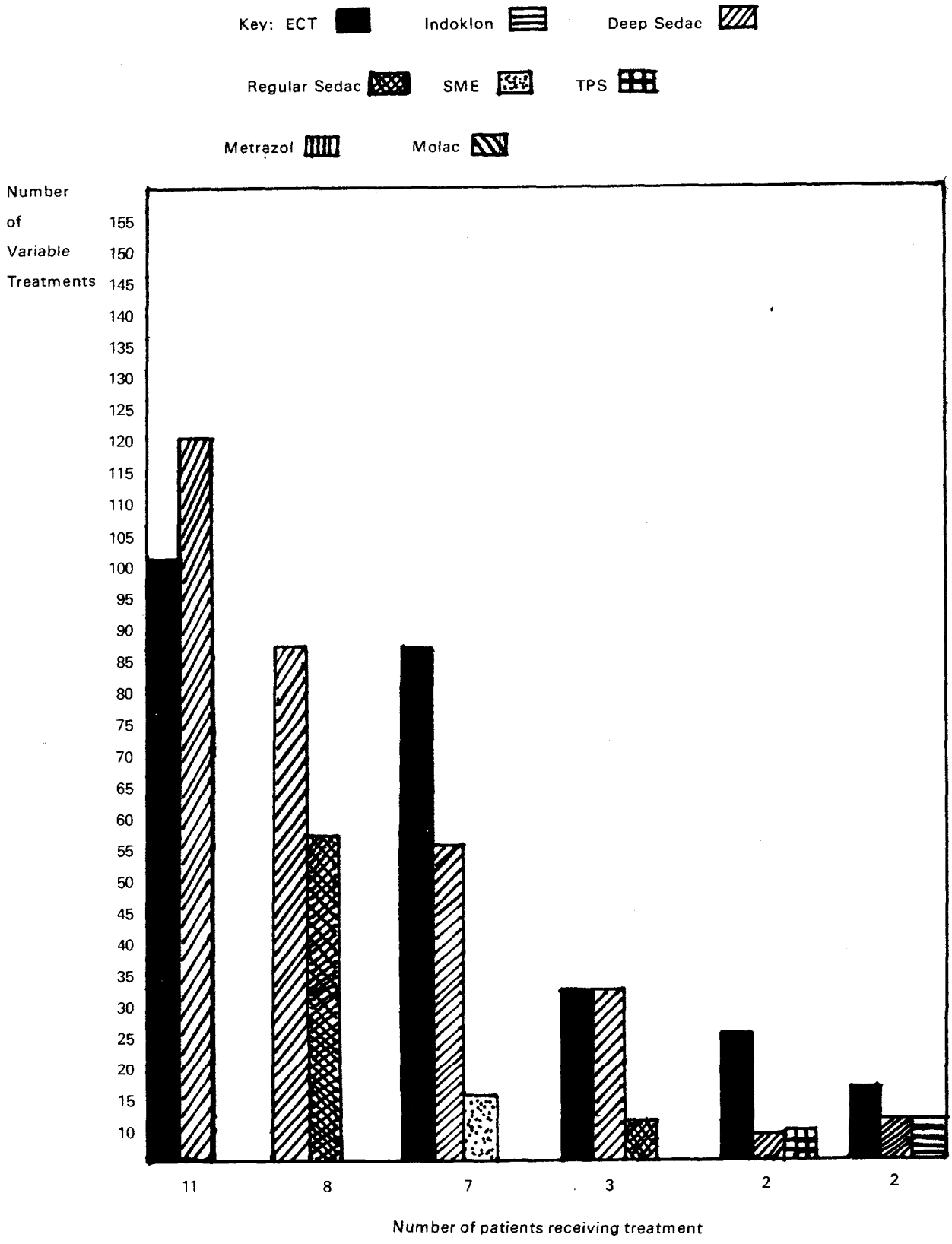

TABLE 3b

Patients who received variable treatment

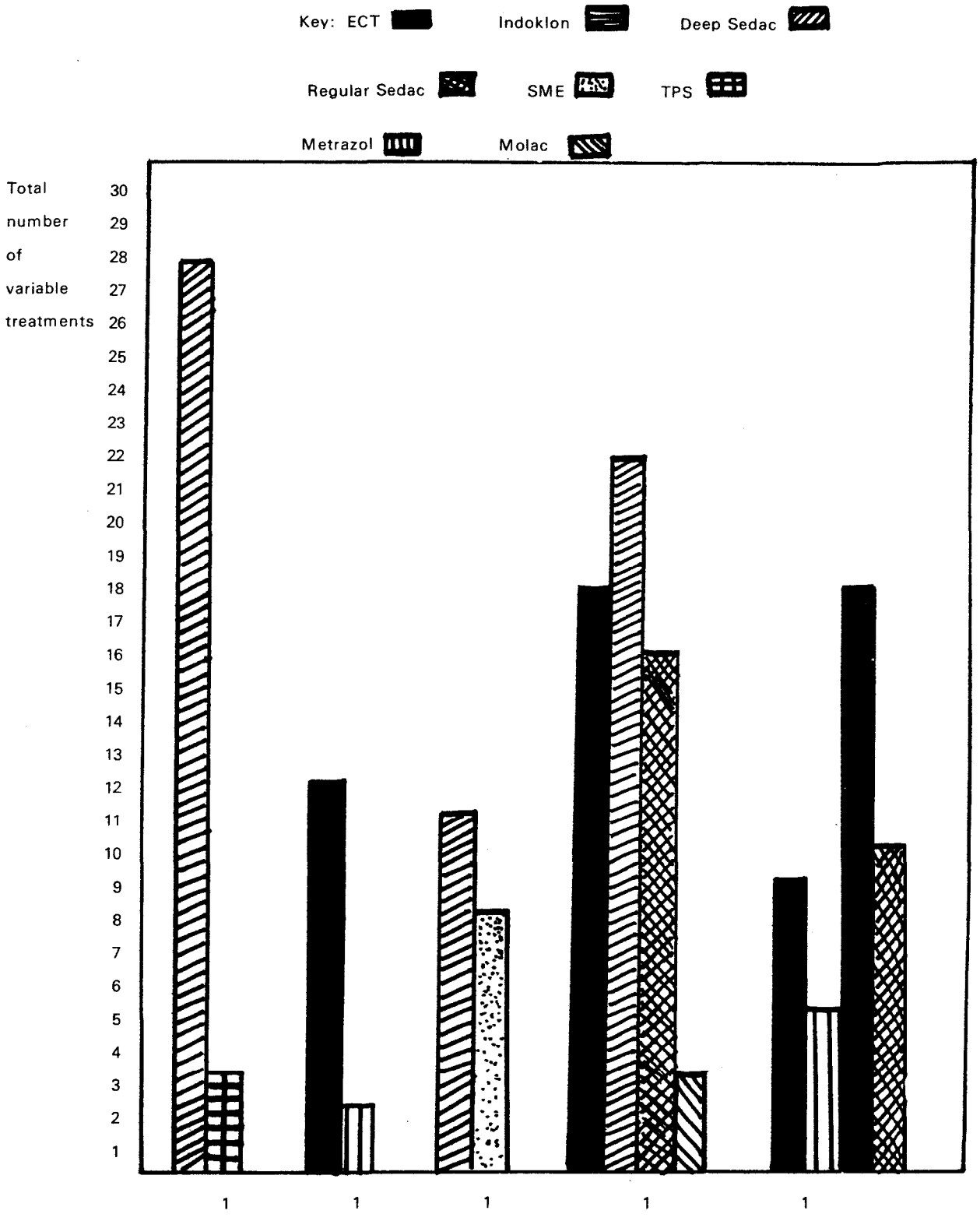

TABLE 3c

Patients who received variable treatments

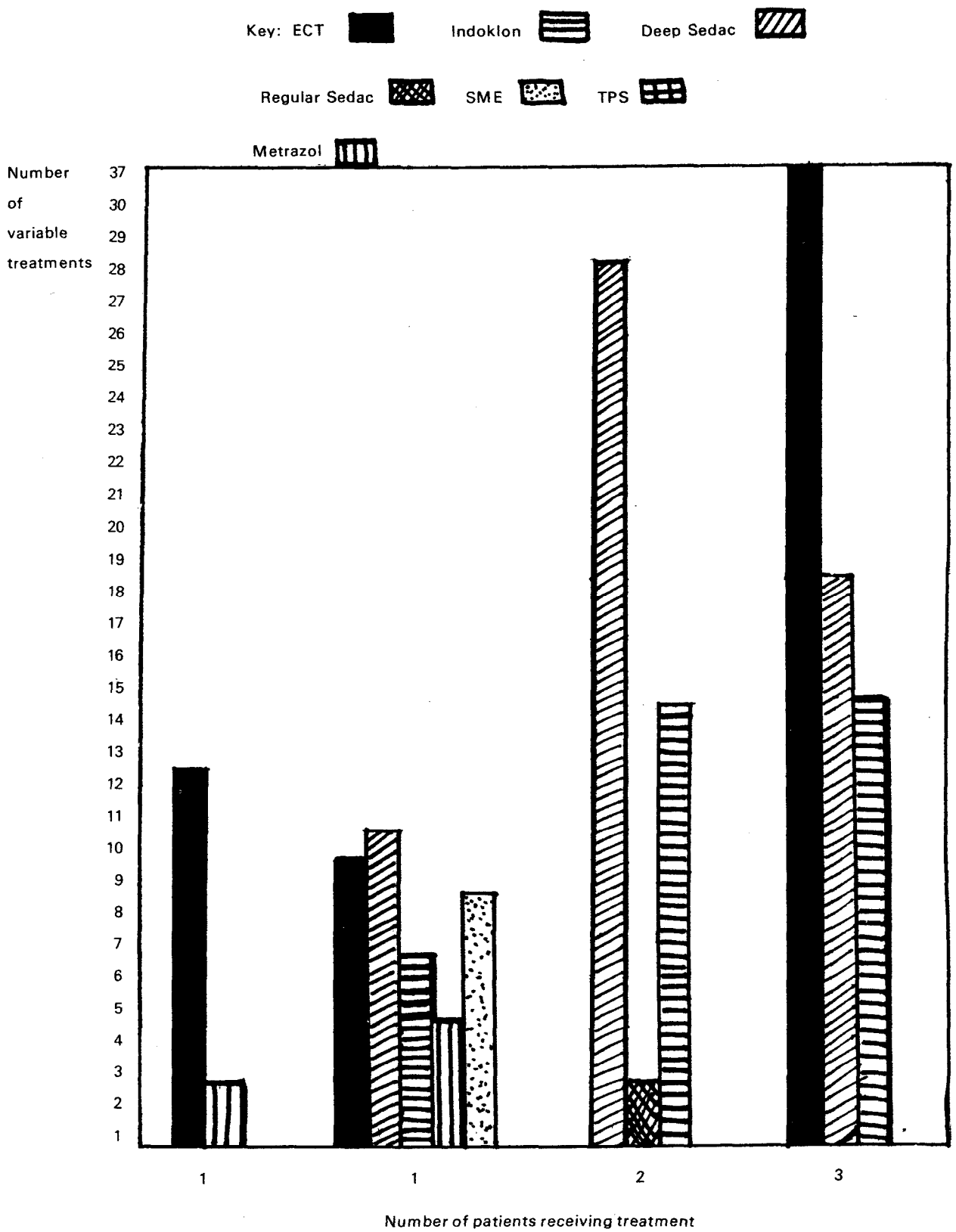

TABLE 4

Range of Age Categories