

Automated.

Easy.

Fast.



NEW REMOTE
TREAT HANDLE
SEE PAGE 4

Thymatron® System IV

Smart ECT Now Easier than Ever to Give

Do you feel ECT machines are too complex? We do, which is why we ship each Thymatron® System IV preinstalled with a ready-to-use exclusive Optimal Stimulus Program that prevents ineffective treatments by automatically selecting the most effective combination of frequency and duration. The preferred 0.5 ms pulsewidth is uniquely available at every dose, including the maximum dose (or, you can instantly select the 0.3 ms ultra-brief stimulus delivered via the same program). Now you can just:

Set Dose, Test Impedance, and Treat

We've also made it easier to rapidly switch to other stimulus programs—including ones you have created and saved, or any other you prefer—by just pressing and turning the single % Energy dial, preventing the accidental missettings that can occur with 4 different dials. And, we have responded to your requests for a Remote Treat Handle by introducing the elegantly shielded model shown on p. 4 that shortens setup time and allows you to deliver the stimulus with a single thumb press.



Best of all, the 900 mA stimulus of the Thymatron® System IV is 50% more effective than 800 mA at the same charge.



SOMATICS, LLC
910 Sherwood Drive, Unit 23
Lake Bluff, IL 60044

**Mecta SR-1
Users See Inside
Back Page!**

USA & Canada toll-free 1-800-642-6761
(847) 234-6761
FAX (847) 234-6763
sales@thymatron.com



Cat. #EDIV

The Thymatron® System IV: Description and Specifications

- EASIEST SEIZURE INDUCTION WITH THE THYMATRON® SYSTEM IV** Dose for dose, Thymatron® stimuli are 60% more effective for inducing seizures than Mecta stimuli, because of the much higher seizure thresholds found with the Mecta (Chanpattana et al., 2001). This enormous difference results from the substantially and significantly higher stimulus dose of the Thymatron's® 900 mA current relative to the 800 mA maximum current of Mecta machines, a higher stimulus dose that yields a larger volume of seizure foci in the brain (Swartz, 2006). This advantage alone is a compelling reason to choose the Thymatron® System IV over the Mecta Spectrum; it provides a critically important edge for the clinician in treating geriatric patients, who are especially resistant to seizure induction.
- New ANESTHESIA DEPTH MONITOR** provides continuous feedback of anesthesia level. Increasing use of propofol anesthesia for ECT worldwide (Abrams, 2002) has made anesthesia depth monitoring routine in many centers, due to propofol's biphasic action and dose-related tendency to shorten seizures. The Thymatron® System IV now includes at no increase in price a front-panel *Anesthesia Depth Monitor* display of your choice of 3 EEG measures shown to correlate significantly with anesthesia depth level: 95% Spectral Edge Frequency, Relative Delta power, and Median Frequency (Billard et al, 1997; Alkire, 1998; Hirota et al, 1999; McDonald et al, 1999; Sakai et al, 1999; Singh et al, 1999; Hans et al, 2001; Kuizenga et al, 2001; Koitabashi et al, 2002).
- ULTRABRIEF 0.3 MS STIMULUS** The Thymatron® System IV was the first modern ECT instrument to introduce ultrabrief ECT and remains the only instrument in the world that can deliver a 0.3 ms ultrabrief stimulus across the entire dosage range, up to and including the maximum allowed dose of 100 joules at 220 ohm impedance, which is 25% more than Mecta's maximum dose of 80 joules at 0.3 ms.
- STATE-OF-THE-ART 4-CHANNEL PRINTER** allows you to monitor two channels of EEG, plus ECG and EMG (or, choose 4 channels of EEG), while providing *hard-copy* documentation for later reference.
- SINGLE FRONT-PANEL DIAL** lets you select the traditional Thymatron® functions plus important new ones, including *Optimal Stimulus* programs that automatically set the most efficient combination of stimulus parameters at every stimulus dose setting.
- ELECTRONIC MEDICAL RECORD-KEEPING** is simple with the included Genie™ IV EMR software. Patient treatment records created and stored with the Genie™ IV are easily incorporated into hospital database systems.
- EXTENDED LOWER STIMULUS RANGE** with pulsewidth and frequency settings to 1/4 msec and 10 Hz allows you to deliver *stimuli up to 8 seconds long*, to optimize treatment in accordance with research showing greater efficacy of short-pulsewidth, extended-duration stimuli (Isenberg et al, 1996).
- EEG COHERENCE MEASURES** of *maximum sustained coherence*, and *time to peak coherence*, interhemispheric cross-correlation measures reported to reflect seizure quality and clinical impact (Krystal & Weiner, 1994; Krystal et al, 1995; Krystal, 1998).
- EEG AMPLITUDE** measures of *maximum sustained EEG power*, and *average seizure energy*, with separate values for *early*, *mid-* and *postictal seizure phases*, found by the Duke University group to be important correlates of seizure quality and efficacy (Krystal & Weiner, 1994; Krystal et al, 1995; Krystal, 1998).
- HEART RATE MEASURES**, including *peak heart rate*, a key measure of cerebral seizure duration and quality (Larson, Swartz & Abrams, 1984; Swartz, 1993; 1996; Swartz and Manly, 2000) that reflects the autonomic (brainstem) response to ECT. This is supplemented by *continuous digital heart rate* monitoring for safety and seizure generalization, with the result printed each second.
- A POWERFUL 32-BIT INTERNAL COMPUTER** employs *Power Spectral Analysis* to process and store up to 10 minutes of digitized EEG for the special features described here. You can send this data to your IBM PC-compatible computer via a rear-panel serial port for further comprehensive EEG analysis, using Somatics' proprietary Genie™ IV software.

- Because each ECT treatment session is **STORED IN MEMORY**, you can retrieve it if you run out of paper during a treatment—just slip in another pad after the treatment and *press a button for a complete printout*.
- **PATENTED INDEPENDENT SAFETY MONITOR CIRCUIT** prevents the patient from receiving an excessive electrical dose regardless of the operation of the regular circuits.
- **TRUE EMG RECORDING OF THE MOTOR SEIZURE.** Unlike simple movement detectors, the Thymatron® System IV's EMG can measure seizure muscle activity that is not visible to the naked eye, and which typically continues substantially longer than optically-detectable movements (Couture et al, 1988).
- Because the special computer-automated programs of the Thymatron® System IV are stored on **REPLACEABLE MICROCHIPS**, updates are easily accomplished on-site via chip replacement. Somatics has already provided 4 advanced microchip upgrades for the System IV: the ultrabrief 0.25 ms pulsewidth program, Genie™ IV computer software, real-time digital EEG monitoring, and the Anesthesia Depth Monitor. In comparison, any upgrades to the Mecta spectrum (there have been none) would have required return to the factory.
- The **PATENTED POSTICTAL SUPPRESSION INDEX** reports the degree of EEG flattening immediately following the seizure, which correlates with clinical efficacy (Nobler et al, 1993; Krystal & Weiner, 1994; Krystal et al, 1995; Krystal, 1998; Nobler et al, 2000). A recent study of the Thymatron®'s *Postictal Suppression Index* found that it significantly differentiated ECT remitters from non-remitters (Petrides et al, 2000). The authors concluded: *"higher PSI values (more abrupt ending of ictal EEG) are correlated with better clinical outcome of ECT in depression"*.
- **COMPUTER DETERMINATION AND PRINTOUT OF EEG AND MOTOR SEIZURE DURATIONS.** The integral computer EEG analyzer continually measures the EEG and EMG and automatically prints the EEG and motor seizure durations with precision and reliability (Swartz et al, 1994; Krystal et al, 1995).
- **JUST SET ACCORDING TO AGE AND TREAT.** Setting the Thymatron® System IV according to the patient's age facilitates easy selection of the stimulus charge.
- **Alternatively, RAPID STIMULUS TITRATION** is facilitated with the Thymatron® System IV using a simple method-of-limits procedure (McCall et al, 1993; Rasmussen et al, 1994) that employs uniform dose increments.

(see next page for references)

THYMATRON® SYSTEM IV FEATURES CHECKLIST¹

	Thymatron® System IV	Mecta Spectrum
Anesthesia Depth Monitor	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Choose 0.25 or 0.3 ms Ultrabrief Pulsewidth	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Genie™ IV Software	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Four-Channel Monitor/Printer	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Optimal Stimulus Programs	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Maximum Sustained EEG Amplitude	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Continuous Digital Heart Rate Monitor	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Peak Heart Rate Printout	<input checked="" type="checkbox"/>	<input type="checkbox"/>
EEG Coherence Analysis	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Seizure Energy Index	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Postictal Suppression Index	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Maximum Dose Available at all Pulsewidths	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Interictal Frontal Delta Analysis	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Computer EEG Seizure Duration	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Computer Motor Seizure Duration	<input checked="" type="checkbox"/>	<input type="checkbox"/>
True EMG Monitor	<input checked="" type="checkbox"/>	<input type="checkbox"/>
EEG Ictal Line Seizure Indicator	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Light-Emitting Elapsed Time Display	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Up to 8 Seconds of Stimulation	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Change Waveform without Altering Dose	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Audible EEG™ monitor	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Instant Impedance Test	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Extended Seizure Alert	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Patented Safety Monitor Circuit	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Isn't it Time to Upgrade to a Thymatron®?

¹U.S. patents 4777952, 4870969, 4873981, 4878498, 5269302, 5470347, 5626627, 5755744, 5871517

SPECIFICATIONS

STIMULUS OUTPUT: Current: 0.9 amp constant, limited to 450 volts, isolated from line current.

Frequency: 10 to 70 Hz in 10 Hz increments (to 140 Hz for 0.25 ms pulse).

Pulsewidth: 0.25 to 1.5 msec in 0.25 msec increments.

Duration: 0.14 to 8.0 sec in increments of equal charge.

Maximum output: Standard maximum output across 220 ohms impedance: 504 milliCoulombs, 99.4 joules. Output with double-dose option (where available) across 220 ohms impedance: 1008 mC, 198.8 joules

RECORDING: 8 user-selectable gain positions: 10, 20, 50, 100, 200, 500, and 2000 μ V/cm.

REQUIREMENTS: 100-130 volts (120 volts) A.C., 60 Hz, single phase. 100 VA. /220-240 volt, 50/60 Hz switchable.

APPROVALS: CSA, CE, ISO 13485:2003, TUV, IEC 60601

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#EEDS

SOMATICS' OWN DISPOSABLE SELF-STICK EEG/ECG/EMG ELECTRODES

Easy and quick to use, "the pregelled electrodes provided in the Thymatron DG starter kit. . . reduce preparation time" (*Convulsive Therapy* 2:53, 1986), compared to metal electrodes and ordinary disposable paper ECG electrodes. Their small size facilitates bifrontal or fronto-mastoid application without interfering with treatment electrode placement. Ideal for recording EEG, ECG, and EMG, they are conveniently packaged 5 per strip. Instantly adherent, they will remain in place throughout the seizure.



MICROSTIM™ PERIPHERAL NERVE STIMULATOR

This hand-held, solid state, peripheral nerve stimulator weighs only 7 oz. It applies a pulsed 0.2 msec square-wave stimulus through surface electrodes to precisely determine the point at which a safe degree of succinylcholine-induced muscle relaxation has been achieved. The operator has the option of selecting continuous (tetanus) or intermittent (twitch) stimulus modes. Battery powered (9 volt alkaline), it comes in a soft carrying case that clips to pocket or belt. 2.4" x 1.0" x 3.8"

#ENSI



NEW REMOTE TREAT HANDLE FOR THYMATRON®

You asked for a remote treat handle and here it is. You can press the TREAT button on this handle instead of reaching over to the Thymatron® itself: a simple thumb press safely triggers the stimulus for any electrode placement, including unilateral.

A ONE-PAGE COURSE IN ADVANCED ELECTROCONVULSIVE THERAPY

% Energy set 45%
 % Energy delivered 45%
 Charge delivered..... 308 mC
 Current 0.90 A
 Stimulus Duration 7.2 sec
 Frequency 70 Hz
 Pulse Width 0.3 msec
 Static Impedance 1440 ohms
 Dynamic Impedance..... 260 ohms
 EEG Seizure Endpoint 48 sec
 EMG Endpoint..... 45 sec

Peak Heart Rate 128/min
 Average Seizure Energy Index 72 V²
 Postictal Suppression Index 96%
 Maximum Sustained Power 77841 μV²
 Time to Peak Amplitude 33 sec
 Maximum Sustained Coherence 95%
 Time to Peak Coherence..... 33 sec
 Early Ictal Amplitude 133 μV
 Midictal amplitude 264 μV
 Post-ictal amplitude 10 μV

This sample ECT report of the Thymatron® System IV shows that the doctor set the % Energy dial to his patient's age of 45 years, yielding a 308 mC stimulus charge. The *Optimal Stimulus Program* selected a 0.3 msec pulsewidth, 70 Hz frequency stimulus delivered over 7.2 sec. Prior to stimulus administration the impedance measured a safe 1440 ohms, which dropped to 260 ohms during stimulus delivery.

The EEG seizure lasted 48 seconds. Peak seizure amplitude was reached at 31 sec, with a mid-ictal amplitude of 264 μV, a *Maximum Sustained Power* of 77841 μV², and an *Average Seizure Energy Index* of 72 V² reflecting strong seizure intensity.

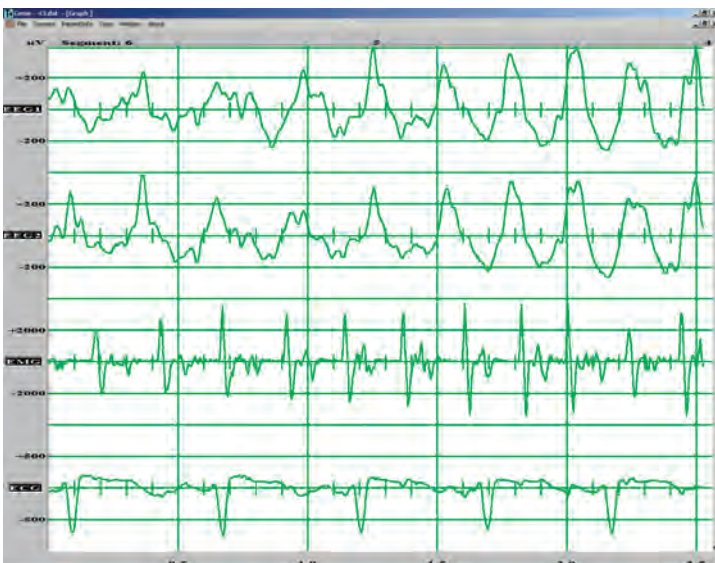
Peak Interhemispheric Coherence reached at 33 sec was consistent with the seizure amplitude peak at 31 sec. The *Maximum Sustained Coherence* value of 95% reflected synchronous participation of both hemispheres in the seizure. The rapid drop of EEG seizure amplitude to 10 μV postictally yielded a high *Postictal Suppression Index* of 96%. Power Spectral Analysis was not enabled.

In summary, the record shows a synchronous, high-intensity, well-developed, and well-generalized EEG seizure pattern with a strong midictal phase, pronounced postictal suppression, and a substantial tachycardia response—which is to say, an ECT-induced seizure of high expected clinical efficacy (Abrams, 2002)

GENIE™ IV ELECTRONIC PATIENT DATABASE AND EEG MONITORING SYSTEM

Designed to meet your clinical and research needs, the Genie™ IV enables you to enter complete patient information at each treatment for storing, printing or incorporating into a hospital-based electronic patient database system.

Equally important is the Genie™ IV's comprehensive real-time display of up to 4 channels of EEG, ECG, and EMG on a PC screen (not included), allowing you to monitor and then store each treatment session.



(GENIE™ IV Patient Information Data File/Printout)

Date: 12-16-05 Name: Laurenz Smarba Age: 58 Sex: M
 Somewhat improved but still has insomnia & poor appetite
 Oriented, alert, coherent and cooperative
 ECT #3 (R-UNI x 1) Anesthesia: Dr. Jones ECT: Dr. Smith
 Atropine 0.2 mg - Brevital 50 mg - Succinylcholine 40 mg
 Thymatron IV 85% Energy (LOW 0.5 program)
 Moderately strong seizure-symmetrical, well developed
 Good heart rate response with rapid return to baseline
 No complications, quick recovery
 Recommendation for ECT #4: same as above

DOES YOUR ECT DEVICE DELIVER THE DOSE YOU SPECIFY? DO YOU TRAIN DOCTORS OR NURSES IN ECT QUALITY?

U.S. PAT.
#6,200,331



Device malfunction can cause ineffective ECT treatments or excessive side-effects. Now you can check your ECT device yourself with Somatics' easy-to-use, patented ECTOBRAIN™ II, which performs the same current output check professional engineers use. A single button press instantly tells you if your ECT device is operating safely— providing reassurance and peace of mind. ECTOBRAIN™ II works with any Thymatron® or MECTA device.

ECTOBRAIN™ II also features a *Patient Simulator* mode that generates EEG, ECG, and EMG signals derived from real patients for testing up to 4 channels of your monitor/printer tracing display and for training and demonstration purposes. Both good- and poor-quality seizures can be selected.

The good-quality seizure shows a high amplitude EEG followed by electrical silence at termination, with a pronounced tachycardia response and a high-amplitude EMG that terminates shortly before EEG termination. The poor-quality recording exhibits a low-amplitude abortive-type EEG seizure lasting only 10 sec, followed by continued but lower-amplitude EEG fluctuations after termination; there is no tachycardia response, and an initial low-amplitude EMG response lasts only a few seconds.

A device checkup can cost \$600 to \$800 but real costs are more. How often does the question arise in treating a difficult patient whether the ECT device is stimulating properly or the EEG tracing recording correctly? *Most ECT units sent to us for presumed malfunction have nothing wrong with them!* ECTOBRAIN™ II can quickly determine whether or not the device is working. It can reveal problems in technique (e.g., recording electrode application) that are correctable on site or with user-replaceable parts (e.g., lead wires). Just connect the stimulus and recording cables and press the TREAT button as for a patient.

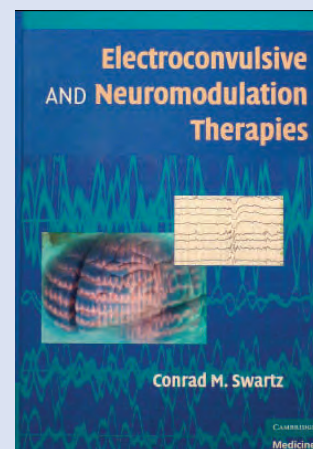
The chart recorder of your ECT device will display samples of EEG, ECG, and EMG tracings as described above. The printed report will show the values of the stimulus parameters and other printed variables of your ECT device, including the *measured stimulus charge output* in mC.

Satisfaction guaranteed by Somatics' 30-day unconditional full-satisfaction trial period. 5-year warranty on parts *and* labor. *Special price when ordered together with a Thymatron® System IV.*

Trouble-Shooting with the ECTOBRAIN™ II

Problem	How to test using Ectobrain™II *
No Stimulus output	Section I
Impedance test error	Section II
ECT stimulus cable failure	Section III
No EEG, EMG endpoint	Section IV
ECG channel doesn't print	Section IV
No Ictal Line	Section IV
Special feature doesn't print	Section IV
EEG amplifiers require calibration	Section VI
ECT stimulus requires calibration	Section VI

* See specified sections of Ectobrain™ II manual on www.thymatron.com downloads page



This ground-breaking new text edited by internationally-recognized ECT expert Dr. Conrad M. Swartz comprehensively covers the scientific basis and clinical practice of ECT as well as the latest nonconvulsive electrical and magnetic brain stimulation therapies. The many expert contributors from around the world illustrate compellingly that ECT is now a mainstream psychiatric treatment. The wealth of new and surprising information it contains is certain to provide ECT practitioners with much enjoyable "brain stimulation".

Call David Mirkovich at 1(800)642-6761 for our very attractive price.

MECTA ABANDONS ITS CUSTOMERS

The bad news is that Mecta no longer supports doctors using Mecta SR, JR, and older machines: no service, no parts, no repairs, no help, *nothing*.

This puts Mecta users in the untenable position of having to treat their patients with unsupported equipment.

Mecta's message is crystal-clear: their unsupported equipment is obsolete. Besides lack of support, who wants the responsibility for treating patients with obsolete equipment?

The concept of abandonment has a special meaning to doctors. Somatics, which is directed by physicians, has always supported all of its products, including the original Thymatron®, now 20 years old.

The good news is that besides supporting every Thymatron® it ever made, Somatics will credit \$500 for your old Mecta towards a state-of-the-art Thymatron® System IV.

And what's more, we now offer a remote treat handle system that is far superior to the one supplied by MECTA for the SR-1.

To take advantage of this special offer (*USA and Canada only*), or to arrange for a free 30-day trial of a Thymatron® System IV, just call David Mirkovich at 1-800-642-6761.

MECTA SPECTRUM PROVIDES USELESS SEIZURE MEASURE

According to MECTA's Instruction Manual for the Spectrum 5000, a stimulus adequacy measure is available that ranges from 0-99%. MECTA claims that "*higher numbers [are] associated with a greater likelihood of seizure adequacy*". But is this true?

Mecta admits that "*The stimulus adequacy measure provides an estimation, for both unilateral and bilateral ECT, of the likelihood that the induced seizure differs from that associated with barely suprathreshold unilateral ECT (a type of ECT shown by Sackeim and colleagues to be subtherapeutic).*"

Indeed. Sackeim and colleagues (1987) achieved only a 17% response rate to barely suprathreshold unilateral ECT, lower even than the response rates reported for sham ECT (Abrams, 1997). Thus, MECTA's measure actually describes *seizure inadequacy*: how much better a seizure is than no seizure at all.

Because higher numbers reflect only a lesser degree of seizure inadequacy, even a result of 99% would just mean that the seizure was 99% less inadequate than no seizure or a subtherapeutic seizure.

In marked contrast, the Postictal Suppression Index of Thymatron® instruments (US Pat. #5269302) truly reflects seizure efficacy. A recent study (Petrides et al, 2000) obtained an 85% remission rate in major depressives with the Thymatron® DGx. The average Postictal Suppression Index for these remitters was 87, significantly higher than for the 15% of patients who failed to achieve remission.

The authors concluded: "*These data support that higher PSI values (more abrupt ending of ictal EEG) are correlated with better clinical outcome of ECT in depression. This putative marker of seizure generalization may be useful as an index of treatment adequacy.*" (Petrides et al, 2000)

MECTA SPECTRUM NO IMPROVEMENT OVER SR-1

In a recent study of ECT-device seizure efficacy, Krystal et al (2000) found they had to set their old MECTA SR-1 machine to the maximum dose in 15% of the patients in order to get a barely acceptable seizure, and even at this dose, the MECTA failed to produce adequate seizures 5% of the time.

If you were hoping to improve seizure efficacy by trading in your old SR-1 towards a new Spectrum, you may be disappointed. Krystal and Weiner (2001) repeated their study using a Spectrum and got even worse results than with their SR-1, despite using the Spectrum's longer stimulus: twice the proportion of patients now required the maximum dose or failed to obtain adequate seizures (30% and 10%, respectively).

The Choice is Easy (and Smart!)

Isn't it Time to Upgrade to a Thymatron®?

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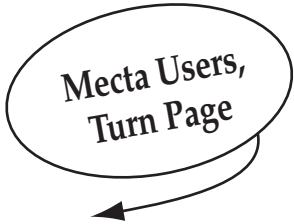
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Rasmussen KG et al (1994): Possible impact of stimulus duration on seizure threshold in ECT. Convul Ther 10:177-180.
Sackeim HA et al (1987): Effects of electrode placement on the efficacy of titrated, low dosage ECT. Am J Psych 144:1449-55



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PRSRST STD
 U.S. POSTAGE
PAID
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Advanced ECT Is Now Easy... Thymatron System IV

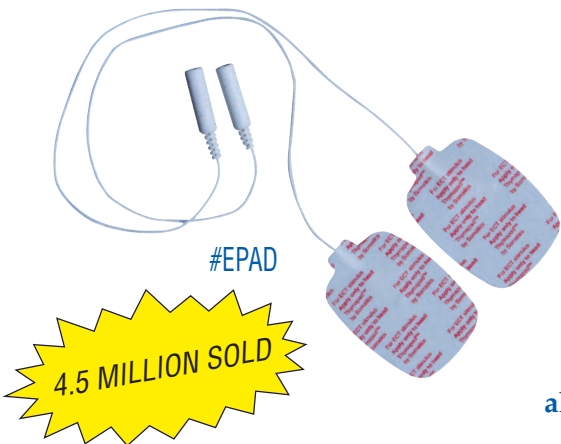
SAFE, TIME-SAVING DISPOSABLES FOR ECT

THYMAPAD™ Adherent Stimulus Electrodes

Thymapads™ are much faster and easier to use than the old-fashioned disk, headstrap, and jelly method.

They remain exactly where applied and have no exposed metal surfaces to cause accidental shocks. There's no mess to clean up afterwards, nothing to wash, dry, or sterilize, no sticky hands - just remove them and discard.

Thymapads™ flexibly conform to the surface of the head and fit all Mecta machines.



VENTIL-A™ Mouth Protector

The *Ventil-A™*'s thick 100% closed-cell foam construction protects all the teeth. Fits easily under any anesthesia mask and features a non-collapsible air channel for free flow oxygen. One-piece design for dimensional stability and looped end for fast and easy insertion/removal. One size fits >98% of adults.

Both of these single-use ECT aids (US Pats 4,870,969 & 6,039,046) save the time and expense of washing and sterilization and eliminate the risk of cross-infection that occurs with re-usable products.

