How Well Prepared Are Operating Room & PACU Teams For An MH Crisis?

There is no doubt that over the past 30 years MH has gone from a virtually unknown, highly fatal problem to one that is well described in every textbook of anesthesia, surgery, medicine, and nursing. Reference to MH can be found, even if it’s just in passing, in the curriculum of most training programs for health care professionals dealing with surgical patients. Since MH is not an extremely common problem, it is not surprising that the average physician or nurse would not know a great deal about the intricacies of the syndrome, such as its clinical manifestations, the underlying pathologic changes and subtleties of treatment. But everyone who has studied some aspect of medicine or nursing will be able to know where to find more information about the syndrome and also to understand at least that it may be fatal if not identified and treated with dantrolene promptly. We would expect that anesthesia providers and surgeons know a good deal about MH and particularly the steps in treating the syndrome. Recent studies provide some disturbing information about MH preparedness.

Mortality From MH As A Measure Of Preparedness
One of the goals of MHAUS has been to not only provide information about MH to health care professionals and the public but also to assist the anesthesia and nursing communities to be prepared to act promptly and effectively when a crisis arises. We have generally measured success in the management of MH based on declining mortality from MH. However, we realize that we are not aware of all cases of MH. In some situations we might not be called when a patient dies from MH because there is an aversion to publicizing a bad outcome.

A study published in the very respectable journal, Anesthesia and Analgesia, found that the mortality from MH is closer to 12% overall based on national data. The mortality ranges from 5% when the syndrome occurs in a hospital to 20% when the patient with MH has to be transferred into a hospital. (1) This statistic causes concern, but again we questioned whether all those cases called MH were really MH, or just cases of high fever after surgery. Hard to know since the individual case data are not presented.

As part of an epidemiologic study

continued on page 3
Malignant Hyperthermia (MH) is an inherited muscle disorder which, when triggered by potent inhalation anesthetics and succinylcholine, may cause a life-threatening crisis. The incidence of MH is low, but, if untreated, the mortality rate is high. Since the advent of the antidote drug, dantrolene sodium, and with greater awareness of the syndrome, the mortality rate has decreased. Great advances in our understanding of MH have been made since it was first recognized in the early 1960s, but the nature of the fundamental defect(s) is still unknown.

MHAUS advocates that all surgical patients undergoing general anesthesia should receive continuous temperature monitoring, that adequate supplies of dantrolene be stocked near the OR and that thorough family histories be obtained.

The mission of MHAUS is to promote optimum care and scientific understanding of MH and related disorders. (The Canadian Malignant Hyperthermia Association closed its doors a few years ago).

There are, of course, other organizations at work around the globe, most notably the European Malignant Hyperthermia Group (EMHG). MHAUS works with EMHG and other groups, and communicates with medical professionals around the world, from South America to Southeast Asia.

The Communicator remains a vital component for distributing information; think of it as the hub of a wheel, with the spokes its information and resources distributed; in its tracks it leaves heightened awareness and a better understanding of MH.

– The Editor

Correction Notice
The article “Calsequestrin1 (CASQ1): A New Gene For MH?” in the summer 2009 issue of The Communicator (Vol. 27, No. 3, pg 6) should have contained the name of the author Sharon Dirksen, PhD, MHAUS Scientific Officer. We apologize for the omission.
Continued from page 1

based on data from the state of NY from 2001-2005, a higher than expected mortality (about 20%) was also identified in certain situations. (2) This data will soon be published in Anesthesia and Analgesia. My coauthors on the study, Dr. Lena Sun, Dr. Guohua Li and Ms. Joanne Brady of Columbia University and I will soon be embarking on an in depth study of the specific cases that were labeled MH in order to be sure that they really were MH and not a syndrome resembling MH.

Use Of Simulation Technology To Test Preparedness For Emergencies
These studies call into question our comfort level that MH is recognized and treated appropriately in greater than 95% of cases. Now another study looking at MH from an entirely different viewpoint, demonstrates that indeed when faced with a crisis many anesthesia providers become confused and overwhelmed and do not follow the standard treatment procedures. They may waste time changing an anesthesia machine, make a mistake in calculating the dose of dantrolene, have insufficient personnel to do all the tasks required for management of MH, etc.

Most interestingly, this study was not aimed at determining how practitioners manage MH specifically. Rather it was a simulation-based study whereby the anesthesiologists and nurse anesthetists were confronted with one of ten emergencies, such as unexpected anaphylaxis (massive allergic response) and were scored on how the response was managed by independent observers. The scores for nine of the emergency situations were quite good, but not for MH! Less than 20% of those handling the crisis performed the key actions required to identify and treat MH as opposed to a much higher percentage for all the other situations. (3)

MHAUS’ Efforts In Simulation-Based Education & Training
A word is in order about the use of simulation in training health care professionals. Full scale high fidelity manikins that may be programmed to respond to drugs or situations with such physiologic responses as blood pressure, heart rate, respiration, even muscle tone, and bleeding have rapidly become an important part of training students and health care professionals. Such simulation has been around for a while, but it has reached the “tipping point”, whereby it will soon be a requirement that trainees and even experienced clinicians demonstrate their abilities in a simulation center.

In the future, we intend for MHAUS to assist in the development of simulator based education programs. However, to do it right requires many hours of planning and development. Meanwhile we are approaching the need for preparation and training in successfully handling an MH crisis using a different form of simulation: an MH drill.

The Board and staff at MHAUS have been delving deeply into what our “customers” need for better management of MH. One of the top requests is for the development of a guide for carrying out an MH drill (like a fire drill or a response to a cardiac arrest). We know that many hospitals and ambulatory surgery centers perform such a drill on a regular basis, in part, because one of the ambulatory center accrediting agencies require such a drill every year. But we also know that others do not know how to develop such a drill. Such questions as how many people need to be involved, where does one get expired dantrolene to practice mixing the stuff, how does one score the success of the drill, does a site require a manikin to carry out the drill or is there an alternative?

Creation of a program to assist hospital ORs, ambulatory centers and other places where MH trigger agents are in use, in developing a drill is tops on the MHAUS project list. Our staff, consultants and other volunteers are committed to having a guideline for setting up and carrying out an MH drill in place soon. So the answer to the question in the headline is that some centers are very well prepared, but there is still a need for improvement.

References:
Both MH-Mini Conferences Very Successful

The MH mini-conferences held last month in Oklahoma City, OK and Latham, NY were very successful. There were 45 attendees at the Oklahoma City conference and 82 attendees at the Latham conference.

Fay Kellogg, MHAUS Fulfillment Administrator, helped organize the events along with Lydia Friedman, head of the MHAUS Patient Liaison Committee.

Both conferences followed the same format. Attendees at the conferences included nurses, family members, and medical doctors. This was the first year that two MH mini-conferences were held.

MHAUS plans to hold more such conferences in the future. The conferences provide updates by medical professionals on current MH research and testing, which includes the latest on molecular genetic testing, as well as addresses any questions posed by those attending.

Highlights of the two mini-conferences included mixing dantrolene (below left), the MH muscle biopsy video, an MH mock drill, and panel discussion with guest speakers in Latham (above, left-to-right) Dr. Barbara Brandom, Dr. Michael Adragna, and Deanna Steele, genetic counselor; and in Oklahoma City (below, left-to-right) Dr. Tae Kim, Jennifer Geurts, genetic counselor, and Dr. Mohanad Shukry.
Happy 30th Anniversary To Dantrium® IV

That’s right, it’s been 30 years now that Dantrium® IV has been on the market and saving lives of those afflicted with malignant hyperthermia. How many lives has Dantrium® IV saved in those years? It’s difficult to calculate. Suffice it to say, there are countless people alive today thanks to this miracle drug.

And yes, it can be (and was) considered a miracle drug when it gained FDA approval based on 14 cases. Before Dantrium® IV, there was no cure for MH, an inherited muscle disorder which, when triggered by certain types of anesthetic agents used during surgery in MH-susceptible individuals, may cause a life-threatening crisis.

Coincidentally, it was by happenstance that Dantrium® IV came to be known as the cure for MH. Keith O. Ellis, PhD, one of the scientists who worked at Norwich Eaton Pharmaceuticals, where the drug was being developed, wrote “(Dantrium IV) was a drug in search of a disease.”

In the early 1970s, the drug was known as a skeletal muscle relaxant and was in clinical development for the treatment of spasticity. It was around this time that Dr. Ellis read about malignant hyperthermia, the skeletal muscle rigidity and pig model of MH. He contacted investigators working with MH pigs and later sent samples of the drug for trial studies. The rest is history.

Norwich Eaton Pharmaceuticals was later bought by Procter & Gamble Pharmaceuticals, which took over the marketing and distribution of Dantrium® IV. The rights to Dantrium® IV were later purchased by JHP Pharmaceuticals, an integrated specialty healthcare company that acquires, manufacturers and distributes sterile injectable products predominately to hospitals and clinicians in the USA and Puerto Rico. With this, the story (and history) of Dantrium® IV continues.

Do you have an MH survival story? Tell us about it and include a before and after picture. Visit the MHAUS website at www.mhaus.org and click on “Faces of MH” in the lower left of the patient or professional section, located just above the “Facebook” link.

In Managing Malignant Hyperthermia...

Reconstitutes 4x faster than before!

Dantrium® IV
(dantrolene sodium for injection)

Available November 2, 2009 under JHP Label Code 42023-123-06

To order Dantrium® IV, call your wholesaler / distributor or call JHP Pharmaceuticals at 1.877.547.4547

Management of Malignant Hyperthermia (MH) crises requires various supportive measures individualized for the patient’s condition. Administration of Dantrium® IV is one component of therapy and should not be considered a substitute for these measures. Even when properly treated, an MH crisis can result in death. Adverse events with Dantrium® IV include loss of grip strength, weakness in the legs, drowsiness, dizziness, thrombophlebitis, and tissue necrosis/injection site reactions secondary to extravasation. There have been rare reports of pulmonary edema, urticaria and erythema.

Please see Full Prescribing Information by visiting http://www.jhppharma.com/products/dantrium-iv.html

SAVE TIME...WHEN TIME MATTERS MOST!
Activated Charcoal As An Alternative To Flushing To Prepare The Dräger Fabius Anesthesia Machine For The MH-Susceptible Patient

by Joel B. Gunter, M.D.
Professor, Clinical Anesthesia and Pediatrics Department of Anesthesiology, Children's Hospital Medical Center Department of Anesthesiology, University of Cincinnati Cincinnati, OH, USA

Care of the malignant hyperthermia-susceptible patient requires avoidance of exposure to even trace concentrations of residual halogenated anesthetics. This has typically been accomplished either by the use of dedicated “clean” anesthesia machines which are never exposed to halogenated anesthetics or by flushing residual anesthetics from anesthesia machines prior to use. The flushing procedure consists of removing or disabling any vaporizers, changing the CO2 absorbent, replacing any readily accessible rubber or plastic parts (e.g., fresh gas hose or ventilator bellows) with dedicated “clean” components, installing a clean breathing circuit and breathing bag, and flushing the machine with oxygen 10 l/min for 20 min while the ventilator cycles into a clean breathing bag or test lung mounted on the patient Y-piece.

A number of recent reports have documented that this procedure may not be adequate in many modern anesthesia workstations, including the Siemens KION(1), Datex-Ohmeda AS/3(2), Dräger Primus(3,4), and Dräger Fabius(5) anesthesia machines. The inadequacies of the conventional flushing procedure were particularly pronounced for the Dräger Primus and Fabius platforms, which required 65 min and 105 min, respectively, to achieve a residual anesthetic concentration < 5 ppm(4,5). The Primus and Fabius workstations employ a piston ventilator and share unique circuit architectural features which may have contributed to delayed clearance of residual anesthetics; however, even completely bypassing the Fabius ventilator failed to significantly accelerate anesthetic clearance (5). While the precise mechanism of delayed clearance of anesthetics from the Primus and Fabius anesthesia machines remains unknown, the most likely explanation appears to be slow elution of absorbed anesthetics from the synthetic components of the breathing circuit and ventilator(4-8).

With this mechanism in mind, Crawford et.al., accelerated clearance of residual halogenated anesthetics from the Dräger Primus by replacing the entire breathing system and ventilator rolling diaphragm with components which had been autoclaved to remove any absorbed anesthetics(3). Prepared in this manner, the Primus required less than 5 min of flushing to reach a residual anesthetic concentration < 5 ppm. Unfortunately, this approach is much less practical for the Dräger Fabius anesthesia machine; unlike the Primus, whose integrated breathing system can be replaced en bloc, replacing the breathing system on the Fabius requires mounting a completely new absorber assembly and connecting several sensor and control cables and hoses. Since failure to attach all the cables and hoses correctly could result in breathing circuit and/or ventilator malfunction, replacement of the Fabius breathing system does not appear to be a task which should be undertaken by the unaided clinician.

As an alternative to flushing residual anesthetics from the Fabius breathing system, we investigated the utility of adsorbing halogenated anesthetics onto activated charcoal placed between the breathing system and the patient(5). Mounting an Anecare Quick Emergence Device (QED®, Anecare Laboratories, Salt Lake City, UT) on the inspiratory port of the breathing circuit made it possible to reduce residual halogenated anesthetic concentration in the inspiratory limb of the breathing circuit to < 10 ppm within 10 min and to < 5 ppm within 15 min; concentrations were maintained < 5 ppm for up to six hours, by which time the residual anesthetic concentration within the breathing system upstream of the QED® was < 5 ppm.

The preparation procedure when using the charcoal filter is similar to that for a conventional flush. Vaporizers are removed or disabled, the CO2 absorbent is changed, and a clean breathing bag and circuit are mounted on the breathing system. The QED® device is mounted on the inspira

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tory port of the breathing system between the inspiratory valve and the breathing circuit. Preparation then proceeds in three phases, each lasting five minutes (the Five-Five-Five Flush). The machine is first flushed for five minutes with oxygen 10 l/min with the ventilator cycling into a clean breathing bag/test lung with the QED® in the OFF position; this serves to remove bulk anesthetic from the circuit, reducing the concentration in the breathing system to around 100 ppm. The QED® is then turned to the ON position and the machine is flushed as above for an additional five minutes; at this point the residual anesthetic concentration at the patient Y-piece will be about 10 ppm. It is now possible to expose the patient to the machine, provided that the total fresh gas flow is maintained at ≥ 10 l/min for the first five minutes of the anesthetic; at the end of the third five minute phase the anesthetic concentration at the patient Y-piece will be < 5 ppm and the total fresh gas flow can be reduced to as low as 2 l/min. Delivered residual anesthetic concentrations will remain < 5 ppm for at least six hours. It should not be necessary to replace the QED® due to saturation during even an extended anesthetic, as the residual halogenated anesthetic concentration in the breathing system will be < 5 ppm after six hours at a total fresh gas flow of 2 l/min.

When preparing the Dräger Fabius anesthesia machine in this fashion, several precautions must be observed in order to avoid inadvertent exposure of the malignant hyperthermia-susceptible patient to halogenated anesthetics. The QED® device must be mounted on the inspiratory port of the breathing system between the inspiratory valve and the breathing circuit. The inspiratory port is usually identified by an arrow pointing away from the breathing system and toward the patient and is typically in-line with the oxygen analyzer; any question regarding which is the inspiratory port should be addressed by breathing through the system and observing the one-way valves. The QED® must remain on the inspiratory port and in the ON position throughout the anesthetic; mounting the QED® on the expiratory port or premature de-activation or removal of the QED® will expose the patient to the residual concentration of anesthetic in the breathing system and ventilator, which may be much greater than 10 ppm. It is hoped that charcoal filters designed specifically for this purpose will be marketed. Such a device would not include features of the QED® related to its intended function of speeding emergence (the ON-OFF switch and expandable tubing) but not needed for this application, and would include a clear housing (to confirm presence of activated charcoal) and instructions and markings on the housing to facilitate proper use and placement on the anesthesia machine.

Use of activated charcoal filters to remove halogenated anesthetics from the inspiratory limb of the breathing circuit makes it possible to prepare the Dräger Fabius anesthesia machine for the malignant hyperthermia-susceptible patient in less than 15 min; the approximate $40 cost of the device is easily offset by recouping OR time which would otherwise be lost to a prolonged conventional flush. Although it has not been formally tested, it is likely that a similar procedure can be employed on any anesthesia machine employing one-way valves and circle-absorber architecture. It is less clear that this procedure should be employed to rapidly clean an anesthesia machine during a malignant hyperthermic crisis; in the absence of laboratory data demonstrating equivalent outcomes for experimental animals whose management during MH crisis included the use of activated charcoal filters to scrub inspired gases, management of suspected MH crisis should continue to include switching to a clean non-rebreathing system or a dedicated, clean anesthesia machine.

REFERENCES
MH Hotline Activity: July – October 2008

by Mohanad Shukry M.D.

During the months of July through October 2008, 14 volunteer physicians answered 71 calls to the MH Hotline. Fifty-four of these calls involved clinical situations where signs and symptoms indicated the potential for the occurrence of a MH event. Seventeen calls involved only questions about MH or follow up calls about a previous MH event.

Consultants working the Hotline during this period included Drs. Brandom, Gronert, Litman, Melton, Millman, Parness, Rosenberg, Skoog, Shukry, Tobin, Watson, Weglinski, and Wong. Seven of the calls were thought to be probably or definitely MH by the consultants. There were no deaths reported from this group. Seven calls were from a hospital setting and none from outpatient surgery centers. Only five of the probable or definite cases received dantrolene while twelve of the non-MH or unlikely MH calls received dantrolene prior to the Hotline call. Calls came from 26 states, and 2 calls from Canada. The callers’ in-hospital locations varied from operating rooms, recovery room, preoperative clinics, to intensive care units.

Many of the no event calls were regarding the association of MH and muscle diseases such as central core disease (CCD), strabismus, limb girdle dystrophy, and muscular dystrophy. Of the true congenital myopathies, CCD and the related multifascicular disease, as well as the myopathy of King-Denborough syndrome, are the only myopathies known today to have a definite relationship with true MH.

Many of the calls had an initial elevation of exhaled carbon dioxide (CO2). Elevated CO2 is an early sign of MH and the skeletal muscle is the source of the CO2. The release of excess amount of calcium from the skeletal muscle causes increased metabolism producing extraordinarily large amounts of CO2 and respiratory acidosis.

Muscle rigidity is an important sign of an MH reaction. Thirteen patients in this group displayed some rigidity. Some had isolated jaw rigidity and some patients had body or limb rigidity. Some of the surgical procedures were cancelled when the rigidity occurred before the surgical incision. Others continued with the operative procedure and switched to non-triggering anesthetic technique.

One phone consult concerned a MH susceptible patient receiving a kidney transplant. The caller was concerned that the donor had been exposed to sevoflurane and residual of the gas in the donated kidney might trigger an MH episode in the recipient. The consultant assured the caller that the surgeon usually flushes the harvested kidney with saline and that should dissipate the sevoflurane. Additionally, the caller was assured that the almost negligible amount of sevoflurane in a transplanted kidney should not trigger an MH episode.

A call was received by

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In the U.S. and Canada, the MH Hotline is
1-800-MH-HYPER (1-800-644-9737)
Outside the U.S., call 1-315-464-7079
a hotline consultant regarding a patient with severe scleroderma, a tissue disease that makes the skin and tissue underneath it inflexible. The patient has been sedated by a radiologist when she stopped breathing. When the anesthesiologist tried to insert a breathing tube, the procedure turned out to be very difficult due to what the anesthesiologist thought was jaw rigidity. The blood gas later showed a respiratory acidosis. The consultant informed the caller that he did not believe that the patient was experiencing an MH episode or rigidity. The consultant believed that the tissue inflexibility mimicked rigidity and dantrolene was not recommended. During an online discussion among the hotline consultants, they all agreed with the conclusion and thought that such a patient could have been better sedated by a more skilled sedation physician such as an anesthesiologist to prevent her from such an event.

Although a significant percent of calls handled by the hotline consultants are thought unlikely to be related to MH, the callers appreciate the guidance and the opportunity to have an expert available to help them determine the best course of action.

**Challenge Yourself With The MH Case Of The Month**

Have you challenged yourself with the MH Case of the Month? Visit [www.mhaus.org](http://www.mhaus.org) and go to the Home or Professional’s Info Center pages to decide the correct way to proceed with these actual MH cases. Answers with narratives are provided for the previous month’s cases.

**Meet This Issue’s Hotline Consultant**

Dr. Shukry received his MD in 1997 from Damascus University Faculty of Medicine in Damascus, Syria, where he also interned from July 1996 to June 1997. The following year he completed his transitional year residency at Razi Hospital in Damascus, Syria. He completed his preliminary year residency in General Surgery at the University of Virginia Health System in Charlottesville, VA, from July 2000 to June 2001, then completed his Residency in Anesthesiology at Tulane University of Medicine in New Orleans, LA, from July 2001 to June 2004. He received a Fellowship in Pediatric Anesthesiology at the University of Pittsburgh Medical Center Children’s Hospital of Pittsburgh in Pittsburgh, PA, from July 2004 to June 2005. Dr. Shukry is currently the Director of the Pediatric Pain Service and the Clinical Director of the Operating Room at The Children’s Hospital in Oklahoma City.

Dr. Shukry has been published in Pediatric Anesthesia, has received honors and awards for his research, and has given numerous lectures both internationally and nationally.
The Lila & Jerry Lewis Memorial Fund

There are many special people who take the time each year to remember their loved ones in a way that helps MHAUS. The people below have made gifts during FY 08-09 (July 2008 - June 2009) in memory of Lila and Jerry Lewis. We are most grateful for their support and special tribute gifts.

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Judy Levine & Steve Lewis
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JHP Pharmaceuticals Introduces A Dantrium® IV (dantrolene sodium for injection), Rapidly Mixing At 20 Seconds

JHP Pharmaceuticals, LLC ("JHP") announced today that it had developed, and received approval by the FDA for Dantrium® IV (dantrolene sodium for injection), a rapidly mixing product. Dantrium® IV now reconstitutes in approximately 20 seconds, which is 4 times faster than before, saving valuable time and effort during a malignant hyperthermia (MH) emergency. Dantrium® IV, the rapidly mixing product, has the following essential benefits:

1.) Reconstitutes in approximately 20 seconds with noticeably less vigorous shaking required to complete the reconstitution process
2.) Easier and faster introduction of diluent into the Dantrium® IV vial

JHP has also introduced two new features in the Dantrium® IV vial; an easy-to-open flip-off vial cap and an easy-to-identify red vial cap and red vial label.

Stuart Hinchen, co-founder and President of JHP said, “We are excited about the dramatic enhancements we have been able to make to Dantrium® IV. The stunning improvement in reconstitution time represents breakthrough innovation that significantly heightens the life-saving characteristics of a drug 30 years after its successful introduction.

“During fulminant MH, when a patient’s core temperature can increase by as much 1 degree Centigrade every 5 minutes and time is obviously a crucial factor, Dantrium® IV can now be reconstituted 4 times faster than before. Taking into account the 36 vials that are recommended by MHAUS (Malignant Hyperthermia Association of the United States) and often needed to stabilize a patient with MH, Dantrium® IV, the rapidly mixing product, saves up to 36 minutes of mixing time.”

NEW Manual Promotion Starting November 1st

MH Procedure Manuals in three versions: Hospital, Ambulatory Surgery Center, and Office-Based.

The procedure manuals consist of: a large flowchart that outlines the tasks of each staff member who may treat an MH episode; laminated checklist worksheets for each role; an instructional videotape demonstrating a mock episode, response plan, and explanation of how to utilize the manual.

The MH Hospital Manual is specifically customized for each facility. A questionnaire will be faxed to obtain pertinent information (i.e., location of MH cart, colors of test tub tops, important phone numbers). The customization results in a unique and complete manual for your facility. The MH ASC Manual and Office-Based Manual contain the same kind of information yet is more generic in nature to better fit the facility’s needs.

ONLY $180 (includes S&H) To order, visit www.mhaus.org
Have you visited us lately? Log on to www.mhaus.org to get the latest information on MH, order materials, post a message to the bulletin board or learn about the “Hotline Case of the Month.”

Every MH-Susceptible Should Wear A Medical ID Tag

MHAUS has help available for the MH-susceptibles who have no insurance or cannot afford to purchase a medical ID tag.

The Sandi Ida Glickstein Fund was established for the purpose of providing free ID tags for MH-susceptible patients who qualify.

To take advantage of this program, please send us a letter indicating why you would like MHAUS to provide you with a complimentary ID tag.

The goal of the free ID tag program is to ensure the safety of MH-susceptibles during an emergency situation and to prevent a tragic outcome from MH.

For further information, please contact MHAUS at P.O. Box 1069, Sherburne, N.Y. 13460-1069; call 607-674-7901, or visit www.mhaus.org.

Yes! I want to support MHAUS in its campaign to prevent MH tragedies through better understanding, information and awareness.

A contribution of: □ $35 □ $50 □ $100 □ $250 □ $500 □ $1000 (President’s Ambassador)

or □ (other amount) $ __________, will help MHAUS serve the entire MH community.

Please print clearly:

Name: ______________________________________________________________________

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City: ____________________ State: _____________ Zip: ____________

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☐ I am MH-Susceptible ☐ I am a Medical Professional

Please charge my ☐ Visa ☐ Mastercard ☐ Discover ☐ American Express

Name on card: _________________________________________________________________

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THANKS! MHAUS is grateful for the financial support of the following State Societies of Anesthesiology: Maryland, Michigan, Ohio. Our appreciation also goes to the following state components of the American Society of PeriAnesthesia Nurses: Kansas, Missouri, and Texas. Call the MHAUS office to ask how your group can join their ranks!

MHAUS will attend the ASA in New Orleans on October 17-21. We hope to see you there!

The next MHAUS Scientific Meeting will be held in Pittsburgh, PA on April 23-24, 2010.

Special Promotion for New and Renewing Members. Get the In-service Kit for half price when you are a new or renewing member! The In-service DVD includes a presentation on MH recognition and management, information relating to suggested dantrolene mixing, patient safety, risk management material, and a mock drill to reinforce the quick response time necessary in an MH event. The kit includes a test booklet offering 1 CEU upon successful completion is available until December 31, 2009. After that date you will receive a Course Completion Certificate. Completed tests can be mailed to MHAUS office at P. O. Box 1069, Sherburne, NY 13460 or can be taken online at the MHAUS website at www.mhaus.org

Visit the MHAUS website for a video clip which demonstrates the mixing and injection of dantrolene. The DVD, “Malignant Hyperthermia: Knowing Your Role,” is available in three different quality formats to match your Internet connection speed.

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