

The North American Malignant Hyperthermia Registry of MHAUS

Report of Acute

**ADVERSE METABOLIC OR MUSCULAR REACTION TO
ANESTHESIA**

(AMRA Report)

INSTRUCTIONS

This form is to be filled out by an anesthesiologist or other health care provider.

1. Complete this form each time you **suspect** a patient may have experienced an adverse metabolic reaction to anesthesia or exercise, possibly related to malignant hyperthermia (MH).

Examples: hypercarbia, acidosis, tachycardia, rigidity, hyperkalemia, myoglobinuria, arrhythmias, unexplained fever.

2. Please fill out as soon as patient is stable, preferably within 48 hours of the event.
3. The attending anesthesiologist or other physician should review the completed form.
4. The patient's name should **not** be recorded on the form sent to the NAMH Registry. If a patient wishes to be registered by name, they may contact the Registry directly. The toll free telephone # of the NAMHR is 888-274-7899
5. Send to:

The North American Malignant Hyperthermia Registry
UPMC Mercy Hospital
8th Floor, Ermire Building (B)
Room 8522-3
1400 Locust Street
Pittsburgh, PA 15219

For **FULMINANT MH** cases refer the patient for a blood test that assesses genetic risk of MH. This may also help diagnose MH susceptibility in other family members. The patient or the legal guardian of a minor should call # **888-274-7899**, the MH Registry, to discuss joining this research registry. In the case of fatal, fulminant MH, muscle should be examined by the autopsy pathologist for genetic defects related to MH and the patient's next of kin should consider calling the MH Registry, # 888-274-7899, to facilitate full reporting of this death.

AMRA Report Version 9.9 - DRAFT
June 2015

FAMILY HISTORY

14. Before this episode, was the patient's family history positive for:

check all applicable

- malignant hyperthermia
- masseter spasm
- intraoperative death not thought to be MH
- sudden infant death syndrome or cot death
- sudden death from unknown cause at < 45 year >1.5 years
- exercise-associated heatstroke
- environmentally induced heatstroke
- neuroleptic malignant syndrome
- intolerance to heat
- chronic muscle pain
- frequent muscle cramps
- chronic muscle weakness
- exercise intolerance due to muscle pain, weakness or fever
- episodes of dark urine (myoglobinuria) and muscle pain
- myopathies *specify type; write unknown if not known:* _____
- idiopathic creatine kinase elevation
- diabetes
 - Type 1
 - Type 2
- Other (*specify*): _____

- none of the above*
- unknown*

* Check one only; if applicable

MEDICAL HISTORY

15. Has the patient had any of the following?

check all applicable

- muscle weakness interferes with daily activity at least once/week
- muscle cramps or pain that interfere with daily activity at least once/week
- cola colored urine
- heat stroke or heat prostration
- oral (or rectal/axillary equivalent) fever >38.8°C or 101.4°C at least 6 times/year without medical cause
- recent generalized infection
If there was infection, how long ago was it? ____ (days)
- recent use of cholesterol lowering drugs
If so, which drug _____, and how long ago was it last ingested? ____ (days)
- recent use of antipsychotic drugs
If so, which drug(s) _____, and how long ago was it last ingested? ____ (days)
- recent use of serotonin re-uptake inhibitors
If so, which drug(s) _____, and how long ago was it last ingested? ____ (days)
- recent use of monoamine oxidase inhibitors
If so, which drug(s) _____, and how long ago was it last ingested? ____ (days)
- recent use of illicit drugs
If so, which drug(s) _____, and how long ago was it last ingested? ____ (days)
- a regular regimen of strenuous physical activity?
If so, how long ago was the last work-out? ____ (days)
- ingestion of any drug to improve muscular performance
If so, which drug: _____, how long ago was it ingested: _____ (days)
- intolerance to heat
- exercise intolerance due to muscle pain, weakness or fever
- diabetes
 - Type 1
 - Type 2
- Other (*specify*): _____

- none of the above*
- unknown*

* Check one only; if applicable

16. Has the patient ever had physical findings of:

check all applicable

- increased muscle tone
- decreased muscle tone
- generalized muscle weakness
- myopathy *specify type; write unknown if not known:* _____
- ptosis
- strabismus
- undescended testes
- clubbed foot
- joint hypermobility
- kyphoscoliosis (moderate or severe; curve > 45°)
- pectus carinatum
- pectus excavatum
- winged scapulae
- skeletal fractures (e.g. possible osteogenesis imperfect) (more than 2)
- kidney stones
- laryngeal papillomas
- other (*specify*): _____

- none of the above*
- unknown*

* Check one only; if applicable

ANESTHETIC HISTORY

17. How many times was this patient anesthetized prior to this event?

__ __
 unknown, but greater than zero Unknown
Skip to question 20 if zero

18. How many were general anesthetics?

__ __
 unknown, but greater than zero Unknown

19. Year of most recent anesthetic (excluding present episode)?

__ __ __ __ unknown
Year

20. Were unusual metabolic or muscular responses (including myoglobinuria) noted during prior anesthetics?

check one
 no
 yes
 unknown

21. Was there unusual delayed awakening from previous general anesthetics?

check one
 no
 yes
 unknown

ADVERSE METABOLIC REACTION TO ANESTHESIA

22. Date of adverse metabolic or muscular reaction.

__ __ / __ __ / __ __ (mm/dd/yy) unknown

23. Type of procedure scheduled

check all applicable

<input type="checkbox"/> cardiothoracic with bypass	<input type="checkbox"/> orthopedic
<input type="checkbox"/> cardiothoracic without bypass	<input type="checkbox"/> plastic surgery
<input type="checkbox"/> dental	<input type="checkbox"/> radiology
<input type="checkbox"/> ear, nose, or throat	<input type="checkbox"/> robot-assisted surgery
<input type="checkbox"/> eye	<input type="checkbox"/> thoracic surgery
<input type="checkbox"/> general surgery	<input type="checkbox"/> thoracoscopic surgery
<input type="checkbox"/> gynecology	<input type="checkbox"/> transplant
<input type="checkbox"/> laparoscopic surgery	transplant type _____
<input type="checkbox"/> neurosurgery	<input type="checkbox"/> trauma
<input type="checkbox"/> obstetrics	<input type="checkbox"/> urology
<input type="checkbox"/> oral surgery	<input type="checkbox"/> vascular

other (specify): _____

unknown

24. Was the procedure an emergency?
check one
 no
 yes
 unknown
25. Did this adverse reaction occur without exposure to anesthetic?
check one
 no
 yes add details _____
26. Was the environment hot when this reaction occurred?
check one
 no
 yes
 unknown
If yes how hot? ___ . ___ C or ___ . ___ F
27. Was any infection present at the time of this reaction?
check one
 no
 yes
 unknown
28. If infection was present, what organisms were known to be present?
specify: _____
29. Where was the reaction noted to occur?
check one
 pre-operative holding area
 in the operating room
 in the intensive care unit
 in a remote location (e.g. GI suite, radiology)
 in the post-anesthesia care unit
 other (specify): _____
30. After adverse metabolic or muscular reaction was noted, the procedure was:
check one
 deferred
 terminated before all scheduled procedures completed
 completed in spite of reaction
 not applicable - patient was in transport at time reaction occurred
 not applicable - patient in recovery or intensive care area at time of reaction

31. Premedication and anesthetic agents utilized (before reaction occurred):
check all applicable

- | | |
|--|---|
| <input type="checkbox"/> sodium citrated citric acid (Bicitra) | <input type="checkbox"/> sufentanil (Sufenta) |
| <input type="checkbox"/> cimetidine (Tagamet) | <input type="checkbox"/> hydromorphone (Dilaudid) |
| <input type="checkbox"/> famotidine (Pepcid) | |
| <input type="checkbox"/> lansoprazole (Prevacid) | <input type="checkbox"/> sevoflurane (Ultane) |
| <input type="checkbox"/> ranitidine (Zantac) | <input type="checkbox"/> desflurane (Suprane) |
| | <input type="checkbox"/> isoflurane (Forane) |
| <input type="checkbox"/> metoclopramide (Reglan) | <input type="checkbox"/> NO volatile anesthetic |
| <input type="checkbox"/> omeprazole (Prilosec) | <input type="checkbox"/> nitrous oxide |
| | |
| <input type="checkbox"/> atropine | <input type="checkbox"/> nalbuphine (Nubain) |
| <input type="checkbox"/> glycopyrrolate (Robinul) | <input type="checkbox"/> naloxone (Narcan) |
| <input type="checkbox"/> scopolamine (Hyoscine) | |
| | |
| <input type="checkbox"/> dolasetron (Anzemet) | <input type="checkbox"/> atracurium (Tracrium) |
| <input type="checkbox"/> droperidol (Inapsine) | <input type="checkbox"/> cisatracurium (Nimbex) |
| <input type="checkbox"/> hydroxyzine (Vistaril) | <input type="checkbox"/> rocuronium (Zemuron) |
| <input type="checkbox"/> ondansetron (Zofran) | <input type="checkbox"/> vecuronium (Norcuron) |
| <input type="checkbox"/> promethazine (Phenergan) | <input type="checkbox"/> pancuronium (Pavulon) |
| <input type="checkbox"/> diphenhydramine (Benadryl) | <input type="checkbox"/> other NMB |
| | <input type="checkbox"/> IM succinylcholine (Anectine) |
| <input type="checkbox"/> clonidine (Duraclon) | <input type="checkbox"/> IV succinylcholine (Anectine) |
| <input type="checkbox"/> ketorolac (Toradol) | <input type="checkbox"/> NO succinylcholine |
| <input type="checkbox"/> acetaminophen (Tylenol) | |
| | <input type="checkbox"/> edrophonium (Tensilon) |
| <input type="checkbox"/> diazepam (Valium) | <input type="checkbox"/> neostigmine (Prostigmin) |
| <input type="checkbox"/> lorazepam (Ativan) | |
| <input type="checkbox"/> midazolam (Versed) | <input type="checkbox"/> bupivacaine (Marcaine) |
| | <input type="checkbox"/> levo-bupivacaine |
| <input type="checkbox"/> dexamethasone | <input type="checkbox"/> chlorprocaine (Nesacaine) |
| <input type="checkbox"/> hydrocortisone | <input type="checkbox"/> cocaine |
| | <input type="checkbox"/> etidocaine (Duranest) |
| <input type="checkbox"/> dexmedetomidine | <input type="checkbox"/> lidocaine (Xylocaine) |
| <input type="checkbox"/> etomidate (Amidate) | <input type="checkbox"/> mepivacaine (Carbocaine) |
| <input type="checkbox"/> ketamine (Ketalar) | <input type="checkbox"/> prilocaine (Citanest) |
| <input type="checkbox"/> propofol (Diprivan) | <input type="checkbox"/> procaine (Novocain) |
| | <input type="checkbox"/> ropivacaine (Naropin) |
| <input type="checkbox"/> alfentanil (Alfenta) | <input type="checkbox"/> tetracaine (Pontocaine) |
| <input type="checkbox"/> fentanyl (Sublimaze) | |
| <input type="checkbox"/> fentanyl and droperidol (Innovar) | <input type="checkbox"/> epinephrine |
| <input type="checkbox"/> meperidine (Demerol) | <input type="checkbox"/> ephedrine |
| <input type="checkbox"/> morphine | <input type="checkbox"/> neosynephrine |
| <input type="checkbox"/> remifentanyl (Ultiva) | |
| | |
| <input type="checkbox"/> other (<i>specify</i>): _____ | |
| <input type="checkbox"/> unknown | |

32. Anesthesia induction date/time
__ __ / __ __ / __ __ (mm/dd/yy)
__ __ : __ __ (military time)
33. General anesthetic induction method
check one
 inhalation
 intravenous
 other (*specify*): _____
34. Total anesthetic duration
__ __ . __ __ (*hours and minutes from induction to anesthetic completion*)
35. Type of anesthetic prior to adverse metabolic or muscular reaction
check all applicable
 monitored anesthesia care
 regional anesthesia
 spinal anesthesia
 epidural anesthesia
 general anesthesia **without** endotracheal intubation
 general anesthesia **with** endotracheal intubation
 general anesthesia with a face mask
 general anesthesia with a laryngeal mask airway
36. Was a tourniquet used prior to the adverse metabolic reaction?
 no
 yes
Time inflated:
__ __ . __ __ (*military time*), date __ __ / __ __ / __ __ (mm/dd/yy)

Time of final release of tourniquet:
__ __ . __ __ (*military time*), date __ __ / __ __ / __ __ (mm/dd/yy)

PATIENT MONITORING UTILIZED BEFORE THE REACTION

37. Monitoring utilized (before reaction occurred):

check all monitoring used

- | | |
|--|---|
| <input type="checkbox"/> blood pressure monitor | <input type="checkbox"/> end-tidal PCO ₂ |
| <input type="checkbox"/> electrocardiograph | <input type="checkbox"/> pulse oximeter |
| <input type="checkbox"/> stethoscope | <input type="checkbox"/> bladder (Foley) catheter |
| <input type="checkbox"/> arterial catheter | <input type="checkbox"/> processed EEG (e.g. BIS) |
| <input type="checkbox"/> central venous catheter | |
| <input type="checkbox"/> pulmonary artery catheter | <input type="checkbox"/> other (<i>specify</i>):_____ |

Temperature probes:

- axillary
 bladder
 esophageal
 nasopharyngeal
 rectal
 skin – electronic (*specify location of skin temperature monitor*):_____
 skin - liquid crystal
*(specify type and location of skin temperature monitor):*_____
 tympanic
 other (*specify*):_____
 no temperature monitoring used before reaction occurred

38. If a liquid crystal temperature probe was used, did it accurately trend with core temperatures?

check one

- no
 yes
 unknown

39. Was a forced air warming device in use?

check one

- no
 yes
_____ temperature used (°C)
 unknown

40. Was an IV fluid warming device in use?

check one

- no
 yes
_____ temperature used (°C)
 unknown

41. Was a circulating water mattress used?

check one

- no
 yes
_____ temperature used (°C)
 unknown

SIGNS NOTED DURING THE REACTION

42. Abnormal signs judged to be inappropriate by the attending anesthesiologist or other physician:

RANK in order of appearance. NUMBER, do not check.

(a number may be used more than once if signs were noted simultaneously)

- masseter spasm: mouth cannot be fully opened, but direct laryngoscopy possible
- masseter spasm: jaw clamped shut, direct laryngoscopy impossible
- generalized muscular rigidity
- cola colored urine
- tachypnea
- hypercarbia
- cyanosis
- skin mottling
- sinus tachycardia
- ventricular tachycardia
- ventricular fibrillation
- elevated temperature
- rapidly increasing temperature
- sweating
- excessive bleeding
- hypertension > 20% of baseline
- other (*specify*): _____

43. Signs: Maximum values and times noted

fill in the blanks, use military time

- ____.____ time first adverse sign noted, date ____/____/____ (mm/dd/yy)
- ____.____ time second adverse sign noted, date ____/____/____ (mm/dd/yy)
- ____.____ maximum temperature noted (°C) **OR**
- ____.____ maximum temperature noted (°F)
- ____.____ time maximum temperature noted, date ____/____/____ (mm/dd/yy)
- ____.____ maximum end-tidal PCO₂ noted (mmHg)
- ____.____ time maximum end-tidal PCO₂ noted, date ____/____/____ (mm/dd/yy)

44. Did the temperature exceed 40°C?

check one

() no

() yes (*specify minutes that temp was > 40 C*) _____

45. Type of ventilation used at the time hypercarbia was first observed:

check one

() spontaneous

____ liters/minute ventilation

() assisted/pressure support

() controlled

at the time hypercarbia 1st noted

() unknown

() not applicable

PATIENT MONITORING UTILIZED AFTER THE REACTION

47. Monitoring utilized (after reaction occurred):

check all monitoring used

- | | |
|--|---|
| <input type="checkbox"/> blood pressure monitor | <input type="checkbox"/> end-tidal PCO ₂ |
| <input type="checkbox"/> electrocardiograph | <input type="checkbox"/> pulse oximeter |
| <input type="checkbox"/> stethoscope | <input type="checkbox"/> bladder (Foley) catheter |
| <input type="checkbox"/> arterial catheter | <input type="checkbox"/> processed EEG (e.g. BIS) |
| <input type="checkbox"/> central venous catheter | |
| <input type="checkbox"/> pulmonary artery catheter | <input type="checkbox"/> other (<i>specify</i>):_____ |

Temperature probes:

- axillary
- bladder
- esophageal
- nasopharyngeal
- rectal
- skin – electronic (*specify location of skin temperature monitor*):_____
- skin - liquid crystal
(*specify type and location of skin temperature monitor*):_____
- tympanic
- other (*specify*):_____
- no temperature probe used after reaction

TREATMENT GIVEN

48. Treatment given for possible or fulminant MH

Check all treatments utilized.

Fill in the blanks.

() Volatile anesthetics discontinued at:

__ __: __ __ military time, date __ __ / __ __ / __ __ (mm/dd/yy)

() Anesthesia circuit changed

() Activated carbon filters in circuit

() Hyperventilation with 100% oxygen

__ __ __ maximum EtCO₂ after initiation of hyperventilation

() Dantrolene (type)

() Dantrium

() Revonto

() Ryanodex

__ __ __. __

Initial dantrolene dose (mg)

__ __. __ __

Time of first dantrolene dose military time

__ __ / __ __ / __ __

Date of first dantrolene dose (mm/dd/yy)

__ __. __ __

Time of last dantrolene dose military time

__ __ / __ __ / __ __

Date of last dantrolene dose (mm/dd/yy)

__ __ __ __. __

Total dantrolene dose (mg) - including maintenance therapy

() Active cooling

Method (specify) _____

() Fluid loading

__ __ __ ml/kg

Fluid type (specify) _____

() Furosemide

() Calcium

() Mannitol

() Bicarbonate

() Glucose, insulin

() Albuterol

() Amiodarone

() Lidocaine

() Procainamide

() Cardioversion or Defibrillation

() CPR

() Inotrope, which one(s): _____

() Vasopressor, which one(s): _____

() other (specify): _____

() none of the above

49. Mark any of the following that were noted after dantrolene was given:

- Decrease in heart rate
- Decrease in end-tidal carbon dioxide or carbon dioxide tension in blood
- Decrease in temperature
- Decrease or resolution of rigidity

If none were noted, please skip to question 52

50. How many minutes after dantrolene administration was the maximum change in this sign noted and what was the magnitude of the maximum change?

Heart rate

- (_ _ _) minutes
- (_ _) (change in beats/min)

Carbon dioxide

- (_ _ _) minutes
- (_ _) (change in mmHg or torr)

Temperature

- (_ _ _) minutes
- (_ . _ °C) or (_ . _ °F) (change in temperature)

51. How many minutes after the start of dantrolene, did the rigidity completely resolve?

(_ _ _) minutes

52. Were any problems noted with the dantrolene administration?

check one

- no
- yes

If no, please skip to question 54

53. What were the observed dantrolene complications?

check all applicable

- excessive secretions
- gastrointestinal upset
- muscle weakness
- phlebitis
- respiratory failure
- other (*specify*): _____

54. Anesthetic Agents Utilized **After** Adverse Metabolic or Muscular Reaction was noted:
check all applicable

- | | |
|--|---|
| <input type="checkbox"/> sodium citrated citric acid (Bicitra) | <input type="checkbox"/> hydromorphone (Dilaudid) |
| <input type="checkbox"/> cimetidine (Tagamet) | |
| <input type="checkbox"/> famotidine (Pepcid) | <input type="checkbox"/> sevoflurane (Ultane) |
| <input type="checkbox"/> lansoprazole (Prevacid) | <input type="checkbox"/> desflurane (Suprane) |
| <input type="checkbox"/> ranitidine (Zantac) | <input type="checkbox"/> isoflurane (Forane) |
| | <input type="checkbox"/> NO volatile anesthetic |
| <input type="checkbox"/> metoclopramide (Reglan) | <input type="checkbox"/> nitrous oxide |
| <input type="checkbox"/> omeprazole (Prilosec) | |
| <input type="checkbox"/> atropine | <input type="checkbox"/> nalbuphine (Nubain) |
| <input type="checkbox"/> glycopyrrolate (Robinul) | <input type="checkbox"/> naloxone (Narcan) |
| <input type="checkbox"/> scopolamine (Hyoscine) | |
| | <input type="checkbox"/> atracurium (Tracrium) |
| <input type="checkbox"/> dolasetron (Anzemet) | <input type="checkbox"/> cisatracurium (Nimbex) |
| <input type="checkbox"/> droperidol (Inapsine) | <input type="checkbox"/> rocuronium (Zemuron) |
| <input type="checkbox"/> hydroxyzine (Vistaril) | <input type="checkbox"/> vecuronium (Norcuron) |
| <input type="checkbox"/> ondansetron (Zofran) | <input type="checkbox"/> pancuronium (Pavulon) |
| <input type="checkbox"/> promethazine (Phenergan) | <input type="checkbox"/> other NMB |
| <input type="checkbox"/> diphenhydramine (Benedryl) | <input type="checkbox"/> IM succinylcholine (Anectine) |
| | <input type="checkbox"/> IV succinylcholine (Anectine) |
| <input type="checkbox"/> clonidine (Duraclon) | <input type="checkbox"/> NO succinylcholine |
| <input type="checkbox"/> ketorolac (Toradol) | |
| <input type="checkbox"/> acetaminophen (Tylenol) | <input type="checkbox"/> edrophonium (Tensilon) |
| | <input type="checkbox"/> neostigmine (Prostigmin) |
| <input type="checkbox"/> diazepam (Valium) | |
| <input type="checkbox"/> lorazepam (Ativan) | <input type="checkbox"/> bupivacaine (Marcaine) |
| <input type="checkbox"/> midazolam (Versed) | <input type="checkbox"/> levo-bupivacaine |
| | <input type="checkbox"/> choroprocaine (Nesacaine) |
| <input type="checkbox"/> dexmedetomidine | <input type="checkbox"/> cocaine |
| <input type="checkbox"/> etomidate (Amidate) | <input type="checkbox"/> etidocaine (Duranest) |
| <input type="checkbox"/> ketamine (Ketalar) | <input type="checkbox"/> lidocaine (Xylocaine) |
| <input type="checkbox"/> propofol (Diprivan) | <input type="checkbox"/> mepivacaine (Carbocaine) |
| | <input type="checkbox"/> prilocaine (Citanest) |
| <input type="checkbox"/> alfentanil (Alfenta) | <input type="checkbox"/> procaine (Novocain) |
| <input type="checkbox"/> fentanyl (Sublimaze) | <input type="checkbox"/> ropivacaine (Naropin) |
| <input type="checkbox"/> fentanyl and droperidol (Innovar) | <input type="checkbox"/> tetracaine (Pontocaine) |
| <input type="checkbox"/> meperidine (Demerol) | |
| <input type="checkbox"/> morphine | <input type="checkbox"/> epinephrine |
| <input type="checkbox"/> remifentanyl (Ultiva) | <input type="checkbox"/> ephedrine |
| <input type="checkbox"/> sufentanil (Sufenta) | <input type="checkbox"/> neosynephrine |
| <input type="checkbox"/> other (<i>specify</i>): _____ | |
| <input type="checkbox"/> unknown | |

PATIENT OUTCOME

55. Did the patient develop any of the following complications?

check all that apply

- brain death
- cardiac dysfunction
- cardiac arrest
- change in consciousness level
- coma
- compartment syndrome
- disseminated intravascular coagulation
- hepatic dysfunction
- hypotension
- pulmonary edema
- renal dysfunction
- SIRS after initial control of MH episode_____
- other (*specify*):__ _____

- none*
- unknown*

* Check one only; if applicable

56. Did the patient survive the initial reaction?

check one

- no
- unknown because of transfer to another facility
- yes

If no or unknown, please skip to question 61

57. Did the patient develop additional signs or symptoms of unanticipated hypercarbia, rigidity, myoglobinuria, or rapidly increasing temperature, after initial adequate treatment (i.e. recrudescence)?

- no
- unknown because of transfer to another facility
- yes

If no or unknown, please skip to question 60

58. What was the date and time of the recrudescence?

___/___/___ date (mm/dd/yy)

___:___ military time

59. Signs of recrudescence that were judged to be inappropriate by the attending anesthesiologist or other physician:

RANK in order of appearance. NUMBER do not check. A number may be used more than once if signs were noted simultaneously.

- masseter spasm: mouth cannot be fully opened, but direct laryngoscopy possible
- masseter spasm: jaw clamped shut, intubation via direct visualization impossible
- generalized muscular rigidity
- cola colored urine
- tachypnea
- hypercarbia
- cyanosis
- skin mottling
- sinus tachycardia
- ventricular tachycardia
- ventricular fibrillation
- elevated temperature
- rapidly increasing temperature
- sweating
- excessive bleeding
- hypertension > 20% of baseline
- other (specify): _____

60. Did the patient survive both the initial reaction & the recrudescence, if any, and recover?

check one

- no
- yes
- unknown due to transfer to another facility

61. If the patient died, what was the primary cause of death?

check all that apply

- MH
- other (specify): _____
- unknown

62. If the patient died, was an autopsy performed?

- no
- yes specify principal findings _____

63. If tissue from this patient was examined for a specific genetic defect, at what lab was this done?

(specify name and location of lab): _____

If so what was found? Specify amino acid change, such as Arg 614 Cys

- Ryanodine receptor type 1 amino acid change _____
- Other, specify: Gene _____ amino acid change _____

In what tissue?

- Blood
- Muscle
- Other (specify) _____

CLINICAL IMPRESSION

64. Patient experienced (opinion of attending anesthesiologist):
check one
 adverse metabolic reaction that was not related to MH
 possible MH - may include masseter spasm (MH diagnostic center referral recommended)
 fulminant MH - (family counseling, MH diagnostic center referral recommended)
 other (*specify*): _____
65. Were the patient and his/her family referred to a MH diagnostic center?
check one
 no
 yes
 unknown
66. If referred to a MH diagnostic center, check identity of center:

 Wake Forest University.....Winston-Salem, NC
 Uniformed Services University.....Bethesda, MD
 University of California at DavisDavis, CA
 University of Minnesota.....Minneapolis, MN
 University of TorontoToronto, ON
67. Were the patient and the family also referred to MHAUS?
PO Box 1069
Sherburne, NY 13460-1069
1-800-986-4287
check one
 no
 yes

COMMENTS ON PATIENT

(Optional)

Original may be mailed to:

The North American Malignant Hyperthermia Registry
UPMC Mercy
8th Floor, Ermire Building (B)
Room 8522-3
1400 Locust Street
Pittsburgh, PA 15219

MH DIAGNOSTIC CENTER DIRECTORY

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