ADVERSE METABOLIC REACTION TO ANESTHESIA
Version 1.2 July 1988

DEMOGRAPHIC INFORMATION

1. Sex
   check one
   ( ) a. male
   ( ) b. female

2. Weight
   ___ ___ ___ kilograms

3. Date of patient's birth
   ___ ___ ___/___ ___/___
   year month day
   (3 letters)

4. Race
   check as many as apply
   ( ) a. caucasian
   ( ) b. negro
   ( ) c. hispanic
   ( ) d. oriental
   ( ) e. other specify: _______________________________

5. Body build:
   check one
   ( ) a. lean
   ( ) b. muscular
   ( ) c. obese
   ( ) d. normal
   ( ) e. other specify: _______________________________

6. State or province of patient's residence
   ___ ___

7. State or province of hospital
   ___ ___

8. Hospital name optional—for statistical purposes only
   ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___.
ANESTHETIC HISTORY

10. Number of times patient anesthetized prior to this evaluation?

   __ __

   Skip to question 14 if zero

11. How many were general anesthetics?

   __ __

12. Year of most recent anesthetic?

   __ __ __ __

   year

13. Were unusual metabolic responses noted during prior anesthetics?

   check one

   ( ) ( )

   no yes

FAMILY HISTORY

14. Family history positive for:

   check all applicable

   ( )a. malignant hyperthermia
   ( )b. intraoperative death not thought to be MH
   ( )c. sudden infant death syndrome or cot death
   ( )d. sudden death from unknown cause at an age between 1.5 and 45 yrs
   ( )e. heat stroke
   ( )f. neurolept malignant syndrome
   ( )g. myopathies specify type; write unknown if not known:

   ________________________________

   ( )h. none of the above

PHYSICAL FINDINGS

15. Has patient ever had physical findings of:

   check all applicable

   ( )a. increased muscle tone
   ( )b. decreased muscle tone

   ( )c. generalized muscle weakness
   ( )d. myopathy specify type write unknown if not known:

   ________________________________

   ( )e. ptosis
   ( )f. strabismus

   ( )g. hiatal hernia
   ( )h. inguinal hernia
   ( )i. umbilical hernia

   ( )j. undescended testes
(  )k. clubbed foot
(  )l. joint hypermobility
(  )m. kyphoscoliosis (moderate or severe; curve >45°)
(  )n. pectus carinatum
(  )o. winged scapulae

(  )p. skeletal fractures (more than 2)

(  )q. gallstones
(  )r. kidney stones

(  )s. laryngeal papillomas

(  )t. other specify: __________________________________________

(  )u. none of the above

**ADVERSE METABOLIC REACTION TO ANESTHESIA**

16. Date of adverse metabolic reaction to anesthesia

   --- ___ ___/___ ___/___ ___
   year   month   day
   (3 letters)

17. Type of procedure scheduled check all applicable

   (  ) cardiothoracic
   (  ) ear, nose, or throat
   (  ) general surgery
   (  ) neurosurgery
   (  ) obstetrics or gynecology
   (  ) oral surgery
   (  ) orthopedic
   (  ) radiologic
   (  ) urology
   (  ) vascular
   (  ) other specify: __________________________________________

18. Was the procedure an emergency? check one

   (  ) (  )
   no yes

19. After adverse metabolic reaction was noted, the surgical procedure was: check one

   (  ) deferred
   (  ) terminated before all scheduled procedures completed
   (  ) completed
20. Premedication and anesthetic agents utilized (before reaction occurred):
check all applicable

( ) cimetidine (Tagamet)  ( ) nalbuphine (Nubain)
( ) metoclopramide (Reglan)  ( ) naloxone (Narcan)
( ) ranitidine (Zantac)  ( ) atracurium (Tracrium)
( ) atropine  ( ) curare
( ) glycopyrrolate (Robinul)  ( ) gallamine
( ) scopolamine  ( ) metocurine (Metubine)
( ) drotaverol (Inapsine)  ( ) pancuronium (Pavulon)
( ) droperidol (Inapsine)  ( ) IM succinylcholine (Anectine)
( ) hydroxyzine (Vistaril)  ( ) IV succinylcholine (Anectine)
( ) promethazine (Phenergan)  ( ) vecuronium (Norcuron)
( ) methohexital (Brevital)  ( ) edrophonium (Tensilon)
( ) pentobarbital (Nembutal)  ( ) neostigmine (Prostigmin)
( ) thiamylal  ( ) physostigmine (Antilirium)
( ) thiopental (Pentothal)  ( ) pyridostigmine (Mestinon)
( ) diazepam (Valium)  ( ) bupivacaine (Marcaine)
( ) midazolam (Versed)  ( ) chloroprocaine (Macacaine)
( ) etomidate (Amidate)  ( ) etidocaine (Duranest)
( ) ketamine (Ketalar)  ( ) lidocaine (Xylocaine)
( ) nitrous oxide  ( ) mepivacaine (Carbocaine)
( ) enflurane (Ethrane)  ( ) procaïne (Novacain)
( ) halothane (Fluothane)  ( ) tetracaine (Pontocaine)
( ) isoflurane (Forane)  ( ) epinephrine
( ) alfentanil (Alfenta)  ( ) neosynephrine
( ) fentanyl (Sublimaze)
( ) meperidine (Demerol)
( ) morphine
( ) sufentanil (Sufenta)
( ) other specify: ____________________________________________________________

21. Anesthesia induction time
__ __ : __ __ (military time)
22. Monitoring utilized (before reaction occurred):
   check all monitoring used
   
   ( ) blood pressure monitor  ( ) end-tidal PCO₂
   ( ) electrocardiograph      ( ) pulse oximeter
   ( ) stethoscope            ( ) bladder (Foley) catheter

   temperature probes:
   ( ) axillary
   ( ) bladder
   ( ) esophageal
   ( ) nasopharyngeal
   ( ) rectal
   ( ) skin
   ( ) tympanic

23. Abnormal signs noted
    NUMBER in order of appearance
    (a number may be used more than once if signs noted simultaneously)

   ___ masseter spasm
   ___ generalized muscular rigidity
   ___ cola colored urine
   ___ tachypnea
   ___ hypercarbia
   ___ cyanosis
   ___ tachycardia
   ___ arrhythmia
   ___ rapidly increasing temperature
   ___ sweating
   ___ excessive bleeding
   ___ other specify: _______________________________________

24. Signs
    fill in the blanks

   ___ : ___  time first adverse sign noted (military time)

   ___ : ___  maximum temperature noted (°C)

   ___ : ___  time noted (military time)

   ___ : ___  maximum end-tidal pCO₂ noted (mmHg)

   ___ : ___  time noted (military time)
25. Laboratory Evaluation

*fill in the blanks for all lab tests obtained; write unknown if results not known*

**first arterial blood gas after MH was suspected**

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<td>FIO₂</td>
<td>pH</td>
<td>PCO₂ (mmHg)</td>
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<tr>
<td>PO₂ (mmHg)</td>
<td>BE (mEq/L) (specify ±)</td>
<td>Bicarbonate (mEq/L)</td>
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<td>time (military time)</td>
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**first venous blood gas after MH was suspected**

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<td>BE (mEq/L) (specify ±)</td>
<td>Bicarbonate (mEq/L)</td>
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<td>time (military time)</td>
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**peak lactic acid**

*fill in the blank next to the correct units*

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<th>mmol/L</th>
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**peak K⁺**

*fill in the blank next to the correct units*

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**initial post-op creatine kinase**

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<td>hours after induction</td>
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**serum myoglobin**

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<th>mg/dl</th>
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<td>hours after induction</td>
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**PT (prothrombin time)**

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<td>laboratory upper limit of normal</td>
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**PTT (partial thromboplastin time)**

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<th>seconds</th>
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<td>laboratory upper limit of normal</td>
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</table>

*recommended intervals for creatine kinase and serum myoglobin determination are 0, 6, 12, 24 hours after adverse metabolic reaction*
26. Monitoring utilized (after reaction occurred):
   check all monitoring used
   ( ) blood pressure monitor  ( ) end-tidal PCO₂
   ( ) electrocardiograph  ( ) pulse oximeter
   ( ) stethoscope  ( ) bladder (Foley) catheter
   
   temperature probes:
   ( ) axillary  ( ) arterial line
   ( ) bladder  ( ) central venous line
   ( ) esophageal  ( ) pulmonary artery line
   ( ) nasopharyngeal
   ( ) rectal
   ( ) skin
   ( ) tympanic

27. Treatment given for possible or fulminant MH
   check all treatments utilized; fill in the blanks
   ( ) Volatile anesthetics discontinued
     ___ __:___ time (military time)
   ( ) Anesthesia machine changed
   ( ) Anesthesia circuit changed
   ( ) Hyperventilation with 100% oxygen
   ( ) Dantrolene (Dantrium)
     ___ ___ ___ Initial dose (mg)
     (2.5 mg/kg initial recommended dose)
     ___ ___ ___ Time of first dose (military time)
     ___ ___ ___ Total dose (mg)
   ( ) Active cooling
   ( ) Fluid loading
   ( ) Furosemide
   ( ) Mannitol
   ( ) Bicarbonate
   ( ) Glucose, insulin
   ( ) Lidocaine
   ( ) Procainamide
   ( ) Defibrillation
   ( ) CPR
   ( ) Other specify: ____________________________

28. Were any problems noted with the dantrolene administration?
   check one
   ( ) ( )
   no yes
   If no, please skip to question 30
29. What were the observed dantrolene complications?  
   check all applicable
   (  ) phlebitis
   (  ) excessive secretions
   (  ) gastrointestinal upset
   (  ) hyperkalemia
   (  ) muscle weakness
   (  ) respiratory failure
   (  ) other specify: __________________________

30. Anesthetic Agents Utilized After Adverse Metabolic Reaction Noted:  
   check all applicable
   (  ) atropine
   (  ) glycopyrrolate (Robinul)
   (  ) scopolamine
   (  ) droperidol (Inapsine)
   (  ) hydroxyzine (Vistaril)
   (  ) promethazine (Phenergan)
   (  ) methohexital (Brevital)
   (  ) pentobarbital (Nembutal)
   (  ) thiamylal
   (  ) thiopental (Pentothal)
   (  ) diazepam (Valium)
   (  ) midazolam (Versed)
   (  ) etomidate (Amidate)
   (  ) nitrous oxide
   (  ) alfentanil (Alfenta)
   (  ) fentanyl (Sublimaze)
   (  ) meperidine (Demerol)
   (  ) morphine
   (  ) sufentanil (Sufenta)
   (  ) nalbuphine (Nubain)
   (  ) atracurium (Tracrium)
   (  ) curare
   (  ) gallamine
   (  ) rocuronium (Metubine)
   (  ) pancuronium (Pavilon)
   (  ) vecuronium (Norcuron)
   (  ) edrophonium (Tensilon)
   (  ) neostigmine (Prostigmin)
   (  ) physostigmine (Artlirium)
   (  ) pyridostigmine (Mestinon)
   (  ) bupivacaine (Marcaine)
   (  ) choroprocaine (Nesacaine)
   (  ) etidocaine (Duranest)
   (  ) lidocaine (Xylocaine)
   (  ) mepivacaine (Carbocaine)
   (  ) tetracaine (Pontocaine)

   (  ) other specify: __________________________

PATIENT OUTCOME

31. Did the patient survive the initial reaction?  
   check one
   (  ) no
   (  ) yes
If no, please skip to question 35
32. Did the patient develop additional signs or symptoms after initial adequate treatment (recrudesce)?
   check one
   ( ) ( )
   no yes
   If no, please skip to comments

33. What was the time of the recrudescence?
   __ __ __ time (military time)

34. Did the patient survive the recrudescence?
   check one
   ( ) ( )
   no yes

**CLINICAL IMPRESSION**

35. Patient experienced (opinion of attending anesthesiologist):
   check one
   ( ) a. adverse metabolic reaction that was **not** related to MH
   ( ) b. **possible** MH (MH diagnostic center referral is recommended)
   ( ) c. **fulminant** MH (MH diagnostic center referral is recommended for patient and family counseling)

36. Were the patient and his family referred to a MH diagnostic center?
   check one
   ( ) ( )
   no yes
   If no, please skip to comments

37. To which MH diagnostic center was the patient referred?
   check one
   ( ) Hahnemann University Hospital .......................... Philadelphia, PA
   ( ) Loyola University Medical Center .......................... Chicago, IL
   ( ) Mayo Clinic .................................................... Rochester, MN
   ( ) Ottawa Civic Hospital ......................................... Ottawa, ON
   ( ) Toronto General Hospital ..................................... Toronto, ON
   ( ) UCLA Medical Center ........................................... Los Angeles, CA
   ( ) Uniformed Services University .............................. Bethesda, MD
   ( ) University of Calgary .......................................... Calgary, AB
   ( ) University of California at Davis ......................... Davis, CA
   ( ) University of Florida ......................................... Gainesville, FL
   ( ) University of Iowa Hospitals and Clinics ............... Iowa City, IA
   ( ) University of Manitoba ...................................... Winnipeg, MB
   ( ) University of Massachusetts Medical Center ........... Worcester, MA
   ( ) University of Nebraska Medical Center ................... Omaha, NE
   ( ) University of South Florida ................................ Tampa, FL
   ( ) University of Texas Health Science Center ............. Houston, TX
   ( ) University of Texas Medical Branch ...................... Galveston, TX
   ( ) University of Washington .................................. Seattle, WA
   ( ) University of Wisconsin Hospital & Clinics ............. Madison, WI

See last page for MH diagnostic center directory
COMMENTS ON PATIENT  (optional)


COMMENTS ON FORM  (suggestions for making this form clearer)


Please make xerox copies and distribute according to instructions on cover sheet
Mail original to:

The North American Malignant Hyperthermia Registry
Department of Anesthesia
Pennsylvania State University College of Medicine
P.O. Box 850
Hershey, Pennsylvania 17033 U.S.A.