Biopsy Report (form C)

Complete this form for each patient referred for MH susceptibility evaluation. The MH muscle biopsy center director must review the completed form before it is submitted to the NAMHR.

Thank you!

INSTRUCTIONS:
1. This survey is only to be used by the director or staff of an MH diagnostic center.
2. Use this survey for each patient referred to you for MH evaluation, if they undergo muscle biopsy.
3. If any adult relatives wish to be registered by name, separate consent forms for participation in the Registry must be signed by that relative. If you wish to register a minor under the age of 18, a consent form must be signed by one of the minor's parent or guardian.
4. The Center Director must review and sign below to verify accuracy before it is submitted to the Registry.
5. Please download the completed form at end of survey for your records.

MH DIAGNOSTIC MUSCLE BIOPSY
(Answer for caffeine halothane contracture test or European IVCT test only. These tests are only done at MH Biopsy centers, and are different from regular pathology biopsies.)

C1.1 - Date of muscle biopsy

(For example, if Dec 25th, 2017, please type in 2017-12-25)
C1.2 - Center which performed MH Biopsy (Caffeine halothane Contracture Test)
- Children's Hospital of Oklahoma
- Cleveland Clinic
- Hahnemann University
- Thomas Jefferson University
- Toronto General Hospital (CODE: 05)
- Wake Forest University (CODE: 06)
- University of California at Davis (CODE: 07)
- Ottawa Hospital- Civic Campus
- Presbyterian University Hospital (Pittsburgh)
- Loyola University
- Mayo Clinic
- UCLA
- University of Iowa
- University of Calgary
- University of Florida
- Uniformed Services University (CODE: 16)
- University of Manitoba
- University of Massachusetts
- University of Nebraska
- University of South Florida
- University of Texas-Houston
- University of Texas Medical Branch
- University of Washington
- University of Minnesota (CODE: 24)
- University of Wisconsin
- Northwestern University
- other (specify)
(select one)

C1.3 - MH Diagnostic Muscle Biopsy Results
- positive - MH susceptible
- negative - not susceptible to MH
- equivocal - MH susceptibility indeterminate
- control biopsy

C1.4 - To date, how many control patients has this lab evaluated with the 1989 Biopsy Standards protocol?

C1.5 - What was the reason for the MH diagnostic muscle biopsy?
- fulminant MH
- possible MH event
- family history of MH
- control
- negative genetic test
- other (specify)
(check all applicable)

C1.5.1 - If negative genetic test, where is the location?

C1.5.2 - If negative genetic test, which date was the test?
(for example, if July 4th, 2000, please type in 2000-7-4)

C1.5.3 - If negative genetic test, which exons examined?

C1.5.4 - If other, please specify:

C1.6 - What's the date and time of anesthetic induction for muscle biopsy?
(for example, 2017-12-25 18:30)

C1.7 - What's the date and time that muscle was excised?
(for example, 2017-12-25 18:30)
C1.8 - Which muscle was biopsied?

○ vastus
○ rectus abdominus
○ gracilis
○ other (specify)

C1.8.1 - If other, please specify:

____________________________
<table>
<thead>
<tr>
<th>Question</th>
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</table>
| C2.1 - Were any medications being taken contains the following agents at the time of biopsy? | ☐ calcium channel blocker  
☐ neuroleptic agent  
☐ adrenergic agent  
☐ lipid lowering agent  
☐ no medication being taken at the time of biopsy  
☐ other (please specify)  
(check all applicable) |
| C2.1.1a - If containing calcium channel blocker, what is the name of drug? | __________________________________________ |
| C2.1.1b - Hrs. before biopsy:                                           | __________________________________________ |
| C2.1.2a - If containing neuroleptic agent, what is the name of drug?    | __________________________________________ |
| C2.1.2b - Hrs. before biopsy:                                           | __________________________________________ |
| C2.1.3a - If containing adrenergic agent, what is the name of drug?     | __________________________________________ |
| C2.1.3b - Hrs. before biopsy:                                           | __________________________________________ |
| C2.1.4a - If containing lipid lowering agent, what is the name of drug? | __________________________________________ |
| C2.1.4b - Hrs. before biopsy:                                           | __________________________________________ |
| C2.1.5a - If other agent, what is the name of drug?                     | __________________________________________ |
| C2.1.5b - Hrs. before biopsy:                                           | __________________________________________ |
C3.1 - Pre-medication and anesthetic agents utilized (for biopsy): (check all applicable)

- **ANTACID AGENT** - cimetidine (Tagament)
- **ANTACID AGENT** - dolasetron (Anzemet)
- **ANTACID AGENT** - droperidol (Inapsine)
- **ANTACID AGENT** - famotidine (Pepcid)
- **ANTACID AGENT** - hydroxyzine (Vistaril)
- **ANTACID AGENT** - lansoprazole (Prevacid)
- **ANTACID AGENT** - metoclopramide (Reglan)
- **ANTACID AGENT** - omeprazole (Prilosec)
- **ANTACID AGENT** - ondansetron (Zofran)
- **ANTACID AGENT** - ranitidine (Zantac)
- **ANTACID AGENT** - scopolamine (Hyoscine)
- **ANTACID AGENT** - sodium citrated citric acid (Bicitra)
- **ANTIMUSCARINIC AGENT** - atropine
- **ANTIMUSCARINIC AGENT** - glycopyrrolate (Robinul)
- **H-1 RECEPTOR BLOCKERS** - diphenhydramine (Benadryl)
- **ALPHA 2 AGONIST** - clonidine (Duraclon)
- **ALPHA 2 AGONIST** - dexmedetomidine (Precedex)
- **NSAID** - celecoxib
- **NSAID** - diclofenac
- **NSAID** - ibuprofen
- **NSAID** - ketorolac (Toradol)
- **NSAID** - meloxicam
- **NSAID** - naproxen
- **ACETAMINOPHEN** - diazepam (Valium)
- **ACETAMINOPHEN** - etomidate (Amidate)
- **ACETAMINOPHEN** - ketamine (Ketalar)
- **ACETAMINOPHEN** - lorazepam (Ativan)
- **ACETAMINOPHEN** - midazolam (Versed)
- **ACETAMINOPHEN** - propofol (Diprivan)
- **OPIOID/OPIOID ANTAGONIST** - alfentanil (Alfenta)
- **OPIOID/OPIOID ANTAGONIST** - fentanyl (Sublimaze)
- **OPIOID/OPIOID ANTAGONIST** - hydromorphone (Dilaudid)
- **OPIOID/OPIOID ANTAGONIST** - meperidine (Demerol)
- **OPIOID/OPIOID ANTAGONIST** - methadone
- **OPIOID/OPIOID ANTAGONIST** - morphine
- **OPIOID/OPIOID ANTAGONIST** - nalbuphine
- **OPIOID/OPIOID ANTAGONIST** - naloxone
- **OPIOID/OPIOID ANTAGONIST** - remifentanil (Ultiva)
- **OPIOID/OPIOID ANTAGONIST** - sufentanil (Sufenta)
- **POTENT VOLATILE ANESTHETIC AGENT** - desflurane (Suprane)
- **POTENT VOLATILE ANESTHETIC AGENT** - halothane
- **POTENT VOLATILE ANESTHETIC AGENT** - isoflurane (Forane)
- **POTENT VOLATILE ANESTHETIC AGENT** - sevoflurane (Ultane)
- **OTHER VOLATILE ANESTHETIC AGENT** - nitrous oxide
- **NON-DEPOLARIZING NEUROMUSCULAR BLOCK AGENT** - atracurium (Tracrium)
- **NON-DEPOLARIZING NEUROMUSCULAR BLOCK AGENT** - cisatracurium (Nimbutal)
- **NON-DEPOLARIZING NEUROMUSCULAR BLOCK AGENT** - pancuronium (Pavulon)
- **NON-DEPOLARIZING NEUROMUSCULAR BLOCK AGENT** - rocuronium (Zemuron)
- **NON-DEPOLARIZING NEUROMUSCULAR BLOCK AGENT** - vecuronium (Norcuron)
- **NON-DEPOLARIZING NEUROMUSCULAR BLOCK AGENT** - other non-depolarizing neuromuscular block (NDNB)
- **DEPOLARIZING NEUROMUSCULAR BLOCK AGENT** - IM succinylcholine (Anectine)
- **DEPOLARIZING NEUROMUSCULAR BLOCK AGENT** - IV succinylcholine (Anectine)
- **CHOLINESTERASE INHIBITOR** - edrophonium (Tensilon)
- **CHOLINESTERASE INHIBITOR** - neostigmine (Prostigmin)
- **CHOLINESTERASE INHIBITOR** - physostigmine (Antilirium)
- **CHOLINESTERASE INHIBITOR** - pyridostigmine (Mestinon)
- **LOCAL ANESTHETICS** - bupivacaine (Marcaine)
- **LOCAL ANESTHETICS** - chloroprocaine (Nesacaine)
- **LOCAL ANESTHETICS** - cocaine
- **LOCAL ANESTHETICS** - etidocaine (Duranest)
- **LOCAL ANESTHETICS** - levo-bupivacaine
- **LOCAL ANESTHETICS** - lidocaine (Xylocaine)
- **LOCAL ANESTHETICS** - mepivacaine (Carbocaine)
- **LOCAL ANESTHETICS** - prilocaine (Citanest)
- **LOCAL ANESTHETICS** - procaine (Novocain)
- **LOCAL ANESTHETICS** - ropivacaine (Naropin)
☐ LOCAL ANESTHETICS - tetracaine (Pontocaine)
☐ VASOPRESSOR - ephedrine
☐ VASOPRESSOR - epinephrine (adrenaline)
☐ VASOPRESSOR - norepinephrine (noradrenaline)
☐ VASOPRESSOR - phenylephrine (neosynephrine)
☐ VASOPRESSOR - vasopressin
☐ unknown
☐ other (specify)

C3.1.1 - If other, please specify:

__________________________________
ANESTHETIC METHOD

C4.1 - Type of anesthetic used for biopsy:
(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
- [ ] tourniquet use
LABS

Laboratory Exam

C5.1 - What's the value of serum creatine kinase at the time of evaluation (U/L)?

((U/L))

C5.2 - Laboratory upper limit of normal for creatine kinase (U/L):

((U/L))
**HISTOLOGY**

C6.1 - Was muscle histology performed?  
- Yes
- No

C6.2 - The muscle histology result was:  
- normal
- abnormal
- equivocal

C6.3 - What were the abnormal histologic findings?  
- diffusely distributed internal nuclei
- other (specify)

C6.3.1 - If other, please specify abnormality (write pending if results not available)

C6.4 - Was muscle histochemistry performed?  
- Yes
- No

C6.5 - The muscle histochemistry results was:  
- normal
- abnormal
- equivocal

C6.6 - Specify results of muscle histochemistry:  
- moth-eaten fibers
- cores
- other (specify)

C6.6.1 - If other, please specify abnormality (write pending if results not available)
C7.1 - In your lab, when muscle is exposed to 3% halothane, what is the minimum contracture indicating MH susceptibility? (grams)
### Strip 1 (HALOTHANE AT 3%)

<table>
<thead>
<tr>
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<tbody>
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<td>C7S1.8 - Pre-drug tension 3% hal(g):</td>
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</tr>
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<td>C7S1.13 - Wet weight (g):</td>
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Strip 2 (HALOTHANE AT 3%)

C7S2.1 - Hours between excision to completion of test (hrs):

C7S2.2 - Stimulation - duration (milliseconds):

C7S2.3 - Stimulation - frequency (Hz):

C7S2.4 - Stimulation - voltage (volts):

C7S2.5 - Stimulation - current (mA):

C7S2.6 - Was a length/tension curve done?

C7S2.7 - Pre-drug twitch tension (g) (measure from baseline for twitch tension only):

C7S2.8 - Pre-drug tension 3% hal(g):

C7S2.9 - Low point tension 3% hal(g):

C7S2.10 - Contracture tension developed to 3% hal(g):

C7S2.11 - Do you consider the tension developed to be abnormal?

C7S2.12 - Length (cm):

C7S2.13 - Wet weight (g):
## Strip 3 (HALOTHANE AT 3%)

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## Strip 1 (CAFFEINE ALONE)

| C8S1.1 - Hours between excision to completion of test (hrs): | 
| C8S1.2 - Stimulation - duration (milliseconds): | 
| C8S1.3 - Stimulation - frequency (Hz): | 
| C8S1.4 - Stimulation - voltage (volts): | 
| C8S1.5 - Stimulation - current (mA): | 
| C8S1.6 - Was a length/tension curve done? | Yes | No | 
| C8S1.7 - Pre-drug twitch tension (g) (measure from baseline for twitch tension only) | 
| C8S1.8 - Predrug tension 0.5mM (g): | 
| C8S1.9 - Plateau tension 0.5mM (g): | 
| C8S1.10 - Predrug tension 1.0mM (g): | 
| C8S1.11 - Plateau tension 1.0mM (g): | 
| C8S1.12 - Predrug tension 2.0mM (g): | 
| C8S1.13 - Plateau tension 2.0mM (g): | 
| C8S1.14 - Predrug tension 4.0mM (g): | 
| C8S1.15 - Plateau tension 4.0mM (g): | 
| C8S1.16 - Predrug tension 8.0mM (g): | 
| C8S1.17 - Plateau tension 8.0mM (g): | 
| C8S1.18 - Predrug tension 32.0mM (g): | 
| C8S1.19 - Plateau tension 32.0mM (g): | 
| C8S1.20 - CSC (mM) | 
| C8S1.21 - % response at 2mM |
C8S1.22 - Do you consider the tension developed to be abnormal?

- Yes
- No

C8S1.22.1 - If yes, at what concentration?

________________________

C8S1.22.2 - If yes, at what CSC?

________________________

C8S1.22.3 - If yes, at what % response?

________________________

C8S1.23 - Length (cm)

________________________ (cms)

C8S1.24 - Wet weight (g)

________________________ (gs)
### Strip 2 (CAFFEINE ALONE)

<table>
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<td>C8S2.20 - CSC (mM)</td>
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<td>C8S2.21 - % response at 2mM</td>
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C8S2.22 - Do you consider the tension developed to be abnormal?  
☐ Yes  
☐ No

C8S2.22.1 - If yes, at what concentration?  
__________________________________

C8S2.22.2 - If yes, at what CSC?  
__________________________________

C8S2.22.3 - If yes, at what % response?  
__________________________________

C8S2.23 - Length (cm)  
__________________________________  
(cms)

C8S2.24 - Wet weight (g)  
__________________________________  
(gs)
### Strip 3 (CAFFEINE ALONE)

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<td>C8S3.21</td>
<td>% response at 2mM</td>
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Yes

No
C8S3.22 - Do you consider the tension developed to be abnormal?
○ Yes
○ No

C8S3.22.1 - If yes, at what concentration?
__________________________

C8S3.22.2 - If yes, at what CSC?
__________________________

C8S3.22.3 - If yes, at what % response?
__________________________

C8S3.23 - Length (cm)
__________________________ (cms)

C8S3.24 - Wet weight (g)
__________________________ (gs)
Continue to add more contracture test results?

C9.1 - Would you like to fill out the following contracture test results? (if you answer no, the Biopsy Report will end here)

1. HALOTHANE 1% & CAFFEINE
2. HALOTHANE 2%

C9.2 - I certify that the information contained in this Biopsy Report is complete and accurate.

☐ Yes  ☐ No

C9.3 - Signature Date:

________________________
Strip 1 (HALOTHANE 1% & CAFFEINE - optional)

Hours between excision to completion of test (hrs):

Stimulation - duration (milliseconds):

Stimulation - frequency (Hz):

Stimulation - voltage (volts):

Stimulation - current (mA):

Was a length/tension curve done?

〇 Yes 〇 No

Pre-drug twitch tension (g) (measure from baseline for twitch tension only)

Pre-drug tension 1% hal(g):

Low point tension 1% hal(g):

Contracture tension developed to 1% hal(g):

Predrug tension 0.25mM (g):

Plateau tension 0.25mM (g):

Predrug tension 0.5mM (g):

Plateau tension 0.5mM (g):

Predrug tension 1.0mM (g):

Plateau tension 1.0mM (g):

Predrug tension 2.0mM (g):

Plateau tension 2.0mM (g):

Predrug tension 4.0mM (g):

Plateau tension 4.0mM (g):
Predrug tension 32.0mM (g):

Pletteau tension 32.0mM (g):

HCSC (mM)

Do you consider the tension developed to be abnormal?

☐ Yes
☐ No

If yes, at what concentration?

If yes, at what HCSC?

Length (cm)

Wet weight (g)
### Strip 2 (HALOTHANE 1% & CAFFEINE - optional)

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<td>Stimulation - duration (milliseconds)</td>
<td></td>
</tr>
<tr>
<td>Stimulation - frequency (Hz)</td>
<td></td>
</tr>
<tr>
<td>Stimulation - voltage (volts)</td>
<td></td>
</tr>
<tr>
<td>Stimulation - current (mA)</td>
<td></td>
</tr>
<tr>
<td>Was a length/tension curve done?</td>
<td></td>
</tr>
<tr>
<td>Pre-drug twitch tension (g) (measure from baseline for twitch tension only)</td>
<td></td>
</tr>
<tr>
<td>Pre-drug tension 1% hal(g)</td>
<td></td>
</tr>
<tr>
<td>Low point tension 1% hal(g)</td>
<td></td>
</tr>
<tr>
<td>Contracture tension developed to 1% hal(g)</td>
<td></td>
</tr>
<tr>
<td>Predrug tension 0.25mM (g)</td>
<td></td>
</tr>
<tr>
<td>Pleteau tension 0.25mM (g)</td>
<td></td>
</tr>
<tr>
<td>Predrug tension 0.5mM (g)</td>
<td></td>
</tr>
<tr>
<td>Pleteau tension 0.5mM (g)</td>
<td></td>
</tr>
<tr>
<td>Predrug tension 1.0mM (g)</td>
<td></td>
</tr>
<tr>
<td>Pleteau tension 1.0mM (g)</td>
<td></td>
</tr>
<tr>
<td>Predrug tension 2.0mM (g)</td>
<td></td>
</tr>
<tr>
<td>Pleteau tension 2.0mM (g)</td>
<td></td>
</tr>
<tr>
<td>Predrug tension 4.0mM (g)</td>
<td></td>
</tr>
<tr>
<td>Pleteau tension 4.0mM (g)</td>
<td></td>
</tr>
</tbody>
</table>
Predrug tension 32.0mM (g): ______________________ (gs)

Plateau tension 32.0mM (g): ______________________ (gs)

HCSC (mM) _______________________________________

Do you consider the tension developed to be abnormal?  
- [ ] Yes  
- [ ] No

If yes, at what concentration? ________________________

If yes, at what HCSC? ______________________________

Length (cm) ______________________________________ (cms)

Wet weight (g) ________________________________ (gs)
### Strip 3 (HALOTHANE 1% & CAFFEINE - optional)

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hours between excision to completion of test (hrs):</td>
<td></td>
</tr>
<tr>
<td>Stimulation - duration (milliseconds):</td>
<td></td>
</tr>
<tr>
<td>Stimulation - frequency (Hz):</td>
<td></td>
</tr>
<tr>
<td>Stimulation - voltage (volts):</td>
<td></td>
</tr>
<tr>
<td>Stimulation - current (mA):</td>
<td></td>
</tr>
<tr>
<td>Was a length/tension curve done?</td>
<td>Yes/No</td>
</tr>
<tr>
<td>Pre-drug twitch tension (g) (measure from baseline for twitch tension only)</td>
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</tr>
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<td>Pre-drug tension 1% hal(g):</td>
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<td></td>
</tr>
<tr>
<td>Contracture tension developed to 1% hal(g):</td>
<td></td>
</tr>
<tr>
<td>Predrug tension 0.25mM (g):</td>
<td></td>
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<tr>
<td>Plateau tension 0.25mM (g):</td>
<td></td>
</tr>
<tr>
<td>Predrug tension 0.5mM (g):</td>
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<tr>
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<tr>
<td>Predrug tension 4.0mM (g):</td>
<td></td>
</tr>
<tr>
<td>Plateau tension 4.0mM (g):</td>
<td></td>
</tr>
</tbody>
</table>
Predrug tension 32.0mM (g):

(grams)

Plateau tension 32.0mM (g):

(grams)

HCSC (mM)


Do you consider the tension developed to be abnormal?

○ Yes
○ No

If yes, at what concentration?


If yes, at what HCSC?


Length (cm)

(cms)

Wet weight (g)

(grams)
Strip 1 (HALOTHANE AT 2% - optional)

Hours between excision to completion of test (hrs):
__________________________________ (hrs)

Stimulation - duration (milliseconds):
__________________________________ (milliseconds)

Stimulation - frequency (Hz):
__________________________________ (Hz)

Stimulation - voltage (volts):
__________________________________ (volts)

Stimulation - current (mA):
__________________________________ (mA)

Was a length/tension curve done?

○ Yes
○ No

Pre-drug twitch tension (g)
(measure from baseline for twitch tension only)
__________________________________ (gs)

Pre-drug tension 3% hal(g):
__________________________________ (gs)

Low point tension 3% hal(g)
__________________________________ (gs)

Contracture tension developed to 3% hal(g):
__________________________________ (gs)

Do you consider the tension developed to be abnormal?

○ Yes
○ No

Length (cm):
__________________________________ (cms)

Wet weight (g):
__________________________________ (gs)
## Strip 2 (HALOTHANE AT 2% - optional)

<table>
<thead>
<tr>
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<tbody>
<tr>
<td>Hours between excision to completion of test (hrs)</td>
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<td>Stimulation - duration (milliseconds)</td>
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</tr>
<tr>
<td>Stimulation - voltage (volts)</td>
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</tr>
<tr>
<td>Stimulation - current (mA)</td>
<td></td>
</tr>
<tr>
<td>Was a length/tension curve done?</td>
<td>Yes</td>
</tr>
<tr>
<td>Pre-drug twitch tension (g)</td>
<td></td>
</tr>
<tr>
<td>Pre-drug tension 3% hal(g)</td>
<td></td>
</tr>
<tr>
<td>Low point tension 3% hal(g)</td>
<td></td>
</tr>
<tr>
<td>Contracture tension developed to 3% hal(g)</td>
<td></td>
</tr>
<tr>
<td>Do you consider the tension developed to be abnormal?</td>
<td>Yes</td>
</tr>
<tr>
<td>Length (cm)</td>
<td></td>
</tr>
<tr>
<td>Wet weight (g)</td>
<td></td>
</tr>
</tbody>
</table>
Strip 3 (HALOTHANE AT 2% - optional)

Hours between excision to completion of test (hrs):
__________________________________________ (hrs)

Stimulation - duration (milliseconds):
__________________________________________ (milliseconds)

Stimulation - frequency (Hz):
__________________________________________ (Hz)

Stimulation - voltage (volts):
__________________________________________ (volts)

Stimulation - current (mA):
__________________________________________ (mA)

Was a length/tension curve done?
○ Yes
○ No

Pre-drug twitch tension (g)
(measure from baseline for twitch tension only)
__________________________________________ (gs)

Pre-drug tension 3% hal(g):
__________________________________________ (gs)

Low point tension 3% hal(g)
__________________________________________ (gs)

Contracture tension developed to 3% hal(g):
__________________________________________ (gs)

Do you consider the tension developed to be abnormal?
○ Yes
○ No

Length (cm):
__________________________________________ (cms)

Wet weight (g):
__________________________________________ (gs)

I certify that the information contained in this Biopsy Report is complete and accurate.

__________________________________________
Signature Date:
NEXT SURVEY FORM

Do you still want to fill out the Clinical Information about the participant?  
○ Yes  ○ No