To minimize the potential for complications resulting from needle muscle biopsies in research subjects, the protocol submitted for ethics review must meet the following conditions:

1. Name a licensed physician as a co-investigator or collaborator on the ethics protocol submission. This physician must accept responsibility for the muscle biopsy procedure and/or supervision of non-physicians performing the biopsies.

2. Exclusion criteria and the recruitment screening process must identify potential subjects with diagnosed and/or underlying pathology, or on any medication, that could increase the risk of excessive bleeding, allergic reaction, infection or other medical condition associated with the procedure. The **Muscle Biopsy Screening Form** must be completed for each subject prior to enrollment. This Screening form must be assessed by the physician or senior researcher doing the procedure.

3. Include, as part of the subject's study participation, a formal post-biopsy appointment to attend to wound care and removal of stitches if required.

4. Identify clearly in the HSREB Submission Form Section 15.1, what health and safety procedures or protocols are in place to deal with emergencies that may arise during the procedure.

5. *In addition* to the usual Letter of Information, subjects must be given the **Muscle Biopsy Information Sheet** .

6. *In addition* to the usual required elements, the Letter of Information must identify;
   - the purpose of the biopsy;
   - the exclusion criteria and indicate that a **Muscle Biopsy Screening Form** will be completed and assessed before they can participate;
   - indicate the source of responsibility for liability/compensation related to any complication of the study if study is sponsored by a commercial or industry sponsor;
   - contain a reference to the **Muscle Biopsy Information Sheet**. (*E.g. You will undergo a Muscle Biopsy - please refer to the Muscle Biopsy Information Sheet that is appended to this letter for complete details about the procedure and its risks*.)
   - The Consent form should also refer to the **Muscle Biopsy Information Sheet**. (*E.g. I have read the Letter of Information and the Muscle Biopsy Information Sheet…)*

"At rest" biopsies on normal healthy subjects

7. Biopsies that are not done in conjunction with exercise may be conducted by physicians or trained non-physicians who are under the supervision of a licensed physician. The supervising physician must be present in the general area when an 'at rest' biopsy is being done and be aware that a muscle biopsy is underway.

8. If the investigator carrying out the muscle biopsy is not a physician, s/he must be a senior, experienced researcher and demonstrate to the supervising physician documented experience in the appropriate sterile technique, use of local anaesthesia

and adequate knowledge regarding potential complications during and following the procedure.

"Exercise" biopsies

9. Given the increased risk of excessive bleeding and difficulty in maintaining an acceptably sterile field, muscle biopsies associated with exercise may only be conducted by licensed physicians in an appropriate clinical setting.

Summary Chart

Type of Muscle Biopsy	Research subject Characteristics:	Biopsy conducted by:	Full board or Expedited Review:
At rest biopsy	Normal, healthy	Physician Or Non-physician [2]	Expedited [1]
At rest biopsy	During or requiring surgery (*This guideline refers to 'needle' biopsies only. In instances where a more extensive biopsy is required, a specially trained surgeon must do the procedure and the protocol submitted for Full Board review.)*	Physician (in some cases this may require a specially trained surgeon) *Non-physicians are not permitted to do this procedure*	Expedited [1]
At rest biopsy	Subjects with diagnosed and/or underlying pathology, or on any medication, that could increase the risk of excessive bleeding, allergic reaction, infection or other medical condition associated with the procedure.	Physician *Non-physicians are not permitted to do this procedure.*	Full board
Exercise biopsy	All	Physician *Non-physicians are not permitted to do this procedure.*	Full board

1 This chart is merely a guide. Full REB Review may be required if the research protocol has other elements that are considered to be more than minimal risk or uses a population that could be considered as 'at risk'.

2 The UWO HSREB will consider approval for those non-MD but experienced senior investigators for limited biopsy settings as per these guidelines but does recommend an attritional phase-out of non MD's being approved for the procedure.

MUSCLE BIOPSY SUBJECT SCREENING FORM

To help us ensure your safety and wellbeing please answer the following questions.

1. Have you ever had a negative or allergic reaction to local freezing (e.g. during dental procedures)?

   No □ Yes □

2. Do you have any tendency toward easy bleeding or bruising (e.g with minor cuts or shaving)?

   No □ Yes □

3. Are you currently taking any medications that may increase the chance of bleeding or bruising (e.g. Aspirin, Coumadin, Anti-inflammatories, Plavix)?

   No □ Yes □

4. Have you ever fainted or do you have a tendency to faint when undergoing or watching medical procedures?

   No □ Yes □

5. Will you contact the physician who did the biopsy directly if you have any concerns about the biopsy site including: excessive redness, swelling, infection, pain or stiffness of the leg?

   No □ Yes □

6. Are you willing to visit the physician who did the biopsy 7 – 10 days following the biopsy for an assessment of the biopsy site?

   No □ Yes □

Subject Name (print) :_____

Subject Signature :_____

Date :_____

Signature of Person Conducting Assessment: _____

Muscle Biopsy Information Sheet

Insert location of research and departmental affiliations

e.g.

Canadian Centre for Activity and Aging
School of Kinesiology, Faculty of Health Sciences
Dept. of Physical Medicine and Rehabilitation,
Faculty of Medicine and Dentistry
The University of Western Ontario

You have volunteered to take part in a research study that requires you to undergo a muscle biopsy. This is a commonly performed procedure in research studies and for the medical diagnosis of muscle disease. The procedure will be performed by a medical doctor trained to perform muscle biopsies or a specially trained researcher directly supervised by a medical doctor.

The muscle biopsy involves the removal of a small piece of muscle tissue from one of the muscles in your leg using a sterile hollow needle. The area over the outside of your lower thigh muscle (vastus lateralis muscle) will be carefully cleaned. A small amount of local freezing (anesthetic) will be injected into and under the skin. You will likely experience a burning sensation while the freezing is injected. Then a small, 4 – 5 mm incision will be made in your skin in order to create an opening for the biopsy needle. There is often a small amount of bleeding from the incision, but this is usually minimal.

The biopsy needle will then be inserted through the incision into the thigh muscle and a small piece of muscle (100 – 200 mg), about the size of a pencil eraser, will be quickly removed and the needle taken out. During the time that the sample is being taken (about 5 seconds), you may feel the sensation of deep pressure in your thigh and on some occasions this is moderately painful. However, the discomfort very quickly passes and you are quite capable of performing exercise and daily activities. There may be some minimal bleeding when the needle is removed which may require application of pressure for a few minutes.

Following the biopsy, the incision will be closed with sterile tape (steri-strips), and wrapped with a tensor bandage. You should refrain from excessive muscle use for the remainder of the day. Once the freezing wears off, your leg may feel tight and often there is the sensation of a deep bruise or "Charlie Horse". Pain killers such as Acetaminophen (e.g. Tylenol) or Ibuprofen (e.g. Advil) are acceptable if you experience pain associated with the biopsy. It is also beneficial to periodically apply an ice pack to the biopsy site the following day, as this will help to reduce any swelling and any residual soreness. The following day your leg may feel uncomfortable when going down stairs. The tightness in the muscle usually disappears within 2 days and subjects routinely begin exercising at normal capacity within 2 days. In order to allow the incisions to heal properly and minimize any risk of infection, you should avoid prolonged submersion in water for 4 days. Daily showers are acceptable, but baths, swimming, saunas, etc. should be avoided for at least 4 days following the biopsy procedure. Seven to ten days after the biopsy you will be asked to visit the doctor who did the biopsy at his/her office (and/or insert alternative address) so that the biopsy site can be assessed to see how it is healing.

Potential Risks

- The local freezing will likely result in a burning feeling in the thigh at the time of the injection. This will last only 5 – 10 seconds. There is an extremely low risk of allergic reaction to the local injection (1 in 1 million).

- The chance of a local skin infection in less than 1 in 1000. Carefully cleaning the skin and keeping the area clean and dry until the skin heals will minimize this.

- Most subjects experience local soreness and stiffness in the leg for two or three days after the biopsy similar to a deep bruise or Charlie Horse. There is a very low risk of internal bleeding at the biopsy site which can result in more prolonged pain and stiffness in the leg.

- On occasion, a small lump of scar tissue may form under the site of the incision, but this normally disappears within 2-3 months, or within a few weeks if massaged. A small visible scar often remains from the biopsy incision.

- There is the possibility of a small area of numbness (about the size of a toonie) around the biopsy site. This usually resolves over 5 – 6 months. There is a very low risk (estimated at less than 1/5000) of damage to a small nerve branch to the muscle. This would result in partial weakness of the vastus lateralis muscle (one of four muscles that straightens the knee) and would likely have no impact on day-to-day activities. Nerve injuries like this usually resolve in 8 – 12 months, but there is a theoretical risk of mild leg weakness.

Concerns or Problems

Infection can be serious, if you experience excessive redness, swelling or infection around the biopsy site or pain or stiffness in your leg you must contact the doctor who did the biopsy *right away*. Insert name of physician doing the biopsy will be available 24 hours a day to answer any of your concerns or questions about the biopsy.

insert name & contact numbers of physician doing the biopsy**:**
Office (519)
Pager (519)

However, if for some reason, you are not able to contact this physician then you should contact your family doctor or go to the Emergency Department.

Please keep this Information Sheet until such time as your biopsy site has fully healed.