NHS, Invasive or Clinical Research (NICR) Committee Title: Maximal Strength Testing

Physiology, Exercise & Nutrition

Research Group



# SCOPE

A number of studies performed in the University involve testing for maximal strength on various resistance exercise machines.

This approved procedure is intended for use by researchers operating in an appropriate laboratory within the University of Stirling, who wish to test the maximal strength of study participants.

This approved procedure is intended for use when the following criteria are met (n.b. the NICR application must explicitly demonstrate how these criteria are met):

* The study involves healthy adults (over the age of 18) who are able to provide informed consent
* Staff involved in the performance of muscle biopsy sampling have received appropriate training

## Appropriate Laboratory Facilities for Maximal Strength Testing

Appropriate laboratory facilities contain the required levels of equipment, staff and services to ensure the strength testing procedure conforms to the SOP and participant safety is guaranteed. Specific equipment includes:

Equipment

Resistance exercise machines. The machines to be used will be identified for each individual study protocol.

# TRAINING OF RESEARCH STAFF

It is the responsibility of the Principle Investigator to ensure that all researchers involved in maximal strength testing have been adequately trained in the procedures used to determine maximal strength.

# PROCEDURES

## Principle

Maximal strength will be determined on each resistance exercise machine using appropriate form. Resistance will be progressively increased until the participant is unable to complete the appropriate number of full repetitions (repetition maximum or RM). RM may be determined for various number of repetitions, most commonly 1RM, 3RM, 6RM or 10RM. The RM will be identified for each individual study protocol.

## Procedure

After appropriate warmup, the participant will be positioned on the resistance exercise machine and the resistance will be set at ~75-80% of the estimated RM. The participant will attempt the designated number of repetitions. If the weight is lifted successfully for the appropriate number of repetitions, then the resistance will be increased and the participant will attempt to lift the increased weight for the appropriate number of repetitions again. The participant will rest 2-3 min between attempts. The resistance will be progressively increased until the participant fails to complete the designated number of repetitions.

# POTENTIAL RISKS TO PARTICIPANTS/RESEARCHERS/OTHERS AND WHAT WILL BE DONE TO MINIMISE THE RISKS

## Risks to participants

All staff performing the technique will have undergone training to minimize all risks. Common risks associated with maximal strength testing include discomfort during the testing, muscle or joint injury, soreness or stiffness subsequent to the testing. Settings for each machine will be determined for each

participant and proper form will be maintained during the exercise to minimize these risks. Potential soreness and stiffness will last only for a short time.

All participants will be fully informed about these risks in the Participant Information Sheet.

As participants may sometimes faint before, during or after the maximal strength testing, at least one member of staff (present in the building) must be trained in basic life support.

## Risk to Researchers/Other Staff

There is a slight risk of catching a digit in the exercise machine. Proper training and care during the procedure will minimize these risks.

# METHODS FOR RECRUITING PARTICIPANTS

Potential participants will be recruited as per existing NICR guidelines and the inclusion and exclusion criteria of the particular study protocol.

# INFORMATION PROVIDED TO PARTICIPANTS

Participants should be fully informed of all procedures involved in the research study.

The Information Sheet should be written in simple but non-patronising language. Most word-processing packages provide readability statistics for a document, and one should aim for a 12-year-old (Year 7) reading level for adults.

Current guidelines for the Information Sheet for Participants can be found on the NICR website.

# CONSENT OF PARTICIPANTS

The informed consent of participants should be recorded on a form that includes explicit consent for the maximal strength testing. The form must also contain an explicit statement that the participant understands that they will be informed of any unexpected findings and encouraged to report these findings to their GP.

# MONITORING AND REPORTING OF ADVERSE OR UNFORSEEN EVENTS

Adverse or unforeseen events will be reported to the departmental safety officer in the first instance and may be followed up by the University Safety officer if deemed necessary. The NICR

Committee also will be notified of such events.

# FINANCIAL AND OTHER REWARDS TO PARTICIPANTS

Compensation for time commitments, travel and parking may be offered to participants in line with existing PENRG policy and will be determined separately for each individual study protocol.

# COMMUNICATION OF RESULTS

Results of the study will be communicated via the normal channels as per existing PENRG practice.

# DUTY OF CARE ISSUES / CONFIDENTIALITY

Duty of care and confidentiality issues arise entirely from the testing results. The confidentiality of the results are also expected to be maintained as per NICR guidelines.