UNIVERSITY OF LIMERICK
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UNIVERSITY OF LIMERICK RESEARCH ETHICS COMMITTEE

RISK ASSESSMENT FORM – PROCEDURES INVOLVING HUMAN SUBJECTS

		Procedure No	**SS 030**
Title of Procedure	Measurement of Physical Fitness		
Name of Assessor(s)	Ciaran MacDonncha	**Assessment Date**	January 2018

Does this procedure already have ethical approval ? **Yes**

If so, enter ethical number and expiry date

Approval No: 2019_11_SS 030_RA
End Date: December 2028

1 Please provide a brief description of the procedure

Joint range of Motion:
Joint range of motion (ROM) can be measured using a number of different methods, all of which are non-invasive. Both angular and linear measures of joint ROM can be assessed. Goniometers, inclinometers, sit/stand and reach boxes and 3D video analysis are used to assess joint ROM. Goniometers and inclinometers are used to measure both active and passive range of motion, come in a variety of sizes and shapes and are usually constructed of either plastic or metal. The subject is either prone or supine, standing or sitting or performing a dynamic action. The joint being measured is passed through the ROM available at that joint.

The sit and reach test is a common measure of flexibility, and specifically measures the flexibility of the lower back and hamstring muscles. A sit and reach box is used in this test. This test involves sitting on the floor with legs stretched out straight ahead, without shoes. The soles of the feet are placed flat against the box, with legs pressed flat to the floor. With the palms facing downwards on the top of the box, the subject reaches forward along the measuring line as far as possible. The hands remain at the same level, not one reaching further forward than the other. Distance of a set number of trials are recorded.

The subject is wearing a T-shirt and shorts for all measurements.

Strength:
Strength will be measured using an electronic hand grip dynamometer. Dominant hand grip measures will be read to the nearest 0.1-kilogram. The dynamometer will be re-calibrated to zero before each test and the dial of the dynamometer faces the tester during the test. Participant should first dry his/her dominant hand. The dynamometer will be adjusted and placed comfortably in the hand to be tested. The second joint of the hand should fit snugly under the handle, which will be gripped between the fingers and the palm at the base of the thumb. The participant assumes an upright, standing position with the arm fully extended down by his/her side.. The hand and arm should be free of the body, not touching anything. The arm can be slightly bent, but the dynamometer is kept in line with the forearm and hangs down at the side. The test involves a maximal gripping effort for 2-3 seconds. No swinging or pumping action of the arm is permitted.

Cardio Respiratory Endurance:
This will be estimated using the 20-Meter Shuttle Test (Leger et al, 1988). The participants move from one line to another 20m apart, reversing direction and in accordance to a pace dictated by an audio signal which gets progressively quicker with time. Participants start at a speed of 8.0 km/hr, with the second stage at 9.0 km/hr, and thereafter there is an increase in speed by 0.5 km/hr each stage.. The test is terminated for each participant when they fail to reach the end lines in time with two consecutive audio signals. Distance covered will be recorded in shuttles one shuttle measuring 20m). For the initial stages of the test, a member of the testing team will join the participants so as to maintain the correct running pace. Participants will be grouped depending on the size of the school hall/ gymnasium. Instructions to the participants are also outlined on the audio recording.

Muscular Endurance:
Endurance of the abdominal muscles will be measured using the sit-up test. The test will involve completing a maximum number of sit-ups to a preset cadence of 20 sit-ups per minute (1 sit-up every 3 seconds). The performer lies in a supine position on the mat, knees bent at an angle of approximately 140°, feet flat on the floor, legs slightly apart, arms straight and parallel to the trunk with palms of hands resting on the mat. After the participant has assumed the correct position on the mat, the observer places a measuring strip on the mat under the participant's legs so that their fingertips are just resting on the nearest edge of the measuring strip. Keeping heels in contact with the mat, the participant curls up slowly, sliding fingers across the measuring strip until fingertips reach the other side and slowly returns to the start position. The participant stops once they cannot maintain a rhythmic pace with the pre-set cadence.

The isometric muscular endurance of the torso is measured by maintaining a static prone position for as long as possible (plank hold) with only forearms and toes touching the ground. The aim of the test is to hold an elevated position for as long as possible. Start with the upper body supported off the ground by the elbows and forearms, and the legs straight with the weight taken by the toes. The hip is lifted off the floor creating a straight line from head to toe. As soon as the participant is in the correct position, the stopwatch is started. The test is over when the subject is unable to hold the back straight and the hip is lowered. Measures will be recorded to the nearest second.

The 90˚ push up test is used to assess upper body muscular endurance. The aim is to complete as many 90˚ push-up repetitions as possible to a set cadence (1.5 seconds concentric, 1.5 seconds eccentric). The participant assumes a prone (facing down) position, hands flat and facing forwards, shoulder width apart. Arms fully extended. Lower the body until elbows bend to 90° and upper arms are parallel to the floor. Maintain ankle, hip shoulder alignment. Repeat as many times as possible to the set cadence. The participant stops once they cannot maintain a rhythmic pace with the pre-set cadence.

Power:
A "standing long jump" using a long jump mat or tape measure attached to foam mats/gym mats will be used to assess lower body power.. Participant stands with feet shoulder width apart and the toes just behind the takeoff line. The takeoff line is a line drawn perpendicular to the tape measure. Preparatory to jumping, the participant bends the knees so that they are parallel to the ground and swings the arms backwards. The jump is completed by swinging the arms forward vigorously while simultaneously extending the knees and jumping as far as possible. The participant must try to land with feet together and remain upright. The distance will be measured from the front edge of the take-off line to the point where the back of the heel nearest to the take-off line lands on the mat. Measures will be read to the nearest centimetre.

The physical fitness tests described above are aligned to internationally recongised health related fitness test batteries from the Cooper Institute (Fitnessgam 2010) and the ALPHA Test Battery (2010).

2	Location in which the procedure may take place

✓	PESS Teaching Labs
✓	PESS Research Laboratory

Others, please specify

✓	PESS Gym, PESS Sports Halls, UL Sports Hall (Arena)
✓	School Gymnasium/ School Sports Hall, Sports Club

3	Eligibility of subject(s) to be used

✓	PESS student (U.G. or P.G.)
✓	University of Limerick staff or campus personnel
✓	Members of the general public engaged in research projects granted ethical approval. Adults and adolescents (aged 7-18yrs)

4	Potential risks. To be explained <u>before</u> obtaining consent

✓	None, or minimal discomfort only

The subject should **not participate** in the tests if there is a recent history of illness or recurrent injury or if the pre-test questionnaire identifies a reason for the participant not to take part in any of the tests.

5	Action to be taken in the event of an foreseeable emergency

The procedure will be terminated if the volunteer shows any sign of distress.

Standard first aid procedures may be required depending on the severity of the situation. The following standard procedure should be followed in the event of an incident occurring in the PESS building / UL Facility:

1. Stop the procedure. Position the subject to prevent self-injury.
2. If appropriate, raise the subject's lower limbs to improve blood flow. Should the subject fail to respond summon help immediately.
3. Check vital signs airways, breathing and circulation (ABC)
4. If required attempt CPR as soon as possible.
5. Requesting Help: Emergency Contact telephone numbers are listed on laboratory door:
   - During normal working hours 9am-5pm, use lab phone to contact the Student Health Centre on **061-20**2534
   - Outside of normal working hours, or if the Student Health Centre number is engaged/busy, use the laboratory phone to dial 3333 for UL security personnel who will then contact the ambulance service. If in PESS, contact one of the PESS First Aiders – names are listed on the PESS laboratory door.
6. When contacting the above clearly state: Location, Building, Room Number, Nature of Incident/Accident and provide a contact number.

7. Complete the UL 'Accident & Emergency' form (completed by the investigator, not the volunteer). Forms available on UL HR website: https://www.ul.ie/hr/hr-policies-procedures-and-forms-z

If an emergency or incident occurs offsite, follow the local procedures for dealing with such an event. **Ensure you are aware of the offsite local safety procedures in the event of a foreseeable emergency.** In the event of a foreseeable emergency the School Principal/ Vice Principal or another member of staff shall be immediately contacted by a member of the testing team. The school's emergency procedure will then be put into effect.

6	**Level of supervision required for procedure**

✓	PESS lecturing, research staff and teaching assistants
✓	PESS postgraduate researcher

Others, please specify

✓	Physical Education Teacher

7	**Other documentation required for this assessment?**

✓	Pre-test subject questionnaire
✓	Detailed protocol

Others, please specify

✓	Participant information sheet and consent form
✓	Parental consent form and child assent form if participant is under 18

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Title of Procedure Measurement of Physical Fitness

Name of Assessor(s) Ciaran MacDonncha

Assessment Date January 2018

Approval of procedure

[Granted

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Others, please specify

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Comments/conditions

Signed: _____ (Head of Department)

Date: 11/1/18