Investigating the molecular effects of cooling human burns

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Part 1 – Introduction

We would like to invite you to take part in our study. The purpose of this leaflet is to provide you with information to enable you to make an informed choice as to whether you wish to participate or not, and it is essential that you read this, understand what is involved, and are happy to proceed before you sign the consent form. Your treatment will not be affected by your participation in this study. The first part outlines the purpose of the study, and the second part sets out the steps involved, if you agree to participate. Please feel free to ask any questions that you may have in order to help you reach your decision.

Burns

Almost everyone has had a burn of some sort during the course of their life, and in the vast majority of cases the burns are small, superficial, and heal without any surgery, hospitalisation, or long-term problems. In their more severe forms, burns can cause pain, severe illness, scarring, psychological harm, disability, and in some cases death. Treatment of severe burns is complex, painful, prolonged, expensive, and still far from perfect.

What are the aims of the study?

Burns develop over the 24-48 hours after initial injury until they reach the limit of their severity, before beginning to heal. Depending upon the depth, they may heal in 5-7 days for the very superficial burns with very little scarring, or over the course of months in the case of deep burns. The longer a burn takes to heal, the worse the scarring and functional outcome, the greater the trauma to the patient, and the greater the cost to the patient and society in terms of treatment costs, loss of earnings and long-term disability.

First-aid recommends the cooling burns under cool running water for at least 20 minutes, as soon as possible after injury, and this has the proven effect of reducing the severity of the burn. However, it is not clear how this works, as the heat of the burn disperses before the cooling starts if there is more than a couple of minutes delay, and yet the benefit of cooling persists even after the heat has dispersed. Hence, complex chains of events in the cells that make up the skin must be taking place, and these are modified by cooling, reducing the severity of the burn. All events taking place in cells are ultimately controlled by “genes” which act as templates for making proteins, which in turn dictate cell behaviour and function. Genes are switched “on” or “off” to change cell behaviour in response to certain events. We want to understand the genes that are switched on and off by burning, and by cooling the burn in order to better understand the mechanism of cooling, and improve the management of burns in the future. Further down the line, it may allow the development of drugs that reduce the severity of burns and improve healing without surgery.
Why have I been selected to participate?

Human skin is unique, compared to other mammals’ skin. It has less hair, more sweat and oil glands and a different structure of blood vessels and muscle. Humans are also unique in forming problem scars after injury, particularly burns, referred to as hypertrophic or keloid scars. Hence, human skin is the ideal skin for research into human burns.

You have elected to undergo breast reconstruction using skin and tissue from your abdomen - the DIEP flap that you have been told about. During the course of your surgery, areas of skin that are not needed for the reconstruction have to be removed to give a neat scar along the abdomen, areas at either end of the scar near the hip areas. Usually, these are discarded at the end of the operation. We would like to ask you for your permission to use these pieces of excess skin for our experiment. This experiment involves the creation of a number of 1.5cm diameter burns on these areas of excess skin early in the operation, while they are still attached to you, but after you are anaesthetised, so that you experience no pain, and are in fact unaware of the whole process.

What would I have to do if I agreed to participate?

If you agree to participate in the study, you will be asked to sign a consent form to this effect, and will be enrolled in the study. If you change your mind, you can withdraw from the study at any point before your operation. On the day of surgery, the Consultant will mark the DIEP flap on your abdomen before you have your anaesthetic, and you will then go to the anaesthetic room as normal for the operation. The anaesthetist will anaesthetise you, and once you are asleep we will use a specially designed piece of apparatus to create a number of very small burns in the skin on the abdomen that is due to be removed, but not used to make the new breast, and would in other cases be discarded. These burns may then be cooled, or not, and then the burned areas of skin removed and sent for processing and analysis. The operation will proceed as normal while this is going on, and you will wake up in the recovery area of theatres when the operation is finished. The process of the experiments will make no change to your operation, or recovery, and your end result will look no different to those of women who have not participated in the study.
What will happen to the sample I provide?

The skin samples will be assigned a unique identification number to allow their identification, but prevent them being linked to the patient. They are then processed in a number of ways so that they can be examined under a microscope, or analysed to see which genes have been switched on or off. While we will extract genetic material from your skin, we will not be conducting any genetic tests on you for any diseases you might develop in the future. Samples will be kept in secure storage or freezers, and there will be no identifiable information attached to the samples. The results and data will be stored securely, but again there will be no identifiable information attached to these files.

What if I do not want to participate?

If you do not wish to participate, you simply say so and you will not be enrolled in the study. You will have your surgery as normal, but no experiments will be carried out. Not participating in the study will not change the clinical care you are given.

If the information in Part 1 has interested you and you are considering participation, please read the additional information in Part 2 before making any decision.

Part 2 – Further Information

What are the benefits of participating?

There are no benefits in participating in the study, but in the long term, the study may help improve the management and treatment of burns.

What are the risks of participation?

The apparatus has all been designed to the highest standards by medical engineers, and the project has been approved by an ethics committee who have carefully considered the risks to patients. There is a very small risk of a very superficial burn being created accidentally in a place on the body that we did not plan. However, the apparatus has inbuilt safety features that limit the temperature and protect the hot part from accidental contact, and the area around where the burn will be created will be protected by a heat-proof template as can be seen in the attached photographs of the apparatus. Were such an event to occur, we would tell you, and the burn would almost certainly heal within a few days with dressings and leave no significant scar.
Where will information I provide be stored?

The data will be anonymised, assigned a unique identification number, and transferred to a password protected database, access to which will be restricted to researchers working on the project, and responsible members of the University for monitoring and audit. Any data collected may also be used retrospectively for other ethically approved studies. At the end of the study, anonymous data and samples will be available to other researchers outside of the University of Oxford, performing studies looking into the molecular basis of burns, or other studies that have been given approval by the relevant ethical review body. Anonymised data collected during the course of the study may be passed on to other organisations that may include commercial organisations. Data may be sent to associated researchers to countries, either within or outside the European Economic Area where the laws don’t protect your privacy to the same extent as the law in the UK. However, there will be no confidential personal information shared in this way.

Responsible members of the University of Oxford or the Buckinghamshire Healthcare NHS trust may be given access to data for monitoring and/ or audit of the study to ensure we are complying with regulations.

Can I withdraw from the study?

You may withdraw from the study at any point before your operation, even after signing the consent form, simply by telling us you do not want to participate, and your surgery will be conducted as normal. Your withdrawal will have no effect upon your treatment. If you decide that you do not want to participate after the surgery, however, it will not be possible to identify your samples and destroy them, as they will have been anonymised and cannot be traced to you.

How can I find out the results of the study?

Lay summaries of the study results will be posted at regular intervals on the website of the Restore Foundation - http://www.restore-research.org.uk/

Who has reviewed the study?

All research in the NHS is looked at by independent group of people, called a Research Ethics Committee to protect your safety, rights, wellbeing and dignity. This study has been reviewed and given favourable opinion by Research Ethics Committee Berkshire.
What if I come to harm by participating in the study?

Given the nature of this study, it is unlikely that you will suffer harm by taking part, however if you are harmed by participation in the study, you may have grounds for legal action for compensation against the University of Oxford.

The University has a specialist insurance policy in place which would operate in the event of any participant suffering harm as a result of their involvement in research: Newline Underwriting Management Ltd, Lloyds’s of London, policy number WD1200463. NHS indemnity operates in respect of the clinical treatment provided.

If you wish to complain about any aspect of the way in which you have been approached or treated during the course of this study, you should contact Mr Hugh Wright on burncoolingproject@gmail.com or 07968826781 or you may contact the University of Oxford Clinical Trials and Research Governance (CTRG) office on 01865 572224 or the head of CTRG, email ctrg@admin.ox.ac.uk

Who can I contact for more information about the study?

If you require further information, are unsure whether or not to participate, in the study, please contact a member of the team in writing, by email, or by telephone using the contact details below.

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The apparatus

The temperature control display on the control unit, the insulated sleeve on the probe, and the silicone template have all been specifically designed to maximise participant safety.