The Fenland Study Phase 3 – Participant Information Sheet

What is the purpose of this study?
This research project is a continuation of Fenland Phase 1 and 2, and is designed to investigate the interaction between genetic, environment and behavioural factors in determining diabetes, obesity, and related metabolic disorders. These conditions are a considerable public health concern, and investigating their causes is key to the development of enhanced approaches to prevention.

Why have I been invited?
Approximately 12,500 people from across Cambridgeshire took part in the first phase of the Fenland Study between 2005 and 2015, and just under 8000 of them took part in the second phase between 2014 and 2020 before the study was stopped due to the Covid-19 pandemic. We would like to invite all participants who attended the first phase of the Fenland Study and who agreed to be re-contacted, to participate in phase 3 of the Fenland Study. The information we collect from you will be used to define how changes in behavioural and environmental factors **over time** determine diabetes, obesity and other related health conditions.

Before you decide to take part, we would like you to understand why the research is being undertaken and what it would involve for you. Please take the time to read the following information carefully and feel free to discuss it with friends, family or your GP. Unfortunately, for the purpose of our study if there is a possibility that you may be pregnant, you won't be able to take part in the study at this time.

Do I have to take part?
No, it is entirely up to you to decide whether or not to take part. If you decide not to take part, we will completely respect your decision and it will not affect the healthcare you receive in any way. If you decide to take part, we will ask you to consent via our electronic consent form.

What will happen if I take part in the study?
If you agree to help us with this research, it will be very similar to the previous two phases of the Fenland Study, except you will have the option to use our bespoke Fenland Study app (compatible with iOS version 13 and above or Android version 10 and above) to complete questionnaires, receive notifications regarding your participation and information about the clinic visit, as well as updates about results from the Fenland Study. Participants who do not wish to use the app (or do not have a compatible device) will have the option to use an online web platform to answer questionnaires from home. If these two options are not convenient, you will be able to complete questionnaires using the online web platform on a tablet at the clinic visit. You will be able to indicate your preferred option at the consent stage. You can contact us via email at fenlandstudy@mrc-epid.cam.ac.uk or call us on free phone 0800 085 6183 to discuss these options further with the team.

Diet and other behavioural patterns – if you use the app or the online web platform, we will ask you to complete a range of questionnaires at home before you attend the clinic visit. These relate to your medical history, physical activity and general behaviours. We would also ask that you complete two 24 hour dietary recall logs (called Intake 24) during the period when you are wearing the wrist-worn accelerometer (see below). If using the app or online web form at home is not convenient, you will be able to complete questionnaires using the online web platform on a tablet at the clinic visit. The study team will be able to assist you.

Physical activity levels:
Two weeks before your appointment, we will send you a wrist-worn accelerometer in the post and ask you to wear it for a period of a week. This measures your movement patterns to provide an estimate of energy expenditure. You will then need to bring this with you to your appointment. Full instructions will be provided.

Clinic visit:
You will be invited to visit one of our Research clinics at either the Princess of Wales Hospital in Ely, the North Cambs Hospital in Wisbech or Addenbrooke's Hospital in Cambridge, whichever is most convenient for you. If it is not possible for you to attend one of our clinics, **you will still be able to contribute to the study**. We will invite you to complete all the questionnaires and assessments that can be completed remotely on the app or the online web platform.

If you attend a clinic visit, it will be a single morning visit of up to 3.5 hours, during which we will carry out a number of tests to:

Measure your metabolic health:
We will take a blood and urine sample to determine your blood glucose, blood fat (such as cholesterol) levels, as well as liver and kidney function. The amount of blood taken is very small and equates to 3 tablespoons (54ml). To ensure accurate measurement of these we ask that you **do not eat or drink anything other than water from 10pm the evening before your visit**. You will then consume a harmless sugary drink and your response to the glucose in the drink will be assessed through a second blood sample taken 2 hours later. This is the standard test to determine whether someone has diabetes or not. If you have been diagnosed with diabetes, **you will still be eligible to take part**. However, we will only take an initial blood sample and you will not consume the sugary drink.

Additionally, blood samples will be collected and stored for future research aimed at understanding the cause of diabetes and related disorders, including DNA analysis. We have extracted DNA from blood samples provided in previous waves of the Fenland study and are using this to investigate the genetic basis of metabolic disorders. In the current phase of the Fenland study, we will take blood samples to extract DNA again to allow us to investigate DNA-related changes that alter over time and influence how genes work.

These samples will not be labelled with any personally identifiable information (i.e. your name is replaced with a code).

Measure your cardiovascular health:
An Electrocardiogram (ECG) of your heart and blood pressure measurements will be taken.

Measure your body composition:
We will measure your height and weight as well as your hip and waist circumferences. Using a Dual Energy X-ray Absorptiometry (DEXA) scanner and an ultrasound, we will assess your body composition in more detail. Both measurements take about 5-15 minutes and cause no discomfort. The ultrasound requires a small amount of gel to be placed on the midriff to allow a sensor to take a measurement. It is the same technique used to visualise babies during pregnancy.

Measure your fitness level:
If you are eligible, we will ask you to walk on a treadmill for up to 15 minutes. Alternatively, you may be asked to perform a self-paced walk test. You will also wear a chest worn heart rate monitor during this procedure.

We will also assess muscular strength by performing a hand grip strength test of both hands.

Missed Assessment

If an assessment could not be completed during your clinic visit, at the discretion of the study investigator and with your agreement, we may invite you back. .

Expenses and payments
Travel costs up to £50 will be reimbursed, so please keep a record of your mileage and parking charges, public transport fares etc. If your claim is likely to exceed £50, please contact the study team in advance. At the end of the visit, we will offer you a voucher for some refreshments at the hospital cafeteria.

What are the possible disadvantages and risks for taking part?
There are no significant risks involved in the tests.

If you take part in this study, you will have a whole body DEXA scan. This scan uses ionising radiation to provide images of your body. The amount of ionising radiation used in our DEXA scans is negligible - up to 8 hours of natural exposure to background radiation from the atmosphere. For reference, a single chest x-ray equals to approximately 3 days (72 hours) of background radiation.

Although we all are exposed to ionising radiation every day from the atmosphere, added exposures like x-rays can negligibly increase the risk of developing cancer later in life. It is estimated that this increased risk is 1 in 12 million.

When taking a blood sample there is a risk of bruising, inflammation and fainting. We also estimate that 0.5% of individuals may feel sick (from data from phase 1 of

the Fenland Study) after consuming the glucose drink. We have changed the supplier of the glucose drink to make the consumption more palatable. However, some individuals may still feel nauseous after consuming the drink.

What are the possible benefits of taking part?
If you decide to take part, you will be contributing to knowledge about obesity, type 2 diabetes and related metabolic conditions which could help patients in the future. Additionally, you will have a very thorough health check, including a test for diabetes and measurement of your blood cholesterol. With your permission, your clinical results will be sent to your GP and you will receive detailed individual feedback from us on the results of your clinic visit. This will include information on how your body composition and fitness compare to the rest of the population. The information you receive will be straightforward to understand and will be made available to you as soon as possible. For some of the measures that are processed after your clinic visit, it could take up to 90 days for you to receive them.

What if there is a problem?
If you have a concern about any aspect of this study, you should ask to speak to the researchers who will do their best to answer your questions. They are contactable by email fenlandstudy@mrc-epid.cam.ac.uk or on free phone 0800 085 6183.

If you remain unhappy and wish to complain formally, you can do this by contacting the Assistant Director of the Research Office, University of Cambridge School of Clinical Medicine on 01223 333543.

What will happen if I don't want to carry on with the study?
You are free to withdraw from the study at any time and without giving any reason. You may choose for us to retain or destroy the samples we store. However, if the samples you have provided have been analysed prior to your withdrawal, then we will be unable to remove these data from the results. For further information on how we use your data, please see paragraph below.

Please note that by deleting the app, you are not withdrawing from the study and may still be contacted. It is important to contact the study team if you wish to withdraw from the study.

Will the information collected on me in this study be kept confidential?
All information that is collected about you during the course of this research will be kept strictly confidential. With your permission, the MRC Epidemiology Unit, University of Cambridge, will store information about you anonymously and will have your name and address removed so that you cannot be identified. It will not be used or made available to anyone for any purpose other than for research. Codes connecting your individual identity to the stored data records will be kept separately.

The contact information you provide such as email address and phone number(s) will be used by the research team to keep you informed about your participation in the study. In the event it becomes necessary for the study team to use an external company to manage this process, for example an SMS service, the company will be GDPR compliant.

More information about how we use your data for the purposes of this study can be found in the study privacy notice, which is available here: https://www.mrc-epid.cam.ac.uk/research/studies/fenland/information-for-participants/ or upon request.

The University of Cambridge is the sponsor for this study based in the United Kingdom. We will be using information from you in order to undertake this study and will act as the data controller for this study. The University of Cambridge will keep identifiable information about you for 15 years after the study has finished.

Your rights to access, change or move your information are limited, as we need to manage your information in specific ways in order for the research to be reliable and accurate. If you withdraw from the study, we will keep the information about you that we have already obtained. To safeguard your rights, we will use the minimum personally-identifiable information possible.

We also work with other research groups and as part of these research collaborations, your pseudonymised information and samples (i.e. your name is replaced with a code number on all data and samples) may be made available to researchers who are working in other countries (including outside the EU) or in commercial companies.

You can find out more about how we use your information at

https://www.information-compliance.admin.cam.ac.uk/data-protection/medical-research-participant-data

Future information on health
In future years, we would like to identify patterns of ill health among participants in this study. We would like to study patterns of hospital admissions or risk of developing particular diseases, including cancer. We will ask you for permission to access information about you held by the NHS for this purpose.

What will happen to the study results?
The study results will allow us to have a better understanding of the causes of diabetes, obesity and related conditions and how to prevent them. You will not be identified personally in any report or publication.

Who is organising and funding the study?
The study is funded by the Medical Research Council (MRC) and is organised by the MRC Epidemiology Unit, University of Cambridge.

Who has reviewed the study?
To protect your interests the Fenland Study has been reviewed by an independent group of people called a Research Ethics Committee. This study has been reviewed and given a favourable opinion by East Midlands - Derby Research Ethics Committee.

What should I do next?
If you decide that you would like to take part, please follow/click the personalised link provided in your invite to our study website to register your interest. Alternatively, you can email us at fenlandstudy@mrc-epid.cam.ac.uk or call us on free phone 0800 085 6183 to register your interest. If you would like to participate, we will send you a personalised link to complete the consent form online one week after we have received your registration. If you are unable to provide consent online, you will be able to do so at the clinic visit.

Further information
If you would like further information or have any queries about the study, e-mail us at fenlandstudy@mrc-epid.cam.ac.uk or please feel free to contact the study team on our free phone number 0800 085 6183 during office hours. In addition, all the information about the study will be available on our website at http://www.mrc-epid.cam.ac.uk/research/studies/fenland/

IRMER Referrer
The referrer for the DEXA scan element of Fenland Study Phase 3 is Professor Nick Wareham *(GMC 3138490)*, who is a Registered Healthcare Professional as required by the Ionising Radiation (Medical Exposures) Regulations 2017 (IRMER).