Cambridge University Hospitals NHS
NHS Foundation Trust

100,000 Genomes Project

Participant Information Sheet

This sheet summarises the project and key points that you need to consider whether or not you want to give consent for your child's potential participation in this Project.

If you are joining this Project as a participant yourself, information will be provided to you separately about your own participation as a family member. This sheet focuses on your child's potential participation.

This sheet includes specific sections about each of the points on the consent form. More detailed information is on the Genomics England website (www.genomicsengland.co.uk).

Please ask as many questions as you want and share this leaflet with friends and family.

If you don't want your child to take part in this project, they don't have to. It's up to you. You don't have to give a reason and their care will not be affected if you say no.

About the 100,000 Genomes Project

Genomics England, with the consent of participants, is creating a lasting legacy for patients, the NHS and the UK economy through the sequencing of 100,000 genomes. This is known as the 100,000 Genomes Project. The goal of the Project is to transform the application of genetics to healthcare in the National Health Service.

Your child's genome

The genome is all of the genetic information in the body's instruction manual for your child's body. Some of your child's genome is unique to them, but they do share most of it with their relatives. The genome is made of DNA that is a series of letters which can be looked at, one by one, using a technique called sequencing. Recent developments in science and technology mean that it has become possible to look at the whole genome.

What can sequencing a whole genome tell us?

Learning more about the work of your child's genes could give vital clues about the cause their disease and help to improve treatments. When different whole genome sequences of patients with the same condition are compared, it is possible to see patterns. These patterns can be put together with health information about the patient and many other participants, sometimes including their family members. Once this is done we may be able to link particular patterns with whether people become ill and how severe their illness is likely to be. Sometimes these patterns can also give clues as to the

best treatments for a patient, or may reveal information that could be important to other family members.

How might this affect patient care?

Allowing researchers to look at detailed information about your child's rare disease in combination with their own whole genome sequence can help to understand their condition and to discover new ways of improving healthcare. A possible advantage of researchers from commercial companies looking at this, as well as other researchers, is that companies can help to develop new medicines, diagnostic tests and treatments for the future more quickly than the NHS itself can. This is especially important for conditions which have few effective treatments.

Why are we doing the 100,000 Genomes Project in the NHS?

Fast, low-cost, whole genome sequencing is now affordable for the NHS. Using whole genome sequencing for the benefit of patients is called genomic medicine. Although genomic medicine is already happening in the NHS in cancer care, we want to develop the evidence that may expand its use in healthcare.

What is the 100,000 Genomes Project planning to do?

This Project will sequence 100,000 whole genomes from around 70,000 people in total by 2017. In cancer patients, we will sequence both the genome of the patient and of their tumour. In rare disease patients, we will sequence the patient's genome as well as the genomes of some of the patient's close relatives (if the relatives wish to take part in the Project). The results will be linked with patients' medical records and stored securely. By combining this information and allowing access to this resource by authorised researchers, the project aims to:

- Bring direct benefit to some participants through a better understanding of the cause of their condition.
- Make new discoveries that will help us understand why some people get ill and others don't.
- Develop a genomic medicine service for the NHS.
- Support researchers and companies of all sizes to develop new medicines, therapies and diagnostics.

The project will initially focus on rare disease, cancer and specific infectious diseases.

What is Genomics England?

The project is run by Genomics England which is a company owned and majority funded by the UK Department of Health.

Why has my child been invited to join the 100,000 Genomes Project?

Your child has been invited to join the 100,000 Genomes Project because they have a rare disease or condition which may or may not have been diagnosed yet. We will invite (ideally) two of their blood

relatives so we can compare the genome of the affected person with two relatives' genomes. Often, but not always, this will be their parents. Everyone who takes part will be invited to join the Project and asked for their consent.

Key point

Some patients with rare diseases may get a genetic diagnosis for their rare disease for the first time but the majority will not. It is most likely that the benefit will be for patients in the future, as everyone who takes part will be helping to develop genomic medicine services for the NHS.

What will your child be invited to do?

After the project has been explained to you and you have read and considered this information sheet, then one of your child's clinical team will ask you if you have any further questions about the details of the Project. You will be given as much time, as you feel is necessary, to consider your decision whether to include your child's samples or not. If you decide to include your child's samples in the Project, (by completing the consent form in discussion with someone from your loved one's health care team) you will always be welcome to ask your child's clinical team further questions about the Project at any time after they have joined. Your child's clinical team will then assume you are happy for your child's sample to remain in the Project unless you let them know otherwise. There are further details in this information sheet about how you can withdraw them from the Project after they have joined.

You will then be asked to:

- Initial all the boxes, date and sign the consent form if you want your child to join the Project
- Your child will need to donate a sample(s) of blood (up to 3 tablespoons), and possibly some saliva if needed.
- Provide details such as your child's date and place of birth, your ethnic group and gender, any family history of illness, any current illnesses, and current treatment to be stored in the database for this Project.
- Allow us to record all clinical details about your child's including your medical history, any laboratory tests or imaging that has been undertaken as part of the investigation and treatment of their medical condition.
- Provide your contact details (including email address and mobile phone if applicable) so that authorised staff from this Project can contact you to ask you further questions about your child's health and lifestyle, or to offer additional opportunities to participate in research. Your contact details are confidential to the project team and will never be shared.
- Agree that either one of your clinical team, or authorised staff from this Project may contact you directly, to ask some further questions about your child's, or your family's health and lifestyle. An example of this type of question might be whether or not you are a smoker.

What will happen to your child's samples after you have donated them to the 100,000 Genomes Project?

This section covers **points 4, 5 and 8** in the consent form

- We will use their samples to extract their DNA so we can undertake whole genome sequencing (looking at all of the genetic code). This is most likely to take place in England, but it could take place abroad.
- We will also take blood samples from your child to allow us to understand how genes work, how your DNA may be changed over your life course, and to measure proteins or chemicals in your blood stream. In future, we may be able to do new tests on the samples that are yet to be developed.
- Instead of your child's name being used to identify their samples and data, they will be labelled with a unique code number that means your child is not directly identifiable. Once the DNA sequence has been obtained from their sample, the sequence data is sent electronically for analysis. According to the results of this analysis, (if you are also a parent and you have joined with your child), you will receive information relating to their 'main condition' (the rare disease which led them to be invited to join this Project).
- You will only receive additional information that might be found in your child's genome sequence if you have asked us to look for this.
- Subject to permission from Genomics England, authorised researchers can then analyse the data for their approved research projects within a confidential space in Genomic England's computer systems. Researchers cannot take away, or copy, their individual data to work on elsewhere.
- Usually, not all their sample is used up for sequencing. All the remaining DNA and any other samples we take will be securely stored by Genomics England for further medical and scientific research in a special secure 'bank' called a bio-repository. This is located in the UK.
- Their samples could be used up soon, (in which case your doctor may ask you to give us more) or they could remain stored for many years.
- There may be certain circumstances where your child's DNA will not be sequenced. Should this occur the explanation will be given to you by their clinical team.

Access to my child's data and confidentiality

What information are we asking your child to donate to the programme?

This covers **points 6 and 7** in the consent form

Via your consent, you and your child are being asked to:

- Give information (data) about their health to this Project.
- Allow information about their health to be sent by their medical team to the 100,000 Genomes Project, including information that you might tell them yourself.
- Allow the Project to obtain information from your child's past medical records that span their entire lifetime, including current and past illnesses, or stays in hospital. We are asking for your permission to obtain their medical records that are held by the NHS, GPs and other bodies like local and national disease registries (these are collections of information about patients with a particular condition).
- Allow the Project to continue to access your child's health records electronically into the future, so we can update the medical records that we hold on them over the rest of their life. This will include receiving annual information from their clinical team charting the course of

their illness.

- Allow researchers to view (but not take away) any digital images that are collected from your child's health records, e.g. MRI scans, and including photographs. Your doctor will have already taken these images of your child/their rare disease after asking your permission. These images when combined with other data and the sequence can assist in identifying the cause of a rare disease.
- The data we keep for the Project will be in the form of electronic copies and not your child's original records, which will remain in the NHS.
- Only people authorised and cleared by Genomics England or by the NHS Trusts will access your child's data.
- Your child's data is important for future healthcare and research and will continue to be studied even after his or her death.

Key point

You are agreeing that past medical records (from birth), as well as current and future information about your child's condition (health data) can be collected by the 100,000 Genomes Project.
You are agreeing that this information can be studied now and after your child's death.

What will happen to your child's data after you have shared it with us?

This covers **points 8, 9 and 10** in the consent form

Key point

The 100,000 Genomes Project links your child's genome sequence with his or her medical records and information about any medical conditions he or she may have and makes it accessible to researchers and organisations which an Advisory Committee to Genomics England will approve according to criteria available on our website or on request from Genomics England.

All this information is securely held, anonymised and only accessible to approved researchers for *scientific and healthcare purposes only*. You are agreeing that other people can look at your child's data but in a way that protects his or her identity (though your child's own clinical team will always be able to access his or her records in full for their care).

- You are agreeing that your child's healthcare information can be linked to his or her sequence data and stored to be compared with many thousands of other sets of such information donated by other participants.
- Your child's data will be used to study their rare disease and may be used to study any other medical conditions that they may have had in the past, any current conditions or any conditions that they have in the future. It might also be used as part of research that mainly looks at medical conditions affecting other people.

Who will have access to your child's data?

This covers **points 9 and 10** in the consent form

- To get the most value for healthcare from the information your child has donated, this needs to be accessible worldwide. Remember that your child's name and identifying details are not attached to these data.
- Genomics England will put the names of all the companies or organisations which have been approved to access data and for what purpose, on the 100,000 Genomes Project website www.genomicsengland.co.uk
- Access to your child's data for marketing or insurance purposes will not be allowed.

Access for commercial researchers and organisations

This covers **point 9** in the consent form

Key point

You are agreeing that approved researchers from for profit companies can have access to this data under specific conditions and rules.

- You are agreeing to let both profit-making (commercial) companies and not-for-profit organisations such as research charities, universities or hospitals access your child's data.
- You are being asked to do this because this may enable new medicines, treatments and diagnostics to be developed much more quickly.
- Profit-making companies might include drug companies, those making diagnostic tests or developing faster ways to analyse large amounts of data.
- Companies will have to pay to access the data we hold, although access may cost them less if they make their results available to all other researchers. If any financial profits are made by Genomics England, these will go back to the NHS.
- Neither you, nor your child, will benefit financially if a product or test is successful because of your child's participation in the Project.

Can I access my child's data?

- Genomics England owns the data from this project. We protect it on your child's behalf and decide who gets access to it, within the terms of your consent.
- You can ask for a copy of your child's data, although there will be a charge for providing this. Details of how to do this are on the Genomic England website or via your clinical care team.
- You can withdraw your child from the Project at any time and can ask that researchers do not use their data any more.

How will we keep your child's information securely and confidentially?

- Your child's data is in a controlled access database in the UK, whose security level meets national and international data standards.
- Your child's name and other personal details are held separately from the data. Your child's data is identified only by a unique code.

- Researchers accessing your child's data will be tracked by Genomics England to monitor for misuse.
- All researchers have to show that they are respecting the laws and ethical guidelines that apply to biomedical research.
- Although researchers can look at your child's data or that of your participating family members and ask questions about it, they can only take away the answers to their questions (their results). They can't copy or take away any of your child's individual data.
- Revealing your child's data on purpose in a way that identifies them would be a legal breach against the permitted use of samples and data from the Project, and is against good research practice. Any individual or institution that misused data in this way could face criminal charges, substantial fines and would be barred from accessing our Project again. Major research funders in the UK have said that they will withdraw funding for any researcher that had done this.

Will this affect my insurance, or my child's?

- Any medical treatment you or your child have may need to be disclosed to an insurer who wants it, however:
- Under an agreement between the Department of Health and the Association of British Insurers, the results of your child's whole-genome sequencing carried out in the 100,000 Genomes Project are not disclosable to insurers. This is because they are part of a healthcare and research project.
- You would not therefore have to disclose to an insurer that your child is part of the 100,000 Genomes Project now, or in the future, or reveal the results of any of your child's tests returned from the Project.
- Companies are not allowed to look at any of the data held by Genomics England for insurance purposes.

What might we contact you about in the future?

This covers **points 11 & 12** in the consent form

Key point

You are being asked to agree to be contacted in the future by your child's clinical team about future research and to being contacted by Genomics England for additional information.

- We ask that you are willing to be contacted in the future through your child's clinical team- for your child to be invited to take part in research in the future. This might include ethically approved trials of new medicines or research about your child's (or your own parental) views on aspects of the Project.
- You are only agreeing to be asked. If you don't want your child to take part in the research (or you do not wish to take part yourself) when it is suggested then they don't have to.
- Your clinical team might need further samples or specific information from your child but if they want this, they will ask your permission. You don't have to say yes.

- You are being asked if Genomics England may contact you directly, no more than four times a year (and likely to be less than this) for further health information. This is because you know more about your child's life and experience than medical staff and sometimes we may need to double-check information with you.

What will happen with my child's results?

This covers **point 13 and 14** in the consent form

What information will you receive about your child's main condition?

Your child's 'main condition' is how we describe the rare diseases for which your child was invited to join this Project.

- After your child's genome is sequenced, the results will be analysed if there are results to return to you regarding conditions you asked us to look for (see below) a detailed report will be sent to their clinical team who will discuss the results with you. Results will never be given to you directly by Genomics England.
- In time, findings will be returned within a couple of weeks as the technology and our understanding of the results develops. At first this will take longer, so you may not receive some or all of your child's findings until after their treatment has been completed.

Key point

You are agreeing to be given the results of your child's whole genome sequencing.

There could be no findings that explain your child's rare disease. The results might not come back in time to influence your child's care.

- Alternatively, there may be information that helps guide your child's treatment.
- It is also possible that there will be no information to report back.
- If something important is found in your child's sample regarding conditions you asked us to look for (see below), a further blood sample may be required from your child to confirm our findings. This is because in the early stages of the project, the NHS will be double-checking all the results in order to validate them. Your clinical team will only inform you of the result after confirmation of the finding by the NHS.
- You will not be told personally about the results of research that has included your child's data, although details of all the studies will be published and will be made available on the Genomics England website.

What specific results can you ask for from the 100,000 Genomes Project?

This covers **Point 15** in the consent form

Key point

You can choose whether or not you want us to look in your child's sample for a limited number of 'Additional Findings' about rare genetic diseases which may be relevant to your child's future health. If this is something that you'd like to consider, your clinician will discuss with you the list of conditions we will look for in your child's sample, and answer any questions you may have.

If you ask us to look for these, we will search for certain conditions known to be rare but serious or life-threatening which would affect your child during their childhood (meaning while your child is under the age of 18). If your child is found to have an increased risk of the conditions on the list, these conditions can either be prevented, or treated early by the NHS so that their effects might be reduced. We won't look for these if you don't ask us to, though.

What information will you receive about your child's additional findings?

- You are being asked to decide whether you want us to look for a specific list of genetic changes that increase the chance of your child having additional rare diseases. You don't have to agree to this.
- These rare diseases are usually unconnected to your family member's main rare disease condition. The chance of your child having them is not high.
- The person taking your consent will show you the list of these additional rare diseases, which will be fully explained to you along with the implications of a positive test for your child, and the support that will be available to you and your child if you choose to ask us to look for these. This list will be updated regularly over the life of the Project.
- If you don't want to agree to let us do this, then we will not look for the additional rare diseases at all in your child's sample and we won't send details about them to your child's clinical team.
- Where you opt to receive additional or carrier status findings it is important you are aware that the list of conditions we will look for were selected on the basis of advice from the Genomics England Scientific Advisory Committee. However, part of the purpose of offering you these options is to help us understand and build the evidence base to decide if this use of genomic testing should be part of NHS standard clinical care.

How will we handle any other findings in your child's genome?

This covers **point 16** in the consent form

- We may find results or information that we did not intend or expect to see in your child's genetic data, or where we are unsure of the significance of a particular result for your child's health.
- Incidental findings are different to the 'Main Findings', detailed above in this sheet, because we aren't setting out to look for them.
- Incidental findings will not be fed back to your child's clinician to discuss with you.
- Incidental findings also include non-medical findings (such as a participant in the Project not being genetically related to someone in this Project that they believe they are related to). These will not be fed back to clinicians to discuss with you or others.

What will happen after the initial report is sent to your child's clinician?

- All your child's information will continue to be held on the Project's research database(s) and added to as new records become available.
- If there is new knowledge about how to interpret your child's results, we will re-analyse their data, so further information about your child's results may be available for your clinician to discuss with you over time.

What are the benefits of joining the 100,000 Genomes Project?

- Your child might benefit in terms of their healthcare personally but they might not benefit at all.
- Other patients may benefit from the knowledge generated by this Project.

What are the risks of joining the 100,000 Genomes Project for my child?

- **Being identified as someone taking part in the project:**
  We will always do everything we can to stop this happening. There are penalties in place but there is still a remote risk that this could happen.
- **Giving blood samples:** there is a small risk of bruising, inflammation or fainting but no more than with any other blood sample. Experienced staff will collect the blood.
- **Future risks:** there might also be new ways in the future to link information back to your child directly, but we will keep up with these developments in order to protect your data. We believe that the likely benefits of taking part in the Project for participants outweigh this remote risk.

How to withdraw your child from the project

This covers **point 18** in the consent form

Key point

You are free to withdraw your child from the 100,000 Genomes Project at any time in the future. You do not have to give a reason.

Information about how to do this will be on our website and available through your clinical team.

If you want your child to leave the Project after they have joined, you are able to withdraw them by asking your clinical team for a withdrawal form, completing this form and returning it to them. You can opt for either:

1) No further contact, but continue to include my child's samples and information in the Project:

- You will not receive further reports on findings relevant to your child's health care beyond any

initial report that their Clinician gives you.

- You will not be contacted by Genomics England or the 100,000 Genomes Project directly any more.
- However, you would still allow the Project to use your child's previously collected samples and collected information would still continue to be updated into the Project's databases from your child's health records as usual.

or

***2)* No further contact and no further use of your child's information:**

- **Your child will completely leave the 100,000 Genomes Project.**
- Researchers will not be allowed to access your child's information or samples in the Project, including your child's clinical team.
- We will not retrieve anything further from your child's health or other records.
- We will make the samples and data we hold from your child unusable by anybody. We won't be able to retrieve samples distributed to other laboratories with whom we collaborate (any surplus from these samples is routinely destroyed after the third parties' research is completed).
- Genomics England or the 100,000 Genomes Project will not continue to contact you directly any more.
- We will only retain a record that your child was once a part of the Project and then was withdrawn.
- Research that is already underway using your child's information and samples (or already published) cannot be stopped or removed if you then decide to withdraw your child.

If you withdraw your child, it would help researchers to know why you did so and so you may be invited to join a project looking at the reasons people withdraw. You do not have to take part in this.

Your child's healthcare team will be happy to answer as many questions as you want. Please share this leaflet with friends and family if you would like to.

Thank you for considering taking part in the 100,000 Genomes Project.

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