

# The Raine Study 16 Year Follow-up

## Family information sheet

Dear Raine Study Family

Thank you for your ongoing contribution to the Raine Study and your participation in the 16 year follow up. Adolescence is a critical period for the development of both physical characteristics and psychological factors that determine lifelong health status. At the 16 year follow up we would like to see you once again to repeat some of the questionnaires and assessments we have done in the past and to introduce you to a few new measures that have been developed specifically for this visit. These are outlined in more detail below.

### **Cardiovascular Health**

Overweight and obesity are on the increase world wide, with rates trebling in children and young adults in Australia over the last 20 years. This is being accompanied by increasing rates of diabetes and, in the developing world, with increasing rates of high blood pressure and cardiovascular health problems. It is predicted that similar trends in Australia and many other Western Countries will reverse many of the gains made in the prevention and treatment of these diseases in recent years. High blood pressure is already a leading cause of cardiovascular health problems globally which will be further exacerbated by the increasing rates of obesity and diabetes. We would like to better understand the development of overweight, obesity and high BP with a view to identifying the relative importance of influences both before and after birth.

### **The Prevention of Back and Neck Pain**

A large number of physical, lifestyle and psychological factors are thought to contribute to the development of back and neck pain in childhood and adolescence. Physical factors include early inter vertebral disc degeneration, excessive joint mobility, and impaired muscle performance. Lifestyle factors include exposure to sitting for long periods of time and vigorous physical activity. Psychological factors include poor self-esteem and mental health as well as inadequate social support. Other factors include increasing age, male gender and a history of prior injuries. Despite this knowledge, the ability of health professionals to identify those who are most at risk and to apply preventive intervention strategies is very limited. We hope to make a significant contribution to the early detection and prevention of back and neck pain by continuing with our data collection at the Raine Study 16 year follow-up.

### **Good Nutrition and Mental Health**

The role of childhood nutrition in the development of mental health problems, such as depression, is poorly understood. We plan to ask questions at the 16 year follow up and use this information, together with information from previous follow ups, to investigate the link between nutrition and mental health. In addition to reaching a better level of understanding, we hope to provide evidence which can be used to develop strategies to improve infant and child nutrition, to minimise the risk of teenagers and adults having conditions such as depression.

### **The Prevention of Diseases of the Liver**

We have recently been joined by a group of researchers who would like to use the Raine Study to understand more about ways to prevent and successfully treat diseases of the liver specifically non-alcoholic fatty liver disease, coeliac disease and haemochromatosis. While these are recognised to be relatively common conditions, the complex causes are not well understood. Because of the links with cardiovascular health research the Raine 16 year follow up provides the perfect opportunity to learn more about these conditions.

## **Pathways by Which Genes Affect Health and Development**

With your permission, we plan to use data collected over the years in the Raine Study and DNA samples collected in the 16 year follow-up to learn more about some of the complex pathways by which genes affect the functioning of the central nervous system and the endocrine system which produces hormones, such as cortisol. Cortisol is known to be involved in immunological and neurological processes, as well as the development of cardiovascular disease. Again, we hope that this information will ultimately lead to the development of intervention strategies that positively impact on child and adolescent health and development.

Over the last 10 years it has become apparent that the environment in pregnancy and childhood impact on the risk of developing a number of adult health problems including high blood pressure, diabetes, obesity and high cholesterol. It appears that complex pathways in the central nervous system and the endocrine (hormone) system regulate this relationship and the genes which control these pathways are important in determining the risk for each individual. Hormones such as cortisol (a stress hormone) appear particularly important in these relationships. With your permission, we plan to use data collected over the last 16 years from the Raine Study and DNA samples collected during the 16 year follow-up to learn more about the relationship between these "regulatory genes", the environment during pregnancy and childhood, and markers of adult disease. We hope that this information will ultimately lead to the development of intervention strategies that will positively impact on child and adolescent health, and also on the health during adulthood.

## **Cognitive development in adolescence**

The capacity to think abstract, to plan and to be able to self regulate your behaviour develops during adolescence. These brain maturation processes include subtle changes in brain organization and function to ensure a healthy transition from adolescence into adulthood. There is evidence that adolescent changes in neural pathways needed for thinking and acting at a mature level are sensitive to early life events of stress. Your participation in a cognitive assessment (playing a card game on the computer) will allow us to study the relationship between cognitive performance in relation to the impact of family history and early life trajectory of events on stress responsiveness (as measured by the stress hormone cortisol in saliva and/or blood samples). We hope that the results will lead to the identification of pre-adolescent risk factors for irreversible deficits in adolescent cognitive development.

## **Additional Information**

You may recall, shortly after the birth of your Raine child we asked for your consent to contact your General Practitioner and other health agencies to seek additional information to that gathered in the questionnaires. We have no specific plans at this stage, but it may be very useful to obtain this information in the future. All information given to the Study will be treated with absolute confidentiality. It will be used for research about child health and development only and treated in strict accordance with current Commonwealth and State privacy legislation, including the Health Records and Information Privacy Act. No publications from the Study will identify individual people or groups of people.

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## **The 16 Year Questionnaires and Assessment**

There will be two parts to the 16 year follow-up. *Stage one* will involve an assessment for parents/caregivers at the Telethon Institute for Child Health Research and teenagers at the Institute and Princess Margaret Hospital. *Stage two* will happen at home during the 7 days following your visit to the Institute. We expect that the Institute part of the assessment will take about 5 to 6 hours. Details of stage one are as follows:

### **Stage One**

#### **Questionnaire**

There are two sections of the 16yr follow-up teenager questionnaire to complete (paper copy enclosed for caregivers to review). The questionnaire, which is similar to the one completed at

13 years, will ask about a range of topics including: eating and exercise habits and beliefs; relationships at home, at school, and at work; self confidence and perceptions of care and support received from others; health and recent medical history; and knowledge around, and participation in, risk taking behaviours such as smoking, drinking and sexual activity. We will ask teenagers to complete non-threatening sections of this questionnaire (part 1) at home prior to attendance for their stage one assessment; we expect this will take between one and two hours. It will take about one hour for teenagers to complete a laptop-based questionnaire (part 2) at the institute during their stage one assessment.

The second part of the questionnaire has been designed so teenagers will only see questions that are relevant to them. As with the 13 year follow-up the choice will always remain with teenagers as to which questions they choose to answer. A Research Assistant will be available to provide assistance if required. The information contained in this questionnaire is confidential. If a teenager tells us about a health or social problem that they don't want parents/caregivers to know about, we will do everything we can to help get things sorted out.

On top of that, we will be sending teenagers a food frequency questionnaire and asking them to fill it in before coming in to the Institute. We expect this will take between half an hour and an hour to complete. Finally, we give parents/caregivers questionnaires to fill in about themselves and their study teenager and we ask the principal or form teacher at the participant's schools to complete a brief questionnaire asking about the school and the teenager's participation at school. If the teenager is no longer at school, we'll just leave that part out.

#### Assessment

Once again we will be measuring teenagers' level of physical fitness as well as looking at their coordination. In addition, height/weight, waist/hip girth, skin folds, blood pressure and blood vessel stiffness will be measured. We'd also like to continue the work we started during the 13 year follow up looking at posture so we will be taking a series of digital photos of teenagers sitting and standing. As before, these photos will be altered so that identifying features are masked. Measurements of back muscle and squat endurance will also be done. Following this, participating teenagers will go across the road to the Department of Radiology at Princess Margaret Hospital where they will have an abdominal ultrasound scan. This is a painless examination where a sound probe is placed on the abdomen to determine whether there is fat within the liver. The ultrasound should only take 5 to 10 minutes. We will also use some time following the teenager's assessment to go through a food frequency questionnaire with them.

**Stage two** will happen at home after the stage one assessment. We will remind teenagers of how to use a pedometer (the small step counters worn during the last follow up) and provide an activity diary to monitor their level of activity on a daily basis for seven days. The diary is very brief; teenagers are only required to make a few notes each day. Once again a small group will be asked to wear an ambulatory blood pressure monitor for a period of 24 hours. If parents/caregivers or teenagers have any questions about any of this equipment they will be able to contact the Raine staff both during normal office hours and after hours. During this seven day period a phlebotomist will visit study families at home to take an early morning fasting blood sample from consenting parents and teenagers. It is important that we collect blood samples from both parents if possible and from study teenagers as all three samples are required to interpret the significance of specific genes in relation to precursors of adult disease. Just as we have done on previous occasions, local anaesthetic cream (EMLA) will be used for those who request it. We would also like to collect three samples of study teenager's saliva. There's nothing much to it, it doesn't hurt a bit.

We will use the blood and saliva to do a number of studies:

- First, we will measure levels of fats, glucose, insulin, antibodies, iron and coeliac disease antibodies.
- Second, we would like to measure the levels of some hormones that are involved in regulating the immune system (e.g. cortisol, oestrogen and testosterone);

- Third, we plan to store plasma which will be used to estimate free fatty acid and vitamin levels as an indicator of dietary intake;
- Fourth, we would like to store DNA so that we can study inherited factors associated with obesity, diabetes, hypertension, stress and anxiety, coeliac disease and haemochromatosis.

Some of the tests will take some time to run in the laboratory; therefore we will send you the results when available. If any of your results are outside the normal range, or we are worried parents or teenagers may have a problem families were not aware of, we will recommend that you see your General Practitioner. However, for some of the tests, such as immunology and genetics, we are not able to send you results, because at this stage we do not know how to interpret what these tests mean for an individual.

### **Risks and Benefits of Genetic (DNA) Testing**

By law, we are not permitted to use your DNA to study anything other than studying factors associated with obesity, diabetes, hypertension and stress and anxiety. The current genetic tests will be undertaken in the laboratories of the Raine Study investigators in Perth and their collaborators in Toronto, Canada. At all times during sample analyses, your name will not be revealed. If, at some time in the future, we wished to test your DNA for some other reason, we are required to obtain your informed, written consent prior to undertaking any additional studies.

All genetic data that will be collected on the Raine families relating to obesity, diabetes, hypertension, and stress and anxiety will be kept in the Raine study database and not in hospital or health department clinical records. This data is stored as a series of numbers and is encrypted by code. In addition, genetic data are stored in multiple small blocks such that even if someone were to access the secure database, your identity is concealed.

#### Risks

Drawing blood from inside the elbow may cause slight discomfort, bruising or swelling. In rare cases, there may be slight bleeding from the site, but this is unlikely if a band-aid is left in place.

#### Benefits

There is no benefit to you from your participation in the DNA testing. Participation in this study may ultimately help health professionals prevent or better treat blood pressure variability, and sugar and fat metabolism in childhood, by increasing their understanding of the causes of these illnesses and their long-term effects.

#### **Confidentiality**

We would like to assure you that all information we collect is strictly confidential. The Institute for Child Health Research is bound by the Privacy Act 1988 and abides by the National Privacy Principles at all times.

If you have any concerns or complaints regarding the way this study is being conducted you can contact the Executive Director of Medical Services at Princess Margaret Hospital on (08) 9340 8222.

#### **Permission**

We will be asking for separate permission for each part of the study so that you can feel free to participate in the study without feeling pressured to agree to it all. You may, of course, withdraw at any stage without prejudicing your teenager's right and access to the best medical attention available at Princess Margaret Hospital.

We would like you to feel free to ask any questions you may have about any aspect of the study. It is important that you understand why we are asking your family to participate in this Raine Study follow-up.

We look forward to seeing you soon.

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