Participant Information Leaflet

Study Title
An Assessment of the Use of Real-time 3-Dimensional Ultrasound Imaging in the Quantification of Large Artery Endothelial Function.

Investigators:
Dr. Liam Kavanagh, Prof. Alice Stanton, Prof. Michael Lee and Dr Patricia Fitzgerald.

Hospital: Beaumont Hospital

Telephone No: 01 8092862

Study explanation

You are invited to take part in a study in Beaumont Hospital that may lead to further knowledge concerning blood vessel function and therefore may be helpful in the early detection and the prevention of heart attacks and strokes.

Your participation is entirely voluntary (your choice). You do not have to take part in this study. If you choose not to take part, your care or future treatment will not be affected. If you agree to take part, you are free to withdraw from the study at any time, without having to give a reason. Withdrawing at any time will in no way affect your future health care.

To help you make your decision please read this information sheet. You may take as much time as you like to consider whether or not to take part. You will be encouraged to ask questions at all times during the study. If you have a problem or have more questions about the study, you can call the study doctor, Dr. Liam Kavanagh. In addition, your General Practitioner will be fully informed of your participation in this study.
You should clearly understand the risks and benefits of participating in this study so that you can make a decision that is right for you – this process is known as Informed Consent.

**Purpose of the study**

The aim of this study is to improve on a test that we currently use to detect early changes in blood vessel function. It is a normal function of blood vessels to enlarge and to contract in response to various stimuli. It is the lining layer of blood vessels, the endothelium, which controls this function. If the endothelium is damaged in any way, this function is blunted, and we call this endothelial dysfunction. If we can improve on current measures of endothelial function and dysfunction, it is likely that we will be better able to identify which patients are at increased risk of heart attacks and strokes, and hopefully better protect these patients.

**Investigators:**

Dr. Liam Kavanagh will be the study doctor performing the various tests. He is hoping to attain a further degree by doing this research. His work will be supervised by the following senior doctors: Prof. Alice Stanton, Prof. Michael Lee and Dr Patricia Fitzgerald.

**Study Sponsors**

This study is supported by research funding from the Higher Education Authority (HEA).
Study procedures

We hope to commence this study in the summer 2009. If you agree to take part in this study, you will attend the Clinical Research Centre at Beaumont Hospital on two occasions, on the first day for about 2.5 hours and the second for about 2 hours. We will ask you not to take any beverages containing caffeine (coffee, tea, and cola) or alcohol for 24 hours before each of these visits, and not to smoke for at least 4 hours. You will need to be fully fasting (i.e. no food and drink from 12 midnight the night before) if the assessment is in the morning, and you will only be allowed a light breakfast (i.e. tea and toast / cereal) if the assessment is in the afternoon.

A full medical history, examination, and a blood sample will be taken (on study day 1 only and will take 30 mins).

On both study days you will undergo tests assessing how much the main blood vessel in your arm (brachial artery) can increase in size in response to various stimuli. Two-dimensional ultrasound examinations will be performed of your brachial artery, firstly while you are resting, again after 5 minutes of a blood pressure cuff being held inflated around your arm, and finally after you have taken a drug called glyceryl trinitrate as a spray under your tongue. This will take approximately one hour. However we need to do these examinations a second time, this time using 3-dimensional ultrasonography, and this will also take one hour.

Potential Risks

The taking of a small blood sample causes a few seconds of pain, and infrequently can result in bruising.

Ultrasound assessments are not painful, and have no associated risks or dangers.
Inflating a blood pressure cuff around your arm for 5 minutes can be moderately painful during this time, but this quickly resolves afterwards.

Glyceryl trinitrate under the tongue causes blood vessels to enlarge in diameter. At the dose that we are using, glyceryl trinitrate does not cause any long-term harmful effects to health. However it may cause transient flushing of the face, dizziness, awareness of heart beat, and a throbbing headache. In the event of headache occurring patients will be offered simple pain relief in the form of paracetemol. If headaches persist then it may be necessary to withdraw from the study. In the case of flushing, dizziness or awareness of heartbeat patients will be monitored closely by Dr. Liam Kavanagh until symptoms subside.

**Potential benefits of participation in this study**

The results obtained from the study are unlikely to be of direct benefit to your medical health. We anticipate that most of the benefits will be for future patients.

Your individual results will not be used directly for commercial purposes. However the combined results from all participants may lead to the development of a test that has commercial value. You will not receive any financial compensation.

On the other hand, you will have a comprehensive cardiovascular health evaluation including a check on your blood sugar, cholesterol, kidney function and blood pressure. You will receive a summary of all of these results. We will provide appropriate advice on how to reduce your chances of having a heart attack or stroke. This summary will be forwarded to your general practitioner if that is your wish. Further, if any test result requires further evaluation, we will arrange this in consultation with you and your GP.
Your rights

Your involvement in this project may be terminated at any time if you or your doctor(s) feels that it is not in your best interest to continue, if you do not wish to continue, or if you do not comply with the study procedures.

It is very unlikely that you will suffer in any way from participation in this study. However, if you think that any injury has resulted from the performance of any of the procedures required by the study protocol, Dr. Liam Kavanagh, your study doctor, should be promptly informed by telephone 01 8092862. Medical care will be made available to treat such injuries. The investigators have arranged for a special type of insurance policy (this is known as indemnity). For you, this means that in the unlikely event of you being harmed or damaged by the study procedures, any reasonable claim you might make for compensation can be covered by this insurance.

Confidentiality Issues

The participants in this study have a right to privacy, and all information that is collected during this study is strictly confidential. No report will contain any information that would allow any individual to be identified. However, health authorities may need to examine your records to confirm the validity and accuracy of the data collected. Paper copies of information will be stored in locked filing cabinets. Any information stored on computer disk will be coded and hence will not identify you by name. All paper and computer records will be stored at Beaumont Hospital for a maximum of 15 years prior to destruction.

If you require further information

If you have any further questions about the study please contact:

Name: Dr. Liam Kavanagh Phone No: 01 8092862
Participant Consent Form

Study Title: An Assessment of the Use of Real-time 3-Dimensional Ultrasound Imaging in the Quantification of Large Artery Endothelial Function.

Investigators: Dr. Liam Kavanagh, Prof. Alice Stanton, Prof. Michael Lee and Dr Patricia Fitzgerald.

Hospital: Beaumont Hospital.

Telephone No: 01 8092862

Participant (First and Last) Name:

..........................................................................................................................

Address:

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..........................................................................................................................
..........................................................................................................................
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Please tick the appropriate answer.

I confirm that I have read and understood the Participant Information Leaflet, and that I have had ample opportunity to ask questions all of which have been satisfactorily answered

Yes No
I understand that my participation in this study is entirely voluntary and that I may withdraw at any time, without giving reason, and without this decision affecting my future treatment or medical care.

Yes  No

I understand that sections of my medical records may be looked at by the study doctors and health authorities, where it is relevant to my taking part in this research. I give permission for these individuals to have access to my records.

Yes  No

I understand that my identity will remain confidential at all times.

Yes  No

I understand that my GP will be informed of my participation in this study and all relevant test results.

Yes  No

I am aware of the potential risks of this research study.

Yes  No

I have been given a copy of the Participant Information Leaflet and this Consent form for my records.

Yes  No

I agree that I will not restrict the use to which the results of this study may be put. Data concerning my person will be securely stored in Beaumont Hospital for a maximum of 15 years and then destroyed.

Yes  No
I agree to take part in the above study.  

Yes  No

Participant Signature…………………………………………… Date…………………..

Name in block capitals………………………………………………

To be completed by the Principal Investigator or his Nominee.

I the undersigned have taken the time to fully explain to the above patient the nature and purpose of this study in a manner that he could understand. I have explained the risks involved as well as the possible benefits and have invited him to ask questions on any aspect of the study that concerned him.

Investigator Signature…………………………………………………… Date…………………..

Name in block capitals………………………………………………

2 copies to be made: 1 for participant, 1 for the study records
Sample GP letter

Dear Dr.

Mr (participant name) has taken part in a clinical research study entitled “An Assessment of the Use of Real-time 3 Dimensional Ultrasound Imaging in the Quantification of Large Artery Endothelial Function.” The study is being conducted by Dr. Liam Kavanagh, under the supervision of Professor Alice Stanton, Professor Michael Lee and Dr Patricia Fitzgerald. A copy of the participant information leaflet is enclosed.
A summary of clinically relevant findings are as follows;

<table>
<thead>
<tr>
<th>Clinical Diagnoses</th>
<th>Current Risk Factor Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blood Pressure</td>
<td>mmHg</td>
</tr>
<tr>
<td>Total Cholesterol</td>
<td>mmol/l</td>
</tr>
<tr>
<td>HDL Cholesterol</td>
<td>mmol/l</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Current Medication</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Fasting Glucose</td>
<td>mmol/l</td>
</tr>
<tr>
<td>Body mass index</td>
<td>kg/m2</td>
</tr>
<tr>
<td>Smoker / Ex-smoker / Never-smoker</td>
<td></td>
</tr>
</tbody>
</table>

**Lifestyle advice offered**

**Follow-up**

If you require any further information please do not hesitate to contact me on 087 2234759.

Yours sincerely,

Dr. Liam Kavanagh

Clinical Research Fellow
Appendix 2
The average IMT of 3 CCA images in 3 different planes is used.

In each plane the median IMT of 150 measured points along a 10 mm length of far wall just proximal to the CCA bifurcation is calculated by the software.
**Analysis Workflow**

- Convert native xif image files → tiff files in ATL
- Note image acquisition scale used
- Save in designated folder
- Load tiff images into AMS
- Optimise image for analysis
- Modify border detection if necessary
- Save results in designated folder

**ATL: Check Preferences**

- Render size x4 (gives 4:1 compression JPEG)
- Default display:
  - ECG
  - Scale
  - Time strip
Importing Raw Data

- Converting .xif into .tiff files
- Open file in external hard drive
- Select R wave frame
- Move slider through frames to select best one
- Note scale mm/pixel
- Naming system: Initials_ID number_CCA_Plane
- e.g. PL_00778_CCA_Anterior
- Save in designated folder

AMS: Check settings

**Config Tab**

**Uncheck “Show detection parameters”**

- If checked, this brings up Weighting and Offset parameters
- Altering these settings will change software detection parameters
- Do not adjust these unless instructed how to by software engineers
AMS: Check settings

Config Tab > Settings

Tabs that are not applicable

- Dicom
  - All images are .xif→.tiff
- Files1
- Compatibles

AMS: Check settings

Config Tab > Settings

- Region
  - 10 mm box width
- Check the “Autodetect contours” option
AMS: Check settings

Config Tab > Settings

- **Calibration**
  - Scale mm/pixel
- Uncheck “Load calibration from file” to avoid error message “Unable to load calibration..” on opening each image.

AMS: Check settings

Config Tab > Settings

- **Reading**
  - Select all that is required in the final output window
  - Not essential for analysis
AMS: Check settings
Config Tab > Settings

- **Misc.**
  - Zoom settings 25, 50, 100, 200, 400
  - Replace 200 with 150, leave rest

- **Image pointer**
  - Select down arrow (user preference)
AMS: Check settings
Config Tab > Settings > Save config

- When all settings are correct
- Click OK
- Click “Config” tab again
- Select “Save config”

AMS: Loading .tiff images

- Either File > Open image or click on “I” icon under File
- Double click on tiff file
- Smaller pop-up window opens
  - Select Drive file is in
  - Select Folder
  - Images converted from ATL within folder are listed
  - Select image to be analysed
AMS: Optimise image for analysis

- Image loads
- Set the scale for the image (from ATL information)
- Set Zoom as follows
  - 100% for resolutions < 0.05 mm/pixel
  - 150% for resolutions 0.05 - 0.08 mm/pixel
  - Zoom setting does not impact on measurements
- Use “Contrast” slider at bottom right to further optimise image

AMS: Select Region of Interest (ROI)

- IMT measurement is carried out on the far wall along a 10 mm length (Box settings) just proximal to the CCA bifurcation
- Place cursor (down facing arrow) in the near wall
- Left click and keeping finger on mouse button drag down into region well beyond the far wall
- ROI box, delineated by 4 blue corners, appears
AMS: Select detection borders

- In the right hand column “Show”
- Select
  - I3 near wall
  - I5 lumen-intima interface
  - I7 media-adventitia interface
- 3 green dotted lines, representing 150 border interface points appear
AMS: Border Modifications

- This can be done by
  - Correcting the area(s) where the software is inaccurate (recommended)
  - Cutting out the regions that are incorrect (acceptable)
  - Manually tracing the border (not recommended)
- If image quality is poor discard and obtain average of the other 2 available planes
AMS: Border Modifications

- Border modifications are made in semi-automated mode in the "Modify" section in the right column
  - Modifying one border impacts on the others
  - Always modify I7 first (software seeks this interface first)
- Select I7 in "Modify"
- Place cursor at correct I7 interface at the point of greatest inaccuracy
- Left click once
- I7 will be adjusted accordingly, not only at that point, but along the length of the interface.
- I5 is also simultaneously and automatically adjusted
AMS: Border Modifications

- If there still remains a section of I7 that is inaccurate, repeat the correction step
- Minimise user intervention to minimise error
  - i.e. no more than 3 corrections should be made
- Next I5 may need further adjustments
- Apply same methods of correction
- Again, limit user intervention to no more than 3 adjustments

AMS: Border Modifications

- If more than 3 adjustments required
- Look at the "slope" of the IMT, which may be down- or upsloping
- Angle correction may be required
- In the "Modify" section, click on the dropdown menu of the middle box, which shows a default “0” angle.
AMS: Angle Correction

- This gives a default range of angle corrections that can be applied
- By convention:
  - "0" is horizontal
  - Negative values denote a downsloping IMT
  - Positive values denote an upsloping IMT
- Select angle correction to be applied
- NB: Click on "Detect" in order to activate the correction
AMS: Cutting Application

- If the proximal and/or distal ends of the ROI are inaccurate and not amenable to modifications above, then these may be excluded from analysis.
- This in effect reduces the number of IMT measurements (<150) for that image.
- If > 20% of the image needs to be excluded, then best to exclude image from analysis altogether.
- Used in < 1% of Phase 1 analysis.

Cutting Option
AMS: Cutting Application

- Select the Far option in "Cut"
- Define the ROI that will be **retained** by left clicking the distal end that will be used for analysis.
- A small vertical marker appears with left clicking
- Left click the proximal end of the section to be retained
- On doing this, the outer edges are “cut” away

AMS: Manual Tracing

- Not recommended
- Select the border to be manually traced in “Manual”
- The green detection border for that interface will disappear
- Left click along the correct interface border, a series of red dots will appear
AMS: Saving Results

- Click on the Floppy disk icon in the 2nd tab row on the top left.

- Results are automatically saved as tab delimited text in the same folder that the image is in.

- Alternatively, if the option was chosen in the "Config > settings > files2 > Use directory > designated folder" where a different target folder is used, then results will be saved here.

- Caution: This latter option is a little "buggy" and sometimes returns an error message.

AMS: Viewing Results

- Some of the default columns displayed in the results are redundant e.g. Project, side, plaque etc.

- To reduce clutter, the information displayed can be limited to what is required.

- In the "Result" tab (top left row) select "Set output format".

- Select from the drop down list the field(s) that are to be removed, then Click "Remove".

- In the same way, additional fields can be added.

- The field order can also be changed.
Appendix 3
Letter of invitation

Dr. Liam Kavanagh,
Research Fellow,
RCSI Smurfit Building,
Beaumont Hospital,
Dublin 9.

Dear «Title» «LastName»

My name is Dr. Liam Kavanagh and I work with Dr. Catherine Brown and Prof. Alice Stanton, at Beaumont Hospital. As you know we are very interested in the protection of women from cardiovascular illnesses such as heart attacks and strokes.

We are writing to you now, because you recently very kindly participated in a study undertaken by Dr. Catherine Brown. From this research we have identified some blood vessel differences between women with and without a history of high blood pressure during pregnancy. These blood vessel changes may allow us to identify women at risk of future heart attacks or strokes. Hence we wish to further study these changes, so that in the future, we can best provide protection to women who are at risk.
Hence we are inviting you, once again, to participate in a research programme. This research, like the last time, would occur in a single visit to Beaumont Hospital lasting approximately 2 hours. You would, once again, have a detailed assessment of your cardiovascular risk factors (smoking habit, weight, blood pressure, cholesterol, blood sugar, and kidney function), and would undergo blood sampling and ultrasound examinations of your blood vessels.

Like the last time, you would get a complete summary of the levels of your cardiovascular risk factors. Any factors that need attention would be discussed, and you would be provided with specific lifestyle advice on how to reduce your risk of a heart attack or stroke.

If you are interested in participating in this programme, or in hearing more details, please telephone Dr. Liam Kavanagh (087 2234759) to discuss this further.

We look forward to hearing from you soon and thank you for your support in the past.

With kind regards,

Yours sincerely,

Dr. Liam Kavanagh
Participant Information Leaflet

Study Title
Further studies into Vascular Structure and Function and in Young Women with and without a History of Gestational Hypertension or Preeclampsia.

Investigators:
Dr. Liam Kavanagh, Dr. Catherine Brown, Prof. Alice Stanton, Prof. Michael Lee, Dr. Patricia Fitzgerald.

Hospital:
Beaumont Hospital

Telephone No:
087 2234759

Study explanation
You are invited to take part in a further study in Beaumont Hospital that may lead to greater knowledge concerning high blood pressure in pregnancy and therefore may be helpful in preventing heart attack and stroke in women.

Your participation is entirely voluntary (your choice). You do not have to take part in this study. If you choose not to take part, your care or future treatment will not be affected. If you agree to take part, you are free to withdraw from the study at any time, without having to give a reason. Withdrawing at any time will in no way affect your future health care.

To help you make your decision please read this information sheet. You may take as much time as you like to consider whether or not to take part. You will be encouraged to ask questions at all times during the study. If you have a problem or have more questions about the study, you can call the study doctor, Dr. Liam Kavanagh.
You should clearly understand the risks and benefits of participating in this study so that you can make a decision that is right for you – this process is known as Informed Consent.

You are been asked to take part because you have previously attended the Rotunda hospital during a pregnancy, and kindly recently participated in a study conducted by Dr. Catherine Brown.

**Purpose of the study**

The aim of this study is to examine the function of large arterial blood vessels and platelets. The normal function of blood vessels is to transport blood in the body. The normal function of the platelets is to be sticky and stop blood leakage. However if the blood vessels become stiffened, or if platelets become too sticky, blood vessel narrowing and blockages can occur, and these lead on to heart attacks and strokes. Our aim is to detect blood vessel stiffening and platelet stickiness as early as possible, and thereby provide protection to those who need it against future heart attacks and stokes.

**Investigators:**

Dr. Liam Kavanagh will be the study doctor performing the various tests. He is hoping to attain a further degree by doing this research. His work will be supervised by the following senior doctors: Prof. Alice Stanton, Prof. Michael Lee and Dr. Patricia Fitzgerald.

**Study Sponsors**

This study is supported by research funding from the Higher Education Authority (HEA).
Study procedures

We hope to commence this study in March 2010. If you agree to take part in this study, you will attend Beaumont Hospital for a period of about 2 hours. We will ask you not to take any beverages containing caffeine (coffee, tea, and cola) nor alcohol for 24 hours before this visit, and not to smoke for at least 4 hours prior to the visit. You will need to be fully fasting if the assessment is in the morning, and you will only be allowed a light breakfast if the assessment is in the afternoon.

A full medical history and physical examination will be performed (20 minutes).

A 30 ml blood sample (~ 6 teaspoons of blood) will be taken (10 minutes). Some of this blood will be used to measure your risk factors, some will be used for the testing of platelet stickiness, and some will be stored for future assays relating to vascular and platelet function.

We will then perform the following test of blood vessel function;

- Ultrasound examinations of the arteries in your neck (carotid). This ultrasound examination will appear very similar to those performed during phase 1. However newer technologies will be used, allowing better quantification of the function of your vessels (40 minutes).

The total time required will be under 2 hours.

Potential Risks

The taking of a blood sample is likely to be temporarily painful, and there may be a small amount of bruising afterwards. Ultrasound assessment of the neck vessels is not painful, and has no associated risks or dangers.
Potential benefits of participation in this study

The results obtained from the study are unlikely to be of direct benefit to your medical health. We anticipate that most of the benefits will be for future patients. However, you will have a comprehensive cardiovascular health evaluation including a check on your blood sugar, cholesterol, kidney function and blood pressure. You will receive a summary of all of these results. We will provide appropriate advice on how to reduce your chances of having a heart attack or stroke. This summary will be forwarded to your general practitioner if that is your wish. Further, if any test result requires further evaluation, we will arrange this in consultation with you and your GP.

Your rights

Your involvement in this project may be terminated at any time if you or your doctor(s) feels that it is not in your best interest to continue, you do not wish to continue, or if you do not comply with the study procedures.

If any injury is suffered as a result of the performance of the procedures required by the study protocol, Dr. Liam Kavanagh, your study doctor, should be promptly informed by telephone 087 2234759. Medical care will be made available to treat such injuries. The investigators have arranged for a special type of insurance policy (this is known as indemnity). For you, this means that in the unlikely event of you being harmed or damaged by the study procedures, any reasonable claim you might make for compensation can be covered by this insurance.

Confidentiality Issues

The participants in this study have a right to privacy and all information that is collected during this study is strictly confidential. However, health authorities may need to examine your records to confirm the validity and accuracy of the data
collected. Any information stored on computer disk will not identify you by name. This coded information will be stored in Beaumont Hospital and/or the Royal College of Surgeons in Ireland, for a maximum of 15 years prior to destruction.

The blood samples taken for future studies will be coded and stored in Beaumont Hospital and/or the Royal College of Surgeons in Ireland again for a maximum of 15 years prior to destruction. All future research studies will only be performed, if approved by an appropriate independent body, such as a medical research ethics committee.

**If you require further information**

If you have any further questions about the study please contact:

Name: Dr. Liam Kavanagh

Address: Clinical Research Centre,

RCSI Smurfit Building,

Beaumont Hospital

Dublin 9

Phone No: 087 2234759
Study Consent Form

Study Title: Further studies into Vascular Structure and Function in Young Women with and without a History of Gestational Hypertension or Preeclampsia.

Investigators: Dr. Liam Kavanagh, Dr. Catherine Brown, Prof. Alice Stanton, Prof. Michael Lee, Dr. Patricia Fitzgerald.

Hospital: Beaumont Hospital.

Telephone No: 087 2234759

Participant: First and Last name:

………………………………………………………………………………………………………………………………………………………………………………

Address:

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Please tick the appropriate answer.

I confirm that I have read and understood the Patient Information Leaflet, and that I have had ample opportunity to ask questions all of which have been satisfactorily answered. Yes No
I understand that my participation in this study is entirely voluntary and that I may withdraw at any time, without giving reason, and without this decision affecting my future treatment or medical care.

Yes    No

I understand that sections of my medical records may be looked at by the study doctors involved, principally Dr. Liam Kavanagh, where it is relevant to my taking part in research. I give permission for these individuals to have access to my records.

Yes    No

I understand that my identity will remain confidential at all times.

Yes    No

I understand that my GP will be informed of all test results.

Yes    No

I am aware of the potential risks of this research study.

Yes    No

I have been given a copy of the Patient Information Leaflet and this Consent form for my records.

Yes    No

I agree that I will not restrict the use to which the results of this study may be put. Coded data concerning my person will be stored in Beaumont Hospital for a maximum of 15 years and then destroyed. I give my approval that coded data concerning my person and blood samples may be stored or electronically processed for the purpose of scientific research and may be used in related or
other studies in the future (This would be subject to approval by the Beaumont Hospital Ethics (Medical Research) Committee).  

Yes  No

I agree to take part in the above study  

Yes  No

Participant Signature…………………………………………Date……………………

Name in block capitals…………………………………………

To be completed by the Principal Investigator or his nominee.

I the undersigned have taken the time to fully explain to the above patient the nature and purpose of this study in a manner that she could understand. I have explained the risks involved as well as the possible benefits and have invited her to ask questions on any aspect of the study that concerned her.

Investigator Signature……………………………………..Date……………………

Name in block capitals………………………………………..

2 copies to be made: 1 for participant, 1 for the study records.
Sample GP letter

Dear Dr. Liam Kavanagh,

The above (name) has taken part in a clinical research study entitled “Further studies into Vascular Structure and Function in Young Women With and Without a History of Gestational Hypertension or Preeclampsia.” This study was undertaken by Dr. Liam Kavanagh, Dr. Catherine Brown, Prof. Michael Lee and Prof. Alice Stanton from Beaumont Hospital.

Research Fellow,
RCSI Smurfit Building,
Beaumont Hospital,
Beaumont road,
Dublin 9.

Tel: 01-8092567
A summary of clinically relevant findings are as follows;

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**Lifestyle advice offered**

Follow-up

If you require any further information please do not hesitate to contact me on 087 2234759.

Yours sincerely,

Dr. Liam Kavanagh

Clinical Research Fellow