DEPARTMENT/SECTION OF NEUROSURGERY

STUDY TITLE

Prospective Measurement of Blood Pressure and End Tidal Carbon Dioxide Content Effects on Venous Sinus Caliber and Pressures in Patients with Idiopathic Intracranial Hypertension Undergoing Stenting

Dr. Kyle Fargen, Principal Investigator

SUMMARY

You are invited to participate in a research study. The purpose of this research is to evaluate the effect of changes in end-tidal carbon dioxide and blood pressure on Venous Sinus pressures. You are invited to be in this study because you are undergoing venous sinus stenting for Idiopathic Intracranial Hypertension (IIH) under general anesthesia. Your participation in this research will take place in the Interventional Radiology Suite when you are having your standard of care venous sinus stenting procedure. There are no additional visits required for this study.

Participation in this study will involve having standard of care venous sinus pressures measured while your end-tidal carbon dioxide level (the measurement of Carbon Dioxide in exhaled air) and mean arterial blood pressure level (a calculated average between systolic and diastolic blood pressure, which represents an average pressure in the arteries) are maintained at a predetermined level. Pressures and waveforms will be documented and recorded. All research studies involve some risks. Additional risks to this study are: 1) the micro catheter used in the standard of care measurements will be used to obtain one additional measurement of values and about 10-15 seconds of additional fluoroscopy time. 2) An additional 3-5 minutes procedural time due to waiting time to adjust end-tidal volumes and blood pressure to the predetermined level. 3) An additional Venogram injection through the micro catheter with an additional 1 ml of contrast dye and 3-4 seconds of additional fluoroscopy time and associated radiation dose. 4) Adjustment in blood pressure to the predetermined level may require the use of additional medications routinely used in general anesthesia to treat low or high blood pressure. 5) Additional adjustments to ventilator settings to adjust end-tidal carbon dioxide to the predetermined level. This is done by the anesthesiologist on the ventilator by either increasing or decreasing the volume of each breath delivered and increasing or decreasing the amount of times you breathe in a minute. These two things affect end-tidal carbon dioxide levels.

There is not the possibility that you may benefit from participation in this study.

Your participation in this study is voluntary. You do not have to participate in this study if you do not want to. You will not lose any services, benefits, or rights you would normally have if you choose not to participate.

The remainder of this form contains a more complete description of this study. Please read this description carefully. You can ask any questions if you need help deciding whether to join the study. The person in charge of this study is Dr. Kyle Fargen. If you have questions, suggestions, or concerns regarding this study or you want to withdraw from the study his contact information is: [redacted].

If you have any questions, suggestions or concerns about your rights as a volunteer in this research, contact the Institutional Review Board at [redacted].

INTRODUCTION

You are invited to be in a research study. Research studies are designed to gain scientific knowledge that may help other people in the future. You are being asked to take part in this study because it has been determined you have a significant venous sinus stenosis or obstruction requiring venous sinus stenting for treatment. Your participation is voluntary. Please take your time in making your decision as to whether or not you wish to participate. Ask your study doctor or the study staff to explain any words or information contained in this informed consent document that you do not understand. You may also discuss the study with your friends and family.

WHY IS THIS STUDY BEING DONE?

This research study is being done to look at how End-tidal carbon dioxide and Blood pressure effect venous sinus pressure measurements. End-tidal carbon dioxide (EtCO2) is the measurement of Carbon Dioxide, which is a naturally occurring gas present as you breathe air out of your lungs. Mean Arterial Pressure (MAP) is an average between systolic blood pressure (top number in a blood pressure reading) and diastolic blood pressure (bottom number in a blood pressure reading. This blood pressure average represents the pressure inside the artery at a given time.

HOW MANY PEOPLE WILL TAKE PART IN THE STUDY?

A total of 8 patients will be enrolled in this study.

WHAT IS INVOLVED IN THE STUDY?

We will be collecting your venous sinus measurements during your standard of care venous sinus stenting procedure while your EtCO2 level and Blood pressure level are maintained at one of the four treatment group levels. . Patients having venous sinus stenting for IIH routinely have a Venogram (an x-ray test that involves injecting contrast material into a vein to show how blood flows through your veins) with Manometry (the measurement of pressure in your veins) before their stenting procedure. For this study, once the initial measurements have been

completed, you're EtCO2 and Blood pressure will be adjusted to one of the study groups (noted in the table below) and maintained at that level for a repeat Venogram with Manometry. The waveforms and measurements will be recorded and collected with software called Meditech Collector. This software allows for quantitative recordings of data. Following the two manometry readings, your standard of care stenting procedure is performed in standard fashion with routine post-stenting manometry. These measurements are repeated to confirm resolution of the stenosis.

Study Intervention:
Patients agreeing to participate and enrolled in this study will be randomized to one of 4 study groups noted in the table below. Randomization means that you are put into a group by chance. It is like flipping a coin. You will have an equal chance of being placed in either study group. The specific study group assigned to you will be determined by your doctor at the time of the procedure. Your EtCO2 and blood pressure will only be maintained at the specific study group measurement during the recording of the second measurements, otherwise they will be maintained by the anesthesiologist's standard protocol. Standard, safe mean arterial pressure readings range from 50-120mmHg and standard, safe end tidal carbon dioxide levels range from 24-45mmHg.These ranges for EtCO2 and MAP are all acceptable levels for patients to be safely maintained during this procedure.

	Initial Recording (time = 0)		**Subsequent Recording (time = 3 minutes)**	
Study Group	Mean Arterial Pressure	End-tidal CO2	Mean Arterial Pressure	End-tidal CO2
A (n = 2 patients)	60-80 mmHg	38-40 mmHg	100-110 mmHg	38-40 mmHg
B (n = 2 patients)	100-110 mmHg	38-40 mmHg	60-80 mmHg	38-40 mmHg
C (n = 2 patients)	100-110 mmHg	24-26 mmHg	100-110 mmHg	38-40 mmHg
D (n = 2 patients)	100-110 mmHg	38-40 mmHg	100-110 mmHg	24-26 mmHg

If you take part in this study, an additional Venogram with manometry (measurement of how blood flows through the veins with measuring of the pressure in the veins) will be done. The additional measurements will be done during your standard of care stenting procedure you are having.

HOW LONG WILL I BE IN THE STUDY?
You will be in the study during your standard of care stenting procedure. The research takes place during the procedure only. There are no follow up or return visits related to the study.

WHAT ARE THE RISKS OF THE STUDY?

Being in this study involves some risk to you. You should discuss the risk of being in this study with the study staff. Risks to this study include the following:

1- The catheter used in the standard of care manometry measurements will be used one additional time to obtain an additional set of measurement values and requiring approximately 10-15 seconds of fluoroscopy time.
2- An additional 3-5 minutes of procedure time due to waiting for the adjustment of EtCO2 and MAP to the predetermined level in the study group assigned.
3- An additional Venogram injection through the standard of care catheter requiring an additional 1 ml of contrast dye and 3-4 seconds of fluoroscopy time and associated radiation dose.
4- The use of additional standard of care medications used in general anesthesia to treat high or low blood pressure to maintain the MAP at the predetermined study group level assigned.
5- There may be additional adjustments to the breathing machine to maintain or get to the predetermined study levels.

In addition, there is a slight risk of a breach of confidentiality. We will do our best to protect your confidential information. There also may be other side effects that we cannot predict. You should tell the research staff about all the medications, vitamins and supplements you take and any medical conditions you have. This may help avoid side effects, interactions and other risks.

If you participate in this study, you will be exposed to amounts of radiation above what you would normally receive in daily life. This research study involves exposure to radiation from the Venogram procedure. The amount of radiation that you will receive from this procedure is equivalent to a uniform whole body exposure of 305 rem. This is equal to 1.02 times the amount of natural background radiation that the average person in the United States receives each year (300millirem). To be sure that you do not receive an unhealthy amount of radiation from your participation in this study, you should let your study doctor know if you have had, or are going to have, any other scans or x-rays as part of your medical or dental care. It is very important that you let your study doctor know if you already are participating in, or plan to participate in, any other research study that involves radiation exposure.

Taking part in this research study may involve providing information that you consider confidential or private. Efforts, such as coding research records, keeping research records secure and allowing only authorized people to have access to research records, will be made to keep your information safe.

Reproductive Risks

Due to unknown risks and potential harm to the unborn fetus, pregnant women are excluded from this study. A standard of care pregnancy test will be performed before your procedure.

ARE THERE BENEFITS TO TAKING PART IN THE STUDY?
You are not expected to receive any direct benefit from taking part in this research study. We hope the information learned from this study will benefit other people in the future.

WHAT OTHER CHOICES ARE THERE?
A choice would be not to participate. You have the choice to participate in this research study; research is voluntary. You do not have to participate in this study to receive the procedure you and your doctor have decided is necessary for your care.

WHAT ARE THE COSTS?
There are no costs to you for participating in this study.

WILL YOUR RESEARCH RECORDS BE CONFIDENTIAL?
The results of this research study may be presented at scientific or medical meetings or published in scientific journals. Your identity and/or your personal health information will not be disclosed unless it is authorized by you, required by law, or necessary to protect the safety of yourself or others. There is always some risk that even de-identified information might be re-identified.

Participant information may be provided to Federal and other regulatory agencies as required. The Food and Drug Administration (FDA), for example, may inspect research records and learn your identity if this study falls within its jurisdiction.

WILL YOU BE PAID FOR PARTICIPATING?
You will receive no payment or other compensation for taking part in this study.

The findings from this research may result in the future development of products that are of commercial value. There are no plans to provide you with financial compensation or for you to share in any profits if this should occur.

WHO IS SPONSORING THIS STUDY?
This study is being sponsored by the Department of Neurosurgery at Wake Forest Baptist Health.

WHAT HAPPENS IF YOU EXPERIENCE AN INJURY OR ILLNESS AS A RESULT OF PARTICIPATING IN THIS STUDY?
Should you experience a physical injury or illness as a direct result of your participation in this study, Wake Forest University School of Medicine maintains limited research insurance coverage for the usual and customary medical fees for reasonable and necessary treatment of such injuries or illnesses. To the extent research insurance coverage is available under this policy the reasonable costs of these necessary medical services will be paid, up to a maximum of $25,000. Wake Forest University Baptist Medical Center holds the insurance policy for this

coverage. It provides a maximum of $25,000 coverage for each claim and is limited to a total of $250,000 for all claims in any one year. The Wake Forest University School of Medicine, and the North Carolina Baptist Hospitals, Incorporated does not assume responsibility to pay for these medical services or to provide any other compensation for such injury or illness. Additional information may be obtained from the Medical Center's Director of Risk and Insurance Management, at [redacted]

If you are injured, the insurer may require information such as your name, social security number, and date of birth in order to pay for your care. This is because the insurer is required by law to report any payments made to cover the care of any persons who are members of a government insurance plan to the Department of Health and Human Services.

You do not give up any legal rights as a research participant by signing this consent form. For more information on medical treatment for research related injuries or to report a study related illness, adverse event, or injury you should call Dr. Kyle Fargen at [redacted].

What About My Health Information?

In this research study, any data we collect from your procedure is considered Protected Health Information (PHI). The information we will collect for this study includes: age, gender, blood pressure, mean arterial pressure, end-tidal carbon dioxide levels, and venous sinus pressures from different anatomic locations.

If this study involves the diagnosis or treatment of a medical condition, the PHI collected from you during this study will be placed in your medical record, and may be used to help treat you, arrange payment for your care, or assist with Medical Center operations.

We will make every effort to keep your Protected Health Information private. We will store records of your Protected Health Information in a cabinet in a locked office or on a password protected computer.

Some of the people, agencies and businesses that may receive and use your health information are the research sponsor, representatives of the sponsor assisting with the research, the Institutional Review Board (IRB), representatives of Wake Forest Baptist Health, representatives from government agencies such as the Food and Drug Administration (FDA), the Department of Health and Human Services (DHHS) and similar agencies in other countries.

Some of these people, agencies and businesses may further disclose your health information. If disclosed by them, your health information may no longer be covered by federal or state privacy regulations. Your health information may be disclosed if required by law. Your health information may be used to create information that does not directly identify you. This information may be used by other researchers. You will not be directly identified in any publication or presentation that may result from this study unless there are photographs or

recorded media which are identifiable.

Monitors, auditors, IRB or other regulatory agencies will be granted direct access to the participant's original medical record for verification of clinical trial procedures or data, without violating confidentiality of the participant and to the extent permitted by other applicable laws.

If required by law or court order, we might also have to share your Protected Health Information with a judge, law enforcement officer, government agencies, or others. If your Protected Health Information is shared with any of these groups it may no longer be protected by federal or state privacy rules.

Any Protected Health Information collected from you in this study that is maintained in the research records will be kept for an indeterminate period of time. This authorization does not expire. Any research information entered into your medical record will be kept for as long as your medical record is kept by the Medical Center. You will not be able to obtain a copy of your PHI in the research records until all activities in the study are completely finished.

You can tell Dr. Kyle Fargen that you want to take away your permission to use and share your Protected Health Information at any time by sending a letter to this address:

Dr. Kyle Fargen
[redacted]

However, if you take away permission to use your Protected Health Information you will not be able to be in the study any longer. We will stop collecting any more information about you, but any information we have already collected can still be used for the purposes of the research study.

By signing this form you give us permission to use your Protected Health Information for this study.

WHAT ARE MY RIGHTS AS A RESEARCH STUDY PARTICIPANT?
Taking part in this study is voluntary. You may choose not to take part or you may leave the study at any time. Refusing to participate or leaving the study will not result in any penalty or loss of benefits to which you are entitled. If you decide to stop participating in the study we encourage you to talk to the investigators or study staff first to learn about any potential health or safety consequences. The investigators also have the right to stop your participation in the study at any time. This could be because it is in your best medical interest, your condition worsened, new information becomes available, you had an unexpected reaction, you failed to follow instructions, or because the entire study has been stopped.
Identifiers might be removed from your identifiable private information or identifiable bio

specimens and after such removal, your information or bio specimens could be used for future research studies or distributed to another investigator for future research studies without additional informed consent from you or your legally authorized representative.

WHOM DO I CALL IF I HAVE QUESTIONS OR PROBLEMS?

For questions about the study or in the event of a research-related injury, contact the study investigator, Dr. Kyle Fargen at [redacted].

The Institutional Review Board (IRB) is a group of people who review the research to protect your rights. If you have a question about your rights as a research participant, or you would like to discuss problems or concerns, have questions or want to offer input, or you want to obtain additional information, you should contact the Chairman of the IRB at [redacted] or the Research Subject Advocate at [redacted]

You will be given a copy of this signed consent form.

SIGNATURES

I agree to take part in this study. I authorize the use and disclosure of my health information as described in this consent and authorization form. If I have not already received a copy of the Privacy Notice, I may request one or one will be made available to me. I have had a chance to ask questions about being in this study and have those questions answered. By signing this consent and authorization form, I am not releasing or agreeing to release the investigator, the sponsor, the institution or its agents from liability for negligence.

Subject Name (Printed):_____

Subject Signature: _____ Date: _____Time:_____ am pm

Person Obtaining Consent (Printed):_____

Person Obtaining Consent: _____ Date: _____ Time: _____ am pm