UNIVERSITY OF PENNSYLVANIA
RESEARCH PARTICIPANT
COMBINED INFORMED CONSENT AND HIPAA AUTHORIZATION FORM

Research Study Summary for Potential Participants

A person who volunteers to take part in a research study is called a research or study subject. In this consent form, "you" refers to you as the research subject. Your participation is voluntary and you should only participate if you completely understand what the study requires and the risks of participation. You should ask the study team any questions you have related to participating before agreeing to join the study. If you have any questions about your rights as a human research participant at any time before, during or after participation, please contact the Institutional Review Board (IRB) at (215) 898-2614 for assistance.

This goal of this study is to better understand when and where intraoperative transesophageal echocardiography (TEE) should (or should not) be used during coronary artery bypass graft (CABG) surgeries. This trial will look at benefits and harms to two different treatments strategies in oder to improve clinical outcomes. Intraoperative TEE is an ultrasound-based, imaging device that uses sound valves to look at your heart continousouly during your heart surgery. If you agree to participate, your involvement in this study will be to:

1. Agree to be randomized to one of two trial arms: (1) Default TEE: Where the TEE probe is placed after you are put to sleep under general anesthesia and a breathing tube is placed. TEE isused to take pictures of your heart before and after your CABG surgery. If you are randomized to this group, the TEE probe will remain in place throughout the surgery. (2) As-Needed TEE: Where the TEE probe is placed only in situations where a surgeon requires information that can only be obtained by ultrasound imaging of your heart.
2. Complete two 15- 30 minute interviews after surgery: (1) 1st interview: within 24 hours after surgery; (2) 2nd interview: within 5 days (120 hours) of surgery.

Why am I being asked to volunteer?

You are being invited to participate in a research study because you are scheduled to undergo CABG surgery at Penn Presbyterian Medical Center (PPMC). The goal of this study is to better understand how intraoperative TEE tool should be used in CABG surgery.

Your doctor may be an investigator in this research study. You do not have to participate in any research study offered by your doctor. If you choose not to participate, there will be no loss of benefits to which you are otherwise entitled. You may also decide to discuss the study with your family, friends, or family doctor. Being in a research study is different from being a patient. As an investigator, your doctor is interested both in your clinical welfare and in the conduct of this study.

If you decide to participate, you will be asked to sign this form.

What is the purpose of this research study?

The purpose of this study is to better understand how, when, and why intraoperative TEE should be used in CABG surgery. Put another way, this study will look at the benefits and harms to two different methods (both of which are typically considered standard of care), to diagnose, treat, or monitor a clinical condition in order to improve clinical outcomes in a specific patient population – in this case CABG surgery patients.

How long will I be in the study?

The expected duration of this study is 120 hours (e.g. 5 days).

What am I being asked to do?

This study will involve assigning you to one of two intraoperative TEE assignments: (1) the TEE device is placed immediately after being put to sleep or (2) the TEE device is only used if deemed medically-necessary by the cardiac surgeon or anesthesiologist caring for you in the operating room.

After surgery you will be asked to complete two interviews. Each survey can take between 15- 30 minutes.

- 1st interview: within 24 hours after surgery
- 2nd interview: within 120 hours after surgery

How many patients will be enrolled in this study?

The targeted number of patients in this trial is 21 subjects.

What are the possible risks or discomforts?

Your participation will last for up to 5 days.

There may be some benefit to participating in the study such as the following:

- By participating in this trial you will play an important role in understanding who, when, and why intraoperative TEE should be used in CABG surgery to maximize clinical benefit and minimize clinical harm.

The most common risks of participation are:

- Risk of injury from the TEE probe itself (higher if randomized to the "default" TEE trial arm because 100% of patients in the default arm will receive TEE):
  - TEE carries a 0.1 – 4% risk of serious injury to your esophagus or stomach. Examples include: sore throat, difficulty swallowing, painful swallowing, esophageal or stomach bleeding, or a partial tear of your esophagus or stomach. The most serious, but also most rare (<0.1%) complication of TEE is a tear in the esophagus called, "esophageal perforation" where the probe itself puts a hole in your esophagus that may require surgical intervention.
  - Please note: the current practice at PPMC is to place the TEE probe for all isolated CABG surgery patients unless you have a preexisting condition that would not make this practice safe (i.e. previous esophageal surgery or esophageal injury).
- Risk of harm from the absence of continuous TEE monitoring during isolated CABG surgery (higher if randomized to the "as-needed" TEE trial arm):
  - If you are randomized to the treatment arm where TEE is only used "if needed," there is risk of a delayed identification of an important event during surgery. Examples include: identifying the cause of low blood pressure, or diagnosing an unanticipated injury to the heart or lungs.
  - Please note: Personnel certified to safely perform and correctly interpret TEE will be immediately available throughout your CABG surgery. The duration of this delay is anticipated to be <5 minutes but could potentially prolong time under anesthesia or on the heart-lung machine.
- Loss of time
  - Participating in the trial will require you to spend additional time above and beyond the typical timeframe for undergoing an isolated CABG surgery to answer questions from research personnel.
- Loss of confidentiality
  - Although protections are in place, there is a risk of inadvertent disclosure of protected health information (PHI), which could lead to breaches of patient privacy, identity left, and loss of public trust (among other serious consequences).

The alternative to participating in the study is to not participate in the study. If you are interested in participating, a member of the study team will review the full information

with you. You are free to decline or stop participation at any time during or after the initial consenting process without penalty or loss of benefits. Please note that the cardiac anesthesiologist responsible for putting you to sleep for your CABG surgery will discuss intraoperative TEE monitoring with you prior to your surgery. He or she will review the risks and benefits associated with the TEE procedure. Through shared decision-making, you will make the final determination of whether or not you would like to receive an intraoperative TEE during your isolated CABG surgery. At PPMC, our typical practice is to place a TEE immediately after putting you to sleep and placing a breathing tube. This practice would be the exact same as being randomized to the "default" arm of this trial. If you have questions about the TEE procedure itself that have not been answered, please feel free to call the PI of this trial, Dr. Emily MacKay. Dr. MacKay's cell phone number is provided at the top of this document and she will be happy to answer questions you may have.

Risks of Genetic Testing

We will not collect samples for genetic testing.

What if new information becomes available about the study?

During the course of this study, we may find more information that could be important to you. This includes information that, once learned, might cause you to change your mind about being in the study. We will notify you as soon as possible if such information becomes available.

What are the possible benefits of the study?

Currently, we do not know if the benefits of intraoperative TEE use (i.e. the ability to immediately look at the heart with an ultrasound device during surgery) outweigh the risks of TEE (i.e. painful or difficulty swallowing, small tear in the esophagus or stomach lining) in patients undergoing CABG surgery. Consequently, there are potential benefits and potential risks to being enrolled in either trial arm.

Default TEE arm:

- Benefits: immediate identification of a heart problem during surgery and potentially avoiding not diagnosing a problem with the surgery itself in the operating room.
- Risks: potentially higher risk of injury to your esophagus or stomach because 100% of patients randomized to the default arm will receive TEE

As-Needed TEE arm:

- Benefits: potentially lower risk of injury to your esophagus or stomach because TEE will only be used if your surgeon or anesthesiologist considers it medically necessary to make a diagnosis in the operating room.

- Risks: potential delay in identification of a heart problem during surgery which could result in a slightly longer (anticipated minumtes) duration of anesthesia or operating room time.

What other choices do I have if I do not participate?

Since your planned surgery is a part of the study, the alternative to participating is to decline participation.

You should note that the current practice at PPMC is exactly the same as the "Default TEE" trial arm. In other words, the TEE probe is placed after you are put to sleep under general anesthesia with a breathing tube. Your anesthesiologist will discuss the risks of TEE with you at the time of the surgery.

Will I be paid for being in this study?

There will be no compensation for this study.

Will I have to pay for anything?

You will not be charged for your participation on this study.

You are still responsible for any deductibles or applicable co-pays for routine office visits, scans and blood work. Please talk to your doctor and study team about putting you in touch with a financial counselor to determine exactly what the deductible and co-pay will be for you; this is highly variable depending on your type of insurance.

What happens if I am injured from being in the study?

We will offer you the care needed to treat injuries directly resulting from taking part in this research. We may bill your insurance company or other third parties, if appropriate, for the costs of the care you get for the injury, but you may also be responsible for some of them.

There are no plans for the University of Pennsylvania to pay you or give you other compensation for the injury. If you feel this injury was caused by medical error on the part of the study doctors or others involved in the study, you have the legal right to seek payment, even though you are in a study. You do not give up your legal rights by signing this form.

If you think you have been injured as a result of taking part in this research study, tell the person in charge of the research study as soon as possible. The researcher's name and phone number are listed in the consent form.

When is the Study over? Can I leave the Study before it ends?

This study will be ongoing for 24 month (2 years), but your participation will only last 5 days.

This study is expected to end after all participants have completed all visits, and all information has been collected. This study may also be stopped at any time by your physician, the study Sponsor, or the Food and Drug Administration (FDA) without your consent because:

- The Primary Investigator feels it is necessary for your health or safety. Such an action would not require your consent, but you will be informed if such a decision is made and the reason for this decision.
- You have not followed study instructions.
- The Sponsor, the study Principal Investigator, or the Food and Drug Administration (FDA) has decided to stop the study.

If you decide to participate, you are free to leave the study at any time. You may do this by contacting the investigator noted on page one of this form. Withdrawal will not interfere with your future care.

If you decide to stop participating in the study, we encourage you to talk to your doctor first. It is important to tell the doctor if you are thinking about stopping so any risks to you can be minimized. A final study visit may be requested to ensure your safety.

How will my personal information be protected during the study?

We will do our best to make sure that the personal information obtained during the course of this research study will be kept private. However, we cannot guarantee total privacy. Your personal information may be given out if required by law. If information from this study is published or presented at scientific meetings, your name and other personal information will not be used. The Institutional Review Board (IRB) at the University of Pennsylvania will have access to your records. If this study is being overseen by the Food and Drug Administration (FDA), they may review your research records.

The confidentiality of your information will be protected in the following way during the study:
Information related to your participation in clinical research will be contained in a clinical trial management system (CTMS). A clinical trial management system (CTMS) is used to register your information as a participant in a study. This allows for your research data to be entered and stored for the purposes of study, operational and financial applications, and other activities required as part of the conduct of the research. Once placed in the CTMS your information may be accessible to other authorized personnel at Penn Medicine that support research operations. After removing any and all identifying information, de-identified data may be shared with other researchers within Penn or other research institutions. After de-identification, it will not be possible for any

researcher to identify you from the information shared as no identifiable data will be shared and only aggregated data will be published. The future use of your information only applies to the information collected on this study. Your information may be held in other research databases only after complete de-identification.

Certificate of Confidentiality

This research is covered by a Certificate of Confidentiality from the National Institutes of Health. This means that the researchers cannot release or use information, documents, or samples that may identify you in any action or suit unless you say it is okay. They also cannot provide them as evidence unless you have agreed. This protection includes federal, state, or local civil, criminal, administrative, legislative, or other proceedings. An example would be a court subpoena.

There are some important things that you need to know. The Certificate DOES NOT stop reporting that federal, state or local laws require. Some examples are laws that require reporting of child or elder abuse, some communicable diseases, and threats to harm yourself or others. The Certificate CANNOT BE USED to stop a sponsoring United States federal or state government agency from checking records or evaluating programs. The Certificate DOES NOT stop disclosures required by the federal Food and Drug Administration (FDA). The Certificate also DOES NOT prevent your information from being used for other research if allowed by federal regulations.

Researchers may release information about you when you say it is okay. For example, you may give them permission to release information to insurers, medical providers or any other persons not connected with the research. The Certificate of Confidentiality does not stop you from willingly releasing information about your involvement in this research. It also does not prevent you from having access to your own information.

Will information about this study be available to the public?

A description of this clinical trial will be available on www.ClinicalTrials.gov, as required by U.S. Law. This website will not include information that can identify you. At most, the website will include a summary of the results. You can search this website at any time.

What may happen to my information collected on this study?

Study records, including your signed informed consent, and other study-related documents for the study will be kept in a secure area. Confidentiality shall be maintained. Specific measures that will be taken to ensure protected health information remains confidential include: (1) All images and data will be stored on the harddrive with password protection; (2) Any data shared with collaborators will be stripped of all identifying information (e.g. de-identified and coded). This means that your data will be assigned a unique, random identifier that is separately linked through one, coded list only available to the PI (MacKay). This means that re-identification is possible, but low-risk of occurance.

With coding of data here is a risk of breach of confidentiality (unintentional release of your information). We will do our best to make sure that this doesn't happen. However, we cannot guarantee total privacy. We will protect your confidentiality during storage and sharing by password protecting files and de-identifying identifying information.

Electronic Medical Record and Release of Study Related Information

What is an Electronic Medical Record?

An Electronic Medical Record (EMR) is an electronic version of your medical chart within a health system. An EMR is simply a computerized version of a paper medical record.

If you have never received care within Penn Medicine and are participating in a University of Pennsylvania research study that uses Penn Medicine healthcare related services, an EMR will be created for you for the purpose of maintaining any information produced from your participation. The creation of this EMR is a requirement of your participation in this study. In order to create your EMR, the study team will need to obtain basic information about you that would be similar to the information you would provide the first time you visit a hospital or medical facility (i.e. your name, the name of your primary doctor, the type of insurance you have). If you have been a patient at Penn Medicine in the past, information from your research participation will be added to your existing medical record.

What may be placed in the EMR?

Information related to your participation in the research (e.g., laboratory tests, notes from your physician, imaging studies, and clinical procedures, etc.) will be placed in your EMR maintained by Penn Medicine.

Once placed in your EMR your information may be accessible to appropriate Penn Medicine workforce members that are not part of the research team. Information within your EMR may also be shared with others who are determined by Penn Medicine to be appropriate to have access to your EMR (e.g. Health Insurance Company, disability provider, etc.).

Penn Medicine also participates in automated information sharing through Health Information Exchanges (HIEs). HIEs securely share parts of your electronic health record, including research information, with other healthcare organizations involved in your care. This information is shared to improve the quality, safety and efficiency of your healthcare. To request that your health information not be shared through HIEs, please call 215-662-4484.

Will I, as a participant, have access to research related information within the EMR?

The 21st Century Cures Act requires healthcare institutions to allow patients increased access to their electronic medical record. As part of your participation in this research,

you will have access to research related information within your EMR through Penn Medicine's patient portal – called MyPennMedicine (MPM).

Some information specific to this clinical research study may be shared with you in a delayed manner, shared with you at the end of the study, or not shared with you. Not sharing or delaying certain research information within your EMR may be necessary to protect the integrity of the trial results or for other reasons.

Will I receive the results of research testing that may be relevant to my health?

There will be no research testing for this study. You will be able to read a report of findings from the intraoperative TEE performed during your CABG surgery as a part of your medical record. As is the University of Pennsylvania's policy, all patients have unrestricted access to their own medical records. Consequently the TEE report will be viewable by you once the images have been reviewed and finalized by the anesthesiologist who cared for you during your CABG surgery.

What information about me may be collected, used or shared with others?

We have designed the data collection procedures to minimize confidentiality breaches. However, so ensure we have the data collected assigned correct patient, our study team will need to collect the following information from your medical record:

- Name, medical record number (MRN), and date of surgery
- Demographic information such as age, height, and weight
- Medical and surgical history from office encounters, hospital notes, or procedures
- Laboratory data
- Imaging results from cardiac catheterizations, echocardiograms, or other imaging procedures
- Intraoperative vital sign data such as blood pressure, oxygen saturation, and heart rate
- Intraoperative medicines administered

Beyond medical record information, our study team will ask you questions about any swallowing difficulty, painful swallowing, or problems eating after your surgery.

Why is my information being used?

Your information is used by the research team to contact you during the study. Your information and results of tests and procedures are used to:

- do the research
- oversee the research
- to see if the research was done right
- to evaluate and manage research functions.

Where may my information be stored?

Information related to your participation in clinical research will be contained in a clinical trial management system (CTMS). A clinical trial management system (CTMS) is used to register your information as a participant in a study. This allows for your research data to be entered and stored for the purposes of study operational and financial applications and other activities required as part of the conduct of the research. Once placed in the CTMS your information may be accessible to other authorized personnel at Penn Medicine that support research operations. Your information may be held in other research databases.

Who may use and share information about me?

The following individuals may use or share your information for this research study:

- The investigator for the study and the study team
- Other authorized personnel at Penn Medicine and the University of Pennsylvania, including offices that support research operations
- Other research personnel with access to the databases for research and/or study coordination and as otherwise approved by the IRB
- The research sponsor – the National Institutes of Health (NIH), National Heart, Lung, and Blood Institute (NHLBI) – and approved NIH, NHLBI personnel.
- Government agencies, such as the Food and Drug Administration

Who, outside of Penn Medicine, might receive my information?

- Data will be shared with IRB-approved study personnel in charge of the statistical analysis for this study. No identifiable, protected health information will be shared outside of Penn Medicine.
- Data may be shared with any or all of the following regulatory bodies overseeing the conduct of this study to ensure your safety:
    - The US Office of Human Research Protections (OHRP)
    - The NIH Office of Biotechnology Activities
    - The Study Data Safety and Monitoring Board

Once your personal health information is disclosed to others outside Penn Medicine, it may no longer be covered by federal privacy protection regulations.

The Principal Investigator or study staff will inform you if there are any additions to the list above during your active participation in the trial. Any additions will be subject to Penn Medicine procedures developed to protect your privacy.

How long may Penn Medicine use or disclose my personal health information?

Your authorization for use of your personal health information for this specific study does not expire.

However, Penn Medicine may not re-use or re-disclose information collected in this study for a purpose other than this study unless:

- You have given written authorization
- The University of Pennsylvania's Institutional Review Board grants permission
- As permitted by law

Can I change my mind about giving permission for use of my information?

Yes. You may withdraw or take away your permission to use and disclose your health information at any time. You do this by sending written notice to the investigator for the study. If you withdraw your permission, you will not be able to stay in this study.

What if I decide not to give permission to use and give out my health information?

Then you will not be able to be in this research study.

You will be given a copy of this Research Participant HIPAA Authorization describing your confidentiality and privacy rights for this study.

By signing this document, you are permitting Penn Medicine to use and disclose personal health information collected about you for research purposes as described above.

Who can I call with questions, complaints or if I'm concerned about my rights as a research participant?

If you have questions, concerns or complaints regarding your participation in this research study or if you have any questions about your rights as a research participant, you should speak with the Principal Investigator listed on page one of this form. If a member of the research team cannot be reached or you want to talk to someone other than those working on the study, you may contact the IRB at the number on page one of this form.

When you sign this form, you are agreeing to take part in this research study. This means that you have read the consent form, your questions have been answered, and you have decided to volunteer. Your signature also means that you are permitting the University of Pennsylvania to use your protected health information collected about you for research purposes within our institution. You are also allowing the University of Pennsylvania to disclose that protected health information to outside organizations or people involved with the operations of this study.

A copy of this consent form will be given to you.

Name of Participant **[print]**	Signature of Participant	Date
Name of Person Obtaining Consent **[print]**	Signature	Date