Protocol Details

Basic Info

Confirmation Number:	[redacted]
Protocol Number:	[redacted]
Created By:	**SANDS, NATHANIEL**
Principal Investigator:	**ABELLA, BENJAMIN S**
Protocol Title:	**Evaluation of the Clinical Impact and Safety of Focused Transesophageal Echocardiography During Resuscitat Critically Ill Patients in the Emergency Department and Intensive Care Settings**
Short Title:	**Focused TEE in Critically-ill Patients**
Protocol Description:	**The general objective of this study is to evaluate the clinical impact and safety of transesophageal echocardiography (TEE) used during the evaluation of critically-ill patients in the emergency and intensive care settings. The target population for this study are critically-ill patients over the age of 18 who as part of their routine clinical care are receiving a focused TEE. There are no interventions, outside those that represent standard clinical care, as part of this study.**
Application Type:	**EXEMPT Category 4**

Resubmission*
Yes

Hospital Sites
Will any research activities and/or services be conducted at a Penn Medicine affiliated hospital site?
Yes

Active Hospital Sites

Penn Presbyterian Medical Center (PPMC)

Hospital of the University of Pennsylvania (HUP) ***Primary***

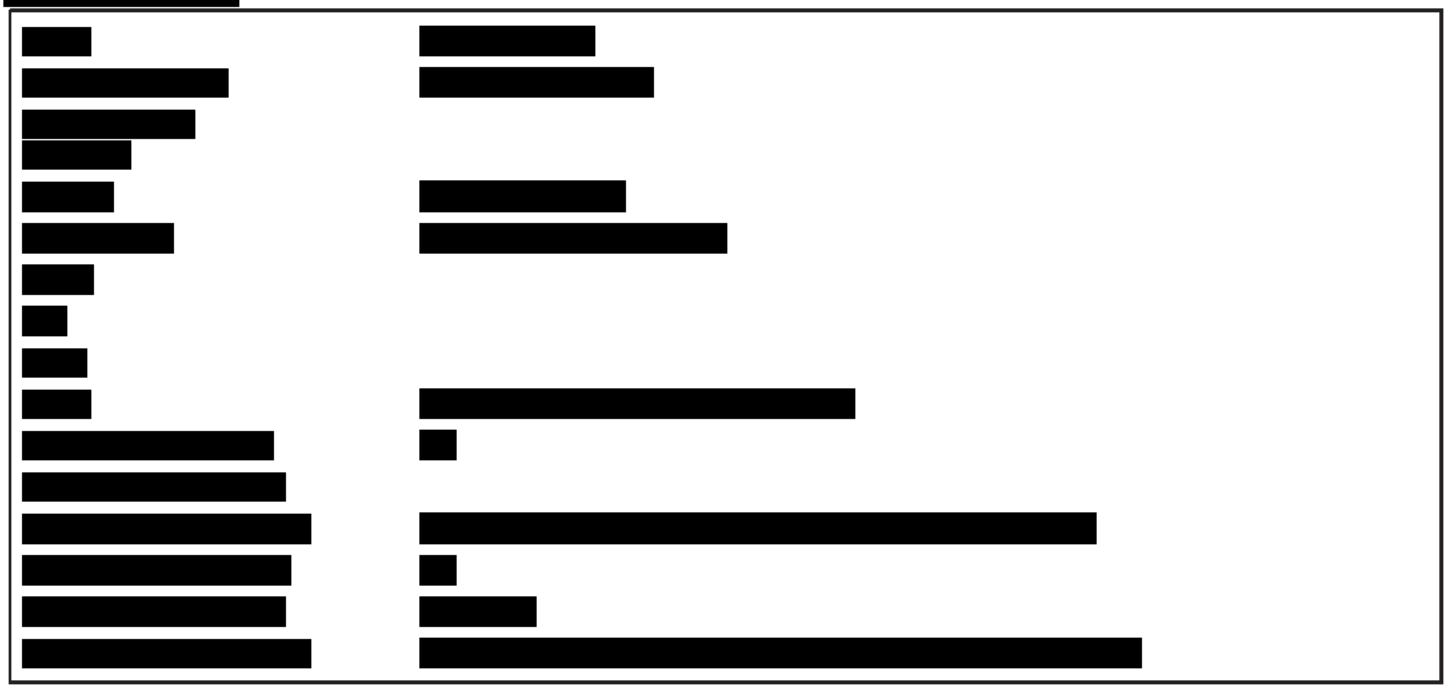
Study Personnel

Principal Investigator

Name:	**ABELLA, BENJAMIN S**
Dept / School / Div:	**4302 - EG-Emergency Medicine**
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]

Study Contacts

Name:	**SANDS, NATHANIEL**
Dept / School / Div:	**4302 - EG-Emergency Medicine**
Campus Address Mail Code	
Address:	**423 Guardian Drive**
City State Zip:	**Philadelphia PA 19104-6021**
Phone:	
Fax:	
Pager:	
Email:	**Nathaniel.Sands@Pennmedicine.upenn.edu**
HS Training Completed:	**Yes**
Training Expiration Date:	
Name of course completed :	**CITI Protection of Human Subjects Research Training - ORA**
GCP Training Completed:	**Yes**
Training Expiration Date:	[redacted]
Name of course completed :	**Good Clinical Practice: An Introduction to ICH (GCP) Guidelines**



[redacted]

[redacted]

[redacted]

Disclosure of Significant Financial Interests*
Does any person who is responsible for the design, conduct, or reporting of this research protocol have a **FINANCIAL INTEREST**?
No

Penn Intellectual Property*
To the best of the Principal Investigator's knowledge, does this protocol involve the testing, development or evaluation of a drug, device, product, or other type of intellectual property (IP) that is owned by or assigned to the University of Pennsylvania?
No

Certification
I have reviewed the *Financial Disclosure and Presumptively Prohibited Conflicts for Faculty Participating in Clinical Trials* and the *Financial Disclosure Policy for Research and Sponsored Projects* with all persons who are responsible for the design, conduct, or reporting of this research; and all required Disclosures have been attached to this application.
Yes

HRPP

Human Source Material*
Does this research include collection or use of human source material (i.e., human blood, blood products, tissues or body fluids)?
No

Medical Information Disclosure*
Does the research proposal involve the use and disclosure of research subject's medical information for research purposes?
No

If the answer is YES, indicate which items is is provided with this submission:

CTRC Resources*
Does the research involve CTRC resources?
No

Pathology and Laboratory Medicine Resources*
Will samples be collected by hospital phlebotomy and/or processed or analyzed by any of the clinical laboratories of the University of Pennsylvania Health System?
No

Research Involves Apheresis, Cell Collection, and/or Blood Product Collection*
Does this research involve collection of blood products in the Penn Donor Center and/or the use of apheresis for treatment or collection of cells or other blood components?
No

Research involving blood transfusion or drug infusions*
Will your research involve blood transfusion or infusion of study drug in 3 Ravdin Apheresis Unit for research purposes?
No

Trial in Radiation Oncology
Is this research a prospective trial being done in Radiation Oncology, and if so, has this protocol been approved by the Radiation Oncology Protocol committee?
N/A

Study in Radiation Oncology
Is this research a retrospective study being done in Radiation Oncology, and if so, has this project been reviewed by the Radiation Oncology Clinical Research Group?
N/A

Use of UPHS services*
Does your study require the use of University of Pennsylvania Health System (UPHS) services, tests or procedures*, whether considered routine care or strictly for research purposes?
No

Primary Focus*
Research on human data sets (e.g. medical records, clinical registries, existing research data sets, medical administrative data, etc.)

Protocol Interventions

	Sociobehavioral (i.e. cognitive or behavioral therapy)
	Drug
	Device - therapeutic
	Device - diagnostic (assessing a device for sensitivity or specificity in disease diagnosis)
	Surgical
	Diagnostic test/procedure (research-related diagnostic test or procedure)
	Obtaining human tissue for basic research or biospecimen bank
	Survey instrument
x	**None of the above**

The following documents are currently attached to this item:

There are no documents attached for this item.

Sponsors

Business Administrator

Name:	[redacted]
Dept / School / Div:	**4302 - EG-Emergency Medicine**
Phone:	[redacted]
Fax:	[redacted]
Pager:	
Email:	[redacted]

Department budget code

[redacted]

Funding Sponsors

Funding sponsors billing address
If you have selected a commercial or industry sponsor, please provide the appropriate address and contact information for the Sponsor for the purposes of billing for IRB review fees (initial review, continuing review and convened modification fees apply here). If the Sponsor is not industry/ commercial, this information is not necessary to provide with your application.

Funding sponsors gift
Is this research being funded by a philanthropic gift?

Project Funding*
Is this project funded by or associated with a grant or contract?
No

Sponsor Funding
Is this study funded by an industry sponsor?

Status of contract

The following documents are currently attached to this item:

There are no documents attached for this item.

Protocol

Objectives

Overall objectives
The primary objective of this study is to determine the clinical impact and safety of transesophageal echocardiography (TEE) performed during the evaluation of critically-ill patients in the emergency department and intensive care settings. The secondary objective(s) of this study are to characterize the use of this imaging modality in the subsets of critically-ill patients in shock and cardiac arrest; including but not limited to: description of the frequency of studies, clinical indications, clinician characteristics, echocardiography findings, timing of studies, procedure-related complications and patient outcomes.

Background
Goal-directed transesophageal echocardiography (TEE) is frequently used by physicians caring for intubated critically-ill patients as a reliable imaging modality that is well-suited to answer questions at bedside. While in most patients transthoracic echocardiography (TTE) can provide the information

needed, there are situations in which goal-directed transesophageal echocardiography (TEE) provides superior diagnostic value. In contrast with comprehensive echocardiography, TEE provides acute care clinicians with a goal-directed framework to guide clinical care at the point-of-care in various clinical scenarios. Common applications of TEE in critically-ill patients include assessment of circulatory failure, hemodynamic monitoring, evaluation of unexplained hypoxemia, procedural guidance and cardiac arrest. Over the last decade, a small number of studies have demonstrated the feasibility and clinical impact of TEE in different acute care settings, including the emergency department and intensive care units. In both of these settings, retrospective studies of focused TEE have demonstrated this modality to be clinically impactful in the diagnostic evaluation of patients in shock, hemodynamic monitoring in patients with circulatory failure, in the evaluation of fluid responsiveness to guide fluid therapy, and in the guidance of procedures such as percutaneous mechanical circulatory support. Specifically in the emergency department setting, one small prospective observational study, evaluating the use of TEE during resuscitation, has shown that traditional chest compressions following external landmarks as recommended by guidelines, resulted in an AMC located over the ascending thoracic aorta, or left ventricular outflow tract in over 50% of patients, suggesting that compressions over the center of the heart may actually impede some of the potential forward blood flow in a significant portion of patients. Most recently animal models of cardiac arrest have demonstrated that chest compressions performed directly over the LV rather than the center of the chest result in improved aortic pressures, ETCO2, and survival. While the above-mentioned studies have provided some promising data on the utility of this emerging modality, to date only small single-center and retrospective studies have evaluated the clinical impact of focused TEE in resuscitative settings. Furthermore, no studies have investigated the safety of this imaging modality, specifically in the population of emergency department patients.

Study Design

Design

We plan to conduct a prospective observational study involving a convenience sample of patients receiving a TEE as part of their clinical care in emergency department (ED) and intensive care unit (ICU) settings. The study will enroll adult patients receiving focused TEE as part of their routine care for the most common clinical indications of focused TEE in critical care patients in ED and ICU settings including: 1. Evaluation of intra-arrest and post cardiac arrest in in-hospital (IHCA) and out-ofhospital cardiac arrest (OHCA), 2. Evaluation of patients in shock, 3. Hemodynamic monitoring, and 4. Procedural guidance. Data will be collected from the patients electronic medical record (EMR) and EMS run-sheets in the case of OHCA cases. Transesophageal echocardiography images routinely recorded for quality assurance and as part of standard clinical care, will be collected. Patients will be enrolled in the study by clinicians participating in their care who are involved in the performance of TEE. Following identification of eligibility criteria by the enrolling clinician, a REDCap data collection instrument will be used to prospectively gather basic demographics, and clinical data, including the indication for the TEE (i.e. including intra-arrest or post arrest, evaluation of shock, hemodynamic monitoring or procedural guidance), operator findings on the TEE, probe insertion procedure details, TEE views obtained during the study, clinicians interpretation of the images, change in management (if any) as a result of the information provided by TEE, procedure-related immediate complications, and outcomes when indicated. Minimal patient demographic information will be collected, but will include: age, gender, and BMI. In the case of cardiac arrests, when applicable the following information will be collected: if the arrest was witnessed, location of arrest, if bystander CPR was performed, will be obtained from the EMR and EMS run sheets. Identification of certain disease states in the medical history patients such as coronary artery disease, congestive heart failure, chronic kidney disease, diabetes mellitus, hypertension, previous STEMI, ventricular assist device, and implantable cardioverter-defibrillator will also be obtained from the EMR and prospectively entered to the RedCap data form. For cases of OHCA, data collection will also include an analysis of pre-hospital care to examine the following factors (Ustein Cardiac Arrest Variables); estimated time of arrest, response time, EMS interventions (chest compressions, defibrillation, airway procedures, dosing and timing of drug administration). For all cardiac arrest cases, information collected will also include time of arrest, ED arrival time in case of OHCA, time to first image of TEE, time of first rhythm, and times and type of intervention (mechanical CPR, arterial line, epi administration, etc.) The study of patient outcomes will be specific to the clinical indication and will include ROSC, survival to hospitalization and discharge in OHCA. In cardiac arrest cases, additional factors pertaining CPR physiology will be examined.

Study duration
The expected duration of the study is 2 years. The relevant dates of data collection are from December 31st, 2021 to December 31, 2023.

Characteristics of the Study Population

Target population
Adult patients who as part of their routine clinical care receive focused TEE in the emergency department of intensive care setting. Children (age under 18 years) will not be eligible for inclusion in this study.

Subjects enrolled by Penn Researchers
200

Subjects enrolled by Collaborating Researchers
0

Vulnerable Populations

	Children Form
	Pregnant women (if the study procedures may affect the condition of the pregnant woman or fetus) Form
	Fetuses and/or Neonates Form
	Prisoners Form
	Other
x	**None of the above populations are included in the research study**

The following documents are currently attached to this item:

There are no documents attached for this item.

Subject recruitment
Not applicable

Will the recruitment plan propose to use any Penn media services (communications, marketing, etc.) for outreach via social media avenues (examples include: Facebook, Twitter, blogging, texting, etc.) or does the study team plan to directly use social media to recruit for the research?
No

The following documents are currently attached to this item:

There are no documents attached for this item.

Subject compensation*
Will subjects be financially compensated for their participation?
No

The following documents are currently attached to this item:

There are no documents attached for this item.

If there is subject compensation, provide the schedule for compensation per study visit or session and total amount for entire participation, either as text or separate document

Not applicable

Study Procedures

Suicidal Ideation and Behavior
Does this research qualify as a clinical investigation that will utilize a test article (ie- drug or biological) which may carry a potential for central nervous system (CNS) effect(s)?
No

Procedures
There are no interventions or procedures in this study. We will be entering previously described clinical data into REDCap from EPIC patient charts. The TEE ultrasound clips that are routinely stored for quality assurance will be reviewed, analyzed, and qualitative data will be extracted. All of the data will be analyzed retrospectively from standard of care procedures. Follow-up of subjects will not occur.

The following documents are currently attached to this item:

There are no documents attached for this item.

Deception
Does your project use deception?
No

International Research
Are you conducting research outside of the United States?
No

Analysis Plan
Baseline and demographic characteristics will be summarized by standard descriptive statistics (including mean and standard deviation for continuous variables such as age and standard percentages for categorical variables such as gender). Continuous variables will be analyzed using Students t-test, categorical data using Chi-square. Descriptive statistics will be presented as a mean with standard deviation, or as a median with an interquartile range. Differences in patient characteristics will be analyzed using chi-squared testing, Students t-test, or the Mann-Whitney U test, as appropriate. We will provide frequencies with their binomial 95% confidence intervals for descriptive purposes. For bivariate or multivariable analyses, we will use logistic regression, ANOVA, or chi-squared testing, as appropriate. Statistical methods will be performed in statistical software (STATA).

The following documents are currently attached to this item:

There are no documents attached for this item.

Subject Confidentiality
Paper-based records will be kept in a secure location and only be accessible to personnel involved in the study. Computer-based files will only be made available to personnel involved in the study through the use of access privileges and passwords. Prior to access to any study-related information, personnel will be required to sign statements agreeing to protect the security and confidentiality of identifiable information. Wherever feasible, identifiers will be removed from study-related information. A waiver of documentation of consent is being requested, because the only link between the subject and the study would be the consent document and the primary risk is a breach of confidentiality. (This is not an option for FDA-regulated research.) Precautions are in place to ensure the data is secure by using passwords and encryption, because the research involves web-based surveys. REDCap, as an encrypted program, will be used to store all study variables and extracted data points.

Sensitive Research Information*
Does this research involve collection of sensitive information about the subjects that should be excluded from the electronic medical record?
No

Data Disclosure
Will the data be disclosed to anyone who is not listed under Personnel?
Data will not be disclosed to anyone who is not listed under Personnel, unless a DUA is established with the institution of the external personnel, in which case the IRB would be notified.

*Data Protection**

	Name
	Street address, city, county, precinct, zip code, and equivalent geocodes
	All elements of dates (except year) for dates directly related to an individual and all ages over 89
	Telephone and fax number
	Electronic mail addresses
	Social security numbers
x	**Medical record numbers**
	Health plan ID numbers
	Account numbers
	Certificate/license numbers
	Vehicle identifiers and serial numbers, including license plate numbers
	Device identifiers/serial numbers
	Web addresses (URLs)
	Internet IP addresses
	Biometric identifiers, incl. finger and voice prints
	Full face photographic images and any comparable images
	Any other unique identifying number, characteristic, or code
	None

Does your research request both a waiver of HIPAA authorization for collection of patient information and involve providing Protected Health Information ("PHI") that is classified as a "limited data set" (city/town/state/zip code, dates except year, ages less than 90 or aggregate report for over 90) to a recipient outside of the University of Pennsylvania covered entity?
No

Consent

1. Consent Process

Overview
Not applicable

Risk / Benefit

Potential Study Risks
Given the design as an observational protocol, there are no interventions as part of this study. As explained before, all the interventions such as procedures occurring during this protocol are the standard clinical practice and their use will be directed by the treating physicians as part of the standard care. Radioisotopes/radiation-producing machines (e.g., X-rays, CT scans, fluoroscopy) and associated risks: No radioisotopes or radiation-producing machines will be used during the protocol. Physical

well-being: Participation in this study will not incur any additional risk to subjects' physical well being beyond what would be experienced during standard care. Psychological well-being: Participation in this study will not incur any additional risk to subjects' psychological well being beyond what would be experienced during standard care. Economic well-being: Participation in this study will not incur any additional risk to subjects' economic well being beyond what would be experienced during standard care. Social well-being: Participation in this study will not incur any additional risk to subjects' social well being beyond what would be experienced during standard care. Although the risk of mortality in our patient population is high (approximately 90%), the risk of the observations made in this study are minimal as all observations are currently being recorded as part of standard of care. All laptops, desktops, and mobile devices used to access, transmit, or store Prohibited or Restricted Data as defined under the Data Classification Guidelines are encrypted. We will make sure that any new device used in this study will be encrypted prior to use.

Potential Study Benefits
There will be no direct benefit to patients enrolled in this study. However, the knowledge gained from this research and specifically the greater understanding on the clinical impact and potential to improve outcomes of TEE in the care of critically-ill patients, will contribute greatly to the field and society at large. Among other applications, this knowledge may contribute to the creation of guidelines for physicians that use this emerging ultrasound modality when caring for critically-ill patients, and may ultimately save patients from death and other adverse outcomes. The medical communitys increased understanding of the value of this imaging modality and best practices in its use for patients with specific clinical conditions such as shock and cardiac arrest is also likely to result from this study.

Risk / Benefit Assessment
Minimal Risk

General Attachments

The following documents are currently attached to this item:

Additional forms (tee_registry_redcap_instruments_010422.pdf)

HIPAA Authorization or Waiver (requestforwaiverofhipaaauthorization_protocol_dfecdaja.docx)