



EAST MULTICENTER STUDY PROPOSAL

(Proposal forms must be completed in its entirety, incomplete forms will not be considered)

GENERAL INFORMATION

Study Title: Outcomes of emergency surgery and trauma cases done at night.

Primary investigator / Senior researcher: Kevin M. Schuster

Co-primary investigator:

BACKGROUND AND SIGNIFICANCE

Use this area to briefly (1-2 paragraphs only) outline the burden of the problem to be examined:

The specialty of acute care surgery by its nature will require surgeons to perform procedures in the overnight hours. The optimal approach to managing coverage schedules for acute care surgeons has not been determined. Studies that have focused on performance of elective procedures after overnight call have been inconsistent in that some studies of complex and simple routine operations have not demonstrated a difference in outcome [1,2]. A commonly referenced study by Rothschild evaluated broad types of operative procedures and did demonstrate differences in complication rates when less than 6 hours of sleep opportunity was recorded [3]. This has been examined by non-surgical procedure based specialists as well with evidence of poorer performance after night call [4]. Transplant surgeons, like acute care surgeons also often operate in the overnight hours and results of studies of transplant surgeon outcomes at night have been mixed also [5,6].

These studies unfortunately have multiple limitations and limited applicability to acute care surgery. Acute care surgeons are often influenced by sleep deprivation in that they are often starting operative cases after having worked sixteen or more hours with little to no rest. Much of their work is also non-operative and they may have responsibilities outside the operating room even in the overnight hours that may influence outcomes. Cases performed by acute care surgeons are also variable with respect to complexity with the majority of cases being less complex. Therefore identifying differences in outcomes will likely will require examining a greater fraction of complex cases matched with similar day cases as more simple operations will likely not have differences in

outcomes [2]. Other issues that have not been controlled for in previous studies are the volume of work outside of the operating room that may be influencing outcome, surgical volume, and experience of the surgeon. It has been suggested the younger surgeons in addition to the lack of clinical experience are less likely to be able to cope with sleep deprivation in the setting of current training paradigms [7]. If there are increased complications or mortality changing to a “night-float” type of schedule may mitigate these findings. Acute care surgeons may in some cases already be working these schedules and this will provide another potential line of investigation.

1. Chu MWA, Stitt LW Fox SA, et al. Prospective evaluation of consultant surgeon sleep deprivation and outcomes in more than 4000 consecutive cardiac surgical procedures. Arch Surg. 2011;146:1080-85.
2. Vinden C, Nash DM, Rangrej J, et al. Complications of daytime elective laparoscopic cholecystectomies performed by surgeons who operated the night before. JAMA. 2013;310:1837-41.
3. Rothschild JM, Keohane CA, Rogers S. Risks of complications by attending physicians after performing nighttime procedures. JAMA. 2009;302:1565-72.
4. Benson M, Grimes I, Gopal D, et al. Influence of previous night call and sleep deprivation on screening colonoscopy quality. Am J Gastroenterol 2014;109:1133-37.
5. Lonze BE, Parsikia A, Feyssa EL, et al. Operative start times and complications after liver transplantation. Am J Transplant 2010;10:1842-9
6. Kienzl-Wagner K, Schneiderbauer S, Bosmuller C, et al. Nighttime procedures are not associated with adverse outcomes in kidney transplantation. Transpl Int 2013;26:879-85.
7. Yuh DD. Effect of sleep deprivation on patient safety; New awakening or tired argument? Arch Surg. 2011;146:1085.

The specific aims of this multicenter study are:

Primary aim:

Primary aim should be succinctly stated here – single sentence ideal:

-
1. Identify any increase in mortality or complications that occurs when comparing day and night cases performed by acute care surgeons.

Secondary aims:

Any secondary aims should be stated here:

-
2. Examine the impact of non-surgical volume whether trauma or acute care surgical consultation on the outcomes of acute care surgical cases performed at night.
 3. Examine the influence of surgical experience and years of training on outcomes of acute care surgical cases.
-

EXPERIMENTAL DESIGN/METHODS

Inclusion Criteria:

Eligible patients will have undergone an emergency operation of at least moderate complexity (laparoscopic, open laparotomy, thoracoscopic, thoracotomy).

Exclusion Criteria:

Cases of low complexity (laparoscopic cholecystectomy, appendectomy, incision of drainage of cutaneous abscess) will be excluded.

Therapeutic Interventions:

None, prospective/retrospective study only.

If no specific interventions are required and this is only a retrospective or prospective observational study, include that language here. Such as: "Prospective observational study only. Patients will be managed according to surgeon's discretion."

Outcomes Measures:

Primary Outcome:

(List here)

Primary outcome is 30 day mortality.

Secondary Outcomes:

(List here)

Secondary outcomes include complications, hospital and ICU length of stay, hospital re-admission and unplanned return to the operating room.

Variables:

List the specific variables to be collected and analyzed here. For organization, it is useful to divide these into categories for consideration. Examples of categories might include: Demographics, Admission physiology, Management variables, Surgical variables, Outcomes

Data Collection and Statistical Analysis:

Outline the data collection plan and statistical analysis plan succinctly here

An example might include:

- *Standardized data will be collected for each patient (see data sheet, Appendix A). Risk factors for failure to achieve primary closure of the open abdomen will be assessed using univariate and multivariate analysis.*
- *Continuous variables will be compared using Student's t-test and the Mann Whitney U test. The Chisquared tests or Fisher's exact test will be used to compare categorical variables. All variables with a p value <0.2 on univariate analysis will be entered into a multivariable logistic regression analysis to identify independent risk factors for failure to achieve primary fascial closure and development of complications. Data will be reported as adjusted odds ratios with 95 % confidence intervals. Statistical significance will be set at a p<0.05.*

Initial data will be collected prospectively to include all moderately or significantly complex cases completed at an institution by acute care surgeons. The start time of the case by the acute care surgery service as well as other potential distractions (concomitant trauma/emergency surgery workload) and any reason the case may be being done at night other than the time of patient presentation will be collected prospectively. Pre-operative sleep pattern of the surgeon will also be collected.

The potential confounders for mortality and complications as outlined above in the introduction and variables collected sections will be captured. The variables include basic demographics, comorbidities and pre-operative physiology. The main variable of interest time of operation start as well as surrogate operative outcomes including blood loss, operative time, creation of an enterostomy and abdominal closure will be captured. Traditional outcome variables of mortality and routine surgical complications as listed above will be captured. All variables with a statistically significant or an expected clinically important impact on mortality or complications will be entered into multivariable logistic regression models with the primary indicator variable of case time. Model outcomes will include mortality, complications, operative time (linear regression) and blood loss (linear regression). Adjusted odds ratios and 95% confidence intervals will be reported with p<0.05 significant. Multilevel mixed models will also be constructed for comparison to account for any center variation however these will be intercept only models at the second level and no conclusion will be drawn from this second level of analysis. No patient identifiers will be transferred as a coding system will be used to identify the cases.

Based on a crude power analysis for a univariable impact of night time cases on mortality it is estimated that mortality will be 10% and increased to 15% with a night time start. Given these estimates 724 patients per group will be necessary to identify a mortality difference. Because the null hypothesis is there is no difference between groups we will only be able to prove that there is at most a small difference between groups. If baseline mortality is lower than expected the number of patients necessary to provide evidence for a small difference in mortality would also be smaller.

Consent Procedures:

Outline consent procedures here, if applicable. As an example for a prospective study where waiver of consent will be sought, verbiage might include:

“This is a prospective observational study, designed to prospectively record data on patients who are managed according to institutional patient management protocols. Thus, waiver of informed consent is requested. Data will be recorded on a data sheet and transferred to a secured database that is devoid of patient identifiers.”

This is a retrospective study with minimal risk and waiver of consent will be requested. The only risk is release of patient information. Data will be initially collect at each institution with patient identifiers however these will all be deleted once data collection on each patient is complete.

Risk/ Benefit Analysis:

Succinctly outline a risk / benefit analysis. An example of this might include:

*“The incidence and natural history **DISEASE PROCCSS TO BE STUDIED** is unknown. If the optimal timing for and type of intervention can be identified to optimize outcomes in these patients, then significant benefit will result.”*

This is a minimal risk study. All data from submitting institutions will be de-identified. The only risk is the release of protected health information at the institutional level.

Instructions for submitting data collection tools:

A Microsoft Access based data collection tool will be created and transmitted by email or the secure Yale File Transmission service both to and from participating institutions. All data at the primary study site will be maintained on a secure password accessed and encrypted server.

References:

Include a brief listing of key references here:

1. Chu MWA, Stitt LW Fox SA, et al. Prospective evaluation of consultant surgeon sleep deprivation and outcomes in more than 4000 consecutive cardiac surgical procedures. Arch Surg. 2011;146:1080-85.
2. Vinden C, Nash DM, Rangrej J, et al. Complications of daytime elective laparoscopic cholecystectomies performed by surgeons who operated the night before. JAMA. 2013;310:1837-41.
3. Rothschild JM, Keohane CA, Rogers S. Risks of complications by attending physicians after performing nighttime procedures. JAMA. 2009;302:1565-72.
4. Benson M, Grimes I, Gopal D, et al. Influence of previous night call and sleep deprivation on screening colonoscopy quality. Am J Gastroenterol 2014;109:1133-37.
5. Lonze BE, Parsikia A, Feyssa EL, et al. Operative start times and complications after liver transplantation. Am J Transplant 2010;10:1842-9
6. Kienzl-Wagner K, Schneiderbauer S, Bosmuller C, et al. Nighttime procedures are not associated with adverse outcomes in kidney transplantation. Transpl Int 2013;26:879-85.
7. Yuh DD. Effect of sleep deprivation on patient safety; New awakening or tired argument? Arch Surg. 2011;146:1085.



**YALE UNIVERSITY
HUMAN INVESTIGATION COMMITTEE**

**Application to Involve Human Subjects in Biomedical Research
100 FR1 (2013-1)**

Please refer to the HIC website for application instructions and information required to complete this application. The Instructions are available at <http://www.yale.edu/hrpp/forms-templates/biomedical.html>
Submit the original application and one (1) copy of all materials including relevant sections of the grant which funds this project (if applicable) to the HIC.

HIC OFFICE USE ONLY

SECTION I: ADMINISTRATIVE INFORMATION

| | | | |
|--|--------------------------|---|--|
| Title of Research Project: A prospective multi-institutional investigation of emergency operations performed at night. | | | |
| Principal Investigator: Kevin M. Schuster | | Yale Academic Appointment: Associate Professor of Surgery | |
| Department: Surgery | | | |
| Campus Address: 330 Cedar Street BB310 PO Box 208062 New Haven, CT 06520 | | | |
| Campus Phone: 203-785-2572 | Fax: 203-785-3950 | Pager: | E-mail: kevin.schuster@yale.edu |
| Protocol Correspondent Name & Address (if different than PI): Kimberly Barre, RN | | | |
| Campus Phone: | Fax: | E-mail: kimberly.barre@ynhh.org | |
| Yale Cancer Center CTO Protocol Correspondent Name & Address (if applicable): | | | |
| Campus Phone: | Fax: | E-mail: | |
| Business Manager: | | | |
| Campus Phone : | Fax : | E-mail | |
| Faculty Advisor: (required if PI is a student, resident, fellow or other trainee) <input type="checkbox"/> NA | | Yale Academic Appointment: | |
| Campus Address: | | | |

| | | | |
|----------------------|-------------|---------------|----------------|
| Campus Phone: | Fax: | Pager: | E-mail: |
|----------------------|-------------|---------------|----------------|

Investigator Interests:

Does the principal investigator, or do any research personnel who are responsible for the design, conduct or reporting of this project or any of their family members (spouse or dependent child) have an incentive or interest, financial or otherwise, that may affect the protection of the human subjects involved in this project, the scientific objectivity of the research or its integrity? Note: The Principal Investigator (Project Director), upon consideration of the individual's role and degree of independence in carrying out the work, will determine who is responsible for the design, conduct, or reporting of the research.

See Disclosures and Management of Personal Interests in Human Research

<http://www.yale.edu/hrpp/policies/index.html#COI>

Yes No

Do you or does anyone on the research team who is determined by you to be responsible for the design, conduct or reporting of this research have any patent (sole right to make, use or sell an invention) or copyright (exclusive rights to an original work) interests related to this research protocol?

Yes No

If yes to either question above, list names of the investigator or responsible person:

The Yale University Principal Investigator, all Yale University co-investigators, and all Yale University individuals who are responsible for the design, conduct or reporting of research must have a current financial disclosure form on file with the University's Conflict of Interest Office. Yale New Haven Hospital personnel who are listed as con-investigators on a protocol with a Yale University Principal Investigator must also have a current financial disclosure form on file with the University's Conflict of Interest Office. If this has not been done, the individual(s) should follow this link to the COI Office Website to complete the form:

<http://www.yale.edu/coi/>

NOTE: The requirement for maintaining a current disclosure form on file with the University's Conflict of Interest Office extends primarily to Yale University and Yale-New Haven Hospital personnel. **Whether or not they are required to maintain a disclosure form with the University's Conflict of Interest Office, all investigators and individuals deemed otherwise responsible by the PI who are listed on the protocol are required to disclose to the PI any interests that are specific to this protocol.**

SECTION II: GENERAL INFORMATION

- 1. Performing Organizations:** Identify the hospital, in-patient or outpatient facility, school or other agency that will serve as the location of the research. Choose all that apply:

a. Internal Location[s] of the Study:

- | | |
|--|--|
| <input type="checkbox"/> Magnetic Resonance Research Center (MR-TAC) | <input type="checkbox"/> Yale University PET Center |
| <input type="checkbox"/> Yale Cancer Center/Clinical Trials Office (CTO) | <input type="checkbox"/> YCCI/Church Street Research Unit (CSRU) |
| <input type="checkbox"/> Yale Cancer Center/Smilow | <input type="checkbox"/> YCCI/Hospital Research Unit (HRU) |
| <input checked="" type="checkbox"/> Yale-New Haven Hospital | <input type="checkbox"/> YCCI/Keck Laboratories |
| <input type="checkbox"/> Cancer Data Repository/Tumor Registry | <input checked="" type="checkbox"/> Yale-New Haven Hospital—Saint Raphael Campus |
| <input type="checkbox"/> Specify Other Yale Location: | |

b. External Location[s]:

- | | |
|---|---|
| <input type="checkbox"/> APT Foundation, Inc. | <input type="checkbox"/> Haskins Laboratories |
| <input type="checkbox"/> Connecticut Mental Health Center | <input type="checkbox"/> John B. Pierce Laboratory, Inc. |
| <input type="checkbox"/> Clinical Neuroscience Research Unit (CNRU) | <input type="checkbox"/> Veterans Affairs Hospital, West Haven |
| <input type="checkbox"/> Other Locations, Specify: | <input type="checkbox"/> International Research Site (Specify location(s)): |

c. Additional Required Documents (check all that apply):

- | | |
|--|------------------------------|
| <input type="checkbox"/> *YCCI-Scientific and Safety Committee (YCCI-SSC) | <input type="checkbox"/> N/A |
| <input type="checkbox"/> *Pediatric Protocol Review Committee (PPRC) | Approval Date: |
| <input type="checkbox"/> *YCC Protocol Review Committee (YRC-PRC) | Approval Date: |
| <input type="checkbox"/> *Dept. of Veterans Affairs, West Haven VA HSS | Approval Date: |
| <input type="checkbox"/> *Radioactive Drug Research Committee (RDRC) | Approval Date: |
| <input type="checkbox"/> YNHH-Radiation Safety Committee (YNHH-RSC) | Approval Date: |
| <input type="checkbox"/> Magnetic Resonance Research Center PRC (MRRC-PRC) | Approval Date: |
| <input type="checkbox"/> YSM/YNHH Cancer Data Repository (CaDR) | Approval Date: |
| <input type="checkbox"/> Dept. of Lab Medicine request for services or specimens form | |
| <input type="checkbox"/> Imaging on YNHH Diagnostic Radiology equipment request form (YDRCTO request) found at http://radiology.yale.edu/research/ClinTrials.aspx | |

***Approval from these committees is required before final HIC approval is granted. See instructions for documents required for initial submission and approval of the protocol. Allow sufficient time for these requests. Check with the oversight body for their time requirements.**

2. **Probable Duration of Project:** State the expected duration of the project, including all follow-up and data analysis activities. 2.5 years

3. **Research Type/Phase: (Check all that apply)**

a. **Study Type**

- Single Center Study
 Multi-Center Study

Does the Yale PI serve as the PI of the multi-site study? Yes No

- Coordinating Center/Data Management
 Other:

b. **Study Phase** N/A

- Pilot Phase I Phase II Phase III Phase IV
 Other (*Specify*)

4. **Area of Research: (Check all that apply)** Note that these are overlapping definitions and more than one category may apply to your research protocol. Definitions for the following can be found in the instructions section 4c:

- | | |
|---|---|
| <input checked="" type="checkbox"/> Clinical Research: Patient-Oriented | <input checked="" type="checkbox"/> Clinical Research: Outcomes and Health Services |
| <input type="checkbox"/> Clinical Research: Epidemiologic and Behavioral | <input type="checkbox"/> Interdisciplinary Research |
| <input type="checkbox"/> Translational Research #1 (“Bench-to-Bedside”) | <input type="checkbox"/> Community-Based Research |
| <input type="checkbox"/> Translational Research #2 (“Bedside-to-Community”) | |

5. Is this study a clinical trial? Yes No

NOTE the current ICMJE (International Committee of Medical Journal Editors) definition of a clinical trial: “any research study that prospectively assigns human participants or groups of humans to one or more health-related interventions to evaluate the effects on health outcomes.” Health-related interventions include any intervention used to modify a biomedical or health-related outcome (for example, drugs, surgical procedures, devices, behavioral treatments, dietary interventions, and process-of-care changes). Health outcomes include any biomedical or health-related measures obtained in patients or participants, including pharmacokinetic measures and adverse events”

If yes, where is it registered?

- Clinical Trials.gov registry
Other (*Specify*)

Registration of clinical trials **at their initiation** is required by the FDA, NIH and by the ICMJE.

If this study is registered on clinicaltrials.gov, there is new language in the consent form and compound authorization that should be used.

For more information on registering clinical trials, including whether your trial must be registered, see the YCCI webpage, <http://ycci.yale.edu/researchers/ors/registerstudy.aspx> or contact YCCI at 203.785.3482)

6. Does the Clinical Trials Agreement (CTA) require compliance with ICH GCP (E6)?
Yes No N/A

7. Will this study have a billable service? A Billable Service is defined as a service or procedure that will be ordered, performed or result in charging in EPIC for individuals who are enrolled in a clinical research study, regardless if the charge is intended to be paid by the subject/their insurance or the research study.

Yes No

If you answered "yes", this study will need to be set up in OnCore Support
<http://medicine.yale.edu/ymg/systems/ppm/index.aspx>

8.. Are there any procedures involved in this protocol that will be performed at YNHH or one of its affiliated entities? Yes ___ No X *If Yes, please answer questions a through c and note instructions below. If No, proceed to Section III.*

a. Does your YNHH privilege delineation currently include the **specific procedure** that you will perform?

b. Will you be using any new equipment or equipment that you have not used in the past for this procedure?

c. Will a novel approach using existing equipment be applied?

If you answered “no” to question 7a, or "yes" to question 7b or c, please contact the YNHH Department of Physician Services (688-2615) for prior approval before commencing with your research protocol.

SECTION III: FUNDING, RESEARCH TEAM AND TRAINING

1. **Funding Source:** Indicate all of the funding source(s) for this study. Check all boxes that apply. Provide information regarding the external funding source. This information should include identification of the agency/sponsor, the funding mechanism (grant or contract), and whether the award is pending or has been awarded. Provide the M/C# and Agency name (if grant-funded). If the funding source associated with a protocol is “pending” at the time of the protocol submission to the HIC (as is the case for most NIH submissions), the PI should note “Pending” in the appropriate section of the protocol application, provide the M/C# and Agency name (if grant-funded) and further note that University (departmental) funds support the research (until such time that an award is made).

| PI | Title of Grant | Name of Funding Source | Funding | Funding Mechanism |
|-----------------------|----------------|------------------------|---|---|
| Kevin M. Schuster, MD | none | departmental | <input type="checkbox"/> Federal <input type="checkbox"/> State <input type="checkbox"/> Non Profit <input type="checkbox"/> Industry <input type="checkbox"/> Other For Profit <input type="checkbox"/> Other | <input type="checkbox"/> Grant-M# <input type="checkbox"/> Contract# <input type="checkbox"/> Contract Pending <input checked="" type="checkbox"/> Investigator/Department Initiated <input type="checkbox"/> Sponsor Initiated <input type="checkbox"/> Other, Specify: |
| | | | <input type="checkbox"/> Federal <input type="checkbox"/> State <input type="checkbox"/> Non Profit <input type="checkbox"/> Industry <input type="checkbox"/> Other For Profit <input type="checkbox"/> Other | <input type="checkbox"/> Grant-M# <input type="checkbox"/> Contract# <input type="checkbox"/> Contract Pending <input type="checkbox"/> Investigator/Department Initiated <input type="checkbox"/> Sponsor Initiated <input type="checkbox"/> Other, Specify: |

| | | | | |
|--|--|--|---|--|
| | | | <input type="checkbox"/> Federal <input type="checkbox"/> State <input type="checkbox"/> Non Profit <input type="checkbox"/> Industry <input type="checkbox"/> Other For Profit <input type="checkbox"/> Other | <input type="checkbox"/> Grant-M# <input type="checkbox"/> Contract# <input type="checkbox"/> Contract Pending <input type="checkbox"/> Investigator/Department Initiated <input type="checkbox"/> Sponsor Initiated <input type="checkbox"/> Other, Specify: |
|--|--|--|---|--|

IRB Review fees are charged for projects funded by Industry or Other For-Profit Sponsors. Provide the Name and Address of the Sponsor Representative to whom the invoice should be sent. *Note: the PI's home department will be billed if this information is not provided.*

Send IRB Review Fee Invoice To:

Name:
 Company:
 Address:

2. **Research Team:** List all members of the research team. Indicate under the affiliation column whether the investigators or study personnel are part of the Yale faculty or staff, or part of the faculty or staff from a collaborating institution, or are not formally affiliated with any institution. **ALL members of the research team MUST complete Human Subject Protection Training (HSPT) and Health Insurance Portability and Accountability Act (HIPAA) Training before they may be listed on the protocol. See NOTE below.**

NOTE: The HIC will remove from the protocol any personnel who have not completed required training.

| | Name | Affiliation: Yale/Other Institution (Identify) | NetID |
|-----------------------------------|-----------------------|--|--------|
| Principal Investigator | Kevin M. Schuster, MD | Yale | kms228 |
| Role: Research Coordinator | Kimberly Barre, RN | Yale | |
| Role: | | | |

A personnel protocol amendment will need to be submitted when training is completed.

**SECTION IV:
PRINCIPAL INVESTIGATOR/FACULTY ADVISOR/ DEPARTMENT CHAIR
AGREEMENT**

As the **principal investigator** of this research project, I certify that:

- The information provided in this application is complete and accurate.
- I assume full responsibility for the protection of human subjects and the proper conduct of the research.
- Subject safety will be of paramount concern, and every effort will be made to protect subjects' rights and welfare.
- The research will be performed according to ethical principles and in compliance with all federal, state and local laws, as well as institutional regulations and policies regarding the protection of human subjects.
- All members of the research team will be kept apprised of research goals.
- I will obtain approval for this research study and any subsequent revisions prior to my initiating the study or any change and I will obtain continuing approval of this study prior to the expiration date of any approval period.
- I will report to the HIC any serious injuries and/or other unanticipated problems involving risk to participants.
- I am in compliance with the requirements set by the University and qualify to serve as the principal investigator of this project or have acquired the appropriate approval from the Dean's Office or Office of the Provost, or the Human Subject Protection Administrator at Yale-New Haven Hospital, or have a faculty advisor.
- I will identify a qualified successor should I cease my role as principal investigator and facilitate a smooth transfer of investigator responsibilities.

PI Name (PRINT) and Signature

Date

As the **faculty advisor** of this research project, I certify that:

- The information provided in this application is complete and accurate.
- This project has scientific value and merit and that the student or trainee investigator has the necessary resources to complete the project and achieve the aims.
- I will train the student investigator in matters of appropriate research compliance, protection of human subjects and proper conduct of research.
- The research will be performed according to ethical principles and in compliance with all federal, state and local laws, as well as institutional regulations and policies regarding the protection of human subjects.
- The student investigator will obtain approval for this research study and any subsequent revisions Prior to initiating the study or revision and will obtain continuing approval prior to the expiration of any approval period.
- The student investigator will report to the HIC any serious injuries and/or other unanticipated problems involving risk to participants.
- I am in compliance with the requirements set forth by the University and qualify to serve as the faculty advisor of this project.

Advisor Name (PRINT) and Signature

Date

Department Chair's Assurance Statement

Do you know of any real or apparent institutional conflict of interest (e.g., Yale ownership of a sponsoring company, patents, licensure) associated with this research project?

- Yes (provide a description of that interest in a separate letter addressed to the HIC.)
 No

As Chair, do you have any real or apparent protocol-specific conflict of interest between yourself and the sponsor of the research project, or its competitor or any interest in any intervention and/or method tested in the project that might compromise this research project?

- Yes (provide a description of that interest in a separate letter addressed to the HIC)
 No

I assure the HIC that the principal investigator and all members of the research team are qualified by education, training, licensure and/or experience to assume participation in the conduct of this research trial. I also assure that the principal investigator has departmental support and sufficient resources to conduct this trial appropriately.

Chair Name (PRINT) and Signature

Date

Department _____

YNHH Human Subjects Protection Administrator Assurance Statement

Required when the study is conducted solely at YNHH by YNHH health care providers.

As Human Subject Protection Administrator (HSPA) for YNHH, I certify that:

- I have read a copy of the protocol and approve it being conducted at YNHH.
- I agree to notify the IRB if I am aware of any real or apparent institutional conflict of interest.
- The principal investigator of this study is qualified to serve as P.I. and has the support of the hospital for this research project.

YNHH HSPA Name (PRINT) and Signature

Date

For HIC Use Only

Date Approved

Human Investigation Committee Signature

This protocol is valid through _____

SECTION V: RESEARCH PLAN

1. **Statement of Purpose:** State the scientific aim(s) of the study, or the hypotheses to be tested.

This study is designed to investigate, in a multi-institutional fashion, whether complex emergency cases done at night by fatigued surgeons who have already worked an entire day have worse outcomes than those done during daytime hours.

2. **Background:** Describe the background information that led to the plan for this project. Provide references to support the expectation of obtaining useful scientific data.

It is well established that fatigue has a deleterious effect on performance, and that medical professionals are not exempt from these effects. [1,2] Work hour restrictions have been imposed on residents by the Accreditation Council for Graduate Medical Education, however no such restrictions exist for attending physicians or surgeons. [3, 4] Studies in various areas of surgery, including hip, rectal, and elective general surgery, found no significant differences in outcomes

between daytime and nighttime cases in their respective fields. [5-7] A more recent study however, did demonstrate increased complications for non-elective laparoscopic cholecystectomies performed at night. [8] When elective cases are performed after an overnight call period the risk of fatigue-induced poor outcomes may be even greater. Retrospective studies examining this situation have demonstrated conflicting outcomes. The largest such study demonstrated increased complications following elective surgery performed the following day when the surgeon has less than six hours of sleep opportunity, though other studies found no difference [9 - 12]. In two of these, complications and readmissions were similar between post call and non-post call surgeons, however; actual work the prior night was not quantified and the cases examined were generally of low complexity. [11, 12] Further studies have shown that the trauma model, where the facility is fully staffed and operational at all times, is protective against the 'weekend effect,' a decline in outcomes during non-business hours, as a result of decreased staffing and unavailability of certain hospital resources. [13, 14]

Acute care surgery is the specialty that provides care for trauma patients and emergency general surgery patients, in addition to covering elective cases and intensive care units. Care of emergency general surgical patients is often more complex and challenging than their elective counterparts. [15] Additionally, the management of trauma and emergency surgery patients is one of the more complex elements of patient management that surgeons confront. [16] These cases often require significant intra-operative decision making and pre-operative planning is usually limited by the urgent nature of the illness or injury. The decision to pursue operative management may be impaired by the sleep status of the surgeon. Given this information, it stands to reason that the effects of surgeon fatigue on patient outcomes would be likely manifest in the areas of trauma and emergency general surgery. This study attempts to determine whether outcomes of trauma and emergency general surgery patients whose case was performed at night differed from their daytime counterparts.

References

1. Gaba DM, Howard SK. Patient Safety: Fatigue Among Clinicians and the Safety of Patients. *N Engl J Med.* 17 Oct 2002. 347(16), 1249-1253.
2. Fisman DN, Harris AD, Rubin M, Sorock GS, Mittleman MA. Fatigue increases the risk of injury from sharp devices in medical trainees: results from a case-crossover study. *Infect Control Hosp Epidemiol.* Jan 2007. 28(1):10-7.
3. Hyman NH. Attending work hour restrictions: is it time? *Arch Surg* 2009; 144(1):7-8.
4. Nurok, M., Czeisler, C. A., & Lehmann, L. S. Sleep deprivation, elective surgical procedures, and informed consent. *N Engl J Med.* Dec 2010. 363(27):2577-2579.
5. Chacko AT, Ramirez MA, Ramappa AJ, Richardson LC, Appleton PT, Rodriguez EK. Does late night hip surgery affect outcome? *J Trauma.* Aug 2011. 71(2):447-453
6. Schieman C, MacLean AR, Buie WD, Rudmik LR, Ghali WA, Dixon E. Does surgeon fatigue influence outcomes after anterior resection for rectal cancer? *The American Journal of Surgery.* May 2008.195(5):684-688
7. Sessler DI, Kurz A, Saager L, Dalton JE. Operation timing and 30-day mortality after elective general surgery. *Anesth Analg.* Dec 2011. 113(6):1423-1428.

8. Phatak UR, Chan WM, Lew DF, Escamilla RJ, Ko TC, Wray CJ, Kao LS. Is nighttime the right time? Risk of complications after laparoscopic cholecystectomy at night. *J Am Coll Surg*. 2014;219:718-24.
 9. Rothschild JM, Keohane CA, Rogers S, et al. Risk of complications by attending physicians after performing nighttime procedures. *JAMA* 2009;302:1565-72.
 10. Chu MWA, Stitt LW, Fox SA, et al. Prospective evaluation of consultant surgeon sleep deprivation and outcomes in more than 4000 consecutive cardiac surgical procedures. *Arch Surg*. 2011;146:1080-1085.
 11. Sharpe JP, Weinberg JA, Magnotti LJ, Nouer SS, Yoo W, Zarzaur BL, Cullian DR, Hendrick LE, Fabian TC, & Croce MA. Outcomes of Operations Performed by Attending Surgeons after Overnight Trauma Shifts. *J Am Coll Surg*. April 2013. 216(4):791-799.
 12. Vinden C, Nash DM, Rangrej J, et al. Complications of Daytime Elective Laparoscopic Cholecystectomies Performed by Surgeons Who Operated the Night Before. *JAMA*. 2013; 310(17):1837-1841.
 13. Carr BG, Jenkins P, Branas CC, Wiebe DJ, Kim P, Schwab CW, Reilly PM. Does the trauma system protect against the weekend effect? *J Trauma*. Nov 2010. 69(5):1042-1047.
 14. Carr BG, Reilly PM, Schwab CW, Branas CC, Geiger J, Wiebe DJ. Weekend and night outcomes in a statewide trauma system. *Arch Surg*. Jul 2011. 146(7):810-817
 15. Ingraham AM, Cohen ME, Raval MV, Ko CY, Nathens AB. Comparison of hospital performance in emergency versus elective general surgery operations at 198 hospitals. *J Am Coll Surg*. Jan 2011. 12(1):20-28.e1
 16. Marshall RL, Smith JS, Gorman PJ, Krummel TM, Haluck RS, Cooney RN. Use of a Human Patient Simulator in the Development of Resident Trauma Management Skills. *J Trauma*. July 2001. 51(1):17-21.
3. **Research Plan:** Summarize the study design and research procedures using non-technical language that can be readily understood by someone outside the discipline. **Be sure to distinguish between standard of care vs. research procedures when applicable, and include any flowcharts of visits specifying their individual times and lengths.** Describe the setting in which the research will take place.

This will be a retrospective evaluation with some prospectively collected data points. All cases done by acute care surgeons will be eligible for inclusion. This will include both trauma and emergency general surgery procedures performed both at night and during daytime hours. Emergency cases begun after 11pm and before 6am will be considered night cases if they were performed by the surgeon who had call responsibilities for the procedures done that night. Emergency cases done during the daytime hours will include those cases started after 6am and before 7pm if performed by a surgeon who started a shift in the morning of that same calendar day. Emergency cases will be defined by those cases where the surgeon made the decision to proceed with operative intervention immediately upon the first encounter with the patient or at some later time when operative intervention was deemed to have become emergent by the surgeon. Cases where the surgeon felt that operative delay of 8 or more hours would not be

detrimental to the patient's outcome will not be considered emergency cases. Delays to operative intervention that were based on pre-operative resuscitation need or scheduling related to operating room case load and associated delays will be identified as such. These data regarding urgency of the surgical cases and delays to the operating room, and any intra-operative complications will be collected prospectively at all centers. All other data will be collected retrospectively. Retrospective data to be collected will include age, gender, comorbidities such that the Charlson comorbidity index can be calculated, additional physiologic data to be collected will be the elements of the p-possum and APACHE – II scores. The ASA classification, operative duration, operative blood loss, operative wound classification, intra-operative transfusion will be recorded. Outcome variables to be collected will include: unplanned return to the operating room, wound dehiscence, pneumonia/ventilator associated pneumonia, surgical site infection, acute renal failure, myocardial infarction, anastomotic leak, ICU days, ventilator days, hospital length of stay, in-hospital mortality and discharge disposition.

We will also collect data with respect the surgeon's experience (years after completion of training). Additionally the number of trauma admissions during the night of the operative intervention, number of non-trauma surgical consults over the night and the number of other operations performed by the same surgeon during the same night will be recorded to assess the impact of additional workload on surgical outcomes.

This will be a multicenter study involving 4-6 centers including Yale New Haven Hospital where a single group of surgeons practices both trauma and emergency general surgery. Each center will collect data between one and two hundred subjects. Data will be collected using an access database designed for the study with forms created for data entry at each of the involved centers. Subjects will be assigned a subject number that designates the center and the subject's position in the center's data collection. Each center will maintain patient identifiers during the study period but only de-identified data will be transmitted by the Yale secure file transfer system. It is anticipated that data collection will proceed for approximately two years.

Once all of the data has been collected and transmitted to Yale for analysis univariable analysis will be completed to determine predictors of mortality. Most importantly the association between mortality, complications, other outcomes and the primary predictor of a night time operation will be assessed. Additionally logistic and linear regression models will be built to control for confounding and more completely assess the impact of the time of the case on patient outcomes.

4. Genetic Testing N/A

A. Describe

- i. the types of future research to be conducted using the materials, specifying if immortalization of cell lines, whole exome or genome sequencing, genome wide association studies, or animal studies are planned
- ii. the plan for the collection of material or the conditions under which material will be received
- iii. the types of information about the donor/individual contributors that will be entered into a database
- iv. the methods to uphold confidentiality

- B. What are the conditions or procedures for sharing of materials and/or distributing for future research projects?
- C. Is widespread sharing of materials planned?
- D. When and under what conditions will materials be stripped of all identifiers?
- E. Can donor-subjects withdraw their materials at any time, and/or withdraw the identifiers that connect them to their materials?
 - i. How will requests to withdraw materials be handled (e.g., material no longer identified: that is, anonymized) or material destroyed)?
- F. Describe the provisions for protection of participant privacy
- G. Describe the methods for the security of storage and sharing of materials

5. **Subject Population:** Provide a detailed description of the types of human subjects who will be recruited into this study.

The patient population will be all adult patients (>18 years of age) who present to one of the participating centers and requires urgent or emergent surgical intervention.

6. **Subject classification:** Check off all classifications of subjects that will be specifically recruited for enrollment in the research project. Will subjects who may require additional safeguards or other considerations be enrolled in the study? If so, identify the population of subjects requiring special safeguards and provide a justification for their involvement.

- | | | |
|--|--|--|
| <input type="checkbox"/> Children | <input type="checkbox"/> Healthy | <input type="checkbox"/> Fetal material, placenta, or dead fetus |
| <input type="checkbox"/> Non-English Speaking | <input type="checkbox"/> Prisoners | <input type="checkbox"/> Economically disadvantaged persons |
| <input type="checkbox"/> Decisionally Impaired | <input type="checkbox"/> Employees | <input type="checkbox"/> Pregnant women and/or fetuses |
| <input type="checkbox"/> Yale Students | <input type="checkbox"/> Females of childbearing potential | |

NOTE: Is this research proposal designed to enroll children who are wards of the state as potential subjects? Yes No (If yes, see Instructions section VII #4 for further requirements)

7. **Inclusion/Exclusion Criteria:** What are the criteria used to determine subject inclusion or exclusion?

There are no specific inclusion/exclusion criteria all adult patients presenting to an eligible center will be included.

8. How will **eligibility** be determined, and by whom?

Eligibility will be assessed by the local investigator who will identify adult patients undergoing operative intervention on an emergency basis.

9. **Risks:** Describe the reasonably foreseeable risks, including risks to subject privacy, discomforts, or inconveniences associated with subjects participating in the research.

There are no foreseeable risks to subjects associated with this study with respect to discomfort or inconvenience as this is essentially a retrospective study. Local investigators will maintain all patient data in secure databases that are password protected. At Yale all of the data will be maintained on a password protected encrypted server. For subject data collected at Yale separate databases will be maintained one functioning as a code key with patient identifiers and the other with patient data. Both of these databases will be maintained on encrypted and password protected databases. Only de-identified data will be transmitted for analysis further minimizing the risks of threat to privacy.

10. **Minimizing Risks:** Describe the manner in which the above-mentioned risks will be minimized.

As described above, data from outside institutions will be maintained only in a de-identified fashion on secure, encrypted and password protected servers. Yale data will be maintained in two secure databases as described.

11. **Data and Safety Monitoring Plan:** Include an appropriate Data and Safety Monitoring Plan (DSMP) based on the investigator's risk assessment stated below. (Note: the HIC will make the final determination of the risk to subjects.) For more information, see the Instructions, page 24.

- a. What is the investigator's assessment of the overall risk level for subjects participating in this study?

Risk is minimal

- b. If children are involved, what is the investigator's assessment of the overall risk level for the children participating in this study?
- c. Copy, paste, and then tailor an appropriate Data and Safety Monitoring Plan from <http://www.yale.edu/hrpp/forms-templates/biomedical.html> for
- i. Minimal risk
 - ii. Greater than minimal/moderate risk
 - iii. High risk
- d. For multi-site studies for which the Yale PI serves as the lead investigator:
- i. How will adverse events and unanticipated problems involving risks to subjects or others be reported, reviewed and managed?
 - ii. What provisions are in place for management of interim results?
 - iii. What will the multi-site process be for protocol modifications?

12. **Statistical Considerations:** Describe the statistical analyses that support the study design.

SECTION VI: RESEARCH INVOLVING DRUGS, BIOLOGICS, RADIOTRACERS, PLACEBOS AND DEVICES

If this section (or one of its parts, A or B) is not applicable, state N/A and delete the rest of the section.

N/A

SECTION VII: RECRUITMENT/CONSENT AND ASSENT PROCEDURES

1. Targeted Enrollment: Give the number of subjects:

- a. targeted for enrollment at Yale for this protocol 150
- b. If this is a multi-site study, give the total number of subjects targeted across all sites 800

2. Indicate recruitment methods below. Attach copies of any recruitment materials that will be used.

- | | | |
|--|---|-------------------------------------|
| <input type="checkbox"/> Flyers | <input type="checkbox"/> Internet/Web Postings | <input type="checkbox"/> Radio |
| <input type="checkbox"/> Posters | <input type="checkbox"/> Mass E-mail Solicitation | <input type="checkbox"/> Telephone |
| <input type="checkbox"/> Letter | <input type="checkbox"/> Departmental/Center Website | <input type="checkbox"/> Television |
| <input type="checkbox"/> Medical Record Review | <input type="checkbox"/> Departmental/Center Research Boards | <input type="checkbox"/> Newspaper |
| <input type="checkbox"/> Departmental/Center Newsletters | <input type="checkbox"/> Web-Based Clinical Trial Registries | |
| <input type="checkbox"/> YCCI Recruitment database | <input type="checkbox"/> Clinicaltrials.gov Registry (do not send materials to HIC) | |
| <input type="checkbox"/> Other (describe): | | |

3. Recruitment Procedures:

- a. Describe how potential subjects will be identified.

Patients will be identified based on individual site preferences. Most Acute Care Surgery Services perform a “morning report” or sign out in the morning and this will likely be the mechanism of patient identification at most centers.

- b. Describe how potential subjects are contacted.

Subjects will not be contacted. Only a few prospective variables will be collected from the medical record and direct communication with the surgeon. All other data will be collected from the medical record.

- c. Who is recruiting potential subjects?

One or two individuals at each site will identify subjects. These individuals will likely be a surgeon, a fellow or resident, or a research nurse.

4. Screening Procedures

- a. Will email or telephone correspondence be used to screen potential subjects for eligibility prior to the potential subject coming to the research office? Yes No
- b. If yes, identify below all health information to be collected as part of screening and check off any of the following HIPAA identifiers to be collected and retained by the research team during this screening process.

HEALTH INFORMATION TO BE COLLECTED:

HIPAA identifiers:

- Names
- All geographic subdivisions smaller than a State, including: street address, city, county, precinct, zip codes and their equivalent geocodes, except for the initial three digits of a zip code if, according to the current publicly-available data from the Bureau of the Census: (1) the geographic unit formed by combining all zip codes with the same three initial digits contains more than 20,000 people, and (2) the initial three digits of a zip code for all such geographic units containing 20,000 or fewer people is changed to 000.
- Telephone numbers
- Fax numbers
- E-mail addresses
- Social Security numbers
- Medical record numbers
- Health plan beneficiary numbers
- Account numbers
- All elements of dates (except year) for dates related to an individual, including: birth date, admission date, discharge date, date of death, all ages over 89 and all elements of dates (including year) indicative of such age, except that such ages and elements may be aggregated into a single category of age 90 or older
- Certificate/license numbers
- Vehicle identifiers and serial numbers, including license plate numbers
- Device identifiers and serial numbers
- Web Universal Resource Locators (URLs)
- Internet Protocol (IP) address numbers
- Biometric identifiers, including finger and voice prints
- Full face photographic images and any comparable images
- Any other unique identifying numbers, characteristics, or codes

5. **Assessment of Current Health Provider Relationship for HIPAA Consideration:**
Does the Investigator or any member of the research team have a direct existing clinical relationship with any potential subject?
- Yes, all subjects
- Yes, some of the subjects
- No

If yes, describe the nature of this relationship.

The investigators at Yale and each site will be a surgeon or surgical trainee who may be involved in the care of some of the subjects.

6. **Request for waiver of HIPAA authorization:** (When requesting a waiver of HIPAA Authorization for either the entire study, or for recruitment purposes only. Note: if you are collecting PHI as part of a phone or email screen, you must request a HIPAA waiver for recruitment purposes.)

Choose one: For entire study: X For recruitment purposes only: _____

- i. Describe why it would be impracticable to obtain the subject's authorization for use/disclosure of this data;

The patients who will be involved in this study are often critically ill and not able to provide consent. They often do not have available surrogates. Critical to this study are patients who die or have poor outcomes early in their course. If we exclude those patients the study will certainly be negative and this may represent a type II error. We would conclude that there is no detrimental effect to surgical intervention by a tired surgeon late at night when this may not be correct.

- ii. If requesting a waiver of **signed** authorization, describe why it would be impracticable to obtain the subject's signed authorization for use/disclosure of this data;

By signing this protocol application, the investigator assures that the protected health information for which a Waiver of Authorization has been requested will not be reused or disclosed to any person or entity other than those listed in this application, except as required by law, for authorized oversight of this research study, or as specifically approved for use in another study by an IRB.

Researchers are reminded that unauthorized disclosures of PHI to individuals outside of the Yale HIPAA-Covered entity must be accounted for in the "accounting for disclosures log", by subject name, purpose, date, recipients, and a description of information provided. Logs are to be forwarded to the Deputy HIPAA Privacy Officer.

7. **Required HIPAA Authorization:** If the research involves the creation, use or disclosure of protected health information (PHI), separate subject authorization is required under the HIPAA Privacy Rule. Indicate which of the following forms are being provided:

- Compound Consent and Authorization form
 HIPAA Research Authorization Form

N/A

8. **Consent Personnel:** List the names of all members of the research team who will be obtaining consent/assent.

N/A

9. **Process of Consent/Assent:** Describe the setting and conditions under which consent/assent will be obtained, including parental permission or surrogate permission and the steps taken to ensure subjects' independent decision-making.

N/A

10. **Evaluation of Subject(s) Capacity to Provide Informed Consent/Assent:** Indicate how the personnel obtaining consent will assess the potential subject's ability and capacity to consent to the research being proposed.

N/A

11. **Documentation of Consent/Assent:** Specify the documents that will be used during the consent/assent process. Copies of all documents should be appended to the protocol, in the same format that they will be given to subjects.

N/A

12. **Non-English Speaking Subjects:** Explain provisions in place to ensure comprehension for research involving non-English speaking subjects. Translated copies of all consent materials must be submitted for approval prior to use.

N/A

13. **Consent Waiver: In certain circumstances, the HIC may grant a waiver of signed consent, or a full waiver of consent, depending on the study.** If you will request either a waiver of consent, or a waiver of signed consent for this study, complete the appropriate section below.

- Not Requesting a consent waiver**
 Requesting a waiver of signed consent
 Requesting a full waiver of consent

A. Waiver of signed consent: (Verbal consent from subjects will be obtained. **If PHI is collected, information in this section must match Section VII, Question 6)**

Requesting a waiver of signed consent for Recruitment/Screening only

If requesting a waiver of signed consent, please address the following:

a. Would the signed consent form be the only record linking the subject and the research?

Yes No

b. Does a breach of confidentiality constitute the principal risk to subjects?

Yes No

OR

c. Does the research activity pose greater than minimal risk?

Yes ***If you answered yes, stop. A waiver cannot be granted.*** Please note:
Recruitment/screening is generally a minimal risk research activity

No

AND

d. Does the research include any activities that would require signed consent in a non-research context? Yes No

Requesting a waiver of signed consent for the Entire Study (Note that an information sheet may be required.)

If requesting a waiver of signed consent, please address the following:

a. Would the signed consent form be the only record linking the subject and the research?

Yes No

b. Does a breach of confidentiality constitute the principal risk to subjects?

Yes No

OR

c. Does the research pose greater than minimal risk? Yes *If you answered yes, stop. A waiver cannot be granted.* No

AND

d. Does the research include any activities that would require signed consent in a non-research context? Yes No

B. Full waiver of consent: (No consent from subjects will be obtained for the activity.)

Requesting a waiver of consent for Recruitment/Screening only

a. Does the research activity pose greater than minimal risk to subjects?

Yes *If you answered yes, stop. A waiver cannot be granted.* Please note:

Recruitment/screening is generally a minimal risk research activity

No

b. Will the waiver adversely affect subjects' rights and welfare? Yes No

c. Why would the research be impracticable to conduct without the waiver?

d. Where appropriate, how will pertinent information be returned to, or shared with subjects at a later date?

Requesting a full waiver of consent for the Entire Study (Note: If PHI is collected, information here must match Section VII, question 6.)

If requesting a full waiver of consent, please address the following:

a. Does the research pose greater than minimal risk to subjects?

Yes *If you answered yes, stop. A waiver cannot be granted.*

No

b. Will the waiver adversely affect subjects' rights and welfare? Yes No

c. Why would the research be impracticable to conduct without the waiver?

The most important subjects for analysis will be those patients with poor outcomes, often represented by death. These patients will be few but statistically the most important. These patients

often present without surrogates present and may succumb to their illness/injury without being able to contact a surrogate. If we are not able to waive consent these most important patients will be lost for entry into the study.

- d. Where appropriate, how will pertinent information be returned to, or shared with subjects at a later date?

Information gained from this study will not be applicable to individual patients.

SECTION VIII: PROTECTION OF RESEARCH SUBJECTS

Confidentiality & Security of Data:

- a. What protected health information (medical information along with the HIPAA identifiers) about subjects will be collected and used for the research?

Retrospective data to be collected will include age, gender, comorbidities such that the Charlson comorbidity index can be calculated, additional physiologic data to be collected will be the elements of the p-possum and APACHE – II scores. The ASA classification, operative duration, operative blood loss, operative wound classification, intra-operative transfusion will be recorded. Outcome variables to be collected will include: unplanned return to the operating room, wound dehiscence, pneumonia/ventilator associated pneumonia, surgical site infection, acute renal failure, myocardial infarction, anastomotic leak, ICU days, ventilator days, hospital length of stay, in-hospital mortality and discharge disposition.

Delays to operative intervention that were based on pre-operative resuscitation need or scheduling related to operating room case load and associated delays will be identified as such. These data regarding urgency of the surgical cases and delays to the operating room, and any intra-operative complications will be collected prospectively at all centers.

Data including medical record number, date of admission and date of birth may be collected at each center according to the regulations promulgated by their individual IRBs in order for them to maintain data integrity during the collection process.

- b. How will the research data be collected, recorded and stored?

Data will be collected at Yale and other participating centers through the use of a customized Microsoft Access database that will be delivered electronically to the centers by email but returned data will be sent using the Yale file transfer system. The database will be designed such that patient identifiers will be maintained in a password protected spreadsheet external to the database file to prevent the transmission of patient identifiers. At Yale the databases will be merged and maintained on an encrypted server in a de-identified fashion. At Yale the code key file will be kept on the same server.

- c. How will the digital data be stored? CD DVD Flash Drive Portable Hard Drive Secured Server Laptop Computer Desktop Computer Other

- d. What methods and procedures will be used to safeguard the confidentiality and security of the identifiable study data and the storage media indicated above during and after the subject's participation in the study?

The only identifiable data stored at Yale will be related to patients cared for at Yale. This patient data will be maintained such that patient identifiers will be maintained in a separate spreadsheet from the main database. Both the spreadsheet for linking identifiers and the balance of the collected data will be maintained on encrypted, password accessed servers.

Data from outside institutions will be collected in a delivered data base that will collect the data and attach a random identifier that will identify the source institution. The database will also create a separate spreadsheet with patient identifiers that will allow the database to be returned to Yale without patient identifiers.

Do all portable devices contain encryption software? Yes No N/A

If no, see <http://hipaa.yale.edu/guidance/policy.html>

- e. What will be done with the data when the research is completed? Are there plans to destroy the identifiable data? If yes, describe how, by whom and when identifiers will be destroyed. If no, describe how the data and/or identifiers will be secured.

Two years after the completion of the study patient identifiers will be destroyed through a request for University IT to delete the appropriate files from the encrypted servers.

- f. Who will have access to the protected health information (such as the research sponsor, the investigator, the research staff, all research monitors, FDA, Yale Cancer Center Data and Safety Monitoring Committee (DSMC), SSC, etc.)? (please distinguish between PHI and de-identified data)

Only the investigators.

- g. If appropriate, has a [Certificate of Confidentiality](#) been obtained? N/A

- h. Are any of the study procedures likely to yield information subject to mandatory reporting requirements? (e.g. HIV testing – reporting of communicable diseases; parent interview - incidents of child abuse, elderly abuse, etc.). Please verify to whom such instances will need to be reported.

No

SECTION IX: POTENTIAL BENEFITS

Potential Benefits: Identify any benefits that may be reasonably expected to result from the research, either to the subject(s) or to society at large. (Payment of subjects is not considered a benefit in this context of the risk benefit assessment.)

The potential benefit will be if any of the factors that we are evaluating prove to impact patient outcomes. Several of these factors may be modifiable such that future patient care can be approved.

SECTION X: RESEARCH ALTERNATIVES AND ECONOMIC CONSIDERATIONS

1. **Alternatives:** What other alternatives are available to the study subjects outside of the research?

There are no interventions therefore there are no alternatives.

2. **Payments for Participation (Economic Considerations):** Describe any payments that will be made to subjects, the amount and schedule of payments, and the conditions for receiving this compensation.

There will be no payments to subjects.

3. **Costs for Participation (Economic Considerations):** Clearly describe the subject's costs associated with participation in the research, and the interventions or procedures of the study that will be provided at no cost to subjects.

There will be no costs.

4. **In Case of Injury:** This section is required for any research involving more than minimal risk.
 - a. Will medical treatment be available if research-related injury occurs?
 - b. Where and from whom may treatment be obtained?
 - c. Are there any limits to the treatment being provided?
 - d. Who will pay for this treatment?
 - e. How will the medical treatment be accessed by subjects? \

This is a minimal risk study.

| Variable | Source | Options | Definition |
|---|----------------|--|------------|
| Demographics DOB Gender Race Ethnicity | Medical Record | | NSQIP |
| Operative Date Operation start time Operation end time Operation CPT code Operative blood loss Wound Class Wound closure ASA class AAST disease grade Fascia closed Colostomy created Transfused blood | Medical Record | Clean, Clean/Contaminated, Contaminated, Dirty/Infected | NSQIP |
| Comorbidities Admitted from Height Weight Diabetes (Insulin) Smoker Dyspnea Functional Health Status Ventilator dependent COPD Ascites within 30 days CHF within 30 days Hypertension with meds Acute renal failure ESRD Disseminated Cancer Open wound Immunosuppressant use Weight loss >10% Bleeding disorder Pre-op Transfusion Sepsis Septic shock | Medical Record | (None, SIRS, Septic shock) | NSQIP |
| Physiology Heart Rate | Medical Record | | |

| | | | |
|--|---|----------------------------|---|
| <p>Systolic blood pressure Respiratory rate Temperature Na/K/BUN/Cr/Albumin/Total bilirubin/AST/Alk Phos/WBC/Hct/Plt/INR/PTT</p> | | | |
| <p>Complications Superficial SSI Deep SSI Organ space SSI Wound disruption Pneumonia Pulmonary Embolism Ventilator days Acute Kidney Injury Acute renal failure Requiring dialysis Urinary tract infection Stroke Cardiac arrest Myocardial Infarction Sepsis Deep venous thrombosis</p> | Medical Record | (None, SIRS, Septic shock) | NSQIP Accordion Severity scoring |
| <p>Outcomes Discharge disposition Death (date if applicable) Unplanned return to OR Hospital discharge data Ventilator free days</p> | Medical Record | | NSQIP |
| <p>Others Type of call schedule (traditional/night float/etc)</p> <p>Hours of sleep prior to Operation</p> <p>Delay to the operating room for scheduling/administrative reasons</p> <p>Patient deterioration prior to operation</p> <p>Surgeon's experience</p> | <p>Prospective collection</p> <p>Prospective collection</p> <p>Prospective collection</p> | | <p>Standard, Night float</p> <p>Year of fellowship completion</p> |

| | | | |
|---|------------------------------------|--|--|
| Number of trauma admissions/alerts over same time frame | Medical record/billing records | | |
| Number of surgical consults seen over same time | Prospective versus billing records | | |
| Number of operations performed same time frame | Prospective vs. billing records | | |