

Summer Student Research Program

Project Description

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PROJECT TITLE (200 Characters max):

Surgical outcomes Analysis Using Large Administrative Datasets:

1. The National Inpatient Sample
2. The National Readmission Database
3. National Surgical Quality Improvement Program
4. Electronic Medical Record/EPIC
5. CDC databases
6. Vizient and University Hospitals Consortium
7. Other publicly available datasets

HYPOTHESIS:

Large datasets can allow analysis of surgical disease outcomes while recognizing important contributing factors such as healthcare cost, health disparities, socioeconomics factors, other environmental factors, and medical co-morbidities.

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Methods

1. Discharge data from a large national or institutional dataset (as above), adult patients, and any general surgical disease.
2. Patient and disease characteristics including prevalence, age, sex, race, household income, and geographic location will be analyzed studied to determine correlations with disease prevalence.
3. Focus will be on the relationship of outcomes of care and prevalence to healthcare disparities in race, gender, and socioeconomic status.

Research Objectives:

1. Utilize large, publicly available datasets to describe the factors that affect the epidemiology and outcomes of surgery.
 - a. Describe the prevalence and incidence of certain surgical disease processes in the United States, such as gallbladder, hernia, appendicitis, diverticulitis, and other surgical emergencies.
 - b. Study trends over time, from rates of surgery to complications and socioeconomic factors.
 - c. Analyze important patient and environmental factors in surgical disease outcomes.

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- i. Complications, health services utilization, late effects and mortality.
2. Develop independent ideas for research with real clinical implications.
3. Topics of research include, but are not limited to:
 - a. Emergency general surgery
 - b. Surgery and Frailty in the elderly
 - c. Health Disparities (Race, economic status, insurance) and surgical outcomes
 - i. Socio-economic, demographic, geographical and clinical factors associated with access to quality surgical care
 - d. Surgical quality improvement
 - e. Minimally Invasive surgery and outcomes
 - f. Robotic surgery outcomes
4. Develop an invaluable, marketable skillset working with large datasets by using statistical knowledge and computer software.

This project(s) will be of interest to the following types of medical students:

1. With a strong background and interest in statistics/biostatistics
2. With an interest in surgery and surgical subspecialties
 - a. However, if you are interested in another specialty, we can find projects that easily overlap with your interest.
3. Looking to establish a research background and publication track-record for acceptance into residency.
4. Those with an interest in healthcare outcomes, social and behavioral determinants of health, and health disparities (race, socioeconomic status, gender, etc.).
5. Those motivated to work hard and are able to troubleshoot and problem-solve independently.

Requirements:

1. Advanced knowledge of statistics including (but not limited to)
 - a. Logistic Regression
 - b. Propensity Score Analysis
 - c. Kaplan-Meier Survivorship Analysis
 - d. Understanding large databases
 - e. Use of SAS or SPSS at a minimum
2. Motivated attitude to learn new statistical methods, both independently and with other colleagues.
3. Maintain regular communication with the principle investigator (PI) of each project.

SPONSOR'S MOST RECENT PUBLICATIONS RELEVANT TO THIS RESEARCH:

Manuscript Publications (Student and Residents are first authors)

1: Elsamna S, Elkattawy O, Merchant AM. Association of metabolic syndrome with morbidity and mortality in emergency general surgery. Am J Surg. 2019 Dec 23.

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pii: S0002-9610(19)31573-9. doi: 10.1016/j.amjsurg.2019.12.021. [Epub ahead of print] PubMed PMID: 31879020.

2: Congiusta DV, Amer KM, Merchant AM, Vosbikian MM, Ahmed IH. Is Insurance Status Associated with the Likelihood of Operative Treatment of Clavicle Fractures? Clin Orthop Relat Res. 2019 Dec;477(12):2620-2628. doi: 10.1097/CORR.0000000000000836. PubMed PMID: 31764322.

3: Oliver JB, Merchant AM, Koneru B. The Impact of Chronic Liver Disease on Postoperative Outcomes and Resource Utilization. J Invest Surg. 2019 Oct 29:1-10. doi: 10.1080/08941939.2019.1676846. [Epub ahead of print] PubMed PMID: 31661332.

4: Patel R, Zagadailov P, Merchant AM. Laparoscopic colectomy for diverticulitis in patients with pre-operative respiratory comorbidity: analysis of post-operative outcomes in the United States from 2005 to 2017. Surg Endosc. 2019 Jul 8. doi: 10.1007/s00464-019-06943-3. [Epub ahead of print] PubMed PMID: 31286256.

5: Singh S BA, Merchant AM MD, FACS. A Propensity Score-Matched Analysis of Laparoscopic versus Open Surgery in Patients with COPD. J Invest Surg. 2019 Mar 21:1-10. doi: 10.1080/08941939.2019.1581307. [Epub ahead of print] PubMed PMID: 30897984.

6: Iyer UR, Merchant AM. Outcomes of Ventral Hernia Repair in Solid Organ Transplant Patients: A Regression Analysis of the National Inpatient Sample. J Surg Res. 2019 Jul;239:284-291. doi: 10.1016/j.jss.2019.02.016. Epub 2019 Mar 18. PubMed PMID: 30897516.

7: Gantz O, Zagadailov P, Merchant AM. The Cost of Surgical Site Infections after Colorectal Surgery in the United States from 2001 to 2012: A Longitudinal Analysis. Am Surg. 2019 Feb 1;85(2):142-149. PubMed PMID: 30819289.

8: Komaravolu SS, Kim JJ, Singh S, Merchant AM. Colonoscopy utilization in rural areas by general surgeons: An analysis of the National Ambulatory Medical Care Survey. Am J Surg. 2019 Aug;218(2):281-287. doi: 10.1016/j.amjsurg.2019.02.009. Epub 2019 Feb 13. PubMed PMID: 30791993.

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9: Patel A, Gantz O, Zagadailov P, Merchant AM. The role of socioeconomic disparity in colorectal cancer stage at presentation. *Updates Surg.* 2019 Sep;71(3):523-531. doi: 10.1007/s13304-019-00632-5. Epub 2019 Feb 20. PubMed PMID: 30788664.

10: Thangamathesvaran L, Armenia SJ, Merchant AM. The effect of pulmonary hypertension on inpatient outcomes of laparoscopic procedures. *Updates Surg.* 2018 Dec;70(4):521-528. doi: 10.1007/s13304-018-0556-y. Epub 2018 Jun 27. PubMed PMID: 29951840.

11: Patel R, Borad NP, Merchant AM. Comparison of outcomes following laparoscopic and open treatment of emergent small bowel obstruction: an 11-year analysis of ACS NSQIP. *Surg Endosc.* 2018 Dec;32(12):4900-4911. doi: 10.1007/s00464-018-6249-2. Epub 2018 Jun 4. PubMed PMID: 29869083.

12: Akyar S, Armenia SJ, Ratnani P, Merchant AM. The Impact of Frailty on Postoperative Cardiopulmonary Complications in the Emergency General Surgery Population. *Surg J (N Y).* 2018 May 23;4(2):e66-e77. doi: 10.1055/s-0038-1655756. eCollection 2018 Apr. PubMed PMID: 29796424; PubMed Central PMCID: PMC5966303.

13: Kothari P, Congiusta DV, Merchant AM. Laparoscopic versus open colectomy: the impact of frailty on outcomes. *Updates Surg.* 2019 Mar;71(1):89-96. doi: 10.1007/s13304-018-0531-7. Epub 2018 Apr 16. PubMed PMID: 29663301.

14: Armenia SJ, Pentakota SR, Merchant AM. Socioeconomic factors and mortality in emergency general surgery: trends over a 20-year period. *J Surg Res.* 2017 May 15;212:178-186. doi: 10.1016/j.jss.2017.01.015. Epub 2017 Jan 28. PubMed PMID: 28550905.

15: Palvannan P, Miranda I, Merchant AM. The combined effect of age and body mass index on outcomes in foregut surgery: a regression model analysis of the National Surgical Quality Improvement Program data. *Surg Endosc.* 2016 Jun;30(6):2572-82. doi: 10.1007/s00464-015-4529-7. Epub 2015 Sep 16. PubMed PMID: 26377066.

16: Serio S, Clements JM, Grauf D, Merchant AM. Outcomes of diabetic and nondiabetic patients undergoing general and vascular surgery. *ISRN Surg.* 2013 Dec 26;2013:963930. doi: 10.1155/2013/963930. eCollection 2013 Dec 26. PubMed PMID: 24455308; PubMed Central PMCID: PMC3888764.

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17: Knapps J, Ghanem M, Clements J, Merchant AM. A systematic review of staple-line reinforcement in laparoscopic sleeve gastrectomy. JSLS. 2013 Jul-Sep;17(3):390-9. doi: 10.4293/108680813X13654754534639. Review. PubMed PMID: 24018075; PubMed Central PMCID: PMC3771757.

18: Yanquez FJ, Clements JM, Grauf D, Merchant AM. Synergistic effect of age and body mass index on mortality and morbidity in general surgery. J Surg Res. 2013 Sep;184(1):89-100. doi: 10.1016/j.jss.2013.05.009. Epub 2013 May 29. PubMed PMID: 23764311.

Abstract/Presentations

THIS PROJECT IS: ☐ Clinical ☐ Laboratory ☐ Behavioral ☒ Other

THIS PROJECT IS CANCER-RELATED ☐

Please explain Cancer relevance

THIS PROJECT IS HEART, LUNG & BLOOD- RELATED ☐

Please explain Heart, Lung, Blood relevance

THIS PROJECT INVOLVE RADIOISOTOPES? ☐

THIS PROJECT INVOLVES THE USE OF ANIMALS ☐

PENDING ☐

APPROVED ☐

IACUC PROTOCOL #

THIS PROJECT INVOLVES THE USE OF HUMAN SUBJECTS? ☐

PENDING ☐

APPROVED ☐

IRB PROTOCOL # M

THIS PROJECT IS SUITABLE FOR:

UNDERGRADUATE STUDENTS ☐

ENTERING FRESHMAN ☐

SOPHOMORES ☐

ALL STUDENTS ☒

THIS PROJECT IS WORK-STUDY: Yes ☒ or No ☐

THIS PROJECT WILL BE POSTED DURING ACADEMIC YEAR

FOR INTERESTED VOLUNTEERS: Yes ☒ or No ☐

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WHAT WILL THE STUDENT LEARN FROM THIS EXPERIENCE?

The overall goals of the Research Program are to:

1. Allow motivated medical students of any level to participate in mentored research projects for an extended period of time during Medical School.
2. Introduce/enhance medical students understanding of clinical research principles as it applies to clinical data, health, disparities, and surgical outcomes.
3. Provide a strong foundation in the ethical conduct of research and understanding of the Institutional Review Board (IRB) process.
4. Strengthen skills in critical evaluation of data and reinforce the concept of evidence-based medicine.
5. Broaden medical student's knowledge of the role and relevance of research to clinical medicine.
6. Develop basic skills of oral and written presentation, poster presentation, and Manuscript preparation and submission.
7. Teach collaboration with other Divisions, Departments, and Faculty