

# USE OF I2B2 TO EXAMINE GENERAL SURGERY OUTCOMES IN RURAL AND URBAN PATIENT POPULATIONS: A BIG DATA ANALYSIS

Priscilla Rodrigues Armijo MD<sup>1,2</sup>, Melissa Leon BS MPH<sup>1,2</sup>, Dmitry Oleynikov MD<sup>1,2</sup>

Department of Surgery, University of Nebraska Medical Center, Omaha NE 8198; Center for Advanced Surgical Technology, University of Nebraska Medical Center, Omaha NE 68198



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## PURPOSE

Examine clinical and surgical outcomes in rural and urban patient populations using the Integrating Biology and the Bedside (i2B2) platform to query data from our hospital electronic health record.

## HYPOTHESIS

**Our hypothesis is that social disparities will exist between patients originating from rural and urban locations, despite receiving care in the same academic hospital, and that rural patients will have lower rates of follow-up and compliance**

## INNOVATION

- One of the first uses of Informatics of the i2B2 platform in the context of surgical outcomes with our hospital electronic health record.
- Explore the feasibility of using this large database with long-term clinical and surgical outcomes.
- Our study would provide experience and background in order to springboard our study methodology to other medical institutions in the Great Plains Collaborative Network.

## BACKGROUND

- 46.1 million individuals live in nonmetropolitan areas in the United States
- 71 of 93 counties in Nebraska are designated as rural
- Nonmetropolitan areas often have a higher proportion of the population at or below the poverty level, creating barriers in healthcare access and increasing health disparities
- Access to primary care physicians and cost continue to be barriers in Nebraska
- Nearly 1 in 5 Nebraska adults reported not having a primary healthcare provider
- 1 out of every 8 Nebraska adults has cited health care cost as a reason for not seeking a doctor
- Most of the state is a designated shortage area for physician specialties such as psychiatry, dentistry, internal medicine, family practice, pediatrics, OB/GYN, occupational therapy, pharmacy, physical therapy and general surgery

## APPROACH

- Utilize the i2b2 database to query existing data from the UNMC hospital electronic health record.
- Examine clinical and surgical outcomes among five surgical procedures (appendectomy, colectomy, cholecystectomy, abdominal wall hernia repair, mastectomy, and bariatric surgery) and the impact of social determinants on these outcomes.
- Social determinants
  - race, gender, ethnicity, geography, age, and socioeconomic status
- Preoperative Outcomes
  - patient demographics, medical and surgical history.
- Surgical Outcomes :
  - surgical approach, hospital length of stay (LOS), medication utilization, infection incidence, readmission and reoperation rates, and follow-up visit compliance.
- Compare rural and urban patients.
- Modeling will control for confounding factors (preoperative variables: demographics, medical and surgical history). Outcomes will be: surgical (intraoperative variables, such as operative room (OR) time, LOS, blood loss, surgical approach), and postoperative (follow-up compliance, and reoperation/readmission rates).

## NEXT STEPS/DELIVERABLES

- We anticipate rural patients will have lower compliance rates, and higher postoperative complication rates(reoperation/readmission). Intraoperative data, LOS, OR time etc., may be similar.
- Nebraska Medicine is an academic medical center located in an urban area, so the majority of patients in the existing health record will be urban.
- The data obtained from this project will help us submit an application for PAR-18-287: Health Services Research on Minority Health and Health Disparities.

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