Surgery Research Conference

General Surgery Research Update
May 9th, 2018
Research Highlights
Annual meeting of the Society of Black Academic Surgeons (SBAS)

1st Place Awarded to Chad Barnes, MD in the Claude H. Organ, Jr. Resident Research Competition for the project:

"Conditional Survival of Patients with Localized Pancreatic Cancer Treated with Neoadjuvant Therapy and Surgery: A Single Institution Experience."

Claude H. Organ, Jr., MD, FACS (1926-2005) was a renowned academic surgeon who was dedicated to mentoring young surgeons and encouraging diversity in the field of surgery. Dr. Organ was instrumental in starting the SBAS. In his honor, the SBAS created the Claude H. Organ, Jr. Resident Research Award in 2008 with the financial sponsorship of the Cleveland Clinic.
Milton and Lidy Lunda/Charles Aprahamian Professorship of Trauma Surgery at the Medical College of Wisconsin

Marc Anthony De Moya, MD
Chief, Associate Professor
Trauma/Acute Care Surgery
Publications

**Cardiothoracic Surgery**


**Colorectal Surgery**

“Pouch Volvulus in Patients Having Undergone Restorative Proctocolectomy for Ulcerative Colitis: A Case Series.” *Diseases of the Colon & Rectum* (Landisch RM, Knechtges PM, Otterson MF, Ludwig KA, Ridolfi TJ)

**Transplant Surgery**


**Vascular Surgery**


**Surgical Oncology**


“Improved surgical outcomes following radical cystectomy at high-volume centers influence overall survival.” *Urologic Oncology* (Scarberry K, Berger NG, Scarberry KB, Agrawal S, Francis JJ, Yih JM, Gonzalez CM, Abouassaly R)

**Transplant Surgery**


**Cardiothoracic Surgery**


**Colorectal Surgery**

“Pouch Volvulus in Patients Having Undergone Restorative Proctocolectomy for Ulcerative Colitis: A Case Series.” *Diseases of the Colon & Rectum* (Landisch RM, Knechtges PM, Otterson MF, Ludwig KA, Ridolfi TJ)

**Transplant Surgery**

The Word on Medicine: where Knowledge is changing life

Thyroid Nodules and Surgery May 19th at 4:00pm

Endocrinologists, radiologists, and surgeons discuss thyroid nodules, thyroid cancer, and thyroid surgery

Dr. Douglas Evans
Dr. Tracy Wang
Dr. Francisco Quiroz
Dr. Ty Carroll
Dr. Aditi Kumar
Dr. Beth Lalande
Next Month:

2017-2018 Research Residents

Kelly Boyle, MD
Jacqueline Blank, MD
Lindsey Clark, MD
Chad Barnes, MD

Wednesday, June 13
5:00-6:00 pm
Location: Cancer Center Conference Room M
General and Minimally Invasive Surgery Research Update

5/7/2018
Faculty
Research Staff

Melissa Helm, MSN, RN  
Research Nurse

Emily Hetzel, BS  
Data Analyst
Funding (Executed Contracts & Budgets)

- 2012: $65,000.00
- 2013: $120,000.00
- 2014: $120,000.00
- 2015: $230,000.00
- 2016: $262,500.00
Active Protocols (Human and Animal)

- 2010: 4
- 2012: 27
- 2013: 21
- 2014: 34
- 2015: 34
- 2016: 51
- 2017: 63
New Protocols (Human and Animal)

- 2010: 4
- 2011: 2
- 2012: 13
- 2013: 16
- 2014: 17
- 2015: 10
- 2016: 21
- 2017: 18
MIGS Faculty Peer Reviewed Publications (First or Senior Author)

- 2012: 10
- 2013: 3
- 2014: 5
- 2015: 14
- 2016: 13
- 2017: 23

Total: 73
Active Studies: MIGS
MIGS Database: QA and Future Research

• Pre-op, surgical, post-op details, as well as surveys are tracked in this clinical database for improvement/quality assurance activities

• Currently 2,862 patients
  – Foregut
  – Achalasia
  – Gastroparesis
  – Hernia

• Ongoing conversion to the Dacima electronic database from RedCap
Americas Hernia Society Quality Collaborative

- 1,400 ventral hernia MCW ventral hernia patients to-date
- Patient-centered data collection, ongoing performance feedback to clinicians, and improvement based on analysis of collected data and collaborative learning.
- Data: Patient demographics, Preoperative evaluation, Operative details, 30-day follow-up, Patient-entered long-term follow-up (+QOL), Surgeon-entered long-term follow-up
A Post-Approval Study of the LINX® Reflux Management System

- **PI:** J Gould
- **Collaborators:** A Kastenmeier
- **Centers:** 19 US hospitals
- **Purpose:** Prospective, multicenter, single-arm study, with patients as their own control to monitor the safety and efficacy of the LINX implant procedure and device in a post-approval environment to supplement existing safety and efficacy data.
- **Funding:** Torax Medical 30K, Amendment in progress to extend study to 10 years
- **Enrolled:** 2 at MCW, 200 nationally
Gastrointestinal Tract Recovery in Patients Undergoing Open Ventral Hernia Repair: A Multi-Center, Randomized, Double-Blind, Trial of Alvimopan and Placebo

- **PI:** M Goldblatt
- **Collaborators:** A Kastenmeier
- **Centers:** MCW, Cleveland Clinic, Greenville, New Hanover Medical Center, UW-Madison, University of North Carolina
- **Purpose:** Determine whether alvimopan is effective in decreasing postoperative ileus in patients undergoing VHR.
- **Funding:** Merck IIT grant 245K
Frailty to Predict Surgical Outcomes following Paraesophageal Hernia Repair

- PI: J Gould
- **Purpose**: Assess frailty in the PEH surgery population as it relates to morbidity and mortality.
- The ability to identify patients at risk of morbidity/mortality or limited positive surgical outcomes will allow our clinical team to create patient specific post-operative care plans and implement a diagnostic tool to assess patient success after surgery.
- **Enrolled**: 45 at MCW
Fig. 1
The scatterplot shows the 11-point mFI (x-axis) and 5-point mFI (y-axis) scores for 885 patients with complete data. The size of the points is proportional to the number of patients. The weighted Kappa statistic and p value are provided. For reference, a weighted Kappa of 1 would correspond to perfect agreement and 0 to no agreement between the two measures.
A Prospective, Multi-Center Study of Phasix™ Mesh for Ventral or Incisional Hernia Repair.

- **PI:** M Goldblatt
- **Collaborators:** J Gould, A Kastenmeier
- **Centers:** 12 US academic medical centers
- **Purpose:** Hernia recurrence and SSI occurrence rates through 60m post-op using Phasix™ Mesh in subjects with high risk of complications.
- **Funding:** C. R. Bard- First contract 75K, March 2018 amendment 50K
- **Enrolled:** 8 at MCW, 121 total
- **Currently conducting 42m follow-ups**
Registry Based, Randomized Controlled Trial comparing Long-Term Results of Heavyweight versus Medium Weight Mesh in Ventral Hernia Repair

- **PI**: M Goldblatt

- **Collaborators**: M Rosen (Cleveland Clinic), 4 Additional US Hospitals

- **Purpose**: Determine if the use of a medium weight material leads to a decrease in pain intensity, hernia recurrence, and QOL at one year following ventral hernia repair.

- **Sample Size**: 50 at MCW, 352 nationally
A Multi-Center Post-Market Single Arm Prospective Study of Parietene™ DS Composite Mesh in Subjects Undergoing Ventral Hernia Repair

- **PI**: M Goldblatt
- **Collaborators**: A Kastenmeier, R Higgins
- **Centers**: MCW, UW-Madison, 2 other sites TBD
- **Purpose**: Generate additional data for approval in Europe market. Assess hernia recurrence rates and clinical outcomes at 12m and 24m post-op.
- **Funding**: Medtronic 200K
The Role of the Robotic Arm in Inguinal Hernia Repair

- **PI**: R Higgins
- **Collaborators**: M Rosen (Cleveland Clinic), A Carbonell (Greenville), W Hope (New Hanover), J Blatnik (Wash U)
- **Purpose**: Determine the differences in post-op pain, cosmetic results, hernia recurrence, cost, and ergonomics for robotic vs. lap inguinal hernia repairs.
- **Sample**: 20 MCW, 100 total
  - 3 To-Date at MCW
Decreasing Readmissions within 72 hours of Discharge in General and Vascular Surgery Patients

- **PI**: J Gould
- **Collaborators**: L Clark (Research Resident), S Singh
- **Data**: NSQIP, FH/MCW EPIC
- **Purpose**: Determine the root cause of admissions within 72 hours in General/Vascular surgery patients at MCW over 1 year. Identify reasons for readmission within 72 hours in General/Vascular surgery patients on a national level using a large clinical dataset. Identify strategies to decrease the readmission rate in General/Vascular Surgery patients within 72 hours by > 50% over the course of 12 months.
42,316 patients were included with 6.4% readmitted within 30 days and 1.6% readmitted within 3 days of discharge (24.7% of all readmissions)
HCHAPS Patient Satisfaction with Hospital Discharge Process and Pain Management

- **PI:** J Gould
- **Purpose:** Determine if patient satisfaction with the discharge process and pain management during their hospital stay is associated with readmission within 30-days of hospital discharge and LOS.
  - Determine if the associations seen within FH/MCW patients are similarly valid at other academic medical centers with publicly available HCAHPS data.
Culture of Reporting Adverse Events: Breaks in the Sterile Field

- **PI**: M Goldblatt
- **Purpose**: Determine the attitudes of employees working in the OR towards reporting breaks in the sterile field.
- **Aim**: To create an intervention with which reporting of such adverse events will increase, thus increasing correction of said adverse event.
- **Responses**: 343 to-date
Active Studies: Bariatrics
Metabolic and Bariatric Surgery Accreditation and Quality Improvement Program

- 1,000+ MCW patients captured since 2011

- 2016 30d national reporting
The Influence of Pre-Operative Carbohydrate Loading on Post-operative Outcomes in Bariatric Surgery Patients: A Randomized, Controlled Trial

- **PI:** R Higgins
- **Collaborators:** K Lak, T Kindel, J Gould
- **Purpose:** Characterize the impact of pre-operative carbohydrate loading on post-operative outcomes in primary minimally invasive bariatric surgery patients.
- **Funding:** Froedtert Foundation $200
Hypertension resolution after bariatric surgery and the microbiome

- **PI**: T Kindel
- **Collaborators**: R Urrutia, N Salzman, J Kirby, M Zimmermann, J Baker
- **Centers**: FMLH/MCW Bariatric Surgery, GSPMC, Center for Microbiome Research
- **Purpose**: Determine how peri-operative antibiotics affect the post-operative gut microbiome and hypertension resolution rate after RYGB
- **Funding**: We Care grant submitted 2018, 50K
Hypertension resolution after bariatric surgery and the microbiome

Figure 1. Post-operative % resolution of hypertension in patients undergoing Roux-en-Y gastric bypass. (*) p<0.05 comparing cefazolin to clindamycin for designated time point.
Hypertension resolution after bariatric surgery and the microbiome: Study Timeline

Study design: prospective
Enrollment #: 114 adult, hypertensive, female, RYGB
Samples: Isolation of bacterial DNA
16s rRNA bacterial gene sequencing
-abundance, diversity, evenness, richness
Bioinformatics and statistical analysis
Structural and Clinical Changes in Chronic Kidney Disease after Bariatric Surgery

• **PI:** T Kindel
• **Collaborators:** T Khairi, E Saad
• **Purpose:** Examine symptoms of CKD, structural changes of the kidney after bariatric surgery, and QOL of patients with late-stage CKD post-op; number reaching successful BMI listing
• 7 patients enrolled/80 needed
Mechanisms for cardiac recovery after bariatric surgery

- **PI:** T Kindel
- **Collaborators:** John Corbett, PhD; Michael Widlansky MD, Jenny Strande MD, PhD, Randy Seeley, PhD (U of Michigan)
- **Purpose:** explore the novel mechanism for cardiac recovery after bariatric surgery induced by cardiac GLP-1R and PPARα, resulting in improved substrate utilization including fatty acid oxidation, insulin signaling, and cellular apoptosis
- **Funding**
  - KL2TR001438 (4/2017-4/2019, +1 renewable), $272,000
  - 4 year K08r1 submitted NHLBI
“Metabolic Cardiomyopathy”

Diabetic Cardiomyopathy

Obesity Cardiomyopathy

Hyperglycemia, insulin resistance, and hyperinsulinemia

Cardiac insulin resistance and metabolic disorders

Mitochondria dysfunction

Activated RAAS

Impairment of mitochondrial Ca²⁺ handling

Inflammation

Oxidative stress

Microvascular dysfunction

Autonomic neuropathy

AGEs

Endoplasmic reticulum stress and cell death

Cardiac stiffness, hypertrophy and fibrosis

Cardiac diastolic dysfunction and systolic dysfunction

Heart Failure

Original article

Bariatric surgery improves cardiac function in morbidly obese patients with severe cardiomyopathy

C. A. McCloskey, M.D., G. V. Ramani, M.D., M. A. Mathier, M.D., P. R. Schauer, M.D., G. M. Eid, M.D., S. G. Mattar, M.D., A. P. Courcoulas, M.D., R. Ramanathan, M.D.

aDepartment of Surgery, University of Pittsburgh Medical Center, Pittsburgh, Pennsylvania
bDepartment of Cardiology, University of Pittsburgh Medical Center, Pittsburgh, Pennsylvania
cDepartment of Surgery, Cleveland Clinic, Cleveland, Ohio
dDepartment of Surgery, Indiana University, Indianapolis, Indiana

Received May 27, 2006; revised May 23, 2007; accepted May 26, 2007
Bariatric surgery improves cardiac geometry and diastolic function

- ↑ Stroke Volume
- LV Hypertrophy
- Impaired relaxation
- LV Dilation

- Decreased LV Mass
- Decreased EDD
- Decreased EDV
- Decreased IVRT
Metabolic Cardiomyopathy
“Weight loss not required?”

- Significant Weight loss
- Decreased body mass
- Improvement in co-morbidities
- Entero-cardiac axis
- Microbiome
- GI hormones (GLP-1)
- Bile Acids

Froedtert & Medical College of Wisconsin
SG preserves systolic function independent of weight loss
SG improves diastolic dysfunction independent of weight loss
SG decreases stress-induced myocardial signaling and changes in glucose transporter expression independent of weight-loss
“Metabolic Cardiomyopathy”

Hyperglycemia, insulin resistance, and hyperinsulinemia

Cardiac insulin resistance and metabolic disorders

Mitochondria dysfunction
Activated RAAS
Impairment of mitochondrial Ca²⁺ handling

Inflammation
Oxidative stress
Microvascular dysfunction

Autonomic neuropathy
AGEs
Endoplasmic reticulum stress and cell death

Cardiac stiffness, hypertrophy and fibrosis

Cardiac diastolic dysfunction and systolic dysfunction
Heart Failure

Structural and Clinical Changes in Advanced Heart Failure after Bariatric Surgery

• PI: T Kindel, MD
• Collaborators: Asim Mohammed, MD; J Strande, MD, PhD
• Purpose: Examine the symptoms of heart failure and structural changes of the heart after bariatric surgery in advanced heart failure, as well as what genetic aspects of the heart may predict improvement in cardiac function after surgery.
• 10 patients enrolled/250 needed
Questions
Next Month:

2017-2018 Research Residents

Kelly Boyle, MD  
Jacqueline Blank, MD

Lindsey Clark, MD  
Chad Barnes, MD

Wednesday, June 13  
5:00-6:00 pm  
Location: Cancer Center Conference Room M