

# 2019 Annual Meeting

FINAL PROGRAM



July 28-30, 2019

| French Lick, IN

| French Lick Springs Hotel

Midwest Surgical Association would like to thank the following organization for their marketing support of the 2019 Annual Meeting:

## **Medtronic | Gold Sponsor**

Midwest Surgical Association would like to thank the following exhibiting companies for their generous support:

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## Officers, Councilors, & Past Presidents

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### TERM ENDING

#### OFFICERS

Nicholas Zyromski   President	2019
Constantine Godellas   President Elect	2019
Ashraf Mansour   Secretary	2021
David Farley   Treasurer	2019
Jeffrey Hardacre   Recorder	2020

#### ACS REPRESENTATIVES

William Cirocco   ACS Board of Governors	2021 (Term 1)
Christopher McHenry   ACS Advisory Council for General Surgery	2019

#### PAST PRESIDENTS

William Cirocco   Immediate Past President	
Margo Shoup   Past President 1	
Conor Delaney   Past President 2	

#### COUNCILORS

Alfred Baylor	2019
Maggie Brandt	2021
Arthur Carlin	2019
Matthew Chung	2021
Heather Dolman	2020
Nicole Kennedy	2019
Jonathan Saxe	2020
Stephanie Valente	2021
Scott Wilhelm	2020

James Tyburski   MSA Foundation President	2019
Richard Berg   Historian	2021

## Committees

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### TERM ENDING

#### EDITORIAL

Jeffrey Hardacre   Chair	2019
Nicholas Zyromski   Ex-Officio	
James Madura	2019
Marshall Baker	2020
Maggie Brandt	2021
Peter Ekeh	2022

#### MEMBERSHIP

Amber Traugott   Chair	2019
Nicholas Zyromski   Ex-Officio	
Ashraf Mansour   Ex-Officio	
Todd Brandon	2019
Jonathon Myers	2019
Michael Valente	2020
Joshua Mammen	2020
Mark Reintjes	2021
Leonard Henry	2021

#### PROGRAM

C. Max Schmidt   Chair	2019 ( <i>serves as Past Chair in 2020</i> )
Nicholas Zyromski   Ex-Officio	
Ashraf Mansour   Ex-Officio	
Jeffrey Hardacre   Ex-Officio	
Theodor Asgeirsson   Past Chair	
James Ouellette	2021
Scott Steele	2022
Gerard Abood	2021

## Committees

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### TERM ENDING

#### **AUDIT**

Anthony Senagore | Chair

2019

Peter Hallowell

2019

#### **LOCAL ARRANGEMENTS**

Dharmesh Patel | Chair

2019

Amy Banks-Venegoni

2019

Allan Lamb

2019

#### **IT COMMITTEE (AD HOC)**

Michael Valente | Chair

Matthew Deppe

Chadrick Evans

# Objectives

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## **At the end of this activity, participants will be able to...**

1. Discuss information presented on the research activities of the association's members and make clinical decisions based on current evidence within their practices.
2. Apply information gained through broad view, collaborative research into future basic and clinical research activities.
3. Utilize research results to initiate optimization of the educational experience to maximally benefit resident training within the framework of work hour restrictions.
4. Implement a strategy to establish new technologies within the context of the individual's current surgical practice.
5. Develop an understanding of current issues relevant to the advancement of the art and practice of surgery, specifically in the evaluation and management of hernia, breast, endocrine, gastrointestinal, thoracic, vascular, pediatric surgery, trauma / critical care and emergency/ acute care surgical disease.

## **Disclosure Information**

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In compliance with the ACCME Accreditation Criteria, the American College of Surgeons, as the accredited provider of this activity, must ensure that anyone in a position to control the content of the educational activity has disclosed all relevant financial relationships with any commercial interest. All reported conflicts are managed by a designated official to ensure a bias-free presentation. Please reference the list at the registration desk for the final disclosure list.



## CONTINUING MEDICAL EDUCATION CREDIT INFORMATION

### Accreditation

This activity has been planned and implemented in accordance with the Essential Areas and Policies of the Accreditation Council for Continuing Medical Education (ACCME) through the joint providership of the American College of Surgeons and the Midwest Surgical Association. The American College of Surgeons is accredited by the ACCME to provide continuing medical education for physicians.

### AMA PRA Category 1 Credits™

#### Annual Meeting

The American College of Surgeons designates this live activity for a maximum of **11.5** AMA PRA Category 1 Credits™. Physicians should claim only the credit commensurate with the extent of their participation in the activity.

Of the AMA PRA Category 1 Credits™ listed above, a maximum of **9.75** credits meet the requirements for Self-Assessment.



AMERICAN COLLEGE OF SURGEONS  
Inspiring Quality:  
Highest Standards, Better Outcomes



AMERICAN COLLEGE OF SURGEONS  
DIVISION OF EDUCATION  
Accredited with Commendation by the  
Accreditation Council for Continuing Medical Education



## Past Presidents of the MSA

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William C. Cirocco, MD, Mackinac Island, MI, 2018  
Margo C. Shoup, MD, Chicago, IL, 2017 (CSA/MSA)  
Conor P. Delaney, MD, MCh, PhD, Mackinac Island, MI, 2016  
James Tyburski, MD, Lake Geneva, WI, 2015  
Raymond P. Onders, MD, Mackinac Island, MI, 2014  
Stephen F. Sener, MD, Acme, MI, 2013  
Richard A. Berg, MD, Mackinac Island, MI, 2012  
Roxie M. Albrecht, MD, Galena, IL, 2011  
Donn M. Schroder, MD, Mackinac Island, MI, 2010  
Jerry M. Hardacre, II, MD, Lake Geneva, WI, 2009  
James R. DeBord, MD, Mackinac Island, MI, 2008  
Anthony Senagore, MD, Farmington, PA, 2007  
Christopher McHenry, MD, Mackinac Island, MI, 2006  
Steven A. De Jong, MD, Niagara-on-the-Lake, Ontario,  
Canada, 2005  
Donald W. Moorman, MD, Mackinac Island, MI, 2004  
John P. Hoffman, MD, Galena, IL, 2003  
Larry R. Lloyd, MD, Mackinac Island, MI, 2002  
Donald J. Scholten, MD, Lake Geneva, WI, 2001  
Thomas A. Stellato, MD, Mackinac Island, MI, 2000  
Norman C. Estes, MD, Galena, IL, 1999  
Darrell A. Campbell, Jr., MD, Mackinac Island, MI, 1998  
Richard A. Prinz, MD, Sawmill Creek, OH, 1997  
Thomas A. Broadie, MD, Mackinac Island, MI, 1996  
Jason H. Bodzin, MD, Grand Traverse, MI, 1995  
Willard S. Stawski, MD, Mackinac Island, MI, 1994  
Gerard V. Aranha, MD, Lincolnshire, IL, 1993  
William C. Boyd, MD, Mackinac Island, MI, 1992  
Douglas B. Dorner, MD, Grand Traverse, MI, 1991  
John L. Glover, MD, Mackinac Island, MI, 1990  
Jack Pickleman, MD, Kohler, WI, 1989

## Past Presidents of the MSA

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Samuel D. Porter, MD, Mackinac Island, MI, 1988  
William H. Baker, MD, Lake Geneva, WI, 1987  
Scott W. Woods, MD, Mackinac Island, MI, 1986  
Angelos A. Kambouris, MD, Lake Geneva, WI, 1985  
Richard E. Dean, MD, Mackinac Island, MI, 1984  
Anna M. Ledgerwood, MD, Sawmill Creek, OH, 1983  
Robert T. Soper, MD, Mackinac Island, MI, 1982  
G. Howard Glassford, MD, Lake Geneva, WI, 1981  
Clark Herrington, MD, Mackinac Island, MI, 1980  
Kenneth J. Printen, MD, Lincolnshire, IL, 1979  
Robert D. Allaben, MD, Mackinac Island, MI, 1978  
Richard S. Webb, MD, Itasca, IL, 1977  
Charles E. Lucas, MD, Mackinac Island, MI, 1976  
Frank A. Folk, MD, Itasca, IL, 1975  
Robert F. Wilson, MD, Mackinac Island, MI, 1974  
William H. Marshall, MD, Oakbrook, IL, 1973  
Ernest M. Berkas, MD, Mackinac Island, MI, 1972  
Wendell J. Schmidtke, MD, Valparaiso, IN, 1971  
Robert J. Freeark, MD, Kalamazoo, MI, 1970  
Robert A. De Bord, MD, Peoria, IL, 1969  
Vernon L. Guynn, MD, Lake Geneva, WI, 1968  
Jack C. Cooley, MD, Champaign-Urbana, IL, 1967  
Robert P. Hohf, MD, St. Charles, IL, 1966  
Douglas R. Morton, MD, St. Charles, IL, 1965  
William H. Harridge, MD, St. Charles, IL, 1964  
John B. Moore, III, MD, Champaign-Urbana, IL, 1963  
Peter V. Moulder, MD, Genoa City, WI, 1962  
Thomas W. Samuels, Jr., MD, Chicago, IL, 1961  
James Cross, MD, Rockton, IL, 1960  
Loring S. Helfrich, MD, Rockton, IL, 1959  
Loring S. Helfrich, MD, Rockton, IL, 1958

## About the MSA

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The Midwest Surgical Association is a surgical organization made up of surgeons who have established reputations as practitioners, authors, teachers, and/or original investigators. The objective of this society is to exemplify and promote the highest standards of surgical practice, especially among young surgeons in the Midwest. The annual meeting is held in late July/early August each year in different locations throughout the Midwest and consists of a stimulating scientific program of the highest quality and a social program planned with children and families in mind.

### **MIDWEST SURGICAL ASSOCIATION**

913-402-7102

[msa@lp-etc.com](mailto:msa@lp-etc.com)

[www.midwestsurg.org](http://www.midwestsurg.org)

# New Members

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**Congratulations and welcome to the following  
New Members elected at the 2018 Annual Meeting:**

## **ASSOCIATE**

Barrett Kielhorn DO | Wyoming, MI

Douglas Slakey MD | Oak Lawn, IL

Anthony Tabatabai DO | Grand Blanc, MI

## **ACTIVE**

Ryan Conway MD | Grand Rapids, MI

Gabriel Gallardo MD | Grand Rapids, MI

Emre Gorgun MD | Cleveland, OH

Ashley Hardy MD | Goshen, IN

Mark Jones DO | Lansing, MI

Jill Onesti MD | Grand Rapids, MI

Benjamin Poulouse MD, MPH | Columbus, OH

Debra Pratt MD | Cleveland, OH

Robert Sawyer MD | Kalamazoo, MI

Karlin Sevensma DO | Wyoming, MI

Lora Silverman MD | Grand Rapids, MI

Tarik Wasfie MD | Flint, MI

## Midwest Surgical Association Foundation

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The Midwest Surgical Association Foundation funding will be used for research awards, programming, special lectureship honorariums, and other appropriate scientific, research, or educational purposes.

The Midwest Surgical Association Foundation is a non-profit organization that is committed to exemplify, support, and promote the highest standards of surgical practice, especially among young surgeons of the Midwest. The Foundation has been organized to pursue exclusively charitable, educational, scientific, benevolent, and eleemosynary purposes including the promotion of surgical education and research that qualifies it as an exempt organization under Section 501(c)3 of the Internal Revenue Code of 1986 and exempt from taxation under Section 501(a).

The Foundation may engage directly in charitable, educational, scientific, benevolent, or eleemosynary activities, including activities to promote surgical education and research. With increased support, these key arenas will strengthen the Association.

Not everyone has the time to participate in all Midwest Surgical Association activities and conferences, but by donating to the Foundation you are able to help support current activities, conferences, research, and lectureships as well as future projects.

The Foundation is now able to accept donations from members or nonmembers. If you would like to support

# Midwest Surgical Association Foundation

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the Association through its Foundation, both current and deferred gifts may be made. These donations are tax deductible and should be made out directly to:

## **Midwest Surgical Association Foundation**

P.O. Box 219191

Kansas City, MO 64121-9191

913-402-7102

[msa@lp-etc.com](mailto:msa@lp-etc.com)

[www.midwestsurg.org/foundation/donate](http://www.midwestsurg.org/foundation/donate)

Federal Tax I.D. Number: 20-8529483

If you have any questions, please contact MSA Headquarters at **913-402-7102**.

## **MSAF Board Members**

James Tyburski | President

Conor Delaney | Vice President

Secretary/Treasurer | Margo Shoup

Board of Directors:

William Cirocco

Nicholas Zyromski

Constantine Godellas

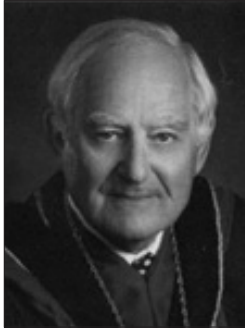


# LECTURES



## Alexander J Walt, 1923-1996

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Alex Walt was born in Cape Town, South Africa after his parents Isaac and Lea escaped religious persecution in Lithuania. He began medical school in 1940, but left to serve in the 6th South African Armored Division of the 5th US Army in WWII. He finished medical school at the University of Cape Town in 1948 and completed

an internship at Groote Schuur Hospital in Cape Town. He continued his surgery residency training at the Royal College of Surgeons in London and the Mayo Clinic in Rochester, Minnesota. Dr Walt began his career in Detroit in 1961 joining the Department of Surgery at Wayne State University at Allen Park, VA. He quickly established himself in Detroit and served as Chief of Surgery at Detroit Receiving Hospital and Harper Hospital, and Penberthy Chair of the Department of Surgery at Wayne State University School of Medicine from 1966 to 1988, as well as assistant and Associate Dean from 1965 to 1970. Following a sabbatical at Oxford University, Dr Walt returned to Detroit to establish the Comprehensive Breast Center of the Karmanos Cancer Institute which now bears his name, the "Alexander J Walt Center". He was named Distinguished Professor of Surgery at Wayne State University in 1990. The author of 165 publications, he served as Vice President of the ASA, President of the AAST, and ABMS. He was Chair of the American College of Surgeons Board of Regents from 1991-1993 and was subsequently the 75th President of the ACS in 1994. Dr Walt trained countless medical students and surgical residents and had a lasting impact on both their careers and Wayne State University. Five of his WSU faculty have served as Presidents of the Midwest Surgical, Berkas (1972), Wilson (1974), Lucas (1976), Allaben (1978), and Ledgerwood (1983); as well as five medical students and residents, Bodzin (1995), Lloyd (2002), Schroder (2010), Tyburski (2015), and Cirocco (2018). Most notably for our Midwest Surgical Association, he was the Harridge lecturer in 1974. He and his wife Irene had 3 children, John, Steven, and Lindsay. His parting words were "work hard, be honest, and the rest will take care of itself".

## Alexander J. Walt Historical Lecture

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### ***A Fur Trapper, an Errant Musket Shot, and the Start of GI Physiology***

**Sunday, July 28, 2019**

**8:45pm - 9:00pm | Clifton**

Introduction: Nicholas J Zyromski MD

Indiana University School of Medicine

Featuring:

**Michael G Sarr MD**

Mayo Clinic

Dr Sarr is the J.C. Masson Professor Emeritus of Surgery at the Mayo Clinic, Rochester, Minnesota having retired a year ago. After finishing his surgery training at the Johns Hopkins Hospital in 1984 and 2 fellowships in experimental surgery, he was on staff for 30 years in the Division of General and GI Surgery which he chaired for 10 years. Aside from an NIH-funded laboratory for 25 years in GI Physiology, his clinical interests have been in pancreatic surgery, bariatric surgery, and abdominal wall reconstruction. He is member of most of the General and GI surgical associations and has been president of the SSAT and the International Society of Surgery. His bibliography includes over 550 peer-reviewed publications and 13 separate books. Dr Sarr is currently one of the 2 co-editors of the journal SURGERY.

# Alexander J. Walt Historical Lecture

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William Cirocco MD

2018

## Scott Warner Woods, 1927-2003

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When attending a Midwest Surgical Association meeting, it takes little effort to almost believe that the haunting notes of a bagpipe still echo in the air. For many years, that sound accompanied the sight of a kilt-clad Scott Warner Woods as he stood wearing his trademark hand-tied tartan bow tie and played to announce the beginning of another annual meeting.

Scott W. Woods, except for his brief stint in Korea with the U.S. Army at the end of World War II, was a life-long Michiganiaan. He was born in Detroit and in 1950 he received his undergraduate degree from the University of Michigan. He then attended Wayne State University College of Medicine and graduated in 1954. After an internship at Wayne County General Hospital, he completed a surgical residency at Wayne State University in 1960. That same year, he achieved his second greatest accomplishment when he established his first solo practice in Ypsilanti, MI. By 1964, he managed to attain his life's greatest accomplishment when he married his beloved Bette.

Second only to his family, Scott loved the Midwest Surgical Association best and served it tirelessly. He was Treasurer of the Association for a decade before ascending to its presidency in 1986. He championed the controversial decision to bring the Annual Meeting to Mackinac Island. Widely questioned at the time due to the island's remoteness and perceived inaccessibility, this location has easily become the best attended and most well-loved site for the annual conference. In 1987, after a long and successful surgical career as a private practitioner and as Clinical Associate Professor of Surgery at Wayne State University, Scott retired from active surgical practice in 1987 due to complications from arthritis. Scott and Bette remained together in Ypsilanti for the rest of his life.

## **Scott Warner Woods, 1927-2003**

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Scott viewed retirement as a chance to cut back to only 50 or 60 hours of work each week. He remained an important part of his community in Ypsilanti, where he served on the city council, the board of the Ypsilanti Savings Bank, the Chamber of Commerce (including a term as president), with the Lions Club and as a trustee of Cleary College. He reviewed disability claims for the state and worked for the Michigan Peer Review Organization. Scott received many honors and awards from the numerous professional organizations that were proud to call him a member. These organizations included the American College of Surgeons, the Academy of Surgery of Detroit and the Detroit Surgical Association. He was awarded an honorary doctorate from Cleary College for his years of service. His highest accolade occurred in 1995 when both Scott and Bette were selected to receive the Distinguished Philanthropist Award from the American College of Surgeons.

Surgeon, teacher, community leader, philanthropist, husband, father and friend—Scott's death left an empty place in the hearts of all who knew him. He gave selflessly during life and will continue to give in death. Gone is the man, but not the memory.

## Scott Warner Woods Memorial Lecture

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### ***The Roles Music and Music Therapy Played in My Recovery***

**Monday, July 29, 2019**

**9:15am - 9:45am | Clifton**

Introduction: Nicholas J Zyromski MD

Indiana University School of Medicine

Featuring:

**Greg Markell**

Mentor, OH

Profession: Director of Community/Public Affairs for the Lake County, OH Alcohol, Drug Addiction, and Mental Health Services (ADAMHS) Board. Guitar plucker/singer in a local acoustic trio. Music was a huge factor in my comeback story from a 2011 ruptured brain aneurysm that hit me while I was doing a solo gig at a fundraiser.

## Scott Warner Woods Memorial Lecture

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Timothy M. Pawlik, MD, MPH, PhD	2018
CSA/MSA Combined Meeting - N/A	2017
R. Matthew Walsh, MD	2016
Rahul Vaidya, MD	2015
David B. Hoyt, MD	2014
Christy A. Russell, MD	2013
O. Willian Brown, MD, JD	2012
David B. Hoyt, MD	2011
David B. Hoyt, MD	2010



## William Hunter Harridge, 1919–1971

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Bill Harridge was a man of uncommon energy, integrity, and honesty. His personal enthusiasm, as well as his organizational abilities, made him an outstanding leader of men and organizations. This was evident early in his life as he served with distinction as a company commander of an Army tank unit. In 1945, he suffered a severe open-chest wound in France causing his discharge from the Army with the rank of major.

In 1963, after much discussion and thought, a decision was made to disband the Midwest Surgical Society. Fortunately for our present Society, Bill was persuaded to assume the Presidency for the coming year. Under his leadership, the Society was resurrected, its geographical base was expanded, and it has flourished ever since.

With the exception of his father, Will Harridge, Sr., who was the President of the American Baseball League, Bill's relationship with Dr. Warren Cole was the most important in his life. Dr. Cole writes: "Bill had good judgment, sincerity, determination, willingness to discipline himself...he had complete honesty and integrity... compassion, a characteristic so necessary if one is to become a fine physician."

Bill graduated from the University of Illinois College of Medicine in 1950 and served his internship and residency under Dr. Cole from 1950 to 1956. While he entered private practice in Evanston, Illinois, he maintained an active clinical affiliation with the University and was promoted to the rank of Clinical Professor. In May of 1970, he received the Distinguished Service Award in recognition of his contribution to the Department of Surgery.

## **William Hunter Harridge, 1919-1971**

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Bill was a strong advocate of doctors determining their own professional organizations. He was a Diplomat of the American Board of Surgery and belonged to the Warren H. Cole Society (President 1968-69), Midwest Surgical Association (President 1964-65), North Suburban Branch of the Chicago Medical Society (President 1969-70), Chicago Surgical Society (Recorder 1967-70), The Western Surgical Association, The Illinois Surgical Society, The Society for Surgery of the Alimentary Tract, North Shore Chapter American Cancer Society (President 1966-68), The Institute of Medicine of Chicago and the American College of Surgeons. His many contributions to the surgical literature were primarily related to peripheral vascular and biliary tract disease.

Beloved by his patients and respected for his abilities by his surgical colleagues, Bill Harridge is most remembered for his rigid adherence to the principle of fairness, honesty, and forthrightness in all situations.

## William Hunter Harridge Memorial Lecture

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### ***Vagal Things and Guitar Strings: The Evolution of Ulcer Surgery and the Electric Blues from Chicago's South Side***

**Monday, July 29, 2019**

**12:15pm - 1:00pm | Clifton**

Introduction: Nicholas J Zyromski MD | Indiana University School of Medicine

Featuring:

**Jeffrey B Matthews MD**

University of Chicago

Dr. Jeffrey B. Matthews is the Dallas B. Phemister Professor of Surgery, Chairman of the Department of Surgery, and Surgeon-in-Chief of The University of Chicago Medicine. A graduate of Harvard College and Harvard Medical School, Dr. Matthews completed surgical residency at Beth Israel Hospital in Boston and a hepatobiliary fellowship at the University of Bern. During his appointment at Harvard Medical School and Beth Israel Hospital, he rose to the rank of Associate Professor of Surgery and Chief of the Division of General Surgery at the Beth Israel Deaconess Medical Center. In 2001, he was appointed Christian R. Holmes Professor and Chairman of the Department of Surgery at the

## **William Hunter Harridge Memorial Lecture**

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University of Cincinnati until assuming his current position in 2006.

Dr. Matthews is a leading expert in pancreaticobiliary and gastrointestinal surgery. He has over 150 original articles and other publications. He led a federally funded research laboratory studying the regulation of epithelial transport and barrier function for over two decades. He serves on the Editorial Board of 11 scientific journals and is Editor-in-Chief Emeritus of the Journal of Gastrointestinal Surgery. He is the Chair of the Surgery Residency Review Committee of the Accreditation Council for Graduate Medical Education. He is a senior Director of the American Board of Surgery, and past President of the Society of Surgical Chairs, the Society of University Surgeons and the Society for Surgery of the Alimentary Tract (SSAT).

# William Hunter Harridge Memorial Lecture

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Ian C. Lavery, MD	2018	Robert E. Hermann, MD	1983
Anees B. Chagpar, MD, MSc, MPH, MA, MBA	2017	Ward O. Griffen, MD	1982
John J. Fung, MD, PhD	2016	Robert Condon, MD	1981
Richard A. Santucci, MD	2015	Robert J. Freeark, MD	1980
Jeffrey L. Ponsky, MD	2014	John Glover, MD	1979
Fred A. Weaver, MD, MMM	2013	Robert Bartlett, MD	1978
Daniel B. Michael, MD, PhD	2012	J. Wesley Alexander, MD	1977
Leigh Neumayer, MD	2011	Raymond Read, MD	1976
Kirby I. Bland, MD	2010	Hushang Javid, MD	1975
Jay L. Grosfeld, MD	2009	*Alexander J. Walt, MD	1974
Douglas J. Mathisen, MD	2008	Warren H. Cole, MD	1973
Terry Hicks, MD	2007	Lester R. Dragstedt, MD	1972
George I. Irvin, III, MD	2006	Allan M. Lansing, MD	1971
J. David Richardson, MD	2005	Lester R. Dragstedt, MD	1962
Josef E. Fischer, MD	2004	Warren H. Cole, MD	1960
Stephen D. Leach, MD	2003		
Charles E. Lucas, MD	2002		
J. Wayne Meredith, MD	2001		
Michael W. L. Gauderer, MD	2000		
Glenn D. Steele, Jr., MD, PhD	1999		
Layton F. Rikkers, MD	1998		
Gregorio A. Sicard, MD	1997		
John P. Delaney, MD, PhD	1996		
Keith A. Kelly, MD	1995		
Robert E. McAfee, MD	1994		
Richard L. Simmons, MD	1993		
David S. Mulder, MD	1992		
Donald D. Trunkey, MD	1991		
Lazer Greenfield, MD	1990		
Erwin R. Thal, MD	1989		
J. Patrick O'Leary, MD	1988		
Robert W. Barnes, MD	1987		
Jeremiah G. Turcotte, MD	1986		
Steven G. Economou, MD	1985		
Jerry M. Shuck, MD	1984		

*\*First official Harridge Lecturer*

## Presidential Address

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### ***Music, Medicine, and Mind***

**Tuesday, July 30, 2019**

**12:15pm - 12:45pm | Clifton**

Introduction: Constantine V Godellas MD

Loyola University Medical Center

Featuring:

### **Nicholas J Zyromski MD**

Indiana University School of Medicine

Nicholas J. Zyromski, MD: is Professor of Surgery and the HPB Surgery Fellowship program director at the Indiana University School of Medicine in Indianapolis, IN. Dr. Zyromski completed medical school and residency at the Medical College of Ohio in Toledo, OH. He completed an NIH sponsored research fellowship in GI surgery at the Mayo Clinic, Rochester, MN, and a clinical Hepato-Pancreatico-Biliary surgery fellowship at Indiana University. His clinical interest is focused on pancreatic disease, particularly acute and chronic pancreatitis. His research program has studied the negative influence of obesity on pancreatitis and pancreatic cancer, and is currently focused on influence of stem cells on modulating the inflammation of acute pancreatitis. His clinical research focus includes management of necrotizing pancreatitis as well as intraoperative HPB ultrasound.

## Schedule At-a-Glance

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### SUNDAY, JULY 28, 2019

- 4:00pm - 6:00pm    **MSA Registration**, Clifton Foyer
- 2:00pm - 4:00pm    **Executive Council Meeting**,  
Kruetzing 104 - Lower Level
- 5:30pm - 6:00pm    **New Member Reception**, Lower Gardens
- 6:00pm - 7:00pm    **Welcome Reception**, Lower Gardens
- 8:00pm - 10:00pm   **Children's Movie Presentation**,  
Murdock 101 - Lower Level
- 8:45pm - 9:00pm    **Alexander J. Walt Historical Lecture**,  
Clifton Ballroom
- 9:00pm - 11:00pm   **Spectacular Problems in Surgery**,  
Clifton Ballroom

### MONDAY, JULY 29, 2019

- 7:00am - 1:00pm    **MSA Registration**, Clifton Foyer
- 7:00am - 1:00pm    **Exhibit Hall Hours**, Taggart Hall
- 7:00am - 8:30am    **Continental Breakfast**, Taggart Hall
- 7:00am - 8:00am    **5K Fun Run**
- 7:00am - 7:55am    **Poster Rounds**, Clifton Ballroom
- 8:10am - 8:15am    **Welcome & Introductions**, Clifton Ballroom
- 8:15am - 9:15am    **Scientific Session 1**, Clifton Ballroom
- 9:15am - 9:45am    **Scott Warner Woods Memorial Lecture**,  
Clifton Ballroom
- 9:45am - 10:00am   **Morning Break**, Taggart Hall
- 10:00am - 12:15pm   **Scientific Session 2**, Clifton Ballroom



## Schedule At-a-Glance

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10:00am - 11:00am	<b>Guest Program   Trolley Tour,</b> Main Entrance
12:15pm - 1:00pm	<b>William H. Harridge Memorial Lecture,</b> Clifton Ballroom
1:30pm	<b>Golf Tournament,</b> Valley Links
1:30pm - 4:00pm	<b>Private Car Collection Tour</b>
2:00pm - 3:00pm	<b>Horseback Riding</b>
6:30pm - 10:00pm	<b>Nonie Lowry Reception and Dinner Dance,</b> Windsor Ballroom

### TUESDAY, JULY 30, 2019

7:30am - 1:00pm	<b>MSA Registration,</b> Clifton Foyer
7:30am - 1:30pm	<b>Exhibit Hall Hours,</b> Taggart Hall
7:15am - 8:00am	<b>Industry Sponsored Breakfast,</b> Murdock 101
7:30am - 9:00am	<b>Continental Breakfast,</b> Taggart Hall
8:05am - 8:15am	<b>Welcome &amp; Introductions,</b> Clifton Ballroom
8:15am - 10:15am	<b>Scientific Session 3,</b> Clifton Ballroom
10:00am - 11:00am	<b>Guest Program - Pete Dye Mansion Tour</b>
10:15am - 10:30am	<b>Morning Break,</b> Taggart Hall
10:30am - 12:15pm	<b>Scientific Session 4,</b> Clifton Ballroom
12:15pm - 12:45pm	<b>Presidential Address,</b> Clifton Ballroom
12:45pm - 1:30pm	<b>MSA Annual Business Meeting,</b> Clifton Ballroom
5:00pm - 7:00pm	<b>MSA Backyard Games and Reception,</b> Lower Gardens

## Family Program

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### SUNDAY, JULY 28, 2019

- 4:00pm – 6:00pm    **MSA Registration**, Clifton Foyer
- 5:30pm – 6:00pm    **New Member Reception**, Lower Gardens
- 6:00pm – 7:00pm    **Welcome Reception**, Lower Gardens
- 8:00pm – 10:00pm   **Children's Movie Presentation**,  
Murdock 101 - Lower Level

### MONDAY, JULY 29, 2019

- 7:00am – 8:00am    **5k Fun Run**
- 7:00am – 1:00pm    **Registration**, Clifton Foyer
- 10:00am – 11:00am   **Guest Program: Guided Trolley Tour**
- 1:30pm                **Golf or Private Car Collection Tour**
- 2:00pm                **Horseback Riding**
- 6:30pm – 10:00pm   **Nonie Lowry Reception and Dinner**  
**Dance**, Windsor Ballroom

### TUESDAY, JULY 30, 2019

- 7:30am – 1:00pm    **Registration**, Clifton Foyer
- 10:00am – 11:00am   **Guest Program: Historic Tour of**  
**Pete Dye Mansion**
- 5:00pm – 7:00pm    **MSA Backyard Games and Reception**,  
Lower Gardens





# SCIENTIFIC PROGRAM



*Surgeon in Training Award Qualifiers*



*Best Paper by a New Member Award Qualifiers*



*Featured Posters*

## SUNDAY, JULY 28, 2019

4:00pm - 6:00pm | Clifton Foyer

### **MSA Registration**

2:00pm - 4:00pm | Kruetzing 104 - Lower Level

### **Executive Council Meeting**

5:30pm - 6:00pm | Lower Gardens

### **New Member Reception**

6:00pm - 7:00pm | Lower Gardens

### **Welcome Reception**

8:00pm - 10:00pm | Murdock 101 - Lower Level

### **Children's Movie Presentation**

8:45pm - 9:00pm | Clifton Ballroom

### **Alexander J. Walt Historical Lecture**

Introduction: Nicholas Zyromski MD | Indiana University  
School of Medicine

### **A Fur Trapper, an Errant Musket Shot, and the Start of GI Physiology**

Michael G Sarr MD

Mayo Clinic

9:00pm - 11:00pm | Clifton Ballroom

### **Spectacular Problems in Surgery**

Moderator: Nicholas Zyromski MD | Indiana University  
School of Medicine

9:00pm - 9:15pm

#### **SP 1 UNCHARTED TERRITORY IN NECROTIZING PANCREATITIS: MULTIPLE VISCERAL ARTERY PSEUDOANEURYSMS**

Elliott J Yee

Indiana University School of Medicine

9:15pm - 9:30pm

#### **SP 2 CUPID'S ARROW PENETRATING THORACOABDOMINAL TRAUMA WITH CROSSBOW BOLT**

Ryan T Deci DO

Miami Valley Hospital

9:30pm - 9:45pm

#### **SP 3 NORMOCALCEMIC PRIMARY HYPERPARATHYROIDISM MORE COMMONLY AFFECTS MULTIPLE GLANDS AS COMPARED TO CLASSIC PRIMARY HYPERPARATHYROIDISM**

Daniel P deLahunta MD

Loyola University Medical Center

9:45pm - 10:00pm

#### **SP 4 THE REMNANT GALLBLADDER: SEQUELA OF A SUBTOTAL CHOLECYSTECTOMY**

Mandakini Venkatramani MD

Rush University Medical Center

10:00pm - 10:15pm

**SP 5 AN EXTRACOLONIC CASE OF CLOSTRIDIUM  
DIFFICILE PRESENTING AS A SPLENIC ABSCESS: A  
RARE COMPLICATION OF COLON RESECTION**

Ryan T Deci DO

Wright State University

10:15pm - 10:30pm

**SP 6 CREATION OF A SUTURELESS REDO  
ESOPHAGO-JEJUNAL ANASTOMOSIS USING A  
COVERED ENDOSCOPIC STENT**

Sejul Chaudhary MD

Ascension St. John Hospital and Medical Center

10:30pm - 10:45pm

**SP 7 IMITATION IS FLATTERY, EXCEPT WHEN  
YOU'RE A PARATHYROID GLAND**

Zachary Senders

Case Western Reserve University School of Medicine

10:45pm - 11:00pm

**SP 8 THE USE OF A TUBED GROIN FLAP FOR  
COVERAGE OF A FULL THICKNESS ELBOW DEFECT**

Kurt Piening MD

University of Illinois, College of Medicine, Peoria



## MONDAY, JULY 29, 2019

7:00am - 1:00pm | Clifton Foyer

### **MSA Registration**

7:00am - 1:00pm | Taggart Hall

### **Exhibit Hall Hours**

7:00am - 8:30am | Taggart Hall

### **Continental Breakfast**

7:00am - 8:00am

### **5K Fun Run**

7:00am - 7:55am | Clifton Ballroom

### **Poster Rounds**

Moderator: Scott Steele MD, MBA | Cleveland Clinic Foundation

7:05am - 7:07am

### **P 1 CARDIAC METASTASIS: A RARE FINDING OF MARJOLIN ULCERS**

Sheel Patel DO

Wayne State University

7:07am - 7:09am



### **P 2 DOES ONE SIZE FIT ALL? RISKS AND BENEFITS OF NEOADJUVANT CHEMORADIATION IN PATIENTS WITH CLINICAL STAGE II (T3N0) RECTAL ADENOCARCINOMA REQUIRING ABDOMINOPERINEAL RESECTION**

Mariane Gouve Monteiro de Camargo MD

Cleveland Clinic Foundation



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Featured Posters

7:09am - 7:11am



**P 3 CLINICALLY RESECTABLE ACINAR CELL  
CANCER OF THE PANCREAS: IS THERE A BENEFIT  
TO ADJUVANT SYSTEMIC THERAPY?**

Dhruv J Patel BS

Loyola University Medical Center

7:11am - 7:13am

**P 4 HOW BIG WAS THAT PARATHYROID GLAND?**

Zachary Senders

Case Western Reserve University School of Medicine

7:13am - 7:15am



**P 5 PREDICTORS OF ILEUS FOLLOWING  
COLORECTAL RESECTIONS**

Ipek Sapci MD

Cleveland Clinic Foundation

7:15am - 7:17am



**P 6 TARGETING AN IDEAL LENGTH OF  
STAY FOR PATIENTS UNDERGOING DISTAL  
PANCREATECTOMY: CAN WE IMPACT AGGREGATE  
COSTS OF CARE?**

Patrick J Sweigert MD

Loyola University Medical Center

7:17am - 7:19am

**P 7 CHANGES IN INJURY CHARACTERISTICS AND  
OUTCOMES OF GUNSHOT WOUNDS AT A HIGH  
VOLUME URBAN TRAUMA CENTER FROM 2004  
TO 2017**

Kimberly R Coughlin PGY-3

Ascension St. John Hospital and Medical Center



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Featured Posters

7:19am - 7:21am

**P 8 THE EFFECTIVENESS OF THE OVER-THE-SCOPE-CLIP SYSTEMS IN THE MANAGEMENT OF GASTROINTESTINAL COMPLICATIONS AT A COMMUNITY TEACHING HOSPITAL**

Victoria Simmons MD

Ascension St. John Hospital and Medical Center

7:21am - 7:23am

**P 9 AGE-RELATED 'RIGHT-SHIFT' IN ADVANCED COLORECTAL ADENOMAS: ANATOMICAL AND HISTOLOGICAL EXAMINATION OF 1482 ADVANCED ADENOMAS OVER A 20-YEAR PERIOD**

David Kearney MD

Cleveland Clinic Foundation

7:23am - 7:25am

**P 10 DOSE ADJUSTING PROPHYLACTIC ENOXAPARIN IS NECESSARY TO ACHIEVE THERAPEUTIC ANTI-FACTOR XA LEVELS IN SURGICAL ONCOLOGY PATIENTS**

Katherine Kramme DO

Western Michigan University

7:25am - 7:27am

**P 11 PERIOPERATIVE THERAPY IN CT1BN0M0G1-3 ESOPHAGEAL/GASTROESOPHAGEAL JUNCTION ADENOCARCINOMA TREATED WITH ESOPHAGECTOMY: A NATIONAL CANCER DATABASE ANALYSIS**

Shravan Leonard-Murali MD

Henry Ford Health System

7:27am - 7:29am

**P 12 OUTCOMES OF VARIOUS TREATMENT SEQUENCING STRATEGIES IN OCTOGENARIANS WITH GASTRIC ADENOCARCINOMA: A NATIONAL CANCER DATABASE ANALYSIS**

Tommy Ivanics MD

Henry Ford Health System

7:29am - 7:31am

**P 13 EVIDENCE-BASED TARGETED CARE PATHWAYS. SIMPLE AND COMPLICATION SPECIFIC**

Maxwell J Otto MD

Spectrum Health Hospitals

7:31am - 7:33am

**P 14 SINGLE SURGEON EXPERIENCE WITH CONVERSION FROM LAPAROSCOPIC TO ROBOTIC ROUX-EN-Y GASTRIC BYPASS: IMPROVING OUTCOMES AS MEASURED BY MBSAQIP REPORTS**

Brooke A Konz MD

Rush University Medical Center

7:33am - 7:35am

**P 15 TXA TOUCHINGDOWN: AN INSTITUTIONAL REVIEW OF AEROMED ADMINISTRATION**

Joseph DeVitis MD

Spectrum Health Hospitals

7:35am - 7:37am

**P 16 IMPACT OF INFORMATION TECHNOLOGY  
ON LENGTH OF STAY AND READMISSIONS IN  
COMPLEX SURGICAL CARE**

Boris Chobrutskiy BS  
University of South Florida

7:37am - 7:39am

**P 17 DASHING THROUGH THE SNOW: A 14 YEAR  
ANALYSIS OF SNOWMOBILE CRASHES AT A  
MIDWESTERN LEVEL 1 TRAUMA CENTER**

Stephen L Carveth MD  
Spectrum Health Hospitals

7:39am - 7:41am

**P 18 WHAT DO FORMER RESIDENTS SAY ABOUT  
THEIR PRELIMINARY YEAR: THEIR EXPERIENCES  
IN A GENERAL SURGERY RESIDENCY PROGRAM**

Nizamuddin Shaikh MBBS  
Mayo Clinic, Rochester

7:41am - 7:43am



**P 19 FEASIBILITY OF USING RESIDENT-SPECIFIC  
OUTCOMES TO MEASURE INDIVIDUAL  
PERFORMANCE**

Stephanie Peters MD  
Loyola University Medical Center

7:43am - 7:45am

**P 20 INFLUENCE OF PRIOR APPENDECTOMY  
AND CHOLECYSTECTOMY ON CLOSTRIDIODES  
DIFFICILE INFECTION RECURRENCE**

Benjamin Ferrel DO  
MercyOne Medical Center



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Featured Posters

7:45am - 7:47am

**P 21 MORTALITY IN ANTICOAGULATED PATIENTS WHO REQUIRE EMERGENCY ABDOMINAL SURGERY- EXAMINING THE EFFECTS OF NEW ORAL ANTICOAGULANTS**

Matthew Abourezk MD

Riverside Methodist Hospital

7:47am - 7:49am

**P 22 MALE GENDER IS A RISK FACTOR IN LAPAROSCOPIC CHOLECYSTECTOMY: EXPERIENCE AT A LEVEL ONE TRAUMA INSTITUTION**

Baongoc Nasri MD

St. Vincent Hospital

7:49am - 7:51am

**P 23 THE EFFECT OF ADAPTING ROBOTIC INGUINAL HERNIORRHOPHY ON SURGEONS AND TOTAL HOSPITAL VOLUME**

Tyler Williams MD

Ascension St. John Hospital and Medical Center

7:51am - 7:53am

**P 24 EXCELLENCE CAN BE ACHIEVED IN "LOW VOLUME" BARIATRIC SURGERY CENTERS; A SINGLE CENTER EXPERIENCE**

Varun Jain MBBS, MD

Mayo Clinic, Phoenix

7:53am - 7:55am

**P 25 INITIATION OF ENHANCED RECOVERY  
AFTER SURGERY PROTOCOL WITH MULTIMODAL  
ANALGESIA DECREASES OPIATE USE IN COLON  
AND RECTAL SURGERY**

Gabie Ong MD  
Franciscan Health

8:10am - 8:15am | Clifton Ballroom

**Welcome & Introductions**

8:15am - 9:15am | Clifton Ballroom

**Scientific Session 1**

Moderator: Nicholas Zyromski MD | Indiana University  
School of Medicine

8:15am - 8:30am

**1 ADJUVANT SYSTEMIC THERAPY FOR  
INTERMEDIATE AND LARGE GASTRIC  
GASTROINTESTINAL STROMAL TUMORS (GISTS):  
IS THERE A SURVIVAL BENEFIT FOLLOWING  
MARGIN NEGATIVE SURGICAL RESECTION?**

Dhruv J Patel BS  
Loyola University Medical Center  
**Invited Discussant:** Joshua Mammen MD, PhD |  
University of Kansas

8:30am - 8:45am



**2 BARIATRIC SURGERY ASSOCIATED  
WITH REDUCTION IN NON-ALCOHOLIC  
STEATOHEPATITIS AND HEPATOCELLULAR  
CARCINOMA: A PROPENSITY MATCHED  
ANALYSIS**

Minyoung Kwak MD MPH  
University of Virginia, Charlottesville  
**Invited Discussant:** James Madura MD | Mayo Clinic,  
Phoenix



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8:45am - 9:00am

## **3 WHAT PREDICTS SUCCESSFUL NONOPERATIVE MANAGEMENT WITH BOTULINUM TOXIN FOR ANAL FISSURE?**

Roxanne Kyriakakis MD

Spectrum Health Hospitals

**Invited Discussant:** Michael Valente DO | Cleveland Clinic Foundation

9:00am - 9:15am

## **4 BREAST CANCER RISK ASSESSMENT IN PATIENTS WHO TEST NEGATIVE FOR A HEREDITARY CANCER SYNDROME**

Caroline Breit MS-2

University of Kansas School of Medicine - Wichita

**Invited Discussant:** Stephanie Valente DO | Cleveland Clinic Foundation

9:15am - 9:45am | Clifton Ballroom

## **Scott Warner Woods Memorial Lecture**

Introduction: Nicholas Zyromski MD | Indiana University School of Medicine

## **The Roles Music and Music Therapy Played in My Recovery**

Greg Markell

Mentor, OH

9:45am - 10:00am | Taggart Hall

## **Morning Break**



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10:00am - 12:15pm | Clifton Ballroom

## Scientific Session 2

Moderator: C. Max Schmidt MD, PhD, MBA | Indiana University School of Medicine

10:00am - 10:15am



### **5 SURGICAL TREATMENT FOR CHRONIC POSTOPERATIVE INGUINAL PAIN - SHORT TERM OUTCOMES OF A SPECIALIZED CENTER**

Aldo Fafaj MD

Cleveland Clinic Foundation

**Invited Discussant:** Robin Alley MD | Peoria Surgical Group

10:15am - 10:30am



### **6 MAKING ENHANCED RECOVERY THE NORM NOT THE EXCEPTION**

Douglas P Slakey MD

Christ Medical Center, Advocate Aurora Health

**Invited Discussant:** Richard Anderson MD | Peoria Surgical Group

10:30am - 10:45am



### **7 INCREASING TREND OF 4-GLAND PARATHYROID EXPLORATION IN PRIMARY HYPERPARATHYROIDISM**



Amna Khokar MD

NorthShore University Healthsystem

**Invited Discussant:** Christopher McHenry MD | MetroHealth Medical Center



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Featured Posters



10:45am - 11:00am

**8 TRENDS IN THE OUTCOMES OF  
CYTOREDUCTIVE SURGERY WITH  
HYPERTHERMIC INTRAPERITONEAL  
CHEMOTHERAPY FOR APPENDICEAL  
NEOPLASMS: A MULTI-INSTITUTIONAL ANALYSIS**

Eliza W. Beal MD

The Ohio State University

**Invited Discussant:** Matthew Chung MD | Spectrum  
Health Hospitals



11:00am - 11:15am

**9 COST-EFFECTIVE APPROACH TO THE  
LAPAROSCOPIC APPENDECTOMY: BALANCING  
DISPOSABLE INSTRUMENT COST WITH  
OPERATIVE TIME**

Alexander M DeMare MD

Beaumont Hospital, Royal Oak

**Invited Discussant:** Mark Hill MD | Chicago Medical  
School



11:15am - 11:30am

**10 ASSESSMENT OF A SURGEON-LED NURSING-  
EDUCATIONAL INITIATIVE FOCUSED ON NURSE  
MANAGEMENT OF GASTRIC DECOMPRESSION  
TUBES AFTER PLACEMENT**

Rachel N Saunders MD

Spectrum Health Hospitals

**Invited Discussant:** David Canal MD | Indiana  
University School of Medicine



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Featured Posters



11:30am - 11:45am

**11 30 DAY OUTCOMES AFTER ESOPHAGECTOMY  
BY TECHNIQUE: ANALYSIS OF MULTI-CENTER  
NSQUIP DATABASE**

Vadim Lyuksemburg MD

University of Illinois, College of Medicine, Peoria

**Invited Discussant:** Maggie Brandt MD, MHSA | St.  
Joseph Mercy Ann Arbor



11:45am - 12Noon

**12 PRE-OPERATIVE WEIGHT, BMI AND THE  
INCIDENCE OF OBESITY CO-MORBIDITIES VARY  
BY SEX IN BARIATRIC SURGERY PATIENTS:  
ANALYSIS OF 166,601 WOMEN AND MEN WITH  
OBESITY**

Casey K Connors MD

Inspira Health Network

**Invited Discussant:** Jonathan Myers MD | Rush  
University Medical Center



12Noon - 12:15pm

**13 EFFECTS OF OHIO'S OPIOID PRESCRIBING  
LIMIT FOR THE GERIATRIC MINIMALLY INJURED  
TRAUMA PATIENT**

Brian T Young MD

MetroHealth Medical Center

**Invited Discussant:** Chadrick Evans MD | University of  
Illinois College of Medicine, Peoria



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Featured Posters

10:00am - 11:00am | Main Entrance

**Guest Program | Trolley Tour**

12:15pm - 1:00pm | Clifton Ballroom

**William H. Harridge Memorial Lecture**

Introduction: Nicholas J Zyromski MD | Indiana University  
School of Medicine

**Vagal Things and Guitar Strings: The Evolution of  
Ulcer Surgery and the Electric Blues from Chicago's  
South Side**

Jeffrey B Matthews MD  
University of Chicago

1:30pm | Valley Links

**Golf Tournament**

1:30pm - 4:00pm

**Private Car Collection Tour**

2:00pm - 3:00pm

**Horseback Riding**

6:30pm - 10:00pm | Windsor Ballroom

**Nonie Lowry Reception and Dinner Dance**

## TUESDAY, JULY 30, 2019

7:30am - 1:00pm | Clifton Foyer

### **MSA Registration**

7:30am - 1:30pm | Taggart Hall

### **Exhibit Hall Hours**

7:15am - 8:00am | Murdock 101

### **Industry Sponsored Breakfast**

7:30am - 9:00am | Taggart Hall

### **Continental Breakfast**

8:05am - 8:15am | Clifton

### **Welcome & Introductions**

8:15am - 10:15am | Clifton

### **Scientific Session 3**

Moderator: Dharmesh Patel MD | Evansville Surgical Associates

8:15am - 8:30am



### **14 THE MORBIDITY OF C. DIFFICILE IN NECROTIZING PANCREATITIS**

Thomas K Maatman MD

Indiana University School of Medicine

**Invited Discussant:** Paul Kuo MD | University of South Florida



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Featured Posters

8:30am - 8:45am



## **15 OPIOID PRESCRIBING TRENDS: A COMPARISON OF FOCUSED RESIDENT INTERVENTION AND STATE OF MICHIGAN MANDATES**

Sejul Chaudhary MD

Ascension St. John Hospital and Medical Center

**Invited Discussant:** Patty Tenofsky MD | Via Christi - Ascension

8:45am - 9:00am



## **16 EFFECTIVE REDUCTION IN STRESS INDUCED POSTOPERATIVE HYPERGLYCEMIA IN BARIATRIC SURGERY BY BETTER CARB LOADING**

Patrick Knight MD

Western Michigan University

**Invited Discussant:** Benjamin Veenstra MD | Rush University Medical Center

9:00am - 9:15am



## **17 LEVEL ONE ACTIVATION FOR EXTREMITY GUNSHOT INJURIES: FINDINGS AT AN URBAN TRAUMA CENTER**

Sejul Chaudhary MD

Ascension St. John Hospital and Medical Center

**Invited Discussant:** A. Peter Ekeh MD | Wright State University



Surgeon in Training Award Qualifiers



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Featured Posters

9:15am - 9:30am



### **18 TWO OPEN WHIPPLES A DAY: EXCESSIVE OR EFFICIENT IN THE MINIMALLY INVASIVE ERA**

Rachel Simpson MD

Indiana University School of Medicine

**Invited Discussant:** Jeffrey Matthews MD | University of Chicago Medicine

9:30am - 9:45am



### **19 ANTITHROMBOTIC PRESCRIPTIONS FOR MANY GENERAL SURGERY PATIENTS SIGNIFICANTLY INCREASES THE LIKELIHOOD OF PSI 09 POST-OPERATIVE BLEEDING COMPLICATIONS**

Alison Coogan

Rush University Medical Center

**Invited Discussant:** Allan Lamb DO | Beaumont Hospital, Trenton

9:45am - 10:00am



### **20 DOES POSITIVE RADIAL RESECTION MARGINS IN LOCALLY ADVANCED COLORECTAL CANCER CORRELATE WITH DEVELOPMENT OF PERITONEAL CARCINOMATOSIS: A PROPENSITY SCORE MATCHED COMPARISON**

Stephen Thorp MD

Spectrum Health Hospitals

**Invited Discussant:** Frederick Lane MD | Kendrick Colon and Rectal Center

10:00am - 10:15am

**21 NON-OPERATIVE MANAGEMENT (NOM) OF  
MOST LIVER INJURIES IMPAIRS THE MASTERY OF  
INTRAOPERATIVE HEMOSTASIS**

Solhee Lee MD

Wayne State University

**Invited Discussant:** Jonathan Saxe MD | St. Vincent  
Hospital

10:00am - 11:00am | Offsite

**Guest Program - Pete Dye Mansion Tour**

10:15am - 10:30am | Taggart Hall

**Morning Break**

10:30am - 12:15pm | Clifton

**Scientific Session 4**

Moderator: Gerard Abood MD | Loyola University Medical  
Center

10:30am - 10:45am

**22 SURGICAL RESECTION OF LOCOREGIONALLY  
RECURRENT COLON CANCER: RESULTS FROM  
TWO LARGE TERTIARY REFERRAL CENTERS IN  
THE USA AND UK**

Awad Jarrar MD

Cleveland Clinic Foundation

**Invited Discussant:** William Cirocco MD | Banner MD  
Anderson Cancer Center



10:45am - 11:00am

**23 THE PARADOX OF THE ROBOTIC APPROACH TO INGUINAL HERNIA REPAIR IN THE INPATIENT SETTING**

Paul C Kuo MD

University of South Florida

**Invited Discussant:** Peter Hallowell MD | University of Virginia, Charlottesville

11:00am - 11:15am

**24 ENUMERATING THE CAUSES AND BURDEN OF FIRST CASE OPERATING ROOM DELAYS**

Kayla B Hicks

Case Western Reserve University School of Medicine

**Invited Discussant:** David Farley MD | Mayo Clinic, Rochester

11:15am - 11:30am

**25 IT'S TIME TO RETIRE GOODSALL'S RULE: THE MIDLINE RULE IS A MORE ACCURATE PREDICTOR OF THE TRUE AND NATURAL COURSE OF ANAL FISTULAS**

William C Cirocco MD

The Ohio State University

**Invited Discussant:** Emre Gorgun MD | Cleveland Clinic Foundation

11:30am - 11:45am

**26 THE SEARCH FOR A URINARY BIOMARKER CORRELATING WITH PANCREATIC CYST MALIGNANT PROGRESSION**

Mazhar Soufi MD

Indiana University School of Medicine

**Invited Discussant:** Jeffrey Hardacre MD | University Hospitals of Cleveland

11:45am - 12Noon

**27 AN UP-TO-DATE PREDICTIVE MODEL FOR  
RECTAL CANCER REFLECTING TUMOR BIOLOGY  
AND CLINICAL FACTORS**

Awad Jarrar MD

Cleveland Clinic Foundation

**Invited Discussant:** Amber Traugott MD | The Ohio  
State University

12Noon - 12:15pm

**28 MEDICAL STUDENTS ENTERING SURGICAL  
RESIDENCY FEEL INADEQUATELY PREPARED TO  
PRESCRIBE POST-OPERATIVE OPIOIDS**

Bianca Di Chiaro MPH

Loyola University Medical Center

**Invited Discussant:** G. Paul Wright MD | Spectrum  
Health Hospitals

12:15pm - 12:45pm | Clifton

**Presidential Address**

Introduction: Constantine V Godellas MD | Loyola  
University Medical Center

**Music, Medicine, and Mind**

Nicholas J Zyromski MD

Indiana University School of Medicine

12:45pm - 1:30pm | Clifton

**MSA Annual Business Meeting**

5:00pm - 7:00pm | Lower Gardens

**MSA Backyard Games and Reception**



# **ORAL PAPER ABSTRACTS**

# Oral Paper Abstracts

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## **1. ADJUVANT SYSTEMIC THERAPY FOR INTERMEDIATE AND LARGE GASTRIC GASTROINTESTINAL STROMAL TUMORS (GISTS): IS THERE A SURVIVAL BENEFIT FOLLOWING MARGIN NEGATIVE SURGICAL RESECTION?**

*D Patel, W Lutfi, P Sweigert, E Eguia, G Abood, L Knab, PC Kuo, MS Baker*  
Loyola University Medical Center

**Objective:** NCCN guidelines recommend adjuvant imatinib for resected GISTs that have high-risk features. The randomized trials that support use of imatinib evaluate mixed populations including tumors from varying sites along the GI tract. Gastric GISTs tend to be more indolent than those arising in other sites of the GI tract, regardless of size. The value of adjuvant therapy in intermediate and large gastric GIST resected to negative margins remains unclear.

**Methods:** We queried the National Cancer Data Base to identify patients undergoing margin negative (R0) resections for gastric GIST >2 cm between 2006 and 2014. Patients with metastatic disease and those receiving adjuvant radiation were excluded. Patients were stratified by tumor size (intermediate: 2 to 5cm, large: >5cm) and histologic grade (low: 5 mitoses/hpf). Unadjusted Kaplan-Meier survival functions and multivariable Cox proportional hazard models adjusting for age, Charlson-Deyo Comorbidity index (CCI), insurance, facility type, tumor size and histologic grade were used to study the relationship between adjuvant systemic therapy and overall survival (OS).

**Results:** 3,743 patients met inclusion criteria. 3037 (81.2%) were of low histologic grade (Table 1). On univariate analysis, patients having low-grade intermediate-sized tumors (91.8% vs 87.2%,  $p=0.0413$ ) and those having high-grade large tumors (82.4% vs. 74.6%,  $p=0.0182$ ) demonstrated a marginal benefit in OS when treated with adjuvant therapy. On multivariable analysis adjusting for tumor size and grade, however, use of adjuvant therapy had no effect on OS (HR .80, 95% CI [.60-1.1]) while age (HR 1.06, 95% CI [1.05, 1.08]), high histologic grade (HR 1.89 95% CI [1.11, 3.21]) and CCI > 1 (HR 2.29 95% CI [1.29, 4.03]) were associated with increased risk of death and private insurance (HR .34, 95% CI [.18-.66]) and treatment at an academic facility (HR .57, 95% CI [.38-.85]) were associated with improved OS.

**Conclusion:** The vast majority of resectable intermediate and large gastric GISTs are low grade, indolent tumors. Use of adjuvant systemic therapy in patients with nonmetastatic intermediate or large gastric GISTs who have undergone R0 resection affords no improvement in overall survival and should be curtailed in patients undergoing these resections.

# Oral Paper Abstracts

Table 1

N=3,743 (100%)								
	Intermediate-Sized GIST (2.1-5cm) n=2,078 (55.6%)				Large-Sized GIST (>5cm) n=1,665 (44.4%)			
	LOW GRADE n=1,825 (48.7%)		HIGH GRADE n=253 (6.8%)		LOW GRADE n=1,212 (32.4%)		HIGH GRADE n=453 (12.1%)	
	NO SYSTEMIC n=1645 (43.9%)	SYSTEMIC n=180 (4.8%)	NO SYSTEMIC n=117 (3.1%)	SYSTEMIC n=136 (3.6%)	NO SYSTEMIC n=775 (20.7%)	SYSTEMIC n=437 (11.7%)	NO SYSTEMIC n=144 (3.8%)	SYSTEMIC n=309 (8.3%)
# of Deaths	126	8	6	8	70	28	27	38
1-YEAR Overall Survival	.9860	.9887	.9912	.9926	.9812	.9976	.9785	.9771
3-YEAR Overall Survival	.9430	.9670	.9701	.9511	.9393	.9510	.8315	.9209
5-YEAR Overall Survival	.8721	.9183	.9424	.9004	.8702	.9040	.7456	.8241
LOG RANK P-VALUE	<b>.0413</b>		<b>.7788</b>		<b>.0736</b>		<b>.0182</b>	

## Oral Paper Abstracts

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### **2. BARIATRIC SURGERY ASSOCIATED WITH REDUCTION IN NON-ALCOHOLIC STEATOHEPATITIS AND HEPATOCELLULAR CARCINOMA: A PROPENSITY MATCHED ANALYSIS**

*M Kwak, JH Mehaffey, A Hsu, RB Hawkins, B Schirmer, PT Hallowell*  
University of Virginia, Charlottesville

**Objective:** Obesity is a significant risk factor in the development of non-alcoholic steatohepatitis (NASH) and hepatocellular carcinoma (HCC). Bariatric surgery has been demonstrated to provide durable weight-loss, but little is known about its effect on the development of NASH and HCC.

**Methods:** All patients (n=3,676) undergoing bariatric surgery (gastric bypass, sleeve gastrectomy, gastric banding) at a single institution (1985-2015) were included. Additionally, obese patients (n=46,873) from an institutional data repository were included as controls. Cases and controls were propensity score matched 1:1 by demographics, comorbidities, BMI, and socioeconomic factors. The matched cohort was compared by paired univariate analysis and conditional logistic regression.

**Results:** A total of 4,110 patients (2,055 patients per group) were well matched with no significant baseline differences in demographics including age (42.5 vs 42.7 years), female gender (84.7% vs 83.1%), alcohol abuse (1.9% vs 1.7%), or history of NASH (12.4% vs 13.5%). However, initial BMI was statistically significant (49.0 vs 48.2 kg/m<sup>2</sup>, p=0.04) but the differences are clinically minimal. The surgery group demonstrated significantly reduced rates of new-onset NASH (6.0% vs 10.3%, p<0.0001) and HCC (0.05% vs 0.34%, p=0.03), with a median follow-up of 7.1 years. After risk-adjustment with logistic regression, bariatric surgery was independently associated with reduced development of NASH (OR 0.52, 0.40-0.68, p<0.0001).

**Conclusion:** Bariatric surgery is associated with reduced incidence of NASH and HCC in this large propensity matched cohort. These data further support the use of bariatric surgery for morbidly obese patients to ameliorate the progression of NASH cirrhosis and development of HCC.

# Oral Paper Abstracts

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## 3. WHAT PREDICTS SUCCESSFUL NONOPERATIVE MANAGEMENT WITH BOTULINUM TOXIN FOR ANAL FISSURE?

*JW Ogilvie, R Kyriakakis, M Luchtefeld*  
Spectrum Health Hospitals

**Objective:** Botulinum toxin is a recognized nonsurgical approach for anal fissures, but there is a paucity of data consisting of small series with limited follow-up. Our aim was to compare those that ultimately underwent lateral internal sphincterotomy (LIS) versus those that did not and to identify predictors of response.

**Methods:** We performed a retrospective review of cases where botulinum toxin was used over a 7-year time frame. We identified cases from an administrative billing databases of a multi-surgeon colorectal practice using CPT code 46505. Chart review was performed identifying demographic data, indications, previous treatments and any post procedure treatments. Positive clinical responses were classified as patients reporting resolution of pain or bleeding after treatment and clinical documentation of good, better or excellent quality of life by physician. Negative clinical responses were defined as patients reporting fair or poor quality of life

**Results:** We identified 105 patients who received 100 units botulinum toxin into the internal anal sphincter muscle. The most common indication was anal fissure (n=97, 91.5%) and 42% of patients had anal surgery in the past including LIS or hemorrhoidectomy. Overall, 56.6% were classified as responders at their first follow-up appointment and remained responders at a mean follow up of 7.7 months. Although 45 patients were non-responders, only twenty-five (23.8%) patients went on to have either LIS or repeat injection at a mean of 9 months after injection. There were no differences in age, sex, ASA, smoking status or prior symptom duration when comparing those who ultimately underwent LIS. Patients who went on to LIS had lower BMIs (26.0+4.3 vs 28.9+7.0,  $p = 0.027$ ) and were likely male (31% vs 10%,  $p = 0.004$ ). People who rated their quality of life excellent during their first follow up visit did not go on to have any additional procedures.

**Conclusion:** This is the largest series to date of botulinum toxin as a treatment for anal fissures, showing short term effectiveness in three-quarters of patients. Although low BMI and male sex were associated with subsequent LIS, this is likely due to patient selection. Only an early excellent response was a clear predictor of successful nonoperative management.

# Oral Paper Abstracts

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## 4. BREAST CANCER RISK ASSESSMENT IN PATIENTS WHO TEST NEGATIVE FOR A HEREDITARY CANCER SYNDROME

*C Breit, E Ablah, M Ward, H Okut, SD Helmer, PL Tenofsky*  
University of Kansas School of Medicine - Wichita

**Objective:** The majority of women who undergo genetic testing due to a significant family history of breast cancer will receive a negative result. A woman who receives a negative test result who has not had a mutation defined in her family is considered to have an uninformative test result. The risk of breast cancer among this population is often difficult to quantify and presents a unique challenge to healthcare providers. The purpose of this study was to calculate the lifetime risk of breast cancer in women undergoing genetic counseling who received an uninformative genetic test result.

**Methods:** A retrospective chart review was conducted of mutation-negative women with newly-diagnosed breast cancer presenting to a breast cancer risk assessment clinic from September 1, 2015 through March 1, 2018. The lifetime risk of breast cancer was calculated using the Tyrer-Cuzick, Claus, and Gail risk assessment models. Women were then stratified into a high-risk group, based on a lifetime risk estimate of  $\geq 20\%$ , and a non-high risk group, based on a lifetime risk estimate of  $<20\%$ .

**Results:** A total of 88 women had sufficient risk information to calculate lifetime risk of breast cancer using all three risk models. Of these women, approximately half (51%) were classified as high-risk by at least one risk model. The Tyrer-Cuzick model identified the highest proportion (43.2%) of patients as high-risk. The Claus and Gail models identified 23 women (26.1%) and 16 women (18.2%) as high-risk, respectively. Only 4 women (4.5%) were considered high-risk by all three risk models.

**Conclusion:** More than half (51%) of women who underwent genetic counseling and received an uninformative negative genetic test result still had a significantly elevated risk for the development of breast cancer, and might benefit from enhanced screening protocols. It is, therefore, imperative that women do not conclude that a negative genetic test result represents a lack of risk.



# Oral Paper Abstracts

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## 5. SURGICAL TREATMENT FOR CHRONIC POSTOPERATIVE INGUINAL PAIN - SHORT TERM OUTCOMES OF A SPECIALIZED CENTER

*DM Krpata, L Tastaldi, CC Petro, H Alkhatib, A Fafaj, S Rosenblatt, AS Prabhu, MJ Rosen*

Cleveland Clinic Foundation

**Objective:** Chronic postoperative groin pain (CPIP) is a challenging long-term complication after inguinal hernia repair and a multidisciplinary approach to pain management is recommended. For patients who are refractory to non-operative measures, surgical treatment can be offered for selected patients. We aim to evaluate the outcomes of surgical treatment for CPIP at our institution.

**Methods:** Consecutive patients undergoing surgical treatment for CPIP from 2017 through 2018 were identified in a prospectively maintained CPIP-specific database. Operative strategy was determined by clinical history, original hernia repair technique, pain characteristics and nerve distribution pattern on a dermatomal mapping. Surgeries typically involved mesh removal associated with either open (OTN), laparoscopic retroperitoneal (RTN) or hybrid triple neurectomy. Measured outcomes included intraoperative complications, hospital length of stay, reduction in pain scores (assessed through the Numeric Rating Pain Scale – NRS11) and patient satisfaction at the last available follow-up (evaluated in person or through a telephone interview).

**Results:** 33 patients were identified; 29 patients had outcomes information available and were included. Mean age was 48 years ( $\pm 15$ ), 79% were male and mean body mass index (BMI) was 26 kg/m<sup>2</sup> ( $\pm 4.7$ ). All patients developed CPIP after an elective inguinal hernia repair with mesh (23 unilateral, 6 bilateral; 20 open, 8 laparoscopic and 1 robotic) and were refractory to multimodal pain management. Median pain score on baseline was 8 (IQR 7-10). Surgeries were uneventful and there were no intraoperative complications. Neurectomies were performed in 27 patients (12 OTN, 9 RTN, 3 hybrids and 3 laparoscopic selective GFN neurectomies); prior meshes were completely removed in all but 3 cases. After a median follow-up of 6 months (IQR 4-11), there was a statistically significant reduction in pain scores (median 2, IQR 2-6,  $p < 0.001$ ) and 27 patients (93%) deemed to be satisfied with the surgery outcome. Sixteen patients referred that were “pain-free” or “almost pain-free” (55%) while 10 patients (34%) indicated that still had residual pain despite experiencing important reduction. 3 patients stated that the operation has not conferred pain reduction.

**Conclusion:** Surgical treatment for CPIP significantly decreased pain scores. Outcomes were considered satisfactory by 93% of the patients even though not all were “pain-free.”

# Oral Paper Abstracts

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## 6. MAKING ENHANCED RECOVERY THE NORM NOT THE EXCEPTION

*DP Slakey, DS Silver, SM Chazin, P Katoozian, KS Sikora*  
Christ Medical Center, Advocate Aurora Health

**Objective:** Enhanced Recovery After Surgery (“STAAR” in our system) is multimodal care focused on the reduction of physiological and psychological stress. Successful implementation requires a multidisciplinary team. While enhanced recovery is well established in colorectal surgery, there is a growing body of evidence for effectiveness in many other surgical disciplines, but to date widespread use is limited.

**Methods:** We developed and implemented a LEAN production process that, within 12 months, expanded STAAR to 13 surgical services lines involving >130 surgeons, and impacting the care of >6,000 surgical patients/year. The process was led jointly by surgeon and nursing champions.

**Results:** Value for patient and surgeons was defined, and a layered implementation approach began involving educational and administrative meetings (279 in the first 6 months) and rounding. Use of STAAR was defined as >60% compliance. Across multiple specialties LOS was reduced up to 40.6%, mortality index and transfusion decreased 67% and 23% respectively. Case mix index increased 17.2%. Readmission rates, infections, ER visits were not increased.

**Conclusion:** Using a LEAN process focused on value, STAAR protocols have become the standard rather than the exception. Time investment by senior surgical leadership was extensive. The methodology has been extended to 27 hospitals across the system.

# Oral Paper Abstracts

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## 7. INCREASING TREND OF 4-GLAND PARATHYROID EXPLORATION IN PRIMARY HYPERPARATHYROIDISM

*A Khokar, K Kuchta, S Abadin, T Moo-Young, D Winchester, R Prinz*  
NorthShore University Healthsystem

**Objective:** Prior to the 1990s, 4-gland parathyroid exploration was the gold standard for surgical treatment of primary hyperparathyroidism. With the advent of intraoperative parathyroid hormone (ioPTH) monitoring and preoperative localization, minimally invasive parathyroidectomy (MIS) became the more common procedure. In this study we look at the operative trend of parathyroidectomy in more recent years.

**Methods:** In this retrospective study, all patients who had a parathyroidectomy for primary hyperparathyroidism by a single endocrine surgeon from 2010 to 2017 were analyzed. Patients who had secondary, tertiary, or hereditary hyperparathyroidism, previous neck surgery, and concomitant procedures were excluded. The operation was classified as MIS or 4-gland exploration. Variables included age, gender, race, duration of disease, symptoms, baseline ioPTH, final ioPTH, number of ioPTH measurements, preoperative localization, single or multiple gland removal (excluding biopsy), operative time, weight and location of largest gland removed, and concordance of preoperative localization and largest gland removed. Outcomes included persistent or recurrent disease, permanent hypocalcemia, and permanent recurrent laryngeal nerve injury. Fishers exact test and t-test were used to evaluate statistical significance.

**Results:** Over the 8-year period, an increasing proportion of patients had 4-gland exploration (17/49 in 2010 vs. 27/55 in 2017,  $p=0.05$ ). Of the patients who had 4-gland exploration, greater proportion of patients had multiple glands removed in 2017 compared to 2010 (18/27 vs. 9/17,  $p=0.17$ ). The median baseline ioPTH was lower in 2017 compared to 2010 (79 vs. 113,  $p=0.03$ ) and the median weight of the largest gland removed was lower as well (300 vs. 475,  $p=0.04$ ). There was no difference in operative time. Two patients had persistent or recurrent disease in 2010 compared to 1 in 2017. No patients had permanent hypocalcemia due to low PTH or recurrent laryngeal nerve injury in 2010 or 2017.

**Conclusion:** Increasing trend of 4-gland parathyroid exploration for the treatment of primary hyperparathyroidism is associated with patient factors including lower baseline ioPTH and smaller size of abnormal gland. There was no difference in mean operative time or complications related to the increasing trend in 4-gland exploration.

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## 8. TRENDS IN THE OUTCOMES OF CYTOREDUCTIVE SURGERY WITH HYPERTHERMIC INTRAPERITONEAL CHEMOTHERAPY FOR APPENDICEAL NEOPLASMS: A MULTI-INSTITUTIONAL ANALYSIS

EW Beal, A Ahmed, C Kimbrough, T Grotz, J Leiting, KF Fournier, AJ Lee, S Dineen, S Dessureault, JM Baumgartner, J Veerapong, C Clarke, E Strong, S Maithel, MC Russell, MY Zaidi, S Patel, V Dhar, R Hendrix, L Lambert, F Johnston, N Fackche, M Raoof, C LaR  
The Ohio State University

**Objective:** Cytoreductive Surgery (CRS) with hyperthermic intraperitoneal chemotherapy (HIPEC) is increasingly used for patients with appendiceal neoplasms. As perioperative care and surgical technique have improved, whether the indications for surgery or the short- and long-term outcomes of CRS-HIPEC have changed over time remains unclear.

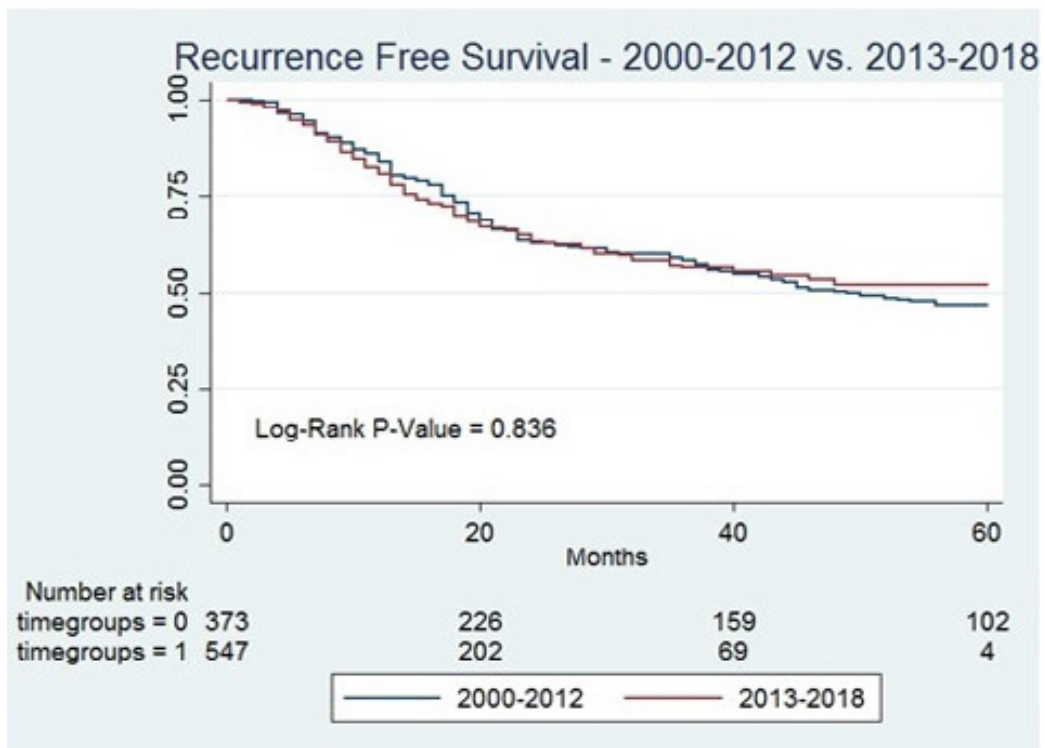
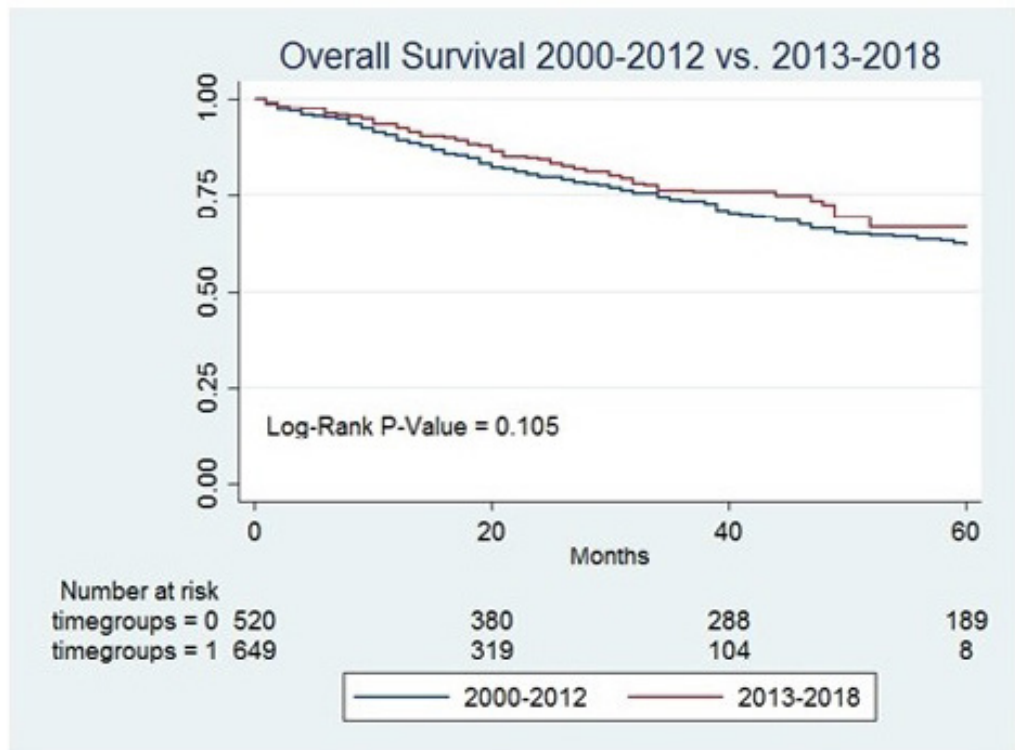
**Methods:** The US HIPEC Collaborative, a 12 center multi-institutional database, was retrospectively reviewed to identify all patients with appendiceal tumors who underwent CRS with or without HIPEC. Patients were divided into two time periods: 2000-2012 (P1) and 2013-2018 (P2). Trends in the indications for, perioperative outcomes, and long-term survival of patients over time were assessed.

**Results:** Among 1,224 patients who met inclusion criteria, 549 (44.9%) were from P1 while 675 (55.1%) were from P2. Patients in P2 were less likely to have adenocarcinoma (P2: 51.2% vs. P1: 62.0%) and more likely to have low-grade appendiceal mucinous neoplasms (37.9% vs. 24.3%). Patients in P2 were less likely to have synchronous disease (80.3% vs. 94.0%,  $p < 0.001$ ). The use of HIPEC at the time of CRS increased over time (71.4% in 2000 vs 93.8% in 2017). While the use of an open technique decreased (19.0% vs. 52.4%,  $p < 0.001$ ), the vast majority in both groups received mitomycin C (98.6% vs. 96.4%,  $p = 0.038$ ).

Despite a similar PCI ( $p > 0.05$ ), the rate of CC0 increased (58.3% vs. 47.9%) and CC2/3 decreased (17.5% vs. 23.5%,  $p = 0.001$ ) over time. Median EBL (mL) (300 vs. 400;  $p < 0.001$ ), median intraoperative intravenous fluids (L) (6.5 vs. 7.5;  $p < 0.001$ ), and need for transfusion (17.8% vs. 33.6%,  $p < 0.001$ ) all decreased. The incidence of any (54.3 vs. 51.9%,  $p = 0.690$ ) and Clavien III/IV (37.1% vs. 30.6%,  $p = 0.346$ ) complications did not change over time but 30-day mortality significantly decreased (2.1% vs 4.4%,  $p = 0.021$ ). While median LOS decreased over time (9 vs. 10,  $p = 0.045$ ), readmission rates (21.3% vs. 14.6%,  $p = 0.003$ ) increased. There were no differences between groups (Figure) in OS ( $p = 0.105$ , Hazard Ratio [HR] 0.81, 95% CI 0.63-1.05) or RFS ( $p = 0.836$ , HR 1.02, 95% CI 0.82-1.27).

**Conclusion:** CRS-HIPEC is increasingly performed for appendiceal neoplasms at high-volume centers. Despite improvements in perioperative outcomes, postoperative morbidity rates remain high and long-term outcomes have not changed over the past two decades.

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## 9. COST-EFFECTIVE APPROACH TO THE LAPAROSCOPIC APPENDECTOMY: BALANCING DISPOSABLE INSTRUMENT COST WITH OPERATIVE TIME

*A DeMare, N Luehmann, E Abbott, J Long, B Akay, A Iacco, P Brahmamdam, N Novotny*

Beaumont Hospital, Royal Oak

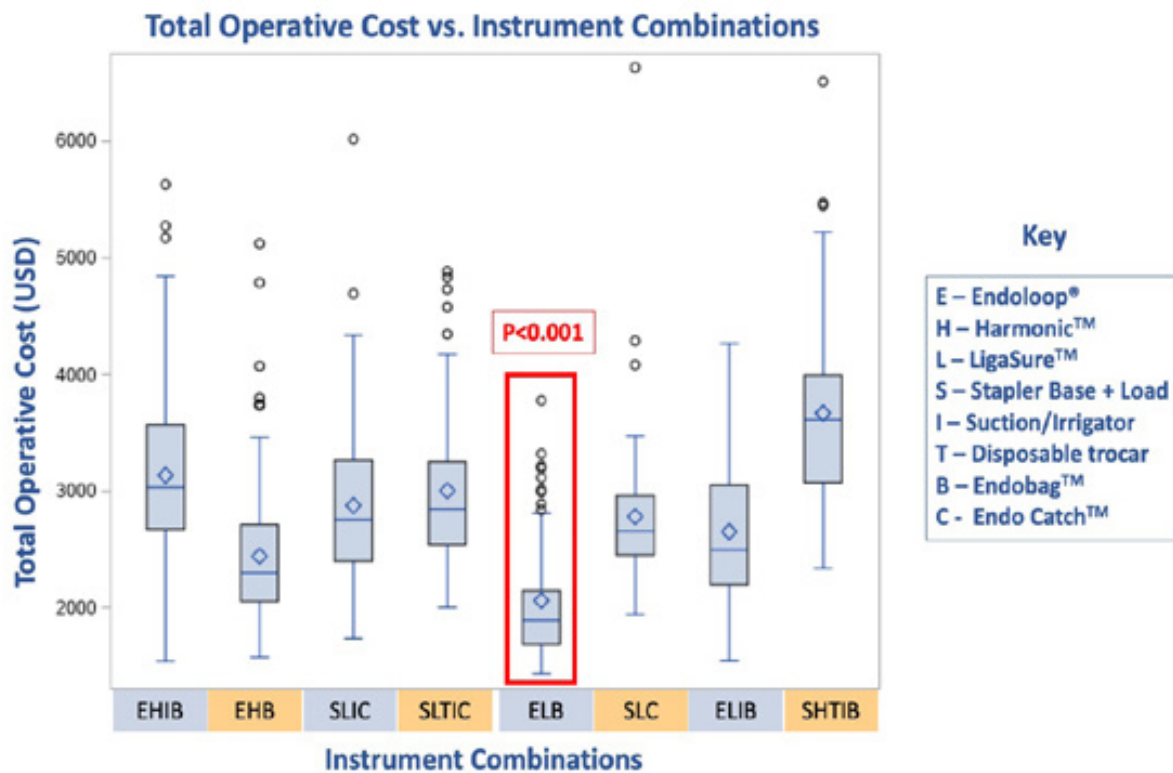
**Objective:** Reducing healthcare spending worldwide is increasingly important. Surgeons are uniquely positioned to safely decrease costs by selecting affordable and efficient instruments that can decrease operative time. The laparoscopic appendectomy is one of the most common operations performed throughout the world and can serve as a model for improving healthcare cost.

**Methods:** We retrospectively reviewed all adult patients who underwent laparoscopic appendectomy for non-perforated appendicitis from March 2015 - November 2017. Data collected included patient demographics, operative details (disposable instrument cost and operative time), and 30-day postoperative complications. Patients were excluded if the operation was an interval appendectomy or if there were any concurrent procedures. Our objective was to determine which combination of instruments allowed for the lowest total operative cost (disposable instrument cost plus operative time cost) without compromising postoperative outcomes.

**Results:** 846 patients were analyzed after determining the eight most commonly utilized combinations of disposable instruments. Patient characteristics were similar between groups with the exception of age. The combination of an Endoloop®, LigaSure™ vessel sealer, and an EndoBag™ (ELB) had the shortest operative time (25 min,  $P < 0.001$ ) and lowest median total operative cost (\$1893,  $P < 0.001$ ). Neither operative time, nor total operative cost were decreased when an endostapler was used. Postoperative complications ranged from 0-5.3% in all groups and was particularly low in the ELB group (2.4%).

**Conclusion:** The combination of ELB rendered the shortest operative time and lowest total operative cost while maintaining favorable outcomes. This combination of instruments could be used to maximize surgical value during laparoscopic appendectomy.

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## 10. ASSESSMENT OF A SURGEON-LED NURSING-EDUCATIONAL INITIATIVE FOCUSED ON NURSE MANAGEMENT OF GASTRIC DECOMPRESSION TUBES AFTER PLACEMENT

*RN Saunders, K Kelly-Schuette, AT Davis, TJ Koehler, BN Gayed, LT Durling, AJ Chapman, CJ Gibson*

Spectrum Health Hospitals

**Objective:** Gastric decompression tubes can prevent emesis and improve patients' discomfort from gastroparesis, small bowel ileus, and bowel obstructions. Decompression tube placement is widely taught; however, tube maintenance and troubleshooting are under-recognized skills with sparse published guidance. On rounds, it is common to find dysfunctional tubes which require manipulation. Nursing discomfort with tube maintenance and troubleshooting offers an opportunity for physician-led nursing education.

**Methods:** A physician-led educational session on naso/orogastric decompression tube management was offered to critical care nurses during a previously planned nursing skill review session. The educational session was led by a surgical intensive care fellow at a level 1 trauma center. Nurses were asked to complete a pre-session and post-session survey (Table 1) to evaluate their understanding of gastric decompression tubes and to evaluate the session's utility. Individual questions were analyzed using the McNemar test. Pearson's  $r$  was used to determine correlations between quantitative data. Significance was assessed at  $p < 0.05$ . The Spectrum Health Institutional Review Board deemed the study to be non-human subjects research.

**Results:** A total of 97 critical care nurses participated in the educational session and completed the pre-session and post-session survey. Median nursing experience was 4 (0.5-31) years, and 17.5% of respondents were charge nurses. For all questions, the proportion of correct answers significantly increased from pre-session survey to post-session survey ( $p < 0.001$ ). Forty-one (42.3%) respondents reported an increased understanding/comfort level managing naso/orogastric tubes from pre-session to post-session survey ( $p < 0.001$ ). Neither years of nursing experience nor charge nurse experience were significantly correlated with scores on the pre-session survey ( $r = 0.09$  and  $r = 0.08$ , respectively) or post-session survey ( $r = -0.12$  and  $r = -0.09$ , respectively). Ninety seven percent of all participants found the session very helpful.

**Conclusion:** This physician-led educational session on gastric decompression tubes was well-received and improved subjective and objective measurements of nurses' knowledge and comfort level with gastric decompression tubes. These improvements were independent of years of experience or charge nurse experience. Surgeon participation in nursing education is critical for enhancing patient care.



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Questions:	Answer Options:				
I understand how NG/OG tubes work and I am comfortable with ensuring NG/OG tubes are working properly:	Not at all	Mildly	Somewhat	Competent	Expert
What is the purpose of the blue tubing on the NG/OG tube?	Free Text				
The blue tubing on the NG/OG tube can be flushed with:	Nothing, ever		Sterile Water	Air	tPA
The NG/OG tubes that we use are intended to be on:	Continuous Suction			Intermittent Suction	
When the NG/OG makes a whistling sound:	It is malfunctioning, the blue port should be flipped			It is working properly	
I am a Charge Nurse:	Yes			No	
Years working as a nurse:	# years				
Years working with in-patients:	# years				
This talk was helpful (Post-talk):	Not at all	Mildly	Somewhat	Very	
Please include any comments to improve the talk (Post-talk):					

# Oral Paper Abstracts

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## **11. 30 DAY OUTCOMES AFTER ESOPHAGECTOMY BY TECHNIQUE: ANALYSIS OF MULTI-CENTER NSQIP DATABASE**

*V Lyuksemburg, J Abou-Hanna, D Ridder, J Drake, H Wang, E Stroumpi, S Tsoraides, R Anderson*

University of Illinois, College of Medicine, Peoria

**Objective:** Esophagectomy is the standard of care for esophageal cancer. However, this complex procedure remains with significant morbidity and mortality. There are various operative approaches for esophagectomy, each with advantages and disadvantages. Our objective was to determine how surgical approach impacts anastomotic leaks and 30 day postoperative outcomes.

**Methods:** Individuals undergoing esophagectomy were identified from January 1, 2016, to December 31, 2016, using the American College of Surgeons National Surgical Quality Improvement Project (ACS-NSQIP) specific esophagectomy database. Individuals were grouped based on operative approach of Ivor Lewis, trans-hiatal, and three-incision McKeown. Primary outcomes evaluated anastomotic leak rate and 30-day postoperative outcomes. Multivariable analysis was used to examine the association between approach and 30-day postoperative outcomes, adjusting for demographics and comorbidities.

**Results:** 1034 patients underwent esophageal resection; of which 865 patients met criteria. Ivor Lewis approach was most common 488 (56.4%), followed by trans-hiatal 209 (24.2%) and McKeown 168 (19.4%). There was a difference between Ivor Lewis, Trans-Hiatal, and McKeown for anastomotic leaks (12.3%, 14.35%, 20.83%;  $p = 0.0246$ ) and organ/space surgical site infection (SSI) (9.63%, 12.44%, 17.86%;  $p = 0.0167$ ). The McKeown approach had higher rates of mortality, length of stay, and operative time. On multivariable analysis, Ivor Lewis and trans-hiatal approaches had comparable anastomotic leak rates, while McKeown was associated with higher leak rates ( $p = 0.0055$ ; OR 1.9; 95% CI 1.2-3.1), organ/space SSI ( $p = 0.0034$ ; OR 2.1; 95% CI 1.3-3.5), and admission > 30 days ( $p = 0.0008$ ; OR 3.1; 95% CI 1.6-6.2).

**Conclusion:** Ivor Lewis and trans-hiatal approach had similar incidence of anastomotic leaks, postoperative outcomes, and mortality. Ivor Lewis is a reasonable approach to esophagectomy with comparable outcomes, while McKeown appears to have worse overall outcomes.

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**Table 1: Postoperative Complications**

	Ivor Lewis (n=488)	Trans-Hiatal (n=209)	McKeown (n=168)	Adjusted p-value
	n (%)	n (%)	n (%)	
Anastomotic Leak	60 (12.3)	30 (14.35)	35 (20.83)	<b>0.0246</b>
Positive Margins	36 (8.39)	10 (5.43)	14 (9.79)	0.2295
Superficial Wound Infection	25 (5.12)	15 (7.18)	13 (7.74)	0.4543
Organ/Space Surgical Site Infection (SSI)	47 (9.63)	26 (12.44)	30 (17.86)	<b>0.0167</b>
Death	16 (3.28)	7 (3.35)	8 (4.76)	0.6539
Pneumonia	76 (15.57)	22 (10.53)	27 (16.07)	0.1288
Unplanned Intubation	51 (10.45)	19 (9.09)	24 (14.29)	0.2251
On Ventilator >48 hours	56 (11.48)	13 (6.22)	24 (14.29)	<b>0.0117</b>
Transfusion	55 (11.27)	22 (10.53)	33 (19.64)	<b>0.0144</b>
DVT	15 (3.07)	3 (1.44)	9 (5.36)	0.0766
Sepsis	25 (5.12)	7 (3.35)	11 (6.55)	0.2683
Septic Shock	38 (7.79)	8 (3.83)	13 (7.74)	0.0946
Return to OR	83 (17.01)	36 (17.22)	40 (23.81)	0.142
Sill in Hospital >30 days	19 (3.89)	7 (3.35)	19 (11.31)	0.0015
Readmission	55 (11.27)	28 (13.4)	24 (14.29)	0.4805
	mean ± SD	mean ± SD	mean ± SD	p-value
Operative Time (Mins)	380.4 ± 124.1	305.7 ± 128.3	445.2 ± 120	<b>&lt;0.0001</b>
Length of Stay (Days)	12.6 ± 9.1	11.3 ± 9.2	14.9 ± 13.6	<b>0.001</b>
Operation to Death (Days)	9.7 ± 6.9	13.8 ± 12.9	18.8 ± 8	<b>0.0349</b>
Operation to Discharge (Days)	12.4 ± 9	11.2 ± 8.9	14.7 ± 13.6	<b>0.0017</b>

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### **12. PRE-OPERATIVE WEIGHT, BMI AND THE INCIDENCE OF OBESITY CO-MORBIDITIES VARY BY SEX IN BARIATRIC SURGERY PATIENTS: ANALYSIS OF 166,601 WOMEN AND MEN WITH OBESITY**

*C Connors, M Gott, G Slotman*  
Inspira Health Network

**Objective:** Variations in pre-operative characteristics by sex in procedure specific bariatric surgery cannot be easily extrapolated from current literature. With all surgical practices now operating on obese patients, additional clinical insight aids in the peri-operative decision-making process. Objective: to identify pre-operative variations between bariatric surgery women and men across the surgical spectrum.

**Methods:** Data from 166,601 pre-operative Surgical Review Corporation BOLD patients undergoing LRYGB (n=83,059), OpenRYGB (n=5389), LAGB (n=67,514), SLEEVE (n=8,966), or BPD/DS (n=1,673) were divided in two groups: Women (n=130,612) and Men (n=35,989). Statistics: Chi-square and ANOVA.

**Results:** Pre-operative clinical results from female and male bariatric surgery patients are displayed in the Table. Female/Male age (45+-12/48+-12 years), weight (124+-22/153+-29 kg) and BMI (46+-8/48+-8) were greater in men (p<0.0001). Cardiopulmonary obesity co-morbidities (hypertension, CHF, sleep apnea, angina, DVT/PE, ischemic heart disease, peripheral vascular disease, pulmonary hypertension, obesity hypoventilation syndrome, and impaired functional status), diabetes, gout, and dyslipidemia affected more men, while asthma was higher in females (p<0.0001). Among abdominal/hepatobiliary issues, abdominal hernia and liver disease rates were higher in men, but women suffered more from GERD, cholelithiasis, stress urinary incontinence, and abdominal panniculitis (p<0.0001). The somatic obesity co-morbidities back pain, fibromyalgia, musculoskeletal pain, and pseudotumor cerebri, and mental health conditions were more common in women (p<0.0001). Alcohol, tobacco use and substance abuse were higher in men (p<0.0001). Of the 31 weight-related problems examined, only lower extremity edema did not vary between men and women.

**Conclusion:** Pre-operative weight, BMI, and weight-related medical problems vary by sex across the spectrum of bariatric surgery procedures. Men are older, heavier, drink, smoke, and use drugs more frequently than women, and experience higher rates of diabetes, gout, dyslipidemia, cardiopulmonary obesity co-morbidities except asthma, abdominal hernia and liver disease. Among women with obesity, rates of asthma, GERD, cholelithiasis, stress urinary incontinence, abdominal panniculitis, somatic and mental health obesity co-morbidities were increased versus men. With this advance clinical knowledge, surgeons managing patients with obesity can anticipate obesity co-morbidities for both sexes. The resulting raised index of suspicion by surgeons regarding patients with morbid obesity could facilitate increased pre-surgical preparation and better outcomes in the peri-operative period.

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**Table: Variation by Sex in Pre-operative Clinical Characteristics of Women and Men with Obesity**

	Female (% total female)	Male (% total male)	Chi-Sq. Probability
<b>Cardio-Pulmonary</b>			
Asthma	18.7	11.88	<.0001
Hypertension	54.78	70.24	<.0001
Obstructive Sleep Apnea	39.45	61.92	<.0001
Hyperlipidemia	39.09	50.15	<.0001
Lower Extremity Edema	27.22	27.31	<.0001
Angina	2.29	3.73	<.0001
CHF	1.52	3.81	<.0001
DVT/PE	2.67	3.23	<.0001
Ischemic Heart Disease	3.00	8.79	<.0001
Obesity Hypoventilation Synd.	1.56	2.53	<.0001
Peripheral Vascular Disease	0.92	1.77	<.0001
Pulmonary Hypertension	4.32	4.90	<.0001
<b>Abdominal/Hepatobiliary</b>			
Abdominal Hernia	4.42	7.4	<.0001
Cholelithiasis	22.42	8.45	<.0001
GERD	47.93	39.86	<.0001
Abdominal Panniculitis	6.86	5.45	<.0001
Stress Incontinence	27.96	3.87	<.0001
Liver disease	5.69	7.03	<.0001
<b>Musculoskeletal/Neurologic</b>			
Fibromyalgia	3.93	0.61	<.0001
Back Pain	48.11	45.61	<.0001
Musculoskeletal Pain	42.97	41.85	<.0001
Gout	2.31	7.70	<.0001
<b>Endocrine</b>			
Diabetes	31.63	44.40	<.0001
Menstrual Irregularities	28.21	.010	<.0001
<b>Psychosocial</b>			
Impaired Functional Status	2.76	3.70	<.0001
Alcohol Use	29.57	34.5	<.0001
Tobacco Use	6.09	8.17	<.0001
Depression	37.35	23.18	<.0001
Mental Health Disease	11.32	6.70	<.0001
Psychological Impairment	17.30	11.73	<.0001
Substance Abuse	0.35	0.61	<.0001

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### 13. EFFECTS OF OHIO'S OPIOID PRESCRIBING LIMIT FOR THE GERIATRIC MINIMALLY INJURED TRAUMA PATIENT

*BT Young, SJ Zolin, KT Beel, AR Harvey, VP Ho, ES Tseng, JA Claridge*  
MetroHealth Medical Center

**Objective:** Minimally injured trauma patients (MITP) are managed with observation or emergency room care alone and many receive opioid prescriptions. Older patients have increased risk for opioid-related complications. In August 2017, Ohio introduced an acute opioid prescribing limit of 30 morphine equivalent doses (MEDs) per day, for up to 7 days. We hypothesized that geriatric MITP would receive fewer opioid prescriptions and MEDs after the limit and that geriatric MITP would receive fewer opioids than a non-geriatric cohort.

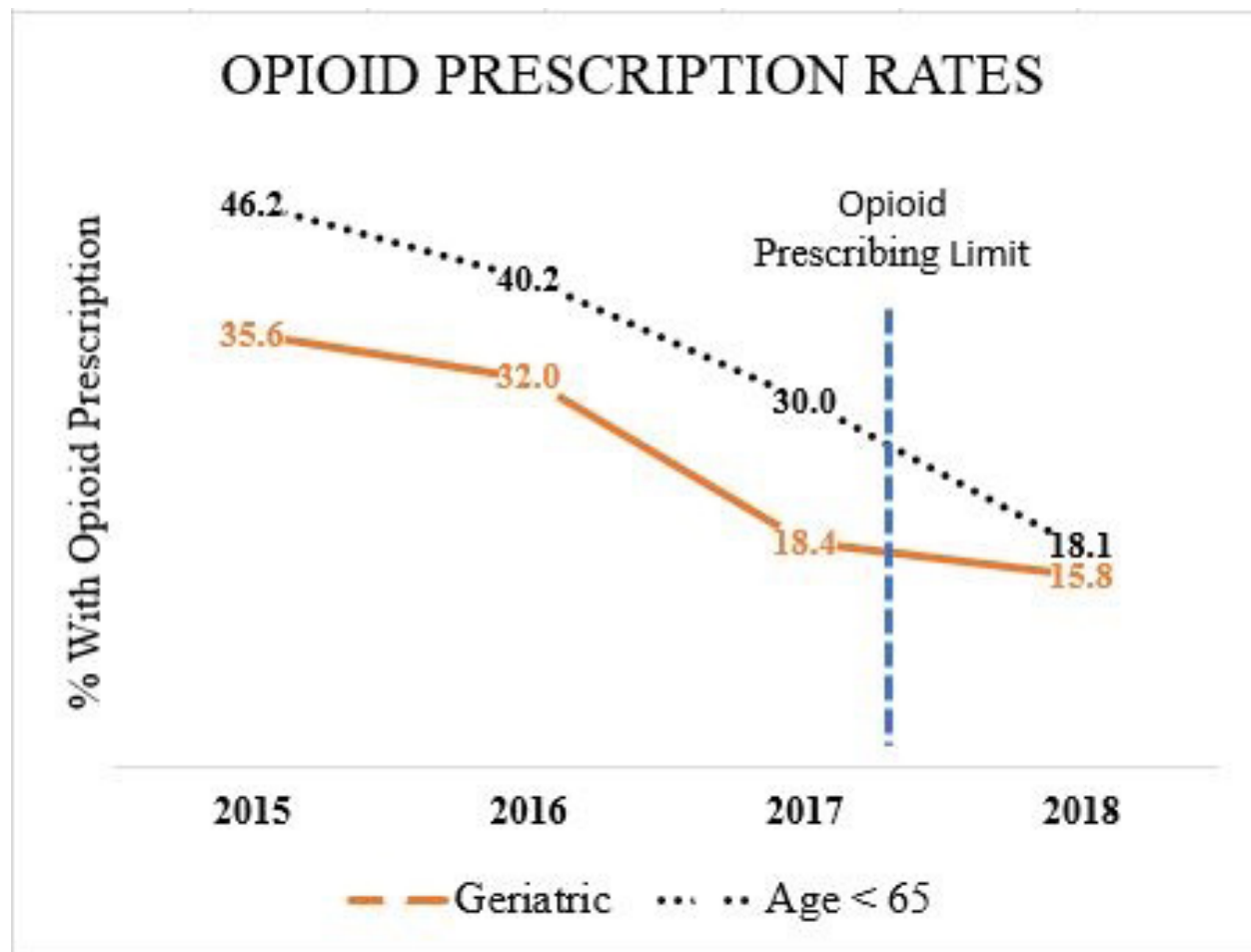
**Methods:** We reviewed MITP with stays  $\leq 1$  midnight at our level 1 trauma center in May and June of 2015-2018, excluding patients who had surgery within 30 days. Demographics, injury characteristics, follow-up needs, and pain prescriptions were collected. Discharge and 30-day post-discharge MEDs were compared pre- and post-limit. Geriatric MITP, age  $\geq 65$ , were compared to a non-geriatric cohort from May 2015-2018. Chi-square and Mann-Whitney U tests were used for comparisons.

**Results:** We included 222 geriatric MITP with 57 post-limit. Patients were 55% female with median age of 76 and 98% had blunt injury. Demographics and injuries were similar pre- and post-limit. Fewer patients received discharge opioids post-limit (16% vs 30%;  $p=0.03$ ), without significant changes in 30-day prescriptions (13% vs. 16%;  $p=0.74$ ). Post-limit, geriatric MITP with opioid prescriptions received fewer discharge and 30-day median MEDs (90 (IQR: 60-128) vs. 225 (113-338),  $p=0.04$ ; and 105 (100-119) vs. 375 (150-530),  $p=0.03$  respectively). Adjunct medication prescribing and follow-up patterns did not change post-limit.

Geriatric MITP had fewer discharge opioid prescriptions over the study period than non-geriatric patients (27% vs. 35%,  $p=0.02$ ) but received more MEDs (150 (98-300) vs. 113 (113-225),  $p<0.05$ ). 30-day prescriptions and MEDs were similar. Opioid prescriptions (figure 1) and MEDs decreased in both cohorts prior to the limit.

**Conclusion:** There were fewer discharge opioid prescriptions and MEDs for geriatric MITP following the limit without earlier follow-up or increased outpatient prescribing. Trauma surgeons and emergency medicine physicians appear to have reduced prescribing habits prior to the limit. While geriatric patients were less frequently prescribed opioids, MEDs were not reduced when compared to a younger cohort, despite safety concerns in this population.

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### 14. THE MORBIDITY OF C. DIFFICILE IN NECROTIZING PANCREATITIS

TK Maatman, ME Nicolas, JA Westfall-Snyder, EP Ceppa, MG House, A Nakeeb, CM Schmidt, NJ Zyromski

Indiana University School of Medicine

**Objective:** Clostridium difficile infection is common, costly, and morbid. Remarkably few data exist evaluating C. difficile infection in necrotizing pancreatitis (NP) patients. NP is associated with high rates of pancreatic and extrapancreatic infection requiring antibiotic treatment. Based on our clinical observation, we hypothesized that C. difficile infection is common in NP patients and may significantly impact morbidity and mortality.

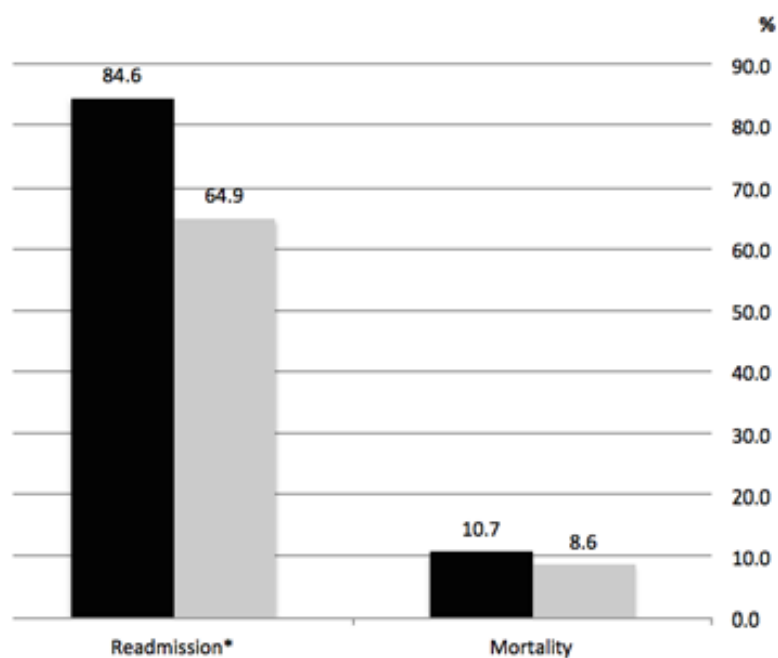
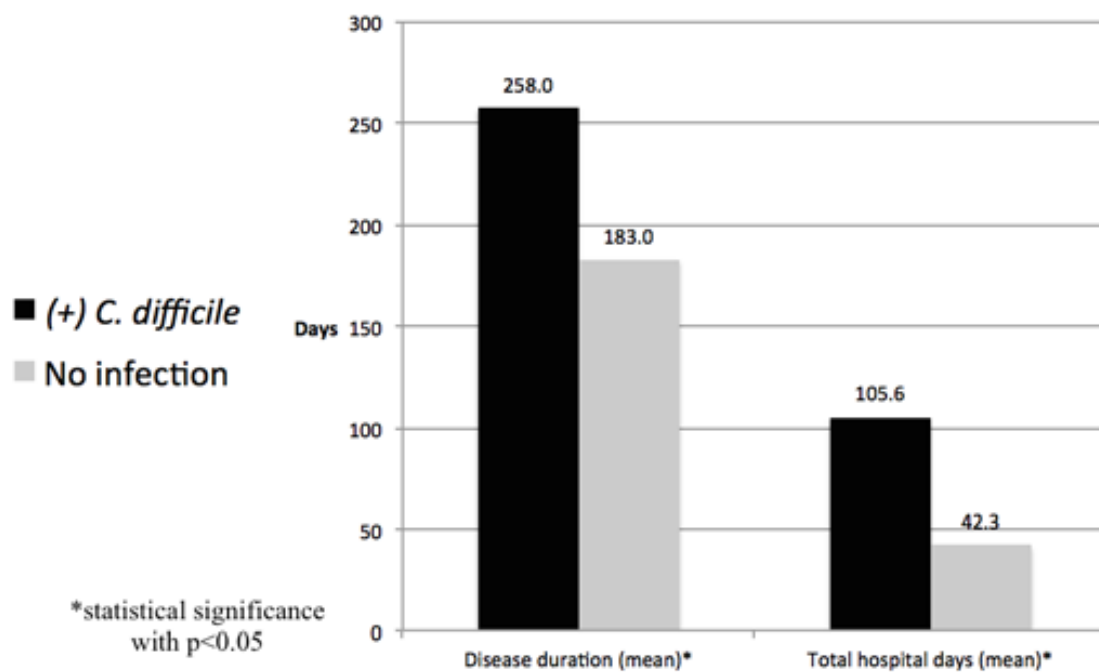
**Methods:** An institutional NP database was retrospectively reviewed to identify the incidence of C. difficile infection in NP. Diagnosis was confirmed in symptomatic patients (diarrhea, abdominal pain) with a positive C. difficile toxin enzyme immunoassay (2005-2010) or polymerase chain reaction (2011-2017). Risk factors and outcomes were evaluated. Utilizing Fisher's exact test, Pearson's correlation, or Student's t-test, as appropriate, NP patients with and without C. difficile infection were compared. P-values <0.05 were accepted as statistically significant.

**Results:** A total of 647 NP patients were treated between 2005-2017. Patients were transferred from outside facilities in 77.4% of cases (n=501). Antibiotics (>24 hours) were prescribed in 451 (69.7%) patients. Sixty-five patients (10.0%) developed C. difficile infection at a mean of 78 days (SEM: 16 days) after NP onset. C. difficile infection was not correlated with etiology of pancreatitis, age, or comorbidities. Significant risk factors for C. difficile include: any antibiotic use (OR: 66.6, 95% CI: 4.1-1081.9, p=0.003, prophylactic/empiric antibiotic use (OR: 2.3, 1.3-3.9, p=0.003), renal failure (OR: 2.0, 1.2-3.5, p=0.01), and any organ failure (OR: 1.8, 1.1-3.0, p=0.03). Recurrent C. difficile infection was seen in eight patients (12.3%). Three patients (4.6%) required emergent colectomy and two patients (3.1%) died secondary to fulminant C. difficile infection. Patients developing C. difficile infection had increased readmission rates, total hospital days, and time to disease resolution, Figure 1. Overall mortality of NP patients with C. difficile infection was 10.7% (n=7); no difference in mortality was seen when compared to NP patients without C. difficile infection (8.6%), p=0.49.

**Conclusion:** Clostridium difficile infection is common in necrotizing pancreatitis and negatively impacts morbidity and disease recovery. Clinical suspicion should be high, and antibiotics prescribed judiciously.



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### 15. OPIOID PRESCRIBING TRENDS: A COMPARISON OF FOCUSED RESIDENT INTERVENTION AND STATE OF MICHIGAN MANDATES

*V Simmons, S Chaudhary, K Hagglund, E Edhayan*  
Ascension St. John Hospital and Medical Center

**Objective:** Opioid dependence is a current societal problem that is ravaging the country. Surgeons have contributed to this epidemic with excess prescriptions after elective surgery. Recognizing this problem, our General Surgery residency program instituted a voluntary decrease in opioid prescribing for post-operative patients in February of 2018. The State of Michigan has mandated a decrease in outpatient opioid prescribing since June 2018. Our study analyzed trends in opioid prescribing for outpatient surgery (specifically, laparoscopic cholecystectomy) during 3 time periods of 4 months each. Our study looked at opioid prescribing before educational awareness and intervention, after educational intervention, and after the state-mandated limitations on opioid prescribing.

**Methods:** This study was a retrospective review using the electronic medical record. Outpatient laparoscopic cholecystectomy (LC) was used as a proxy for a general surgical outpatient procedure. The electronic record was evaluated for the opioids prescribed on discharge, which were converted to morphine milligram equivalents (MME). Period 1 (October 1, 2017 - January 31, 2018) had 49 cases; Period 2 (February 1 - May 31, 2018) had 57 cases; Period 3 (June 1 - September 30, 2018) had 51 cases.

**Results:** Average MME prescribed for LC were as follows: Period 1 87.11, Period 2 65.96, and Period 3 51.80. ANOVA showed that MME differed significantly among the 3 study periods, with  $p < 0.0005$ . Scheffe post-hoc t-tests showed that MME prescribed during Period 2 was significantly lower than for Period 1 ( $p < 0.0005$ ), and MME prescribed during Period 3 was significantly lower than for Period 1 ( $p < 0.0005$ ). MME prescribed during Period 3 compared to Period 2 was not significantly different ( $p = 0.087$ ).

**Conclusion:** MME prescribed after outpatient LC significantly decreased over the study period. This suggests that the surgery residents began self-monitoring opioids prescribed on discharge after the educational intervention and before the law limiting opioid prescriptions went into effect. This study gives a baseline on prescribing practices and provides an idea of MME prescribed for a common procedure. This study can lead to further awareness and reduction in MME prescribed. Additionally, this study is a model for resident-driven change in patient care practices.

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### **16. EFFECTIVE REDUCTION IN STRESS INDUCED POSTOPERATIVE HYPERGLYCEMIA IN BARIATRIC SURGERY BY BETTER CARB LOADING**

*P Knight, S Verseman, A Elia*

Western Michigan University

**Objective:** Although carbohydrate loading is a recommended component of enhanced recovery protocols (ERP's), there is limited understanding regarding the desired outcome measures tied to the process: a reduction in the rate of stress induced hyperglycemia and the subsequent need for rescue insulin therapy. This has resulted in a lack of standardization in the chemical composition of these preoperative drinks. There is no published data in bariatric surgery patients on the impact of specific drinks on post-operative stress induced hyperglycemia.

**Methods:** A pragmatic bariatric surgery quality improvement project was performed assessing the rate of glycemic variability (incidence of serum glucose >140mg/dl) and the number of patients requiring insulin treatment postoperatively in a non-diabetic group of patients. A historical control group (Grape), who received three doses of grape juice, was compared to a consecutive group who received 3 doses of a perioperative drink (25 grams maltodextrin/3 grams citrulline- GED). No other changes were made in the ERP.

**Results:** The study population included 70 patients (Grape - 54; GED - 16). There was no significant difference in gender, age or mix of sleeve gastrectomy/bypass between the groups. The rate of glycemic variability was significantly higher for the Grape group on postoperative day 0 (113/162, 70% vs 17/48, 35%;  $p < 0.05$ ). In addition, a significantly greater number of Grape patients required postoperative insulin treatment (63% vs 25%;  $p < 0.05$ ).

**Conclusion:** The results demonstrate that preoperative loading with a low complex carb/citrulline drink results in both a significantly lower rate of glycemic variation and the need for postoperative insulin management in a non-diabetic bariatric surgery patient population compared to grape juice. These data represent the first direct evidence that a specific preoperative drink composition and treatment process is necessary to reduce the rate and severity of postoperative stress induced hyperglycemia.

## Oral Paper Abstracts

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### **17. LEVEL ONE ACTIVATION FOR EXTREMITY GUNSHOT INJURIES: FINDINGS AT AN URBAN TRAUMA CENTER**

*S Chaudhary, V Simmons, E Edhayan*

Ascension St. John Hospital and Medical Center

**Objective:** Since 2014, isolated gunshot wounds to the extremities (GSE) became a non-physiologic criterion for a level one activation. This study aims to evaluate patients with GSE to determine whether they benefit from level one activation and its subsequent mobilization of resources.

**Methods:** This study was a retrospective review using the hospital trauma registry. Charts of patients with GSE seen from 2013-2018 were analyzed for presenting heart rate, blood pressure, presence of a torso gunshot wound, injury severity score (ISS) and revised trauma score (RTS). 688 patients presented to the emergency department (ED) with GSE, 52 of which went to the operating room (OR) within one hour.

**Results:** Of the 52 patients who went to the OR, 13 patients had isolated extremity injuries. 7 patients had vascular injuries, 4 had isolated orthopedic injuries and the remaining 2 patients had combined vascular and orthopedic injuries. The average ISS was 15.7 and the average RTS was 7.06. 9 patients were discharged home and 2 were discharged to rehab. There were two mortalities. Both patients had isolated vascular injuries and died secondary to multi-system organ failure.

**Conclusion:** Over the past 5 years, 1% of patients who presented with GSE required operative intervention in the first hour. Our data shows that most patients with GSE have minor injuries and those who needed immediate surgery had physiologic or other criteria for Level 1 activation. Larger pools of data should be studied to assess the need for Level 1 activation for GSE.

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### 18. TWO OPEN WHIPPLES A DAY: EXCESSIVE OR EFFICIENT IN THE MINIMALLY INVASIVE ERA

*RE Simpson, ML Fennerty, KF Flick, CL Colgate, EP Ceppa, MG House, NJ Zyromski, A Nakeeb, CM Schmidt*  
Indiana University School of Medicine

**Objective:** Minimally invasive pancreatoduodenectomy (MIPD) has gained popularity despite no clear morbidity benefit, but consistently reported longer anesthetic times (average 7-12+ hours.) To facilitate patient throughput, surgeons are able and willing to perform consecutive, quicker open PD (OPD) in a single workday—without substantial rest period between—despite the complexity and unpredictability associated with PD. We sought to assess the safety of this practice by comparing outcomes between first (PD1) or second (PD2) OPD performed by a single surgeon in a single day.

**Methods:** Our institution's prospective ACS-NSQIP database was reviewed for OPD (2013-2017). Instances where a single surgeon performed two sequential OPD in the same day were defined as a PD pair (PD1 vs PD2) and compared. Unpaired OPD beginning before/after noon were further controls for PD1/PD2 respectively. Fisher's-Exact/Independent-Samples t-Tests were used for univariable analyses. Multivariable regression analysis (MVA) was performed to account for group differences and potential confounders.

**Results:** 661 OPD were performed including 25 PD pairs (Operative time mean±standard deviation: 294±95min). There was no significant difference between PD1 and PD2 regarding infectious (12% vs16%, OR 0.9[0.1-7.0]), pulmonary (8% vs8%, OR 1.3[0.1-23.5]), cardiovascular (52% vs36%, OR 0.5[0.1-3.7]), or aggregate (56% vs48%, OR 0.8[0.2-4.6]) morbidity on univariable or MVA. The rate of pancreatic fistula (grades B+C 0%), delayed gastric emptying (4% vs12%, OR 2.3[0.2-29.2]), hospital stay (9.3 vs8.8 days, B-coefficient 1.5[-1.1 - 4.0]) and 30-day mortality (4% vs4%, OR 0.3[0.02-5.2]) were similar between groups ( $P>0.05$ ). Compared to PD1, unpaired PD before noon had a lower unadjusted rate of cardiovascular morbidity (28% vs52%,  $P=0.013$ ). Compared to PD2, unpaired PD after noon had longer unadjusted length of stay (11.2 vs 8.8days,  $P=0.034$ ). On MVA, these and other aggregate outcomes were similar between groups.

**Conclusion:** There was no significant difference in outcomes between PD1 vs PD2, or in comparing early/late unpaired PD controls. At high-volume centers in experienced hands and with proper patient selection, two open PD may be safely performed in a single day by the same surgeon without adverse effects on care. This knowledge may support OPD over MIPD approaches to provide quality care for more patients over less anesthetic/operative time.

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### **19. ANTITHROMBOTIC PRESCRIPTIONS FOR MANY GENERAL SURGERY PATIENTS SIGNIFICANTLY INCREASES THE LIKELIHOOD OF PSI 09 POST-OPERATIVE BLEEDING COMPLICATIONS**

*AL Wiegmann, SI Khalid, TQ Xu, AC Coogan, CJ Fredericks, LA DeCesare, J Velasco, JA Myers*

Rush University Medical Center

**Objective:** The decision to interrupt antithrombotic therapy for surgery balances the risks of thromboembolism and hemorrhage. Surgeons follow evidence-based recommendations for elective procedures when managing peri-operative anticoagulation. Despite this, post-operative bleed rates between 3% and 29% for patients on long-term anticoagulation are seen. The investigators hypothesized that despite following recommendations for peri-operative antithrombotic management in the elective setting, the use of these drugs is likely associated with increased odds for bleeding complications.

**Methods:** Humana medical, prescription, and lab insurance claims from 22 million covered lives from 2007 through Q1 2016 were retrospectively analyzed. Only patients undergoing elective general surgery procedures were included (Table 1). Patient demographics, history of antithrombotic use prior to surgery (aspirin, clopidogrel, warfarin, enoxaparin, apixaban, dabigatran, edoxaban, rivaroxaban, fondaparinux, argatroban), and post-operative bleeding complications as per Patient Safety Indicator 09 (PSI 09) coding (ICD-9-CM diagnosis code: 99811 "HEMORRHAGE COMPLICATING A PROCEDURE," ICD-9-CM diagnosis code: 99812 "HEMATOMA COMPLICATING A PROCEDURE") were identified and analyzed.

**Results:** 212,763 patients (36.5% female and 63.5% male) underwent the analyzed procedures; 8,210 patients (3.9%) had PSI 09 coded bleeding complications. A total of 146,132,013 prescriptions of the above medications were filled. 18,740 patients (8.8%) who underwent the procedures filled 6,636,412 (4.5%) of these prescriptions. 1,922 of these patients (10.3%) were found to have PSI 09 post-operative bleeding complications (884 hemorrhage (46%); 1,038 hematomas (54%)). Patients taking the analyzed antithrombotics and undergoing the analyzed surgical procedures were 3.4 times more likely to develop post-operative bleeding complications overall (OR: 3.3771, 95% CI: 3.2013-3.5626,  $P < 0.0001$ ), 3 times more likely to develop hemorrhage (OR: 3.0304, 95% CI: 2.8084-3.2699,  $P < 0.0001$ ) and 3.7 times more likely to develop hematomas (OR: 3.7417, 95% CI: 3.4813-4.0216,  $P < 0.0001$ ) than those not taking antithrombotics.

**Conclusion:** It can be assumed that surgeons, if able, are following evidence-based recommendations for the peri-operative management of antithrombotic therapy when their patients are undergoing elective surgical procedures. This data would suggest, however, that despite appropriate pre-operative cessation, antithrombotic therapy in many elective procedures in general surgery may significantly increase the likelihood of developing post-operative bleeding complications. This begs the question whether these recommendations should be revisited.

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General Surgery Procedures (Humana® 2007-2016)	Patients	Hemorrhage Complications (Anticoagulation)	Hematoma Complications (Anticoagulation)
Laparoscopy surgical esophagogastric fundoplasty (eg Nissen Toupet procedures) (CPT-43280)	4,846	17	22
Laparoscopy surgical gastric restrictive procedure; with gastric bypass and Roux-en-Y gastroenterostomy (roux limb 150 cm or less) (CPT-43644)	7,251	53	48
Laparoscopy surgical gastric restrictive procedure; with gastric bypass and small intestine reconstruction to limit absorption (CPT-43645)	231	0	0
Laparoscopy surgical gastric restrictive procedure; placement of adjustable gastric band (gastric band and subcutaneous port components) (CPT-43770)	3,125	13	20
Laparoscopy surgical gastric restrictive procedure; revision of adjustable gastric band component only (CPT-43771)	168	0	0
Laparoscopy surgical gastric restrictive procedure; removal of adjustable gastric band component only (CPT-43772)	134	0	0
Laparoscopy surgical gastric restrictive procedure; removal and replacement of adjustable gastric band component only (CPT-43773)	110	0	0
Laparoscopy surgical gastric restrictive procedure; removal of adjustable gastric band and subcutaneous port components (CPT-43774)	1,390	0	13
LAP5 GSTRC RSTRICTIV PX LONGITUDINAL GASTRECTOMY (CPT-43775)	6,778	17	15
Laparoscopy surgical; colectomy partial with anastomosis (CPT-44204)	10,137	45	51
Laparoscopy surgical; colectomy partial with removal of terminal ileum with ileocolostomy (CPT-44205)	8,513	53	43
Laparoscopy surgical; colectomy partial with end colostomy and closure of distal segment (Hartmann type procedure) (CPT-44206)	989	0	0
Laparoscopy surgical; colectomy partial with anastomosis with colopectostomy (low pelvic anastomosis) (CPT-44207)	6,595	33	31
Laparoscopy surgical; colectomy partial with anastomosis with colopectostomy (low pelvic anastomosis) with colostomy (CPT-44208)	468	0	0
Laparoscopy surgical; colectomy total abdominal without proctectomy with ileostomy or ileoproctostomy (CPT-44210)	531	0	0
Laparoscopy surgical; colectomy total abdominal with proctectomy with ileoanal anastomosis creation of ileal reservoir (S or J) with loop ileostomy includes rectal mucosectomy when performed (CPT-44211)	158	0	0
Laparoscopy surgical; colectomy total abdominal with proctectomy with ileostomy (CPT-44212)	126	0	0
Repair initial inguinal hernia age 5 years or older; reducible (CPT-49505)	55,746	208	261
Repair recurrent inguinal hernia any age; reducible (CPT-49520)	6,833	27	47
Repair initial incisional or ventral hernia; reducible (CPT-49560)	25,794	169	207
Repair recurrent incisional or ventral hernia; reducible (CPT-49565)	6,095	50	55
Repair epigastric hernia (eg preperitoneal fat); reducible (separate procedure) (CPT-49570)	1,326	0	0
Repair umbilical hernia younger than age 5 years; reducible (CPT-49580)	274	0	0
Repair umbilical hernia age 5 years or older; reducible (CPT-49585)	23,843	96	64
Repair spigelian hernia (CPT-49590)	662	0	0
Laparoscopy surgical; repair initial inguinal hernia (CPT-49650)	22,107	53	72
Laparoscopy surgical; repair recurrent inguinal hernia (CPT-49651)	3,370	0	22
LAP5 REPAIR HERNIA EXCEPT INCAL/INGUIN REDUCIBLE (CPT-49652)	7,827	21	32
LAPAROSCOPY REPAIR INCISIONAL HERNIA REDUCIBLE (CPT-49654)	5,842	29	35
LAP5 RPR RECURRENT INCISIONAL HERNIA REDUCIBLE (CPT-49656)	1,494	0	0
<b>Total</b>	<b>212,763</b>	<b>884</b>	<b>1,038</b>



## Oral Paper Abstracts

### 20. DOES POSITIVE RADIAL RESECTION MARGINS IN LOCALLY ADVANCED COLORECTAL CANCER CORRELATE WITH DEVELOPMENT OF PERITONEAL CARCINOMATOSIS: A PROPENSITY SCORE MATCHED COMPARISON

S Thorp, A Witte, M Chung, MM Assifi  
Spectrum Health Hospitals

**Objective:** The peritoneum is a common site of disease spread in colorectal cancer (CRC). There is little data on the role of positive radial resection margins (+RM) as a risk factor for the development of peritoneal carcinomatosis (PC). This study examined the development of PC in those patients with +RM compared to negative radial resection margins (-RM) patients.

**Methods:** Seventy-seven consecutive patients with locally advanced, nonmetastatic CRC with +RM between 2010 and 2015 were case matched (age, sex, tumor site, stage) using propensity scoring to 77 patients with negative radial resection margins (-RM). Patients with unknown PC status or less than 6 months follow-up, as well as prior CRC, were excluded from analysis.

**Results:** Data for 71 +RM and 74 -RM patients were analyzed. Demographic and clinical variables were comparable between the groups ( $p > 0.05$ ). Median follow up was 37.7 (5.2 – 84.4) months. No significant differences were noted for histologic type, tumor grade, lymphovascular invasion, completeness of mesorectal excision, macroscopic perforation or microsatellite instability. There was no significant difference in the rate of development of PC (+RM 7/71 (9.9%) vs -RM 3/74 (4.1%);  $p = 0.203$ ) or time to development of PC ( $p = 0.161$ ) per Kaplan-Meier analysis. Overall median time to PC was 20 (5.2 – 43.6) months.

**Conclusion:** Patients with +RM developed PC more than twice as frequently as -RM. This trend did not meet significance likely due to low study power. Further collaborative study is needed to define the role of +RM as a risk factor for PC development in CRC patients.

Variable	+RM	-RM	p-value
Development of PC (% yes)	7/71 (9.9%)	3/74 (4.1%)	0.203
Completeness of mesorectal excision			0.556
Complete	10/32 (31.3%)	14/35 (40%)	
Near complete	11/32 (34.4%)	8/35 (22.9%)	
Incomplete	11/32 (34.4%)	13/35 (37.1%)	
Macroscopic perforation (% yes)	13/71 (18.3%)	9/74 (12.2%)	0.302
Microsatellite instability (% stable)	16/23 (69.6%)	17/26 (65.4%)	0.755



## Oral Paper Abstracts

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### **21. NON-OPERATIVE MANAGEMENT (NOM) OF MOST LIVER INJURIES IMPAIRS THE MASTERY OF INTRAOPERATIVE HEMOSTASIS**

*C Lucas, S Lee, J Buck, A Ledgerwood*  
Wayne State University

**Objective:** Nonoperative management (NOM) of most liver injury (LI) compromises teaching of technical skills required for intraoperative LI hemostasis. This study assesses this void.

**Methods:** The records of patients admitted for LI during two years (1/1/16-12/31/17) at an ACS verified trauma center (ACSTC) were analyzed and compared to patients treated during two-year intervals in each of the last six decades. Factors assessed were age, etiology (stab, GSW, blunt), severity (LI/AIS, ISS), length of stay, treatment, and outcome; treatment included NOM, OR without LI hemostasis, suture (Sut), tractotomy (Tra), dearterialization (HAL), debridement (Deb), and resection. These findings were then compared to an adjacent ACSTC.

**Results:** During 2016/2017, 41 patients had LI from stab (3), GSW (20), or blunt (18). 36 patients survived; 3 died from GSW with vascular injuries without LI hemostasis. Of the remaining 20 penetrating LI, 4 had NOM, 9 had laparotomy without LI hemostasis, and 7 had hemostasis with Sut (3), HAL (1), Tra (1), and Res (2). 1 GSW patient died from traumatic brain injury (TBI). The 18 blunt patients had NOM (16) and OR without LI hemostasis (2); the one death had severe TBI. Thus, 7 pts required LI hemostasis. During the past six decades, the number of LI requiring hemostasis fell from 121, 114, 30, 48, 17, to 7. During 2011/2017, 16 surgical residents performed an average of 0.7 LI hemostasis/resident. Similar data from the adjacent ACSTC identified 52 admissions in 2 years with 3 pts undergoing NAR and 7 pts had SUT; (two of the 3 NAR required reoperation with SUT repair for refractory bleeding) the 10 residents who finished during that time had an average of one hemostatic procedure for liver bleeding.

**Conclusion:** NOM for LI precludes adequate surgical training for hemostasis of LI. Technical proficiency for intraoperative LI hemostasis for trauma center residents and fellows requires obtainment of instructorship in ATOM, ASSET, and rotation through a liver transplant or hepatobiliary service.

## Oral Paper Abstracts

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### **22. SURGICAL RESECTION OF LOCOREGIONALLY RECURRENT COLON CANCER: RESULTS FROM TWO LARGE TERTIARY REFERRAL CENTERS IN THE USA AND UK**

*A Jarrar, J Tiernan, J Helliwell, B Bandi, D Liska, R Seth, M Valente, P Sagar, S Steele*  
Cleveland Clinic Foundation

**Objective:** Locoregional recurrence of colon cancer (LRRCC) includes anastomotic, intra-abdominal, abdominal wall and pelvic disease, and occurs in up to 5% of patients who have undergone a curative primary resection. Unlike recurrent rectal cancer, there is a paucity of published data on outcomes for colon cancer. We aimed to examine these outcomes for patients undergoing resection at two specialist centers to provide guidance on management.

**Methods:** Patients undergoing resection of LRRCC with curative intent were identified from prospectively maintained databases in each center. Data were collected regarding demographics, primary and recurrent surgery details and clinical outcomes. Patients found to have R2 disease intra-operatively were included to enable real-world pre-operative predictions of outcomes. Survival analysis was performed using the Kaplan-Meier method with log rank testing to compare differences between survival curves.

**Results:** One hundred and thirty-three patients (78 USA, 55 UK; 62 men; median age 60 (range 30-88) years) were included. The site of recurrence was peri-anastomotic in 49.6% (n=66), intra-abdominal or abdominal wall in 19.5% (n=26), and pelvic 'drop metastases' in 30.8% (n=41). R0 resection was obtained in 44.8% (n=56), R1 in 37.6% (n=47) and R2 in 17.6% (n=22). Three and five year survival were 46% and 23% for R0 resection, compared to 29% and 14% for R1 resection. On survival curve analysis, median survival was significantly greater in R0 compared to R1 resections (84.3 vs 46.0 months,  $P=0.021$ , see figure). Patients with anastomotic and abdominal recurrences had similar median survival (75.4 and 76.9 months) but pelvic LRCC ('drop metastases') had a poorer median survival (52.5 months,  $P=0.047$ ).

**Conclusion:** This is the largest published series of outcomes following resection for LRCC and demonstrates that good outcomes are possible when planning surgery with curative intent. R0 resection and non-pelvic recurrence site demonstrated a statistically significant survival advantage in the studied patient cohort.

# Oral Paper Abstracts

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## 23. THE PARADOX OF THE ROBOTIC APPROACH TO INGUINAL HERNIA REPAIR IN THE INPATIENT SETTING

*H Janjua, E Cousin-Peterson, MC Kuo, MS Baker, PC Kuo*  
University of South Florida

**Objective:** When compared to laparoscopy, robotics offers improved ergonomics, enhanced visualization, increased dexterity, instrument articulation, and tremor filtration. Disadvantages include startup, maintenance and instrument costs, surgeon separation, and system breakdown. Paradoxically, robotics has been used in thyroidectomy, mastectomy, cholecystectomy and inguinal hernia repair. Surgeon education notwithstanding, we hypothesized that robotic inguinal hernia repair carries minimal advantages over the laparoscopic or open approach in the inpatient setting.

**Methods:** The 2009-2015 Healthcare Cost and Utilization Project-State Inpatient (HCUP-SID) and American Hospital Association Annual Health (AHA) datasets from CA, FL, IA, MA, MD, NC, NY and WA were queried for Open (7), Laparoscopic (10) and Robotic (3) inguinal hernia repair (unilateral or bilateral) ICD9 codes. Hospital and patient demographic, financial and comorbidity data (n= 26 total variables) were evaluated using Chi square, ANOVA and/or logistic regression. Data are presented as mean+SEM;  $p < 0.05$  were considered significant.

**Results:** 36,396 cases (27,776 Open, 7,104 Laparoscopic and 1,516 Robotic) were identified. Patient characteristics were: male, white, age > 70, urgent admission, non-govt and non-profit hospital, grouped Charlson Comorbidity Category (CC)=0, Medicare coverage, and routine discharge disposition. (All  $p < 0.05$ ) Length of stay (days) was: 4.24+6.21 (Open); 3.27+4.73 (Lap) and 2.21+2.82 (Robot). ( $p < 0.0001$  Robot vs Open, Robot vs Lap, Open vs Lap) Total charges were: \$44,138+333 (Open), \$44,884+591 (Lap) and \$60,418+1,320 (Robot). ( $p < 0.0001$  Robot vs Open, Robot vs Lap) The top 5 factors (odds ratio;  $p < 0.05$ ) positively associated with: Open (AUC 0.707)= Black, self-pay, CA state, other pay status and Hispanic; Lap (AUC 0.665)= elective admission, female, non-govt and non-profit hospital, median income quartile 4 (highest), and emergency admission; and Robotic (AUC 0.950)= CC = 2, elective admission, emergency admission, number of procedures codes at discharge, and CA state.

**Conclusion:** Indications for robotic surgery continue to evolve. With inguinal hernia repair, its benefits are unclear, esp in the inpatient setting. Robotic surgery has increased charges despite a decreased length of stay. The open approach is more apt to be performed in Black, Hispanic and self-pay patients. The surgical community must determine if it is rational to perform robotic inguinal hernia repair.

# Oral Paper Abstracts

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## 24. ENUMERATING THE CAUSES AND BURDEN OF FIRST CASE OPERATING ROOM DELAYS

*K Hicks, K Glaser, C Scott, D Sparks, C McHenry*  
Case Western Reserve University School of Medicine

**Objective:** Surgical first case operating room (OR) delays result in inadequate utilization of resources, downstream delays and cancellation of cases, staff overtime, patient dissatisfaction and loss of revenue. The purpose of this study was to identify the frequency, causes and estimated cost of first case OR delays.

**Methods:** A multidisciplinary group was convened to help understand the problem of delayed first case starts in the OR in a large metropolitan teaching hospital. A quarterly prospective review of all first cases of the day in the OR was completed from January through December of 2018. The frequency of first case OR delays was determined. The specific causes for delay were divided into one of eight categories: patient, room, equipment and instrumentation, anesthesia, nursing, surgeon, other and no cause listed. Average delay times were determined, and the cost related to first case delays was estimated based on idle labor costs and the cost of overtime for staffing of rooms beyond the scheduled end times.

**Results:** Of 3,604 first cases performed during the 12-month period, 55% were delayed. The average delay time was 19 minutes. Services with the greatest percentage of delayed first case starts were: General (19%) and Orthopedic Surgery (18%). The causes for first case OR delays were: patient 25 %; surgeon 25%; equipment and instrumentation 11%; nursing 7%; room 5%; anesthesia 4%; and other 2%. No documented reason was given for the delay in 21% of cases. A total loss of 631 hours due to late starts resulted in an estimated \$311,966 for idle labor costs, which includes personnel costs for OR and central supply staff, anesthesia and surgeon provider at a calculated cost of \$8.24/min for this institution. The potential nursing overtime costs were estimated to be \$78,623 based on a time-and-a-half rate of \$2.08/min.

**Conclusion:** Increasing first case on time starts is an opportunity for improving efficiency and reducing unnecessary cost in the OR. Improving accountability and reducing patient-related delays are the areas that likely will have the greatest impact on first case on time starts.

## Oral Paper Abstracts

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### **25. IT'S TIME TO RETIRE GOODSALL'S RULE: THE MIDLINE RULE IS A MORE ACCURATE PREDICTOR OF THE TRUE AND NATURAL COURSE OF ANAL FISTULAS**

*WC Cirocco, JC Reilly*

The Ohio State University

**Objective:** On May 6, 1887, observations of D.H. Goodsall (1843-1906) describing an association between the secondary (external) sinus opening of an anal fistula to the location of its primary (internal) sinus opening (posterior external sinuses originate from a midline internal sinus and anterior external sinuses take a straight path to an internal sinus), were first reported and eponymously became known as Goodsall's Rule. Published reports since that era support the midline as the primary (internal) origin of ALL anal fistulas, thus challenging the predictive accuracy of Goodsall's Rule.

**Methods:** Review of the literature describing the primary (internal) opening of anal fistulas to determine the predictive accuracy of Goodsall's Rule, including the positive predictive value (ppv) in selected studies.

**Results:** The midline location was the dominant primary (internal) sinus opening site of ALL anal fistulas with up to 95% accuracy (Table 1). Goodsall's Rule was inaccurate when applied to anal fistulas with an anterior, off-midline external sinus opening, as these tend to curve to a midline anterior internal sinus opening rather than take a straight course to their internal origin, as predicted by Goodsall's Rule. In the anterior group, the ppv of the location of the primary (internal) sinus opening increased from 49% overall as predicted by Goodsall's Rule (57% men, 31% women) to 71% overall predicted by a Midline Rule (62% men, 90% women), with accuracy among women increased from 31% to 90%.

**Conclusion:** Goodsall's Rule falls short in predicting the natural course of anal fistulas, especially for women with an anterior, off-midline external sinus opening. Given the increased risk of fecal incontinence related to surgical intervention at an anterior location, supported by diminished sphincter muscle mass compared to the posterior location, especially in women, dependence on Goodsall's Rule as a predictor of the course of anal fistulas and as a guide for surgeons may result in "disastrous consequences". A Midline Rule corrects the inaccuracy of Goodsall's Rule in the anterior location, thus providing a dramatic increase in ppv, especially among women. The preponderance of evidence supports a Midline Rule as a more accurate predictor of the true and natural course of anal fistulas.

# Oral Paper Abstracts

**Table 1. Literature Review- Location of the Primary (Internal) Opening**

Author(s)	Country	Year	Number of Patients	PRIMARY (INTERNAL) OPENING LOCATION (%)		
				Midline	Midline Posterior	Midline Anterior
Gant	USA	1923	-	95	95	-
Minor	USA	1929	-	80	80	-
Rankin, Borgen and Buie	USA	1932	1000	70	50	20
Buie	USA	1960	600	87	56	31
Parks	UK	1961	30	73	-	-
Lockhart-Mummery and Todd	UK	1977	-	80	-	-
Vasilevsky and Gordon	Canada	1984	160	59	44	15
Cirotto and Reilly	USA	1992	216	81	51	30
Garcia-Aguilar	USA	1996	353	83	-	-

## Oral Paper Abstracts

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### 26. THE SEARCH FOR A URINARY BIOMARKER CORRELATING WITH PANCREATIC CYST MALIGNANT PROGRESSION

*MT Yip-Schneider, M Soufi, RA Carr, KF Flick, H Wu, CM Schmidt*  
Indiana University School of Medicine

**Objective:** Mucinous pancreatic cysts known as intraductal papillary mucinous neoplasm (IPMN) are precursor lesions that may develop into pancreatic cancer. Intense interest has focused on identifying biomarkers that correlate with dysplastic grade of IPMN. Potential biomarkers of IPMN progression have been identified in pancreatic cyst fluid and blood but to date, not in urine. However, a few novel urinary biomarkers have been reported for the detection of pancreatic ductal adenocarcinoma (PDAC) or prediction of pancreatic cancer risk. Here, we seek to validate these findings and further assess the ability of the markers to detect high-risk IPMN.

**Methods:** Urine was collected from patients undergoing surgery for pancreatic cysts including IPMN, chronic pancreatitis, or PDAC as well as from healthy controls. The urinary concentrations of three candidate biomarkers was determined by ELISA: TIMP-1 (Tissue Inhibitor of Metalloproteinase-1), LYVE-1 (Lymphatic Vessel Endothelial Receptor 1), PGEM (Prostaglandin E Metabolite). For each biomarker, group results were analyzed by the Kruskal-Wallis test and if  $P < 0.05$ , followed by post-test analysis.

**Results:** Urinary TIMP-1 levels (n; median, interquartile range) were significantly lower in healthy controls (n=9; 0.83 ng/mg total protein, 0.50-1.25) when compared to PDAC patients (n=19; 5.11, 1.88-7.19) or to low/moderate grade IPMNs (n=19; 2.67, 1.57-8.76). However, TIMP-1 levels were not significantly different between IPMN low/moderate and high/invasive grades (n=19; 1.51, 0.74-2.29). Similarly, urinary LYVE-1 levels were significantly lower in healthy controls (n=9; 0.03 ng/mg creatinine, 0.02-0.05) when compared to patients with PDAC (n=27; 0.32, 0.15-0.68) or chronic pancreatitis (n=14; 0.17, 0.05-1.70) or IPMN low/moderate grade (n=16; 0.37, 0.19-0.73). No significant difference in LYVE-1 concentration was detected between IPMN low/moderate and high/invasive grades (n=21; 0.09, 0.05-0.44). Finally, urinary PGEM levels were not significantly different between any of the groups tested (benign/pre-malignant/malignant pancreatic cysts, PDAC; n=10-20/group).

**Conclusion:** Our work confirms that urinary TIMP-1 and LYVE-1 can distinguish between healthy controls and PDAC. However, these two biomarkers do not differentiate between IPMN dysplastic grades. Similarly, urinary PGEM does not correlate with the malignant potential of pancreatic lesions.



## Oral Paper Abstracts

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### 27. AN UP-TO-DATE PREDICTIVE MODEL FOR RECTAL CANCER REFLECTING TUMOR BIOLOGY AND CLINICAL FACTORS

*A Jarrar, D Liska, M Cruise, J Church, M Valente, M Kalady, C Delaney, S Steele*  
Cleveland Clinic Foundation

**Objective:** Estimates of recurrence are integral to rectal cancer patient care. The gold standard for rectal cancer staging is the TNM system which is constrained by its inability to incorporate the variability in clinicopathologic features within each stage along with the newly characterized histopathological features associated with poor prognosis. The aim of this study was to develop a nomogram predicting the overall and recurrence free survival for patients diagnosed with primary rectal adenocarcinoma.

**Methods:** A total of 1688 patients diagnosed with rectal adenocarcinoma between 2007 and 2017 were included. Prognostic factors were assessed with multivariable analysis using Cox regression, whereas nonlinear continuous variables were modeled with cubic splines. Important known predictive factors like TNM staging, mesorectal quality, neoadjuvant chemoradiation (nCRT) and adjuvant chemotherapy, tumor margins, distance from anal verge, MSI status, KRAS mutations, histopathological features such as lymphovascular invasion, differentiation grade, perineural invasion, AJCC tumor regression grade after nCRT, tumor deposits, and pathological subtypes of adenocarcinomas were included. The impact of each of these factors was assessed individually using Kaplan Meier survival curves, and the interactions between each was also assessed in the overall model.

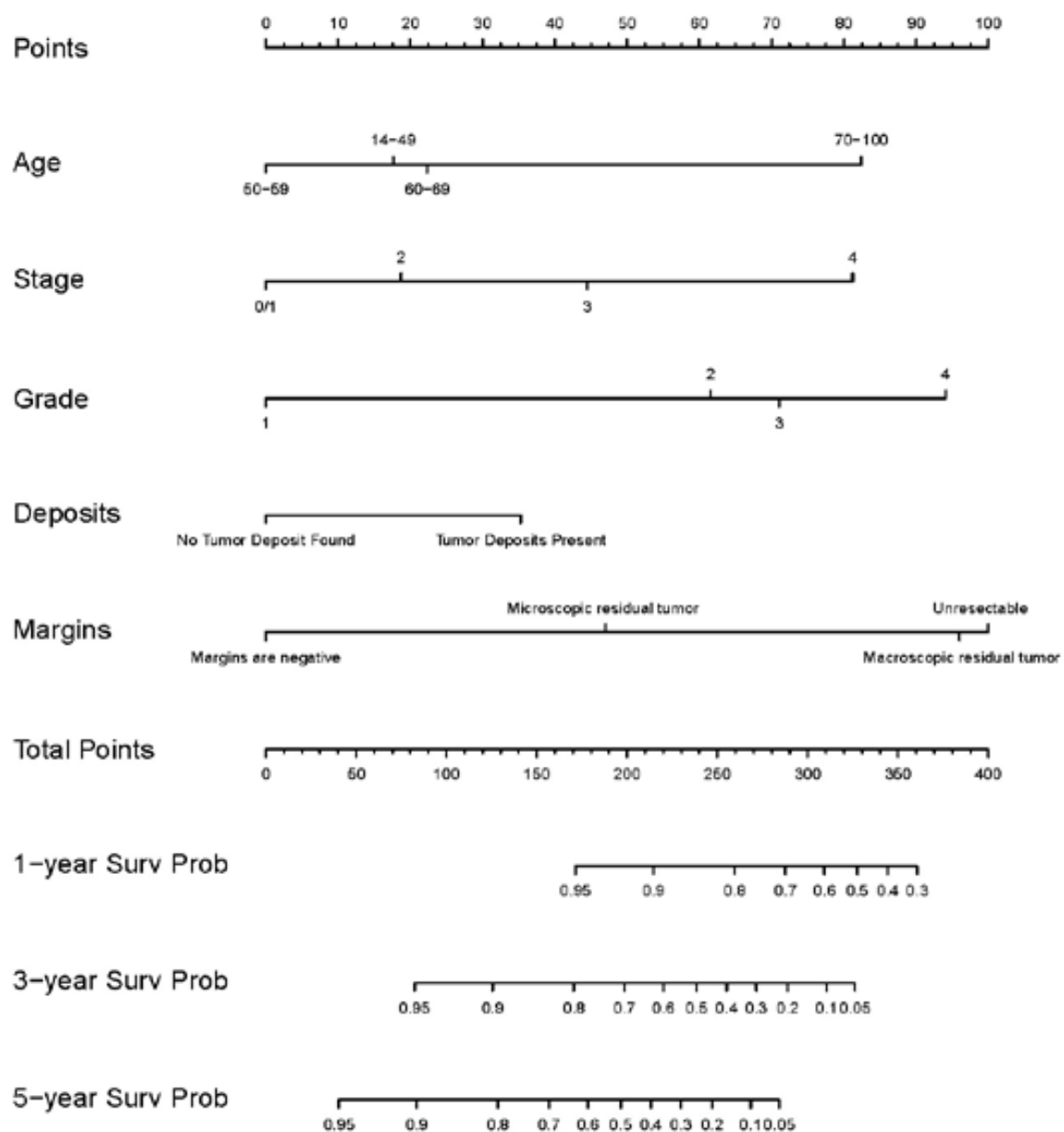
**Results:** A total of 1688 patients (male: 61%) with a mean age of  $59.8 \pm 13.5$  years were included with a median follow-up of 2.9 years (Range 1 – 11). 39% of the patients received nCRT of which 27.7% achieved a pathological complete response. Cox proportional hazards models were constructed for overall survival and recurrence-free survival. The only statistical significant factors affecting the model were age at the time of diagnosis, pathological staging, tumor deposits, differentiation grade, and resection margin. The overall survival and recurrence free models concordance index were 0.79 and 0.74 respectively. Internal validation with 200 bootstrap samples yielded shrinkage coefficients of 0.93 and 0.81, and Somer's D of 0.56 and 0.38, for overall and recurrence free survival, respectively, indicating good model calibration and discrimination.

**Conclusion:** The current prognostic models incorporate histopathological and clinical factors to predict overall and recurrence free survival. In consistence with the modification of TNM classification, this model emphasizes the importance of tumor deposits and other variables to generate prognosis based on a broader set of variables.



# Oral Paper Abstracts

Nomegram Predictive Model for Overall Survival in Rectal Cancer



## Oral Paper Abstracts

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### **28. MEDICAL STUDENTS ENTERING SURGICAL RESIDENCY FEEL INADEQUATELY PREPARED TO PRESCRIBE POST-OPERATIVE OPIOIDS**

*PJ Sweigert, B DiChiaro, PP Patel, AS Kabaker*  
Loyola University Medical Center

**Objective:** Little is known regarding medical school curricular variability regarding safe prescribing of post-operative opioids for students entering surgical residency.

**Methods:** A brief survey was electively administered to all interviewees for general surgery residency positions at an accredited academic institution during the 2018-2019 application season. The population represented US seniors from 62 medical schools in 28 different states. Responses were recorded using a web-based software on an electronic tablet in an anonymous fashion. Items were posed as yes/no, 5-point Likert scale, or numeric free-text response. Descriptive statistics were evaluated using proportions, and medians with interquartile range (IQR).

**Results:** 90/103 (87.4%) of interviewees participated. 72.2% of respondents anticipated no further opioid related medical education between survey date and graduation. Although 96.7% of students reported opioid pharmacology during medical school, 35.6% reported their curriculum did not include educational material on acute pain management. Lectures (94.4%), case-based learning groups (62.2%), and self-directed learning (58.9%) were the most commonly used pre-clinical educational methods used for opioid-related educational content while that for clinical years included: inpatient experience (85.6%), ambulatory experience (71.1%), and lectures (52.2%). Although 91.1% felt their medical school education adequately covered opioid related adverse events, only 28.8% felt their medical school curriculum provided them with an adequate foundation to safely prescribe opioids to surgical patients. Students anticipated prescribing a median of 10 tablets of 5mg/325mg hydrocodone-acetaminophen following an ambulatory laparoscopic appendectomy (IQR: 5,15; Range: 0-100).

**Conclusion:** Students entering surgical residency from US medical schools have variable exposures to opioid related educational content and most students feel their medical education inadequately prepared them for prescribing postoperative opioids.



# **SPECTACULAR PROBLEMS IN SURGERY**

# Spectacular Problems in Surgery Abstracts

## SP 1. UNCHARTED TERRITORY IN NECROTIZING PANCREATITIS: MULTIPLE VISCERAL ARTERY PSEUDOANEURYSMS

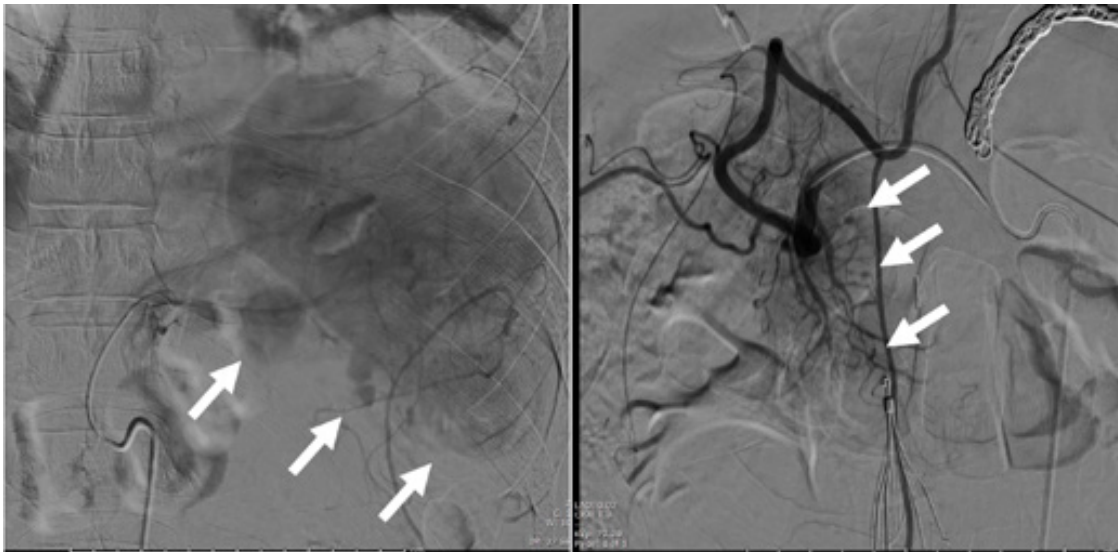
*EJ Yee, TK Maatman, NJ Zyromski*  
Indiana University School of Medicine

**Objective:** Visceral artery pseudoaneurysm (PSA) is a rare and often lethal complication of pancreatitis. Endovascular techniques are first-line intervention for PSA; however, is this approach appropriate for multiple PSAs complicated by active bleeding? We describe a patient who developed six visceral artery PSAs in the setting of acute necrotizing pancreatitis (NP).

**Methods:** A 46-year-old male presented with chronic pancreatitis. He was discharged after two weeks but was readmitted the following day for 10/10 umbilical pain and non-bloody emesis. Cross-sectional imaging revealed two, new large peripancreatic hematomas near the distal body and tail, measuring 5.5 and 9.0 cm respectively, and four foci of contained, active bleeding – one within the larger hematoma, two within the smaller hematoma, and one near the pancreatic head.

**Results:** Two interventional radiology procedures were performed to identify and embolize a total of six PSAs. Three PSAs involving the distal splenic artery and another three off the superior pancreaticoduodenal arterial arcade were coil embolized. The patient remained hemodynamically stable throughout this hospitalization and was discharged shortly thereafter. He continues to follow up in our clinic.

**Conclusion:** The presence of multiple visceral artery PSAs under any circumstance is extremely rare. In our patient, the sheer number of PSAs, their remote locations and active bleeding, and his underlying condition all contribute to a scenario never previously described. Although an endovascular approach ultimately achieved a good outcome, questions still remain: What should be the ideal follow-up strategy? What if coiling had failed? Is surgery a realistic remedy, and if so, what operation would that be? These are the questions we face as we enter uncharted territory in necrotizing pancreatitis.



# Spectacular Problems in Surgery Abstracts

## SP 2. CUPID'S ARROW PENETRATING THORACOABDOMINAL TRAUMA WITH CROSSBOW BOLT

DR Jacobs, CE Hardman, AP Ekeh  
Miami Valley Hospital

**Objective:** A 33-year-old female was transferred from an outside hospital with a penetrating injury to her right chest. Patient was shot with a crossbow with the entry site to the right breast/chest and a transmediastinal trajectory. The tip of the bolt was palpable at the patient's left midaxillary line. Chest x-ray in trauma bay showed the transmediastinal trajectory and the bolt appeared to have a field point (not a broadhead point)

**Methods:** Cardiothoracic surgery was consulted for assistance. Patient was taken to the operating room. In the OR, a transesophageal echocardiogram was performed that demonstrated the bolt penetrating the cardiac musculature, but not entering any chamber. A significant pericardial effusion was also demonstrated along with limited mobility of the heart due to it being "pinned down". A median sternotomy was performed and the pericardial tamponade was released. The bolt had penetrated the anterior right ventricular wall and exited posteriorly. Patient was placed on cardiopulmonary bypass and the heart decompressed. The bolt was carefully removed and both holes were repaired with pledgeted sutures. The defect in the left hemidiaphragm was also repaired. Drains were placed in the pericardial sac and both pleural cavities. She remained hemodynamically stable during most of the case. A midline laparotomy was performed and the two gastrotomies in the proximal stomach were repaired. The spleen was uninjured and there were no other intra-abdominal injuries.

**Results:** Her postoperative course was uncomplicated and she was discharged home on postoperative day 7. The patient did well and attained full recovery and returned to her activities of daily living.

**Conclusion:** In crossbow, carbon fiber arrows (bolts), as in this case, require an abrasive saw to cut them to avoid undesirable splintering. This was therefore not an option in this case before or during surgery. The bolt had a field point tip which is typically used for target-practice to prevent destruction of the target when withdrawn. The alternative, a broadhead arrow as is normally used in the sport, has a more complex configuration and would likely have resulted in a more destructive injury and reduced likelihood of survival.



# Spectacular Problems in Surgery Abstracts

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## **SP 3. NORMOCALCEMIC PRIMARY HYPERPARATHYROIDISM MORE COMMONLY AFFECTS MULTIPLE GLANDS AS COMPARED TO CLASSIC PRIMARY HYPERPARATHYROIDISM**

*DP deLahunta, G Aitken, B Britton, A Kabaker*  
Loyola University Medical Center

**Objective:** Primary hyperparathyroidism (PHPT) is classically associated with elevated parathyroid hormone and calcium levels. However, there is a growing amount of literature documenting patients with normocalcemic PHPT where the calcium levels are within the normal range but the PTH levels are inappropriately elevated and secondary hyperparathyroidism has been definitively ruled out. These patients are often symptomatic from their disease and undergo definitive management with parathyroidectomy. There is a paucity of information on the distribution of glands affected by this unique subgroup of patients and the results are mixed.

**Methods:** A retrospective chart review was conducted with IRB approval for patients with PHPT who underwent subtotal parathyroidectomy at a large academic center between January 2007 and December 2017. Data collected from each chart included age, race, pre-operative calcium levels and number of enlarged parathyroid glands found at time of surgery. Chi squared analysis was then used to assess the rates of single, double and 4 gland enlargement in normocalcemic vs hypercalcemic PHPT.

**Results:** A total of 505 patients who underwent subtotal parathyroidectomy for PHPT were reviewed. Of these cases, 385 were hypercalcemic PHPT and 120 were normocalcemic PHPT. The percentage of single gland and multigland disease in hypercalcemic PHPT was 82% and 18% respectively and for normocalcemic PHPT was 62% and 38% respectively ( $p < .01$ ). When doing subgroup analysis looking at the rates of double gland and 4 gland disease with respect to single gland disease, double and 4 gland disease were individually found to have a higher frequency compared to single gland disease with normocalcemic PHPT ( $p < 0.01$  and  $p < 0.01$  respectively).

**Conclusion:** Our study confirms the incidence of multigland disease is higher in patients with normocalcemic PHPT when compared to classic hypercalcemic PHPT. This information can help guide surgical planning in conjunction with pre-operative imaging and intraoperative parathyroid hormone levels particularly in reference to the decision to pursue a unilateral or bilateral neck exploration for patients with normocalcemic PHPT.

# Spectacular Problems in Surgery Abstracts

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## SP 4. THE REMNANT GALLBLADDER: SEQUELA OF A SUBTOTAL CHOLECYSTECTOMY

*M Venkatramani, BR Veenstra*

Rush University Medical Center

**Objective:** The management of the difficult gallbladder remains a hot topic in the surgical community. Despite a large volume of literature, no one approach has been established as the gold standard. One approach gaining moderate traction is that of the subtotal cholecystectomy. This technique offers a safe way to remove the majority of the diseased gallbladder while avoiding injury to the porta hepatis. The two methods described for subtotal cholecystectomy include fenestrated and reconstituting. With the fenestrated approach, the remaining gallbladder is left open while in the reconstituting approach the remaining gallbladder is closed. This approach is not without a downside with risk of recurrent biliary events, biliary leak and post-operative biliary fistula.

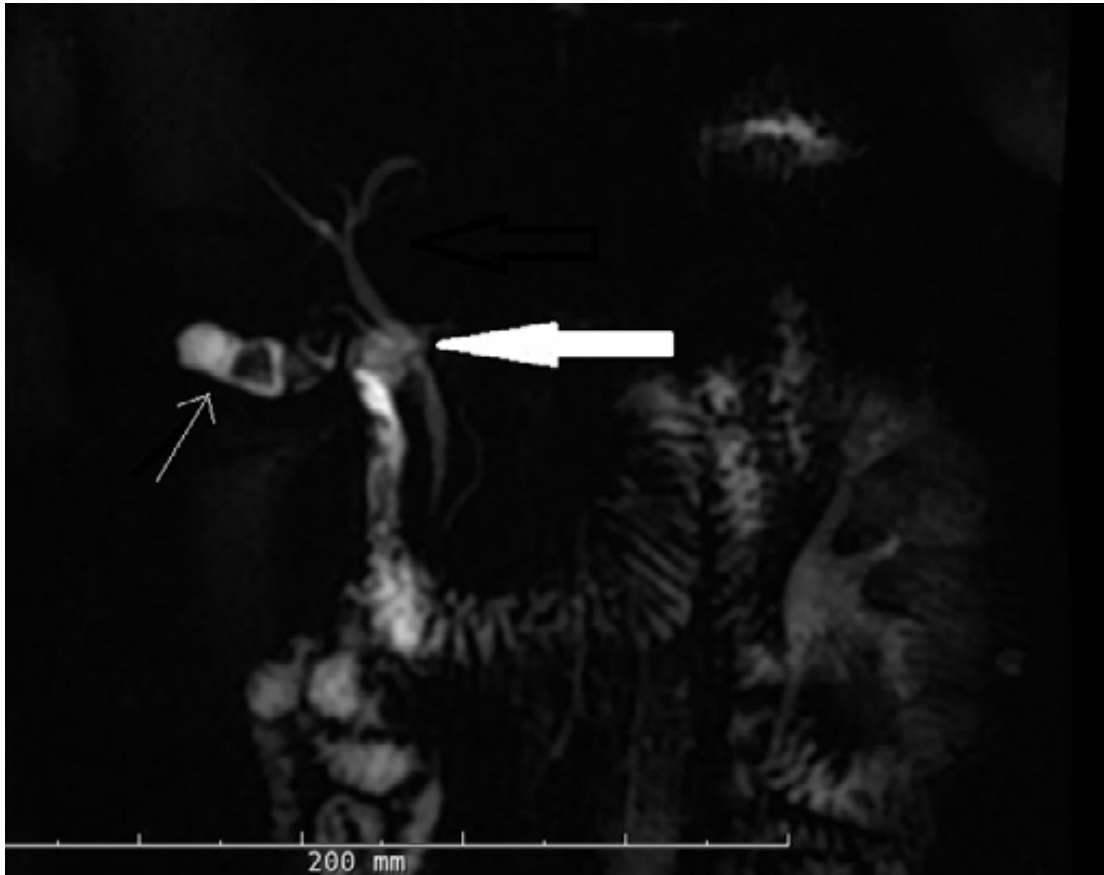
**Methods:** Our case is that of a 30 year-old female who presented with acute on chronic cholecystitis. Intraoperatively, she had a significantly inflamed gallbladder with a thick rind of inflammatory tissue extending from the fundus down through the hepatocystic triangle and to the duodenum. We opted to perform a dome-down, subtotal fenestrating cholecystectomy, taking a majority of the fundus and body of the gallbladder, stopping at what we believed was the infundibular stump. We extracted several stones from the opening of the cystic duct, then secured this with a suture and left a drain. Her post-operative course was uncomplicated with no biliary leak.

**Results:** However, she presented eight months later with recurrent biliary colic. Imaging included an US and MRCP (Fig. 1), both demonstrating a remnant gallbladder with stones. The patient was taken back to the operating room electively for a robotic-assisted remnant cholecystectomy. In anticipation of a difficult dissection, we administered 2.5mg of indocyanin green pre-operatively, and used near-infrared fluorescent cholangiography (Firefly Fluorescence Imaging) to help identify biliary structures. With this adjunct, despite persistent fibrosis in the hepatocystic triangle, we were able to identify the cystic duct and CBD, and complete the remnant cholecystectomy.

**Conclusion:** Our case illustrates the sequela of a subtotal cholecystectomy, even when the fenestrated technique is applied. Furthermore, this case highlights the use of advanced technology (robotic-assistance and Firefly) to tackle increasingly complex cases in a safe and minimally invasive manner.

## Spectacular Problems in Surgery Abstracts

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# Spectacular Problems in Surgery Abstracts

## SP 5. AN EXTRACOLONIC CASE OF CLOSTRIDIUM DIFFICILE PRESENTING AS A SPLENIC ABSCESS: A RARE COMPLICATION OF COLON RESECTION

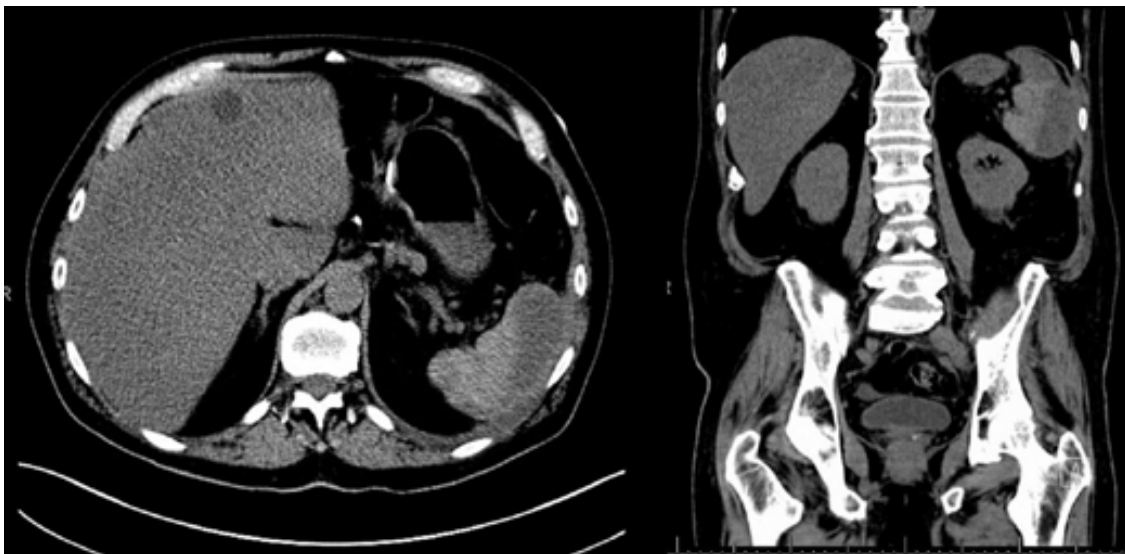
JA Miner, LM Kranker, RT Deci, CE Hardman, JK Bini  
Wright State University

**Objective:** Clostridium difficile is the most common hospital-acquired infection; however, extracolonic manifestations of C. difficile infection are exceedingly rare, occurring in only 0.17% of all cases. Of the 71 unique cases reported in the literature, 5 have presented as a splenic abscess. Extracolonic C. difficile carries an overall mortality of 36%, but when presenting as a splenic abscess mortality was 60% during the index hospitalization. Recent gastrointestinal surgery, antimicrobial exposure, and antecedent hospitalization have been identified as specific risk factors.

**Methods:** We herein report a case of C. difficile splenic abscess which developed following elective sigmoidectomy performed for a history of diverticular bleed.

**Results:** He was initially treated with open splenectomy and metronidazole, however, on discharge did not complete his antibiotic course and subsequently presented with an intra-abdominal abscess which was successfully treated with percutaneous drainage and an extended antimicrobial course. Extracolonic cultures most commonly identify C. difficile as part of a polymicrobial infection, however, cases of C. difficile as the sole microorganism have been reported, as in our patient.

**Conclusion:** Because of the rarity of the condition, no broadly-accepted guidelines exist for the management of extracolonic C. difficile. Given its associated high mortality, we recommend early surgical source control in conjunction with targeted antimicrobial therapy.



# Spectacular Problems in Surgery Abstracts

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## **SP 6. CREATION OF A SUTURELESS REDO ESOPHAGO-JEJUNAL ANASTOMOSIS USING A COVERED ENDOSCOPIC STENT**

*A Hufton, A Hawasli, M Taylor*

Ascension St. John Hospital and Medical Center

**Objective:** Our patient is a 41 year old male with previous total gastrectomy for gastric adenocarcinoma who presented 10 months later with obstruction of the pancreaticobiliary Roux limb. During his exploration, the esophago-jejunal anastomosis was devitalized. We recreated an esophago-jejunal anastomosis without using staples or sutures, instead using a self-expanding stent between the esophagus and jejunum.

**Methods:** We are reporting the successful reconstruction of redo esophago-jejunal anastomosis that was performed by using a covered endoscopic esophageal stent without primary suture or stapled anastomosis.

**Results:** Our patient presented to our hospital multiple times in the 10 months after his gastrectomy with obstruction of the duodeno-jejunal limb. The decision was made to perform an exploratory laparotomy. We did not note any carcinomatosis. During our dissection, we were unable to develop normal planes between bowel loops. Multiple enterotomies of the small intestine and transverse colon necessitated resection. The alimentary limb was devitalized distal to the esophagojejunal anastomosis. We temporarily closed the abdomen and returned the next day. We restored continuity to the small bowel. However, the esophago-jejunal anastomosis was ischemic. We did not want to risk dissection into the esophageal hiatus due to adhesions and worried about poor outcome from proximal diversion. We employed a novel approach with a sutureless anastomosis between the esophagus and viable jejunum using a covered esophageal stent. A covered esophageal stent was passed into the esophagus and out through the old anastomosis. The stent was then deployed partially into the healthy jejunal limb, pulled back into the esophagus and deployed. The stent was secured to the esophagus to prevent pull down of the stent. Endoscopy confirmed coverage of esophagus proximally and healthy jejunum distally. We placed a J-tube, left drains, matured a colostomy and closed the abdomen. Postoperatively, the patient was diagnosed with recurrent adenocarcinoma. One month postoperatively, a swallow study showed no leak.

**Conclusion:** Our approach to this case is novel from our search of the literature. It allowed us to stabilize a poor situation. We are not advocating for routine use of covered stents for sutureless anastomoses, but this can be an alternative method for damage control in extraordinary situations.

## Spectacular Problems in Surgery Abstracts

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# Spectacular Problems in Surgery Abstracts

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## **SP 7. IMITATION IS FLATTERY, EXCEPT WHEN YOU'RE A PARATHYROID GLAND**

*ZJ Senders, CR McHenry*

Case Western Reserve University School of Medicine

**Objective:** Preoperative parathyroid localization is essential prior to reoperation for persistent or recurrent primary hyperparathyroidism (HPT), however it is not without limitations. A lymph node, thyroid nodule and even thymus can have a sonographic or gross appearance similar to a parathyroid adenoma, complicating surgical exploration. Herein we report an unusual finding discovered during reoperative parathyroidectomy that mimicked a parathyroid adenoma.

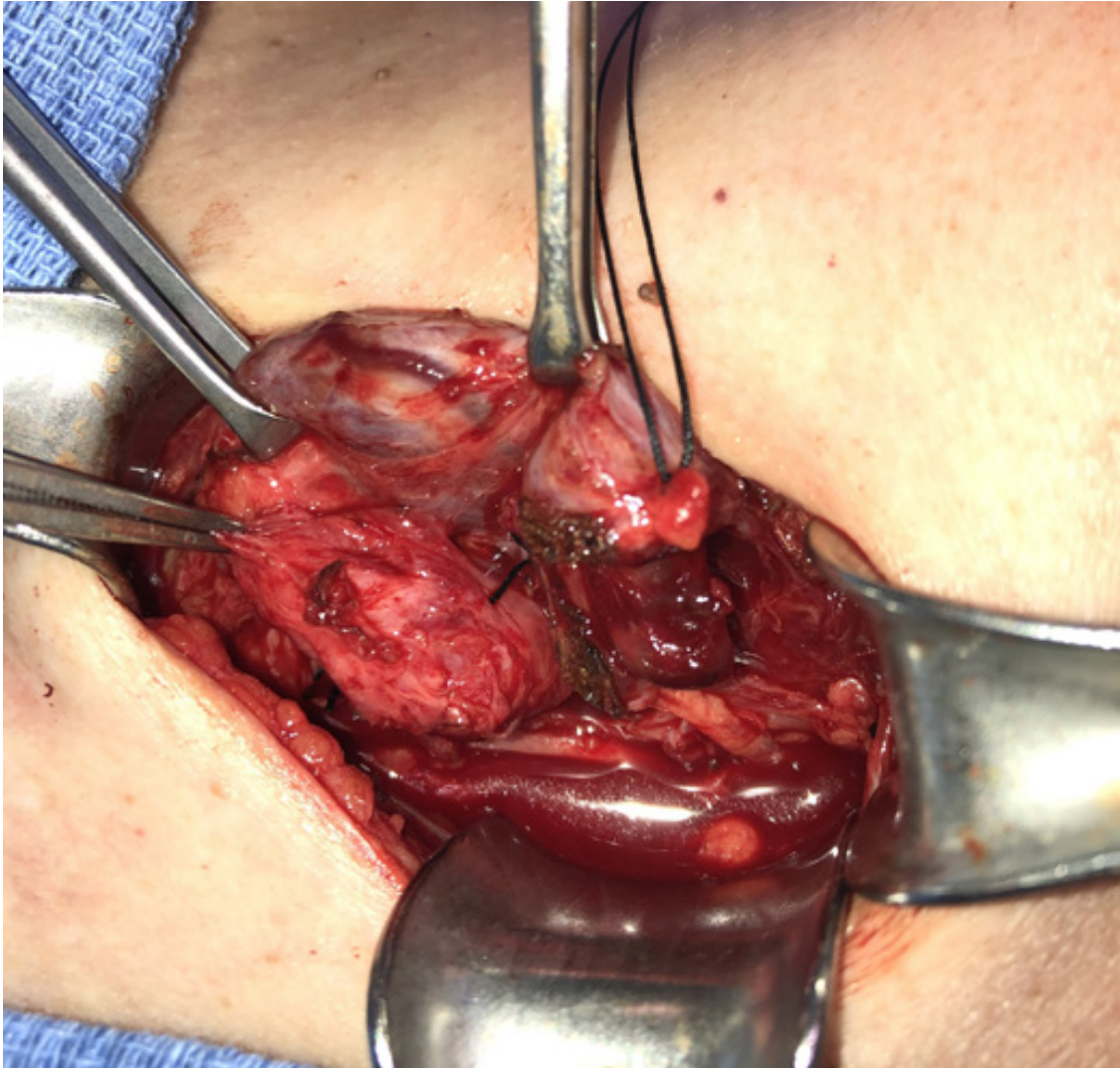
**Methods:** We report a case of a 53-year-old woman with persistent primary HPT who underwent reoperative parathyroidectomy.

**Results:** The patient initially underwent unsuccessful parathyroid exploration at an outside institution in 2014. She was subsequently admitted on multiple occasions for hypercalcemic crisis with calcium levels as high as 14.7mg/dL and was eventually referred to us for treatment. On evaluation, her calcium level was 11.6mg/dL and intact PTH was 109.6pg/mL. Neck ultrasound revealed a 1.6x1.0x2.2cm mass medial to the left common carotid artery and lateral to the superior pole of the left lobe of her thyroid gland suspicious for left superior parathyroid adenoma. Sestamibi scan showed no persistent area of abnormal radiotracer accumulation. At surgery, a large mass was identified medial to the left common carotid artery and lateral to the upper/mid portion of the left lobe of the thyroid surrounded by scar tissue, corresponding to the abnormality seen on ultrasound. Once completely dissected, it became clear that this was not a parathyroid adenoma, but was a diverticulum arising from the cervical esophagus. Exploration in the retropharyngeal, retroesophageal, and submandibular areas did not reveal any parathyroid tissue, however a nodule was noted in the superior pole of the left thyroid gland, which after enucleation was confirmed to be an intrathyroidal parathyroid adenoma. The adenoma was excised, and an esophageal diverticulectomy was performed. Intraoperative PTH decreased to 37.8pg/mL from a baseline of 125.1pg/mL, indicating cure. The patient was discharged on postoperative day 1 with a normal calcium level.

**Conclusion:** We report a patient with primary HPT and an incidental esophageal diverticulum mimicking a parathyroid adenoma. Despite the confusion that occurred as a result of the diverticulum, thorough and persistent exploration revealed an ectopic intrathyroidal parathyroid adenoma that was resected, resulting in cure of the patient's persistent HPT.

## Spectacular Problems in Surgery Abstracts

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# Spectacular Problems in Surgery Abstracts

## SP 8. THE USE OF A TUBED GROIN FLAP FOR COVERAGE OF A FULL THICKNESS ELBOW DEFECT

*K Piening, CK Rammos*

University of Illinois, College of Medicine, Peoria

**Objective:** Loss of skin and subcutaneous tissue frequently results from trauma or virulent infection. The simplest treatment of these defects is skin grafting, either split thickness or full thickness. However, in many areas, such as the upper extremity, and specifically the elbow, this form of treatment is inadequate, and use of an axial flap is preferred in order to obtain optimal function and appearance. The skin of the lateral groin may be elevated as a groin flap extending between the femoral vessels and the posterior iliac spine.

**Methods:** The long axis of the groin flap is centered over a line parallel and 3 cm inferior to the inguinal ligament. The dominant pedicle of the flap is the superficial circumflex iliac artery, that arises from the superficial femoral artery. A decision was made to proceed with a staged groin flap reconstruction. The flap extended from the medial edge of the sartorius muscle to a distance of 7 cm lateral to the anterior superior iliac spine. The initial bulk was necessary to allow healing with good-quality tissue coverage. Flap width was selected to be 10 cm to facilitate primary closure of the donor site defect. To avoid tension at the inset, the distal end of the tube was left open.

**Results:** The flap was elevated, tubed, and attached to the elbow defect. Division and inset was performed 4 weeks postoperatively, achieving healthy coverage.

**Conclusion:** As this case demonstrates, the groin flap provides a safe practical way of providing soft tissue coverage.





# **POSTER ABSTRACTS**

## Poster Abstracts

### P 1. CARDIAC METASTASIS: A RARE FINDING OF MARJOLIN ULCERS

*S Patel, JG Tyburski, H Dolman*  
Wayne State University

**Case Report:** Marjolin ulcer, first described by the French surgeon Dr. Jean Nicolas Marjolin, is defined by the presence of villous changes arising in a burn scar. It is a rare and often very aggressive skin cancer that usually develops in previously damaged areas or those areas which are affected by chronic inflammation. This ulcer is most often seen in deep burn wounds since these wounds are associated with a slow healing process. Rate of incidence is usually 1 to 2%. Treatment is wide local excision with margins of 4-6 mm. This case study describes a 33-year-old male from Philippines, who was seen 23 years after sustaining extensive burn to the entire body with a large ulcerating wound of the left flank and back, measuring about 30X30cm developed over unknown time-length. Subsequently, he underwent local excision of the ulcerated area with pathology confirmation of an invasive squamous cell carcinoma. Split thickness skin graft was performed of the excised area. During the work up, patient was noted to have metastases to the heart, confirmed by TEE and with a biopsy of the mass. Recurrence of cancer was noted at the excision site with worsening of patient condition within just 4 months of diagnosis. This progression was associated with declining respiratory status and worsened prognosis. Patient was made comfort care and was transferred to hospice.





## Poster Abstracts

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### **P 2. DOES ONE SIZE FIT ALL? RISKS AND BENEFITS OF NEOADJUVANT CHEMORADIATION IN PATIENTS WITH CLINICAL STAGE II (T3N0) RECTAL ADENOCARCINOMA REQUIRING ABDOMINOPERINEAL RESECTION**

*MGM Camargo, A Aiello, D Liska, E Gorgun, X Xhaja, D Dietz, M Kalady, CP Delaney, SR Steele, MA Valente*  
Cleveland Clinic Foundation

**Objective:** Neoadjuvant chemoradiotherapy (nCRT) has become the standard of care for treatment of locally advanced clinically stage II/III rectal cancer. Standardized surgery for low rectal cancer requiring abdominoperineal resection (APR), using a wide, cylindrical excision involving the levator muscles, has also improved oncologic outcomes. We aimed to assess the benefit of nCRT on oncologic outcomes in patients with clinical stage II (T3N0) rectal adenocarcinoma treated with APR.

**Methods:** Retrospective review of patients with clinical stage II rectal adenocarcinoma that underwent APR surgery between Jan/1995 and Dec/2015. A univariate analysis was conducted to compare patients who received nCRT to those who did not. Kaplan-Meier curves were used for survival analysis.

**Results:** 129 patients were included, of whom 96 received nCRT. nCRT patients were younger (60 vs. 66 years;  $p=0.018$ ), had smaller tumors (2.0 vs. 4.2cm;  $p<0.001$ ) and longer surgeries (183 vs. 159min;  $p=0.030$ ). 28% of nCRT patients had pathological stage I, while 39.4% of no-nCRT had pathological stage III ( $p=0.005$ ). There was no difference in circumferential margins ( $p=0.19$ ). Postoperative morbidity was comparable. 11% of patients in nCRT groups had a delayed perineal wound healing, which did not occur in the no-nCRT group ( $p=0.04$ ). There was no difference in 5-year survival analysis.

**Conclusion:** Patients with T3N0 rectal adenocarcinoma who received nCRT followed by APR have the same 5-year oncological outcomes with similar overall morbidity as those not receiving nCRT, but more complications with perineal wound. The utility of administering nCRT in this patient population should be further studied and potentially obviated from routine use.

# Poster Abstracts

**Table. Demographics, Perioperative and Tumor characteristics**

<b>Factor</b>	<b>Neoadjuvant treatment (N=96)</b>	<b>No neoadjuvant treatment (N=33)</b>	<b>p-value</b>
Female gender	28 (29.2)	13 (39.4)	0.28
ASA Classification			0.76
. 1-2	27 (28)	11 (33)	
. 3-4	68 (72)	22 (67)	
BMI	28 [24 - 32]	27 [25 - 30]	0.91
Age at surgery	60.6 ± 12.1	66.4 ± 14.7	<b>0.024</b>
Open Approach	85 (88.5)	32 (97.0)	0.44
Operative Time (min)	183 [144 - 225]	159 [128 - 193]	<b>0.030</b>
Estimated Blood Loss (ml)	400 [250 - 950]	300 [200 - 600]	0.27
Pathology Tumor Size (cm)	2.0 [1.1 - 3.5]	4.2 [2.9 - 5.5]	<b>&lt;0.001</b>
Pathology Stage			<b>0.005</b>
. 0	25(26.0)	0(0.0)	
. I	27(28.1)	9(27.3)	
. II	26(27.1)	10(30.3)	
. III	15(15.6)	13(39.4)	
. IV	3(3.1)	1(3.0)	
Pathology T			<b>0.014</b>
. Tx	2(2.1)	1(3.0)	
. To	23(24.0)	0(0.0)	
. T1	5(5.2)	3(9.1)	
. T2	30(31.3)	8(24.2)	
. T3	34(35.4)	21(63.6)	
. T4	2(2.1)	0(0.0)	
Pathology N			<b>0.028</b>
. No	79(82.3)	20(60.6)	
. N1	11(11.5)	10(30.3)	
. N2	6(6.3)	3(9.1)	
Radial Margins			0.96
. Clear	88(93.6)	28(93.3)	
. Involved	6(6.4)	2(6.7)	
Postoperative complication	57(59.4)	20(60.6)	0.90
Perineal Wound - Infection	15 (16)	6 (18)	0.73
Perineal Wound – Delayed Healing	11 (11)	0	<b>0.04</b>
Clavien-Dindo			0.19
. I-II	40 (70)	17 (85)	
. III-V	17 (30)	3 (15)	
Recurrence	29 (30)	7 (23)	0.41
Local Recurrence	6 (7)	3 (10)	0.52
Distant Metastases	21 (23)	6 (20)	0.77

## Poster Abstracts

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### **P 3. CLINICALLY RESECTABLE ACINAR CELL CANCER OF THE PANCREAS: IS THERE A BENEFIT TO ADJUVANT SYSTEMIC THERAPY?**

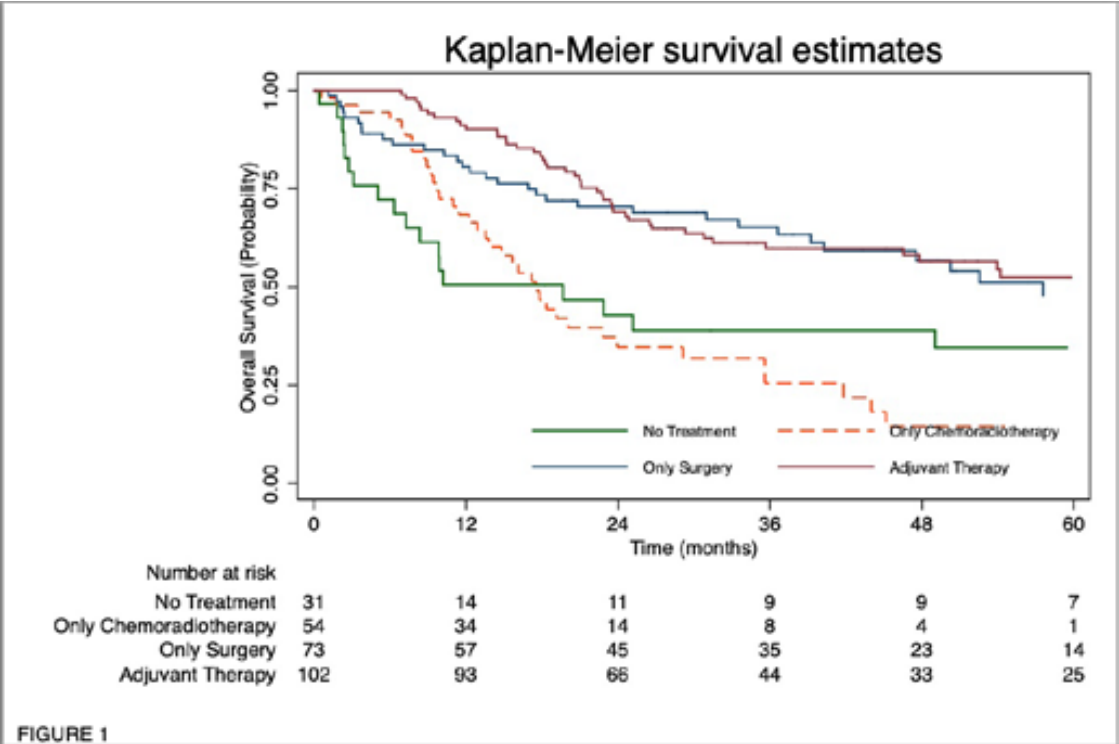
*D Patel, W Lutfi, P Sweigert, E Eguia, G Abood, L Knab, PC Kuo, MS Baker*  
Loyola University Medical Center

**Objective:** Acinar cell cancer (ACC) is a rare pancreatic malignancy. For patients presenting with resectable disease, margin negative surgical resection offers the only potential for cure. Prior studies evaluating the role of adjuvant therapy in resectable ACC have been small retrospective single institution series or underpowered registry studies. These have, in general, shown a marginal survival advantage to adjuvant therapy.

**Methods:** We queried the National Cancer Database to identify patients presenting with resectable (clinical stage I-II) ACC between 2004 and 2014. Patients were stratified by treatment: none, chemo- or chemoradiotherapy alone, surgical resection alone, or resection with adjuvant chemo- or chemoradiotherapy. Kaplan-Meier method and cox proportional hazard analysis adjusting for age, insurance, Charlson-Deyo comorbidity index (CCI), income, facility type, resection (yes/no), and adjuvant chemo- or chemoradiotherapy (yes/no) were used to identify factors associated with overall survival (OS).

**Results:** 260 patients met inclusion criteria. 31 (11.9%) received no treatment, 54 (20.7%) received chemo or chemo-radiotherapy alone, 73 (28.1%) underwent surgical resection alone and 102 (39.2%) underwent resection with adjuvant chemo- or chemoradiotherapy. In both unadjusted and adjusted analyses, use of adjuvant therapy was associated with no survival benefit. On univariate analysis, three-year OS was 38.9% for patients receiving no therapy, 25.4% for those receiving adjuvant chemo- or chemoradiotherapy alone ( $p=0.6166$ ), 63.4% for those undergoing resection alone ( $p=0.0660$  relative to no treatment and  $p<0.01$  relative to systemic therapy alone), and 59.8% for those undergoing resection with adjuvant chemo- or chemoradiotherapy ( $p<0.01$  relative to no treatment and  $p=0.8412$  relative to resection alone). On multivariable Cox analysis, having Medicare (HR 5.89, 95% CI [2.00, 17.28]) and CCI  $\geq 3$  (HR 3.86, 95% CI [1.02, 14.7]) were factors associated with increased risk of death while surgical resection (HR 0.38, 95% CI [0.24, 0.61]) was associated with decreased risk of death; use of adjuvant therapy (HR 1.0, 95% CI [0.62, 1.6]) was not associated with OS.

**Conclusion:** Surgical resection provides a substantive improvement in OS for patients with resectable ACC. The use of adjuvant chemoradiotherapy in patients undergoing resection for clinical stage I-II ACC offers no survival benefit over resection alone and should be curtailed.



# Poster Abstracts

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## **P 4. HOW BIG WAS THAT PARATHYROID GLAND?**

*ZJ Senders, K Shulemovich, SM Wilhelm*

Case Western Reserve University School of Medicine

**Objective:** Parathyroid adenomas are larger than normal parathyroid glands but rarely weigh more than 1-2 grams. Glands weighing more than 3.5g are considered giant adenomas. Few reports of parathyroid glands weighing more than 30 grams have been published.

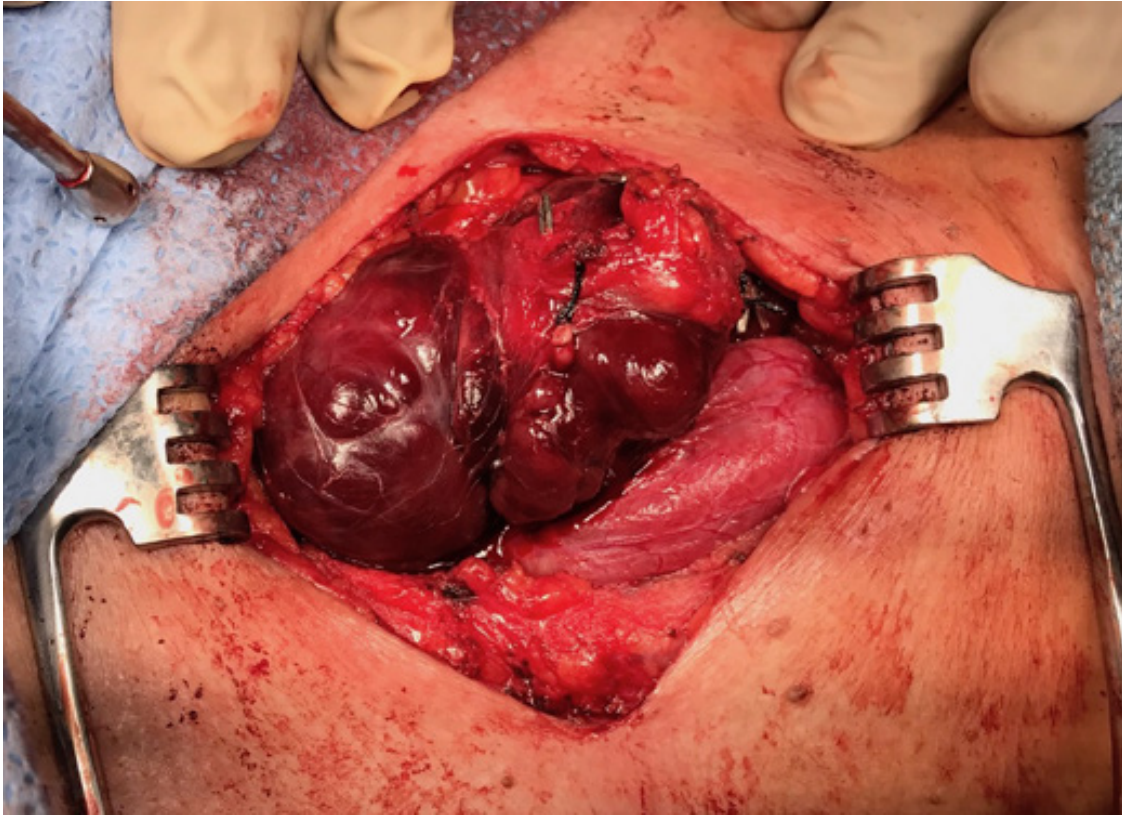
**Methods:** We report a case of a 57-year-old man presenting with a massive parathyroid adenoma.

**Results:** The patient presented to the emergency department with dehydration, polydipsia, and increased urinary output. His calcium level was 12.9 mg/dL and intact PTH level was 2274 pg/mL. Neck ultrasound revealed a 6.6x3.1x4.3 cm mass posterior to the right lobe of the thyroid. CT scan showed that the mass was causing tracheal displacement and extending substernally below the brachiocephalic vessels. No local invasion was noted. The lesion had significant uptake on sestamibi scan. The patient was treated with IV fluids, diuretics, bisphosphonates, and was discharged with a normal calcium level and plans for parathyroidectomy. At surgery, a soft, well-circumscribed mass was found posterior to the right lobe of the thyroid. It extended into the upper mediastinum and displaced the carotid artery laterally and trachea medially. The right recurrent laryngeal nerve was draped over the medial aspect of the mass. Despite its intimate involvement with these structures, there was no evidence of localized invasion and it was completely resected. Intraoperative PTH level decreased to 147 from a baseline of 2391. Final pathologic examination revealed a giant parathyroid adenoma weighing 49.5 grams. The patient was discharged on post-operative day 1 with normal calcium (8.5 mg/dl) and PTH (42.6 pg/ml) levels.

**Conclusion:** We report the case of a 57-year-old man presenting with a 49.5 gram parathyroid adenoma, 1,650 times larger than a normal gland and in range of the largest parathyroid adenomas ever reported. While markedly elevated PTH levels and large size must raise concern for parathyroid carcinoma, other preoperative imaging characteristics were more consistent with an adenoma that, although massive, could be resected without significant morbidity. These patients are at high risk for post-operative hungry bone syndrome and calcium levels should be monitored closely.

## Poster Abstracts

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## Poster Abstracts

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### **P 5. PREDICTORS OF ILEUS FOLLOWING COLORECTAL RESECTIONS**

*I Sapci, A Ceylan, A Oktem, A Rencuzogullari, T Hull, D Liska, CP Delaney, E Gorgun*  
Cleveland Clinic Foundation

**Objective:** Ileus following colorectal surgery is a significant burden for healthcare burden and management can be challenging. This study aims to evaluate risk factors for postoperative ileus in patients undergoing colorectal surgery.

**Methods:** Patients who underwent colorectal resections for any diagnosis were identified from our institutional database between 2009-2014. Emergency surgeries, patients with ASA 4, patients who had surgery for mechanical obstruction and patients with slow transit constipation were excluded from the study. Patient demographics, pre-operative comorbidities, and operation-related variables were compared in patients with and without ileus within 30 days after surgery. A univariate analysis was conducted to identify potential risk factors, as well as a multivariable logistic regression model to determine the independent risk factors.

**Results:** A total of 5369 patients were identified in our study group with a mean age of 53 years. There were 892 patients (16.6%) who developed postoperative ileus. There were no differences between the groups in terms of pre-operative comorbidities. After adjustment for other risk factors in the multivariate model, males were two times more likely to develop postoperative ileus compared to females ( $p < 0.001$ ). Patients with anastomosis formation were 1.4 times more likely to develop ileus compared to those without ( $p < 0.001$ ). Patients who underwent laparoscopic surgery had lower risk of postoperative ileus when compared with open procedures (OR: 0.59,  $p < 0.00$ ), and older patients had a higher risk of postoperative ileus development (OR: 1.01,  $p = 0.015$ ). Patients with a diagnosis of colorectal cancer, Crohn's disease, and Ulcerative colitis were all more likely to develop postoperative ileus compared to patients with diverticular disease (OR's: 1.7, 1.7 vs 1.4,  $p = 0.002$ ).

**Conclusion:** Male gender, older age, anastomosis formation, diagnosis of cancer and inflammatory bowel disease are independent risk factors for developing postoperative ileus after colorectal surgery. Consideration of these factors in clinical practice can help facilitate earlier diagnosis, management and potentially preoperative prevention using opioid receptor antagonists.



## Poster Abstracts

	Ileus N=892	No Ileus N=4477	P value
<b>Age, year</b>	54.6±17.1	52.5±17.1	<b>&lt;0.001</b>
<b>Gender (male)</b>	562(63)	2094(46.8)	<b>&lt;0.001</b>
<b>ASA</b>			0.11
1	8(0.9)	49(1.1)	
2	376(42.4)	2045(46)	
3	503(56.7)	2348(52.9)	
<b>Smoking (yes)</b>	5(9.8)	78(16.2)	0.41
<b>Diagnosis</b>			<b>&lt;0.001</b>
<i>Colorectal Cancer</i>	275(30.8)	1085(24.2)	
<i>Crohn's Disease</i>	169(18.9)	714(15.9)	
<i>Ulcerative Colitis</i>	164(18.4)	871(19.5)	
<i>Diverticular Disease</i>	77(8.6)	562(12.6)	
<i>Other benign disease</i>	207(23.2)	1245(27.8)	
<b>Transfusion (yes)</b>	86(9.6)	317(7.1)	<b>0.008</b>
<b>Operative Time</b>	146.3±97.1	141.4±102.1	0.19
<b>Anesthesia Time</b>	255.5±104.7	242.7±117.4	<b>0.002</b>
<b>Surgical Approach</b>			<b>&lt;0.001</b>
<i>Open</i>	597(66.9)	2543(56.8)	
<i>Laparoscopic</i>	295(33.1)	1934(43.2)	
<b>Length of Hospital Stay</b>	11.1±5.7	6.5±4.8	<b>&lt;0.001</b>
Values are reported as mean ±SD or absolute values (%). BMI: Body Mass Index; ASA: American Society of Anesthesiologists classification			



## Poster Abstracts

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### **P 6. TARGETING AN IDEAL LENGTH OF STAY FOR PATIENTS UNDERGOING DISTAL PANCREATECTOMY: CAN WE IMPACT AGGREGATE COSTS OF CARE?**

*PJ Sweigert, H Janjua, PC Kuo, E Eguia, E Cousin-Peterson, MS Baker*  
Loyola University Medical Center

**Objective:** There is increasing recognition that premature hospital discharge is associated with unplanned readmission. Few studies evaluate the relationship between postoperative complications, appropriate timing of discharge, rates of readmission and aggregate costs for patients undergoing distal pancreatectomy (DP).

**Methods:** The Healthcare Cost and Utilization Project-State Inpatient Databases and the American Hospital Association Annual Health Survey Databases were used to evaluate patients undergoing DP between 2009 and 2013. Those that were readmitted after their index hospitalization were propensity matched for age, demographics, pathologic diagnosis, facility characteristics, comorbid disease and complication type to those undergoing DP and having no readmission. Multivariable regression was used within the no-readmission cohort to develop a model for ideal index length of stay (iLOS). Aggregate charges including all readmissions for patients in the readmission cohort that were discharged 2 days or more prior to their iLOS were compared to charges for their iLOS to impute costs associated with early discharge.

**Results:** 7983 patients underwent DP. 1096 (13.7%) had at least one readmission. After propensity matching, a total of 4709 admissions were modeled. 651 of these were readmissions. On multivariable regression within the no readmission cohort, the top ten variables associated with LOS included: operation in a community hospital ( $\beta$ 11.9), pulmonary embolism ( $\beta$ 9.4), sepsis ( $\beta$  9.4), deep venous thrombosis ( $\beta$  6.1), pneumonia ( $\beta$ 4.9), discharge to another facility ( $\beta$  3.6), weight loss ( $\beta$  2.8), having no insurance ( $\beta$ 2.5), having Medicaid ( $\beta$ 1.9) and having a neurologic disorder ( $\beta$  1.6). The top 25 variables associated with LOS were included in the final model of iLOS ( $r^2$  0.50). 197 patients from the matched readmission cohort were discharged >2 days prior to their iLOS. These patients accounted for 23.09% of readmissions and 36.34% of the total days spent in readmission. Comparing aggregate total charges for these patients to that for their iLOS, identified a mean potential savings with iLOS of \$41,693.95 per patient.

**Conclusion:** Targeting an optimal length of stay accounting for facility type, patient condition and complication type has potential to prevent readmission and lower aggregate costs of care for patients undergoing DP.

## Poster Abstracts

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### **P 7. CHANGES IN INJURY CHARACTERISTICS AND OUTCOMES OF GUNSHOT WOUNDS AT A HIGH VOLUME URBAN TRAUMA CENTER FROM 2004 TO 2017**

*K Coughlin, RD Hayward, E Edhayan*

Ascension St. John Hospital and Medical Center

**Objective:** Gunshot wounds (GSW) are a common cause of serious traumatic injury in the US. The study aimed to study changes in prevalence, demographics and outcomes from GSW over the last 14 years.

**Methods:** This study examined data on patients with GSW trauma over the course of a 14-year period, from 2004 to 2017, from a single center located in an urban area with a high violent crime rate. 3,694 patients presented in the emergency department (ED) with GSW trauma, including 378 pronounced dead on arrival, and 195 who died in the hospital. Generalized linear modeling was used to assess change over time in patient demographics, injury severity, and outcomes.

**Results:** The average age of GSW patients increased ( $p=.007$ ) between 2004 and 2017, whereas the gender and racial composition of the patient population did not change significantly. Average ISS did not change significantly ( $p=.864$ ), but the likelihood of having a multi-region injury increased ( $p<.001$ ). The rate of patient's dead on arrival decreased ( $p=.009$ ), as did the mortality rate for patients admitted to the hospital floor ( $p=.003$ ), whereas the mortality rate in the ED increased ( $p<.001$ ). The likelihood of ICU admission increased ( $p=.006$ ), while the average length of time spent in the ICU and total length of hospital stay did not change.

**Conclusion:** These results could partially be explained by better pre-hospital care. Sicker patients are brought alive to the ED, leading to higher ED mortality and more ICU admissions. Overall hospital mortality remained the same possibly due to improvements in care for sicker patients.

## Poster Abstracts

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### **P 8. THE EFFECTIVENESS OF THE OVER-THE-SCOPE-CLIP SYSTEMS IN THE MANAGEMENT OF GASTROINTESTINAL COMPLICATIONS AT A COMMUNITY TEACHING HOSPITAL**

*A Hufton, A Hawasli*

Ascension St. John Hospital and Medical Center

**Objective:** The use of the over-the-scope-clip (OTSC) or “bear-claw” system has increased in recent years in treatment for gastro-intestinal complications. Our study is designed to evaluate the effectiveness of the OTSC system for management of these complications at our institution.

**Methods:** We performed a retrospective analysis for all uses of the OTSC device, with attention to resolution of or failure to address the patient’s issue. We identified two general categories of uses: immediate uses after endoscopic resection, and late uses after anastomotic leak and fistulas.

**Results:** From November 2010 to January of 2019 a total of 21 patients with 24 uses of OTSC were identified. Of these, 4 were immediate uses for closure of a defect after endoscopic mucosal resection (EMR). All were successful (100%) in closing the defect. Unfortunately, one caused acute appendicitis after it closed off the appendiceal orifice, requiring an appendectomy and resection of the OTSC device. The remaining 19 uses were late uses for chronic problems in 17 patients. Three patients required a second use of the device. Two patients were lost to follow up. Of the remaining 15 patients, five patient had anastomotic leak only one resolved (20%) and the remaining 10 patients had fistula where 7 (70%) were successfully closed. The overall success in late uses is in 8 of 15 patients (53%).

**Conclusion:** The OTSC system is rapidly advancing in use as a minimally-invasive adjunct for GI complications. It is best used in early uses with fresh tissue while the success rate falls drastically to 53% in late uses especially after leaks where the tissue of the surrounding abscess is stiff and hard to bring together. Further studies are needed to identify optimal conditions and situations for its use.

## Poster Abstracts

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### **P 9. AGE-RELATED 'RIGHT-SHIFT' IN ADVANCED COLORECTAL ADENOMAS: ANATOMICAL AND HISTOLOGICAL EXAMINATION OF 1482 ADVANCED ADENOMAS OVER A 20-YEAR PERIOD**

*DE Kearney, AE Feinberg, J Church*  
Cleveland Clinic Foundation

**Objective:** Colorectal adenomas are a known precursor to colorectal cancer, and their removal has repeatedly been shown to decrease its incidence. Advanced colorectal adenomas (ACAs) carry a significantly greater risk of colorectal cancer. Previous studies have demonstrated a 'right-shift' in colorectal cancer with age, with a higher percentage of right-sided tumors in elderly patients. The aim of this study was to examine whether a similar 'right-shift' phenomenon was present in ACAs.

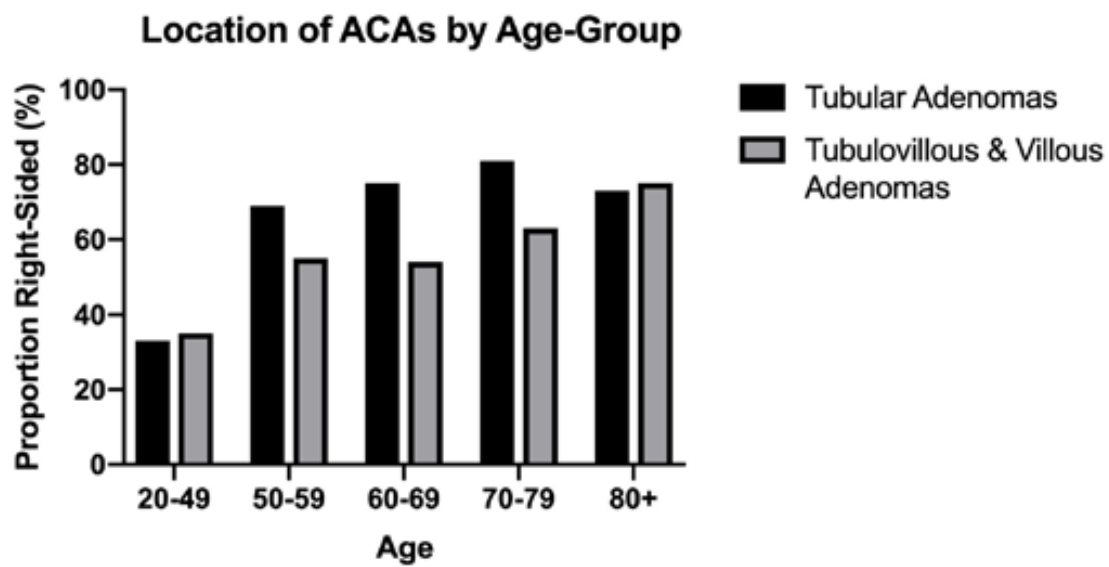
**Methods:** A prospective database of all adenomas removed at colonoscopy from 1994-2014 by a high-volume endoscopist was queried for patients who had an ACA (defined as adenomas  $\geq 10$ mm, adenomas with high grade dysplasia (HGD), or adenomas  $>25\%$  villous architecture). Patient demographics, polyp size, morphology, location, architecture, and dysplasia were recorded. A specialist board-certified GI pathologist reviewed all histology. Polyps that had in-situ or invasive adenocarcinoma were excluded as well as patients with a history of hereditary colorectal cancer or IBD.

**Results:** Over the 20-year study period 1482 ACAs were removed from 790 patients. 60% of patients were men and 40% were women. Men had more ACAs per patient compared to women (1.98 vs 1.66,  $P < 0.001$ ). Two-thirds of ACAs (978) were located on the right-side of the colon with the ascending colon being the most frequent location (21%). The mean ACA size was 20.9mm  $\pm$  15.9mm (SD). On histological analysis, there were 791 tubular adenomas (54%), 639 tubulovillous adenomas (43%), and 46 villous adenomas (3%). The proportion of ACAs with HGD increased with polyp size; 9% of ACAs  $< 4$ cm had HGD compared to 39% of ACAs  $\geq 4$ cm ( $P < 0.001$ ). In patients  $< 50$  two-thirds of ACAs were located on the left-side of the colon. In all other age-groups there were significantly more ACAs on the right-side of the colon ( $P < 0.001$ ; see Figure 1). The highest proportion were in patients over 80 with three-quarters of all ACAs on the right-side of the colon.

**Conclusion:** ACA location changes with age. Although flexible sigmoidoscopy will detect two-thirds of ACAs in the  $< 50$ 's age-group, this screening modality will miss the majority of lesions in older patients. This study reinforces the importance of colonoscopy as a screening modality for colorectal cancer.

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### **P 10. DOSE ADJUSTING PROPHYLACTIC ENOXAPARIN IS NECESSARY TO ACHIEVE THERAPEUTIC ANTI-FACTOR XA LEVELS IN SURGICAL ONCOLOGY PATIENTS**

*K Kramme, G Munene, P Sarraf*  
Western Michigan University

**Objective:** Recommended venous thromboembolism (VTE) prophylaxis with enoxaparin has been reported to result in sub therapeutic anti-Factor Xa (anti-Xa) levels in certain patient populations which may result in elevated VTE rates. Surgical oncology patients are among those at highest risk of development of venous thromboembolism. The goal of this study was to determine the adequacy of once-a-day enoxaparin dosing in the immediate postoperative period for patients undergoing major abdominal cancer surgery.

**Methods:** Patients undergoing major abdominal cancer surgery who received at least three daily doses of prophylactic enoxaparin were included in the study. Peak anti-Xa levels following single-day dosing of enoxaparin were monitored. Outcomes included therapeutic peak anti-Xa levels and development of in hospital VTE.

**Results:** Thirty-five patients met our inclusion criteria. Patients had a median age of 56.9 years of age with 57% being males; a majority, 60%, had hepatobiliary and pancreatic surgery. A majority of the patients, 68.6%, had sub therapeutic anti-Xa levels and required dose modifications. There were no differences in age, sex, BMI, OR time, or Caprini scores between patients who were therapeutic compared to those who were subtherapeutic. One patient was diagnosed with VTE (3.3%). There were no significant bleeding events in the group that received an enoxaparin dose adjustment.

**Conclusion:** Most patients had sub therapeutic peak anti-Xa levels while receiving enoxaparin 40mg daily. These findings challenge the standard dosing of enoxaparin in the postoperative period of patients undergoing major abdominal cancer surgery and warrant further study.

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### **P 11. PERIOPERATIVE THERAPY IN CT1bN0MOG1-3 ESOPHAGEAL/GASTROESOPHAGEAL JUNCTION ADENOCARCINOMA TREATED WITH ESOPHAGECTOMY: A NATIONAL CANCER DATABASE ANALYSIS**

*S Leonard-Murali, T Ivanics, X Han, CP Steffes, DS Kwon, RA Shah*  
Henry Ford Health System

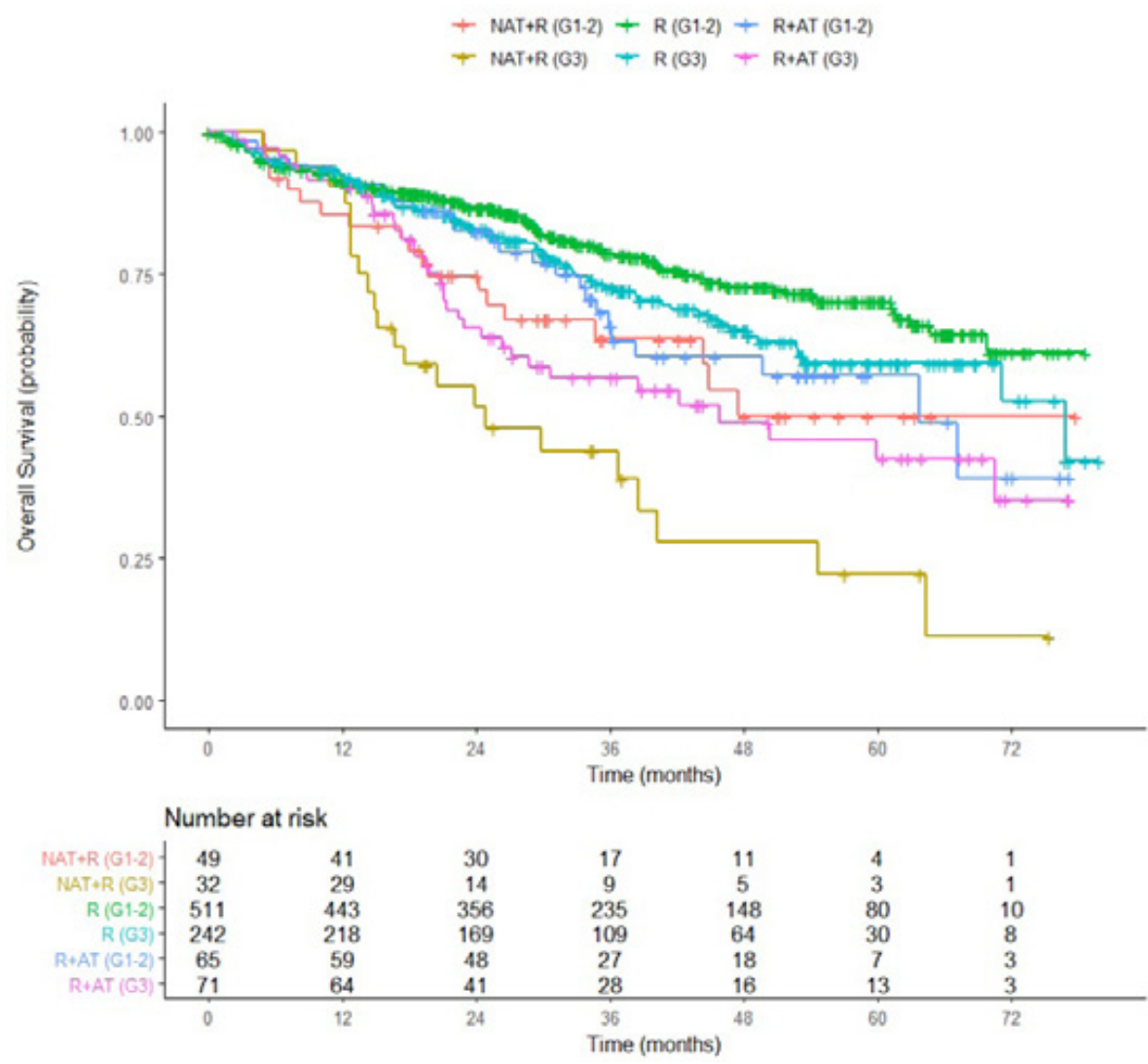
**Objective:** Esophagectomy is recommended for cT1bN0MOG1-3 esophageal/gastroesophageal junction adenocarcinoma (EGAC); the role of perioperative therapy (PT) is not as well defined. We aimed to evaluate outcomes of neoadjuvant (NAT) and adjuvant (AT) therapies in patients with cT1bN0MOG1-3 EGAC treated with esophagectomy.

**Methods:** The National Cancer Database was queried for patients with cT1bN0MOG1-3 EGAC from 2010-2015. Those who underwent radical resection (R) were stratified into groups by PT and grade (G): NAT+R(G1-2), NAT+R(G3), R(G1-2), R(G3), R+AT(G1-2), R+AT(G3). Demographic/clinicopathologic data were analyzed with univariate and multivariable cox proportional hazard models. Overall survival was estimated from time of diagnosis using Kaplan-Meier curves and compared using log-rank tests with adjusted p-values by Benjamini-Hochberg method. Analyses were performed using R version 3.5.2 with significance established at  $p < 0.05$ .

**Results:** 970 patients with cT1bN0MOG1-3 EGAC were identified from 2010-2015, with no demographic differences between groups. AT groups had higher rates of pathologic T ( $p < 0.001$ ) and N ( $p < 0.001$ ) upstaging. Overall survivals were highest in the R(G1-2) and NAT+R(G1-2) groups, with no median survivals reached. Median follow-up time was 32.5 months. Median survivals (in months): R(G3)=76.8, R+AT(G1-2)=63.8, R+AT(G3)=45.8, NAT+R(G3)=24.8. Overall survivals were significantly improved in the R versus PT groups, and G1-2 versus G3 groups. Older age, fewer examined lymph nodes, and higher pN stage were associated with reduced survival by univariate and multivariable analyses.

**Conclusion:** Esophagectomy alone was associated with improved overall survival in both G1-2 and G3 groups. This suggests that upfront esophagectomy should remain standard of care for cT1bN0MOG1-3 EGAC, with AT reserved for pathologic upstaging.

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### **P 12. OUTCOMES OF VARIOUS TREATMENT SEQUENCING STRATEGIES IN OCTOGENARIANS WITH GASTRIC ADENOCARCINOMA: A NATIONAL CANCER DATABASE ANALYSIS**

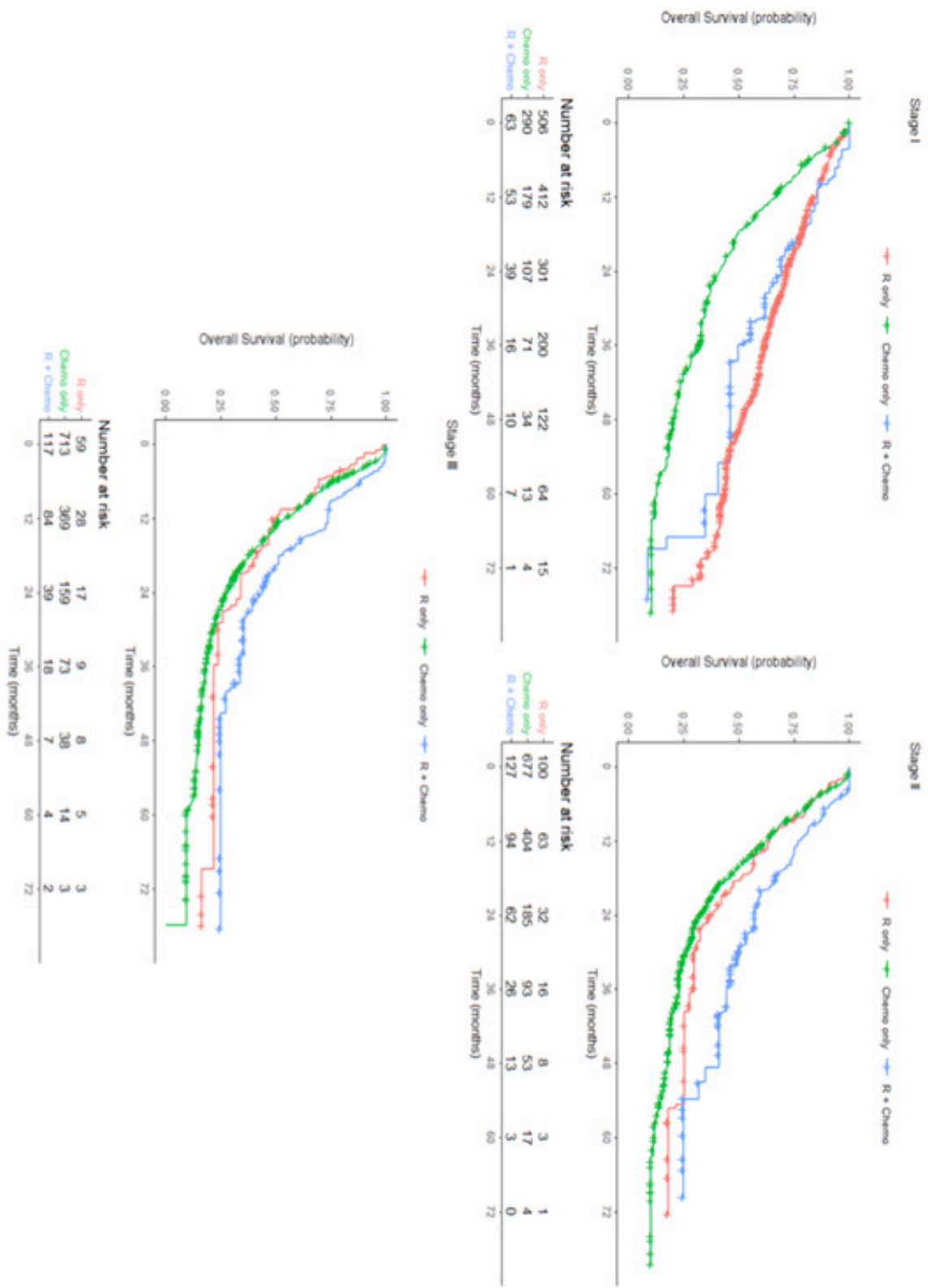
*T Ivanics, S Leonard-Murali, X Han, C Steffes, R Shah, D Kwon*  
Henry Ford Health System

**Objective:** Perioperative therapy for gastric adenocarcinoma (GA) has demonstrated survival benefit. Multi-modality therapy in the elderly can be challenging due to comorbidities/frailty. We aimed to describe outcomes of various treatment sequencing strategies in octogenarians with non-metastatic GA.

**Methods:** The National Cancer Database was queried for patients with GA from 2010-2015. Patients with Stage I-III disease aged 80-89 at diagnosis were included, then stratified into 3 groups: resection only(R), systemic therapy only(ST), and resection with systemic therapy (neoadjuvant and/or adjuvant therapy; R+ST). Overall survival was estimated from time of diagnosis using Kaplan-Meier curves and compared using logrank tests (LRT). Multivariable cox proportional hazard models (MV) were used to compare overall survival among treatment groups, adjusted for demographic and clinicopathologic data.

**Results:** 2,652 octogenarians with stage I-III GA were identified (R=665, ST=1680, R+ST=307). ST was the predominant treatment strategy in stage II-III disease. Stage I median survivals (MS): R=50, ST=17.6, R+ST=35.9 months (LRT: RvsST;p<0.001, R+STvsST;p<0.001, RvsR+ST;p=0.175). ST was an independent risk factor for mortality in stage I on MV analysis (reference:R). Stage II MS: R=18.5, ST=16.3, R+ST=29.2 months (LRT: RvsST;p=0.242, R+STvsST;p<0.001, RvsR+ST;p=0.008). Stage III MS: R=12.0, ST=13.6, R+ST=19.7 months (LRT: RvsST;p=0.475, R+STvsST;p<0.001, RvsR+ST;p=0.082). ST was not an independent risk factor for mortality in stage II-III on MV analysis (reference:R).

**Conclusion:** While ST represented a risk factor for mortality in octogenarians with stage I, ST-only appears non-inferior to R-only in stage II-III GA. Outlining outcomes of treatment approaches for octogenarians with GA may aid in patient counseling and clinical decision-making.



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### **P 13. EVIDENCE-BASED TARGETED CARE PATHWAYS. SIMPLE AND COMPLICATION SPECIFIC**

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Spectrum Health Hospitals

**Objective:** Enhanced recovery pathways (ERP) have shown clinical benefits in colorectal surgery. What hasn't been clear is which components contribute to their success. Institutional data review revealed higher than expected complication rates for serious morbidity, serious SSIs, anastomotic leaks, readmissions, reoperations and acute kidney injury. Using evidence-based targeted pathways for these morbid complications we hoped to focus our resources and optimize outcomes. We hypothesized that this structure would minimize surgical trauma, decrease glycemic variability, and protect end-organ function.

**Methods:** Institutional data and 30 day outcomes were gathered on elective colorectal procedures prior to ERP implementation (pre). This data was compared to the last 2 years of our targeted ERP. Our institution has emphasized compliance with mechanical bowel preparation with oral antibiotics, laparoscopic surgery, and a low dose complex carbohydrate with citrulline. This study was IRB exempt. Statistical analysis was performed using students T test and comparison of proportions with statistical significance set at  $p < 0.05$ .

**Results:** There were 139 patients in pre-ERP group and 143 in ERP group. Age, sex, ASA, and diabetes type I or II did not differ between the groups. Compliance with laparoscopic surgery increased significantly from 52.52% to 70.6%,  $p = 0.0018$  while conversion rates decreased from 35.61% to 15.84%,  $p = 0.0001$ . There was statistical improvement maintaining glucose  $\leq 140$  during pts hospital stay where pre-ERP was 64.01% and ERP was 75.52%,  $p = 0.0356$ . Clinical outcomes that showed statistical improvement included the following: serious morbidity 12.9% vs 2.1%,  $p = 0.0006$ , all SSIs 8.63% vs 2.1%,  $p = 0.0147$ , organ space infections 6.47% vs 1.40%,  $p = 0.0282$  and rates of reoperation 8.03% vs 2.1%,  $p = 0.0229$ . Reduction was found in anastomotic leaks and AKI but these did not reach statistical significance. Resource utilization decreased in ED visits, readmission, and length of stay (LOS), but only LOS reached statistical significance 6.65 days vs 3.59 days,  $p < 0.0001$ .

**Conclusion:** Compliance and implementation of specific care components targeted at complications associated with colectomy significantly reduced the rate of postoperative hyperglycemia, septic complications and severe morbidity. Targeted pathways may be required for sustainable improvement in colectomy outcomes.

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### **P 14. SINGLE SURGEON EXPERIENCE WITH CONVERSION FROM LAPAROSCOPIC TO ROBOTIC ROUX-EN-Y GASTRIC BYPASS: IMPROVING OUTCOMES AS MEASURED BY MBSAQIP REPORTS**

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Rush University Medical Center

**Objective:** Bariatric surgery is the only available therapy that consistently results in long-term weight loss and improvement of obesity related comorbidities. In the 21st century, minimally invasive is the most common approach to weight loss surgery. Laparoscopic or robotic assisted approaches are generally used in the performance of Roux-en-Y gastric bypass. We performed a retrospective review of a consecutive case series of patients who underwent either laparoscopic or robotic assisted Roux-en-Y gastric bypass. This study is an analysis of a single surgeon's experience of converting from laparoscopic Roux-en-Y gastric bypass (LGB), utilizing a circular stapled technique for the gastro-jejunal anastomosis, to a robotic Roux-en-Y gastric bypass (RGB) utilizing the robotic two-layer hand sewn gastro-jejunal anastomotic technique in an effort to improve outcomes.

**Methods:** Data was collected on 83 patients from the initial reporting of Metabolic and Bariatric Surgical Accreditation Quality Improvement Program (MBSAQIP) through December 2014. MBSAQIP reports and a chart review were utilized in a retrospective analysis to compare 30-day and 6-month outcomes between the LGB and RGB. 30-day and 6-month reoperation for any cause, readmission, anastomotic leak, stricture, GI perforation, reoperation for bleeding, and anastomotic ulcer were reviewed.

**Results:** In this study, 29 LGB and 54 RGB cases were completed. Switching to RGB from LGB showed a significant reduction in the rate of reoperations, readmissions, anastomotic leaks, stricture, and readmissions at both 30 days and 6 months. Complication rates for LGB vs RGB at 30 days were reoperation 13.8% vs 3.7%, readmission 10.3% vs 3.7%, anastomotic leak 3.4 vs 0.0%, stricture 3.4% vs 0.0%, GI perforation 0.0% vs 1.9%, and reoperation for bleeding 0.0% vs 1.9% respectively. At 6 months complication rates for LGB vs RGB were reoperation 28.6% vs 5.6%, readmission 14.3% vs 7.4%, anastomotic leak 0.0% vs 0.0%, stricture 21.4% vs 0.0%, GI perforation 3.6% vs 0.0%, reoperation for bleeding 0.0% vs 0.0%, and anastomotic ulcer 0.0% vs 0.0% respectively.

**Conclusion:** Introducing RGB into a single surgeon's practice was feasible, safe, and reduced postsurgical complications. Additionally, when changes within a practice are made, MBSAQIP reporting can help surgeons track improvement in procedures and patient outcomes.

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### **P 15. TXA TOUCHING DOWN: AN INSTITUTIONAL REVIEW OF AEROMED ADMINISTRATION**

*J DeVitis, C Barnhart, A Davis, T Koehler, C Chadwick, A Ziegler, M Dull, C Gibson, A Chapman*  
Spectrum Health Hospitals

**Objective:** Following the CRASH-2 study, tranexamic acid (TXA) administration has become common in patients with traumatic hemorrhage. This has led front line providers, such as AeroMed, to administer TXA to establish early inhibition of fibrinolysis. This study assesses our institutional experience with pre-hospital, AeroMed administration of TXA.

**Methods:** A retrospective review identified 88 trauma patients that received TXA per AeroMed between 2014 and 2018. TXA was administered based on the original CRASH-2 study indications. All cases were reviewed by 3 fellowship trained Trauma surgeons to determine if significant traumatic hemorrhage was evident in retrospect. Outcomes measured included TXA indicated/not indicated 30-day mortality, blood product administration, ICU length of stay (LOS), vent days, hospital LOS and disposition.

**Results:** Of the 88 TXA patients reviewed in this study, 44.3% of did not have retrospective evidence of significant traumatic hemorrhage. The TXA indicated group had significantly higher ISS scores ( $p=0.004$ ) and rates of blood product administration ( $p=0.001$ ; Table). There was a significant difference in discharge destination ( $p=0.038$ ). Mortality, as well as median ICU length of stay, ventilation days and overall length of stay did not significantly vary between the groups. A VTE rate of 4.5% was noted for the entire cohort.

**Conclusion:** TXA was frequently administered by AeroMed in patients without traumatic hemorrhage. While AeroMed has limited diagnostic tools, many patients were administered TXA based on suspicion for clinically significant bleeding only, despite having normal vital signs. Administration of TXA by AeroMed should be based on more stringent guidelines.

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	TXA Indicated (n=49)	TXA Not-Indicated (n=39)	p-value
ISS	28.6±12.0	20.9±11.2	0.004
Blood Product Administration (% y)	69.4% (34/49)	33.3% (13/39)	<0.001
ICU LOS	3 (1-30)	3 (1-21)	0.852
Vent Days	3 (1-30)	2 (1-16)	0.401
Hospital LOS	7 (1-36)	5.5 (1-23)	0.214
Mortality	28.6% (14/49)	25.6% (10/39)	0.759
Discharge Destination			0.038
Home	14.7% (5/34)	39.3% (11/28)	
Rehab	61.8% (21/34)	32.1% (9/28)	
Other	23.5% (8/34)	28.6% (8/28)	

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### **P 16. IMPACT OF INFORMATION TECHNOLOGY ON LENGTH OF STAY AND READMISSIONS IN COMPLEX SURGICAL CARE**

*B Chobrutskiy, H Janjua, E Cousin-Peterson, E Eguia, M Baker, PC Kuo*  
University of South Florida

**Objective:** Implementation of health information technology (IT) is widely assumed to improve clinical outcomes. Although computer MD order entry is associated with decreased length of stay (LOS) and patient safety events, the impact of other IT functions is unknown. Our objective is to determine the relative importance of specific IT functionality compared to patient (P) and hospital (H) characteristics on LOS and 30-day Readmission using liver and pancreas surgeries as a complex care model.

**Methods:** Health Information and Management Systems Society (HIMSS), Healthcare Cost and Utilization Project-State Inpatient Databases (HCUP-SID), and the American Hospital Association Annual Health Survey databases (AHA) for 2013 were linked to create a dataset of 278 variables (90 HCUP; 31 AHA; 157 HIMSS) with 14126 hospital admissions (2355 Readmit; 10228 No Readmit) in 531 hospitals (FL, IA, MA, MD, NY, WA, and WI); 26 liver and pancreas surgeries were identified with ICD-9 procedure codes. Linear backward stepwise regression for LOS ( $r^2$  0.532, 83 variables in final model) and logistic regression for readmission (accuracy 0.832, AUC 0.693) with 80-20 split for training-test subsets were implemented.

**Results:** Among the top 10 variables associated with increased LOS, 7 are patient and 3 are IT (presence of clinical data repository, chart deficiency app and registration module for revenue cycle). For decreased LOS, 1 variable is hospital and 9 are IT (abstracting in the EMR, hospital MRI, computer order entry x 3, enterprise personnel index, ER information system, web based image distribution system, and credit collection app for revenue cycle). Overall, IT variables account for 12/20 variables in LOS. For Readmission, the top 10 included 6 patient variables, 1 hospital and 3 IT (3D image display, lab information system and IT security).

**Conclusion:** In the context of complex surgical care, IT variables are prominently featured among factors associated with LOS and Readmission, even outnumbering hospital factors in certain instances. However, specific IT functionalities may also negatively influence outcomes in an unintended manner. Blind and ever increasing adoption of IT does not inherently improve clinical outcomes.

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TABLE (IT features are highlighted)

	INCREASES	Coefficient	DECREASES	Coefficient
Length of Stay	Sepsis (P)	7.40	Abstracting app in EMR (IT)	-5.78
	Disposition at d/c- Other (P)	6.58	MRI capability in hospital (IT)	-4.45
	Deep venous thrombosis (P)	6.47	MD computer order entry (IT)	-3.57
	Pneumonia (P)	4.40	Total facility admissions (H)	-2.53
	Clinical data repository (IT)	4.40	Enterprise master person index (IT)	-2.09
	Disposition at d/c- Home Health Care (P)	4.15	Computer practitioner order entry (IT)	-1.63
	Chart deficiency app (IT)	3.61	Computer MD order entry (>75%) (IT)	-1.63
	Admission type- Urgent (P)	3.15	Credit collection for Revenue cycle (IT)	-1.56
	Registration module for Revenue cycle (IT)	2.69	Web based image distribution system (IT)	-1.49
	Admission type- Emergency (P)	2.59	ED information system (IT)	-1.47
Readmission	VARIABLE IMPORTANCE			
	Length of stay (P)	4.98	P= patient	
	Number of procedures on d/c record (P)	3.96	H=hospital	
	Comorbidity- Weight loss (P)	3.25	IT= information technology	
	Comorbidity- Alcohol (P)	2.96		
	# Full time registered nurses (H)	2.94		
	Admission type- Urgent (P)	2.78		
	3D image display (IT)	2.67		
	Lab information system (IT)	2.48		
	IT security functions (IT)	2.38		
	Disposition at d/c- Home Health Care (P)	2.36		



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### **P 17. DASHING THROUGH THE SNOW: A 14 YEAR ANALYSIS OF SNOWMOBILE CRASHES AT A MIDWESTERN LEVEL 1 TRAUMA CENTER**

*S Carveth, M Gribbell, R Saunders, A Davis, T Koehler, L Durling, G Iskander, C Gibson, M Maroto, A Chapman*

Spectrum Health Hospitals

**Objective:** Snowmobile-related trauma is a potentially high energy mechanism of injury unique to regions with regular below-freezing temperatures. This study evaluates the impact of snowmobile crashes on a Level 1 Trauma Center with focus on axial skeleton injuries, appendicular skeleton injuries, high energy fractures, visceral injuries and intracranial injuries, with a subgroup analysis on patients with pelvic ring injuries.

**Methods:** Retrospective cohort study examining snowmobile related traumas from 2004 to 2018 at a Midwestern Level 1 trauma center.

**Results:** A total of 202 patients were included, 59.3% of whom were transferred from outside hospitals. Most patients were male (87.3%). The mean age was 38.2+/-12.6 y and the median ISS was 12.5 (4 - 50). Protective devices were worn by 77% of patients, which did not confer an improved outcome. More than 25% of patients (51/202) required ICU admission. 77% of patients required care by more than one medical or surgical service (155/202). A majority of the subjects, >60%, suffered either axial skeleton injuries and/or appendicular skeleton injuries. Comparisons between axial skeleton injuries, appendicular skeleton injuries, high-energy fractures, visceral injuries and intra-cranial injuries showed significant differences for ISS, trauma bay GCS score, number of services involved, ICU stay, transfusion requirement, and total LOS. A subgroup analysis was performed on 21 patients with pelvic ring injuries, among whom the median ISS was 22 (Table). 13 patients sustained lateral compression (LC) type injuries and 8 sustained anterior-posterior compression (APC) type pelvic ring injuries. The APC injury group had a significantly longer median hospital stay of 9 vs 4 days ( $p=0.03$ ), and was more likely to require discharge to a rehabilitation center or skilled nursing facility ( $p=0.02$ ).

**Conclusion:** Snowmobile trauma causes significant injuries that require the expertise of a Level 1 trauma center for definitive care. Patients sustaining pelvic ring injuries are likely to require additional surgical and medical services.

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Variable	Total	LC (n=13)	APC (n=8)	p-value
Age, y	46.5±12.9	46.5±13.2	46.6±13.4	0.978
ISS	22 (9-48)	17 (9-34)	29 (9-48)	0.10
Total LOS	5 (1-92)	4 (1-13)	9 (4-92)	0.03
Discharge Disposition				0.02
Home	35% (7/20)	58.3% (7/12)	0% (0/8)	
Rehab	55% (11/20)	33.3% (4/12)	87.5% (7/8)	
SNF	10% (2/10)	8.3% (1/12)	12.5% (1/8)	

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### **P 18. WHAT DO FORMER RESIDENTS SAY ABOUT THEIR PRELIMINARY YEAR: THEIR EXPERIENCES IN A GENERAL SURGERY RESIDENCY PROGRAM**

*A Rajesh, M Asaad, A Chandra, C Backstrom, N Shaikh, D Farley*  
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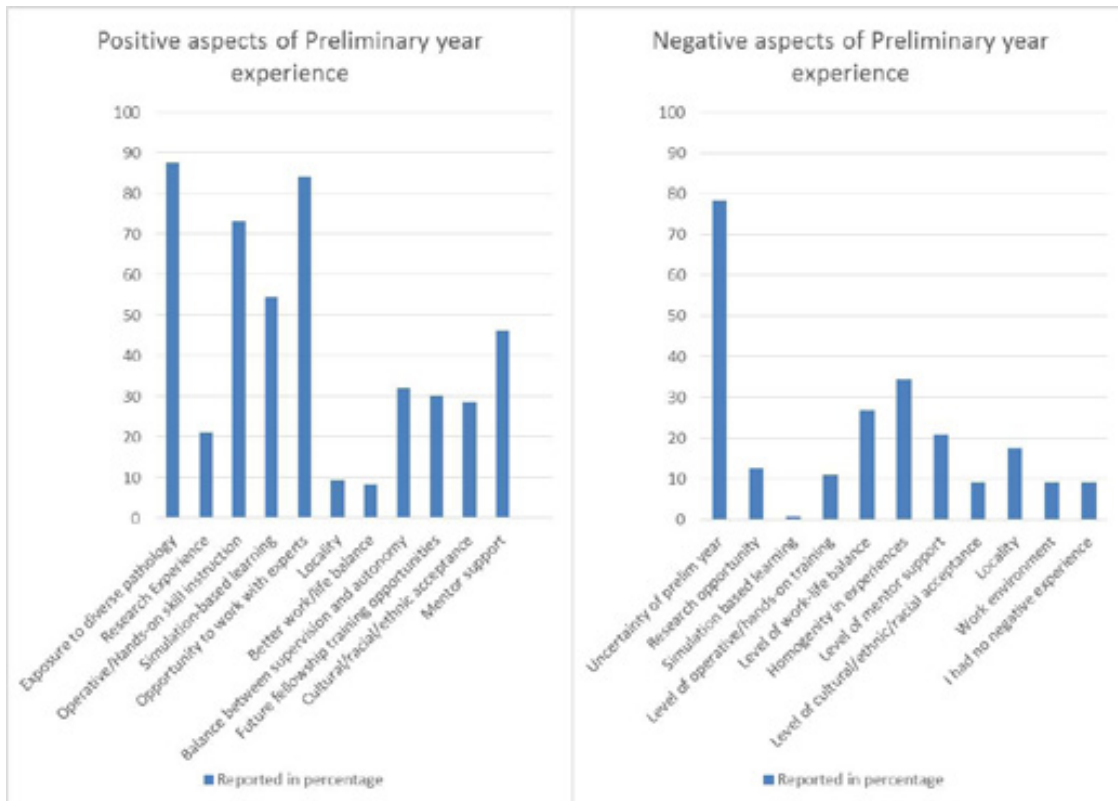
**Objective:** The non-designated preliminary position (NDP) in General Surgery offers a one-year surgical training opportunity for medical school graduates prior to obtaining categorical residency positions. Given there is little long term follow-up of NDPs, we reviewed our 25 years of experience with NDP graduates.

**Methods:** A list of all 315 NDP interns from 1993-2018 in our program was compiled and used to identify and connect with individuals through internet searches (Doximity, LinkedIn, etc.) and personal communication (alumni office, program coordinators, etc.). A 14-question survey was emailed to these individuals.

**Results:** Of 315 NDP interns spending one year with us, we were able to find the current whereabouts of 296 (94%). 119 (40%) former NDP interns responded to the survey. While 71% (n=85) reported that their NDP year gave them a 'strong' foundation for their future career, most respondents suggested that the training year was stressful and increased mentoring and support would have been appreciated. The experiences of our NDP graduates are depicted in the graph. 60% (n=70) of respondents stated that they might have preferred a categorical position at a smaller institution. A total of 72 (62%) told us they applied solely to General Surgery in their first NRMP Match (the one they matched with us as a NDP). 38% of respondents reported fewer interviews and 26% reported the same number of interviews offered when applying to the Match as a PGY1 prelim resident. Nonetheless, 97 (82%) stated that, if given the choice again, they would redo the preliminary year. Of these 97 individuals, 52 (53%) responded that they would do this because it helped them match into their preferred specialty.

**Conclusion:** Pursuing the NDP year is difficult given the looming uncertainty and pressure to perform well. While the vast majority of our NDPs obtained a categorical residency spot following their one year of training with us, feedback from this survey using 25 years of experience suggests we can and should do more to mentor, support, and assist them.

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### **P 19. FEASIBILITY OF USING RESIDENT-SPECIFIC OUTCOMES TO MEASURE INDIVIDUAL PERFORMANCE**

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Loyola University Medical Center

**Objective:** The development and use of novel measures of resident performance have gained the attention of national regulatory and accrediting bodies. With improvements in the availability of surgical quality improvement data and improved risk adjustment, a potential opportunity is to leverage resident-specific patient outcome data to evaluate resident performance. The objective of this study was to determine the feasibility of using surgical outcomes data to measure individual resident performance.

**Methods:** Institutional NSQIP data were obtained for all patients that underwent colectomy on a single surgical service from January 2016 – December 2017. A composite outcome of the following postoperative occurrences was used to develop risk-adjusted models: surgical site infection, wound disruption, unplanned intubation, pulmonary embolism, renal insufficiency, urinary tract infection, c. diff infection, readmission, death. These were chosen using a nominal group technique to identify occurrences potentially modified by resident involvement by program faculty. Resident-level outcomes were estimated from 2-level, random effects models.

**Results:** A total of 280 cases for 12 chief residents were analyzed. Resident case volume ranged from 15 to 32 with unadjusted complication rates ranging from 11.1% to 53.3%. No residents were classified as low outliers with better than expected outcomes, while one resident was classified as a high outlier with worse than expected outcomes (risk-adjusted rate: 41.8%). The proportion of variation attributable to the resident was 0.03 (model intra-class correlation). Reliability of estimates was 0.02 (0.01 – 0.06).

**Conclusion:** Resident-specific surgical outcomes cannot be reliably used to determine individual resident performance on an institutional level. Variation in measured outcomes can only be minimally attributed to the operating resident. Therefore, other metrics of resident performance should be examined to better understand individual progress within a training program.

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### **P 20. INFLUENCE OF PRIOR APPENDECTOMY AND CHOLECYSTECTOMY ON CLOSTRIDIODES DIFFICILE INFECTION RECURRENCE**

*B Ferrel, P Pierson, S Raman, D Frankova, L Rearigh, A Afroze, M Guevara-Hernandez, D Terrero-Salcedo, D Kermode, M Gorvet, J Franko*  
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**Objective:** Appendectomy and cholecystectomy are common procedures and are known to alter the intestinal microbiome. Prior appendectomy has been linked to increased incidence of *Clostridioides difficile* infection (CDI), but the effect of cholecystectomy remains unstudied despite known sporulation-enhancing effects of bile acids. We evaluated the effect of prior appendectomy and/or cholecystectomy on recurrence rate and severity of CDI.

**Methods:** We assessed a system-wide patient cohort diagnosed with their initial CDI in 2014 in a Midwestern teaching hospital and its associated clinics. CDI was established by clinical presentation and confirmed by ELISA toxin immunoassay. The primary outcome measure was recurrence after initial treatment (defined as symptomatic CDI  $\geq 14$  after initial treatment).

**Results:** There were 250 patients with an average age of 65.4  $\pm$  20.1 years. 136 (54.4%) patients experienced a single episode of CDI, whereas 114 (45.6%) experienced  $\geq 1$  recurrence. 12 patients died. The appendix was absent among 47 patients and the gallbladder was absent among 64 patients.

Hospitalization was more common among patients without an appendix (38 out of 151 admitted patients, 25.1% versus 9/99 outpatients, 9.1%;  $p=0.001$ ). CDI recurrence rate was similar among patients without their appendix (24 of 47 patients, 51.1%) as compared to patients with appendix in situ (90 out of 203 patients, 44.3%;  $p=0.404$ ). Mortality was similar between appendectomy versus appendix in situ patients (3/47, 6.4% versus 9/203, 4.4%;  $p=0.573$ ).

Similarly, hospitalization was also more common among patients without their gallbladder (47/151 admitted patients, 31.1% versus 17/99 outpatients, 17.1%;  $p=0.013$ ). CDI recurrence rate was similar among patients without their gallbladder (29 of 64 patients, 45.3%) as compared to patients with gallbladder in situ (85 out of 186 patients, 45.7%;  $p=0.957$ ). Mortality rate was higher in those with an absent gallbladder (7 deaths among 64 patients with prior cholecystectomy, 10.9% versus 5 deaths out of 186 patients with an intact gallbladder, 2.7%;  $p=0.008$ ).

**Conclusion:** *Clostridioides difficile* infected patients with prior appendectomy and/or cholecystectomy require hospitalization more often as compared to patients with intact respective organs, but CDI recurrence rate is not affected by these organs. Patients with prior cholecystectomy experience higher mortality rates associated with their CDI. Further studies remain warranted.

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### **P 21. MORTALITY IN ANTICOAGULATED PATIENTS WHO REQUIRE EMERGENCY ABDOMINAL SURGERY- EXAMINING THE EFFECTS OF NEW ORAL ANTICOAGULANTS**

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**Objective:** The impact of chronic anticoagulation with warfarin or a new oral anticoagulant (NOA) in patients requiring emergency intraabdominal surgery is unknown. The objectives of this study were to determine if patients undergoing emergency intraabdominal surgery receiving NOAs were at increased risk of morbidity and mortality compared to warfarin and to assess the prescribing practices of reversal agents and blood products.

**Methods:** A retrospective, single-center chart review of patients requiring emergency intraabdominal surgery from July 1, 2015 to March 31, 2018 was conducted. Patients were excluded if age 48 hours prior to surgery, warfarin patients with INR <1.5, pregnancy, intra-operative death not due to acute blood loss or large vessel rupture, acute trauma, preexisting congenital coagulopathy, and history of disseminated intravascular coagulation. The objective was to determine if patients who receive NOAs for chronic therapeutic anticoagulation are at increased risk of morbidity and mortality.

**Results:** Thirty-one patients, 23 taking warfarin and 8 taking a NOA were identified, with similar characteristics. Inpatient mortality occurred in 8.7% of warfarin patients and 25% of patients taking a NOA ( $p = 0.268$ ). Bleeding complications were not reported in the 23 warfarin patients but were reported in 2 patients (25%) in the NOA group. No statistically significant difference existed in intensive care unit admission among the warfarin and NOA groups (78.3% and 87.5% respectively;  $p = 1.0$ ). Mean length of hospital stay was 11.5 days in the warfarin group and 8.4 days in the NOA group. Patients in the warfarin group were treated with various reversal agents including vitamin K, and blood products. Patients in the NOA group were treated with prothrombin complex concentrate and red blood cells. As expected, reversal with vitamin K and fresh frozen plasma were statistically significantly higher in the warfarin group ( $p = 0.010$  and  $p = 0.028$ , respectively).

**Conclusion:** Morbidity and inpatient mortality occurred in more patients chronically anticoagulated with a NOA than warfarin.

## Poster Abstracts

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### **P 22. MALE GENDER IS A RISK FACTOR IN LAPAROSCOPIC CHOLECYSTECTOMY: EXPERIENCE AT A LEVEL ONE TRAUMA INSTITUTION**

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St. Vincent Hospital

**Objective:** Laparoscopic cholecystectomy remains one of the most frequent surgeries, accounting for more than 700,000 cholecystectomies in the United States. Although women have a 4-fold higher rate of cholelithiasis than men during the reproductive years, recent articles report that women have better clinical outcomes than age-matched men. We hypothesize that the male sex associates with worse outcomes.

**Methods:** We reviewed records of all laparoscopic cholecystectomies between January 2012 and June 2017 at a trauma level one institution. Patients less than 18 year of age or missing data were excluded. A retrospective analysis of multiple parameters, including patient demographics, perioperative findings and various risk factors between gender was performed. Primary endpoint includes the rate of conversion to open, 30-day morbidity. Secondary endpoint includes ERCP intervention, length of postoperative hospital stays. Statistical analysis was performed using IBM SPSS Statistics 23 software (IBM, Inc., Armonk, NY, and U.S.A). A p value <0.05 was considered statistically significant.

**Results:** A total of 1216 patients were identified. There were 388 males (32.91%) and 828 females (68.09%) with 678 (55.8%) emergency surgeries. Male (mean 57 years) was significantly older than female (mean 49 years) ( $p=0.019$ ), had higher rate of ASA more than 3 (57% vs 40.9%,  $p<0.0001$ ), higher rate of concomitant pancreatitis (5.1% vs 2%,  $p=0.004$ ). Male were more likely to present with acute cholecystitis (64.4% vs 51.8%,  $p<0.0001$ ), had concomitant pancreatitis (4.9% vs 2.1%,  $p=0.006$ ) and more likely to undergo emergent cholecystectomy (62.6% vs 52.5%,  $p<0.001$ ). Multivariable analysis showed that male gender was a risk factor for ERCP procedure (OR 1.59, 95% CI 1.1-2.51,  $p=0.04$ ), 30-day morbidity (OR 1.64, 95% CI 1.03-2.59,  $p=0.03$ ), length of stay longer than 3 days (OR 1.77, 95% CI 1.30-2.41,  $p<0.0001$ ). Male gender was not a risk factor for conversion to open.

**Conclusion:** Male gender showed a significant higher rate of ERCP intervention, higher morbidity and longer hospital stays. The main reason for this may be because male gender was more likely to present with acute cholecystitis or concomitant pancreatitis. These results can be used to give patients a better basis of their informed consent and better resource management in connection with the operation.



## Poster Abstracts

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### **P 23. THE EFFECT OF ADAPTING ROBOTIC INGUINAL HERNIORRHOPHY ON SURGEONS AND TOTAL HOSPITAL VOLUME**

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**Objective:** Laparoscopic inguinal herniorrhaphy started in early 1990's. The Trans Abdominal Pre-peritoneal repair (TAPP) quickly was replaced by the Total Extra-peritoneal repair (TEP) arguably to avoid violating the abdominal cavity and difficulty in closing the peritoneum. In the second half of 2010's the Robotic Trans Abdominal inguinal herniorrhaphy (RTIH) started to make its appearance by strong marketing. Our goal was to evaluate the effect of the robotic approach on surgeon's and hospital total volume and cost.

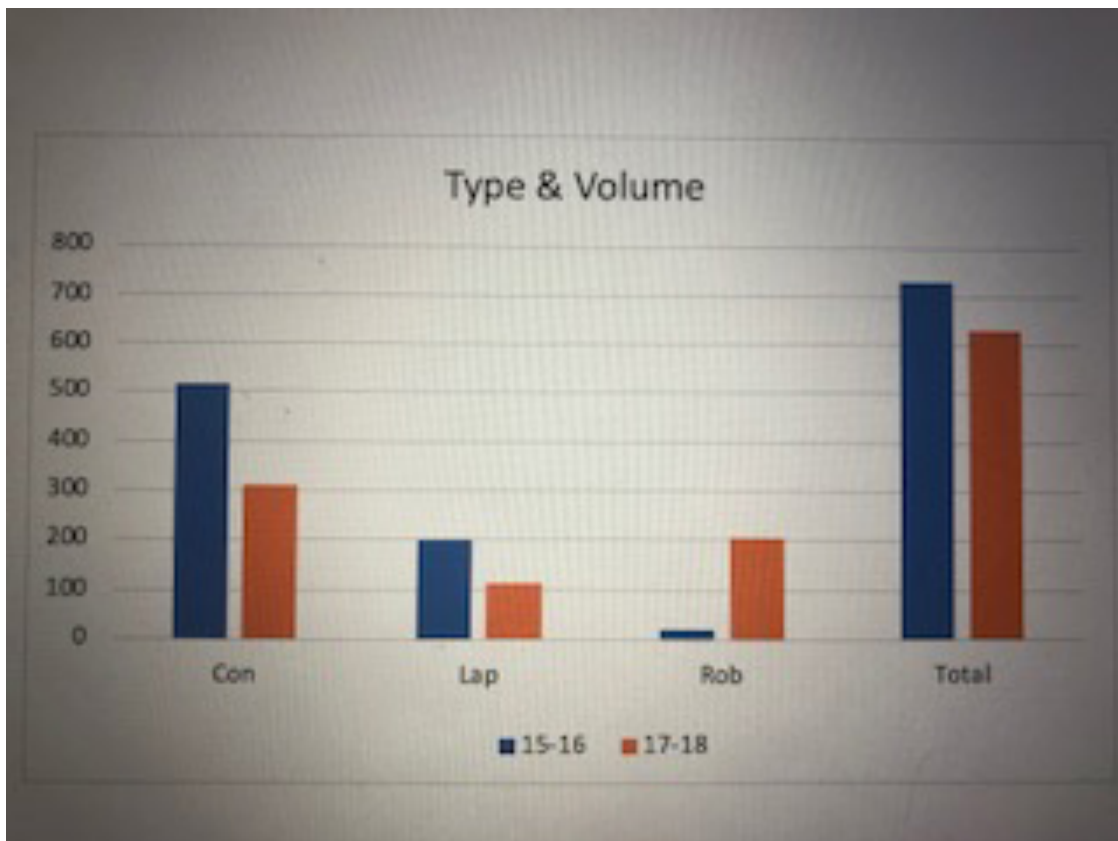
**Methods:** A retrospective hospital and two associated outpatient surgery centers data on inguinal herniorrhaphy were evaluated. Data were divided into two periods. Pre-robotic (2015-2016) and post-robotic (2017-2018). Ten surgeons who operated continuously over the study periods were included. Patients' demographics, volume and hospital cost were evaluated.

**Results:** During the study periods 1,364 patients were operated on electively. Patients' demographics were similar between the two groups. The total number of conventional and laparoscopic repairs dropped from 514 cases to 311 cases and from 198 cases to 115 cases for the conventional and the laparoscopic repair respectively between the two periods. The robotic cases, however, increased from 21 cases to 205 cases.

**Conclusion:** Adapting robotic inguinal herniorrhaphy did not increase total hospital volume. It created a shift from out-patient facilities to main hospital. The profitability declined. Surgeons' volume also did not change and it was basically a shift in choosing the type of repair and the facility.

## Poster Abstracts

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## Poster Abstracts

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### **P 24. EXCELLENCE CAN BE ACHIEVED IN "LOW VOLUME" BARIATRIC SURGERY CENTERS; A SINGLE CENTER EXPERIENCE**

*V Jain, KL Harold, DG Pearson, JA Madura*  
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**Objective:** Bariatric surgery is a complex intervention with a controversial volume-outcome relationship. Center of Excellence (COE) designation, and often insurance coverage, require an arbitrary annual surgery volume potentially restricting access to quality care. This analysis evaluates outcomes of a single center (with a dedicated multidisciplinary bariatric surgery team) to demonstrate that high quality bariatric surgical outcomes can be achieved at a "low volume" center.

**Methods:** Retrospective review of a prospectively maintained database including 337 bariatric surgeries performed over 6 years at a single tertiary care center. Descriptive statistics were reported to summarize the data. Median was used as a measure of central tendency and interquartile range (IQ 25-75) was used to reflect distribution of data. Outcomes of interest included 30-day mortality, perioperative complication rate (surgical and medical complications occurring within 30 days), percentage of excess weight lost (%EWL), and improvement of obesity related co-morbidities. Evaluations were representative of the study population at 1 year after surgery.

**Results:** 271 primary procedures were performed: 244 gastric bypass (GBP), 23 laparoscopic adjustable gastric banding (LAGB), 4 sleeve gastrectomies (SG); and 66 revisions or remedial operations. Combined total procedures average 56 per year (range 41-72). No in-hospital or 30-day mortalities occurred. Total perioperative surgical complication rate was 9.8% (wound infection 5.4%). Of total surgical complications, 3.6% occurred with primary procedures and 6.3% with revisions or remedial operations. Total perioperative medical complication rate was 3.6%. At 1 year, mean %EWL was as follows: Gastric Bypass- 70%, Sleeve Gastrectomy- 63.5%, Lap adjustable gastric band- 31.3 %, revisions 24.2%. Resolution of diabetes overall with stringent criteria was 42.9% (GB 44.9% (35/78), LAGB 50% (1/2), revisions 27.27% (3/11), overall improvement in hypertension and OSA was 63.7% and 69.4%, respectively, and overall mean change in total cholesterol and triglycerides was -19.8 mg/dL and -71.3 mg/dL, respectively.

**Conclusion:** This single center experience confirms that excellent bariatric surgery outcomes can be achieved at institutions committed to comprehensive evaluation and treatment of obese patients through a structured bariatric program irrespective of annual volume of surgeries performed. This supports the adoption of lower volume requirement for COE designation and insurance coverage policy.

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### **P 25. INITIATION OF ENHANCED RECOVERY AFTER SURGERY PROTOCOL WITH MULTIMODAL ANALGESIA DECREASES OPIATE USE IN COLON AND RECTAL SURGERY**

*G Ong, W Oh, D Maun, TJ Reidy, RB Melbert, B Tsai, FR Lane*  
Franciscan Health

**Objective:** Enhanced recovery after surgery (ERAS) protocols can reduce measurable outcomes such as hospital stay, postoperative pain, hospital readmission, and complications. Our institution initiated a multimodality analgesia protocol based on these potential benefits. The objective of this study was to evaluate postoperative outcomes before and after initiation of our ERAS protocol in colon and rectal surgery patients.

**Methods:** Retrospective chart review was performed on all inpatient colorectal surgeries performed at a single institution during two distinct seven month time frames. January to July 2017 constituted surgeries performed prior to ERAS protocols and December 2017 to June 2018 was after initiation of ERAS protocols. Our protocol consisted of multimodality analgesia during all phases of surgery. Preoperatively, patients were given oral gabapentin, acetaminophen, celecoxib, and tramadol. At the time of surgery, anesthesiology performed four quadrant transverse abdominis plane blocks and infused ketamine. During postoperative hospital recovery, oral gabapentin, tramadol, and celecoxib were given primarily for pain control with opiates available only as a backup option for severe pain. Primary outcome measures were postoperative inpatient opiate consumption and pain scores. Length of hospital stay was a secondary outcome measure. Data were grouped and analyzed using student's t-test,  $p < 0.05$  considered statistically significant.

**Results:** A total of 265 and 279 colorectal procedures were performed before and during ERAS periods, respectively. Postoperative opiate use decreased 55% from  $40.8 \pm 12.6$  morphine-milligram equivalent (MME) to  $18.5 \pm 8.6$  MME ( $p = 0.00005$ ). Mean length of stay decreased from  $120.8 \pm 14.3$  hours to  $108.2 \pm 9.6$  hours after starting ERAS protocol, but this did not reach statistical significance ( $p = 0.26$ ). There were no differences in pain scores at immediate postop or day of hospital discharge.

**Conclusion:** Our enhanced recovery protocol significantly reduced postoperative opiate consumption following colon and rectal surgery without affecting postoperative pain scores. This suggests that multimodal analgesia strategies with non-narcotic medications have equivalent pain control compared to opiates. Although length of stay was trending down after ERAS initiation, this did not reach statistical significance. The marked reduction in postoperative opiate consumption justifies continued utilization of this ERAS protocol and application across other surgical specialties.

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	Before ERAS n=265	With ERAS n=279	p Value
Inpatient Opiate Use (MME)	40.8 ± 12.5	18.5 ± 8.5	0.00005
Pain Score on POD#0	2.4 ± 0.2	2.1 ± 0.2	0.25
Pain Score on Discharge Date	2.3 ± 0.1	2.1 ± 0.1	0.32
Length of Stay (hours)	120.8 ± 14.3	108.2 ± 9.5	0.26

ERAS, enhanced recovery after surgery protocol

MME, morphine milligram equivalent

## In Memoriam

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There were no reported deaths  
of MSA members  
during the 2018-2019 year.

To send notice of death to  
MSA Headquarters,  
please email [msa@lp-etc.com](mailto:msa@lp-etc.com)

## Notice of Change

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## Notes

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## Notes

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## Notes

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[www.midwestsurg.org](http://www.midwestsurg.org)



# 2020 MSA Annual Meeting

SAVE THE DATE  
August 2 - 4, 2020

Mackinac Island, MI | Grand Hotel



# 2021 CSA & MSA Annual Meeting

SAVE THE DATE  
July 25 - 27, 2021

Chicago, IL | Westin Chicago River North